

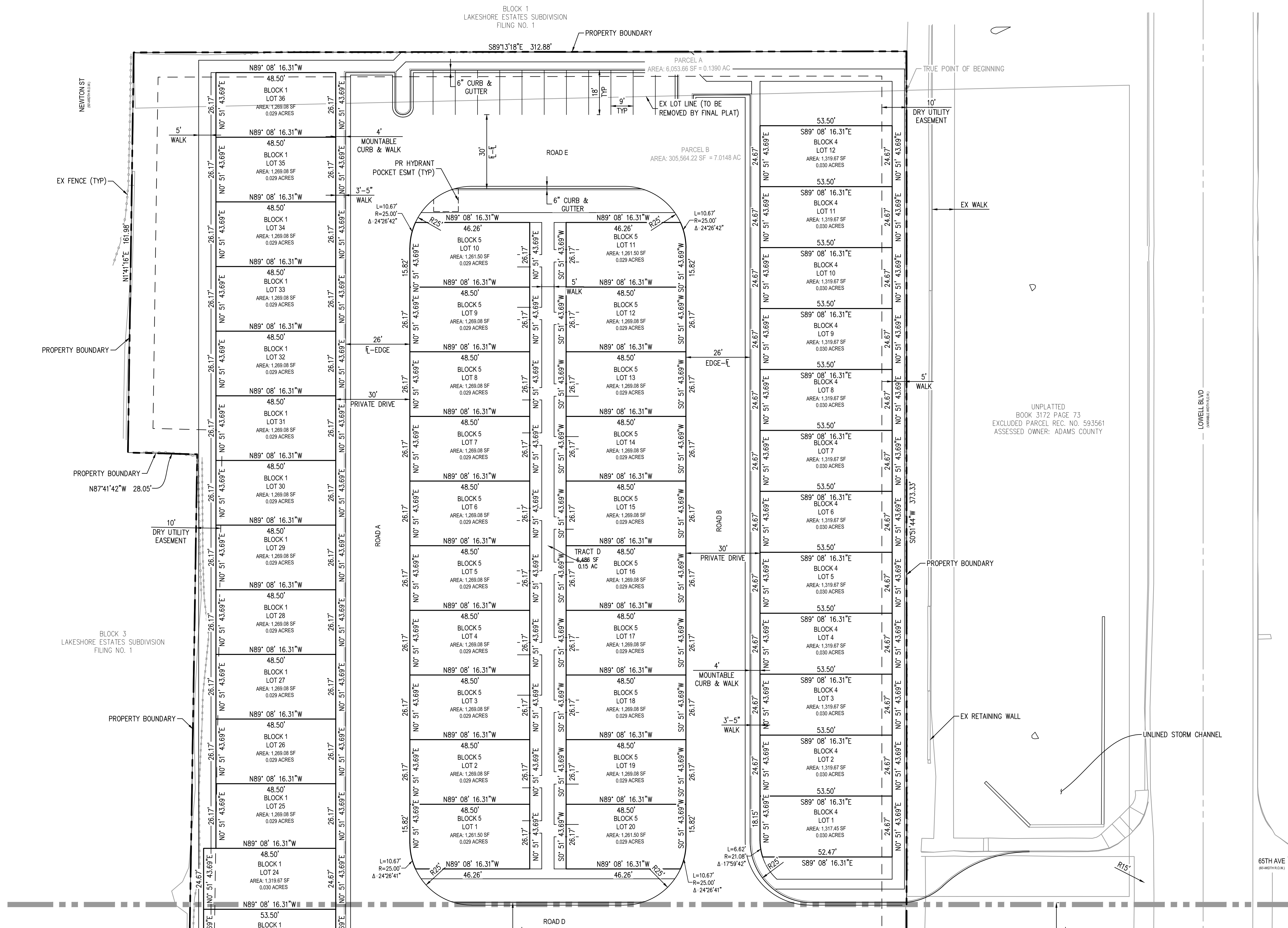
TTLIC DENVER - LOWELL

TWO PARCELS LOCATED IN THE SOUTHEAST 1/4 OF THE SOUTHEAST 1/4 OF SECTION 6, TOWNSHIP 3 SOUTH, RANGE 68 WEST OF THE SIXTH P.M. COUNTY OF ADAMS, STATE OF COLORADO

MAJOR SUBDIVISION PRELIMINARY PLAT

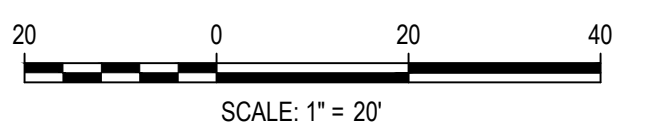
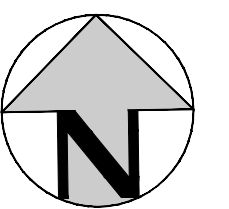
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- LEGEND**
- PROPERTY BOUNDARY
 - LOT LINE
 - SETBACK LINE
 - DRY UTILITY EASEMENT

UNPLATTED
BOOK 3172 PAGE 73
EXCLUDED PARCEL REC. NO. 593561
ASSESSED OWNER: ADAMS COUNTY



MATCH LINE - SEE SHEET 3

REVISION DATE:

ISSUE DATE: 06-11-2021

SITE PLAN
SHEET 2 OF 10

TTLIC DENVER - LOWELL

PROJECT #: 20217

TTLIC DENVER - LOWELL

TWO PARCELS LOCATED IN THE SOUTHEAST 1/4 OF THE SOUTHEAST 1/4 OF SECTION 6, TOWNSHIP 3 SOUTH, RANGE 68 WEST OF THE SIXTH P.M. COUNTY OF ADAMS, STATE OF COLORADO

MAJOR SUBDIVISION PRELIMINARY PLAT

MATCH LINE - SEE SHEET 2

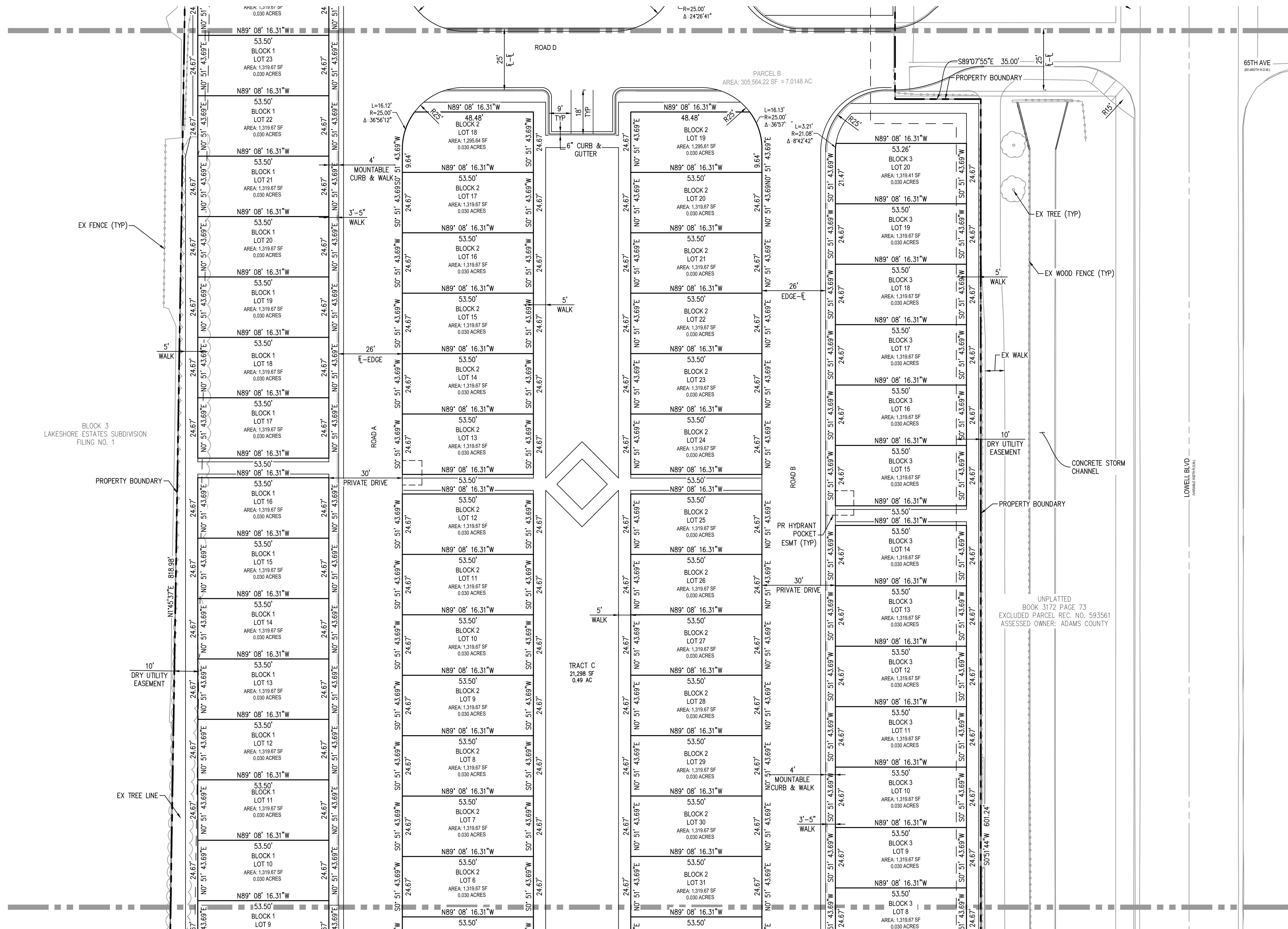
R=25.00'
Δ 24°26'41"

PARCEL B
AREA: 305,564.22 SF = 7.0148 AC

65TH AVE
(R-2000 ZONING)

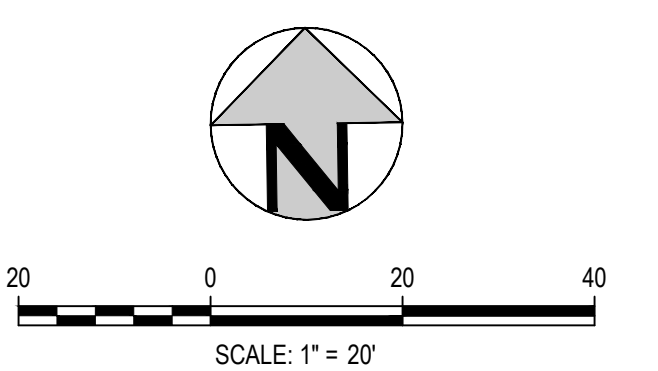
- LEGEND**
- PROPERTY BOUNDARY
 - LOT LINE
 - SETBACK LINE
 - DRY UTILITY EASEMENT

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MATCH LINE - SEE SHEET 4

REVISION DATE: ISSUE DATE: 06-11-2021 SHEET 3 OF 10



TTLIC DENVER - LOWELL

Project: 16-2009 PENDING PRELIMINARY PLAT - SITE LAYOUT - LAYOUT
Client: HARRIS KOCHER SMITH
Date: 06/11/2021 10:05:34 AM
By: Kevin Bunch

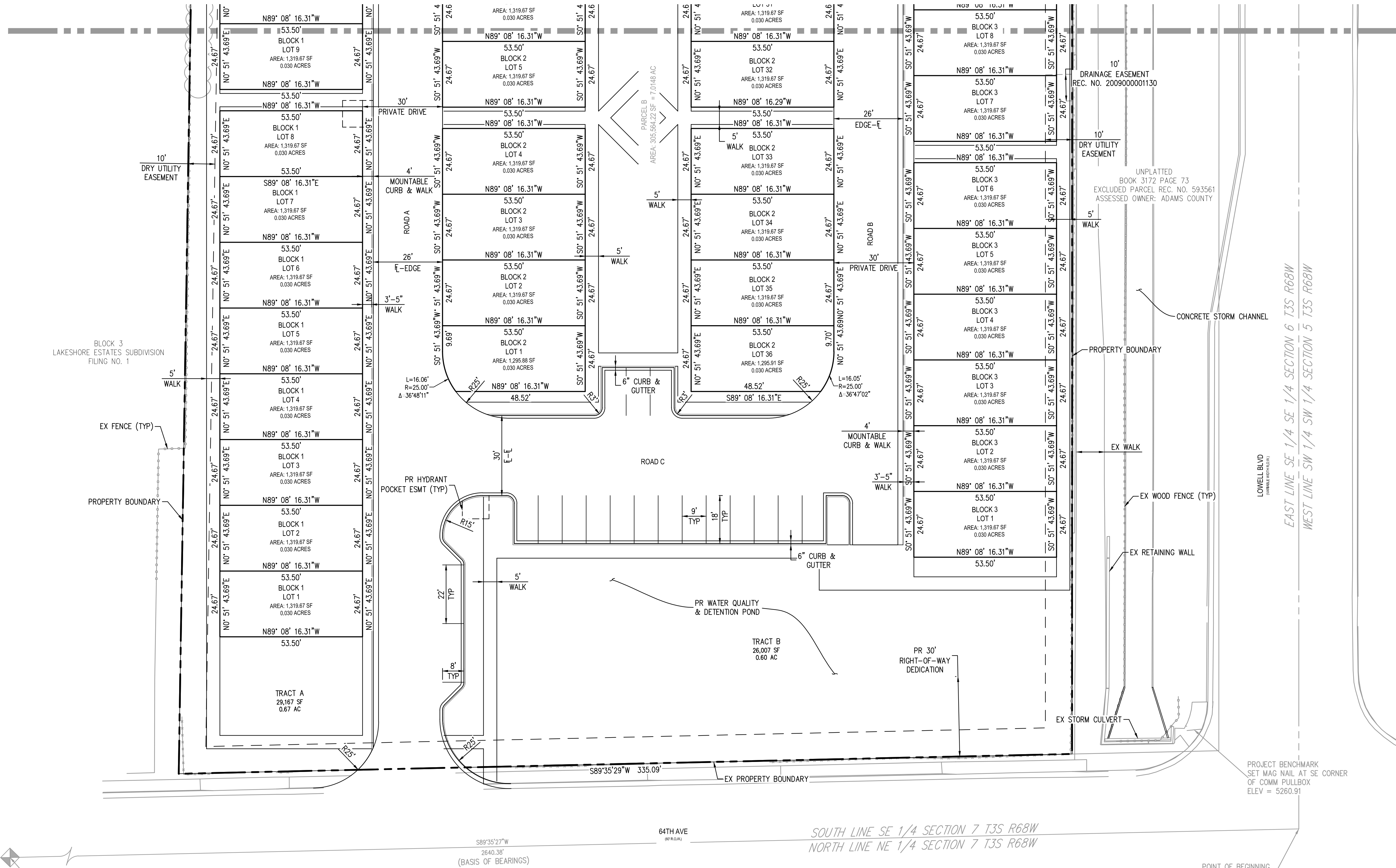
PROJECT #: 200817

TTLIC DENVER - LOWELL

TWO PARCELS LOCATED IN THE SOUTHEAST 1/4 OF THE SOUTHEAST 1/4 OF SECTION 6, TOWNSHIP 3 SOUTH, RANGE 68 WEST OF THE SIXTH P.M. COUNTY OF ADAMS, STATE OF COLORADO

MAJOR SUBDIVISION PRELIMINARY PLAT

MATCH LINE - SEE SHEET 3



LEGEND

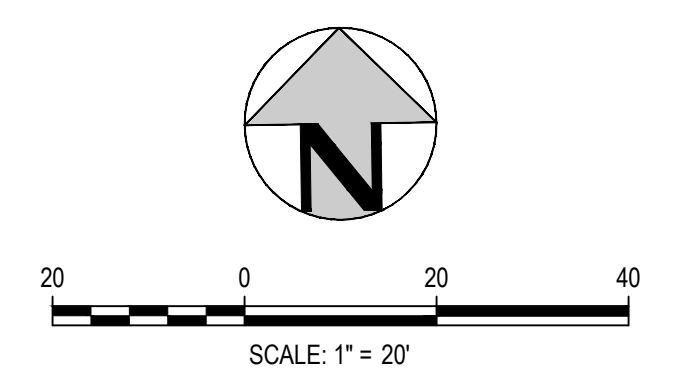
PROPERTY BOUNDARY	---
LOT LINE	---
SETBACK LINE	---
DRY UTILITY EASEMENT	---

NO CHANGES ARE TO BE MADE TO THIS DRAWING WITHOUT WRITTEN PERMISSION OF HARRIS KOEHLER SMITH.

FILED IN 2021 ENGINEERING PRELIMINARY PLAT FOR SITE PLANNING LAYOUTS
PROJECT: PRC 2021-00002, BY: Kevin Boudreau

1/4 CORNER SECTION 6/SECTION 7
FOUND 1.5" AXLE W/
2" ALUMINUM CAP IN RANGE BOX
DOWN 1.5' BELOW ROAD SURFACE
ILLEGIBLE

POINT OF BEGINNING
SW CORNER SECTION 6
FOUND 1" AXLE IN RANGE BOX
DOWN 1.3' BELOW ROAD SURFACE



EAST LINE SE 1/4 SE 1/4 SECTION 6 T3S R68W
WEST LINE SW 1/4 SW 1/4 SECTION 5 T3S R68W

SOUTH LINE SE 1/4 SECTION 7 T3S R68W
NORTH LINE NE 1/4 SECTION 7 T3S R68W

REVISION DATE:

ISSUE DATE: 06-11-2021

SITE PLAN
SHEET 4 OF 10

TTLIC DENVER - LOWELL

PROJECT #: 200917

TTLIC DENVER - LOWELL

TWO PARCELS LOCATED IN THE SOUTHEAST 1/4 OF THE SOUTHEAST 1/4 OF SECTION 6, TOWNSHIP 3 SOUTH, RANGE 68 WEST OF THE SIXTH P.M. COUNTY OF ADAMS, STATE OF COLORADO
MAJOR SUBDIVISION PRELIMINARY PLAT

BLOCK 1
LAKESHORE ESTATES SUBDIVISION
FILING NO. 1

S89°13'18"E 312.88'

PROPERTY BOUNDARY

10'
DRY UTILITY EASEMENT

EX STORM
FLARED END SECTION

NEWTON ST
(UNIMPROVED)

N1°41'16"E 161.98'

8'
SETBACK

PROPERTY BOUNDARY

N87°41'42"W 28.05'

10'
DRY UTILITY EASEMENT

BLOCK 3
LAKESHORE ESTATES SUBDIVISION
FILING NO. 1

BLOCK 1
LOT 36
AREA: 1,269.08 SF
0.029 ACRES

BLOCK 1
LOT 35
AREA: 1,269.08 SF
0.029 ACRES

BLOCK 1
LOT 34
AREA: 1,269.08 SF
0.029 ACRES

BLOCK 1
LOT 33
AREA: 1,269.08 SF
0.029 ACRES

BLOCK 1
LOT 32
AREA: 1,269.08 SF
0.029 ACRES

BLOCK 1
LOT 31
AREA: 1,269.08 SF
0.029 ACRES

BLOCK 1
LOT 30
AREA: 1,269.08 SF
0.029 ACRES

BLOCK 1
LOT 29
AREA: 1,269.08 SF
0.029 ACRES

BLOCK 1
LOT 28
AREA: 1,269.08 SF
0.029 ACRES

BLOCK 1
LOT 27
AREA: 1,269.08 SF
0.029 ACRES

BLOCK 1
LOT 26
AREA: 1,269.08 SF
0.029 ACRES

BLOCK 1
LOT 25
AREA: 1,269.08 SF
0.029 ACRES

BLOCK 1
LOT 24
AREA: 1,319.67 SF
0.030 ACRES

BLOCK 1

BLOCK 5
LOT 10
AREA: 1,261.50 SF
0.029 ACRES

BLOCK 5
LOT 11
AREA: 1,261.50 SF
0.029 ACRES

BLOCK 5
LOT 9
AREA: 1,269.08 SF
0.029 ACRES

BLOCK 5
LOT 8
AREA: 1,269.08 SF
0.029 ACRES

BLOCK 5
LOT 7
AREA: 1,269.08 SF
0.029 ACRES

BLOCK 5
LOT 6
AREA: 1,269.08 SF
0.029 ACRES

BLOCK 5
LOT 5
AREA: 1,269.08 SF
0.029 ACRES

BLOCK 5
LOT 4
AREA: 1,269.08 SF
0.029 ACRES

BLOCK 5
LOT 3
AREA: 1,269.08 SF
0.029 ACRES

BLOCK 5
LOT 2
AREA: 1,269.08 SF
0.029 ACRES

BLOCK 5
LOT 1
AREA: 1,261.50 SF
0.029 ACRES

BLOCK 5
LOT 20
AREA: 1,261.50 SF
0.029 ACRES

BLOCK 5
LOT 19
AREA: 1,269.08 SF
0.029 ACRES

BLOCK 5

BLOCK 4
LOT 12
AREA: 1,319.67 SF
0.030 ACRES

BLOCK 4
LOT 11
AREA: 1,319.67 SF
0.030 ACRES

BLOCK 4
LOT 10
AREA: 1,319.67 SF
0.030 ACRES

BLOCK 4
LOT 9
AREA: 1,319.67 SF
0.030 ACRES

BLOCK 4
LOT 8
AREA: 1,319.67 SF
0.030 ACRES

BLOCK 4
LOT 7
AREA: 1,319.67 SF
0.030 ACRES

BLOCK 4
LOT 6
AREA: 1,319.67 SF
0.030 ACRES

BLOCK 4
LOT 5
AREA: 1,319.67 SF
0.030 ACRES

BLOCK 4
LOT 4
AREA: 1,319.67 SF
0.030 ACRES

BLOCK 4
LOT 3
AREA: 1,319.67 SF
0.030 ACRES

BLOCK 4
LOT 2
AREA: 1,319.67 SF
0.030 ACRES

BLOCK 4
LOT 1
AREA: 1,317.45 SF
0.030 ACRES

BLOCK 4

PR BLOW-OFF VALVE (TYP)

PR 8" x 8" TEE (TYP)

PR 8" PVC WATER MAIN (TYP)

PR FIRE HYDRANT

PR SANITARY MANHOLE (TYP)

PR 8" PVC SANITARY MAIN (TYP)

PR 8" PVC WATER MAIN (TYP)

PR 8" PVC SANITARY MAIN (TYP)

PR 8" PVC WATER MAIN (TYP)

PR 8" PVC SANITARY MAIN (TYP)

PR 8" PVC WATER MAIN (TYP)

PR 8" PVC SANITARY MAIN (TYP)

PR 8" PVC WATER MAIN (TYP)

PR 8" PVC SANITARY MAIN (TYP)

PR 8" PVC WATER MAIN (TYP)

PR 8" PVC SANITARY MAIN (TYP)

PR 8" PVC WATER MAIN (TYP)

PR 8" PVC SANITARY MAIN (TYP)

PR 10" TYPE R STORM INLET

PR 10" TYPE R STORM INLET

PR 24" RCP STORM SEWER (TYP)

PR 8" x 8" TEE (TYP)

PR 8" PVC WATER MAIN (TYP)

PR FIRE HYDRANT

PR SANITARY MANHOLE (TYP)

PR 8" PVC SANITARY MAIN (TYP)

PR 8" PVC WATER MAIN (TYP)

PR 8" PVC SANITARY MAIN (TYP)

PR 8" PVC WATER MAIN (TYP)

PR 8" PVC SANITARY MAIN (TYP)

PR 8" PVC WATER MAIN (TYP)

PR 8" PVC SANITARY MAIN (TYP)

PR 8" PVC WATER MAIN (TYP)

PR 8" PVC SANITARY MAIN (TYP)

PR 8" PVC WATER MAIN (TYP)

PR 8" PVC SANITARY MAIN (TYP)

PR 8" PVC WATER MAIN (TYP)

PR 8" PVC SANITARY MAIN (TYP)

PR 8" PVC WATER MAIN (TYP)

PR 10" TYPE R STORM INLET

PR 10" TYPE R STORM INLET

PR 24" RCP STORM SEWER (TYP)

ROAD E

WALK (TYP)

ROAD A

ROAD B

ROAD D

ROAD E

WALK (TYP)

ROAD A

ROAD B

ROAD D

ROAD E

WALK (TYP)

ROAD A

ROAD B

ROAD D

ROAD E

WALK (TYP)

ROAD A

ROAD B

ROAD D

ROAD E

WALK (TYP)

ROAD A

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WALK (TYP)

ROAD A

ROAD B

ROAD D

ROAD E

WALK (TYP)

ROAD A

ROAD B

ROAD D

ROAD E

WALK (TYP)

ROAD A

ROAD B

ROAD D

UNPLATTED
BOOK 3172 PAGE 73
EXCLUDED PARCEL REC. NO. 593561
ASSESSED OWNER: ADAMS COUNTY

EX 8" PVC WATER MAIN

EX UNDERGROUND TELECOMM (TYP)

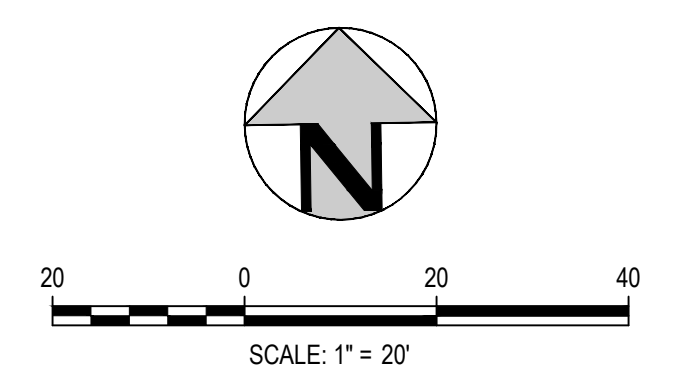
EX 8" PVC SANITARY MAIN

EX STORM FLARED END SECTION

UNLINED STORM CHANNEL

65TH AVE
(IMPROVED)

LEGEND	
PROPERTY BOUNDARY	---
PROPOSED WATER	—W—
PROPOSED HYDRANT	▲
PROPOSED SANITARY SEWER W/ MANHOLE	—SS—
PROPOSED STORM SEWER	—ST—
PROPOSED STORM SEWER INLET	—UT—
EXISTING WATER	—W—
EXISTING SANITARY SEWER	—SS—
EXISTING STORM SEWER	—ST—
EXISTING UNDERGROUND TELECOMM	—UT—
EXISTING GAS	—G—
EXISTING UNDERGROUND ELECTRIC	—UE—



MATCH LINE - SEE SHEET 6

REVISION DATE: ISSUE DATE: 06-11-2021 SHEET 5 OF 10

OVERALL UTILITY PLAN
TTLIC DENVER - LOWELL

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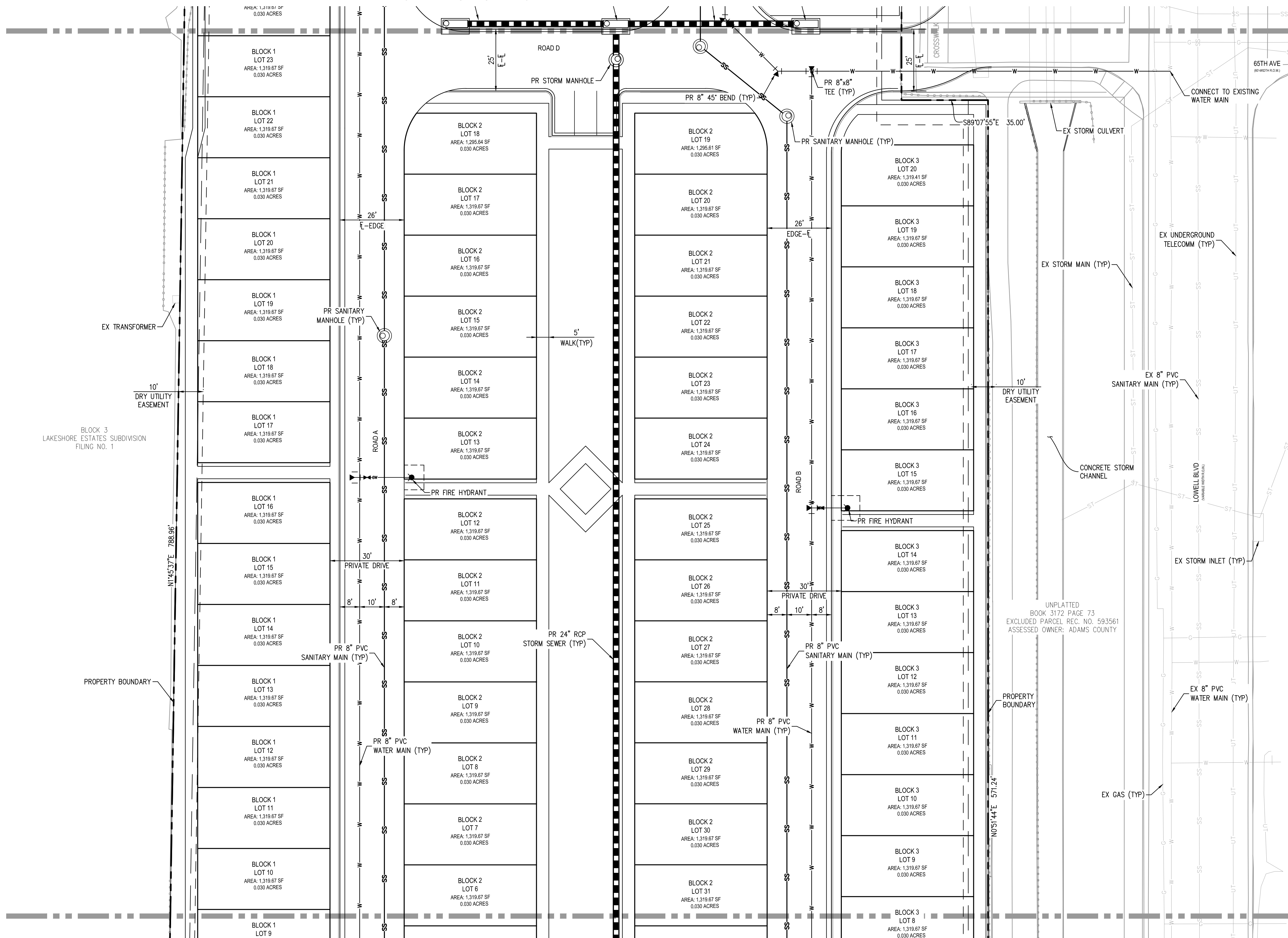
TTLIC DENVER - LOWELL

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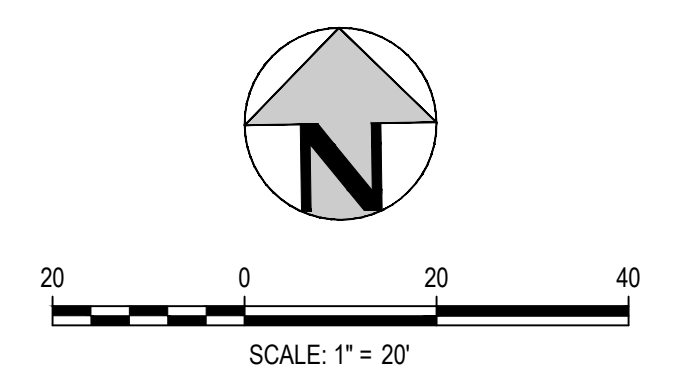
MAJOR SUBDIVISION PRELIMINARY PLAT

MATCH LINE - SEE SHEET 5

MATCH LINE - SEE SHEET 7



LEGEND	
PROPERTY BOUNDARY	---
PROPOSED WATER	W
PROPOSED HYDRANT	▲
PROPOSED SANITARY SEWER W/ MANHOLE	SS (with circle)
PROPOSED STORM SEWER	SS (with dashed line)
PROPOSED STORM SEWER INLET	□
EXISTING WATER	W
EXISTING SANITARY SEWER	SS
EXISTING STORM SEWER	ST
EXISTING UNDERGROUND TELECOMM	UT
EXISTING GAS	G
EXISTING UNDERGROUND ELECTRIC	UE



REVISION DATE: ISSUE DATE: 06-11-2021 SHEET 6 OF 10

OVERALL UTILITY PLAN
TTLIC DENVER - LOWELL

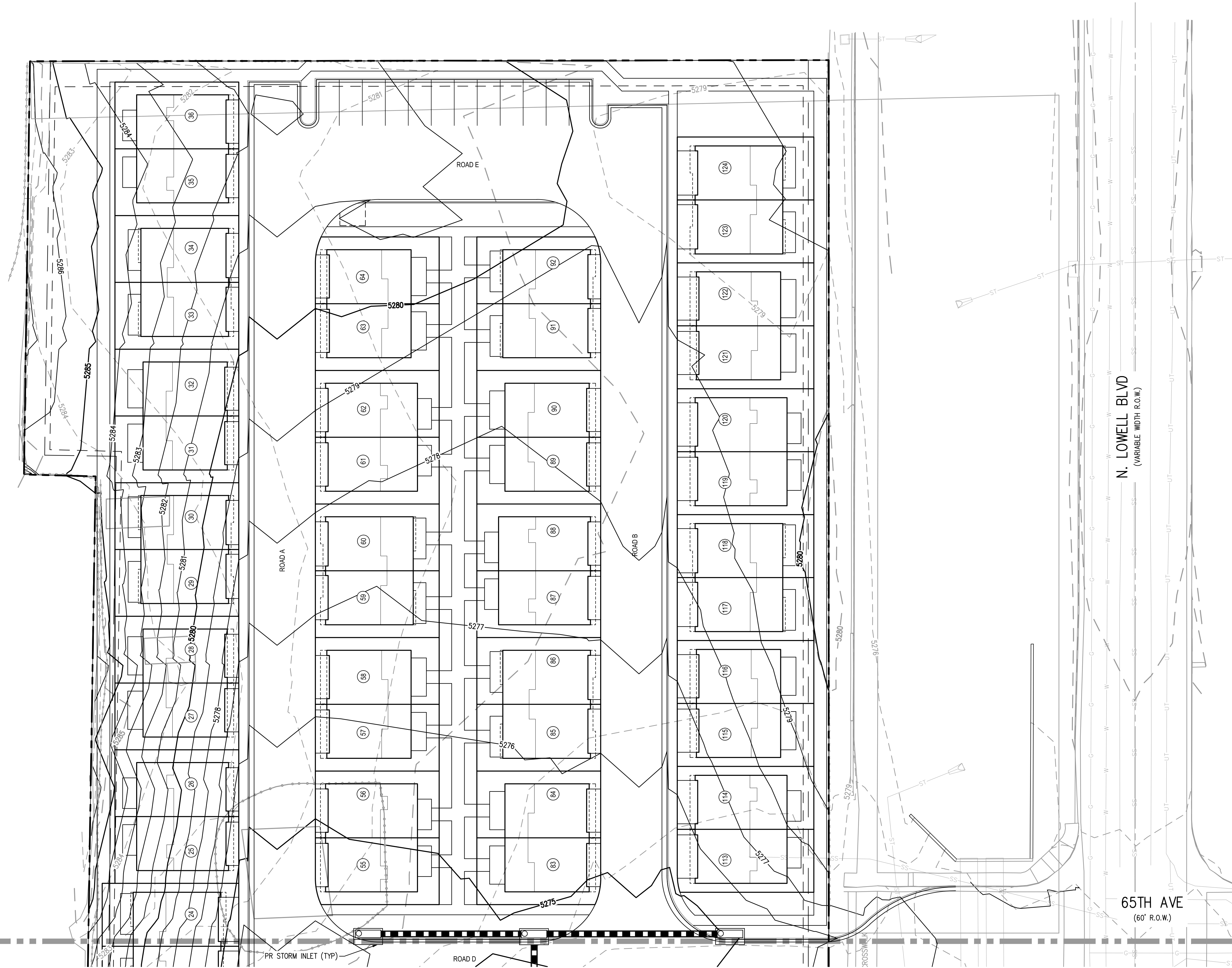
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TTLIC DENVER - LOWELL

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MAJOR SUBDIVISION PRELIMINARY PLAT

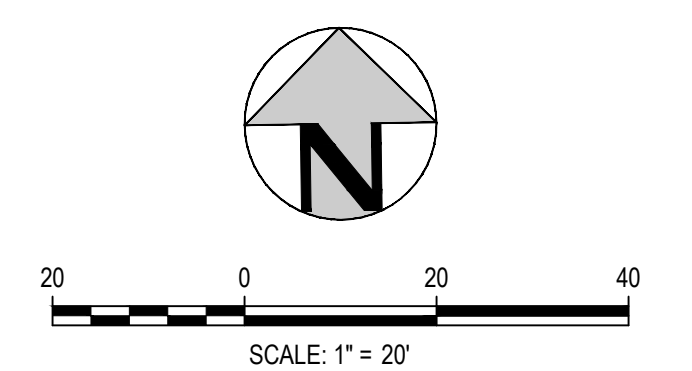
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LEGEND

- PROPERTY BOUNDARY
- PROPOSED CONTOUR
- EXISTING CONTOUR
- PROPOSED STORM SEWER
- PROPOSED STORM SEWER INLET
- EXISTING STORM SEWER



MATCH LINE - SEE SHEET 9

65TH AVE
(60' R.O.W.)

REVISION DATE: ISSUE DATE: 06-11-2021 SHEET 8 OF 10

OVERALL GRADING PLAN
TTLIC DENVER - LOWELL

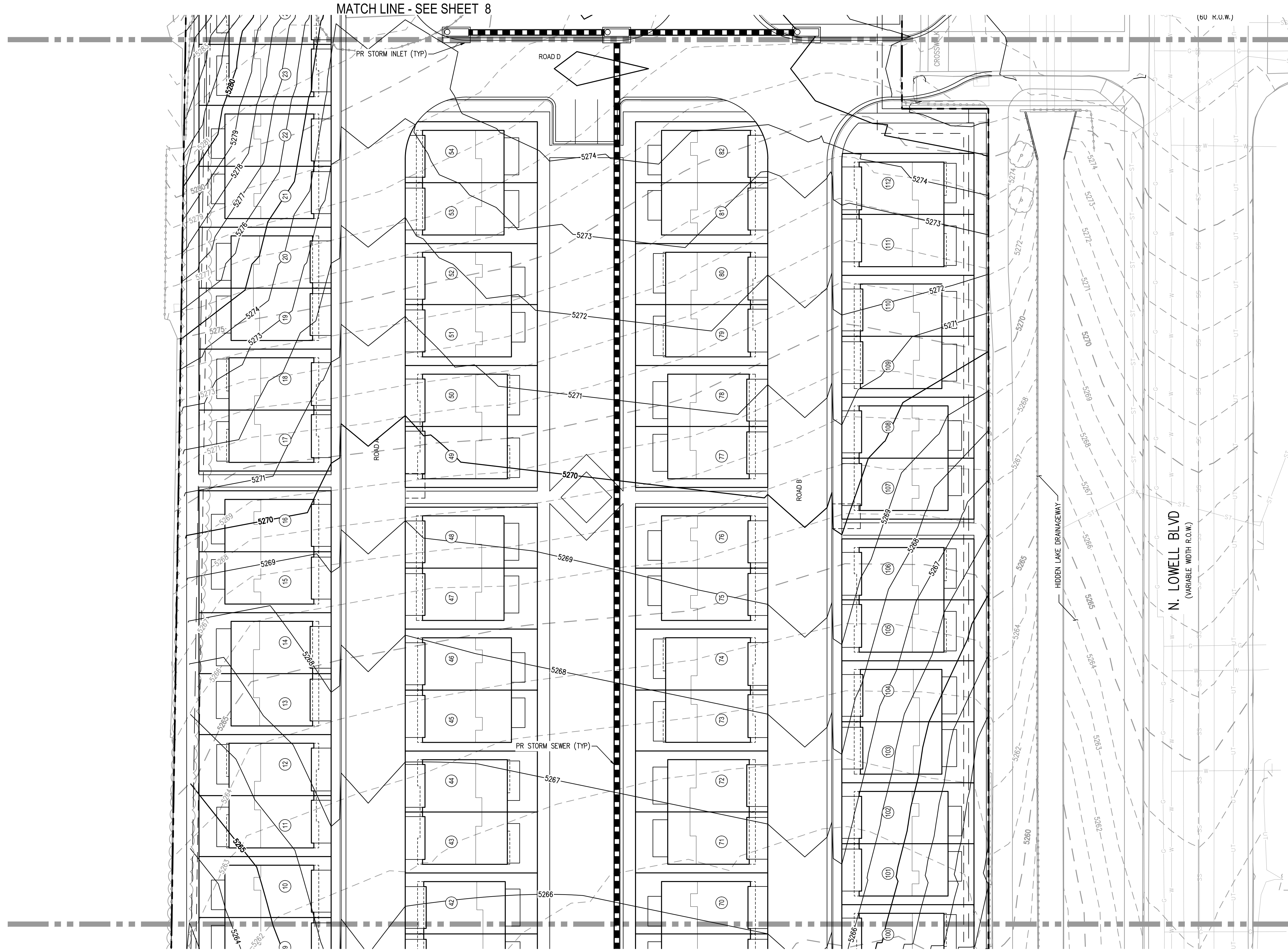
PROJECT #: 200817

TTLIC DENVER - LOWELL

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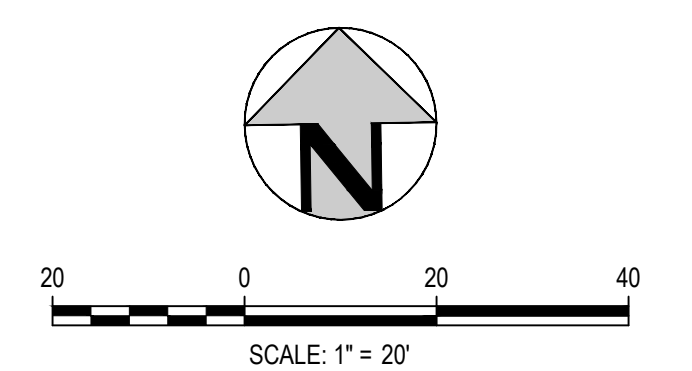
MAJOR SUBDIVISION PRELIMINARY PLAT

NO CHANGES ARE TO BE MADE TO THIS DRAWING WITHOUT WRITTEN PERMISSION OF HARRIS KOCHER SMITH.



LEGEND

- PROPERTY BOUNDARY
- PROPOSED CONTOUR
- EXISTING CONTOUR
- PROPOSED STORM SEWER
- PROPOSED STORM SEWER INLET
- EXISTING STORM SEWER



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 Project: PRC 2021-00002

MATCH LINE - SEE SHEET 10

REVISION DATE:

ISSUE DATE: 06-11-2021

SHEET 9 OF 10

OVERALL GRADING PLAN

TTLIC DENVER - LOWELL

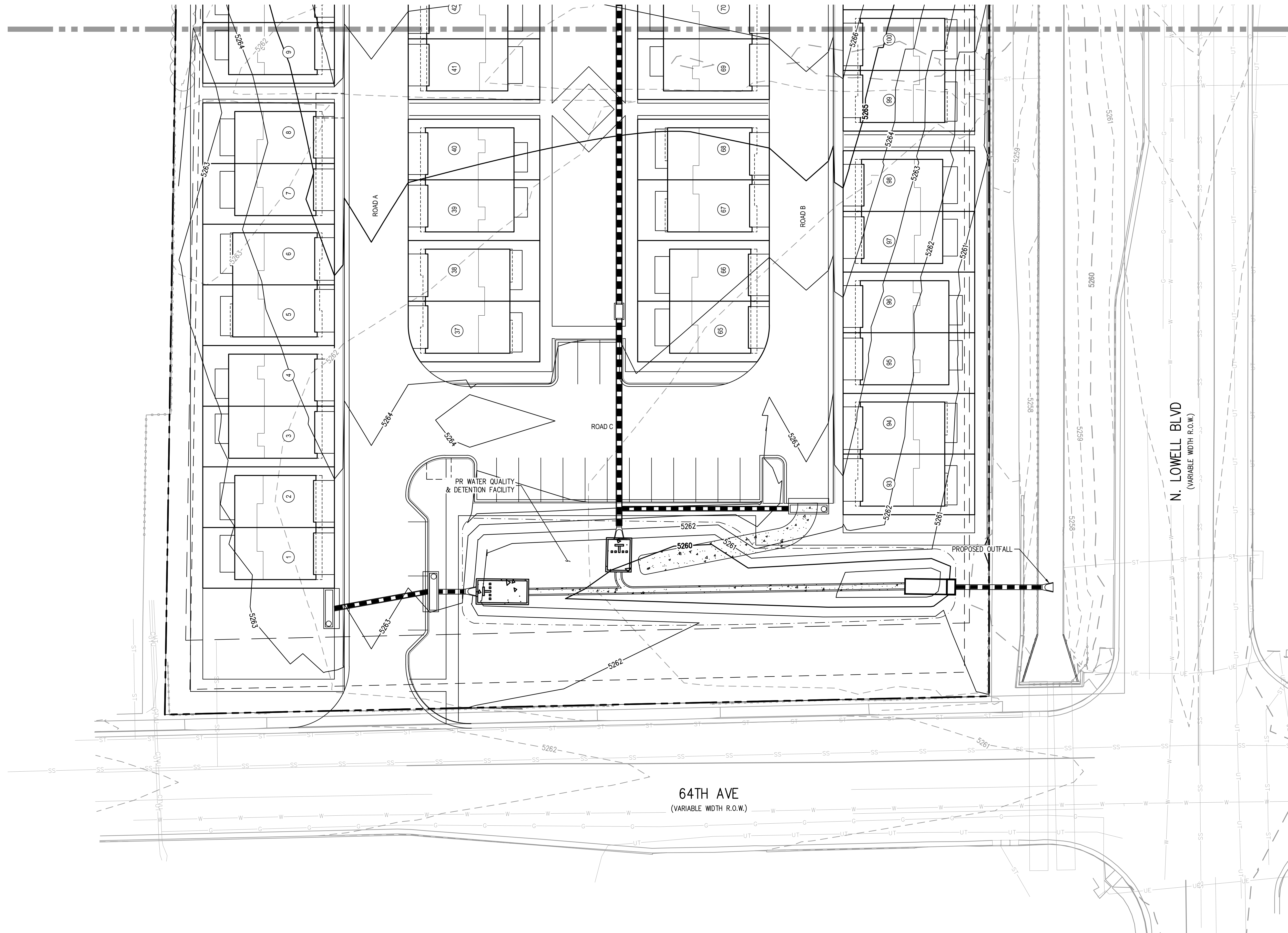
PROJECT #: 200817

TTLIC DENVER - LOWELL

TWO PARCELS LOCATED IN THE SOUTHEAST 1/4 OF THE SOUTHEAST 1/4 OF SECTION 6, TOWNSHIP 3 SOUTH, RANGE 68 WEST OF THE SIXTH P.M. COUNTY OF ADAMS, STATE OF COLORADO

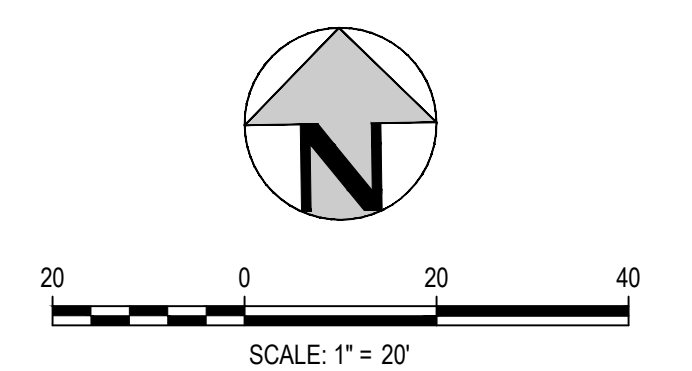
MAJOR SUBDIVISION PRELIMINARY PLAT

MATCH LINE - SEE SHEET 9



LEGEND

PROPERTY BOUNDARY	
PROPOSED CONTOUR	
EXISTING CONTOUR	
PROPOSED STORM SEWER	
PROPOSED STORM SEWER INLET	
EXISTING STORM SEWER	



NO CHANGES ARE TO BE MADE TO THIS DRAWING WITHOUT WRITTEN PERMISSION OF HARRIS KOCHER SMITH.
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Plotted: FRI 08/11/21 10:05:58A By: Kevin Blumhardt

PROJECT #: 200817

TRAFFIC IMPACT REPORT

6501 LOWELL BLVD
ADAMS COUNTY, COLORADO

June 9, 2021

Prepared for:
The True Life Companies
1350 17th St., Suite 350
Denver, CO 80202

Prepared by:



1120 Lincoln Street
Denver, CO 80203
Ph: 303-623-6300

Harris Kocher Smith Project No. 200917

TABLE OF CONTENTS

I.	INTRODUCTION.....	3
A.	Project Overview.....	3
B.	Purpose of Study.....	3
C.	Study Area.....	3
II.	EXISTING CONDITIONS.....	3
A.	Existing Traffic Volumes.....	3
B.	Existing Roadway System.....	4
III.	BACKGROUND TRAFFIC.....	7
A.	Background Traffic Volumes.....	7
B.	Background Traffic Operational Analysis.....	7
IV.	PROJECT DEVELOPMENT.....	8
A.	Trip Generation.....	8
B.	Trip Distribution.....	9
C.	Trip Assignment.....	9
V.	TOTAL TRAFFIC.....	9
VI.	PROJECT ANALYSIS.....	9
A.	Operational Analysis.....	9
B.	Queue Lengths and Storage Required.....	13
VII.	SUMMARY.....	15

LIST OF TABLES

Table 1:	Trip Generation.....	8
Table 2:	Summary of Results – Intersection Capacity Analysis.....	12
Table 3:	Summary of Results – Queue Analysis.....	14
Table 4:	Summary of Recommendations.....	15

FIGURES

- 1 Site Location Map
- 2 Conceptual Site Plan
- 3 2021 Existing (COVID Adjusted) Traffic Volumes
- 4 2028 Background Traffic Volumes
- 5 2040 Background Traffic Volumes
- 6 2021 Existing Traffic Operational Conditions
- 7 2028 Background Traffic Operational Conditions
- 8 2040 Background Traffic Operational Conditions
- 9 Site-Generated Trip Distribution
- 10 Site-Generated Trip Assignment
- 11 2028 Total Traffic Volumes (Background + Site Generated)
- 12 2040 Total Traffic Volumes (Background + Site Generated)
- 13 2028 Total Traffic Operational Conditions
- 14 2040 Total Traffic Operational Conditions

APPENDIX "A" 2021 EXISTING TRAFFIC VOLUME COUNTS

APPENDIX "B" INTERSECTION CAPACITY ANALYSIS WORKSHEETS

I. INTRODUCTION

A. Project Overview

The True Life Companies is proposing to develop a parcel of land containing approximately 7.15 acres located within the jurisdictional boundaries of Adams County, Colorado. The undeveloped property is bound on the south by W. 64th Ave., on the east by Lowell Blvd., on the north by residential properties fronting Meade Ct., and on the west by residential properties fronting Newton St. Upon buildout, the proposed development will contain 126 3-story duplex housing units. The proposed development will be known as 6501 Lowell Blvd. Figure 1 provides a site location map of the proposed project and surrounding transportation system.

The proposed development will have two access points. One access point will be the existing west leg of the Lowell Blvd./W. 65th Ave. intersection. The existing west leg will be extended to provide access into the proposed site. The second access point will be a proposed “T” intersection with W. 64th Ave. located west of Lowell Blvd. Figure 2 illustrates the conceptual site plan for the development.

B. Purpose of Study

The purpose of this study is to evaluate the impacts of the vehicular trips projected to be generated by the proposed 6501 Lowell Blvd development on the study area intersections and roadway system. The study includes 2021 (existing), 2028 (short-term), and 2040 (long-range) analysis horizons. The 2028 (short-term) analysis horizon is five years after the proposed occupancy year (2023) for this project. The 2040 (long-range) analysis horizon evaluates implications of the proposed project on the long-range traffic condition.

C. Study Area

The study area encompasses the existing roadway system in the vicinity of the project site. Specifically, the following existing intersections are included in the study:

- W. 68th Ave./Lowell Blvd.
- W. 66th Ave./Lowell Blvd.
- W. 65th Ave./Lowell Blvd.
- W. 64th Ave./Tennyson St.
- W. 64th Ave./Lowell Blvd.
- W. 64th Ave./Federal Blvd. (SH 287)

II. EXISTING CONDITIONS

A. Existing Traffic Volumes

Existing peak hour intersection turning movement traffic volume counts were collected for this study at the following intersections on Thursday, March 4, 2021:

- W. 66th Ave./Lowell Blvd.
- W. 65th Ave./Lowell Blvd.
- W. 64th Ave./Lowell Blvd.

24-hour directional traffic volume counts were collected for this study at the following locations on March 4, 2021:

- Lowell Blvd. north of W. 64th Ave.
- W. 64th Ave. west of Lowell Blvd.

Existing peak hour intersection turning movement traffic volume counts were collected for this study at the additional following intersections on Wednesday, June 2, 2021:

- W. 68th Ave./Lowell Blvd.
- W. 64th Ave./Tennyson St.
- W. 64th Ave./Federal Blvd. (SH 287)

In order to account for the ongoing COVID-19 pandemic and its impact on current traffic volumes, the 2021 (existing) traffic volume counts collected for this study were adjusted based on the following methodology. Utilizing the Denver Regional Council of Governments (DRCOG) travel models for 2015 and 2040 daily traffic volume forecasts it was determined that the average annual traffic volume growth rate (AGR) for Lowell Blvd. and W. 64th Ave. within the study limits is 1.0%. This AGR was applied to a DRCOG Regional Count Map daily traffic count collected on W. 64th Ave. just west of Lowell Blvd. in 2010 (12,100vpd) to project the expected non-COVID 2021 (existing) traffic volume (13,500vpd). The projected non-COVID 2021 (existing) average daily traffic for W. 64th Ave. was found to be 21.6% higher than the daily traffic volume counted in March 2021. Based on this methodology, the 2021 (existing) traffic volume counts were increased by 21.6% to project the equivalent non-COVID 2021 (existing) traffic volumes.

A summary of the 2021 (existing) COVID adjusted peak hour intersection turning movement traffic volume counts and 24-hour directional traffic volume counts collected for this study are illustrated in Figure 3. Detailed traffic volume count data collected for this study is provided in Appendix "A".

B. Existing Roadway System

The existing transportation network in the vicinity of the subject property is graphically illustrated in Figure 1. The following narrative provides a description of the study area roadways and associated intersections as they currently exist in 2021:

Study Area Roadways:

- **Federal Blvd. (SH 287)** – Federal Blvd. (SH 287) is classified as a Non-Rural Regional Arterial (NR-A) roadway under the jurisdiction of the Colorado Department of Transportation (CDOT) within the study area. The roadway section consists of three travel lanes in each direction with a raised center median. There is curb and gutter along both sides of the roadway. There are intermittent sections of attached sidewalk along both sides of the roadway. The posted speed limit is 45 mph within the study area. Per the *Adams County Transportation Plan*, Federal Blvd. (SH 287) within the study area is not anticipated to undergo any modifications through the 2040 (long-range) analysis horizon.
- **Lowell Blvd.** – Lowell Blvd. is classified as a Minor Arterial roadway under the jurisdiction of Adams County within the study area. The roadway section consists of one travel lane in each direction with a striped center two-way continuous left turn lane.

There is curb and gutter along both sides of the roadway. There is attached sidewalk along the east side of the roadway, and a detached sidewalk along the west side of the roadway. The posted speed limit is 30 mph within the study area. Lowell Blvd. within the study area is not anticipated to undergo any modifications through the 2040 (long-range) analysis horizon.

- **Tennyson St.** – Tennyson St. is classified as a Local roadway under the jurisdiction of Adams County within the study area. The roadway section consists of one travel lane in each direction. South of W. 64th Ave., there is curb and gutter on both sides of the roadway. There is attached sidewalk along the east side of the roadway and detached sidewalk along the west side of the roadway. North of W. 64th Ave., there is curb and gutter and attached sidewalk only along the east side of the roadway. The posted speed limit is 25 mph within the study area.
- **W. 64th Ave.** – W. 64th Ave. is classified as a Minor Arterial roadway under the jurisdiction of Adams County within the study area. The roadway section consists of one travel lane in each direction with a striped center two-way continuous left turn lane. There is curb and gutter and attached sidewalk along both sides of the roadway. The posted speed limit is 30 mph within the study area. W. 64th Ave. within the study area is not anticipated to undergo any modifications through the 2040 (long-range) analysis horizon.
- **W. 65th Ave.** – W. 65th Ave. is classified as a Local roadway under the jurisdiction of Adams County within the study area. The roadway section consists of one travel lane in each direction with no striping. There is curb and gutter and attached sidewalk along both sides of the roadway. The posted speed limit is 25 mph within the study area.
- **W. 66th Ave.** – W. 66th Ave. is classified as a Local roadway under the jurisdiction of Adams County within the study area. The roadway section consists of one travel lane in each direction with no striping. There is curb and gutter and attached sidewalk along both sides of the roadway. The posted speed limit is 25 mph within the study area.
- **W. 68th Ave.** – W. 68th Ave. is classified as a Local roadway under the jurisdiction of Adams County within the study area. The roadway section consists of one travel lane in each direction with a striped center two-way continuous left turn lane west of Lowell Blvd., and one travel lane in each direction with no median east of Lowell Blvd. There is curb and gutter along both sides of the roadway. West of Lowell Blvd., there is attached sidewalk along the north side of the roadway and detached sidewalk along the south side of the roadway. East of Lowell Blvd., there is attached sidewalk along both sides of the roadway. The posted speed limit is 25 mph within the study area.

Study Area Intersections:

- **W. 68th Ave./Lowell Blvd.** - The W. 68th Ave./Lowell Blvd. intersection is a four-legged signalized intersection operating under actuated/coordinated control with permissive only left turn phasing on all approaches. The east leg of the intersection has one left turn lane with approximately 150 feet of storage and one shared through/right turn lane on the westbound approach, and one eastbound departure lane. The west leg of the intersection has one left turn lane with approximately 150 feet of storage, one through lane, and one right turn lane with approximately 150 feet of storage on the eastbound approach, and one westbound departure lane. The north leg of the intersection has one left turn lane with approximately 150 feet of storage, one through lane, and one right turn

lane with approximately 150 feet of storage on the southbound approach, and one northbound departure lane. The south leg of the intersection has one left turn lane with approximately 225 feet of storage, one through lane, and one right turn lane with approximately 250 feet of storage on the northbound approach, and one southbound departure lane.

- **W. 66th Ave./Lowell Blvd.** - The W. 66th Ave./Lowell Blvd. intersection is a four-legged intersection operating under stop sign control on the eastbound and westbound approaches. The east leg of the intersection has one shared left/through/right turn lane on the westbound approach, and one eastbound departure lane. The west leg of the intersection has one shared left/through/right turn lane on the eastbound approach, and one westbound departure lane. The north leg of the intersection has one left turn lane with approximately 575 feet of storage and one shared through/right turn lane on the southbound approach, and one northbound departure lane. The south leg of the intersection has one left turn lane with approximately 200 feet of storage and one shared through/right turn lane on the northbound approach, and one southbound departure lane.
- **W. 65th Ave./Lowell Blvd.** – The W. 65th Ave./Lowell Blvd. intersection is a four-legged intersection operating under stop sign control on the eastbound and westbound approaches. The east leg of the intersection has one shared left/through/right turn lane on the westbound approach, and one eastbound departure lane. The west leg of the intersection has one shared left/through/right turn lane on the eastbound approach, and one westbound departure lane. The west leg currently does not carry any traffic as it dead-ends to undeveloped land, but is proposed to be extended as an access road as part of the 6501 Lowell Blvd development. The north leg of the intersection has one left turn lane with approximately 300 feet of storage and one shared through/right turn lane on the southbound approach, and one northbound departure lane. The south leg of the intersection has one left turn lane with approximately 150 feet of storage and one shared through/right turn lane on the northbound approach, and one southbound departure lane.
- **W. 64th Ave./Tennyson St.** – The W. 64th Ave./Tennyson St. intersection is a four-legged signalized intersection operating under actuated/coordinated control with permissive only left turn phasing on the eastbound and westbound approaches. The east leg of the intersection has one left turn lane with approximately 225 feet of storage, and one shared through/right turn lane on the westbound approach, and one eastbound departure lane. The west leg of the intersection has one left turn lane with approximately 150 feet of storage, one through lane, and one right turn lane with approximately 100 feet of storage on the eastbound approach, and one westbound departure lane. The north leg of the intersection has one shared left/through/right turn lane on the southbound approach, and one northbound departure lane. The south leg of the intersection has one shared left/through/right turn lane on the northbound approach, and one southbound departure lane.
- **W. 64th Ave./Lowell Blvd.** – The W. 64th Ave./Lowell Blvd. intersection is a four-legged signalized intersection operating under actuated/coordinated control with protected/permissive left turn phasing on the eastbound and southbound approaches, and permissive only left turn phasing on the westbound and northbound approaches. The east leg of the intersection has one left turn lane with approximately 270 feet of storage, one through lane, and one right turn lane with approximately 75 feet of storage on the westbound approach, and one eastbound departure lane. The west leg of the

intersection has one left turn lane with approximately 500 feet of storage, one through lane, and one right turn lane with approximately 200 feet of storage on the eastbound approach, and one westbound departure lane. The north leg of the intersection has one left turn lane with approximately 220 feet of storage, one through lane, and one right turn lane with approximately 150 feet of storage on the southbound approach, and one northbound departure lane. The south leg of the intersection has one left turn lane with approximately 200 feet of storage, one through lane, and one right turn lane with approximately 150 feet of storage on the northbound approach, and one southbound departure lane.

- **W. 64th Ave./Federal Blvd. (SH 287)** – The W. 64th Ave./Federal Blvd. (SH 287) intersection is a four-legged signalized intersection operating under actuated/coordinated control with protected/permissive left turn phasing on all four approaches. The east leg of the intersection has one left turn lane with approximately 150 feet of storage, one through lane, and one right turn lane with approximately 100 feet of storage on the westbound approach, and two eastbound departure lanes. The west leg of the intersection has one left turn lane with approximately 100 feet of storage, one through lane, and one right turn lane with approximately 150 feet of storage on the eastbound approach, and two westbound departure lanes. The north leg of the intersection has one left turn lane with approximately 250 feet of storage, two through lanes, and one shared through/right turn lane on the southbound approach, and three northbound departure lanes. The south leg of the intersection has one left turn lane with approximately 600 feet of storage, two through lanes, and one shared through/right turn lane on the northbound approach, and three southbound departure lanes.

III. BACKGROUND TRAFFIC

A. Background Traffic Volumes

Background traffic volume forecasts for the 2028 (short-term) and 2040 (long-range) analysis horizons were developed for this study utilizing the following strategy:

- For the purposes of this study it is assumed that peak-hour distribution of background intersection approach traffic (left turn, through, right turn) will remain constant through the 2028 and 2040 analysis horizons.
- Utilizing the Denver Regional Council of Governments (DRCOG) travel models for 2015 and 2040 daily traffic volume forecasts it was determined that the average annual traffic volume growth rate (AGR) for both Lowell Blvd. and W. 64th Ave. within the study limits is 1.0%. This traffic volume growth rate was applied to all peak hour 2021 (existing) COVID adjusted traffic volumes to determine the 2028 (short-term) and 2040 (long-range) background traffic volumes. A 1.0% growth rate equates to a 7-year (2021 to 2028) growth factor of 1.072 and a 19-year (2021 to 2040) growth factor of 1.21.

Figures 4 and 5 graphically illustrate the projected background traffic volumes for the 2028 (short-term) and 2040 (long-range) analysis horizons, respectively.

B. Background Traffic Operational Analysis

In order to establish a base condition in which to evaluate the impact of the traffic generated by the proposed development on the study area intersections, peak hour capacity analyses were performed for the 2021 (existing), 2028 (short-term) and 2040 (long-range) background traffic

conditions. These analyses utilized the methodologies contained in the *Highway Capacity Manual 6th Edition* (HCM 6) employing *Synchro 10* software and resulted in a qualitative measure of the operational characteristics of the intersection described by a letter designation ranging from “A” to “F” known as “Level of Service” (LOS). LOS “A” represents ideal free flow operating conditions, whereas LOS “F” represents excessive congestion and delay. Un-signalized intersection capacity analysis reports a LOS designation for each impeded intersection movement. Signalized intersection capacity analysis reports the overall LOS designation for the intersection as well as for each lane group and approach. LOS “D” is considered the minimum acceptable standard of operation.

The following study area intersections were analyzed for the 2021 (existing) traffic conditions, as well as for the 2028 (short-term) and 2040 (long-range) background traffic analysis horizons:

- W. 68th Ave./Lowell Blvd.
- W. 66th Ave./Lowell Blvd.
- W. 65th Ave./Lowell Blvd.
- W. 64th Ave./Tennyson St.
- W. 64th Ave./Lowell Blvd.
- W. 64th Ave./Federal Blvd. (SH 287)

The results of these background traffic operational analyses are summarized graphically for the 2021 (existing) COVID adjusted traffic conditions, as well as for the 2028 (short-term) and 2040 (long-range) background traffic analysis horizons in Figures 6, 7, and 8, respectively. A summary of the results of the intersection capacity analyses is provided in Table 2 and detailed *Synchro 10* software intersection capacity analysis reports in Appendix “B”.

IV. PROJECT DEVELOPMENT

A. Trip Generation

Site generated vehicular trip projections for the proposed 6501 Lowell Blvd development were forecast using the publication *Trip Generation, 10th Edition*, by the Institute of Transportation Engineers (ITE). Estimates of total daily traffic volumes and a.m. and p.m. peak hour traffic volumes were calculated. Trip generation reductions due to transportation demand management, internal trip capture, or transit use were not considered.

For the purposes of this study it was assumed that the subject parcel will be fully developed by 2023 and consist of 126 3-story duplex housing units. Based on these parameters, at build-out, the proposed 6501 Lowell Blvd development is projected to generate 1,286 daily vehicle trips of which 94 are projected to be generated during the a.m. peak hour and 127 during the p.m. peak hour. Trip generation projections for the proposed 6501 Lowell Blvd development are provided in Table 1.

**TABLE 1
TRIP GENERATION**

Land Use	Intensity	ITE Code	Daily (vpd)	AM Peak Hour (vph)				PM Peak Hour (vph)					
				Total	% In	% Out	In	Out	Total	% In	% Out	In	Out
Single-Family Detached Housing	126 DU	210	1286	94	25%	75%	24	70	127	63%	37%	80	47
		Total	1,286	94			24	70	127			80	47

B. Trip Distribution

The distribution of the projected site generated vehicle trips by the proposed 6501 Lowell Blvd development was established based on current and projected future traffic patterns on the surrounding transportation system, efficiency of access to the principal transportation corridors serving the proposed development, and the potential trip origins/destinations for the proposed land uses within the development. Figure 9 graphically illustrates the projected trip distribution patterns for the proposed development.

C. Trip Assignment

The site generated vehicular trips projected to be generated by the proposed 6501 Lowell Blvd development were assigned to the study area roadways and intersections utilizing the trip distribution analysis described above. Figure 10 graphically illustrates the site generated trip assignment for the proposed development.

V. TOTAL TRAFFIC

Total traffic forecasts for the 2028 (short-term) and 2040 (long-range) analysis horizons were computed by combining the associated 2028 (short-term) and 2040 (long-range) background traffic volumes with the projected site generated traffic volumes. Figures 11 and 12 graphically illustrate the total traffic projections for the study area intersections for the 2028 (short-term) and 2040 (long-range) analysis horizons, respectively.

VI. PROJECT ANALYSIS

A. Operational Analysis

In order to evaluate the impact of the proposed 6501 Lowell Blvd development on the study area roadway system, peak hour intersection capacity analyses for total traffic conditions (projected site generated trips + background traffic) were performed for the 2028 (short-term) and 2040 (long-range) analysis horizons at each of the study area intersections listed below.

- W. 68th Ave./Lowell Blvd.
- W. 66th Ave./Lowell Blvd.
- W. 65th Ave./Lowell Blvd.
- W. 64th Ave./Tennyson St.
- W. 64th Ave./Lowell Blvd.
- W. 64th Ave./Federal Blvd. (SH 287)
- W. 64th Ave./South Site Access

A narrative of the summary of the analysis and comparison to background traffic conditions for the 2028 (short-term) and 2040 (long-range) analysis horizons is provided below. The results of the total traffic operational analyses are summarized graphically for the 2028 (short-term) and 2040 (long-range) analysis horizons in Figures 13 and 14, respectively. A summary of the results of the intersection capacity analysis is provided in Table 2 and detailed *Synchro 10* software intersection capacity analysis reports in Appendix "B".

Study-Area Intersections – Summary of Results:

- **W. 68th Ave./Lowell Blvd.** – The W. 68th Ave./Lowell Blvd. intersection is not anticipated to undergo any significant geometric or operational modifications through the 2040 (long-range) analysis horizon. Therefore, the intersection is anticipated to remain under actuated/coordinated signalized control with permissive only left turn phasing on all four approaches. Based on these parameters, it is projected that the intersection, as well as all lane groups will operate at an acceptable level of service (LOS “D” or better) through the 2040 (long-range) analysis horizon. No operational modifications are recommended as a result of the proposed 6501 Lowell Blvd development.
- **W. 66th Ave./Lowell Blvd.** – The W. 66th Ave./Lowell Blvd. intersection is not anticipated to undergo any significant geometric or operational modifications through the 2040 (long-range) analysis horizon. Therefore, the intersection is anticipated to remain under stop sign control on the eastbound and westbound approaches. Based on these parameters, it is projected that the intersection, as well as all lane groups will operate at an acceptable level of service (LOS “D” or better) through the 2028 (short-term) analysis horizon, with the exception of the eastbound shared left/through/right turn lane which is experiencing a failing level of service in the p.m. peak hour under current conditions. This failing level of service is projected to continue in the p.m. peak hour through 2028. The failing level of service on the eastbound approach is due to high north/south through volumes on Lowell Blvd., causing substantial delay for vehicles on the eastbound and westbound approaches attempting to turn left or go straight through the intersection. By the 2040 (long-range) background analysis horizon, it is projected that the westbound shared left/through/right turn lane will have a failing level of service in the p.m. peak hour as well due to the background through traffic volumes on Lowell Blvd. These failing levels of service for 66th Ave are typical for stop controlled minor street approaches along Lowell Blvd. due to the high background traffic through volumes on Lowell Blvd causing substantial delay. No operational modifications are recommended as a result of the proposed 6501 Lowell Blvd development.
- **W. 65th Ave./Lowell Blvd.** – The W. 65th Ave./Lowell Blvd. intersection is not anticipated to undergo any significant geometric or operational modifications through the 2028 (short-term) background analysis horizon. Therefore, the intersection is anticipated to remain under stop sign control on the eastbound and westbound approaches. Based on these parameters, it is projected that the intersection, as well as all lane groups will operate at an acceptable level of service (LOS “D” or better) through the 2028 (short-term) background analysis horizon.

Concurrent with construction of the proposed 6501 Lowell Blvd development, the west leg of this intersection will be extended and serve as an access for the proposed development. With the addition of site traffic on the west leg, the intersection is projected to continue operating with an acceptable level of service for all impeded movements. By the 2040 (long-range) analysis horizon, it is projected that in the background traffic scenario, the westbound shared left/through/right turn lane will experience a failing level of service in the p.m. peak hour. The failing level of service on the westbound approach is typical for stop controlled minor street approaches along Lowell Blvd. due to the high background traffic through volumes on Lowell Blvd. causing substantial delay for vehicles on the minor approaches attempting to turn left or go straight through the intersection.

- **W. 64th Ave./Tennyson St.** – The W. 64th Ave./Tennyson St. intersection is not anticipated to undergo any significant geometric or operational modifications through the

2040 (long-range) analysis horizon. Therefore, the intersection is anticipated to remain under actuated/coordinated signalized control with permissive only left turn phasing on the eastbound and westbound approach. Based on these parameters, it is projected that the intersection, as well as all lane groups will operate at an acceptable level of service (LOS "D" or better) through the 2040 (long-range) analysis horizon. No operational modifications are recommended as a result of the proposed 6501 Lowell Blvd development.

- **W. 64th Ave./Lowell Blvd.** – The W. 64th Ave./Lowell Blvd. Dr. intersection is not anticipated to undergo any significant geometric or operational modifications through the 2040 (long-range) analysis horizon. Therefore, the intersection is anticipated to remain under actuated/coordinated signalized control with protected/permissive left turn phasing on the eastbound and southbound approaches, and permissive only left turn phasing on the northbound and westbound approaches. Based on these parameters, it is projected that the intersection, as well as all lane groups will operate at acceptable levels of service (LOS "D" or better) through the 2040 (long-range) analysis horizon. No operational modifications are recommended as a result of the proposed 6501 Lowell Blvd development.
- **W. 64th Ave./Federal Blvd. (SH 287)** – The W. 64th Ave./Federal Blvd. (SH 287) intersection is not anticipated to undergo any significant geometric or operational modifications through the 2040 (long-range) analysis horizon. Therefore, the intersection is anticipated to remain under actuated/coordinated signalized control with protected/permissive left turn phasing on all four approaches. Based on these parameters, it is projected that by the 2040 (long-range) analysis horizon, the intersection overall will have a failing level of service (LOS "E" or worse) in the p.m. peak hour, and multiple lane groups will also have a failing level of service in the a.m. and p.m. peak hour. This is due to high background traffic through volumes on Federal Blvd. (SH 287). No operational modifications are recommended as a result of the proposed 6501 Lowell Blvd development.
- **W. 64th Ave./South Site Access** – The W. 64th Ave./ South Site Access intersection will be constructed concurrently with the proposed 6501 Lowell Blvd. development. The intersection will be a "T" intersection under stop sign control on the southbound approach. The east leg of the intersection will have one shared through/right turn lane on the westbound approach, and one eastbound departure lane. The west leg of the intersection will have one left turn lane with approximately 250 feet of storage and one through lane on the eastbound approach, and one westbound departure lane. The north leg of the intersection will be constructed to have one shared left/right turn lane on the southbound approach, and one northbound departure lane. Based on these parameters, it is projected that all impeded lane groups will operate with acceptable levels of service (LOS "D" or better) through the 2040 (long-range) analysis horizon total traffic scenario.

**TABLE 2
SUMMARY OF RESULTS - INTERSECTION CAPACITY ANALYSIS**

INTERSECTION	INTERSECTION CONTROL	2021		2028		2028		2040		2040	
		EXISTING TRAFFIC		BACKGROUND TRAFFIC		TOTAL TRAFFIC		BACKGROUND TRAFFIC		TOTAL TRAFFIC	
		AM PEAK LOS	PM PEAK LOS	AM PEAK LOS	PM PEAK LOS	AM PEAK LOS	PM PEAK LOS	AM PEAK LOS	PM PEAK LOS	AM PEAK LOS	PM PEAK LOS
1. W. 68th Ave./Lowell Blvd. a. EB L (Perm) b. EB T c. EB R d. WB L (Perm) e. WB TR f. NB L (Perm) g. NB T h. NB R i. SBL (Perm) j. SBT k. SBR l. INTERSECTION	Signal										
		C	C	C	C	C	C	C	C	C	C
		C	C	C	C	C	C	C	C	C	C
		C	C	C	C	C	C	C	C	C	C
		C	C	C	C	C	C	C	C	C	C
		C	C	C	C	C	C	C	C	C	C
		A	A	A	A	A	A	A	A	A	A
		A	A	A	A	A	A	A	A	A	A
		A	A	A	A	A	A	A	A	A	A
		A	A	A	A	A	A	A	A	A	A
		A	A	A	A	A	A	A	A	A	A
		A	A	A	A	A	A	A	A	A	A
		A	A	A	A	A	A	A	A	A	A
2. W. 66th Ave./Lowell Blvd. a. EB LTR b. WB LTR c. NB L d. SBL e. INTERSECTION	TWSC										
	Stop	B	E	C	E	C	F	C	F	C	F
	Stop	C	D	C	D	C	D	C	E	C	E
		A	A	A	A	A	A	A	A	A	A
		A	A	A	A	A	A	A	B	A	B
		A	A	A	A	A	A	A	A	A	A
3. W. 65th Ave./Lowell Blvd. a. EB LTR b. WB LTR c. NB L d. SBL e. INTERSECTION	TWSC										
	Stop	A	A	A	A	C	C	A	A	C	D
	Stop	B	C	B	D	B	D	C	E	C	E
		A	A	A	A	A	A	A	A	A	A
		A	A	A	A	A	A	A	B	A	B
		A	A	A	A	A	A	A	A	A	A
4. W. 64th Ave./Tennyson St. a. EB L (Perm) b. EB T c. EB R d. WB L (Perm) e. WB TR f. NB LTR g. SB LTR h. INTERSECTION	Signal										
		C	B	C	B	C	B	C	B	C	B
		C	C	C	C	C	C	C	C	C	C
		C	B	C	B	C	B	C	B	C	B
		D	B	D	B	D	B	D	C	D	C
		C	A	C	A	C	A	C	A	C	A
		B	C	B	C	B	C	B	C	B	C
		A	B	B	B	B	B	B	B	B	B
		C	B	C	B	C	B	C	B	C	B
5. W. 64th Ave./Lowell Blvd. a. EB L (Prot+Perm) b. EB T c. EB R d. WB L (Perm) e. WB T f. WB R g. NB L (Perm) h. NB T i. NB R j. SBL (Prot+Perm) k. SBT l. SBR m. INTERSECTION	Signal										
		C	C	C	C	C	D	C	D	C	D
		C	B	D	B	D	B	D	B	D	B
		C	B	C	B	C	B	C	B	C	B
		D	C	D	C	D	C	D	C	D	C
		D	D	D	D	D	D	D	D	D	D
		D	C	D	C	D	C	D	C	D	C
		B	C	B	C	B	C	B	C	B	C
		B	C	B	C	B	C	B	D	B	D
		B	B	B	B	B	C	B	C	B	C
		A	B	A	B	A	B	B	C	B	C
		A	B	A	B	A	B	B	B	B	B
		A	B	A	B	A	B	A	B	A	B
		C	C	C	C	C	C	C	C	C	C
	6. W. 64th Ave./Federal Blvd. (SH 287) a. EB L (Prot+Perm) b. EB T c. EB R d. WB L (Prot+Perm) e. WB T f. WB R g. NB L (Prot+Perm) h. NB TR i. SBL (Prot+Perm) j. SB TR k. INTERSECTION	Signal									
		C	D	C	D	C	D	D	F	D	F
		D	D	D	D	D	D	D	D	D	D
		D	D	D	D	D	D	D	D	D	D
		D	C	D	C	D	C	D	D	D	D
		D	D	D	D	D	D	D	F	D	F
		C	D	C	D	C	C	C	D	C	D
		C	D	C	D	C	D	C	F	C	F
		B	C	B	D	B	D	B	D	B	D
		A	C	A	C	A	C	A	D	A	D
		C	C	D	D	D	D	F	E	F	F
		C	C	C	D	C	D	D	E	D	E
7. W. 64th Ave./South Site Access a. EB L b. SB LR c. INTERSECTION		TWSC									
	Stop	-	-	-	-	A	A	-	-	A	A
		-	-	-	-	C	D	-	-	C	D
		-	-	-	-	A	A	-	-	A	A

B. Queue Lengths and Storage Required

Queue lengths and associated storage requirements for auxiliary lanes (turn bays) at the study area intersections were calculated for the 2021 (existing) and 2028 (short-term) and 2040 (long-range) analysis horizon background and total traffic scenarios using the results of the *Synchro* 10⁹⁵th percentile reported queue lengths. Queue lengths are based on a 25-foot vehicle length. All queue lengths are reported in total feet. Results of the queue length/turn bay storage length requirement calculations are provided in Table 3. A narrative of the summary of the queue length/storage analysis and comparison to existing turn bay storage is provided below.

- **W. 68th Ave./Lowell Blvd.** - Based on the results of the queuing analysis, it is projected that all turn bays will have adequate capacity to serve the intersection through the 2040 (long-range) analysis horizon total traffic scenario.
- **W. 66th Ave./Lowell Blvd.** – Based on the results of the queuing analysis, it is projected that there will not be any queuing impacts associated with this intersection through the 2040 (long-range) analysis horizon total traffic scenario.
- **W. 65th Ave./Lowell Blvd.** – Based on the results of the queuing analysis, it is projected that there will not be any queuing impacts associated with this intersection through the 2040 (long-range) analysis horizon total traffic scenario. Right-turning traffic volumes at this intersection do not warrant the construction of any right turn auxiliary lanes per the *Adams County Development Standards*.
- **W. 64th Ave./Tennyson St.** - Based on the results of the queuing analysis, it is projected that all turn bays will have adequate capacity to serve the intersection through the 2040 (long-range) analysis horizon total traffic scenario.
- **W. 64th Ave./Lowell Blvd.** - Based on the results of the queuing analysis, it is projected that all turn bays will have adequate capacity to serve the intersection through the 2040 (long-range) analysis horizon total traffic scenario, with the exception of the westbound right turn lane queue, which is projected to spill back into the westbound through lane in the 2040 (long-range) p.m. peak hour. Also, by the 2040 (long-range) background analysis horizon, it is projected the westbound through lane queue will spill back through the W. 64th Ave./Knox Ct. intersection during the p.m. peak hour.
- **W. 64th Ave./Federal Blvd. (SH 287)** - Based on the results of the queuing analysis, it is projected under existing conditions, the eastbound left turn bay exceeds its capacity in the p.m. peak hour, blocking access to driveways along W. 64th Ave. This will continue through the 2040 (long-range) analysis horizon. All other turn bays will have adequate capacity to serve the intersection through the 2040 (long-range) analysis horizon total traffic scenario. However, by the 2040 (long-range) background analysis horizon, it is projected the southbound through lane queue will spill back through the W. Hawthorne Pl./Federal Blvd. (SH 287) intersection during the a.m. peak hour.
- **W. 64th Ave./South Site Access** - Based on the results of the queuing analysis, it is projected that there will not be any queuing impacts associated with this intersection through the 2040 (long-range) analysis horizon total traffic scenario. Right-turning traffic volumes at this intersection do not warrant the construction of any right turn auxiliary lanes per the *Adams County Development Standards*.

**TABLE 3
SUMMARY OF RESULTS - QUEUE ANALYSIS**

INTERSECTION (# OF LANES IN LANE GROUP)	EXISTING STORAGE (CUMULATIVE) (FT)	2021 EXISTING TRAFFIC		2028 BACKGROUND TRAFFIC		2028 TOTAL TRAFFIC		2040 BACKGROUND TRAFFIC		2040 TOTAL TRAFFIC	
		QUEUE LENGTH (FT) 95TH%		QUEUE LENGTH (FT) 95TH%		QUEUE LENGTH (FT) 95TH%		QUEUE LENGTH (FT) 95TH%		QUEUE LENGTH (FT) 95TH%	
		AM PEAK	PM PEAK	AM PEAK	PM PEAK	AM PEAK	PM PEAK	AM PEAK	PM PEAK	AM PEAK	PM PEAK
1. W. 68th Ave./Lowell Blvd.											
a. EB L (1)	150	42	44	44	46	44	46	48	49	48	49
b. EB T (1)	500	14	16	14	17	14	17	15	18	15	18
c. EB R (1)	150	36	28	37	29	37	29	39	30	39	30
d. WB L (1)	150	6	16	7	16	7	16	7	17	7	17
e. WB TR (1)	275	19	29	19	30	19	30	20	32	20	32
f. NB L (1)	225	16	30	18	32	18	33	20	39	20	39
g. NB T (1)	320	35	172	38	198	40	202	44	256	46	261
h. NB R (1)	250	25	4	25	5	25	5	25	5	25	5
i. SB L (1)	150	6	6	6	6	6	6	7	7	7	7
j. SB T (1)	150	61	75	68	83	69	87	80	99	82	103
k. SB R (1)	150	8	10	8	10	8	10	9	11	9	11
2. W. 66th Ave./Lowell Blvd.											
a. EB LTR (1)	180	10	38	10	48	10	50	15	83	15	85
b. WB LTR (1)	285	8	15	8	18	8	20	10	28	10	30
c. NB L (1)	200	0	3	0	3	0	3	0	3	0	3
d. SB L (1)	575	0	3	0	3	0	3	0	3	0	3
3. W. 65th Ave./Lowell Blvd.											
a. EB LTR (1)	-	0	0	0	0	10	10	0	0	10	13
b. WB LTR (1)	115	3	10	5	13	5	18	5	20	8	30
c. NB L (1)	150	0	0	0	0	0	3	0	0	0	3
d. SB L (1)	300	0	3	0	3	0	3	0	3	0	3
4. W. 64th Ave./Tennyson St.											
a. EB L (1)	150	15	19	16	20	16	20	16	23	16	22
b. EB T (1)	250	196	406	202	455	200	473	213	623	212	646
c. EB R (1)	100	23	34	23	37	22	37	22	42	22	42
d. WB L (1)	225	156	74	164	85	167	89	177	116	176	111
e. WB TR (1)	310	314	383	333	394	342	390	358	413	357	410
f. NB LTR (1)	300	61	235	71	260	73	264	90	324	92	350
g. SB LTR (1)	700	26	30	29	32	30	32	34	34	34	34
5. W. 64th Ave./Lowell Blvd.											
a. EB L (1)	500	111	177	115	193	110	195	114	213	111	290
b. EB T (1)	500	242	294	249	314	248	318	256	323	261	317
c. EB R (1)	200	59	25	59	23	53	23	49	50	48	50
d. WB L (1)	270	58	35	60	37	59	36	58	63	57	62
e. WB T (1)	385	167	312	173	320	173	336	178	451	182	463
f. WB R (1)	75	30	50	33	50	33	75	45	85	50	90
g. NB L (1)	200	46	109	50	118	51	121	55	133	56	143
h. NB T (1)	1250	101	346	110	410	115	422	125	494	126	533
i. NB R (1)	150	25	28	28	33	28	33	35	41	35	43
j. SB L (1)	220	49	34	54	35	63	40	63	38	72	46
k. SB T (1)	600	149	134	164	143	172	147	198	161	204	173
l. SB R (1)	150	28	34	30	35	31	35	33	37	34	39
6. W. 64th Ave./Federal Blvd. (SH 287)											
a. EB L (1)	100	48	247	55	276	64	292	70	468	79	468
b. EB T (1)	1220	73	217	83	236	92	242	106	321	119	311
c. EB R (1)	150	25	76	27	84	28	84	75	85	19	79
d. WB L (1)	150	108	86	114	88	114	88	140	136	144	132
e. WB T (1)	1250	154	212	165	236	167	243	185	391	187	396
f. WB R (1)	100	38	25	40	50	40	50	45	90	45	18
g. NB L (1)	600	53	214	68	227	77	246	91	355	98	371
h. NB TR (3)	2275	152	546	164	631	164	632	191	840	191	821
i. SB L (1)	250	32	48	35	54	35	54	37	133	37	134
j. SB TR (3)	750	638	458	717	544	718	531	858	736	860	736
7. W. 64th Ave./South Site Access											
a. EB L (1)	-	-	-	-	-	0	3	-	-	0	3
b. SB LR (1)	-	-	-	-	-	8	10	-	-	10	13

VII. SUMMARY

The True Life Companies is proposing to develop a parcel of land containing approximately 7.15 acres located within the jurisdictional boundaries of Adams County, Colorado. The undeveloped property is bound on the south by W. 64th Ave., on the east by Lowell Blvd., on the north by residential properties fronting Meade Ct., and on the west by residential properties fronting Newton St. Upon buildout, the proposed development will contain 126 3-story duplex housing units. The proposed development will be known as 6501 Lowell Blvd.

The proposed development will have two access points. One access point will be the existing west leg of the Lowell Blvd./W. 65th Ave. intersection. The existing west leg will be extended to provide access into the proposed site. The second access point will be a proposed “T” intersection with W. 64th Ave. located west of Lowell Blvd.

Upon buildout, the proposed 6501 Lowell Blvd development is projected to generate 1,286 daily vehicle trips of which 94 are projected to be generated during the a.m. peak hour and 127 during the p.m. peak hour.

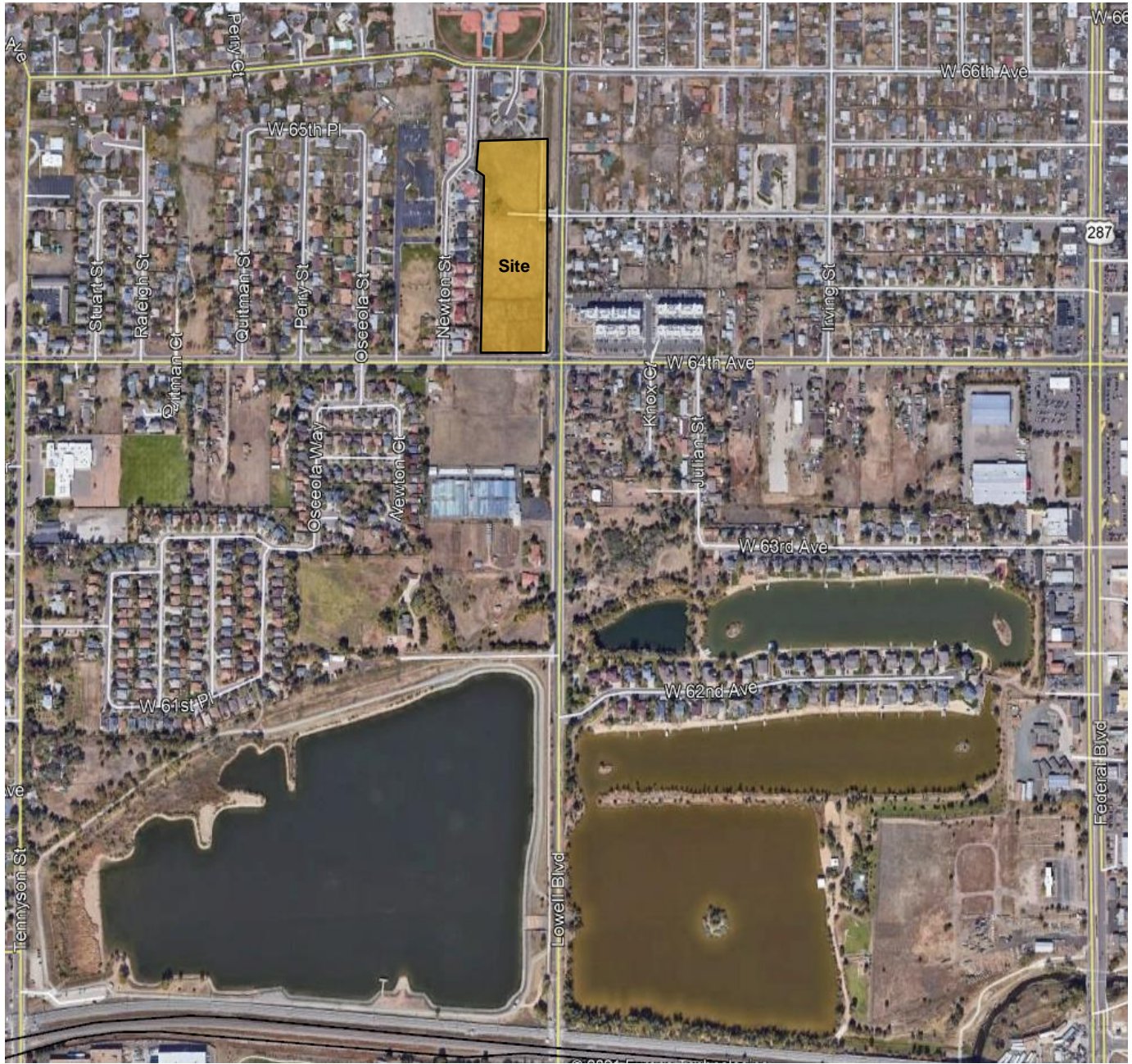
Based on the analyses contained herein, Table 4 presents the summary of recommendations for the study area intersections required to accommodate the proposed 6501 Lowell Blvd development project.

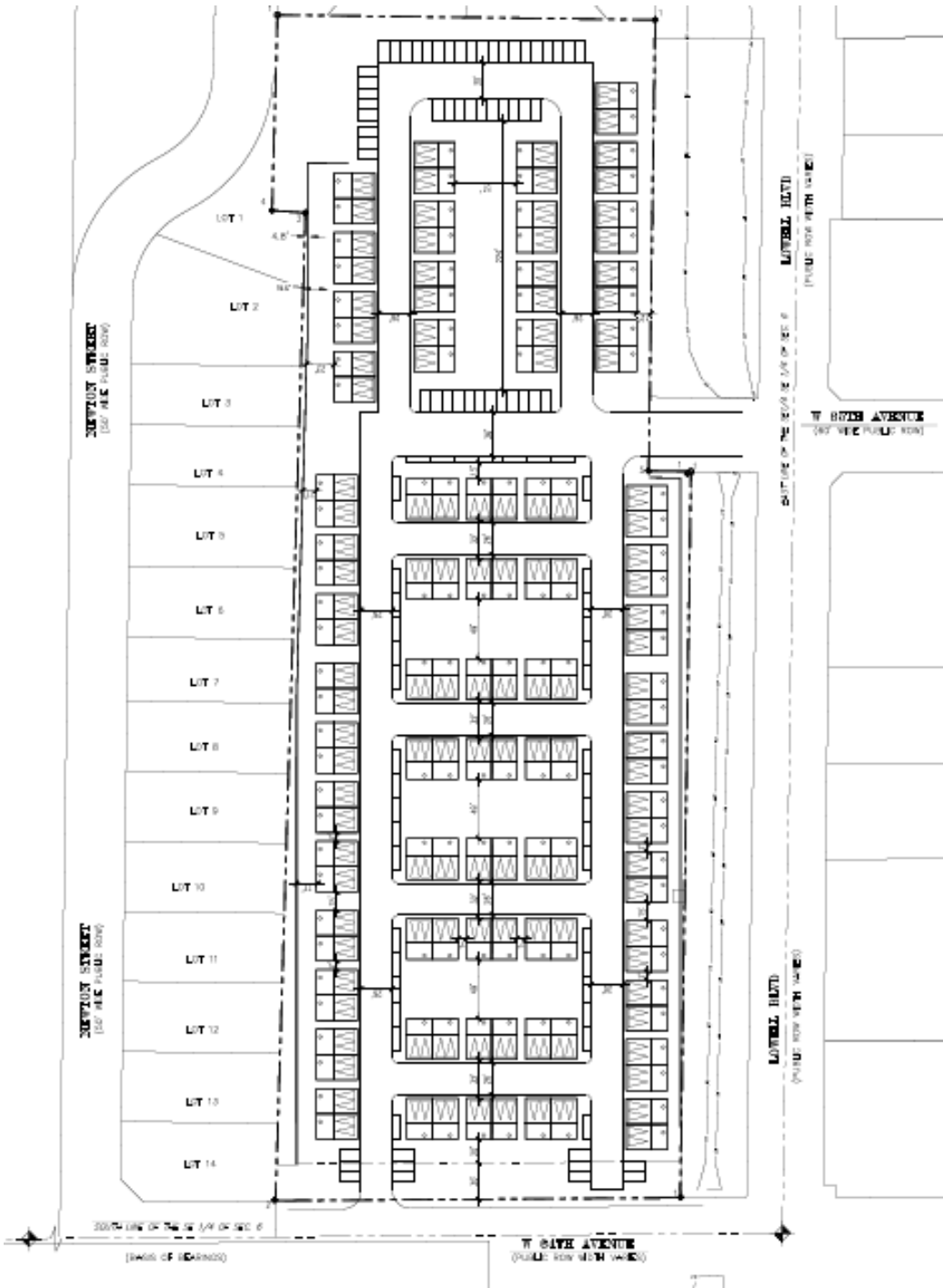
**TABLE 4
SUMMARY OF RECOMMENDATIONS**

Intersection	Recommendations	Responsible	Timing
W. 68 th Ave./Lowell Blvd.	No geometric or operational modifications are recommended as a result of the development of the proposed project.	N/A	N/A
W. 66 th Ave./Lowell Blvd.	No geometric or operational modifications are recommended as a result of the development of the proposed project.	N/A	N/A
W. 65 th Ave./Lowell Blvd.	Extend the west leg of the intersection to serve as an access for the proposed development.	Developer	Concurrently with Project
W. 64 th Ave./Tennyson St.	No geometric or operational modifications are recommended as a result of the development of the proposed project.	N/A	N/A
W. 64 th Ave./Lowell Blvd.	No geometric or operational modifications are recommended as a result of the development of the proposed project.	N/A	N/A

**TABLE 4 (CONTINUED)
SUMMARY OF RECOMMENDATIONS**

Intersection	Recommendations	Responsible	Timing
W. 64 th Ave./Federal Blvd. (SH 287)	No geometric or operational modifications are recommended as a result of the development of the proposed project.	N/A	N/A
W. 64 th Ave./South Site Access	Construct concurrently with the proposed 6501 Lowell Blvd development. The intersection will be under stop sign control on the southbound approach. The east leg of the intersection will have one shared through/right turn lane on the westbound approach, and one eastbound departure lane. The west leg of the intersection will have one left turn lane with approximately 250 feet of storage and one through lane on the eastbound approach, and one westbound departure lane. The north leg of the intersection will be constructed to have one shared left/right turn lane on the southbound approach, and one northbound departure lane.	Developer	Concurrently with Project

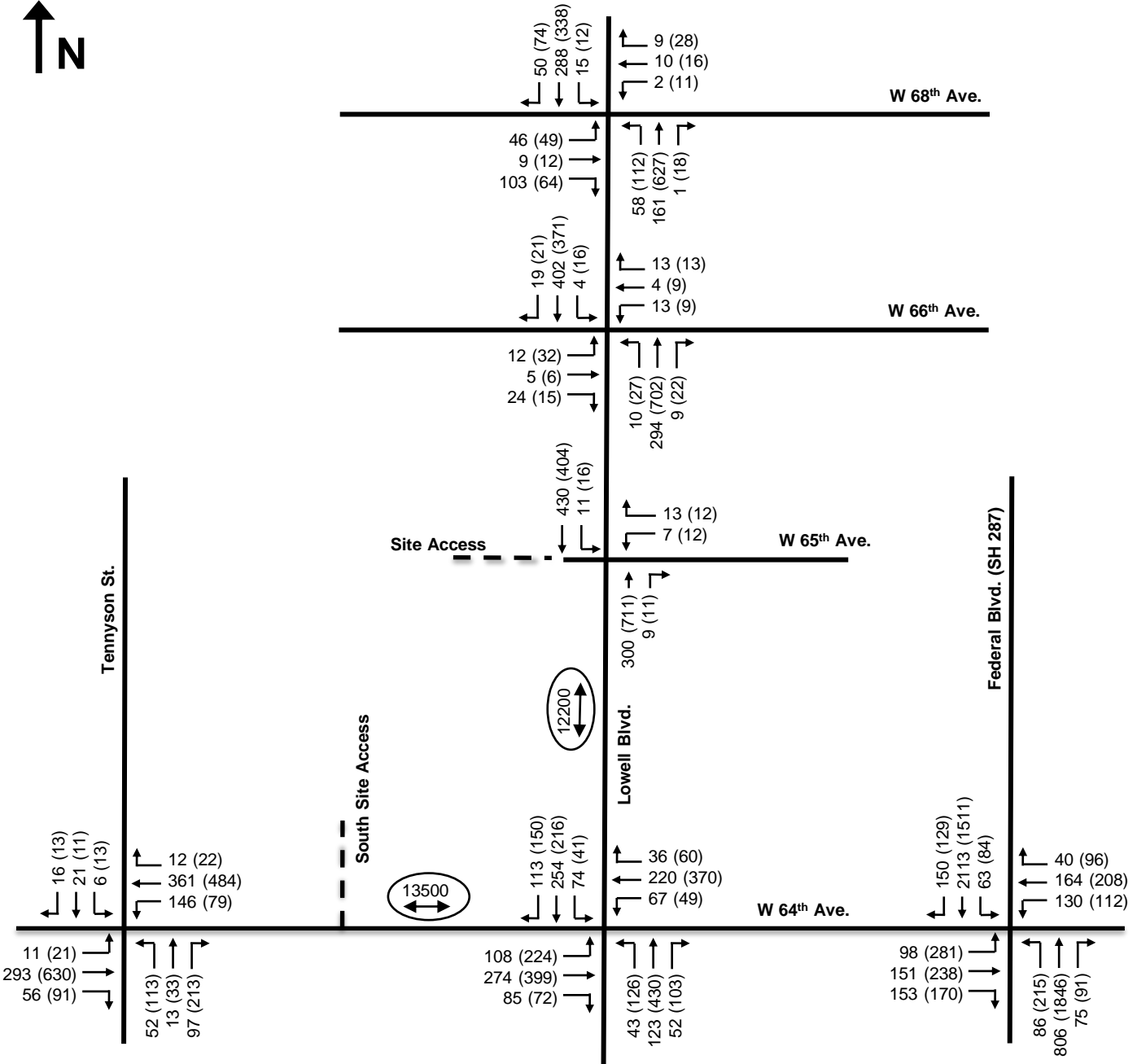




Conceptual Site Plan

6501 Lowell Blvd
The True Life Companies
HKS #200917

Figure 2



Legend: Drawing Not To Scale

- ↖ 5 (8) Weekday AM (PM)
- ← 64 (50) Peak Hour
- ↙ 8 (7) Traffic Volumes, vph
- ↔ (3200) Daily Traffic Volumes, vpd

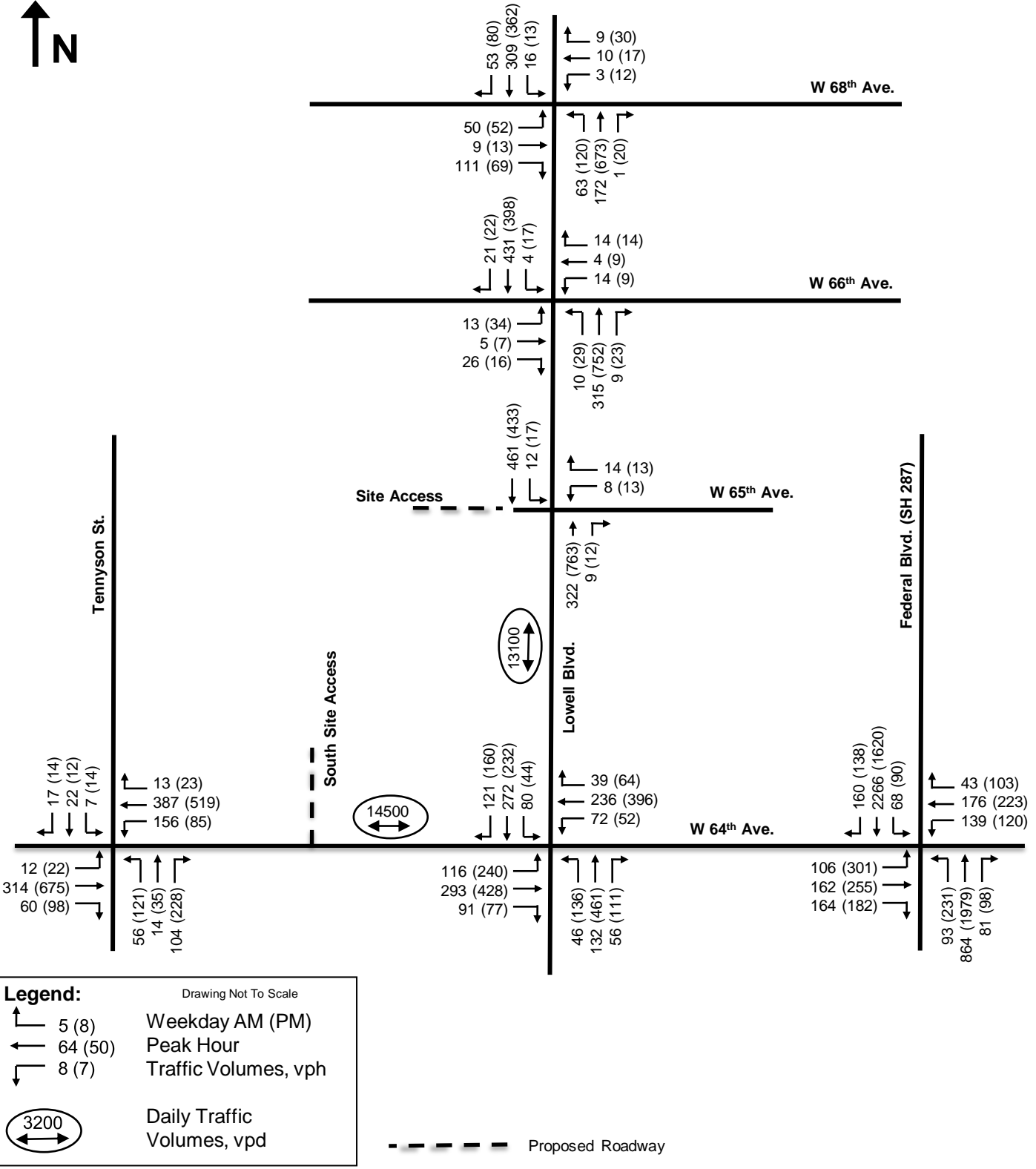
Proposed Roadway: - - - - -

2021 Existing (COVID Adjusted) Traffic Volumes

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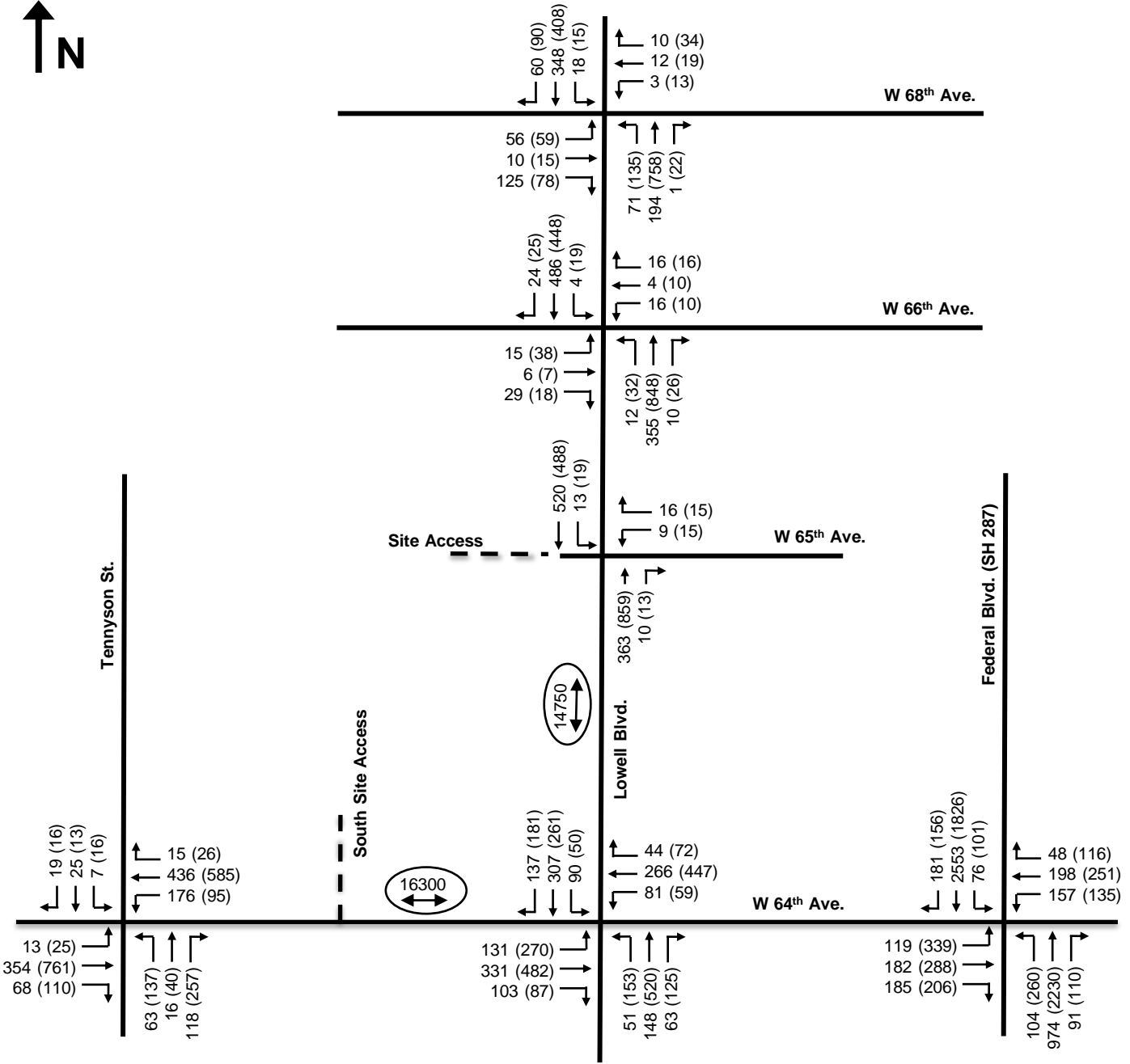
Figure 3



2028 Background Traffic Volumes

6501 Lowell Blvd
 The True Life Companies
 HKS #200917

Figure 4



Legend: Drawing Not To Scale

- 5 (8) Weekday AM (PM)
- 64 (50) Peak Hour
- 8 (7) Traffic Volumes, vph
- 3200 Daily Traffic Volumes, vpd

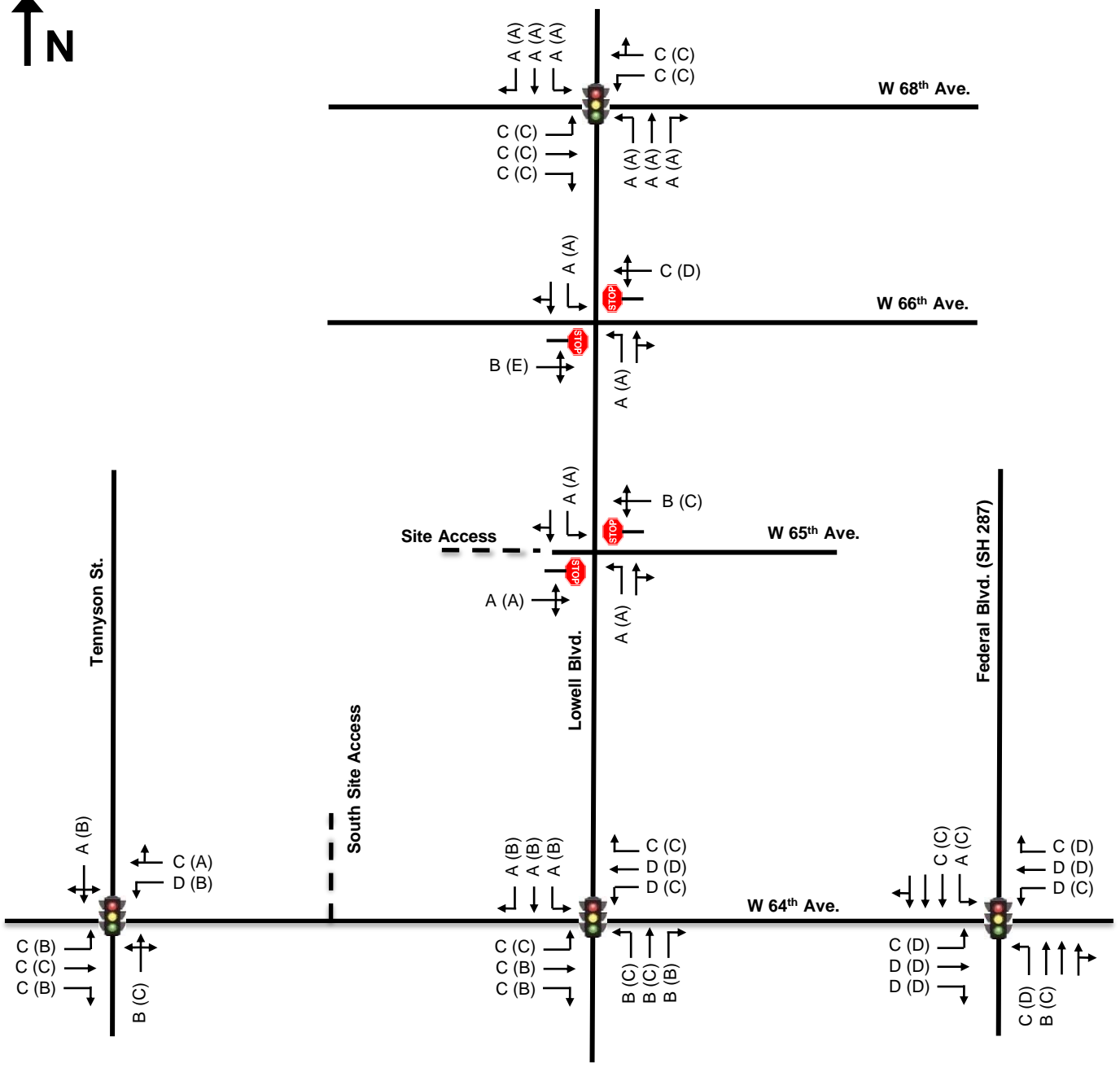
- - - - - Proposed Roadway



2040 Background Traffic Volumes

6501 Lowell Blvd
 The True Life Companies
 HKS #200917

Figure 5



Legend: Drawing Not To Scale

	A (B)	Weekday AM (PM)
	B (C)	Peak Hour
	D (D)	Level of Service

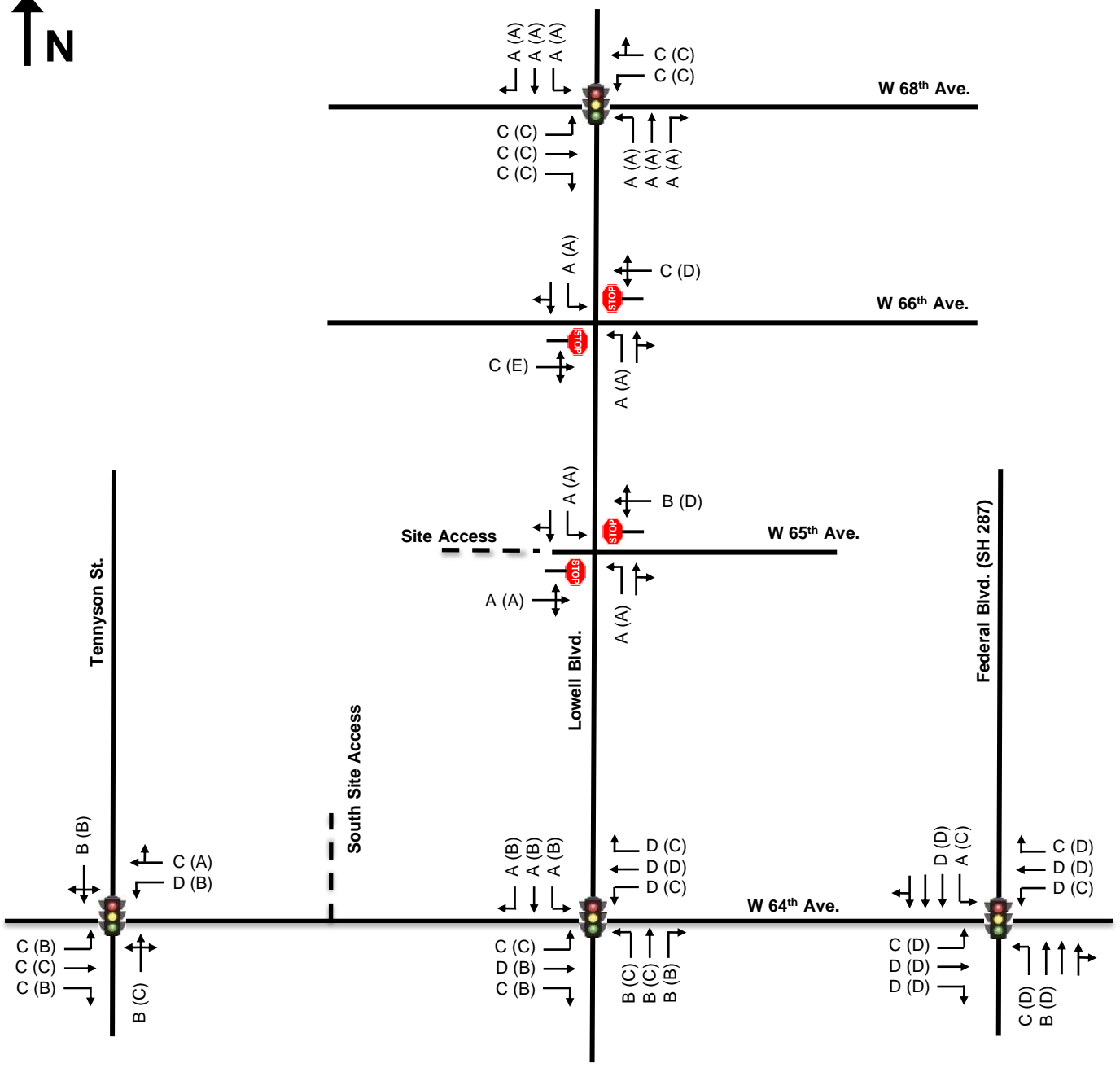
- - - - - Proposed Roadway



6501 Lowell Blvd
 The True Life Companies
 HKS #200917

2021 Existing Traffic Operational Conditions

Figure 6



Legend: Drawing Not To Scale

	A (B)	Weekday AM (PM)
	B (C)	Peak Hour
	D (D)	Level of Service

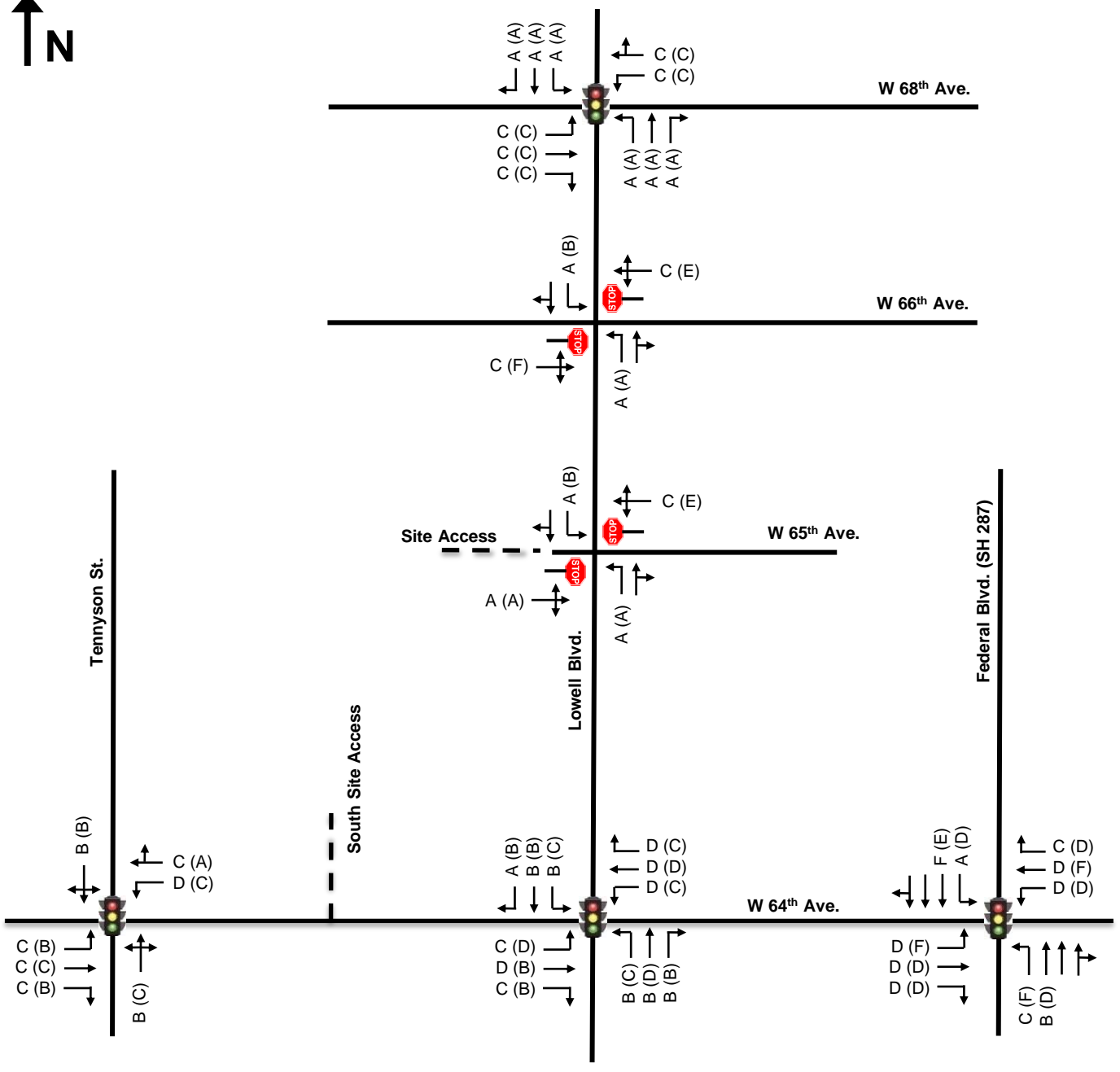
- - - - - Proposed Roadway



6501 Lowell Blvd
 The True Life Companies
 HKS #200917

2028 Background Traffic Operational Conditions

Figure 7



Legend: Drawing Not To Scale

	A (B)	Weekday AM (PM)
	B (C)	Peak Hour
	D (D)	Level of Service

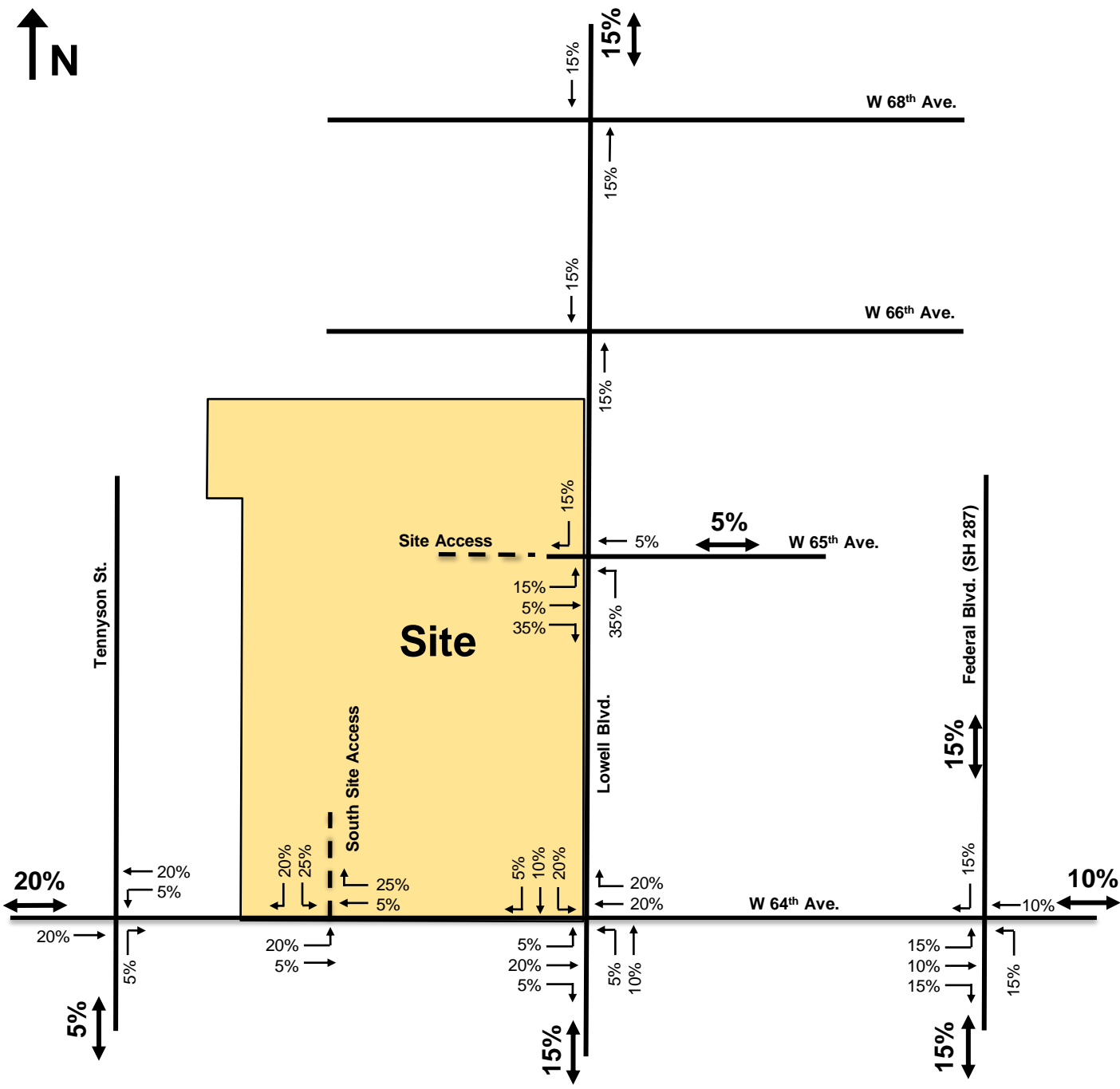
----- Proposed Roadway



2040 Background Traffic Operational Conditions

6501 Lowell Blvd
 The True Life Companies
 HKS #200917

Figure 8



Legend: Drawing Not To Scale

XX% Site-Generated Trip Distribution

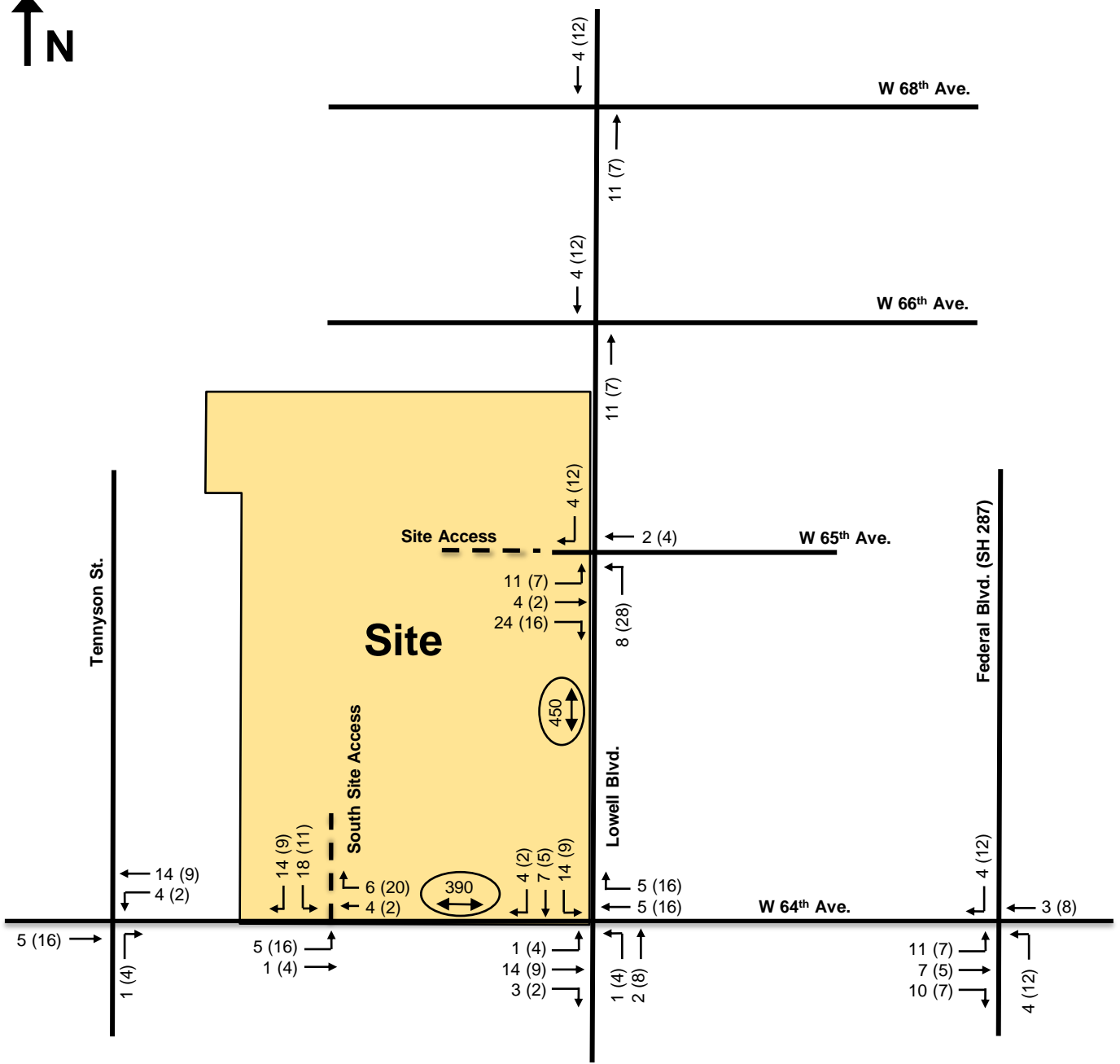
Proposed Roadway



6501 Lowell Blvd
 The True Life Companies
 HKS #200917

Site Generated Trip Distribution

Figure 9



Legend: Drawing Not To Scale

- 5 (8) Weekday AM (PM)
- 64 (50) Peak Hour
- 8 (7) Traffic Volumes, vph
- 3200 Daily Traffic Volumes, vpd

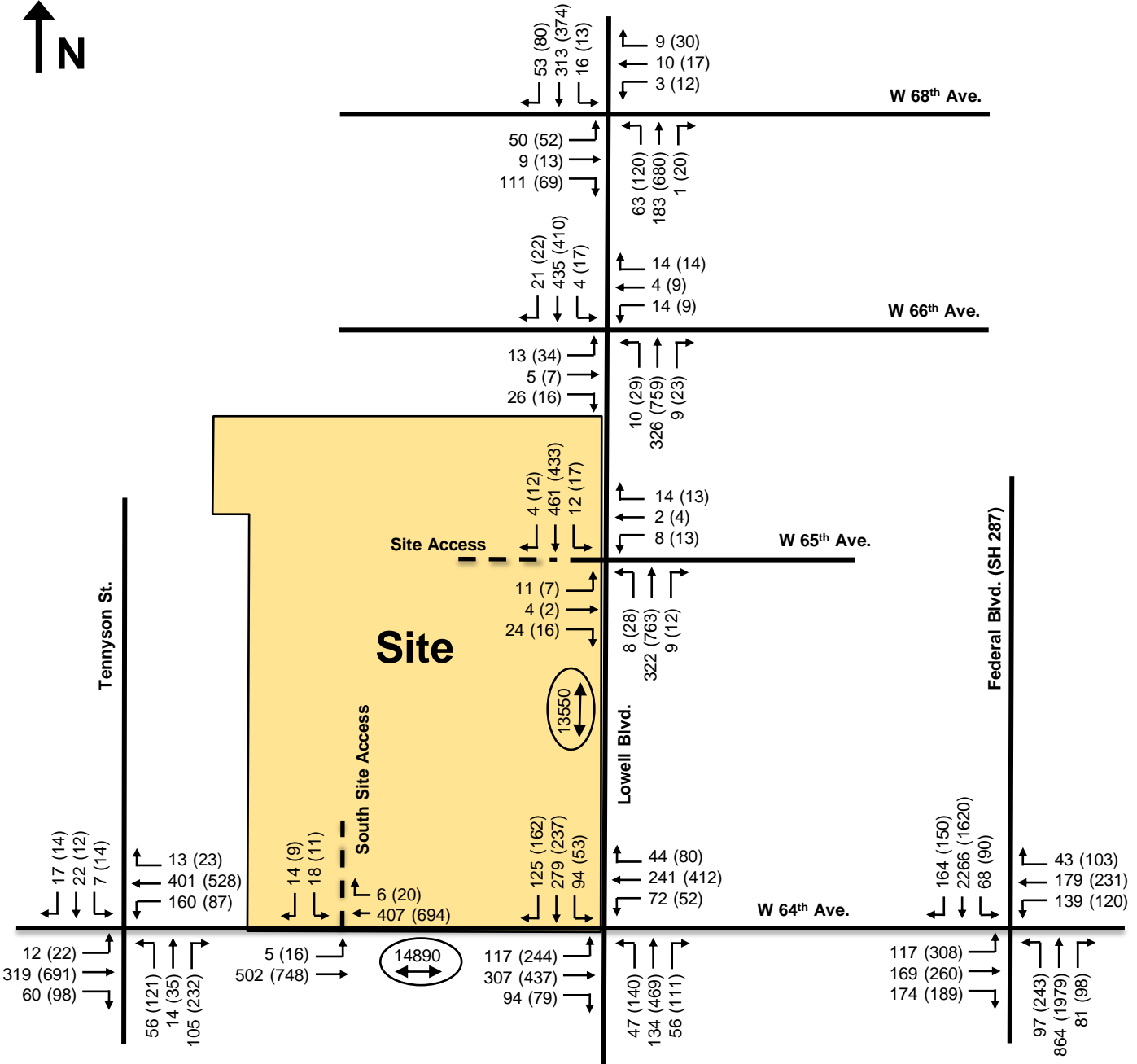
--- Proposed Roadway



Site Generated Trip Assignment

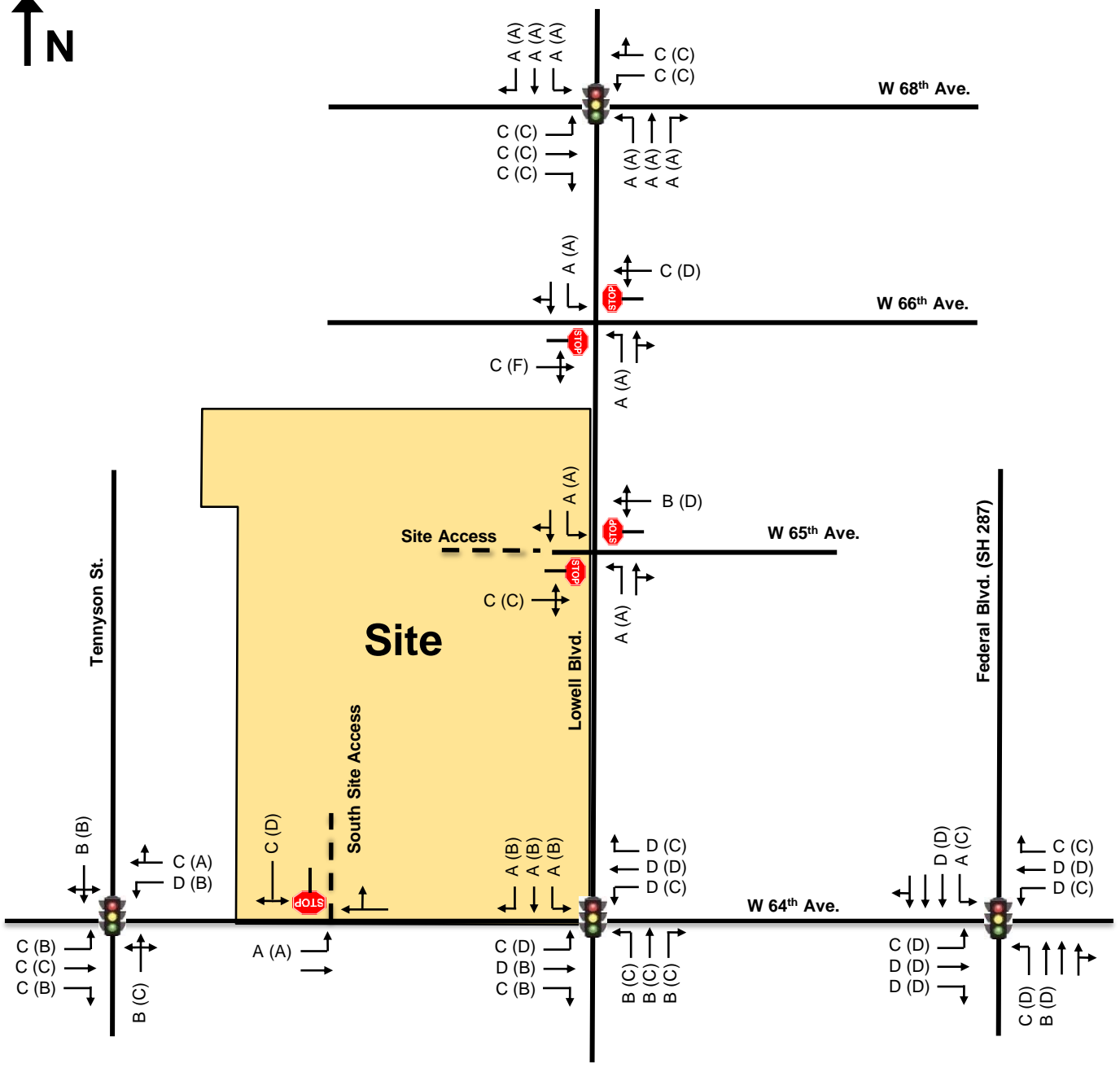
6501 Lowell Blvd
 The True Life Companies
 HKS #200917

Figure 10



2028 Total Traffic Volumes (Background + Site Generated)

Figure 11



Legend: Drawing Not To Scale

	A (B)	Weekday AM (PM)
	B (C)	Peak Hour
	D (D)	Level of Service

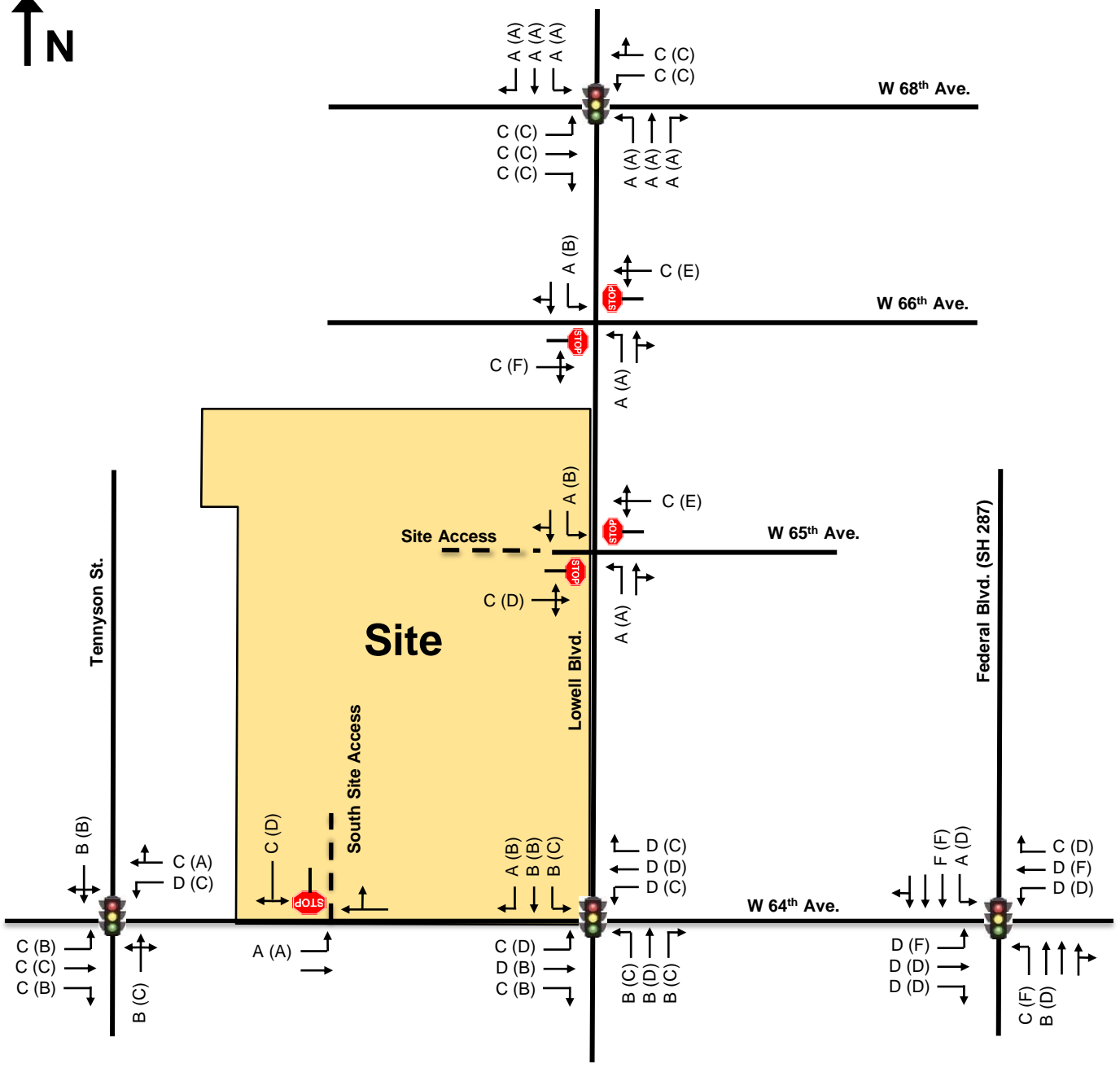
- - - - - Proposed Roadway

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HKS #200917

2028 Total Traffic Operational Conditions

Figure 13



Legend: Drawing Not To Scale

	A (B)	Weekday AM (PM)
	B (C)	Peak Hour
	D (D)	Level of Service

- - - - - Proposed Roadway



6501 Lowell Blvd
 The True Life Companies
 HKS #200917

2040 Total Traffic Operational Conditions

Figure 14

APPENDIX “A”

**2021 EXISTING
TRAFFIC VOLUME COUNTS**

All Traffic Data Services
www.alltrafficdata.net

Date Start: 04-Mar-21
Site Code: 4
Station ID: 4
LOWELL BLVD N.O. 64TH AVE

Start Time	04-Mar-21 Thu	NB	SB	Total						
12:00 AM		63	33	96						
01:00		26	25	51						
02:00		24	16	40						
03:00		8	10	18						
04:00		13	17	30						
05:00		23	28	51						
06:00		63	108	171						
07:00		118	277	395						
08:00		266	428	694						
09:00		295	377	672						
10:00		244	245	489						
11:00		212	239	451						
12:00 PM		243	270	513						
01:00		301	279	580						
02:00		346	258	604						
03:00		434	292	726						
04:00		516	327	843						
05:00		590	335	925						
06:00		726	328	1054						
07:00		386	255	641						
08:00		224	171	395						
09:00		159	87	246						
10:00		111	73	184						
11:00		76	59	135						
Total		5467	4537	10004						
Percent		54.6%	45.4%							
AM Peak	-	09:00	08:00	-	-	-	-	-	-	08:00
Vol.	-	295	428	-	-	-	-	-	-	694
PM Peak	-	18:00	17:00	-	-	-	-	-	-	18:00
Vol.	-	726	335	-	-	-	-	-	-	1054
Grand Total		5467	4537							10004
Percent		54.6%	45.4%							
ADT		ADT 10,004	AADT 10,004							

All Traffic Data Services
www.alltrafficdata.net

Date Start: 04-Mar-21
Site Code: 5
Station ID: 5
64TH AVE W.O. LOWELL BLVD

Start Time	04-Mar-21 Thu	EB	WB							Total
12:00 AM		20	24							44
01:00		13	20							33
02:00		13	8							21
03:00		19	18							37
04:00		37	22							59
05:00		79	94							173
06:00		228	134							362
07:00		347	266							613
08:00		354	286							640
09:00		269	216							485
10:00		266	268							534
11:00		328	324							652
12:00 PM		371	370							741
01:00		380	342							722
02:00		448	416							864
03:00		519	468							987
04:00		538	466							1004
05:00		534	516							1050
06:00		366	353							719
07:00		239	233							472
08:00		181	163							344
09:00		128	121							249
10:00		93	90							183
11:00		55	40							95
Total		5825	5258							11083
Percent		52.6%	47.4%							
AM Peak	-	08:00	11:00	-	-	-	-	-	-	11:00
Vol.	-	354	324	-	-	-	-	-	-	652
PM Peak	-	16:00	17:00	-	-	-	-	-	-	17:00
Vol.	-	538	516	-	-	-	-	-	-	1050
Grand Total		5825	5258							11083
Percent		52.6%	47.4%							
ADT		ADT 11,083	AADT 11,083							



(303) 216-2439
www.alltrafficdata.net

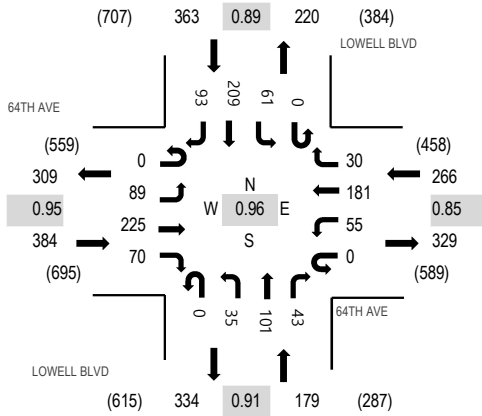
Location: 1 LOWELL BLVD & 64TH AVE AM

Date: Thursday, March 4, 2021

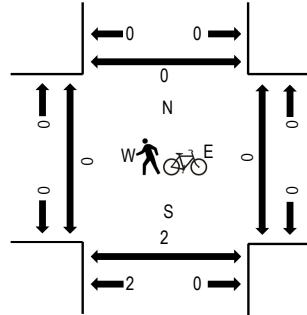
Peak Hour: 07:30 AM - 08:30 AM

Peak 15-Minutes: 07:45 AM - 08:00 AM

Peak Hour - All Vehicles



Peak Hour - Pedestrians/Bicycles on Crosswalk



Note: Total study counts contained in parentheses.

Traffic Counts

Interval Start Time	64TH AVE Eastbound				64TH AVE Westbound				LOWELL BLVD Northbound				LOWELL BLVD Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
7:00 AM	0	19	38	14	0	12	21	4	0	4	14	4	0	25	39	17	211	1,073	0	0	0	0
7:15 AM	0	11	46	16	0	8	34	4	0	7	17	5	0	17	55	35	255	1,166	0	0	1	0
7:30 AM	0	16	63	21	0	14	35	6	0	6	22	12	0	19	69	14	297	1,192	0	0	2	0
7:45 AM	0	23	57	18	0	21	47	11	0	13	26	10	0	16	42	26	310	1,171	0	0	0	0
8:00 AM	0	22	58	21	0	8	57	6	0	4	27	11	0	16	52	22	304	1,074	0	0	0	0
8:15 AM	0	28	47	10	0	12	42	7	0	12	26	10	0	10	46	31	281		0	0	0	0
8:30 AM	0	32	47	15	0	8	40	9	0	6	21	2	0	15	48	33	276		0	0	0	0
8:45 AM	0	13	38	22	0	14	33	5	0	5	15	8	0	15	30	15	213		0	0	0	0
Count Total	0	164	394	137	0	97	309	52	0	57	168	62	0	133	381	193	2,147		0	0	3	0
Peak Hour	0	89	225	70	0	55	181	30	0	35	101	43	0	61	209	93	1,192		0	0	2	0



(303) 216-2439
www.alltrafficdata.net

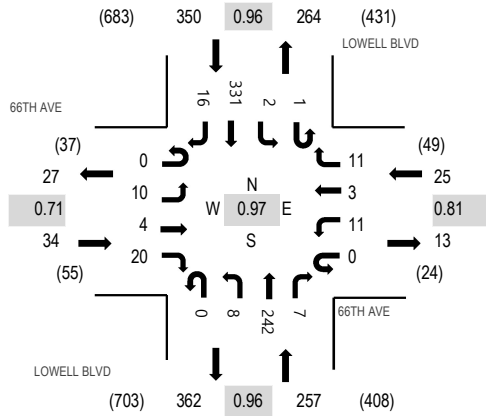
Location: 3 LOWELL BLVD & 66TH AVE AM

Date: Thursday, March 4, 2021

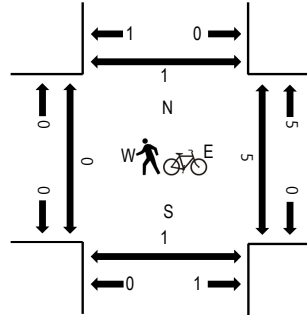
Peak Hour: 07:45 AM - 08:45 AM

Peak 15-Minutes: 08:15 AM - 08:30 AM

Peak Hour - All Vehicles



Peak Hour - Pedestrians/Bicycles on Crosswalk



Note: Total study counts contained in parentheses.

Traffic Counts

Interval Start Time	66TH AVE Eastbound				66TH AVE Westbound				LOWELL BLVD Northbound				LOWELL BLVD Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
7:00 AM	0	1	0	2	0	1	1	4	0	0	36	0	0	4	83	3	135	592	0	0	3	0
7:15 AM	0	0	2	4	0	2	1	2	0	0	34	1	0	0	93	1	140	620	0	1	0	0
7:30 AM	0	3	1	3	0	2	0	6	0	0	43	2	0	0	95	0	155	652	0	0	0	2
7:45 AM	0	2	0	5	0	1	1	3	0	3	60	1	0	0	80	6	162	666	0	0	0	1
8:00 AM	0	2	2	9	0	1	2	3	0	2	63	2	1	1	73	2	163	603	0	0	0	0
8:15 AM	0	5	1	4	0	5	0	2	0	1	59	3	0	0	86	6	172		0	5	1	0
8:30 AM	0	1	1	2	0	4	0	3	0	2	60	1	0	1	92	2	169		0	0	0	0
8:45 AM	0	2	0	3	0	2	0	3	0	2	33	0	0	1	51	2	99		0	0	0	0
Count Total	0	16	7	32	0	18	5	26	0	10	388	10	1	7	653	22	1,195		0	6	4	3
Peak Hour	0	10	4	20	0	11	3	11	0	8	242	7	1	2	331	16	666		0	5	1	1

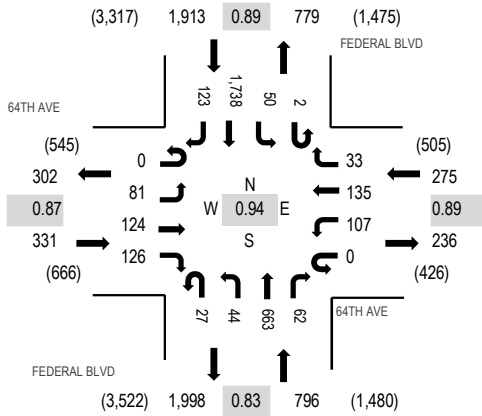
Location: 1 FEDERAL BLVD & 64TH AVE AM

Date: Wednesday, June 2, 2021

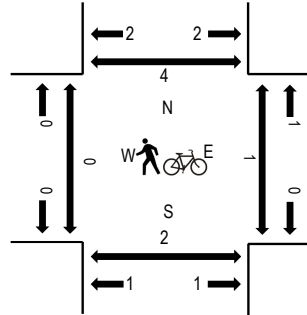
Peak Hour: 07:15 AM - 08:15 AM

Peak 15-Minutes: 07:30 AM - 07:45 AM

Peak Hour - All Vehicles



Peak Hour - Pedestrians/Bicycles on Crosswalk

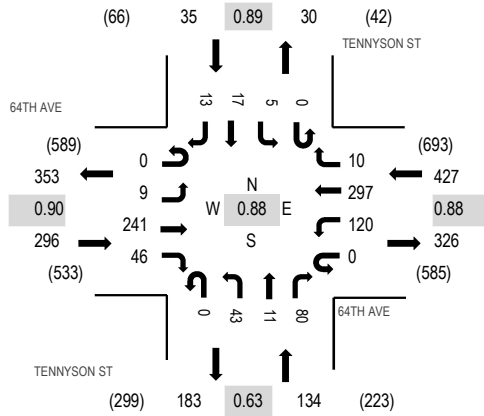


Note: Total study counts contained in parentheses.

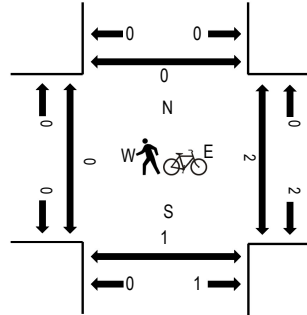
Traffic Counts

Interval Start Time	64TH AVE Eastbound				64TH AVE Westbound				FEDERAL BLVD Northbound				FEDERAL BLVD Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
7:00 AM	0	20	38	33	0	25	14	9	2	11	102	11	0	9	376	13	663	3,253	0	0	0	0
7:15 AM	0	15	18	25	0	22	24	8	7	14	168	18	1	11	500	14	845	3,315	0	0	0	1
7:30 AM	0	25	32	40	0	29	34	10	9	8	149	6	0	13	487	38	880	3,150	0	0	0	2
7:45 AM	0	21	42	27	0	29	40	8	4	10	201	25	1	13	399	45	865	2,961	0	0	0	0
8:00 AM	0	20	32	34	0	27	37	7	7	12	145	13	0	13	352	26	725	2,715	0	0	1	0
8:15 AM	0	14	19	33	0	18	25	9	4	17	169	7	1	8	332	24	680		1	1	0	1
8:30 AM	1	20	26	40	0	20	40	13	9	15	152	6	2	17	310	20	691		1	0	0	1
8:45 AM	0	27	31	33	0	22	32	3	8	10	151	10	4	8	259	21	619		0	1	2	2
Count Total	1	162	238	265	0	192	246	67	50	97	1,237	96	9	92	3,015	201	5,968		2	2	3	7
Peak Hour	0	81	124	126	0	107	135	33	27	44	663	62	2	50	1,738	123	3,315		0	0	1	3

Peak Hour - All Vehicles



Peak Hour - Pedestrians/Bicycles on Crosswalk

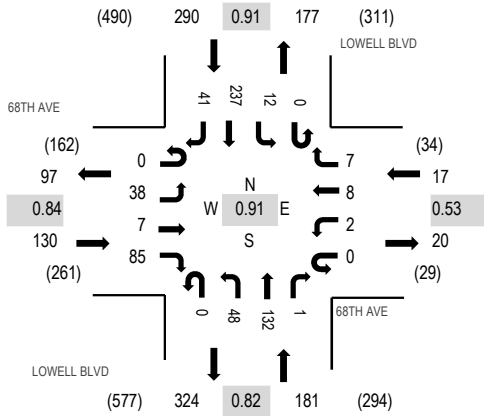


Note: Total study counts contained in parentheses.

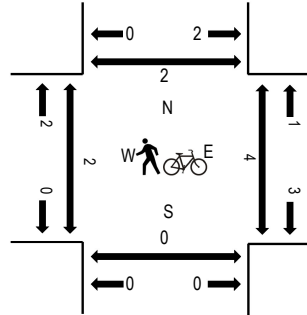
Traffic Counts

Interval Start Time	64TH AVE Eastbound				64TH AVE Westbound				TENNYSON ST Northbound				TENNYSON ST Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
7:00 AM	0	0	47	4	0	21	35	1	0	5	2	15	0	2	0	3	135	698	1	0	0	0
7:15 AM	0	0	48	12	0	11	45	1	0	3	0	9	0	2	3	5	139	771	0	0	0	0
7:30 AM	0	3	51	9	0	28	52	2	0	14	0	18	0	3	3	2	185	824	0	0	0	0
7:45 AM	0	2	62	15	0	39	80	2	0	5	2	22	0	0	6	4	239	892	0	0	1	0
8:00 AM	0	1	62	9	0	27	71	4	0	5	2	16	0	2	6	3	208	817	0	0	0	0
8:15 AM	0	3	49	11	0	24	69	1	0	12	2	15	0	2	0	4	192		0	1	0	0
8:30 AM	0	3	68	11	0	30	77	3	0	21	5	27	0	1	5	2	253		0	0	0	0
8:45 AM	0	1	50	12	0	10	59	1	0	10	1	12	0	2	3	3	164		0	1	0	0
Count Total	0	13	437	83	0	190	488	15	0	75	14	134	0	14	26	26	1,515		1	2	1	0
Peak Hour	0	9	241	46	0	120	297	10	0	43	11	80	0	5	17	13	892		0	1	1	0

Peak Hour - All Vehicles



Peak Hour - Pedestrians/Bicycles on Crosswalk



Note: Total study counts contained in parentheses.

Traffic Counts

Interval Start Time	68TH AVE Eastbound				68TH AVE Westbound				LOWELL BLVD Northbound				LOWELL BLVD Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
7:00 AM	0	15	0	18	0	0	0	0	0	4	14	0	0	0	30	7	88	461	0	3	0	2
7:15 AM	0	12	3	24	0	0	2	0	0	5	21	0	0	2	36	3	108	506	0	0	0	0
7:30 AM	0	12	1	23	0	2	0	3	0	6	22	0	0	2	48	9	128	550	0	1	0	1
7:45 AM	0	6	0	17	0	2	5	3	0	14	26	1	0	0	53	10	137	586	0	0	0	0
8:00 AM	0	5	0	22	0	1	0	3	0	11	30	0	0	4	45	12	133	618	0	0	0	0
8:15 AM	0	16	2	17	0	0	0	2	0	15	25	1	0	3	57	14	152		1	1	0	1
8:30 AM	0	7	3	31	0	0	2	2	0	12	32	0	0	2	68	5	164		1	0	0	1
8:45 AM	0	10	2	15	0	1	6	0	0	10	45	0	0	3	67	10	169		0	0	0	0
Count Total	0	83	11	167	0	6	15	13	0	77	215	2	0	16	404	70	1,079		2	5	0	5
Peak Hour	0	38	7	85	0	2	8	7	0	48	132	1	0	12	237	41	618		2	1	0	2



(303) 216-2439
www.alltrafficdata.net

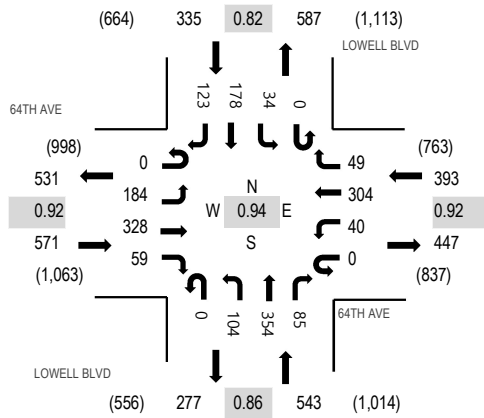
Location: 1 LOWELL BLVD & 64TH AVE PM

Date: Thursday, March 4, 2021

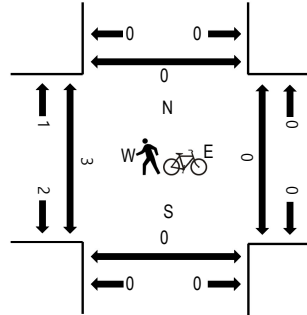
Peak Hour: 04:30 PM - 05:30 PM

Peak 15-Minutes: 05:00 PM - 05:15 PM

Peak Hour - All Vehicles



Peak Hour - Pedestrians/Bicycles on Crosswalk



Note: Total study counts contained in parentheses.

Traffic Counts

Interval Start Time	64TH AVE Eastbound				64TH AVE Westbound				LOWELL BLVD Northbound				LOWELL BLVD Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
4:00 PM	0	40	85	15	0	8	71	13	0	24	57	19	0	15	58	33	438	1,704	0	0	0	0
4:15 PM	0	29	71	9	0	8	62	13	0	20	79	17	0	9	47	31	395	1,755	0	0	0	0
4:30 PM	0	54	91	8	0	8	73	13	0	20	78	22	0	8	38	23	436	1,842	0	0	0	0
4:45 PM	0	40	68	25	0	11	75	9	0	24	76	21	0	7	46	33	435	1,807	0	0	0	0
5:00 PM	0	41	75	13	0	12	81	15	0	30	110	22	0	10	50	30	489	1,800	1	0	0	0
5:15 PM	0	49	94	13	0	9	75	12	0	30	90	20	0	9	44	37	482		1	0	0	0
5:30 PM	0	46	58	14	0	14	59	13	0	23	93	16	0	10	33	22	401		0	0	0	0
5:45 PM	0	45	64	16	0	22	72	15	0	23	83	17	0	9	35	27	428		0	0	0	1
Count Total	0	344	606	113	0	92	568	103	0	194	666	154	0	77	351	236	3,504		2	0	0	1
Peak Hour	0	184	328	59	0	40	304	49	0	104	354	85	0	34	178	123	1,842		2	0	0	0



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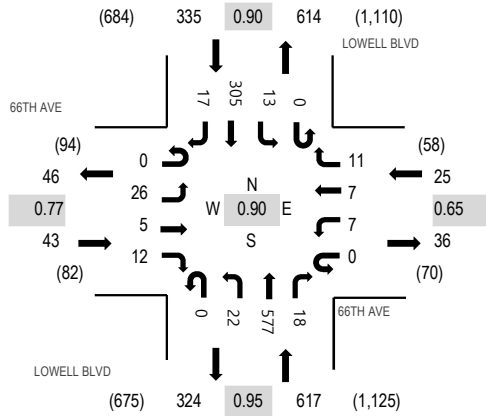
Location: 3 LOWELL BLVD & 66TH AVE PM

Date: Thursday, March 4, 2021

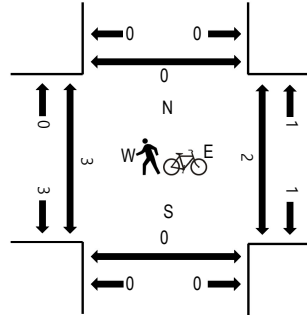
Peak Hour: 05:00 PM - 06:00 PM

Peak 15-Minutes: 05:00 PM - 05:15 PM

Peak Hour - All Vehicles



Peak Hour - Pedestrians/Bicycles on Crosswalk



Note: Total study counts contained in parentheses.

Traffic Counts

Interval Start Time	66TH AVE Eastbound			66TH AVE Westbound			LOWELL BLVD Northbound			LOWELL BLVD Southbound			Total	Rolling Hour	Pedestrian Crossings							
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North				
4:00 PM	0	2	0	9	0	3	2	1	0	5	101	9	0	2	98	6	238	929	0	0	0	0
4:15 PM	0	5	1	7	0	5	3	5	0	4	109	4	0	0	76	9	228	974	0	1	1	2
4:30 PM	0	6	1	2	0	3	0	4	0	6	140	5	0	5	76	4	252	1,019	0	0	0	0
4:45 PM	0	3	1	2	0	4	1	2	0	3	118	4	0	2	66	5	211	998	0	1	0	0
5:00 PM	0	9	2	3	0	1	2	4	0	9	150	4	0	3	92	4	283	1,020	1	0	0	0
5:15 PM	0	5	1	5	0	3	3	0	0	6	152	0	0	6	88	4	273		2	1	0	0
5:30 PM	0	4	2	3	0	0	1	4	0	3	135	6	0	4	66	3	231		0	0	0	0
5:45 PM	0	8	0	1	0	3	1	3	0	4	140	8	0	0	59	6	233		0	1	0	0
Count Total	0	42	8	32	0	22	13	23	0	40	1,045	40	0	22	621	41	1,949		3	4	1	2
Peak Hour	0	26	5	12	0	7	7	11	0	22	577	18	0	13	305	17	1,020		3	2	0	0

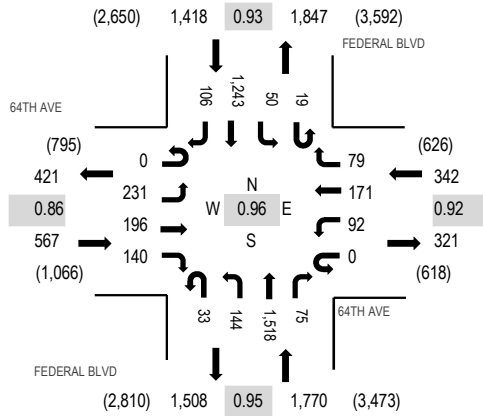
Location: 1 FEDERAL BLVD & 64TH AVE PM

Date: Wednesday, June 2, 2021

Peak Hour: 04:30 PM - 05:30 PM

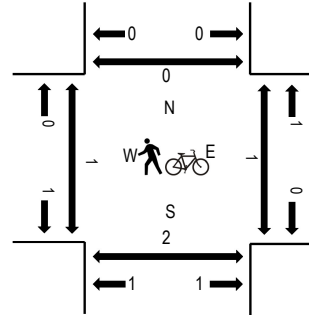
Peak 15-Minutes: 05:00 PM - 05:15 PM

Peak Hour - All Vehicles



Note: Total study counts contained in parentheses.

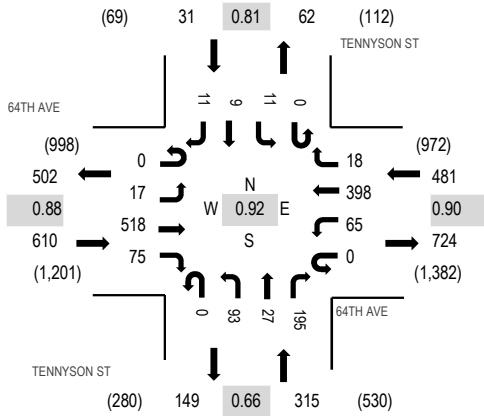
Peak Hour - Pedestrians/Bicycles on Crosswalk



Traffic Counts

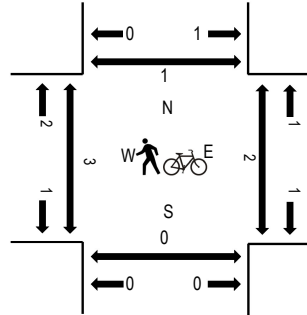
Interval Start Time	64TH AVE Eastbound				64TH AVE Westbound				FEDERAL BLVD Northbound				FEDERAL BLVD Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
4:00 PM	0	44	46	39	0	20	34	17	3	24	359	26	3	15	288	30	948	3,939	3	0	0	0
4:15 PM	0	51	42	38	0	25	43	20	7	33	350	19	5	12	256	41	942	4,062	0	0	0	0
4:30 PM	0	62	43	37	0	22	35	21	1	34	365	25	2	10	331	24	1,012	4,097	0	0	0	0
4:45 PM	0	66	65	35	0	26	46	21	12	33	381	17	6	12	298	19	1,037	4,031	0	0	2	0
5:00 PM	0	51	46	33	0	21	43	18	12	37	408	22	6	11	326	37	1,071	3,876	0	0	0	0
5:15 PM	0	52	42	35	0	23	47	19	8	40	364	11	5	17	288	26	977		0	0	0	0
5:30 PM	0	36	33	31	0	24	29	9	5	30	433	15	4	14	257	26	946		0	0	0	0
5:45 PM	0	53	48	38	0	15	38	10	5	28	349	17	2	10	251	18	882		0	2	0	0
Count Total	0	415	365	286	0	176	315	135	53	259	3,009	152	33	101	2,295	221	7,815		3	2	2	0
Peak Hour	0	231	196	140	0	92	171	79	33	144	1,518	75	19	50	1,243	106	4,097		0	0	2	0

Peak Hour - All Vehicles



Note: Total study counts contained in parentheses.

Peak Hour - Pedestrians/Bicycles on Crosswalk



Traffic Counts

Interval Start Time	64TH AVE Eastbound				64TH AVE Westbound				TENNYSON ST Northbound				TENNYSON ST Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
4:00 PM	0	3	129	25	0	17	96	2	0	20	7	42	0	4	1	4	350	1,437	2	0	0	0
4:15 PM	0	7	108	20	0	19	115	6	0	19	2	44	0	1	5	2	348	1,427	1	1	0	1
4:30 PM	0	3	126	16	0	14	104	3	0	35	7	78	0	2	2	2	392	1,436	0	0	0	0
4:45 PM	0	4	155	14	0	15	83	7	0	19	11	31	0	4	1	3	347	1,356	0	0	0	0
5:00 PM	0	5	111	14	0	16	118	2	0	16	6	43	0	2	3	4	340	1,335	0	0	0	1
5:15 PM	0	2	135	18	0	12	121	3	0	15	2	39	0	5	1	4	357		0	0	0	0
5:30 PM	0	7	117	16	0	11	93	4	0	12	5	35	0	0	7	5	312		0	1	1	0
5:45 PM	0	7	146	13	0	16	90	5	0	17	2	23	0	2	4	1	326		0	0	0	0
Count Total	0	38	1,027	136	0	120	820	32	0	153	42	335	0	20	24	25	2,772		3	2	1	2
Peak Hour	0	17	518	75	0	65	398	18	0	93	27	195	0	11	9	11	1,437		3	1	0	1

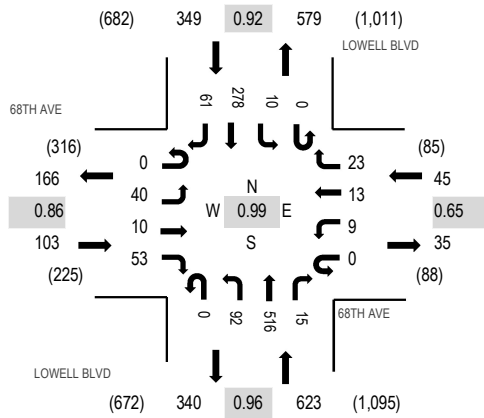
Location: 3 LOWELL BLVD & 68TH AVE PM

Date: Wednesday, June 2, 2021

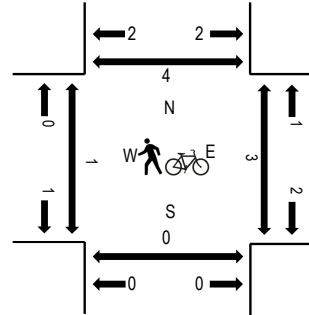
Peak Hour: 05:00 PM - 06:00 PM

Peak 15-Minutes: 05:45 PM - 06:00 PM

Peak Hour - All Vehicles



Peak Hour - Pedestrians/Bicycles on Crosswalk



Note: Total study counts contained in parentheses.

Traffic Counts

Interval Start Time	68TH AVE Eastbound				68TH AVE Westbound				LOWELL BLVD Northbound				LOWELL BLVD Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
4:00 PM	0	8	3	13	0	1	2	5	0	12	78	6	0	5	66	16	215	967	1	0	0	0
4:15 PM	0	6	0	21	0	1	2	1	0	17	102	5	0	8	61	16	240	1,022	2	2	0	1
4:30 PM	0	7	4	24	0	1	1	1	0	18	97	5	0	7	69	12	246	1,065	0	0	0	3
4:45 PM	0	17	2	17	0	4	7	14	0	36	96	0	0	8	54	11	266	1,102	3	2	1	17
5:00 PM	0	8	1	12	0	1	3	8	0	17	127	7	0	4	70	12	270	1,120	0	0	0	0
5:15 PM	0	14	4	14	0	4	6	6	0	18	131	4	0	3	61	18	283		1	2	0	1
5:30 PM	0	9	0	13	0	4	3	5	0	32	128	3	0	0	70	16	283		0	0	0	0
5:45 PM	0	9	5	14	0	0	1	4	0	25	130	1	0	3	77	15	284		0	1	0	0
Count Total	0	78	19	128	0	16	25	44	0	175	889	31	0	38	528	116	2,087		7	7	1	22
Peak Hour	0	40	10	53	0	9	13	23	0	92	516	15	0	10	278	61	1,120		1	3	0	1

APPENDIX “B”

**INTERSECTION
CAPACITY ANALYSIS
WORKSHEETS**



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		150	150		0	225		250	150		150
Storage Lanes	1		1	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850		0.929				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1730	0	1770	1863	1583	1770	1863	1583
Flt Permitted	0.744			0.751			0.570			0.647		
Satd. Flow (perm)	1386	1863	1583	1399	1730	0	1062	1863	1583	1205	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			112		10				27			54
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		594			990			699			502	
Travel Time (s)		13.5			22.5			15.9			11.4	

Intersection Summary

Area Type: Other

Timings
1: Lowell Blvd. & W. 68th Ave.

6501 Lowell Blvd
06/07/2021



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↘	↖	↗	↖	↗	↘	↖	↗	↘
Traffic Volume (vph)	46	9	103	2	10	58	161	1	15	288	50
Future Volume (vph)	46	9	103	2	10	58	161	1	15	288	50
Turn Type	Perm	NA	Perm	Perm	NA	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8		2			6	
Permitted Phases	4		4	8		2		2	6		6
Detector Phase	4	4	4	8	8	2	2	2	6	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	26.0	26.0	26.0	26.0	26.0	34.0	34.0	34.0	34.0	34.0	34.0
Total Split (%)	43.3%	43.3%	43.3%	43.3%	43.3%	56.7%	56.7%	56.7%	56.7%	56.7%	56.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag											
Lead-Lag Optimize?											
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	7.7	7.7	7.7	7.7	7.7	46.2	46.2	46.2	46.2	46.2	46.2
Actuated g/C Ratio	0.13	0.13	0.13	0.13	0.13	0.77	0.77	0.77	0.77	0.77	0.77
v/c Ratio	0.28	0.04	0.37	0.01	0.09	0.08	0.12	0.00	0.02	0.22	0.04
Control Delay	26.9	21.9	9.4	21.5	17.1	3.2	3.1	0.0	3.0	3.4	1.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.9	21.9	9.4	21.5	17.1	3.2	3.1	0.0	3.0	3.4	1.2
LOS	C	C	A	C	B	A	A	A	A	A	A
Approach Delay		15.2			17.5		3.1			3.1	
Approach LOS		B			B		A			A	

Intersection Summary

Cycle Length: 60
 Actuated Cycle Length: 60
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 45
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.37
 Intersection Signal Delay: 6.0
 Intersection LOS: A
 Intersection Capacity Utilization 39.8%
 ICU Level of Service A
 Analysis Period (min) 15

Splits and Phases: 1: Lowell Blvd. & W. 68th Ave.



Queues

6501 Lowell Blvd

1: Lowell Blvd. & W. 68th Ave.

06/07/2021


























Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	50	10	112	2	21	63	175	1	16	313	54
v/c Ratio	0.28	0.04	0.37	0.01	0.09	0.08	0.12	0.00	0.02	0.22	0.04
Control Delay	26.9	21.9	9.4	21.5	17.1	3.2	3.1	0.0	3.0	3.4	1.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.9	21.9	9.4	21.5	17.1	3.2	3.1	0.0	3.0	3.4	1.2
Queue Length 50th (ft)	17	3	0	1	4	5	14	0	1	28	0
Queue Length 95th (ft)	42	14	36	6	19	16	35	0	6	61	8
Internal Link Dist (ft)		514			910		619			422	
Turn Bay Length (ft)	150		150	150		225		250	150		150
Base Capacity (vph)	496	667	639	501	626	817	1433	1224	927	1433	1231
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.01	0.18	0.00	0.03	0.08	0.12	0.00	0.02	0.22	0.04

Intersection Summary

HCM 6th Signalized Intersection Summary
 1: Lowell Blvd. & W. 68th Ave.

6501 Lowell Blvd
 06/07/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	46	9	103	2	10	9	58	161	1	15	288	50
Future Volume (veh/h)	46	9	103	2	10	9	58	161	1	15	288	50
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	50	10	112	2	11	10	63	175	1	16	313	54
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	250	195	166	247	94	86	825	1394	1182	989	1394	1182
Arrive On Green	0.10	0.10	0.10	0.10	0.10	0.10	0.75	0.75	0.75	0.75	0.75	0.75
Sat Flow, veh/h	1391	1870	1585	1269	902	820	1015	1870	1585	1209	1870	1585
Grp Volume(v), veh/h	50	10	112	2	0	21	63	175	1	16	313	54
Grp Sat Flow(s),veh/h/ln	1391	1870	1585	1269	0	1723	1015	1870	1585	1209	1870	1585
Q Serve(g_s), s	2.0	0.3	4.1	0.1	0.0	0.7	1.2	1.6	0.0	0.2	3.1	0.5
Cycle Q Clear(g_c), s	2.7	0.3	4.1	0.4	0.0	0.7	4.3	1.6	0.0	1.8	3.1	0.5
Prop In Lane	1.00		1.00	1.00		0.48	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	250	195	166	247	0	180	825	1394	1182	989	1394	1182
V/C Ratio(X)	0.20	0.05	0.68	0.01	0.00	0.12	0.08	0.13	0.00	0.02	0.22	0.05
Avail Cap(c_a), veh/h	603	670	568	569	0	617	825	1394	1182	989	1394	1182
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.6	24.2	25.9	24.4	0.0	24.4	3.0	2.1	1.9	2.4	2.3	2.0
Incr Delay (d2), s/veh	0.4	0.1	4.8	0.0	0.0	0.3	0.2	0.2	0.0	0.0	0.4	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.2	0.2	3.0	0.0	0.0	0.5	0.3	0.6	0.0	0.1	1.2	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.0	24.3	30.6	24.4	0.0	24.6	3.2	2.3	1.9	2.4	2.7	2.1
LnGrp LOS	C	C	C	C	A	C	A	A	A	A	A	A
Approach Vol, veh/h		172			23			239			383	
Approach Delay, s/veh		28.9			24.6			2.5			2.6	
Approach LOS		C			C			A			A	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		49.2		10.8		49.2		10.8				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		29.5		21.5		29.5		21.5				
Max Q Clear Time (g_c+I1), s		6.3		6.1		5.1		2.7				
Green Ext Time (p_c), s		1.2		0.4		2.1		0.0				
Intersection Summary												
HCM 6th Ctrl Delay			8.7									
HCM 6th LOS			A									



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↘		↗	↘	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	100		0	100		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.920			0.941			0.995				0.993
Flt Protected		0.985			0.979		0.950			0.950		
Satd. Flow (prot)	0	1688	0	0	1716	0	1770	1853	0	1770	1850	0
Flt Permitted		0.985			0.979		0.950			0.950		
Satd. Flow (perm)	0	1688	0	0	1716	0	1770	1853	0	1770	1850	0
Link Speed (mph)		30			30			30				30
Link Distance (ft)		458			470			732				699
Travel Time (s)		10.4			10.7			16.6				15.9

Intersection Summary

Area Type: Other

Intersection												
Int Delay, s/veh	1.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	12	5	24	13	4	13	10	294	9	4	402	19
Future Vol, veh/h	12	5	24	13	4	13	10	294	9	4	402	19
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	13	5	26	14	4	14	11	320	10	4	437	21

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	812	808	448	818	813	325	458	0	0	330	0	0
Stage 1	456	456	-	347	347	-	-	-	-	-	-	-
Stage 2	356	352	-	471	466	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	298	315	611	295	313	716	1103	-	-	1229	-	-
Stage 1	584	568	-	669	635	-	-	-	-	-	-	-
Stage 2	661	632	-	573	562	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	286	311	611	276	309	716	1103	-	-	1229	-	-
Mov Cap-2 Maneuver	286	311	-	276	309	-	-	-	-	-	-	-
Stage 1	578	566	-	662	629	-	-	-	-	-	-	-
Stage 2	637	626	-	542	560	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	14.6		15.2		0.3		0.1	
HCM LOS	B		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1103	-	-	421	384	1229	-
HCM Lane V/C Ratio	0.01	-	-	0.106	0.085	0.004	-
HCM Control Delay (s)	8.3	-	-	14.6	15.2	7.9	-
HCM Lane LOS	A	-	-	B	C	A	-
HCM 95th %tile Q(veh)	0	-	-	0.4	0.3	0	-



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↘		↗	↘	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	100		0	100		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt					0.914			0.996				
Flt Protected					0.982					0.950		
Satd. Flow (prot)	0	1863	0	0	1672	0	1863	1855	0	1770	1863	0
Flt Permitted					0.982					0.950		
Satd. Flow (perm)	0	1863	0	0	1672	0	1863	1855	0	1770	1863	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		319			430			608			732	
Travel Time (s)		7.3			9.8			13.8			16.6	

Intersection Summary

Area Type: Other

Intersection												
Int Delay, s/veh	0.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↖	↗		↖	↗	
Traffic Vol, veh/h	0	0	0	7	0	13	0	300	9	11	430	0
Future Vol, veh/h	0	0	0	7	0	13	0	300	9	11	430	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	8	0	14	0	326	10	12	467	0

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	829	827	467	822	822	331	467	0	0	336	0	0
Stage 1	491	491	-	331	331	-	-	-	-	-	-	-
Stage 2	338	336	-	491	491	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	290	307	596	293	309	711	1094	-	-	1223	-	-
Stage 1	559	548	-	682	645	-	-	-	-	-	-	-
Stage 2	676	642	-	559	548	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	282	304	596	291	306	711	1094	-	-	1223	-	-
Mov Cap-2 Maneuver	282	304	-	291	306	-	-	-	-	-	-	-
Stage 1	559	543	-	682	645	-	-	-	-	-	-	-
Stage 2	663	642	-	554	543	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	13	0	0.2
HCM LOS	A	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1094	-	-	-	472	1223	-
HCM Lane V/C Ratio	-	-	-	-	0.046	0.01	-
HCM Control Delay (s)	0	-	-	0	13	8	-
HCM Lane LOS	A	-	-	A	B	A	-
HCM 95th %tile Q(veh)	0	-	-	-	0.1	0	-

Lanes and Geometrics
 4: Tennyson St. & W 64th Ave.

6501 Lowell Blvd
 06/07/2021



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%				0%
Storage Length (ft)	150		100	150		0	0		0	0		0
Storage Lanes	1		1	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850		0.995			0.919				0.951
Flt Protected	0.950			0.950				0.984				0.993
Satd. Flow (prot)	1770	1863	1583	1770	1853	0	0	1684	0	0	1759	0
Flt Permitted	0.258			0.379				0.906				0.970
Satd. Flow (perm)	481	1863	1583	706	1853	0	0	1551	0	0	1718	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			61		3			91				17
Link Speed (mph)		30			30			30				30
Link Distance (ft)		700			1434			502				485
Travel Time (s)		15.9			32.6			11.4				11.0

Intersection Summary

Area Type: Other



Lane Group	EBL	EBT	EBR	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	12	318	61	159	405	176	47
v/c Ratio	0.08	0.57	0.12	0.75	0.72	0.18	0.05
Control Delay	19.9	29.4	5.4	59.4	45.5	5.9	7.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.9	29.4	5.4	59.4	45.5	5.9	7.6
Queue Length 50th (ft)	5	152	0	91	228	19	6
Queue Length 95th (ft)	15	196	23	156	314	61	26
Internal Link Dist (ft)		620			1354	422	405
Turn Bay Length (ft)	150		100	150			
Base Capacity (vph)	264	1024	898	388	1020	965	1035
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.31	0.07	0.41	0.40	0.18	0.05
Intersection Summary							

HCM 6th Signalized Intersection Summary
 4: Tennyson St. & W 64th Ave.

6501 Lowell Blvd
 06/07/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	11	293	56	146	361	12	52	13	97	6	21	16
Future Volume (veh/h)	11	293	56	146	361	12	52	13	97	6	21	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	12	318	61	159	392	13	57	14	105	7	23	17
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	227	646	548	292	622	21	304	93	509	151	486	335
Arrive On Green	0.35	0.35	0.35	0.23	0.23	0.23	0.55	0.55	0.55	0.55	0.55	0.55
Sat Flow, veh/h	980	1870	1585	1004	1800	60	453	168	918	190	877	605
Grp Volume(v), veh/h	12	318	61	159	0	405	176	0	0	47	0	0
Grp Sat Flow(s),veh/h/ln	980	1870	1585	1004	0	1860	1539	0	0	1672	0	0
Q Serve(g_s), s	0.9	12.1	2.4	13.7	0.0	17.6	0.5	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	18.6	12.1	2.4	25.8	0.0	17.6	4.7	0.0	0.0	1.1	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.03	0.32		0.60	0.15		0.36
Lane Grp Cap(c), veh/h	227	646	548	292	0	642	906	0	0	973	0	0
V/C Ratio(X)	0.05	0.49	0.11	0.54	0.00	0.63	0.19	0.00	0.00	0.05	0.00	0.00
Avail Cap(c_a), veh/h	427	1029	872	498	0	1023	906	0	0	973	0	0
HCM Platoon Ratio	1.00	1.00	1.00	0.67	0.67	0.67	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	0.90	0.00	0.90	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	33.0	23.2	20.1	38.3	0.0	29.4	10.0	0.0	0.0	9.2	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.6	0.1	1.4	0.0	0.9	0.5	0.0	0.0	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.4	9.0	1.6	6.5	0.0	12.9	3.1	0.0	0.0	0.8	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.1	23.8	20.1	39.7	0.0	30.3	10.4	0.0	0.0	9.3	0.0	0.0
LnGrp LOS	C	C	C	D	A	C	B	A	A	A	A	A
Approach Vol, veh/h		391			564			176				47
Approach Delay, s/veh		23.5			33.0			10.4				9.3
Approach LOS		C			C			B				A
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		54.4		35.6		54.4		35.6				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		31.5		49.5		31.5		49.5				
Max Q Clear Time (g_c+I1), s		6.7		20.6		3.1		27.8				
Green Ext Time (p_c), s		1.0		2.3		0.2		3.3				
Intersection Summary												
HCM 6th Ctrl Delay				25.5								
HCM 6th LOS				C								



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	200		150	150		75	200		150	200		100
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.300			0.578			0.590			0.604		
Satd. Flow (perm)	559	1863	1583	1077	1863	1583	1099	1863	1583	1125	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			92			127			127			123
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1434			1268			763			608	
Travel Time (s)		32.6			28.8			17.3			13.8	

Intersection Summary

Area Type: Other

Timings
5: W 64th Ave./W. 64th Ave. & Lowell Blvd.

6501 Lowell Blvd
06/07/2021

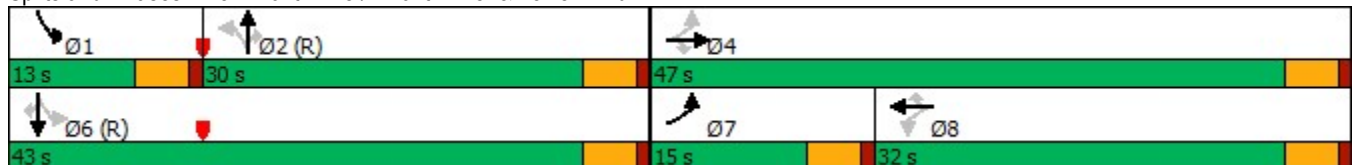
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	108	274	85	67	220	36	43	123	52	74	254	113
Future Volume (vph)	108	274	85	67	220	36	43	123	52	74	254	113
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4			8			2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	7	4	4	8	8	8	2	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	15.0	47.0	47.0	32.0	32.0	32.0	30.0	30.0	30.0	13.0	43.0	43.0
Total Split (%)	16.7%	52.2%	52.2%	35.6%	35.6%	35.6%	33.3%	33.3%	33.3%	14.4%	47.8%	47.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead			Lag	Lag	Lag	Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes			Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	29.1	29.1	29.1	17.4	17.4	17.4	41.8	41.8	41.8	51.9	51.9	51.9
Actuated g/C Ratio	0.32	0.32	0.32	0.19	0.19	0.19	0.46	0.46	0.46	0.58	0.58	0.58
v/c Ratio	0.38	0.49	0.16	0.35	0.66	0.10	0.09	0.15	0.07	0.11	0.26	0.13
Control Delay	38.0	41.6	19.0	33.5	39.8	2.2	20.0	19.0	0.2	11.6	12.3	2.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.0	41.6	19.0	33.5	39.8	2.2	20.0	19.0	0.2	11.6	12.3	2.9
LOS	D	D	B	C	D	A	C	B	A	B	B	A
Approach Delay		36.7			34.3			14.7			9.7	
Approach LOS		D			C			B			A	

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 65
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.66
 Intersection Signal Delay: 24.6
 Intersection Capacity Utilization 51.1%
 Analysis Period (min) 15

Intersection LOS: C
 ICU Level of Service A

Splits and Phases: 5: W 64th Ave./W. 64th Ave. & Lowell Blvd.





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	117	298	92	73	239	39	47	134	57	80	276	123
v/c Ratio	0.38	0.49	0.16	0.35	0.66	0.10	0.09	0.15	0.07	0.11	0.26	0.13
Control Delay	38.0	41.6	19.0	33.5	39.8	2.2	20.0	19.0	0.2	11.6	12.3	2.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.0	41.6	19.0	33.5	39.8	2.2	20.0	19.0	0.2	11.6	12.3	2.9
Queue Length 50th (ft)	64	167	16	37	128	1	16	47	0	20	79	0
Queue Length 95th (ft)	111	242	59	m58	m167	m3	46	101	0	49	149	28
Internal Link Dist (ft)		1354			1188			683			528	
Turn Bay Length (ft)	200		150	150		75	200		150	200		100
Base Capacity (vph)	322	879	796	329	569	571	511	866	803	711	1073	964
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.36	0.34	0.12	0.22	0.42	0.07	0.09	0.15	0.07	0.11	0.26	0.13

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM 6th Signalized Intersection Summary
 5: W 64th Ave./W. 64th Ave. & Lowell Blvd.

6501 Lowell Blvd
 06/07/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↘	↖	↗	↘	↖	↗	↘	↖	↗	↘
Traffic Volume (veh/h)	108	274	85	67	220	36	43	123	52	74	254	113
Future Volume (veh/h)	108	274	85	67	220	36	43	123	52	74	254	113
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	117	298	92	73	239	39	47	134	57	80	276	123
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	251	537	455	214	310	263	588	963	816	735	1146	972
Arrive On Green	0.02	0.09	0.09	0.05	0.05	0.05	0.51	0.51	0.51	0.05	0.61	0.61
Sat Flow, veh/h	1781	1870	1585	994	1870	1585	986	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	117	298	92	73	239	39	47	134	57	80	276	123
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	994	1870	1585	986	1870	1585	1781	1870	1585
Q Serve(g_s), s	4.7	13.7	4.8	6.5	11.4	2.1	2.2	3.4	1.6	1.8	6.0	2.9
Cycle Q Clear(g_c), s	4.7	13.7	4.8	9.2	11.4	2.1	2.2	3.4	1.6	1.8	6.0	2.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	251	537	455	214	310	263	588	963	816	735	1146	972
V/C Ratio(X)	0.47	0.56	0.20	0.34	0.77	0.15	0.08	0.14	0.07	0.11	0.24	0.13
Avail Cap(c_a), veh/h	331	883	748	353	571	484	588	963	816	817	1146	972
HCM Platoon Ratio	0.33	0.33	0.33	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.80	0.80	0.80	0.85	0.85	0.85	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.0	35.2	31.2	41.2	40.9	36.5	11.1	11.4	11.0	8.3	7.9	7.3
Incr Delay (d2), s/veh	1.1	0.7	0.2	0.8	3.5	0.2	0.3	0.3	0.2	0.1	0.5	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	3.8	10.8	3.4	3.1	9.6	1.5	0.9	2.5	1.1	1.1	4.2	1.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	30.0	36.0	31.4	42.0	44.3	36.7	11.4	11.7	11.1	8.3	8.4	7.6
LnGrp LOS	C	D	C	D	D	D	B	B	B	A	A	A
Approach Vol, veh/h		507			351			238			479	
Approach Delay, s/veh		33.8			43.0			11.5			8.2	
Approach LOS		C			D			B			A	
Timer - Assigned Phs	1	2		4		6	7	8				
Phs Duration (G+Y+Rc), s	8.8	50.8		30.3		59.7	10.9	19.4				
Change Period (Y+Rc), s	4.5	4.5		4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s	8.5	25.5		42.5		38.5	10.5	27.5				
Max Q Clear Time (g_c+I1), s	3.8	5.4		15.7		8.0	6.7	13.4				
Green Ext Time (p_c), s	0.1	1.1		2.1		2.1	0.1	1.6				

Intersection Summary

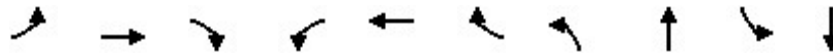
HCM 6th Ctrl Delay	24.7
HCM 6th LOS	C



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	100		150	150		100	600		0	250		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor			0.850			0.850		0.987			0.990	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	5019	0	1770	5034	0
Flt Permitted	0.535			0.474			0.085			0.251		
Satd. Flow (perm)	997	1863	1583	883	1863	1583	158	5019	0	468	5034	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			139			127		23			17	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1268			424			903			562	
Travel Time (s)		28.8			9.6			20.5			12.8	

Intersection Summary

Area Type: Other

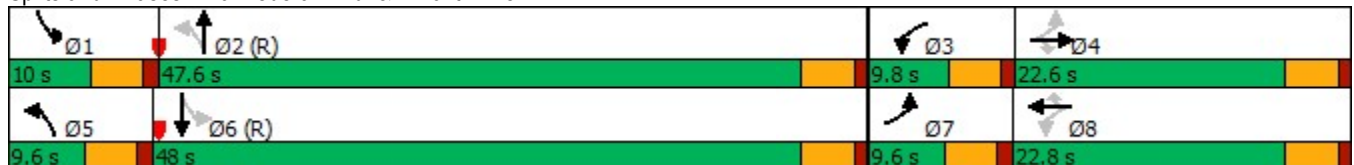


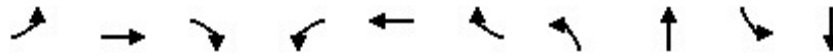
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations	↖	↑	↗	↖	↑	↗	↖	↑↑↑	↖	↑↑↑
Traffic Volume (vph)	98	151	153	130	164	40	86	806	63	2113
Future Volume (vph)	98	151	153	130	164	40	86	806	63	2113
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA
Protected Phases	7	4		3	8		5	2	1	6
Permitted Phases	4		4	8		8	2		6	
Detector Phase	7	4	4	3	8	8	5	2	1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	9.5	22.5
Total Split (s)	9.6	22.6	22.6	9.8	22.8	22.8	9.6	47.6	10.0	48.0
Total Split (%)	10.7%	25.1%	25.1%	10.9%	25.3%	25.3%	10.7%	52.9%	11.1%	53.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)	18.6	13.5	13.5	19.8	15.6	15.6	54.2	49.0	54.0	48.9
Actuated g/C Ratio	0.21	0.15	0.15	0.22	0.17	0.17	0.60	0.54	0.60	0.54
v/c Ratio	0.43	0.59	0.47	0.57	0.55	0.11	0.44	0.35	0.18	0.90
Control Delay	20.9	28.7	6.5	36.9	41.2	0.6	16.5	12.7	8.3	25.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.9	28.7	6.5	36.9	41.2	0.6	16.5	12.7	8.3	25.8
LOS	C	C	A	D	D	A	B	B	A	C
Approach Delay		18.4			34.7			13.1		25.3
Approach LOS		B			C			B		C

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.90
 Intersection Signal Delay: 22.5
 Intersection LOS: C
 Intersection Capacity Utilization 79.1%
 ICU Level of Service D
 Analysis Period (min) 15

Splits and Phases: 6: Federal Blvd. & W. 64th Ave.





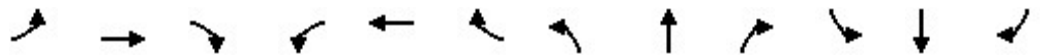
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	107	164	166	141	178	43	93	958	68	2460
v/c Ratio	0.43	0.59	0.47	0.57	0.55	0.11	0.44	0.35	0.18	0.90
Control Delay	20.9	28.7	6.5	36.9	41.2	0.6	16.5	12.7	8.3	25.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.9	28.7	6.5	36.9	41.2	0.6	16.5	12.7	8.3	25.8
Queue Length 50th (ft)	24	41	0	65	96	0	18	110	13	462
Queue Length 95th (ft)	48	73	0	108	154	0	53	152	32	#638
Internal Link Dist (ft)		1188			344			823		482
Turn Bay Length (ft)	100		150	150		100	600		250	
Base Capacity (vph)	249	374	429	246	378	423	209	2741	371	2741
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.44	0.39	0.57	0.47	0.10	0.44	0.35	0.18	0.90

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM 6th Signalized Intersection Summary
6: Federal Blvd. & W. 64th Ave.

6501 Lowell Blvd
06/07/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	98	151	153	130	164	40	86	806	75	63	2113	150
Future Volume (veh/h)	98	151	153	130	164	40	86	806	75	63	2113	150
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	107	164	166	141	178	43	93	876	82	68	2297	163
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	235	252	214	236	256	217	190	2665	249	431	2709	190
Arrive On Green	0.02	0.04	0.04	0.06	0.14	0.14	0.05	0.56	0.56	0.05	0.56	0.56
Sat Flow, veh/h	1781	1870	1585	1781	1870	1585	1781	4751	443	1781	4871	342
Grp Volume(v), veh/h	107	164	166	141	178	43	93	627	331	68	1598	862
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	1585	1781	1702	1791	1781	1702	1809
Q Serve(g_s), s	4.6	7.8	9.3	5.3	8.2	2.2	2.0	8.9	9.0	1.4	35.3	36.4
Cycle Q Clear(g_c), s	4.6	7.8	9.3	5.3	8.2	2.2	2.0	8.9	9.0	1.4	35.3	36.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.25	1.00		0.19
Lane Grp Cap(c), veh/h	235	252	214	236	256	217	190	1909	1004	431	1893	1006
V/C Ratio(X)	0.46	0.65	0.78	0.60	0.69	0.20	0.49	0.33	0.33	0.16	0.84	0.86
Avail Cap(c_a), veh/h	235	376	319	236	380	322	202	1909	1004	459	1893	1006
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.94	0.94	0.94	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.0	40.9	41.7	33.3	37.0	34.4	19.8	10.6	10.7	7.9	16.7	16.9
Incr Delay (d2), s/veh	1.3	2.6	6.4	4.1	3.4	0.4	1.9	0.5	0.9	0.2	4.8	9.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	3.8	7.1	7.5	1.2	7.0	1.5	2.0	5.8	6.4	0.9	19.7	22.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.2	43.6	48.1	37.4	40.4	34.9	21.7	11.1	11.5	8.1	21.5	26.3
LnGrp LOS	C	D	D	D	D	C	C	B	B	A	C	C
Approach Vol, veh/h		437			362			1051			2528	
Approach Delay, s/veh		43.0			38.6			12.2			22.8	
Approach LOS		D			D			B			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.6	55.0	9.8	16.6	9.0	54.5	9.6	16.8				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	5.5	43.1	5.3	18.1	5.1	43.5	5.1	18.3				
Max Q Clear Time (g_c+I1), s	3.4	11.0	7.3	11.3	4.0	38.4	6.6	10.2				
Green Ext Time (p_c), s	0.0	7.5	0.0	0.8	0.0	4.8	0.0	0.6				
Intersection Summary												
HCM 6th Ctrl Delay			23.6									
HCM 6th LOS			C									



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		150	150		0	225		250	150		150
Storage Lanes	1		1	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850		0.904				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1684	0	1770	1863	1583	1770	1863	1583
Flt Permitted	0.726			0.749			0.543			0.359		
Satd. Flow (perm)	1352	1863	1583	1395	1684	0	1011	1863	1583	669	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			70		30				27			80
Link Speed (mph)		30			30			30				30
Link Distance (ft)		549			716			667				367
Travel Time (s)		12.5			16.3			15.2				8.3

Intersection Summary

Area Type: Other

Timings
1: Lowell Blvd. & W. 68th Ave.

6501 Lowell Blvd
06/07/2021

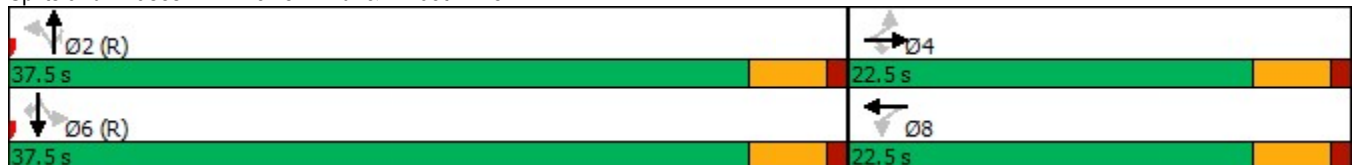


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑	↗	↖	↗	↖	↑	↗	↖	↑	↗
Traffic Volume (vph)	49	12	64	11	16	112	627	18	12	338	74
Future Volume (vph)	49	12	64	11	16	112	627	18	12	338	74
Turn Type	Perm	NA	Perm	Perm	NA	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8		2			6	
Permitted Phases	4		4	8		2		2	6		6
Detector Phase	4	4	4	8	8	2	2	2	6	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	22.5	22.5	22.5	22.5	22.5	37.5	37.5	37.5	37.5	37.5	37.5
Total Split (%)	37.5%	37.5%	37.5%	37.5%	37.5%	62.5%	62.5%	62.5%	62.5%	62.5%	62.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag											
Lead-Lag Optimize?											
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	7.9	7.9	7.9	7.9	7.9	46.0	46.0	46.0	46.0	46.0	46.0
Actuated g/C Ratio	0.13	0.13	0.13	0.13	0.13	0.77	0.77	0.77	0.77	0.77	0.77
v/c Ratio	0.30	0.05	0.26	0.07	0.19	0.16	0.48	0.02	0.03	0.26	0.06
Control Delay	27.2	21.8	9.3	22.2	14.2	3.7	5.3	1.3	3.2	3.7	1.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.2	21.8	9.3	22.2	14.2	3.7	5.3	1.3	3.2	3.7	1.1
LOS	C	C	A	C	B	A	A	A	A	A	A
Approach Delay		17.5			15.8		4.9			3.2	
Approach LOS		B			B		A			A	

Intersection Summary

Cycle Length: 60
 Actuated Cycle Length: 60
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.48
 Intersection Signal Delay: 6.0
 Intersection Capacity Utilization 57.8%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service B

Splits and Phases: 1: Lowell Blvd. & W. 68th Ave.



Queues

6501 Lowell Blvd

1: Lowell Blvd. & W. 68th Ave.

06/07/2021



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	53	13	70	12	47	122	682	20	13	367	80
v/c Ratio	0.30	0.05	0.26	0.07	0.19	0.16	0.48	0.02	0.03	0.26	0.06
Control Delay	27.2	21.8	9.3	22.2	14.2	3.7	5.3	1.3	3.2	3.7	1.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.2	21.8	9.3	22.2	14.2	3.7	5.3	1.3	3.2	3.7	1.1
Queue Length 50th (ft)	18	4	0	4	6	10	80	0	1	34	0
Queue Length 95th (ft)	44	16	28	16	29	30	172	4	6	75	10
Internal Link Dist (ft)		469			636		587			287	
Turn Bay Length (ft)	150		150	150		225		250	150		150
Base Capacity (vph)	405	558	523	418	526	775	1429	1220	513	1429	1233
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.02	0.13	0.03	0.09	0.16	0.48	0.02	0.03	0.26	0.06

Intersection Summary

HCM 6th Signalized Intersection Summary
 1: Lowell Blvd. & W. 68th Ave.

6501 Lowell Blvd
 06/07/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	49	12	64	11	16	28	112	627	18	12	338	74
Future Volume (veh/h)	49	12	64	11	16	28	112	627	18	12	338	74
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	53	13	70	12	17	30	122	682	20	13	367	80
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	218	183	155	240	59	105	772	1407	1192	574	1407	1192
Arrive On Green	0.10	0.10	0.10	0.10	0.10	0.10	0.75	0.75	0.75	0.75	0.75	0.75
Sat Flow, veh/h	1359	1870	1585	1315	607	1071	943	1870	1585	745	1870	1585
Grp Volume(v), veh/h	53	13	70	12	0	47	122	682	20	13	367	80
Grp Sat Flow(s),veh/h/ln	1359	1870	1585	1315	0	1678	943	1870	1585	745	1870	1585
Q Serve(g_s), s	2.3	0.4	2.5	0.5	0.0	1.6	2.7	8.5	0.2	0.4	3.6	0.8
Cycle Q Clear(g_c), s	3.8	0.4	2.5	0.9	0.0	1.6	6.4	8.5	0.2	9.0	3.6	0.8
Prop In Lane	1.00		1.00	1.00		0.64	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	218	183	155	240	0	164	772	1407	1192	574	1407	1192
V/C Ratio(X)	0.24	0.07	0.45	0.05	0.00	0.29	0.16	0.48	0.02	0.02	0.26	0.07
Avail Cap(c_a), veh/h	492	561	476	506	0	503	772	1407	1192	574	1407	1192
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.9	24.6	25.5	25.0	0.0	25.1	3.3	2.9	1.9	4.6	2.3	1.9
Incr Delay (d2), s/veh	0.6	0.2	2.0	0.1	0.0	0.9	0.4	1.2	0.0	0.1	0.5	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.3	0.3	1.8	0.3	0.0	1.1	0.7	3.2	0.1	0.1	1.3	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.5	24.7	27.6	25.1	0.0	26.1	3.7	4.1	1.9	4.7	2.7	2.0
LnGrp LOS	C	C	C	C	A	C	A	A	A	A	A	A
Approach Vol, veh/h		136			59			824			460	
Approach Delay, s/veh		27.3			25.9			4.0			2.7	
Approach LOS		C			C			A			A	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		49.6		10.4		49.6		10.4				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		33.0		18.0		33.0		18.0				
Max Q Clear Time (g_c+I1), s		10.5		5.8		11.0		3.6				
Green Ext Time (p_c), s		5.8		0.3		2.6		0.2				
Intersection Summary												
HCM 6th Ctrl Delay				6.6								
HCM 6th LOS				A								



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	100		0	100		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.963			0.944			0.995			0.992	
Flt Protected		0.971			0.986		0.950			0.950		
Satd. Flow (prot)	0	1742	0	0	1734	0	1770	1853	0	1770	1848	0
Flt Permitted		0.971			0.986		0.950			0.950		
Satd. Flow (perm)	0	1742	0	0	1734	0	1770	1853	0	1770	1848	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		458			470			732			667	
Travel Time (s)		10.4			10.7			16.6			15.2	

Intersection Summary

Area Type: Other

Intersection												
Int Delay, s/veh	2.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↔	↔		↔	↔	
Traffic Vol, veh/h	32	6	15	9	9	13	27	702	22	16	371	21
Future Vol, veh/h	32	6	15	9	9	13	27	702	22	16	371	21
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	35	7	16	10	10	14	29	763	24	17	403	23

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1294	1294	415	1293	1293	775	426	0	0	787	0	0
Stage 1	449	449	-	833	833	-	-	-	-	-	-	-
Stage 2	845	845	-	460	460	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	139	163	637	140	163	398	1133	-	-	832	-	-
Stage 1	589	572	-	363	384	-	-	-	-	-	-	-
Stage 2	357	379	-	581	566	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	123	156	637	128	156	398	1133	-	-	832	-	-
Mov Cap-2 Maneuver	123	156	-	128	156	-	-	-	-	-	-	-
Stage 1	574	561	-	354	374	-	-	-	-	-	-	-
Stage 2	327	369	-	548	555	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	38.1		27.6		0.3		0.4	
HCM LOS	E		D					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1133	-	-	165	193	832	-	-
HCM Lane V/C Ratio	0.026	-	-	0.349	0.175	0.021	-	-
HCM Control Delay (s)	8.3	-	-	38.1	27.6	9.4	-	-
HCM Lane LOS	A	-	-	E	D	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	1.5	0.6	0.1	-	-



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↘		↗	↘	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	100		0	100		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt					0.932			0.998				
Flt Protected					0.976					0.950		
Satd. Flow (prot)	0	1863	0	0	1694	0	1863	1859	0	1770	1863	0
Flt Permitted					0.976					0.950		
Satd. Flow (perm)	0	1863	0	0	1694	0	1863	1859	0	1770	1863	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		319			430			608			732	
Travel Time (s)		7.3			9.8			13.8			16.6	

Intersection Summary

Area Type: Other

Intersection												
Int Delay, s/veh	0.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	0	0	0	12	0	12	0	711	11	16	404	0
Future Vol, veh/h	0	0	0	12	0	12	0	711	11	16	404	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	13	0	13	0	773	12	17	439	0

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1259	1258	439	1252	1252	779	439	0	0	785	0	0
Stage 1	473	473	-	779	779	-	-	-	-	-	-	-
Stage 2	786	785	-	473	473	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	147	171	618	149	172	396	1121	-	-	834	-	-
Stage 1	572	558	-	389	406	-	-	-	-	-	-	-
Stage 2	385	404	-	572	558	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	140	168	618	147	169	396	1121	-	-	834	-	-
Mov Cap-2 Maneuver	140	168	-	147	169	-	-	-	-	-	-	-
Stage 1	572	547	-	389	406	-	-	-	-	-	-	-
Stage 2	372	404	-	560	547	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	0		24.1		0		0.4	
HCM LOS	A		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1121	-	-	-	214	834	-	-
HCM Lane V/C Ratio	-	-	-	-	0.122	0.021	-	-
HCM Control Delay (s)	0	-	-	0	24.1	9.4	-	-
HCM Lane LOS	A	-	-	A	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	-	0.4	0.1	-	-



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%				0%
Storage Length (ft)	150		100	150		0	0		0	0		0
Storage Lanes	1		1	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850		0.993			0.920				0.953
Flt Protected	0.950			0.950				0.985				0.983
Satd. Flow (prot)	1770	1863	1583	1770	1850	0	0	1688	0	0	1745	0
Flt Permitted	0.265			0.148				0.887				0.872
Satd. Flow (perm)	494	1863	1583	276	1850	0	0	1520	0	0	1548	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			61		4			93				14
Link Speed (mph)		30			30			30				30
Link Distance (ft)		501			1329			646				482
Travel Time (s)		11.4			30.2			14.7				11.0

Intersection Summary

Area Type: Other



Lane Group	EBL	EBT	EBR	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	23	685	99	86	550	391	40
v/c Ratio	0.10	0.81	0.13	0.69	0.66	0.53	0.06
Control Delay	13.0	29.3	5.8	59.8	37.0	18.2	12.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.0	29.3	5.8	59.8	37.0	18.2	12.9
Queue Length 50th (ft)	7	315	11	51	320	121	8
Queue Length 95th (ft)	19	406	34	m74	m383	235	30
Internal Link Dist (ft)		421			1249	566	402
Turn Bay Length (ft)	150		100	150			
Base Capacity (vph)	260	983	864	145	978	732	701
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.70	0.11	0.59	0.56	0.53	0.06

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM 6th Signalized Intersection Summary
 4: Tennyson St. & W 64th Ave.

6501 Lowell Blvd
 06/07/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	21	630	91	79	484	22	113	33	213	13	11	13
Future Volume (veh/h)	21	630	91	79	484	22	113	33	213	13	11	13
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	23	685	99	86	526	24	123	36	232	14	12	14
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	445	879	745	193	834	38	237	87	397	241	207	212
Arrive On Green	0.47	0.47	0.47	0.94	0.94	0.94	0.43	0.43	0.43	0.43	0.43	0.43
Sat Flow, veh/h	858	1870	1585	690	1775	81	429	203	922	434	481	493
Grp Volume(v), veh/h	23	685	99	86	0	550	391	0	0	40	0	0
Grp Sat Flow(s),veh/h/ln	858	1870	1585	690	0	1856	1554	0	0	1407	0	0
Q Serve(g_s), s	1.4	27.6	3.2	10.1	0.0	4.0	12.6	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	5.4	27.6	3.2	37.6	0.0	4.0	16.9	0.0	0.0	1.2	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.04	0.31		0.59	0.35		0.35
Lane Grp Cap(c), veh/h	445	879	745	193	0	872	721	0	0	660	0	0
V/C Ratio(X)	0.05	0.78	0.13	0.45	0.00	0.63	0.54	0.00	0.00	0.06	0.00	0.00
Avail Cap(c_a), veh/h	495	987	837	233	0	979	721	0	0	660	0	0
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.78	0.00	0.78	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	15.3	20.0	13.5	15.0	0.0	1.6	19.3	0.0	0.0	14.9	0.0	0.0
Incr Delay (d2), s/veh	0.0	3.6	0.1	1.3	0.0	0.9	2.9	0.0	0.0	0.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.5	17.8	2.0	2.4	0.0	1.6	10.6	0.0	0.0	0.9	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	15.3	23.6	13.6	16.2	0.0	2.4	22.2	0.0	0.0	15.1	0.0	0.0
LnGrp LOS	B	C	B	B	A	A	C	A	A	B	A	A
Approach Vol, veh/h		807			636			391			40	
Approach Delay, s/veh		22.1			4.3			22.2			15.1	
Approach LOS		C			A			C			B	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		43.2		46.8		43.2		46.8				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		33.5		47.5		33.5		47.5				
Max Q Clear Time (g_c+I1), s		18.9		29.6		3.2		39.6				
Green Ext Time (p_c), s		2.2		5.1		0.2		2.6				

Intersection Summary

HCM 6th Ctrl Delay	15.9
HCM 6th LOS	B



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	200		150	150		75	200		150	200		100
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.154			0.510			0.612			0.251		
Satd. Flow (perm)	287	1863	1583	950	1863	1583	1140	1863	1583	468	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			78			127			127			163
Link Speed (mph)		30			30			30				30
Link Distance (ft)		1329			1480			763				608
Travel Time (s)		30.2			33.6			17.3				13.8

Intersection Summary

Area Type: Other

Timings
5: W 64th Ave./W. 64th Ave. & Lowell Blvd.

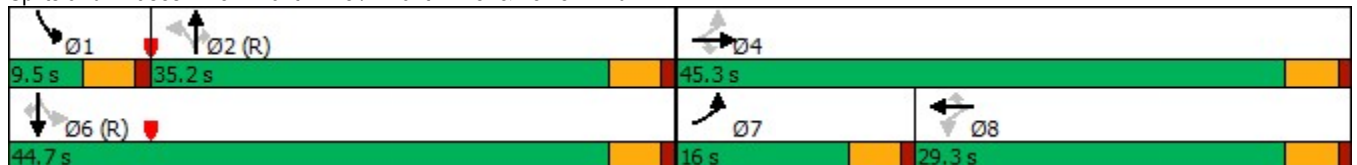
6501 Lowell Blvd
06/07/2021

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	224	399	72	49	370	60	126	430	103	41	216	150
Future Volume (vph)	224	399	72	49	370	60	126	430	103	41	216	150
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4			8			2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	7	4	4	8	8	8	2	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	16.0	45.3	45.3	29.3	29.3	29.3	35.2	35.2	35.2	9.5	44.7	44.7
Total Split (%)	17.8%	50.3%	50.3%	32.6%	32.6%	32.6%	39.1%	39.1%	39.1%	10.6%	49.7%	49.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead			Lag	Lag	Lag	Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes			Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	38.7	38.7	38.7	22.7	22.7	22.7	36.6	36.6	36.6	42.3	42.3	42.3
Actuated g/C Ratio	0.43	0.43	0.43	0.25	0.25	0.25	0.41	0.41	0.41	0.47	0.47	0.47
v/c Ratio	0.78	0.54	0.11	0.22	0.86	0.13	0.30	0.62	0.16	0.15	0.27	0.20
Control Delay	46.1	32.3	10.4	30.8	47.6	6.8	22.8	27.6	3.8	15.3	16.2	3.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.1	32.3	10.4	30.8	47.6	6.8	22.8	27.6	3.8	15.3	16.2	3.2
LOS	D	C	B	C	D	A	C	C	A	B	B	A
Approach Delay		34.5			40.8			23.0			11.3	
Approach LOS		C			D			C			B	

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 70
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.86
 Intersection Signal Delay: 28.2
 Intersection Capacity Utilization 73.7%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service D

Splits and Phases: 5: W 64th Ave./W. 64th Ave. & Lowell Blvd.





























Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	243	434	78	53	402	65	137	467	112	45	235	163
v/c Ratio	0.78	0.54	0.11	0.22	0.86	0.13	0.30	0.62	0.16	0.15	0.27	0.20
Control Delay	46.1	32.3	10.4	30.8	47.6	6.8	22.8	27.6	3.8	15.3	16.2	3.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.1	32.3	10.4	30.8	47.6	6.8	22.8	27.6	3.8	15.3	16.2	3.2
Queue Length 50th (ft)	125	207	9	27	247	2	58	231	0	14	82	0
Queue Length 95th (ft)	m#177	294	m25	m35	m312	m4	109	346	28	34	134	34
Internal Link Dist (ft)		1249			1400			683			528	
Turn Bay Length (ft)	200		150	150		75	200		150	200		100
Base Capacity (vph)	312	844	760	261	513	528	463	758	719	297	876	831
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.78	0.51	0.10	0.20	0.78	0.12	0.30	0.62	0.16	0.15	0.27	0.20

Intersection Summary

- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

HCM 6th Signalized Intersection Summary
 5: W 64th Ave./W. 64th Ave. & Lowell Blvd.

6501 Lowell Blvd
 06/07/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	224	399	72	49	370	60	126	430	103	41	216	150
Future Volume (veh/h)	224	399	72	49	370	60	126	430	103	41	216	150
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	243	434	78	53	402	65	137	467	112	45	235	163
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	325	779	660	299	461	391	471	741	628	310	905	767
Arrive On Green	0.16	0.55	0.55	0.08	0.08	0.08	0.40	0.40	0.40	0.04	0.48	0.48
Sat Flow, veh/h	1781	1870	1585	888	1870	1585	987	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	243	434	78	53	402	65	137	467	112	45	235	163
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	888	1870	1585	987	1870	1585	1781	1870	1585
Q Serve(g_s), s	8.8	13.5	2.1	5.0	19.1	3.4	8.8	18.1	4.1	1.3	6.7	5.3
Cycle Q Clear(g_c), s	8.8	13.5	2.1	5.0	19.1	3.4	8.8	18.1	4.1	1.3	6.7	5.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	325	779	660	299	461	391	471	741	628	310	905	767
V/C Ratio(X)	0.75	0.56	0.12	0.18	0.87	0.17	0.29	0.63	0.18	0.15	0.26	0.21
Avail Cap(c_a), veh/h	339	848	719	325	515	437	471	741	628	342	905	767
HCM Platoon Ratio	1.33	1.33	1.33	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.48	0.48	0.48	0.51	0.51	0.51	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.5	14.7	12.2	33.5	39.9	32.7	19.1	21.9	17.7	16.0	13.7	13.4
Incr Delay (d2), s/veh	4.2	0.3	0.0	0.1	7.8	0.1	1.6	4.0	0.6	0.2	0.7	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	5.9	7.3	1.3	2.0	14.3	2.4	3.9	13.2	2.8	0.9	5.2	3.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.8	15.1	12.2	33.6	47.8	32.8	20.6	25.9	18.3	16.3	14.4	14.0
LnGrp LOS	C	B	B	C	D	C	C	C	B	B	B	B
Approach Vol, veh/h		755			520			716			443	
Approach Delay, s/veh		18.2			44.5			23.7			14.5	
Approach LOS		B			D			C			B	
Timer - Assigned Phs	1	2		4		6	7	8				
Phs Duration (G+Y+Rc), s	7.9	40.2		42.0		48.0	15.3	26.7				
Change Period (Y+Rc), s	4.5	4.5		4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s	5.0	30.7		40.8		40.2	11.5	24.8				
Max Q Clear Time (g_c+I1), s	3.3	20.1		15.5		8.7	10.8	21.1				
Green Ext Time (p_c), s	0.0	3.0		3.1		2.0	0.1	1.1				
Intersection Summary												
HCM 6th Ctrl Delay				24.8								
HCM 6th LOS				C								



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	100		150	150		100	600		0	250		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor			0.850			0.850		0.993			0.988	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	5050	0	1770	5024	0
Flt Permitted	0.265			0.531			0.102			0.115		
Satd. Flow (perm)	494	1863	1583	989	1863	1583	190	5050	0	214	5024	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			185			182		10			17	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1480			550			1046			611	
Travel Time (s)		33.6			12.5			23.8			13.9	

Intersection Summary

Area Type: Other

Timings
6: Federal Blvd. & W. 64th Ave.

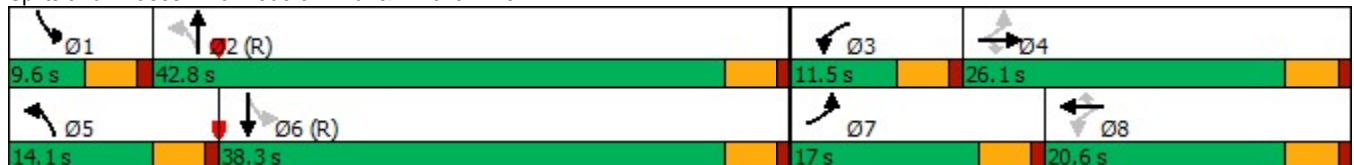
6501 Lowell Blvd
06/07/2021

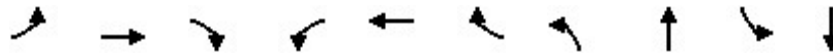
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	281	238	170	112	208	96	215	1846	84	1511
Future Volume (vph)	281	238	170	112	208	96	215	1846	84	1511
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA
Protected Phases	7	4		3	8		5	2	1	6
Permitted Phases	4		4	8		8	2		6	
Detector Phase	7	4	4	3	8	8	5	2	1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	20.6	20.6	9.5	22.5	9.5	22.5
Total Split (s)	17.0	26.1	26.1	11.5	20.6	20.6	14.1	42.8	9.6	38.3
Total Split (%)	18.9%	29.0%	29.0%	12.8%	22.9%	22.9%	15.7%	47.6%	10.7%	42.6%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)	31.5	20.1	20.1	21.5	14.5	14.5	49.5	41.4	40.5	34.9
Actuated g/C Ratio	0.35	0.22	0.22	0.24	0.16	0.16	0.55	0.46	0.45	0.39
v/c Ratio	0.87	0.62	0.37	0.41	0.75	0.25	0.84	0.90	0.47	0.91
Control Delay	64.1	52.6	18.0	25.3	52.1	1.8	44.8	30.6	19.9	34.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	64.1	52.6	18.0	25.3	52.1	1.8	44.8	30.6	19.9	34.6
LOS	E	D	B	C	D	A	D	C	B	C
Approach Delay		48.7			33.3			32.0		33.9
Approach LOS		D			C			C		C

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.91
 Intersection Signal Delay: 35.1
 Intersection Capacity Utilization 85.5%
 Analysis Period (min) 15
 Intersection LOS: D
 ICU Level of Service E

Splits and Phases: 6: Federal Blvd. & W. 64th Ave.





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	305	259	185	122	226	104	234	2106	91	1782
v/c Ratio	0.87	0.62	0.37	0.41	0.75	0.25	0.84	0.90	0.47	0.91
Control Delay	64.1	52.6	18.0	25.3	52.1	1.8	44.8	30.6	19.9	34.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	64.1	52.6	18.0	25.3	52.1	1.8	44.8	30.6	19.9	34.6
Queue Length 50th (ft)	161	139	24	46	121	0	81	418	24	348
Queue Length 95th (ft)	#247	217	76	86	#212	3	#214	#546	48	#458
Internal Link Dist (ft)		1400			470			966		531
Turn Bay Length (ft)	100		150	150		100	600		250	
Base Capacity (vph)	350	447	520	297	333	432	280	2330	192	1958
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.87	0.58	0.36	0.41	0.68	0.24	0.84	0.90	0.47	0.91

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM 6th Signalized Intersection Summary
6: Federal Blvd. & W. 64th Ave.

6501 Lowell Blvd
06/07/2021


























Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	281	238	170	112	208	96	215	1846	91	84	1511	129
Future Volume (veh/h)	281	238	170	112	208	96	215	1846	91	84	1511	129
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	305	259	185	122	226	104	234	2007	99	91	1642	140
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	357	391	331	285	272	231	279	2321	114	189	2021	172
Arrive On Green	0.05	0.07	0.07	0.08	0.15	0.15	0.09	0.47	0.47	0.05	0.42	0.42
Sat Flow, veh/h	1781	1870	1585	1781	1870	1585	1781	4985	245	1781	4793	408
Grp Volume(v), veh/h	305	259	185	122	226	104	234	1368	738	91	1166	616
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	1585	1781	1702	1826	1781	1702	1797
Q Serve(g_s), s	12.5	12.2	10.2	5.2	10.6	5.4	6.4	32.3	32.6	2.6	27.1	27.2
Cycle Q Clear(g_c), s	12.5	12.2	10.2	5.2	10.6	5.4	6.4	32.3	32.6	2.6	27.1	27.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.13	1.00		0.23
Lane Grp Cap(c), veh/h	357	391	331	285	272	231	279	1585	850	189	1436	758
V/C Ratio(X)	0.85	0.66	0.56	0.43	0.83	0.45	0.84	0.86	0.87	0.48	0.81	0.81
Avail Cap(c_a), veh/h	357	449	380	288	335	284	302	1585	850	201	1436	758
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.90	0.90	0.90	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.1	38.8	37.9	29.6	37.4	35.2	19.3	21.5	21.6	20.2	22.9	22.9
Incr Delay (d2), s/veh	16.4	2.7	1.3	1.0	13.5	1.4	17.5	6.5	11.6	1.9	5.1	9.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	11.8	10.3	7.6	4.0	9.7	3.9	6.7	19.4	22.2	2.0	16.8	18.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	46.5	41.5	39.2	30.6	50.8	36.5	36.8	28.0	33.1	22.1	28.0	32.2
LnGrp LOS	D	D	D	C	D	D	D	C	C	C	C	C
Approach Vol, veh/h		749			452			2340			1873	
Approach Delay, s/veh		43.0			42.1			30.5			29.1	
Approach LOS		D			D			C			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.0	46.4	11.3	23.3	12.9	42.5	17.0	17.6				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	5.1	38.3	7.0	21.6	9.6	33.8	12.5	16.1				
Max Q Clear Time (g_c+I1), s	4.6	34.6	7.2	14.2	8.4	29.2	14.5	12.6				
Green Ext Time (p_c), s	0.0	3.4	0.0	1.3	0.1	3.8	0.0	0.5				

Intersection Summary

HCM 6th Ctrl Delay	32.7
HCM 6th LOS	C

Notes

User approved pedestrian interval to be less than phase max green.

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		150	150		0	225		250	150		150
Storage Lanes	1		1	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850		0.929				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1730	0	1770	1863	1583	1770	1863	1583
Flt Permitted	0.744			0.751			0.558			0.640		
Satd. Flow (perm)	1386	1863	1583	1399	1730	0	1039	1863	1583	1192	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			121		10				27			58
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		594			990			699			502	
Travel Time (s)		13.5			22.5			15.9			11.4	

Intersection Summary

Area Type: Other

Timings
1: Lowell Blvd. & W. 68th Ave.

6501 Lowell Blvd
06/07/2021

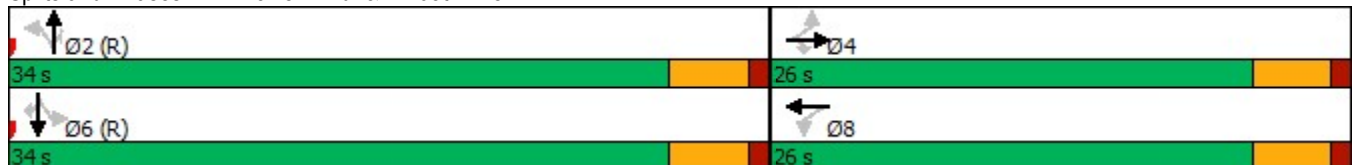


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑	↗	↖	↗	↖	↑	↗	↖	↑	↗
Traffic Volume (vph)	50	9	111	3	10	63	172	1	16	309	53
Future Volume (vph)	50	9	111	3	10	63	172	1	16	309	53
Turn Type	Perm	NA	Perm	Perm	NA	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8		2			6	
Permitted Phases	4		4	8		2		2	6		6
Detector Phase	4	4	4	8	8	2	2	2	6	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	26.0	26.0	26.0	26.0	26.0	34.0	34.0	34.0	34.0	34.0	34.0
Total Split (%)	43.3%	43.3%	43.3%	43.3%	43.3%	56.7%	56.7%	56.7%	56.7%	56.7%	56.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag											
Lead-Lag Optimize?											
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	7.9	7.9	7.9	7.9	7.9	46.0	46.0	46.0	46.0	46.0	46.0
Actuated g/C Ratio	0.13	0.13	0.13	0.13	0.13	0.77	0.77	0.77	0.77	0.77	0.77
v/c Ratio	0.30	0.04	0.39	0.02	0.09	0.09	0.13	0.00	0.02	0.24	0.05
Control Delay	27.0	21.7	9.2	21.3	16.9	3.3	3.2	0.0	3.1	3.5	1.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.0	21.7	9.2	21.3	16.9	3.3	3.2	0.0	3.1	3.5	1.2
LOS	C	C	A	C	B	A	A	A	A	A	A
Approach Delay		15.1			17.4		3.2			3.2	
Approach LOS		B			B		A			A	

Intersection Summary

Cycle Length: 60
 Actuated Cycle Length: 60
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 45
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.39
 Intersection Signal Delay: 6.1
 Intersection Capacity Utilization 41.1%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service A

Splits and Phases: 1: Lowell Blvd. & W. 68th Ave.



Queues

6501 Lowell Blvd

1: Lowell Blvd. & W. 68th Ave.

06/07/2021



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	54	10	121	3	21	68	187	1	17	336	58
v/c Ratio	0.30	0.04	0.39	0.02	0.09	0.09	0.13	0.00	0.02	0.24	0.05
Control Delay	27.0	21.7	9.2	21.3	16.9	3.3	3.2	0.0	3.1	3.5	1.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.0	21.7	9.2	21.3	16.9	3.3	3.2	0.0	3.1	3.5	1.2
Queue Length 50th (ft)	18	3	0	1	4	5	16	0	1	30	0
Queue Length 95th (ft)	44	14	37	7	19	18	38	0	6	68	8
Internal Link Dist (ft)		514			910		619			422	
Turn Bay Length (ft)	150		150	150		225		250	150		150
Base Capacity (vph)	496	667	644	501	626	797	1429	1220	914	1429	1227
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.01	0.19	0.01	0.03	0.09	0.13	0.00	0.02	0.24	0.05

Intersection Summary

HCM 6th Signalized Intersection Summary
 1: Lowell Blvd. & W. 68th Ave.

6501 Lowell Blvd
 06/07/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	9	111	3	10	9	63	172	1	16	309	53
Future Volume (veh/h)	50	9	111	3	10	9	63	172	1	16	309	53
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	54	10	121	3	11	10	68	187	1	17	336	58
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	259	208	176	254	100	91	795	1382	1171	969	1382	1171
Arrive On Green	0.11	0.11	0.11	0.11	0.11	0.11	0.74	0.74	0.74	0.74	0.74	0.74
Sat Flow, veh/h	1391	1870	1585	1259	902	820	990	1870	1585	1195	1870	1585
Grp Volume(v), veh/h	54	10	121	3	0	21	68	187	1	17	336	58
Grp Sat Flow(s),veh/h/ln	1391	1870	1585	1259	0	1723	990	1870	1585	1195	1870	1585
Q Serve(g_s), s	2.2	0.3	4.4	0.1	0.0	0.7	1.4	1.7	0.0	0.3	3.4	0.6
Cycle Q Clear(g_c), s	2.8	0.3	4.4	0.4	0.0	0.7	4.8	1.7	0.0	2.0	3.4	0.6
Prop In Lane	1.00		1.00	1.00		0.48	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	259	208	176	254	0	191	795	1382	1171	969	1382	1171
V/C Ratio(X)	0.21	0.05	0.69	0.01	0.00	0.11	0.09	0.14	0.00	0.02	0.24	0.05
Avail Cap(c_a), veh/h	603	670	568	565	0	617	795	1382	1171	969	1382	1171
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.3	23.8	25.7	24.0	0.0	24.0	3.3	2.3	2.0	2.6	2.5	2.1
Incr Delay (d2), s/veh	0.4	0.1	4.7	0.0	0.0	0.3	0.2	0.2	0.0	0.0	0.4	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.3	0.2	3.2	0.1	0.0	0.5	0.4	0.7	0.0	0.1	1.4	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.7	23.9	30.3	24.0	0.0	24.2	3.5	2.5	2.0	2.6	2.9	2.2
LnGrp LOS	C	C	C	C	A	C	A	A	A	A	A	A
Approach Vol, veh/h		185			24			256			411	
Approach Delay, s/veh		28.6			24.2			2.7			2.8	
Approach LOS		C			C			A			A	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		48.8		11.2		48.8		11.2				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		29.5		21.5		29.5		21.5				
Max Q Clear Time (g_c+I1), s		6.8		6.4		5.4		2.7				
Green Ext Time (p_c), s		1.3		0.5		2.3		0.1				
Intersection Summary												
HCM 6th Ctrl Delay			8.8									
HCM 6th LOS			A									



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↘		↗	↘	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	100		0	100		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.920			0.940			0.996			0.993	
Flt Protected		0.985			0.978		0.950		0.950		0.950	
Satd. Flow (prot)	0	1688	0	0	1712	0	1770	1855	0	1770	1850	0
Flt Permitted		0.985			0.978		0.950		0.950		0.950	
Satd. Flow (perm)	0	1688	0	0	1712	0	1770	1855	0	1770	1850	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		458			470			732			699	
Travel Time (s)		10.4			10.7			16.6			15.9	

Intersection Summary

Area Type: Other

Intersection												
Int Delay, s/veh	1.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	13	5	26	14	4	14	10	315	9	4	431	21
Future Vol, veh/h	13	5	26	14	4	14	10	315	9	4	431	21
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	14	5	28	15	4	15	11	342	10	4	468	23

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	867	862	480	873	868	347	491	0	0	352	0	0
Stage 1	488	488	-	369	369	-	-	-	-	-	-	-
Stage 2	379	374	-	504	499	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	273	293	586	271	290	696	1072	-	-	1207	-	-
Stage 1	561	550	-	651	621	-	-	-	-	-	-	-
Stage 2	643	618	-	550	544	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	261	289	586	251	286	696	1072	-	-	1207	-	-
Mov Cap-2 Maneuver	261	289	-	251	286	-	-	-	-	-	-	-
Stage 1	555	548	-	644	615	-	-	-	-	-	-	-
Stage 2	618	612	-	517	542	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	15.4		16.2		0.3		0.1	
HCM LOS	C		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1072	-	-	395	356	1207	-	-
HCM Lane V/C Ratio	0.01	-	-	0.121	0.098	0.004	-	-
HCM Control Delay (s)	8.4	-	-	15.4	16.2	8	-	-
HCM Lane LOS	A	-	-	C	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.4	0.3	0	-	-



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↘		↗	↘	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	100		0	100		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt					0.916			0.996				
Flt Protected					0.982					0.950		
Satd. Flow (prot)	0	1863	0	0	1676	0	1863	1855	0	1770	1863	0
Flt Permitted					0.982					0.950		
Satd. Flow (perm)	0	1863	0	0	1676	0	1863	1855	0	1770	1863	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		319			430			608			732	
Travel Time (s)		7.3			9.8			13.8			16.6	

Intersection Summary

Area Type: Other

Intersection												
Int Delay, s/veh	0.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	0	0	0	8	0	14	0	322	9	12	461	0
Future Vol, veh/h	0	0	0	8	0	14	0	322	9	12	461	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	9	0	15	0	350	10	13	501	0

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	890	887	501	882	882	355	501	0	0	360	0	0
Stage 1	527	527	-	355	355	-	-	-	-	-	-	-
Stage 2	363	360	-	527	527	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	264	283	570	267	285	689	1063	-	-	1199	-	-
Stage 1	535	528	-	662	630	-	-	-	-	-	-	-
Stage 2	656	626	-	535	528	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	256	280	570	265	282	689	1063	-	-	1199	-	-
Mov Cap-2 Maneuver	256	280	-	265	282	-	-	-	-	-	-	-
Stage 1	535	522	-	662	630	-	-	-	-	-	-	-
Stage 2	642	626	-	529	522	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	0		13.7		0		0.2	
HCM LOS	A		B					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1063	-	-	-	436	1199	-
HCM Lane V/C Ratio	-	-	-	-	0.055	0.011	-
HCM Control Delay (s)	0	-	-	0	13.7	8	-
HCM Lane LOS	A	-	-	A	B	A	-
HCM 95th %tile Q(veh)	0	-	-	-	0.2	0	-

Lanes and Geometrics
 4: Tennyson St. & W 64th Ave.

6501 Lowell Blvd
 06/07/2021



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		100	150		0	0		0	0		0
Storage Lanes	1		1	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850		0.995			0.919				0.951
Flt Protected	0.950			0.950				0.984				0.992
Satd. Flow (prot)	1770	1863	1583	1770	1853	0	0	1684	0	0	1757	0
Flt Permitted	0.246			0.368				0.903				0.965
Satd. Flow (perm)	458	1863	1583	685	1853	0	0	1546	0	0	1709	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			65		3			91				18
Link Speed (mph)		30			30			30				30
Link Distance (ft)		700			1434			502				485
Travel Time (s)		15.9			32.6			11.4				11.0

Intersection Summary

Area Type: Other



Lane Group	EBL	EBT	EBR	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	13	341	65	170	435	189	50
v/c Ratio	0.09	0.57	0.12	0.78	0.73	0.20	0.05
Control Delay	19.1	28.2	5.0	60.8	44.3	6.7	8.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.1	28.2	5.0	60.8	44.3	6.7	8.2
Queue Length 50th (ft)	5	160	0	98	246	23	7
Queue Length 95th (ft)	16	202	23	164	333	71	29
Internal Link Dist (ft)		620			1354	422	405
Turn Bay Length (ft)	150		100	150			
Base Capacity (vph)	251	1024	899	376	1020	933	997
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.33	0.07	0.45	0.43	0.20	0.05
Intersection Summary							

HCM 6th Signalized Intersection Summary
 4: Tennyson St. & W 64th Ave.

6501 Lowell Blvd
 06/07/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	314	60	156	387	13	56	14	104	7	22	17
Future Volume (veh/h)	12	314	60	156	387	13	56	14	104	7	22	17
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	13	341	65	170	421	14	61	15	113	8	24	18
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	233	690	585	304	664	22	291	90	488	155	456	318
Arrive On Green	0.37	0.37	0.37	0.25	0.25	0.25	0.53	0.53	0.53	0.53	0.53	0.53
Sat Flow, veh/h	954	1870	1585	979	1800	60	449	170	920	205	859	599
Grp Volume(v), veh/h	13	341	65	170	0	435	189	0	0	50	0	0
Grp Sat Flow(s),veh/h/ln	954	1870	1585	979	0	1860	1539	0	0	1664	0	0
Q Serve(g_s), s	1.0	12.7	2.4	15.0	0.0	18.8	1.3	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	19.8	12.7	2.4	27.6	0.0	18.8	5.5	0.0	0.0	1.2	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.03	0.32		0.60	0.16		0.36
Lane Grp Cap(c), veh/h	233	690	585	304	0	686	870	0	0	930	0	0
V/C Ratio(X)	0.06	0.49	0.11	0.56	0.00	0.63	0.22	0.00	0.00	0.05	0.00	0.00
Avail Cap(c_a), veh/h	405	1029	872	481	0	1023	870	0	0	930	0	0
HCM Platoon Ratio	1.00	1.00	1.00	0.67	0.67	0.67	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	0.89	0.00	0.89	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	32.2	21.9	18.7	37.9	0.0	28.5	11.2	0.0	0.0	10.2	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.5	0.1	1.4	0.0	0.9	0.6	0.0	0.0	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.4	9.3	1.6	6.8	0.0	13.5	3.6	0.0	0.0	0.9	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	32.3	22.5	18.8	39.3	0.0	29.3	11.7	0.0	0.0	10.3	0.0	0.0
LnGrp LOS	C	C	B	D	A	C	B	A	A	B	A	A
Approach Vol, veh/h		419			605			189				50
Approach Delay, s/veh		22.2			32.1			11.7				10.3
Approach LOS		C			C			B				B
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		52.3		37.7		52.3		37.7				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		31.5		49.5		31.5		49.5				
Max Q Clear Time (g_c+I1), s		7.5		21.8		3.2		29.6				
Green Ext Time (p_c), s		1.1		2.4		0.2		3.6				
Intersection Summary												
HCM 6th Ctrl Delay				24.9								
HCM 6th LOS				C								



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	200		150	150		75	200		150	200		100
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.280			0.568			0.579			0.595		
Satd. Flow (perm)	522	1863	1583	1058	1863	1583	1079	1863	1583	1108	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			99			127			127			132
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1434			1268			763			608	
Travel Time (s)		32.6			28.8			17.3			13.8	

Intersection Summary

Area Type: Other

Timings
5: W 64th Ave./W. 64th Ave. & Lowell Blvd.

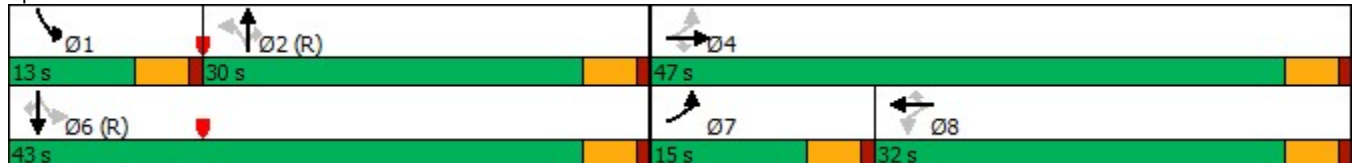
6501 Lowell Blvd
06/07/2021

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	116	293	91	72	236	39	46	132	56	80	272	121
Future Volume (vph)	116	293	91	72	236	39	46	132	56	80	272	121
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4			8			2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	7	4	4	8	8	8	2	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	15.0	47.0	47.0	32.0	32.0	32.0	30.0	30.0	30.0	13.0	43.0	43.0
Total Split (%)	16.7%	52.2%	52.2%	35.6%	35.6%	35.6%	33.3%	33.3%	33.3%	14.4%	47.8%	47.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead			Lag	Lag	Lag	Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes			Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	32.1	32.1	32.1	18.0	18.0	18.0	38.7	38.7	38.7	48.9	48.9	48.9
Actuated g/C Ratio	0.36	0.36	0.36	0.20	0.20	0.20	0.43	0.43	0.43	0.54	0.54	0.54
v/c Ratio	0.40	0.48	0.16	0.37	0.69	0.10	0.11	0.18	0.08	0.13	0.29	0.14
Control Delay	37.0	40.0	17.6	33.2	40.4	2.5	21.2	20.3	0.2	12.3	13.5	3.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.0	40.0	17.6	33.2	40.4	2.5	21.2	20.3	0.2	12.3	13.5	3.0
LOS	D	D	B	C	D	A	C	C	A	B	B	A
Approach Delay		35.2			34.7			15.7			10.6	
Approach LOS		D			C			B			B	

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 65
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.69
 Intersection Signal Delay: 24.6
 Intersection Capacity Utilization 53.1%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service A

Splits and Phases: 5: W 64th Ave./W. 64th Ave. & Lowell Blvd.





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	126	318	99	78	257	42	50	143	61	87	296	132
v/c Ratio	0.40	0.48	0.16	0.37	0.69	0.10	0.11	0.18	0.08	0.13	0.29	0.14
Control Delay	37.0	40.0	17.6	33.2	40.4	2.5	21.2	20.3	0.2	12.3	13.5	3.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.0	40.0	17.6	33.2	40.4	2.5	21.2	20.3	0.2	12.3	13.5	3.0
Queue Length 50th (ft)	68	179	17	39	139	1	17	51	0	23	87	0
Queue Length 95th (ft)	115	249	59	m60	m173	m3	50	110	0	54	164	30
Internal Link Dist (ft)		1354			1188			683			528	
Turn Bay Length (ft)	200		150	150		75	200		150	200		100
Base Capacity (vph)	331	879	799	323	569	571	463	800	752	668	1013	921
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.38	0.36	0.12	0.24	0.45	0.07	0.11	0.18	0.08	0.13	0.29	0.14

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM 6th Signalized Intersection Summary
 5: W 64th Ave./W. 64th Ave. & Lowell Blvd.

6501 Lowell Blvd
 06/07/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↘	↖	↗	↘	↖	↗	↘	↖	↗	↘
Traffic Volume (veh/h)	116	293	91	72	236	39	46	132	56	80	272	121
Future Volume (veh/h)	116	293	91	72	236	39	46	132	56	80	272	121
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	126	318	99	78	257	42	50	143	61	87	296	132
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	258	564	478	215	330	279	559	934	791	707	1119	949
Arrive On Green	0.02	0.10	0.10	0.06	0.06	0.06	0.50	0.50	0.50	0.05	0.60	0.60
Sat Flow, veh/h	1781	1870	1585	969	1870	1585	960	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	126	318	99	78	257	42	50	143	61	87	296	132
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	969	1870	1585	960	1870	1585	1781	1870	1585
Q Serve(g_s), s	5.0	14.6	5.2	7.1	12.2	2.3	2.5	3.7	1.8	2.0	6.8	3.3
Cycle Q Clear(g_c), s	5.0	14.6	5.2	10.4	12.2	2.3	2.5	3.7	1.8	2.0	6.8	3.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	258	564	478	215	330	279	559	934	791	707	1119	949
V/C Ratio(X)	0.49	0.56	0.21	0.36	0.78	0.15	0.09	0.15	0.08	0.12	0.26	0.14
Avail Cap(c_a), veh/h	332	883	748	340	571	484	559	934	791	788	1119	949
HCM Platoon Ratio	0.33	0.33	0.33	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	0.80	0.80	0.80	0.82	0.82	0.82	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.3	34.9	30.6	41.4	40.7	36.0	11.9	12.2	11.7	8.9	8.6	7.9
Incr Delay (d2), s/veh	1.1	0.7	0.2	0.8	3.3	0.2	0.3	0.3	0.2	0.1	0.6	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	4.1	11.4	3.7	3.4	10.1	1.6	1.0	2.8	1.2	1.3	4.9	2.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	29.4	35.6	30.8	42.3	44.0	36.2	12.2	12.6	11.9	9.0	9.2	8.2
LnGrp LOS	C	D	C	D	D	D	B	B	B	A	A	A
Approach Vol, veh/h		543			377			254			515	
Approach Delay, s/veh		33.3			42.8			12.3			8.9	
Approach LOS		C			D			B			A	
Timer - Assigned Phs	1	2		4		6	7	8				
Phs Duration (G+Y+Rc), s	8.9	49.4		31.6		58.4	11.3	20.4				
Change Period (Y+Rc), s	4.5	4.5		4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s	8.5	25.5		42.5		38.5	10.5	27.5				
Max Q Clear Time (g_c+I1), s	4.0	5.7		16.6		8.8	7.0	14.2				
Green Ext Time (p_c), s	0.1	1.1		2.3		2.3	0.1	1.7				

Intersection Summary

HCM 6th Ctrl Delay	24.8
HCM 6th LOS	C



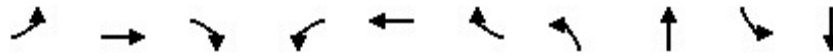
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	100		150	150		100	600		0	250		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor			0.850			0.850		0.987			0.990	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	5019	0	1770	5034	0
Flt Permitted	0.505			0.450			0.086			0.227		
Satd. Flow (perm)	941	1863	1583	838	1863	1583	160	5019	0	423	5034	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			134			127		23			17	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1268			424			903			562	
Travel Time (s)		28.8			9.6			20.5			12.8	

Intersection Summary

Area Type: Other

Timings
6: Federal Blvd. & W. 64th Ave.

6501 Lowell Blvd
06/07/2021



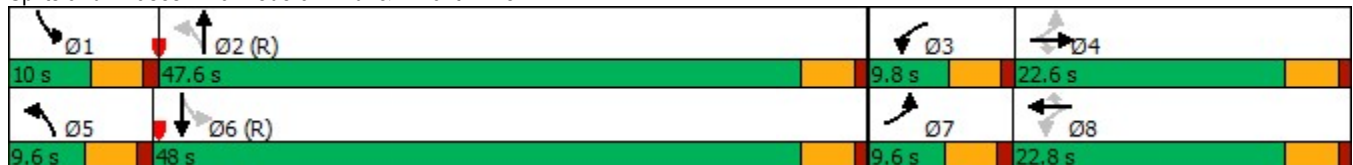
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations	↖	↑	↗	↖	↑	↗	↖	↑↑↑	↖	↑↑↑
Traffic Volume (vph)	106	162	164	139	176	43	93	864	68	2266
Future Volume (vph)	106	162	164	139	176	43	93	864	68	2266
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA
Protected Phases	7	4		3	8		5	2	1	6
Permitted Phases	4		4	8		8	2		6	
Detector Phase	7	4	4	3	8	8	5	2	1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	9.5	22.5
Total Split (s)	9.6	22.6	22.6	9.8	22.8	22.8	9.6	47.6	10.0	48.0
Total Split (%)	10.7%	25.1%	25.1%	10.9%	25.3%	25.3%	10.7%	52.9%	11.1%	53.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)	19.0	13.9	13.9	20.2	16.0	16.0	53.7	48.5	53.7	48.5
Actuated g/C Ratio	0.21	0.15	0.15	0.22	0.18	0.18	0.60	0.54	0.60	0.54
v/c Ratio	0.47	0.61	0.50	0.62	0.58	0.12	0.48	0.38	0.21	0.97
Control Delay	22.8	30.5	8.1	39.2	41.5	0.7	18.5	13.3	8.8	34.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.8	30.5	8.1	39.2	41.5	0.7	18.5	13.3	8.8	34.0
LOS	C	C	A	D	D	A	B	B	A	C
Approach Delay		20.1			35.7			13.7		33.3
Approach LOS		C			D			B		C

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.97
 Intersection Signal Delay: 27.5
 Intersection Capacity Utilization 83.7%
 Analysis Period (min) 15

Intersection LOS: C
 ICU Level of Service E

Splits and Phases: 6: Federal Blvd. & W. 64th Ave.





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	115	176	178	151	191	47	101	1027	74	2637
v/c Ratio	0.47	0.61	0.50	0.62	0.58	0.12	0.48	0.38	0.21	0.97
Control Delay	22.8	30.5	8.1	39.2	41.5	0.7	18.5	13.3	8.8	34.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.8	30.5	8.1	39.2	41.5	0.7	18.5	13.3	8.8	34.0
Queue Length 50th (ft)	27	45	0	69	103	0	20	123	14	~599
Queue Length 95th (ft)	55	83	0	114	165	0	#68	164	35	#717
Internal Link Dist (ft)		1188			344			823		482
Turn Bay Length (ft)	100		150	150		100	600		250	
Base Capacity (vph)	245	374	425	243	378	423	209	2717	346	2721
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.47	0.47	0.42	0.62	0.51	0.11	0.48	0.38	0.21	0.97

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

HCM 6th Signalized Intersection Summary
6: Federal Blvd. & W. 64th Ave.

6501 Lowell Blvd
06/07/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	106	162	164	139	176	43	93	864	81	68	2266	160
Future Volume (veh/h)	106	162	164	139	176	43	93	864	81	68	2266	160
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	115	176	178	151	191	47	101	939	88	74	2463	174
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	235	267	226	236	271	229	179	2621	245	406	2668	186
Arrive On Green	0.02	0.05	0.05	0.06	0.14	0.14	0.05	0.55	0.55	0.05	0.55	0.55
Sat Flow, veh/h	1781	1870	1585	1781	1870	1585	1781	4750	444	1781	4874	339
Grp Volume(v), veh/h	115	176	178	151	191	47	101	672	355	74	1709	928
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	1585	1781	1702	1790	1781	1702	1809
Q Serve(g_s), s	4.9	8.3	10.0	5.3	8.8	2.4	2.2	9.9	10.0	1.6	41.1	42.9
Cycle Q Clear(g_c), s	4.9	8.3	10.0	5.3	8.8	2.4	2.2	9.9	10.0	1.6	41.1	42.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.25	1.00		0.19
Lane Grp Cap(c), veh/h	235	267	226	236	271	229	179	1878	988	406	1864	991
V/C Ratio(X)	0.49	0.66	0.79	0.64	0.71	0.20	0.56	0.36	0.36	0.18	0.92	0.94
Avail Cap(c_a), veh/h	235	376	319	236	380	322	189	1878	988	431	1864	991
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.94	0.94	0.94	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.6	40.7	41.5	33.5	36.7	33.9	20.9	11.3	11.3	8.3	18.5	18.9
Incr Delay (d2), s/veh	1.5	2.6	7.9	5.7	3.4	0.4	3.4	0.5	1.0	0.2	8.7	16.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	4.1	7.5	8.1	1.8	7.5	1.7	2.3	6.5	7.1	1.0	23.4	28.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.0	43.4	49.4	39.2	40.1	34.4	24.4	11.8	12.3	8.5	27.2	35.8
LnGrp LOS	C	D	D	D	D	C	C	B	B	A	C	D
Approach Vol, veh/h		469			389			1128			2711	
Approach Delay, s/veh		43.4			39.0			13.1			29.6	
Approach LOS		D			D			B			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.7	54.2	9.8	17.3	9.1	53.8	9.6	17.5				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	5.5	43.1	5.3	18.1	5.1	43.5	5.1	18.3				
Max Q Clear Time (g_c+I1), s	3.6	12.0	7.3	12.0	4.2	44.9	6.9	10.8				
Green Ext Time (p_c), s	0.0	8.2	0.0	0.8	0.0	0.0	0.0	0.7				
Intersection Summary												
HCM 6th Ctrl Delay			27.8									
HCM 6th LOS			C									



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		150	150		0	225		250	150		150
Storage Lanes	1		1	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850		0.903				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1682	0	1770	1863	1583	1770	1863	1583
Flt Permitted	0.724			0.748			0.530			0.330		
Satd. Flow (perm)	1349	1863	1583	1393	1682	0	987	1863	1583	615	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			75		33				27			87
Link Speed (mph)		30			30			30				30
Link Distance (ft)		549			716			667				367
Travel Time (s)		12.5			16.3			15.2				8.3

Intersection Summary

Area Type: Other

Timings
1: Lowell Blvd. & W. 68th Ave.

6501 Lowell Blvd
06/07/2021

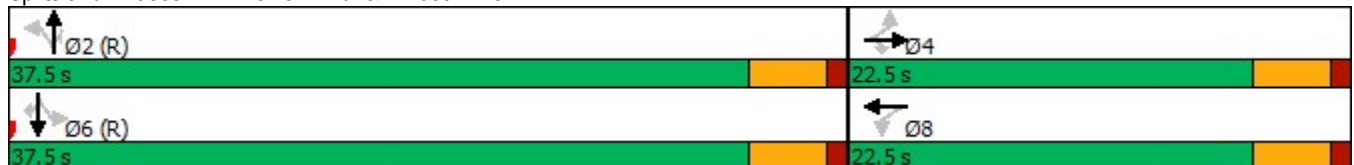


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑	↗	↖	↗	↖	↑	↗	↖	↑	↗
Traffic Volume (vph)	52	13	69	12	17	120	673	20	13	362	80
Future Volume (vph)	52	13	69	12	17	120	673	20	13	362	80
Turn Type	Perm	NA	Perm	Perm	NA	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8		2			6	
Permitted Phases	4		4	8		2		2	6		6
Detector Phase	4	4	4	8	8	2	2	2	6	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	22.5	22.5	22.5	22.5	22.5	37.5	37.5	37.5	37.5	37.5	37.5
Total Split (%)	37.5%	37.5%	37.5%	37.5%	37.5%	62.5%	62.5%	62.5%	62.5%	62.5%	62.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag											
Lead-Lag Optimize?											
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	8.1	8.1	8.1	8.1	8.1	45.8	45.8	45.8	45.8	45.8	45.8
Actuated g/C Ratio	0.14	0.14	0.14	0.14	0.14	0.76	0.76	0.76	0.76	0.76	0.76
v/c Ratio	0.31	0.06	0.27	0.07	0.20	0.17	0.51	0.02	0.03	0.28	0.07
Control Delay	27.3	21.6	9.1	22.1	13.9	3.9	5.8	1.4	3.4	3.8	1.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.3	21.6	9.1	22.1	13.9	3.9	5.8	1.4	3.4	3.8	1.1
LOS	C	C	A	C	B	A	A	A	A	A	A
Approach Delay		17.4			15.5		5.4			3.3	
Approach LOS		B			B		A			A	

Intersection Summary

Cycle Length: 60
 Actuated Cycle Length: 60
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.51
 Intersection Signal Delay: 6.3
 Intersection Capacity Utilization 60.4%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service B

Splits and Phases: 1: Lowell Blvd. & W. 68th Ave.





Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	57	14	75	13	51	130	732	22	14	393	87
v/c Ratio	0.31	0.06	0.27	0.07	0.20	0.17	0.51	0.02	0.03	0.28	0.07
Control Delay	27.3	21.6	9.1	22.1	13.9	3.9	5.8	1.4	3.4	3.8	1.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.3	21.6	9.1	22.1	13.9	3.9	5.8	1.4	3.4	3.8	1.1
Queue Length 50th (ft)	19	5	0	4	6	11	91	0	1	38	0
Queue Length 95th (ft)	46	17	29	16	30	32	198	5	6	83	10
Internal Link Dist (ft)		469			636		587			287	
Turn Bay Length (ft)	150		150	150		225		250	150		150
Base Capacity (vph)	404	558	527	417	527	754	1423	1215	469	1423	1230
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.03	0.14	0.03	0.10	0.17	0.51	0.02	0.03	0.28	0.07

Intersection Summary

HCM 6th Signalized Intersection Summary
 1: Lowell Blvd. & W. 68th Ave.

6501 Lowell Blvd
 06/07/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	52	13	69	12	17	30	120	673	20	13	362	80
Future Volume (veh/h)	52	13	69	12	17	30	120	673	20	13	362	80
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	57	14	75	13	18	33	130	732	22	14	393	87
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	223	195	165	247	62	113	741	1395	1182	533	1395	1182
Arrive On Green	0.10	0.10	0.10	0.10	0.10	0.10	0.75	0.75	0.75	0.75	0.75	0.75
Sat Flow, veh/h	1354	1870	1585	1308	591	1084	915	1870	1585	710	1870	1585
Grp Volume(v), veh/h	57	14	75	13	0	51	130	732	22	14	393	87
Grp Sat Flow(s),veh/h/ln	1354	1870	1585	1308	0	1675	915	1870	1585	710	1870	1585
Q Serve(g_s), s	2.4	0.4	2.7	0.5	0.0	1.7	3.2	9.8	0.2	0.5	4.1	0.9
Cycle Q Clear(g_c), s	4.1	0.4	2.7	0.9	0.0	1.7	7.3	9.8	0.2	10.3	4.1	0.9
Prop In Lane	1.00		1.00	1.00		0.65	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	223	195	165	247	0	174	741	1395	1182	533	1395	1182
V/C Ratio(X)	0.26	0.07	0.45	0.05	0.00	0.29	0.18	0.52	0.02	0.03	0.28	0.07
Avail Cap(c_a), veh/h	488	561	476	504	0	503	741	1395	1182	533	1395	1182
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.7	24.3	25.3	24.7	0.0	24.8	3.6	3.2	2.0	5.3	2.5	2.0
Incr Delay (d2), s/veh	0.6	0.2	2.0	0.1	0.0	0.9	0.5	1.4	0.0	0.1	0.5	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.4	0.3	1.9	0.3	0.0	1.2	0.9	3.9	0.1	0.1	1.6	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.3	24.4	27.2	24.8	0.0	25.8	4.1	4.6	2.0	5.4	3.0	2.2
LnGrp LOS	C	C	C	C	A	C	A	A	A	A	A	A
Approach Vol, veh/h		146			64			884			494	
Approach Delay, s/veh		27.0			25.6			4.5			2.9	
Approach LOS		C			C			A			A	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		49.3		10.7		49.3		10.7				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		33.0		18.0		33.0		18.0				
Max Q Clear Time (g_c+I1), s		11.8		6.1		12.3		3.7				
Green Ext Time (p_c), s		6.3		0.3		2.8		0.2				

Intersection Summary

HCM 6th Ctrl Delay	6.9
HCM 6th LOS	A



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕		↗	↘		↗	↘	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	100		0	100		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.963			0.942			0.996			0.992	
Flt Protected		0.971			0.986		0.950		0.950			
Satd. Flow (prot)	0	1742	0	0	1730	0	1770	1855	0	1770	1848	0
Flt Permitted		0.971			0.986		0.950		0.950			
Satd. Flow (perm)	0	1742	0	0	1730	0	1770	1855	0	1770	1848	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		458			470			732			667	
Travel Time (s)		10.4			10.7			16.6			15.2	

Intersection Summary

Area Type: Other

Intersection												
Int Delay, s/veh	3.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↔	↔		↔	↔	
Traffic Vol, veh/h	34	7	16	9	9	14	29	752	23	17	398	22
Future Vol, veh/h	34	7	16	9	9	14	29	752	23	17	398	22
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	37	8	17	10	10	15	32	817	25	18	433	24

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1387	1387	445	1388	1387	830	457	0	0	842	0	0
Stage 1	481	481	-	894	894	-	-	-	-	-	-	-
Stage 2	906	906	-	494	493	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	120	143	613	120	143	370	1104	-	-	794	-	-
Stage 1	566	554	-	336	360	-	-	-	-	-	-	-
Stage 2	331	355	-	557	547	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	105	136	613	107	136	370	1104	-	-	794	-	-
Mov Cap-2 Maneuver	105	136	-	107	136	-	-	-	-	-	-	-
Stage 1	550	541	-	326	350	-	-	-	-	-	-	-
Stage 2	300	345	-	521	534	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	48.7		31.5		0.3		0.4	
HCM LOS	E		D					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1104	-	-	142	170	794	-
HCM Lane V/C Ratio	0.029	-	-	0.436	0.205	0.023	-
HCM Control Delay (s)	8.4	-	-	48.7	31.5	9.6	-
HCM Lane LOS	A	-	-	E	D	A	-
HCM 95th %tile Q(veh)	0.1	-	-	1.9	0.7	0.1	-



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	100		0	100		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt					0.932			0.998				
Flt Protected					0.976					0.950		
Satd. Flow (prot)	0	1863	0	0	1694	0	1863	1859	0	1770	1863	0
Flt Permitted					0.976					0.950		
Satd. Flow (perm)	0	1863	0	0	1694	0	1863	1859	0	1770	1863	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		319			430			608			732	
Travel Time (s)		7.3			9.8			13.8			16.6	

Intersection Summary

Area Type: Other

Intersection												
Int Delay, s/veh	0.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	0	0	0	13	0	13	0	763	12	17	433	0
Future Vol, veh/h	0	0	0	13	0	13	0	763	12	17	433	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	14	0	14	0	829	13	18	471	0

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	1350	1349	471	1343	1343	836	471	0	0	842	0	0
Stage 1	507	507	-	836	836	-	-	-	-	-	-	-
Stage 2	843	842	-	507	507	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	128	151	593	129	152	367	1091	-	-	794	-	-
Stage 1	548	539	-	362	382	-	-	-	-	-	-	-
Stage 2	358	380	-	548	539	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	121	148	593	127	149	367	1091	-	-	794	-	-
Mov Cap-2 Maneuver	121	148	-	127	149	-	-	-	-	-	-	-
Stage 1	548	527	-	362	382	-	-	-	-	-	-	-
Stage 2	344	380	-	536	527	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	0		27.4		0		0.4	
HCM LOS	A		D					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1091	-	-	-	-	189	794	-
HCM Lane V/C Ratio	-	-	-	-	0.15	0.023	-	-
HCM Control Delay (s)	0	-	-	0	27.4	9.6	-	-
HCM Lane LOS	A	-	-	A	D	A	-	-
HCM 95th %tile Q(veh)	0	-	-	-	0.5	0.1	-	-

Lanes and Geometrics
 4: Tennyson St. & W 64th Ave.

6501 Lowell Blvd
 06/07/2021



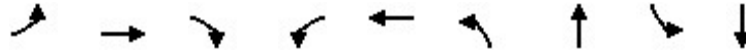
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		100	150		0	0		0	0		0
Storage Lanes	1		1	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850		0.994			0.920				0.953
Flt Protected	0.950			0.950				0.984				0.983
Satd. Flow (prot)	1770	1863	1583	1770	1852	0	0	1686	0	0	1745	0
Flt Permitted	0.247			0.128				0.884				0.863
Satd. Flow (perm)	460	1863	1583	238	1852	0	0	1515	0	0	1532	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			62		4			93				15
Link Speed (mph)		30			30			30				30
Link Distance (ft)		501			1329			646				482
Travel Time (s)		11.4			30.2			14.7				11.0

Intersection Summary

Area Type: Other

Timings
4: Tennyson St. & W 64th Ave.

6501 Lowell Blvd
06/07/2021

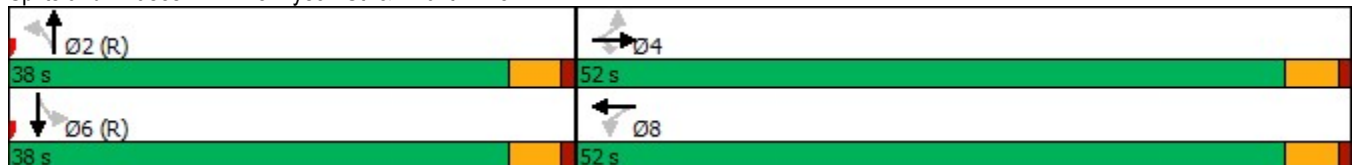


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↖	↑	↗	↖	↗		↕		↕
Traffic Volume (vph)	22	675	98	85	519	121	35	14	12
Future Volume (vph)	22	675	98	85	519	121	35	14	12
Turn Type	Perm	NA	Perm	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4			8		2		6
Permitted Phases	4		4	8		2		6	
Detector Phase	4	4	4	8	8	2	2	6	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	52.0	52.0	52.0	52.0	52.0	38.0	38.0	38.0	38.0
Total Split (%)	57.8%	57.8%	57.8%	57.8%	57.8%	42.2%	42.2%	42.2%	42.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	42.3	42.3	42.3	42.3	42.3		38.7		38.7
Actuated g/C Ratio	0.47	0.47	0.47	0.47	0.47		0.43		0.43
v/c Ratio	0.11	0.84	0.14	0.83	0.68		0.59		0.06
Control Delay	12.8	30.1	5.9	79.7	36.4		20.5		13.3
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	12.8	30.1	5.9	79.7	36.4		20.5		13.3
LOS	B	C	A	E	D		C		B
Approach Delay		26.6			42.2		20.5		13.3
Approach LOS		C			D		C		B

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 55
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.84
 Intersection Signal Delay: 30.4
 Intersection Capacity Utilization 80.0%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service D

Splits and Phases: 4: Tennyson St. & W 64th Ave.





Lane Group	EBL	EBT	EBR	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	24	734	107	92	589	418	43
v/c Ratio	0.11	0.84	0.14	0.83	0.68	0.59	0.06
Control Delay	12.8	30.1	5.9	79.7	36.4	20.5	13.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.8	30.1	5.9	79.7	36.4	20.5	13.3
Queue Length 50th (ft)	7	336	13	54	335	142	9
Queue Length 95th (ft)	20	455	37	m#85	m394	260	32
Internal Link Dist (ft)		421			1249	566	402
Turn Bay Length (ft)	150		100	150			
Base Capacity (vph)	242	983	864	125	979	705	667
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.75	0.12	0.74	0.60	0.59	0.06

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

HCM 6th Signalized Intersection Summary
 4: Tennyson St. & W 64th Ave.

6501 Lowell Blvd
 06/07/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	22	675	98	85	519	23	121	35	228	14	12	14
Future Volume (veh/h)	22	675	98	85	519	23	121	35	228	14	12	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	24	734	107	92	564	25	132	38	248	15	13	15
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	487	930	788	193	883	39	227	80	371	220	192	192
Arrive On Green	0.50	0.50	0.50	0.99	0.99	0.99	0.40	0.40	0.40	0.40	0.40	0.40
Sat Flow, veh/h	827	1870	1585	654	1777	79	433	198	921	413	476	476
Grp Volume(v), veh/h	24	734	107	92	0	589	418	0	0	43	0	0
Grp Sat Flow(s),veh/h/ln	827	1870	1585	654	0	1856	1552	0	0	1366	0	0
Q Serve(g_s), s	1.4	29.2	3.3	11.5	0.0	0.5	15.7	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	1.8	29.2	3.3	40.8	0.0	0.5	19.6	0.0	0.0	1.3	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.04	0.32		0.59	0.35		0.35
Lane Grp Cap(c), veh/h	487	930	788	193	0	923	678	0	0	604	0	0
V/C Ratio(X)	0.05	0.79	0.14	0.48	0.00	0.64	0.62	0.00	0.00	0.07	0.00	0.00
Avail Cap(c_a), veh/h	512	987	837	213	0	980	678	0	0	604	0	0
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.75	0.00	0.75	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	12.0	18.7	12.2	13.6	0.0	0.1	21.8	0.0	0.0	16.4	0.0	0.0
Incr Delay (d2), s/veh	0.0	4.2	0.1	1.4	0.0	1.0	4.2	0.0	0.0	0.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.4	18.6	2.0	2.6	0.0	0.6	12.2	0.0	0.0	1.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	12.0	22.9	12.3	15.0	0.0	1.1	25.9	0.0	0.0	16.7	0.0	0.0
LnGrp LOS	B	C	B	B	A	A	C	A	A	B	A	A
Approach Vol, veh/h		865			681			418				43
Approach Delay, s/veh		21.3			3.0			25.9				16.7
Approach LOS		C			A			C				B
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		40.8		49.2		40.8		49.2				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		33.5		47.5		33.5		47.5				
Max Q Clear Time (g_c+I1), s		21.6		31.2		3.3		42.8				
Green Ext Time (p_c), s		2.2		5.3		0.2		1.9				

Intersection Summary

HCM 6th Ctrl Delay	15.9
HCM 6th LOS	B



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12	
Grade (%)	0%		0%		0%		0%		0%		0%		
Storage Length (ft)	200		150	150		75	200		150	200		100	
Storage Lanes	1		1	1		1	1		1	1		1	
Taper Length (ft)	25			25			25			25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor	Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950			
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	1863	1583	1770	1863	1583	
Flt Permitted	0.143			0.496			0.603			0.212			
Satd. Flow (perm)	266	1863	1583	924	1863	1583	1123	1863	1583	395	1863	1583	
Right Turn on Red			Yes			Yes			Yes			Yes	
Satd. Flow (RTOR)			84			127			127			174	
Link Speed (mph)		30			30			30				30	
Link Distance (ft)		1329			1480			763				608	
Travel Time (s)		30.2			33.6			17.3				13.8	

Intersection Summary

Area Type: Other



























Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	261	465	84	57	430	70	148	501	121	48	252	174
v/c Ratio	0.85	0.57	0.11	0.24	0.89	0.14	0.33	0.67	0.17	0.18	0.29	0.21
Control Delay	50.5	31.4	9.7	31.6	49.9	7.6	23.6	29.9	4.4	15.8	16.7	3.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.5	31.4	9.7	31.6	49.9	7.6	23.6	29.9	4.4	15.8	16.7	3.1
Queue Length 50th (ft)	134	227	9	30	270	3	63	254	0	15	89	0
Queue Length 95th (ft)	m#193	314	m23	m37	m320	m4	118	#410	33	35	143	35
Internal Link Dist (ft)		1249			1400			683			528	
Turn Bay Length (ft)	200		150	150		75	200		150	200		100
Base Capacity (vph)	308	844	763	254	513	528	448	743	708	263	861	825
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.85	0.55	0.11	0.22	0.84	0.13	0.33	0.67	0.17	0.18	0.29	0.21

Intersection Summary

- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

HCM 6th Signalized Intersection Summary
 5: W 64th Ave./W. 64th Ave. & Lowell Blvd.

6501 Lowell Blvd
 06/07/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	240	428	77	52	396	64	136	461	111	44	232	160
Future Volume (veh/h)	240	428	77	52	396	64	136	461	111	44	232	160
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	261	465	84	57	430	70	148	501	121	48	252	174
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	329	810	686	290	483	409	444	708	600	270	874	740
Arrive On Green	0.12	0.43	0.43	0.09	0.09	0.09	0.38	0.38	0.38	0.04	0.47	0.47
Sat Flow, veh/h	1781	1870	1585	858	1870	1585	961	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	261	465	84	57	430	70	148	501	121	48	252	174
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	858	1870	1585	961	1870	1585	1781	1870	1585
Q Serve(g_s), s	9.2	16.9	2.9	5.6	20.5	3.7	10.2	20.5	4.6	1.4	7.5	5.9
Cycle Q Clear(g_c), s	9.2	16.9	2.9	6.8	20.5	3.7	10.2	20.5	4.6	1.4	7.5	5.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	329	810	686	290	483	409	444	708	600	270	874	740
V/C Ratio(X)	0.79	0.57	0.12	0.20	0.89	0.17	0.33	0.71	0.20	0.18	0.29	0.23
Avail Cap(c_a), veh/h	335	848	719	305	515	437	444	708	600	300	874	740
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.43	0.43	0.43	0.46	0.46	0.46	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.1	19.3	15.3	34.2	39.9	32.2	20.6	23.8	18.8	17.5	14.8	14.4
Incr Delay (d2), s/veh	5.5	0.4	0.0	0.2	8.7	0.1	2.0	5.9	0.8	0.3	0.8	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	6.3	9.9	1.8	2.2	15.1	2.6	4.4	15.0	3.2	1.0	5.8	3.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.6	19.6	15.3	34.3	48.6	32.3	22.6	29.7	19.6	17.8	15.6	15.1
LnGrp LOS	C	B	B	C	D	C	C	C	B	B	B	B
Approach Vol, veh/h		810			557			770				474
Approach Delay, s/veh		21.8			45.1			26.7				15.6
Approach LOS		C			D			C				B
Timer - Assigned Phs	1	2		4		6	7	8				
Phs Duration (G+Y+Rc), s	8.0	38.6		43.5		46.5	15.7	27.8				
Change Period (Y+Rc), s	4.5	4.5		4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s	5.0	30.7		40.8		40.2	11.5	24.8				
Max Q Clear Time (g_c+I1), s	3.4	22.5		18.9		9.5	11.2	22.5				
Green Ext Time (p_c), s	0.0	2.8		3.3		2.2	0.0	0.8				
Intersection Summary												
HCM 6th Ctrl Delay				27.1								
HCM 6th LOS				C								



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	100		150	150		100	600		0	250		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor			0.850			0.850		0.993			0.988	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	5050	0	1770	5024	0
Flt Permitted	0.243			0.498			0.108			0.123		
Satd. Flow (perm)	453	1863	1583	928	1863	1583	201	5050	0	229	5024	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			198			236		10			17	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1480			550			1046			611	
Travel Time (s)		33.6			12.5			23.8			13.9	

Intersection Summary

Area Type: Other

Timings
6: Federal Blvd. & W. 64th Ave.

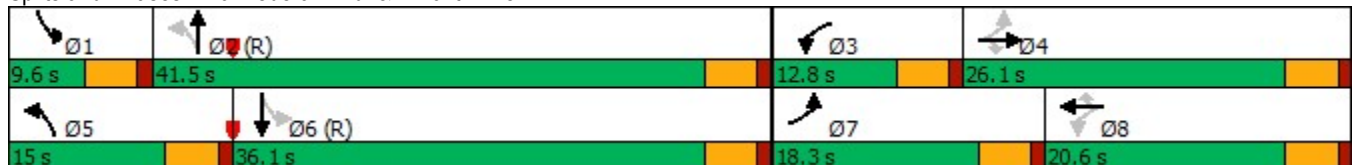
6501 Lowell Blvd
06/07/2021

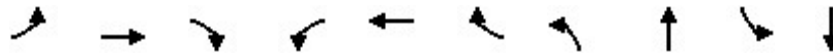
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	
Lane Configurations											
Traffic Volume (vph)	301	255	182	120	223	103	231	1979	90	1620	
Future Volume (vph)	301	255	182	120	223	103	231	1979	90	1620	
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA	
Protected Phases	7	4		3	8		5	2	1	6	
Permitted Phases	4		4	8		8	2		6		
Detector Phase	7	4	4	3	8	8	5	2	1	6	
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	9.5	22.5	22.5	9.5	20.6	20.6	9.5	22.5	9.5	22.5	
Total Split (s)	18.3	26.1	26.1	12.8	20.6	20.6	15.0	41.5	9.6	36.1	
Total Split (%)	20.3%	29.0%	29.0%	14.2%	22.9%	22.9%	16.7%	46.1%	10.7%	40.1%	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None	None	None	None	None	None	C-Max	None	C-Max	
Act Effct Green (s)	33.2	20.7	20.7	22.9	14.9	14.9	47.8	39.9	38.1	32.6	
Actuated g/C Ratio	0.37	0.23	0.23	0.25	0.17	0.17	0.53	0.44	0.42	0.36	
v/c Ratio	0.89	0.65	0.38	0.42	0.79	0.24	0.86	1.01	0.51	1.04	
Control Delay	63.9	53.7	18.4	24.0	54.8	1.3	47.1	47.8	22.4	62.9	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	63.9	53.7	18.4	24.0	54.8	1.3	47.1	47.8	22.4	62.9	
LOS	E	D	B	C	D	A	D	D	C	E	
Approach Delay		49.1			34.1			47.8		60.9	
Approach LOS		D			C			D		E	

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.04
 Intersection Signal Delay: 51.4
 Intersection Capacity Utilization 90.6%
 Analysis Period (min) 15
 Intersection LOS: D
 ICU Level of Service E

Splits and Phases: 6: Federal Blvd. & W. 64th Ave.





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	327	277	198	130	242	112	251	2258	98	1911
v/c Ratio	0.89	0.65	0.38	0.42	0.79	0.24	0.86	1.01	0.51	1.04
Control Delay	63.9	53.7	18.4	24.0	54.8	1.3	47.1	47.8	22.4	62.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.9	53.7	18.4	24.0	54.8	1.3	47.1	47.8	22.4	62.9
Queue Length 50th (ft)	176	154	30	48	131	0	91	~533	27	~446
Queue Length 95th (ft)	#276	236	84	88	#236	0	#227	#631	#54	#544
Internal Link Dist (ft)		1400			470			966		531
Turn Bay Length (ft)	100		150	150		100	600		250	
Base Capacity (vph)	369	447	530	316	333	476	294	2243	191	1832
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.89	0.62	0.37	0.41	0.73	0.24	0.85	1.01	0.51	1.04

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

HCM 6th Signalized Intersection Summary
6: Federal Blvd. & W. 64th Ave.

6501 Lowell Blvd
06/07/2021


























Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	301	255	182	120	223	103	231	1979	98	90	1620	138
Future Volume (veh/h)	301	255	182	120	223	103	231	1979	98	90	1620	138
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	327	277	198	130	242	112	251	2151	107	98	1761	150
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	381	425	360	298	287	243	285	2205	109	173	1825	155
Arrive On Green	0.05	0.07	0.07	0.08	0.15	0.15	0.11	0.44	0.44	0.05	0.38	0.38
Sat Flow, veh/h	1781	1870	1585	1781	1870	1585	1781	4983	247	1781	4794	407
Grp Volume(v), veh/h	327	277	198	130	242	112	251	1466	792	98	1249	662
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	1585	1781	1702	1826	1781	1702	1797
Q Serve(g_s), s	13.2	13.0	10.8	5.4	11.3	5.8	8.1	38.0	38.4	3.0	32.3	32.5
Cycle Q Clear(g_c), s	13.2	13.0	10.8	5.4	11.3	5.8	8.1	38.0	38.4	3.0	32.3	32.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.14	1.00		0.23
Lane Grp Cap(c), veh/h	381	425	360	298	287	243	285	1506	808	173	1296	684
V/C Ratio(X)	0.86	0.65	0.55	0.44	0.84	0.46	0.88	0.97	0.98	0.57	0.96	0.97
Avail Cap(c_a), veh/h	381	449	380	321	335	284	292	1506	808	184	1296	684
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.88	0.88	0.88	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.2	38.2	37.2	28.8	37.0	34.7	23.0	24.6	24.7	21.9	27.3	27.3
Incr Delay (d2), s/veh	15.6	2.7	1.3	1.0	15.7	1.4	24.7	17.6	27.2	3.6	17.7	27.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	12.2	10.8	8.1	4.3	10.4	4.1	8.9	24.9	29.2	2.4	22.1	25.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	44.7	40.9	38.5	29.8	52.7	36.1	47.7	42.2	51.9	25.5	45.0	54.7
LnGrp LOS	D	D	D	C	D	D	D	D	D	C	D	D
Approach Vol, veh/h		802			484			2509			2009	
Approach Delay, s/veh		41.9			42.7			45.8			47.2	
Approach LOS		D			D			D			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.1	44.3	11.7	24.9	14.6	38.8	18.3	18.3				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	5.1	37.0	8.3	21.6	10.5	31.6	13.8	16.1				
Max Q Clear Time (g_c+I1), s	5.0	40.4	7.4	15.0	10.1	34.5	15.2	13.3				
Green Ext Time (p_c), s	0.0	0.0	0.0	1.3	0.0	0.0	0.0	0.5				

Intersection Summary

HCM 6th Ctrl Delay	45.5
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		150	150		0	225		250	150		150
Storage Lanes	1		1	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850		0.929				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1730	0	1770	1863	1583	1770	1863	1583
Flt Permitted	0.744			0.751			0.556			0.633		
Satd. Flow (perm)	1386	1863	1583	1399	1730	0	1036	1863	1583	1179	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			121		10				27			58
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		594			990			699			502	
Travel Time (s)		13.5			22.5			15.9			11.4	

Intersection Summary

Area Type: Other

Timings
1: Lowell Blvd. & W. 68th Ave.

6501 Lowell Blvd
06/07/2021



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	50	9	111	3	10	63	183	1	16	313	53
Future Volume (vph)	50	9	111	3	10	63	183	1	16	313	53
Turn Type	Perm	NA	Perm	Perm	NA	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8		2			6	
Permitted Phases	4		4	8		2		2	6		6
Detector Phase	4	4	4	8	8	2	2	2	6	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	26.0	26.0	26.0	26.0	26.0	34.0	34.0	34.0	34.0	34.0	34.0
Total Split (%)	43.3%	43.3%	43.3%	43.3%	43.3%	56.7%	56.7%	56.7%	56.7%	56.7%	56.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag											
Lead-Lag Optimize?											
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	7.9	7.9	7.9	7.9	7.9	46.0	46.0	46.0	46.0	46.0	46.0
Actuated g/C Ratio	0.13	0.13	0.13	0.13	0.13	0.77	0.77	0.77	0.77	0.77	0.77
v/c Ratio	0.30	0.04	0.39	0.02	0.09	0.09	0.14	0.00	0.02	0.24	0.05
Control Delay	27.0	21.7	9.2	21.3	16.9	3.3	3.2	0.0	3.1	3.6	1.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.0	21.7	9.2	21.3	16.9	3.3	3.2	0.0	3.1	3.6	1.2
LOS	C	C	A	C	B	A	A	A	A	A	A
Approach Delay		15.1			17.4		3.2			3.2	
Approach LOS		B			B		A			A	

Intersection Summary

Cycle Length: 60
 Actuated Cycle Length: 60
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 45
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.39
 Intersection Signal Delay: 6.1
 Intersection Capacity Utilization 41.3%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service A

Splits and Phases: 1: Lowell Blvd. & W. 68th Ave.



Queues

6501 Lowell Blvd

1: Lowell Blvd. & W. 68th Ave.

06/07/2021

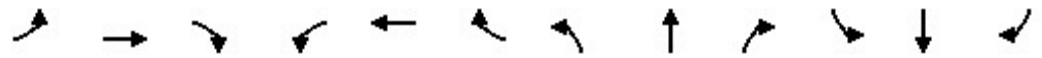


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	54	10	121	3	21	68	199	1	17	340	58
v/c Ratio	0.30	0.04	0.39	0.02	0.09	0.09	0.14	0.00	0.02	0.24	0.05
Control Delay	27.0	21.7	9.2	21.3	16.9	3.3	3.2	0.0	3.1	3.6	1.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.0	21.7	9.2	21.3	16.9	3.3	3.2	0.0	3.1	3.6	1.2
Queue Length 50th (ft)	18	3	0	1	4	5	17	0	1	31	0
Queue Length 95th (ft)	44	14	37	7	19	18	40	0	6	69	8
Internal Link Dist (ft)		514			910		619			422	
Turn Bay Length (ft)	150		150	150		225		250	150		150
Base Capacity (vph)	496	667	644	501	626	794	1429	1220	904	1429	1227
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.01	0.19	0.01	0.03	0.09	0.14	0.00	0.02	0.24	0.05

Intersection Summary

HCM 6th Signalized Intersection Summary
 1: Lowell Blvd. & W. 68th Ave.

6501 Lowell Blvd
 06/07/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	9	111	3	10	9	63	183	1	16	313	53
Future Volume (veh/h)	50	9	111	3	10	9	63	183	1	16	313	53
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	54	10	121	3	11	10	68	199	1	17	340	58
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	259	208	176	254	100	91	792	1382	1171	957	1382	1171
Arrive On Green	0.11	0.11	0.11	0.11	0.11	0.11	0.74	0.74	0.74	0.74	0.74	0.74
Sat Flow, veh/h	1391	1870	1585	1259	902	820	987	1870	1585	1182	1870	1585
Grp Volume(v), veh/h	54	10	121	3	0	21	68	199	1	17	340	58
Grp Sat Flow(s),veh/h/ln	1391	1870	1585	1259	0	1723	987	1870	1585	1182	1870	1585
Q Serve(g_s), s	2.2	0.3	4.4	0.1	0.0	0.7	1.4	1.9	0.0	0.3	3.5	0.6
Cycle Q Clear(g_c), s	2.8	0.3	4.4	0.4	0.0	0.7	4.9	1.9	0.0	2.1	3.5	0.6
Prop In Lane	1.00		1.00	1.00		0.48	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	259	208	176	254	0	191	792	1382	1171	957	1382	1171
V/C Ratio(X)	0.21	0.05	0.69	0.01	0.00	0.11	0.09	0.14	0.00	0.02	0.25	0.05
Avail Cap(c_a), veh/h	603	670	568	565	0	617	792	1382	1171	957	1382	1171
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.3	23.8	25.7	24.0	0.0	24.0	3.3	2.3	2.0	2.6	2.5	2.1
Incr Delay (d2), s/veh	0.4	0.1	4.7	0.0	0.0	0.3	0.2	0.2	0.0	0.0	0.4	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.3	0.2	3.2	0.1	0.0	0.5	0.4	0.7	0.0	0.1	1.4	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.7	23.9	30.3	24.0	0.0	24.2	3.5	2.5	2.0	2.6	2.9	2.2
LnGrp LOS	C	C	C	C	A	C	A	A	A	A	A	A
Approach Vol, veh/h		185			24			268			415	
Approach Delay, s/veh		28.6			24.2			2.8			2.8	
Approach LOS		C			C			A			A	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		48.8		11.2		48.8		11.2				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		29.5		21.5		29.5		21.5				
Max Q Clear Time (g_c+I1), s		6.9		6.4		5.5		2.7				
Green Ext Time (p_c), s		1.4		0.5		2.3		0.1				

Intersection Summary

HCM 6th Ctrl Delay	8.7
HCM 6th LOS	A



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕		↗	↖		↗	↖	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	100		0	100		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.920			0.940			0.996			0.993	
Flt Protected		0.985			0.978		0.950		0.950			
Satd. Flow (prot)	0	1688	0	0	1712	0	1770	1855	0	1770	1850	0
Flt Permitted		0.985			0.978		0.950		0.950			
Satd. Flow (perm)	0	1688	0	0	1712	0	1770	1855	0	1770	1850	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		458			470			732			699	
Travel Time (s)		10.4			10.7			16.6			15.9	

Intersection Summary

Area Type: Other

Intersection												
Int Delay, s/veh	1.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	13	5	26	14	4	14	10	326	9	4	435	21
Future Vol, veh/h	13	5	26	14	4	14	10	326	9	4	435	21
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	14	5	28	15	4	15	11	354	10	4	473	23

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	884	879	485	890	885	359	496	0	0	364	0	0
Stage 1	493	493	-	381	381	-	-	-	-	-	-	-
Stage 2	391	386	-	509	504	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	266	286	582	264	284	685	1068	-	-	1195	-	-
Stage 1	558	547	-	641	613	-	-	-	-	-	-	-
Stage 2	633	610	-	547	541	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	254	282	582	245	280	685	1068	-	-	1195	-	-
Mov Cap-2 Maneuver	254	282	-	245	280	-	-	-	-	-	-	-
Stage 1	552	545	-	635	607	-	-	-	-	-	-	-
Stage 2	608	604	-	514	539	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	15.6		16.5		0.2		0.1	
HCM LOS	C		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1068	-	-	387	348	1195	-
HCM Lane V/C Ratio	0.01	-	-	0.124	0.1	0.004	-
HCM Control Delay (s)	8.4	-	-	15.6	16.5	8	-
HCM Lane LOS	A	-	-	C	C	A	-
HCM 95th %tile Q(veh)	0	-	-	0.4	0.3	0	-



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↘		↗	↘	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	100		0	100		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.916			0.922			0.996				0.999
Flt Protected		0.986			0.983		0.950			0.950		
Satd. Flow (prot)	0	1682	0	0	1688	0	1770	1855	0	1770	1861	0
Flt Permitted		0.986			0.983		0.950			0.950		
Satd. Flow (perm)	0	1682	0	0	1688	0	1770	1855	0	1770	1861	0
Link Speed (mph)		30			30			30				30
Link Distance (ft)		319			430			608				732
Travel Time (s)		7.3			9.8			13.8				16.6

Intersection Summary

Area Type: Other

Intersection												
Int Delay, s/veh	1.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↔	↔		↔	↔	
Traffic Vol, veh/h	11	4	24	8	2	14	8	322	9	12	461	4
Future Vol, veh/h	11	4	24	8	2	14	8	322	9	12	461	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	12	4	26	9	2	15	9	350	10	13	501	4

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	911	907	503	917	904	355	505	0	0	360	0	0
Stage 1	529	529	-	373	373	-	-	-	-	-	-	-
Stage 2	382	378	-	544	531	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	255	276	569	253	277	689	1060	-	-	1199	-	-
Stage 1	533	527	-	648	618	-	-	-	-	-	-	-
Stage 2	640	615	-	523	526	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	244	271	569	235	272	689	1060	-	-	1199	-	-
Mov Cap-2 Maneuver	244	271	-	235	272	-	-	-	-	-	-	-
Stage 1	529	521	-	643	613	-	-	-	-	-	-	-
Stage 2	618	610	-	489	520	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	15.6		14.9		0.2		0.2	
HCM LOS	C		B					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1060	-	-	382	389	1199	-	-
HCM Lane V/C Ratio	0.008	-	-	0.111	0.067	0.011	-	-
HCM Control Delay (s)	8.4	-	-	15.6	14.9	8	-	-
HCM Lane LOS	A	-	-	C	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.4	0.2	0	-	-

Lanes and Geometrics
 4: Tennyson St. & W 64th Ave.

6501 Lowell Blvd
 06/07/2021



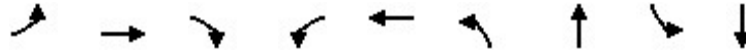
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%				0%
Storage Length (ft)	150		100	150		0	0		0	0		0
Storage Lanes	1		1	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850		0.995			0.919				0.951
Flt Protected	0.950			0.950				0.984				0.992
Satd. Flow (prot)	1770	1863	1583	1770	1853	0	0	1684	0	0	1757	0
Flt Permitted	0.239			0.368				0.904				0.965
Satd. Flow (perm)	445	1863	1583	685	1853	0	0	1548	0	0	1709	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			65		3			92				18
Link Speed (mph)		30			30			30				30
Link Distance (ft)		700			838			502				485
Travel Time (s)		15.9			19.0			11.4				11.0

Intersection Summary

Area Type: Other

Timings
4: Tennyson St. & W 64th Ave.

6501 Lowell Blvd
06/07/2021

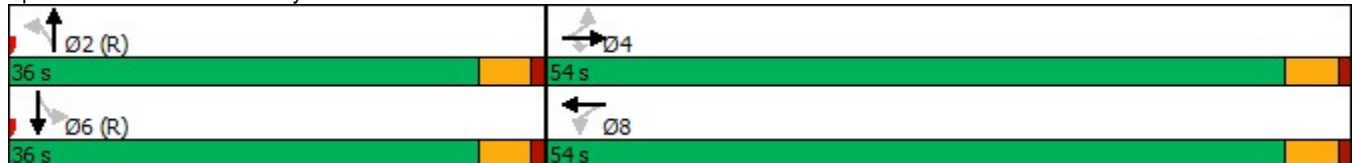


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↖	↑	↗	↖	↗		↕		↕
Traffic Volume (vph)	12	319	60	160	401	56	14	7	22
Future Volume (vph)	12	319	60	160	401	56	14	7	22
Turn Type	Perm	NA	Perm	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4			8		2		6
Permitted Phases	4		4	8		2		6	
Detector Phase	4	4	4	8	8	2	2	6	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	54.0	54.0	54.0	54.0	54.0	36.0	36.0	36.0	36.0
Total Split (%)	60.0%	60.0%	60.0%	60.0%	60.0%	40.0%	40.0%	40.0%	40.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0		0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5		4.5		4.5
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	29.7	29.7	29.7	29.7	29.7		51.3		51.3
Actuated g/C Ratio	0.33	0.33	0.33	0.33	0.33		0.57		0.57
v/c Ratio	0.09	0.56	0.11	0.77	0.73		0.21		0.05
Control Delay	18.3	27.3	4.8	59.3	43.8		7.0		8.6
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	18.3	27.3	4.8	59.3	43.8		7.0		8.6
LOS	B	C	A	E	D		A		A
Approach Delay		23.6			48.2		7.0		8.6
Approach LOS		C			D		A		A

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 45
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.77
 Intersection Signal Delay: 32.5
 Intersection Capacity Utilization 54.3%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service A

Splits and Phases: 4: Tennyson St. & W 64th Ave.





Lane Group	EBL	EBT	EBR	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	13	347	65	174	450	190	50
v/c Ratio	0.09	0.56	0.11	0.77	0.73	0.21	0.05
Control Delay	18.3	27.3	4.8	59.3	43.8	7.0	8.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.3	27.3	4.8	59.3	43.8	7.0	8.6
Queue Length 50th (ft)	5	161	0	99	254	24	7
Queue Length 95th (ft)	16	200	22	167	342	73	30
Internal Link Dist (ft)		620			758	422	405
Turn Bay Length (ft)	150		100	150			
Base Capacity (vph)	244	1024	899	376	1020	921	981
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.34	0.07	0.46	0.44	0.21	0.05

Intersection Summary

HCM 6th Signalized Intersection Summary
 4: Tennyson St. & W 64th Ave.

6501 Lowell Blvd
 06/07/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	319	60	160	401	13	56	14	105	7	22	17
Future Volume (veh/h)	12	319	60	160	401	13	56	14	105	7	22	17
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	13	347	65	174	436	14	61	15	114	8	24	18
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	231	704	596	308	678	22	286	89	484	154	450	314
Arrive On Green	0.38	0.38	0.38	0.25	0.25	0.25	0.52	0.52	0.52	0.52	0.52	0.52
Sat Flow, veh/h	940	1870	1585	974	1802	58	446	170	923	205	860	599
Grp Volume(v), veh/h	13	347	65	174	0	450	190	0	0	50	0	0
Grp Sat Flow(s),veh/h/ln	940	1870	1585	974	0	1860	1539	0	0	1664	0	0
Q Serve(g_s), s	1.1	12.8	2.4	15.4	0.0	19.4	1.4	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	20.5	12.8	2.4	28.2	0.0	19.4	5.6	0.0	0.0	1.3	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.03	0.32		0.60	0.16		0.36
Lane Grp Cap(c), veh/h	231	704	596	308	0	700	859	0	0	918	0	0
V/C Ratio(X)	0.06	0.49	0.11	0.56	0.00	0.64	0.22	0.00	0.00	0.05	0.00	0.00
Avail Cap(c_a), veh/h	394	1029	872	477	0	1023	859	0	0	918	0	0
HCM Platoon Ratio	1.00	1.00	1.00	0.67	0.67	0.67	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	32.2	21.5	18.3	37.7	0.0	28.3	11.5	0.0	0.0	10.5	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.5	0.1	1.6	0.0	1.0	0.6	0.0	0.0	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.4	9.4	1.6	7.1	0.0	14.2	3.7	0.0	0.0	0.9	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	32.3	22.0	18.3	39.3	0.0	29.3	12.1	0.0	0.0	10.6	0.0	0.0
LnGrp LOS	C	C	B	D	A	C	B	A	A	B	A	A
Approach Vol, veh/h		425			624			190				50
Approach Delay, s/veh		21.8			32.0			12.1				10.6
Approach LOS		C			C			B				B
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		51.6		38.4		51.6		38.4				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		31.5		49.5		31.5		49.5				
Max Q Clear Time (g_c+I1), s		7.6		22.5		3.3		30.2				
Green Ext Time (p_c), s		1.1		2.5		0.2		3.7				
Intersection Summary												
HCM 6th Ctrl Delay				24.9								
HCM 6th LOS				C								



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	200		150	150		75	200		150	200		100
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.279			0.559			0.575			0.589		
Satd. Flow (perm)	520	1863	1583	1041	1863	1583	1071	1863	1583	1097	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			102			127			127			136
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		596			1268			763			608	
Travel Time (s)		13.5			28.8			17.3			13.8	

Intersection Summary

Area Type: Other

Timings
5: W 64th Ave./W. 64th Ave. & Lowell Blvd.

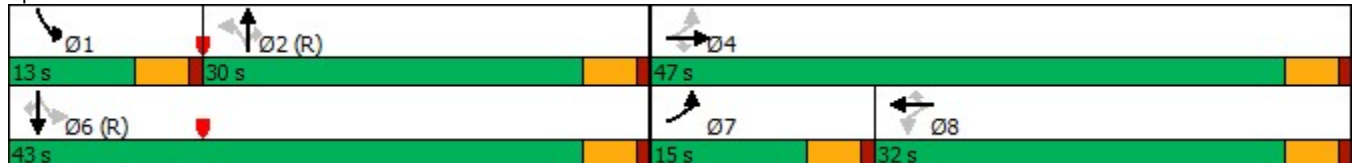
6501 Lowell Blvd
06/07/2021

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	117	307	94	72	241	44	47	134	56	94	279	125
Future Volume (vph)	117	307	94	72	241	44	47	134	56	94	279	125
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4			8			2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	7	4	4	8	8	8	2	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	15.0	47.0	47.0	32.0	32.0	32.0	30.0	30.0	30.0	13.0	43.0	43.0
Total Split (%)	16.7%	52.2%	52.2%	35.6%	35.6%	35.6%	33.3%	33.3%	33.3%	14.4%	47.8%	47.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead			Lag	Lag	Lag	Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes			Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	32.5	32.5	32.5	18.4	18.4	18.4	38.0	38.0	38.0	48.5	48.5	48.5
Actuated g/C Ratio	0.36	0.36	0.36	0.20	0.20	0.20	0.42	0.42	0.42	0.54	0.54	0.54
v/c Ratio	0.40	0.50	0.16	0.37	0.69	0.11	0.11	0.19	0.08	0.16	0.30	0.15
Control Delay	35.6	39.1	16.4	32.6	39.4	3.2	22.0	21.0	0.2	12.7	13.9	3.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.6	39.1	16.4	32.6	39.4	3.2	22.0	21.0	0.2	12.7	13.9	3.0
LOS	D	D	B	C	D	A	C	C	A	B	B	A
Approach Delay		34.2			33.5			16.3			10.9	
Approach LOS		C			C			B			B	

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 65
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.69
 Intersection Signal Delay: 24.2
 Intersection Capacity Utilization 54.2%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service A

Splits and Phases: 5: W 64th Ave./W. 64th Ave. & Lowell Blvd.





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	127	334	102	78	262	48	51	146	61	102	303	136
v/c Ratio	0.40	0.50	0.16	0.37	0.69	0.11	0.11	0.19	0.08	0.16	0.30	0.15
Control Delay	35.6	39.1	16.4	32.6	39.4	3.2	22.0	21.0	0.2	12.7	13.9	3.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.6	39.1	16.4	32.6	39.4	3.2	22.0	21.0	0.2	12.7	13.9	3.0
Queue Length 50th (ft)	68	187	17	39	141	1	18	53	0	27	91	0
Queue Length 95th (ft)	110	248	53	m59	m173	m4	51	115	0	63	172	31
Internal Link Dist (ft)		516			1188			683			528	
Turn Bay Length (ft)	200		150	150		75	200		150	200		100
Base Capacity (vph)	333	879	801	318	569	571	452	786	741	659	1004	916
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.38	0.38	0.13	0.25	0.46	0.08	0.11	0.19	0.08	0.15	0.30	0.15

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM 6th Signalized Intersection Summary
 5: W 64th Ave./W. 64th Ave. & Lowell Blvd.

6501 Lowell Blvd
 06/07/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↘	↖	↗	↘	↖	↗	↘	↖	↗	↘
Traffic Volume (veh/h)	117	307	94	72	241	44	47	134	56	94	279	125
Future Volume (veh/h)	117	307	94	72	241	44	47	134	56	94	279	125
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	127	334	102	78	262	48	51	146	61	102	303	136
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	259	570	483	208	335	284	549	924	783	701	1113	943
Arrive On Green	0.02	0.10	0.10	0.06	0.06	0.06	0.49	0.49	0.49	0.05	0.60	0.60
Sat Flow, veh/h	1781	1870	1585	953	1870	1585	950	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	127	334	102	78	262	48	51	146	61	102	303	136
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	953	1870	1585	950	1870	1585	1781	1870	1585
Q Serve(g_s), s	5.0	15.4	5.3	7.2	12.4	2.6	2.6	3.9	1.8	2.4	7.0	3.4
Cycle Q Clear(g_c), s	5.0	15.4	5.3	11.3	12.4	2.6	2.6	3.9	1.8	2.4	7.0	3.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	259	570	483	208	335	284	549	924	783	701	1113	943
V/C Ratio(X)	0.49	0.59	0.21	0.38	0.78	0.17	0.09	0.16	0.08	0.15	0.27	0.14
Avail Cap(c_a), veh/h	332	883	748	328	571	484	549	924	783	778	1113	943
HCM Platoon Ratio	0.33	0.33	0.33	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.76	0.76	0.76	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.1	35.0	30.5	42.1	40.6	36.0	12.2	12.5	12.0	9.1	8.8	8.1
Incr Delay (d2), s/veh	1.4	1.0	0.2	0.9	3.1	0.2	0.3	0.4	0.2	0.1	0.6	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	4.1	12.4	3.8	3.4	10.1	1.8	1.0	3.0	1.2	1.6	5.0	2.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	29.6	36.0	30.7	42.9	43.7	36.2	12.5	12.9	12.2	9.2	9.4	8.4
LnGrp LOS	C	D	C	D	D	D	B	B	B	A	A	A
Approach Vol, veh/h		563			388			258			541	
Approach Delay, s/veh		33.6			42.6			12.6			9.1	
Approach LOS		C			D			B			A	
Timer - Assigned Phs	1	2		4		6	7	8				
Phs Duration (G+Y+Rc), s	9.1	49.0		31.9		58.1	11.3	20.6				
Change Period (Y+Rc), s	4.5	4.5		4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s	8.5	25.5		42.5		38.5	10.5	27.5				
Max Q Clear Time (g_c+I1), s	4.4	5.9		17.4		9.0	7.0	14.4				
Green Ext Time (p_c), s	0.1	1.2		2.4		2.4	0.1	1.7				

Intersection Summary

HCM 6th Ctrl Delay	24.9
HCM 6th LOS	C



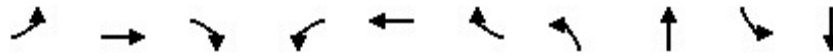
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	100		150	150		100	600		0	250		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor			0.850			0.850		0.987			0.990	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	5019	0	1770	5034	0
Flt Permitted	0.433			0.447			0.084			0.229		
Satd. Flow (perm)	807	1863	1583	833	1863	1583	156	5019	0	427	5034	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			134			127			23			17
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1268			424			903			562	
Travel Time (s)		28.8			9.6			20.5			12.8	

Intersection Summary

Area Type: Other

Timings
6: Federal Blvd. & W. 64th Ave.

6501 Lowell Blvd
06/07/2021

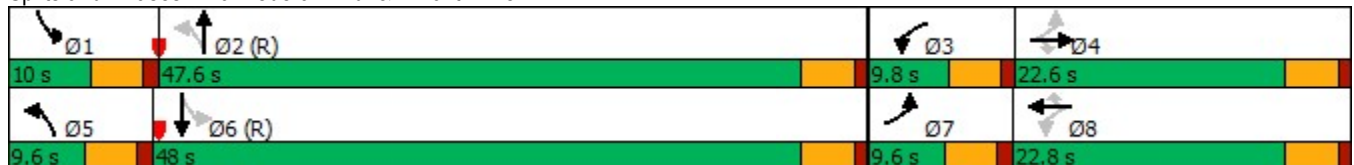


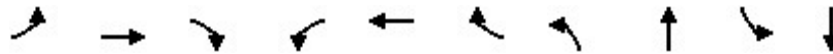
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations	↖	↑	↗	↖	↑	↗	↖	↑↑↑	↖	↑↑↑
Traffic Volume (vph)	117	169	174	139	179	43	97	864	68	2266
Future Volume (vph)	117	169	174	139	179	43	97	864	68	2266
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA
Protected Phases	7	4		3	8		5	2	1	6
Permitted Phases	4		4	8		8	2		6	
Detector Phase	7	4	4	3	8	8	5	2	1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	9.5	22.5
Total Split (s)	9.6	22.6	22.6	9.8	22.8	22.8	9.6	47.6	10.0	48.0
Total Split (%)	10.7%	25.1%	25.1%	10.9%	25.3%	25.3%	10.7%	52.9%	11.1%	53.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)	19.2	14.1	14.1	19.6	14.3	14.3	53.6	48.4	53.4	48.3
Actuated g/C Ratio	0.21	0.16	0.16	0.22	0.16	0.16	0.60	0.54	0.59	0.54
v/c Ratio	0.56	0.63	0.53	0.64	0.66	0.13	0.50	0.38	0.21	0.98
Control Delay	27.3	32.6	9.7	40.3	46.1	0.8	20.1	13.3	8.8	35.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.3	32.6	9.7	40.3	46.1	0.8	20.1	13.3	8.8	35.2
LOS	C	C	A	D	D	A	C	B	A	D
Approach Delay		22.6			38.5			14.0		34.5
Approach LOS		C			D			B		C

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.98
 Intersection Signal Delay: 28.7
 Intersection Capacity Utilization 84.4%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service E

Splits and Phases: 6: Federal Blvd. & W. 64th Ave.





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	127	184	189	151	195	47	105	1027	74	2641
v/c Ratio	0.56	0.63	0.53	0.64	0.66	0.13	0.50	0.38	0.21	0.98
Control Delay	27.3	32.6	9.7	40.3	46.1	0.8	20.1	13.3	8.8	35.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.3	32.6	9.7	40.3	46.1	0.8	20.1	13.3	8.8	35.2
Queue Length 50th (ft)	32	50	0	69	105	0	21	123	15	~606
Queue Length 95th (ft)	64	92	0	114	167	0	#77	164	35	#718
Internal Link Dist (ft)		1188			344			823		482
Turn Bay Length (ft)	100		150	150		100	600		250	
Base Capacity (vph)	226	374	425	236	378	423	208	2707	346	2708
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.49	0.44	0.64	0.52	0.11	0.50	0.38	0.21	0.98

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

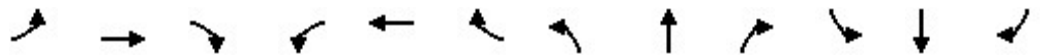
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

HCM 6th Signalized Intersection Summary
6: Federal Blvd. & W. 64th Ave.

6501 Lowell Blvd
06/07/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	117	169	174	139	179	43	97	864	81	68	2266	164
Future Volume (veh/h)	117	169	174	139	179	43	97	864	81	68	2266	164
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	127	184	189	151	195	47	105	939	88	74	2463	178
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	241	279	237	238	283	240	178	2589	242	401	2629	187
Arrive On Green	0.02	0.05	0.05	0.06	0.15	0.15	0.05	0.55	0.55	0.05	0.54	0.54
Sat Flow, veh/h	1781	1870	1585	1781	1870	1585	1781	4750	444	1781	4866	346
Grp Volume(v), veh/h	127	184	189	151	195	47	105	672	355	74	1712	929
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	1585	1781	1702	1790	1781	1702	1808
Q Serve(g_s), s	5.1	8.7	10.6	5.3	8.9	2.3	2.3	10.1	10.1	1.6	41.8	43.8
Cycle Q Clear(g_c), s	5.1	8.7	10.6	5.3	8.9	2.3	2.3	10.1	10.1	1.6	41.8	43.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.25	1.00		0.19
Lane Grp Cap(c), veh/h	241	279	237	238	283	240	178	1855	976	401	1839	977
V/C Ratio(X)	0.53	0.66	0.80	0.63	0.69	0.20	0.59	0.36	0.36	0.18	0.93	0.95
Avail Cap(c_a), veh/h	241	376	319	238	380	322	187	1855	976	426	1839	977
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.93	0.93	0.93	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.7	40.5	41.4	33.0	36.2	33.4	21.0	11.6	11.6	8.6	19.1	19.6
Incr Delay (d2), s/veh	2.0	2.5	9.2	5.4	3.2	0.4	4.4	0.6	1.1	0.2	10.0	19.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	4.6	7.8	8.6	1.7	7.6	1.6	2.4	6.7	7.3	1.1	24.2	29.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.7	43.0	50.7	38.4	39.4	33.8	25.4	12.2	12.7	8.8	29.1	38.8
LnGrp LOS	C	D	D	D	D	C	C	B	B	A	C	D
Approach Vol, veh/h		500			393			1132			2715	
Approach Delay, s/veh		43.8			38.4			13.5			31.8	
Approach LOS		D			D			B			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.7	53.6	9.8	17.9	9.1	53.1	9.6	18.1				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	5.5	43.1	5.3	18.1	5.1	43.5	5.1	18.3				
Max Q Clear Time (g_c+I1), s	3.6	12.1	7.3	12.6	4.3	45.8	7.1	10.9				
Green Ext Time (p_c), s	0.0	8.2	0.0	0.8	0.0	0.0	0.0	0.7				
Intersection Summary												
HCM 6th Ctrl Delay				29.3								
HCM 6th LOS				C								



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)		0%	0%		0%	
Storage Length (ft)	100			0	0	0
Storage Lanes	1			0	1	0
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.998		0.942	
Flt Protected	0.950				0.972	
Satd. Flow (prot)	1770	1863	1859	0	1706	0
Flt Permitted	0.950				0.972	
Satd. Flow (perm)	1770	1863	1859	0	1706	0
Link Speed (mph)		30	30		30	
Link Distance (ft)		838	596		267	
Travel Time (s)		19.0	13.5		6.1	

Intersection Summary
























Area Type: Other

Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	5	502	407	6	18	14
Future Vol, veh/h	5	502	407	6	18	14
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	546	442	7	20	15

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	449	0	-	0	1002 446
Stage 1	-	-	-	-	446 -
Stage 2	-	-	-	-	556 -
Critical Hdwy	4.12	-	-	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.218	-	-	-	3.518 3.318
Pot Cap-1 Maneuver	1111	-	-	-	269 612
Stage 1	-	-	-	-	645 -
Stage 2	-	-	-	-	574 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1111	-	-	-	268 612
Mov Cap-2 Maneuver	-	-	-	-	268 -
Stage 1	-	-	-	-	642 -
Stage 2	-	-	-	-	574 -

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	16.2
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1111	-	-	-	355
HCM Lane V/C Ratio	0.005	-	-	-	0.098
HCM Control Delay (s)	8.3	-	-	-	16.2
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	0.3

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		150	150		0	225		250	150		150
Storage Lanes	1		1	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850		0.903				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1682	0	1770	1863	1583	1770	1863	1583
Flt Permitted	0.724			0.748			0.521			0.327		
Satd. Flow (perm)	1349	1863	1583	1393	1682	0	970	1863	1583	609	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			75		33				27			87
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		549			716			667			367	
Travel Time (s)		12.5			16.3			15.2			8.3	

Intersection Summary

Area Type: Other

Timings
1: Lowell Blvd. & W. 68th Ave.

6501 Lowell Blvd
06/07/2021

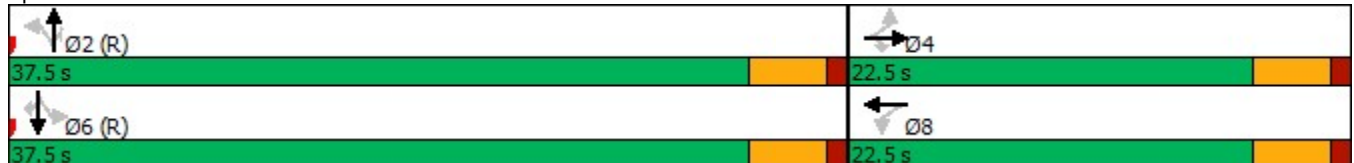


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑	↗	↖	↗	↖	↑	↗	↖	↑	↗
Traffic Volume (vph)	52	13	69	12	17	120	680	20	13	374	80
Future Volume (vph)	52	13	69	12	17	120	680	20	13	374	80
Turn Type	Perm	NA	Perm	Perm	NA	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8		2			6	
Permitted Phases	4		4	8		2		2	6		6
Detector Phase	4	4	4	8	8	2	2	2	6	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	22.5	22.5	22.5	22.5	22.5	37.5	37.5	37.5	37.5	37.5	37.5
Total Split (%)	37.5%	37.5%	37.5%	37.5%	37.5%	62.5%	62.5%	62.5%	62.5%	62.5%	62.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag											
Lead-Lag Optimize?											
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	8.1	8.1	8.1	8.1	8.1	45.8	45.8	45.8	45.8	45.8	45.8
Actuated g/C Ratio	0.14	0.14	0.14	0.14	0.14	0.76	0.76	0.76	0.76	0.76	0.76
v/c Ratio	0.31	0.06	0.27	0.07	0.20	0.18	0.52	0.02	0.03	0.29	0.07
Control Delay	27.3	21.6	9.1	22.1	13.9	3.9	5.8	1.4	3.4	3.9	1.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.3	21.6	9.1	22.1	13.9	3.9	5.8	1.4	3.4	3.9	1.1
LOS	C	C	A	C	B	A	A	A	A	A	A
Approach Delay		17.4			15.5		5.4			3.4	
Approach LOS		B			B		A			A	

Intersection Summary

Cycle Length: 60
 Actuated Cycle Length: 60
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.52
 Intersection Signal Delay: 6.3
 Intersection Capacity Utilization 60.8%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service B

Splits and Phases: 1: Lowell Blvd. & W. 68th Ave.



Queues

6501 Lowell Blvd

1: Lowell Blvd. & W. 68th Ave.

06/07/2021



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	57	14	75	13	51	130	739	22	14	407	87
v/c Ratio	0.31	0.06	0.27	0.07	0.20	0.18	0.52	0.02	0.03	0.29	0.07
Control Delay	27.3	21.6	9.1	22.1	13.9	3.9	5.8	1.4	3.4	3.9	1.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.3	21.6	9.1	22.1	13.9	3.9	5.8	1.4	3.4	3.9	1.1
Queue Length 50th (ft)	19	5	0	4	6	11	93	0	1	39	0
Queue Length 95th (ft)	46	17	29	16	30	33	202	5	6	87	10
Internal Link Dist (ft)		469			636		587			287	
Turn Bay Length (ft)	150		150	150		225		250	150		150
Base Capacity (vph)	404	558	527	417	527	741	1423	1215	465	1423	1230
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.03	0.14	0.03	0.10	0.18	0.52	0.02	0.03	0.29	0.07

Intersection Summary

HCM 6th Signalized Intersection Summary
 1: Lowell Blvd. & W. 68th Ave.

6501 Lowell Blvd
 06/07/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	52	13	69	12	17	30	120	680	20	13	374	80
Future Volume (veh/h)	52	13	69	12	17	30	120	680	20	13	374	80
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	57	14	75	13	18	33	130	739	22	14	407	87
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	223	195	165	247	62	113	730	1395	1182	529	1395	1182
Arrive On Green	0.10	0.10	0.10	0.10	0.10	0.10	0.75	0.75	0.75	0.75	0.75	0.75
Sat Flow, veh/h	1354	1870	1585	1308	591	1084	903	1870	1585	705	1870	1585
Grp Volume(v), veh/h	57	14	75	13	0	51	130	739	22	14	407	87
Grp Sat Flow(s),veh/h/ln	1354	1870	1585	1308	0	1675	903	1870	1585	705	1870	1585
Q Serve(g_s), s	2.4	0.4	2.7	0.5	0.0	1.7	3.3	10.0	0.2	0.5	4.2	0.9
Cycle Q Clear(g_c), s	4.1	0.4	2.7	0.9	0.0	1.7	7.5	10.0	0.2	10.5	4.2	0.9
Prop In Lane	1.00		1.00	1.00		0.65	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	223	195	165	247	0	174	730	1395	1182	529	1395	1182
V/C Ratio(X)	0.26	0.07	0.45	0.05	0.00	0.29	0.18	0.53	0.02	0.03	0.29	0.07
Avail Cap(c_a), veh/h	488	561	476	504	0	503	730	1395	1182	529	1395	1182
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.7	24.3	25.3	24.7	0.0	24.8	3.7	3.2	2.0	5.4	2.5	2.0
Incr Delay (d2), s/veh	0.6	0.2	2.0	0.1	0.0	0.9	0.5	1.4	0.0	0.1	0.5	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.4	0.3	1.9	0.3	0.0	1.2	0.9	4.0	0.1	0.1	1.6	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.3	24.4	27.2	24.8	0.0	25.8	4.2	4.6	2.0	5.5	3.0	2.2
LnGrp LOS	C	C	C	C	A	C	A	A	A	A	A	A
Approach Vol, veh/h		146			64			891			508	
Approach Delay, s/veh		27.0			25.6			4.5			2.9	
Approach LOS		C			C			A			A	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		49.3		10.7		49.3		10.7				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		33.0		18.0		33.0		18.0				
Max Q Clear Time (g_c+I1), s		12.0		6.1		12.5		3.7				
Green Ext Time (p_c), s		6.3		0.3		2.9		0.2				
Intersection Summary												
HCM 6th Ctrl Delay				6.9								
HCM 6th LOS				A								



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↗	↖		↗	↖	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	100		0	100		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.963			0.942			0.996			0.992	
Flt Protected		0.971			0.986		0.950		0.950		0.950	
Satd. Flow (prot)	0	1742	0	0	1730	0	1770	1855	0	1770	1848	0
Flt Permitted		0.971			0.986		0.950		0.950		0.950	
Satd. Flow (perm)	0	1742	0	0	1730	0	1770	1855	0	1770	1848	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		458			470			732			667	
Travel Time (s)		10.4			10.7			16.6			15.2	

Intersection Summary

Area Type: Other

Intersection												
Int Delay, s/veh	3.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	34	7	16	9	9	14	29	759	23	17	410	22
Future Vol, veh/h	34	7	16	9	9	14	29	759	23	17	410	22
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	37	8	17	10	10	15	32	825	25	18	446	24

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1408	1408	458	1409	1408	838	470	0	0	850	0	0
Stage 1	494	494	-	902	902	-	-	-	-	-	-	-
Stage 2	914	914	-	507	506	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	116	139	603	116	139	366	1092	-	-	788	-	-
Stage 1	557	546	-	332	356	-	-	-	-	-	-	-
Stage 2	327	352	-	548	540	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	101	132	603	103	132	366	1092	-	-	788	-	-
Mov Cap-2 Maneuver	101	132	-	103	132	-	-	-	-	-	-	-
Stage 1	541	533	-	322	346	-	-	-	-	-	-	-
Stage 2	296	342	-	513	528	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	51.3		32.6		0.3		0.4	
HCM LOS	F		D					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1092	-	-	137	165	788	-
HCM Lane V/C Ratio	0.029	-	-	0.452	0.211	0.023	-
HCM Control Delay (s)	8.4	-	-	51.3	32.6	9.7	-
HCM Lane LOS	A	-	-	F	D	A	-
HCM 95th %tile Q(veh)	0.1	-	-	2	0.8	0.1	-



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↘		↗	↘	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	100		0	100		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.915			0.941			0.998			0.996	
Flt Protected		0.985			0.979		0.950		0.950			
Satd. Flow (prot)	0	1679	0	0	1716	0	1770	1859	0	1770	1855	0
Flt Permitted		0.985			0.979		0.950		0.950			
Satd. Flow (perm)	0	1679	0	0	1716	0	1770	1859	0	1770	1855	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		319			430			608			732	
Travel Time (s)		7.3			9.8			13.8			16.6	

Intersection Summary

Area Type: Other

Intersection												
Int Delay, s/veh	1.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	7	2	16	13	4	13	28	763	12	17	433	12
Future Vol, veh/h	7	2	16	13	4	13	28	763	12	17	433	12
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	8	2	17	14	4	14	30	829	13	18	471	13

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1419	1416	478	1419	1416	836	484	0	0	842	0	0
Stage 1	514	514	-	896	896	-	-	-	-	-	-	-
Stage 2	905	902	-	523	520	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	114	137	587	114	137	367	1079	-	-	794	-	-
Stage 1	543	535	-	335	359	-	-	-	-	-	-	-
Stage 2	331	356	-	537	532	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	103	130	587	105	130	367	1079	-	-	794	-	-
Mov Cap-2 Maneuver	103	130	-	105	130	-	-	-	-	-	-	-
Stage 1	528	523	-	326	349	-	-	-	-	-	-	-
Stage 2	306	346	-	507	520	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	23.1		33.6		0.3		0.4	
HCM LOS	C		D					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1079	-	-	226	158	794	-
HCM Lane V/C Ratio	0.028	-	-	0.12	0.206	0.023	-
HCM Control Delay (s)	8.4	-	-	23.1	33.6	9.6	-
HCM Lane LOS	A	-	-	C	D	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.4	0.7	0.1	-



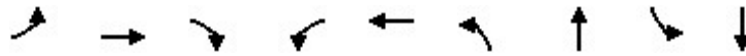
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%				0%
Storage Length (ft)	150		100	150		0	0		0	0		0
Storage Lanes	1		1	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850		0.994			0.919				0.953
Flt Protected	0.950			0.950				0.985				0.983
Satd. Flow (prot)	1770	1863	1583	1770	1852	0	0	1686	0	0	1745	0
Flt Permitted	0.243			0.120				0.884				0.862
Satd. Flow (perm)	453	1863	1583	224	1852	0	0	1513	0	0	1530	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			60		4			94				15
Link Speed (mph)		30			30			30				30
Link Distance (ft)		501			853			646				482
Travel Time (s)		11.4			19.4			14.7				11.0

Intersection Summary

Area Type: Other

Timings
4: Tennyson St. & W 64th Ave.

6501 Lowell Blvd
06/07/2021

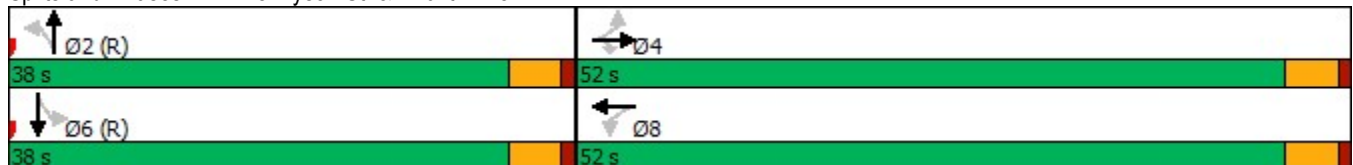


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↖	↑	↗	↖	↗		↕		↕
Traffic Volume (vph)	22	691	98	87	528	121	35	14	12
Future Volume (vph)	22	691	98	87	528	121	35	14	12
Turn Type	Perm	NA	Perm	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4			8		2		6
Permitted Phases	4		4	8		2		6	
Detector Phase	4	4	4	8	8	2	2	6	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	52.0	52.0	52.0	52.0	52.0	38.0	38.0	38.0	38.0
Total Split (%)	57.8%	57.8%	57.8%	57.8%	57.8%	42.2%	42.2%	42.2%	42.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0		0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5		4.5		4.5
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	42.8	42.8	42.8	42.8	42.8		38.2		38.2
Actuated g/C Ratio	0.48	0.48	0.48	0.48	0.48		0.42		0.42
v/c Ratio	0.11	0.85	0.14	0.90	0.68		0.61		0.07
Control Delay	12.7	30.5	6.0	92.7	35.7		21.0		13.4
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	12.7	30.5	6.0	92.7	35.7		21.0		13.4
LOS	B	C	A	F	D		C		B
Approach Delay		27.0			43.5		21.0		13.4
Approach LOS		C			D		C		B

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 55
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.90
 Intersection Signal Delay: 31.1
 Intersection Capacity Utilization 81.1%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service D

Splits and Phases: 4: Tennyson St. & W 64th Ave.





Lane Group	EBL	EBT	EBR	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	24	751	107	95	599	422	43
v/c Ratio	0.11	0.85	0.14	0.90	0.68	0.61	0.07
Control Delay	12.7	30.5	6.0	92.7	35.7	21.0	13.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.7	30.5	6.0	92.7	35.7	21.0	13.4
Queue Length 50th (ft)	7	343	13	55	334	145	9
Queue Length 95th (ft)	20	473	37	m#89	m390	264	32
Internal Link Dist (ft)		421			773	566	402
Turn Bay Length (ft)	150		100	150			
Base Capacity (vph)	239	983	863	118	979	696	658
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.76	0.12	0.81	0.61	0.61	0.07

Intersection Summary

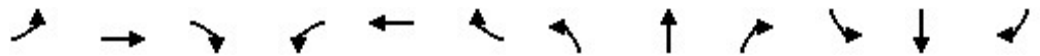
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

HCM 6th Signalized Intersection Summary
 4: Tennyson St. & W 64th Ave.

6501 Lowell Blvd
 06/07/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	22	691	98	87	528	23	121	35	232	14	12	14
Future Volume (veh/h)	22	691	98	87	528	23	121	35	232	14	12	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	24	751	107	95	574	25	132	38	252	15	13	15
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	495	947	803	193	901	39	222	77	365	214	186	186
Arrive On Green	0.51	0.51	0.51	1.00	1.00	1.00	0.39	0.39	0.39	0.39	0.39	0.39
Sat Flow, veh/h	820	1870	1585	644	1779	77	430	195	927	407	474	472
Grp Volume(v), veh/h	24	751	107	95	0	599	422	0	0	43	0	0
Grp Sat Flow(s),veh/h/ln	820	1870	1585	644	0	1856	1552	0	0	1353	0	0
Q Serve(g_s), s	1.3	29.8	3.2	12.3	0.0	0.0	16.4	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	1.3	29.8	3.2	42.1	0.0	0.0	20.2	0.0	0.0	1.4	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.04	0.31		0.60	0.35		0.35
Lane Grp Cap(c), veh/h	495	947	803	193	0	940	663	0	0	586	0	0
V/C Ratio(X)	0.05	0.79	0.13	0.49	0.00	0.64	0.64	0.00	0.00	0.07	0.00	0.00
Avail Cap(c_a), veh/h	513	987	837	207	0	980	663	0	0	586	0	0
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	11.3	18.3	11.8	13.7	0.0	0.0	22.5	0.0	0.0	17.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	4.3	0.1	1.9	0.0	1.3	4.6	0.0	0.0	0.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.4	18.9	2.0	2.7	0.0	0.6	12.5	0.0	0.0	1.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	11.3	22.7	11.8	15.7	0.0	1.3	27.2	0.0	0.0	17.2	0.0	0.0
LnGrp LOS	B	C	B	B	A	A	C	A	A	B	A	A
Approach Vol, veh/h		882			694			422				43
Approach Delay, s/veh		21.0			3.3			27.2				17.2
Approach LOS		C			A			C				B
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		39.9		50.1		39.9		50.1				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		33.5		47.5		33.5		47.5				
Max Q Clear Time (g_c+I1), s		22.2		31.8		3.4		44.1				
Green Ext Time (p_c), s		2.1		5.4		0.2		1.5				
Intersection Summary												
HCM 6th Ctrl Delay				16.2								
HCM 6th LOS				B								



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	200		150	150		75	200		150	200		100
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.141			0.491			0.600			0.185		
Satd. Flow (perm)	263	1863	1583	915	1863	1583	1118	1863	1583	345	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			86			127			127			176
Link Speed (mph)		30			30			30				30
Link Distance (ft)		476			1480			763				608
Travel Time (s)		10.8			33.6			17.3				13.8

Intersection Summary

Area Type: Other



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	265	475	86	57	448	87	152	510	121	58	258	176
v/c Ratio	0.86	0.58	0.11	0.23	0.91	0.17	0.37	0.74	0.18	0.24	0.30	0.22
Control Delay	50.9	30.6	9.4	31.7	51.3	9.7	25.3	33.6	4.5	16.9	17.0	3.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.9	30.6	9.4	31.7	51.3	9.7	25.3	33.6	4.5	16.9	17.0	3.1
Queue Length 50th (ft)	135	233	9	30	280	5	65	260	0	18	91	0
Queue Length 95th (ft)	m#195	m318	m23	m36	m#336	m7	121	#422	33	40	147	35
Internal Link Dist (ft)		396			1400			683			528	
Turn Bay Length (ft)	200		150	150		75	200		150	200		100
Base Capacity (vph)	308	844	764	252	513	528	416	693	668	238	851	818
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.86	0.56	0.11	0.23	0.87	0.16	0.37	0.74	0.18	0.24	0.30	0.22

Intersection Summary

- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

HCM 6th Signalized Intersection Summary
 5: W 64th Ave./W. 64th Ave. & Lowell Blvd.

6501 Lowell Blvd
 06/07/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↘	↖	↗	↘	↖	↗	↘	↖	↗	↘
Traffic Volume (veh/h)	244	437	79	52	412	80	140	469	111	53	237	162
Future Volume (veh/h)	244	437	79	52	412	80	140	469	111	53	237	162
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	265	475	86	57	448	87	152	510	121	58	258	176
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	327	824	698	292	496	421	430	687	582	259	860	728
Arrive On Green	0.12	0.44	0.44	0.09	0.09	0.09	0.37	0.37	0.37	0.04	0.46	0.46
Sat Flow, veh/h	1781	1870	1585	849	1870	1585	954	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	265	475	86	57	448	87	152	510	121	58	258	176
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	849	1870	1585	954	1870	1585	1781	1870	1585
Q Serve(g_s), s	9.2	17.1	2.9	5.7	21.4	4.6	10.8	21.4	4.7	1.7	7.8	6.1
Cycle Q Clear(g_c), s	9.2	17.1	2.9	7.1	21.4	4.6	10.8	21.4	4.7	1.7	7.8	6.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	327	824	698	292	496	421	430	687	582	259	860	728
V/C Ratio(X)	0.81	0.58	0.12	0.20	0.90	0.21	0.35	0.74	0.21	0.22	0.30	0.24
Avail Cap(c_a), veh/h	332	848	719	301	515	437	430	687	582	282	860	728
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.43	0.43	0.43	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.8	18.9	14.9	34.0	39.9	32.3	21.4	24.8	19.5	18.3	15.2	14.8
Incr Delay (d2), s/veh	13.8	0.9	0.1	0.1	9.4	0.1	2.3	7.1	0.8	0.4	0.9	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	8.6	11.7	1.8	2.2	15.7	3.2	4.7	15.7	3.3	1.3	6.1	4.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	35.7	19.8	15.0	34.2	49.3	32.4	23.7	31.9	20.3	18.7	16.1	15.6
LnGrp LOS	D	B	B	C	D	C	C	C	C	B	B	B
Approach Vol, veh/h		826			592			783			492	
Approach Delay, s/veh		24.4			45.4			28.5			16.2	
Approach LOS		C			D			C			B	
Timer - Assigned Phs	1	2		4		6	7	8				
Phs Duration (G+Y+Rc), s	8.3	37.5		44.1		45.9	15.7	28.4				
Change Period (Y+Rc), s	4.5	4.5		4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s	5.0	30.7		40.8		40.2	11.5	24.8				
Max Q Clear Time (g_c+I1), s	3.7	23.4		19.1		9.8	11.2	23.4				
Green Ext Time (p_c), s	0.0	2.7		3.3		2.2	0.0	0.5				
Intersection Summary												
HCM 6th Ctrl Delay				28.7								
HCM 6th LOS				C								



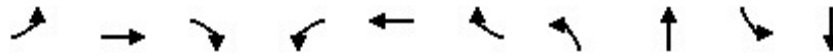
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	100		150	150		100	600		0	250		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor			0.850			0.850		0.993			0.988	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	5050	0	1770	5024	0
Flt Permitted	0.235			0.470			0.109			0.124		
Satd. Flow (perm)	438	1863	1583	875	1863	1583	203	5050	0	231	5024	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			205			236		10			18	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1480			550			1046			611	
Travel Time (s)		33.6			12.5			23.8			13.9	

Intersection Summary

Area Type: Other

Timings
6: Federal Blvd. & W. 64th Ave.

6501 Lowell Blvd
06/07/2021

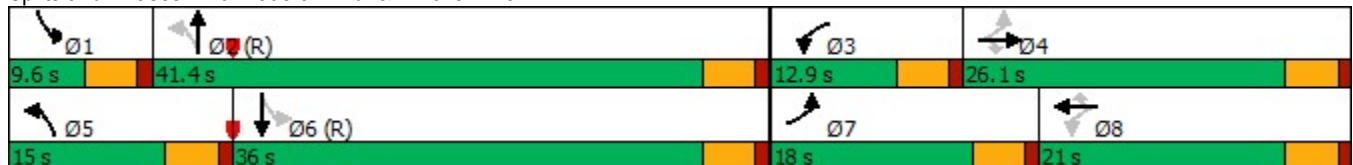


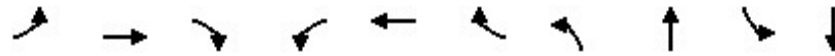
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations	↖	↗	↖	↖	↗	↖	↖	↑↑↑	↖	↑↑↑
Traffic Volume (vph)	308	260	189	120	231	103	243	1979	90	1620
Future Volume (vph)	308	260	189	120	231	103	243	1979	90	1620
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA
Protected Phases	7	4		3	8		5	2	1	6
Permitted Phases	4		4	8		8	2		6	
Detector Phase	7	4	4	3	8	8	5	2	1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	20.6	20.6	9.5	22.5	9.5	22.5
Total Split (s)	18.0	26.1	26.1	12.9	21.0	21.0	15.0	41.4	9.6	36.0
Total Split (%)	20.0%	29.0%	29.0%	14.3%	23.3%	23.3%	16.7%	46.0%	10.7%	40.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)	33.3	20.7	20.7	23.4	15.3	15.3	47.7	39.8	37.7	32.2
Actuated g/C Ratio	0.37	0.23	0.23	0.26	0.17	0.17	0.53	0.44	0.42	0.36
v/c Ratio	0.93	0.66	0.39	0.42	0.79	0.24	0.89	1.01	0.51	1.04
Control Delay	70.3	53.9	18.1	24.0	54.9	1.2	51.6	48.6	22.4	61.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	70.3	53.9	18.1	24.0	54.9	1.2	51.6	48.6	22.4	61.2
LOS	E	D	B	C	D	A	D	D	C	E
Approach Delay		51.7			34.5			48.9		59.3
Approach LOS		D			C			D		E

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.04
 Intersection Signal Delay: 51.6
 Intersection Capacity Utilization 92.3%
 Analysis Period (min) 15
 Intersection LOS: D
 ICU Level of Service F

Splits and Phases: 6: Federal Blvd. & W. 64th Ave.





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	335	283	205	130	251	112	264	2258	98	1879
v/c Ratio	0.93	0.66	0.39	0.42	0.79	0.24	0.89	1.01	0.51	1.04
Control Delay	70.3	53.9	18.1	24.0	54.9	1.2	51.6	48.6	22.4	61.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	70.3	53.9	18.1	24.0	54.9	1.2	51.6	48.6	22.4	61.2
Queue Length 50th (ft)	181	158	31	48	136	0	99	~534	27	~433
Queue Length 95th (ft)	#292	242	84	88	#243	0	#246	#632	54	#531
Internal Link Dist (ft)		1400			470			966		531
Turn Bay Length (ft)	100		150	150		100	600		250	
Base Capacity (vph)	361	447	535	313	341	482	298	2237	191	1811
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.93	0.63	0.38	0.42	0.74	0.23	0.89	1.01	0.51	1.04

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

HCM 6th Signalized Intersection Summary
6: Federal Blvd. & W. 64th Ave.

6501 Lowell Blvd
06/07/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	308	260	189	120	231	103	243	1979	98	90	1620	150
Future Volume (veh/h)	308	260	189	120	231	103	243	1979	98	90	1620	150
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	335	283	205	130	251	112	264	2151	107	98	1723	156
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.94	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	375	428	363	295	296	251	293	2197	109	173	1788	161
Arrive On Green	0.05	0.08	0.08	0.08	0.16	0.16	0.12	0.44	0.44	0.05	0.38	0.38
Sat Flow, veh/h	1781	1870	1585	1781	1870	1585	1781	4983	247	1781	4766	430
Grp Volume(v), veh/h	335	283	205	130	251	112	264	1466	792	98	1229	650
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	1585	1781	1702	1826	1781	1702	1793
Q Serve(g_s), s	13.5	13.3	11.2	5.4	11.7	5.8	8.8	38.1	38.5	3.0	31.8	32.0
Cycle Q Clear(g_c), s	13.5	13.3	11.2	5.4	11.7	5.8	8.8	38.1	38.5	3.0	31.8	32.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.14	1.00		0.24
Lane Grp Cap(c), veh/h	375	428	363	295	296	251	293	1501	805	173	1277	673
V/C Ratio(X)	0.89	0.66	0.57	0.44	0.85	0.45	0.90	0.98	0.98	0.57	0.96	0.97
Avail Cap(c_a), veh/h	375	449	380	320	343	291	293	1501	805	183	1277	673
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.88	0.88	0.88	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.2	38.2	37.3	28.5	36.8	34.3	23.5	24.7	24.8	22.0	27.5	27.6
Incr Delay (d2), s/veh	20.4	3.0	1.6	1.0	16.0	1.2	28.9	18.3	28.0	3.6	17.7	27.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	12.9	11.0	8.3	4.2	10.8	4.1	9.7	25.1	29.5	2.4	21.8	25.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	49.6	41.2	38.8	29.6	52.8	35.6	52.5	43.0	52.8	25.7	45.2	54.9
LnGrp LOS	D	D	D	C	D	D	D	D	D	C	D	D
Approach Vol, veh/h		823			493			2522			1977	
Approach Delay, s/veh		44.0			42.8			47.1			47.4	
Approach LOS		D			D			D			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.1	44.2	11.6	25.1	15.0	38.3	18.0	18.7				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	5.1	36.9	8.4	21.6	10.5	31.5	13.5	16.5				
Max Q Clear Time (g_c+I1), s	5.0	40.5	7.4	15.3	10.8	34.0	15.5	13.7				
Green Ext Time (p_c), s	0.0	0.0	0.0	1.3	0.0	0.0	0.0	0.5				

Intersection Summary

HCM 6th Ctrl Delay	46.4
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)		0%	0%		0%	
Storage Length (ft)	100			0	0	0
Storage Lanes	1			0	1	0
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.996		0.939	
Flt Protected	0.950				0.973	
Satd. Flow (prot)	1770	1863	1855	0	1702	0
Flt Permitted	0.950				0.973	
Satd. Flow (perm)	1770	1863	1855	0	1702	0
Link Speed (mph)		30	30		30	
Link Distance (ft)		853	476		311	
Travel Time (s)		19.4	10.8		7.1	

Intersection Summary

Area Type: Other

Intersection						
Int Delay, s/veh	0.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	16	748	694	20	11	9
Future Vol, veh/h	16	748	694	20	11	9
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	17	813	754	22	12	10

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	776	0	-	0	1612 765
Stage 1	-	-	-	-	765 -
Stage 2	-	-	-	-	847 -
Critical Hdwy	4.12	-	-	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.218	-	-	-	3.518 3.318
Pot Cap-1 Maneuver	840	-	-	-	115 403
Stage 1	-	-	-	-	459 -
Stage 2	-	-	-	-	420 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	840	-	-	-	113 403
Mov Cap-2 Maneuver	-	-	-	-	113 -
Stage 1	-	-	-	-	450 -
Stage 2	-	-	-	-	420 -

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	29.8
HCM LOS			D

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	840	-	-	-	167
HCM Lane V/C Ratio	0.021	-	-	-	0.13
HCM Control Delay (s)	9.4	-	-	-	29.8
HCM Lane LOS	A	-	-	-	D
HCM 95th %tile Q(veh)	0.1	-	-	-	0.4



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		150	150		0	225		250	150		150
Storage Lanes	1		1	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850		0.931				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1734	0	1770	1863	1583	1770	1863	1583
Flt Permitted	0.742			0.750			0.537			0.626		
Satd. Flow (perm)	1382	1863	1583	1397	1734	0	1000	1863	1583	1166	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			136		11				27			65
Link Speed (mph)		30			30			30				30
Link Distance (ft)		594			990			699				502
Travel Time (s)		13.5			22.5			15.9				11.4

Intersection Summary

Area Type: Other

Timings
1: Lowell Blvd. & W. 68th Ave.

6501 Lowell Blvd
06/07/2021



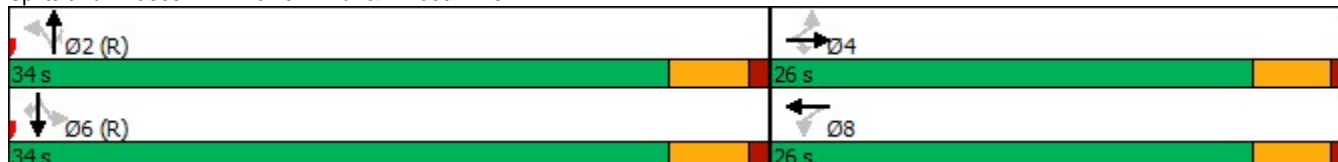
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑	↗	↖	↗	↖	↑	↗	↖	↑	↗
Traffic Volume (vph)	56	10	125	3	12	71	194	1	18	348	60
Future Volume (vph)	56	10	125	3	12	71	194	1	18	348	60
Turn Type	Perm	NA	Perm	Perm	NA	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8		2			6	
Permitted Phases	4		4	8		2		2	6		6
Detector Phase	4	4	4	8	8	2	2	2	6	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	26.0	26.0	26.0	26.0	26.0	34.0	34.0	34.0	34.0	34.0	34.0
Total Split (%)	43.3%	43.3%	43.3%	43.3%	43.3%	56.7%	56.7%	56.7%	56.7%	56.7%	56.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag											
Lead-Lag Optimize?											
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	8.2	8.2	8.2	8.2	8.2	45.7	45.7	45.7	45.7	45.7	45.7
Actuated g/C Ratio	0.14	0.14	0.14	0.14	0.14	0.76	0.76	0.76	0.76	0.76	0.76
v/c Ratio	0.32	0.04	0.41	0.02	0.10	0.10	0.15	0.00	0.02	0.27	0.05
Control Delay	27.2	21.3	8.9	21.0	16.5	3.6	3.4	0.0	3.2	3.8	1.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.2	21.3	8.9	21.0	16.5	3.6	3.4	0.0	3.2	3.8	1.2
LOS	C	C	A	C	B	A	A	A	A	A	A
Approach Delay		14.9			17.0		3.4			3.4	
Approach LOS		B			B		A			A	

Intersection Summary

Cycle Length: 60
 Actuated Cycle Length: 60
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 45
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.41
 Intersection Signal Delay: 6.2
 Intersection Capacity Utilization 43.5%
 Analysis Period (min) 15

Intersection LOS: A
 ICU Level of Service A

Splits and Phases: 1: Lowell Blvd. & W. 68th Ave.





Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	61	11	136	3	24	77	211	1	20	378	65
v/c Ratio	0.32	0.04	0.41	0.02	0.10	0.10	0.15	0.00	0.02	0.27	0.05
Control Delay	27.2	21.3	8.9	21.0	16.5	3.6	3.4	0.0	3.2	3.8	1.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.2	21.3	8.9	21.0	16.5	3.6	3.4	0.0	3.2	3.8	1.2
Queue Length 50th (ft)	20	4	0	1	4	6	18	0	2	36	0
Queue Length 95th (ft)	48	15	39	7	20	20	44	0	7	80	9
Internal Link Dist (ft)		514			910		619			422	
Turn Bay Length (ft)	150		150	150		225		250	150		150
Base Capacity (vph)	495	667	654	500	628	762	1419	1212	888	1419	1221
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.12	0.02	0.21	0.01	0.04	0.10	0.15	0.00	0.02	0.27	0.05

Intersection Summary

HCM 6th Signalized Intersection Summary
 1: Lowell Blvd. & W. 68th Ave.

6501 Lowell Blvd
 06/07/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	56	10	125	3	12	10	71	194	1	18	348	60
Future Volume (veh/h)	56	10	125	3	12	10	71	194	1	18	348	60
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	61	11	136	3	13	11	77	211	1	20	378	65
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	272	229	194	265	114	97	744	1361	1154	931	1361	1154
Arrive On Green	0.12	0.12	0.12	0.12	0.12	0.12	0.73	0.73	0.73	0.73	0.73	0.73
Sat Flow, veh/h	1387	1870	1585	1241	936	792	947	1870	1585	1170	1870	1585
Grp Volume(v), veh/h	61	11	136	3	0	24	77	211	1	20	378	65
Grp Sat Flow(s),veh/h/ln	1387	1870	1585	1241	0	1728	947	1870	1585	1170	1870	1585
Q Serve(g_s), s	2.5	0.3	4.9	0.1	0.0	0.7	1.8	2.1	0.0	0.3	4.1	0.7
Cycle Q Clear(g_c), s	3.2	0.3	4.9	0.4	0.0	0.7	5.9	2.1	0.0	2.4	4.1	0.7
Prop In Lane	1.00		1.00	1.00		0.46	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	272	229	194	265	0	211	744	1361	1154	931	1361	1154
V/C Ratio(X)	0.22	0.05	0.70	0.01	0.00	0.11	0.10	0.16	0.00	0.02	0.28	0.06
Avail Cap(c_a), veh/h	600	670	568	558	0	619	744	1361	1154	931	1361	1154
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.9	23.3	25.3	23.4	0.0	23.4	3.8	2.5	2.2	2.9	2.8	2.3
Incr Delay (d2), s/veh	0.4	0.1	4.6	0.0	0.0	0.2	0.3	0.2	0.0	0.0	0.5	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.4	0.2	3.6	0.1	0.0	0.5	0.5	0.9	0.0	0.1	1.8	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.3	23.3	29.9	23.5	0.0	23.7	4.1	2.7	2.2	2.9	3.3	2.4
LnGrp LOS	C	C	C	C	A	C	A	A	A	A	A	A
Approach Vol, veh/h		208			27			289			463	
Approach Delay, s/veh		28.2			23.7			3.1			3.2	
Approach LOS		C			C			A			A	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		48.2		11.8		48.2		11.8				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		29.5		21.5		29.5		21.5				
Max Q Clear Time (g_c+I1), s		7.9		6.9		6.1		2.7				
Green Ext Time (p_c), s		1.6		0.5		2.6		0.1				

Intersection Summary

HCM 6th Ctrl Delay	9.0
HCM 6th LOS	A



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↘		↗	↘	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	100		0	100		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.921			0.940			0.996			0.993	
Flt Protected		0.986			0.978		0.950		0.950		0.950	
Satd. Flow (prot)	0	1692	0	0	1712	0	1770	1855	0	1770	1850	0
Flt Permitted		0.986			0.978		0.950		0.950		0.950	
Satd. Flow (perm)	0	1692	0	0	1712	0	1770	1855	0	1770	1850	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		458			470			732			699	
Travel Time (s)		10.4			10.7			16.6			15.9	

Intersection Summary

Area Type: Other

Intersection												
Int Delay, s/veh	1.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↗	↘		↗	↘	
Traffic Vol, veh/h	15	6	29	16	4	16	12	355	10	4	486	24
Future Vol, veh/h	15	6	29	16	4	16	12	355	10	4	486	24
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	16	7	32	17	4	17	13	386	11	4	528	26

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	977	972	541	987	980	392	554	0	0	397	0	0
Stage 1	549	549	-	418	418	-	-	-	-	-	-	-
Stage 2	428	423	-	569	562	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	230	252	541	226	250	657	1016	-	-	1162	-	-
Stage 1	520	516	-	612	591	-	-	-	-	-	-	-
Stage 2	605	588	-	507	510	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	218	248	541	206	246	657	1016	-	-	1162	-	-
Mov Cap-2 Maneuver	218	248	-	206	246	-	-	-	-	-	-	-
Stage 1	513	514	-	604	583	-	-	-	-	-	-	-
Stage 2	577	580	-	470	508	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	17.5		18.6		0.3		0.1	
HCM LOS	C		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1016	-	-	341	304	1162	-
HCM Lane V/C Ratio	0.013	-	-	0.159	0.129	0.004	-
HCM Control Delay (s)	8.6	-	-	17.5	18.6	8.1	-
HCM Lane LOS	A	-	-	C	C	A	-
HCM 95th %tile Q(veh)	0	-	-	0.6	0.4	0	-



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↘		↗	↘	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	100		0	100		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt					0.915			0.996				
Flt Protected					0.982					0.950		
Satd. Flow (prot)	0	1863	0	0	1674	0	1863	1855	0	1770	1863	0
Flt Permitted					0.982					0.950		
Satd. Flow (perm)	0	1863	0	0	1674	0	1863	1855	0	1770	1863	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		319			430			608			732	
Travel Time (s)		7.3			9.8			13.8			16.6	

Intersection Summary

Area Type: Other

Intersection												
Int Delay, s/veh	0.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	0	0	0	9	0	16	0	363	10	13	520	0
Future Vol, veh/h	0	0	0	9	0	16	0	363	10	13	520	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	10	0	17	0	395	11	14	565	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1002	999	565	994	994	401	565	0	0	406	0	0
Stage 1	593	593	-	401	401	-	-	-	-	-	-	-
Stage 2	409	406	-	593	593	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	221	243	524	224	245	649	1007	-	-	1153	-	-
Stage 1	492	493	-	626	601	-	-	-	-	-	-	-
Stage 2	619	598	-	492	493	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	213	240	524	222	242	649	1007	-	-	1153	-	-
Mov Cap-2 Maneuver	213	240	-	222	242	-	-	-	-	-	-	-
Stage 1	492	487	-	626	601	-	-	-	-	-	-	-
Stage 2	602	598	-	486	487	-	-	-	-	-	-	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			15.1			0			0.2		
HCM LOS	A			C								

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1007	-	-	-	383	1153	-	-
HCM Lane V/C Ratio	-	-	-	-	0.071	0.012	-	-
HCM Control Delay (s)	0	-	-	0	15.1	8.2	-	-
HCM Lane LOS	A	-	-	A	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	-	0.2	0	-	-



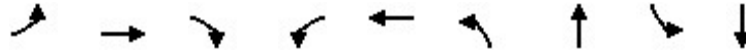
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		100	150		0	0		0	0		0
Storage Lanes	1		1	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850		0.995			0.919				0.949
Flt Protected	0.950			0.950				0.984				0.993
Satd. Flow (prot)	1770	1863	1583	1770	1853	0	0	1684	0	0	1755	0
Flt Permitted	0.226			0.347				0.899				0.966
Satd. Flow (perm)	421	1863	1583	646	1853	0	0	1539	0	0	1708	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			74		3			93				21
Link Speed (mph)		30			30			30				30
Link Distance (ft)		700			1434			502				485
Travel Time (s)		15.9			32.6			11.4				11.0

Intersection Summary

Area Type: Other

Timings
4: Tennyson St. & W 64th Ave.

6501 Lowell Blvd
06/07/2021

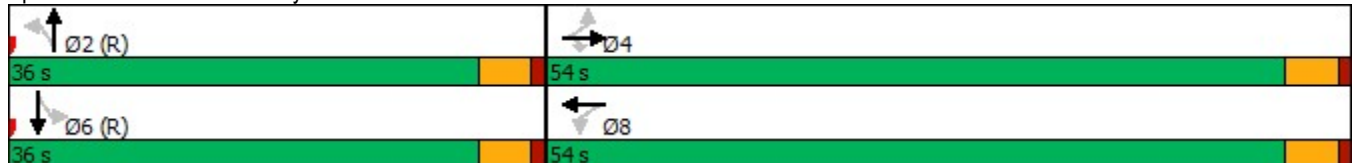


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↖	↑	↗	↖	↗		↕		↕
Traffic Volume (vph)	13	354	68	176	436	63	16	7	25
Future Volume (vph)	13	354	68	176	436	63	16	7	25
Turn Type	Perm	NA	Perm	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4			8		2		6
Permitted Phases	4		4	8		2		6	
Detector Phase	4	4	4	8	8	2	2	6	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	54.0	54.0	54.0	54.0	54.0	36.0	36.0	36.0	36.0
Total Split (%)	60.0%	60.0%	60.0%	60.0%	60.0%	40.0%	40.0%	40.0%	40.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0		0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5		4.5		4.5
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	32.1	32.1	32.1	32.1	32.1		48.9		48.9
Actuated g/C Ratio	0.36	0.36	0.36	0.36	0.36		0.54		0.54
v/c Ratio	0.09	0.58	0.12	0.83	0.74		0.24		0.06
Control Delay	17.0	26.0	4.1	65.2	42.8		8.4		9.4
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	17.0	26.0	4.1	65.2	42.8		8.4		9.4
LOS	B	C	A	E	D		A		A
Approach Delay		22.3			49.1		8.4		9.4
Approach LOS		C			D		A		A

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 50
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.83
 Intersection Signal Delay: 32.5
 Intersection LOS: C
 Intersection Capacity Utilization 57.9%
 ICU Level of Service B
 Analysis Period (min) 15

Splits and Phases: 4: Tennyson St. & W 64th Ave.





Lane Group	EBL	EBT	EBR	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	14	385	74	191	490	213	56
v/c Ratio	0.09	0.58	0.12	0.83	0.74	0.24	0.06
Control Delay	17.0	26.0	4.1	65.2	42.8	8.4	9.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.0	26.0	4.1	65.2	42.8	8.4	9.4
Queue Length 50th (ft)	5	174	0	111	275	32	9
Queue Length 95th (ft)	16	213	22	177	358	90	34
Internal Link Dist (ft)		620			1354	422	405
Turn Bay Length (ft)	150		100	150			
Base Capacity (vph)	231	1024	903	355	1020	878	937
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.38	0.08	0.54	0.48	0.24	0.06
Intersection Summary							

HCM 6th Signalized Intersection Summary
 4: Tennyson St. & W 64th Ave.

6501 Lowell Blvd
 06/07/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	13	354	68	176	436	15	63	16	118	7	25	19
Future Volume (veh/h)	13	354	68	176	436	15	63	16	118	7	25	19
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	14	385	74	191	474	16	68	17	128	8	27	21
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	260	767	650	320	737	25	268	86	453	130	427	307
Arrive On Green	0.41	0.41	0.41	0.41	0.41	0.41	0.49	0.49	0.49	0.49	0.49	0.49
Sat Flow, veh/h	906	1870	1585	933	1799	61	439	175	924	173	871	626
Grp Volume(v), veh/h	14	385	74	191	0	490	213	0	0	56	0	0
Grp Sat Flow(s),veh/h/ln	906	1870	1585	933	0	1859	1538	0	0	1670	0	0
Q Serve(g_s), s	1.1	13.8	2.6	17.2	0.0	19.0	2.7	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	20.1	13.8	2.6	31.0	0.0	19.0	6.9	0.0	0.0	1.5	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.03	0.32		0.60	0.14		0.37
Lane Grp Cap(c), veh/h	260	767	650	320	0	762	806	0	0	864	0	0
V/C Ratio(X)	0.05	0.50	0.11	0.60	0.00	0.64	0.26	0.00	0.00	0.06	0.00	0.00
Avail Cap(c_a), veh/h	387	1029	872	450	0	1023	806	0	0	864	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.87	0.00	0.87	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	29.3	19.7	16.4	31.2	0.0	21.3	13.4	0.0	0.0	12.1	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.5	0.1	1.6	0.0	0.8	0.8	0.0	0.0	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.4	9.8	1.7	6.9	0.0	12.4	4.7	0.0	0.0	1.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	29.4	20.2	16.5	32.8	0.0	22.1	14.2	0.0	0.0	12.2	0.0	0.0
LnGrp LOS	C	C	B	C	A	C	B	A	A	B	A	A
Approach Vol, veh/h		473			681			213			56	
Approach Delay, s/veh		19.9			25.1			14.2			12.2	
Approach LOS		B			C			B			B	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		48.6		41.4		48.6		41.4				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		31.5		49.5		31.5		49.5				
Max Q Clear Time (g_c+I1), s		8.9		22.1		3.5		33.0				
Green Ext Time (p_c), s		1.3		2.8		0.2		3.9				
Intersection Summary												
HCM 6th Ctrl Delay				21.2								
HCM 6th LOS				C								



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	200		150	150		75	200		150	200		100
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.257			0.546			0.559			0.569		
Satd. Flow (perm)	479	1863	1583	1017	1863	1583	1041	1863	1583	1060	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			112			127			127			149
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1434			1268			763			608	
Travel Time (s)		32.6			28.8			17.3			13.8	

Intersection Summary

Area Type: Other

Timings
5: W 64th Ave./W. 64th Ave. & Lowell Blvd.

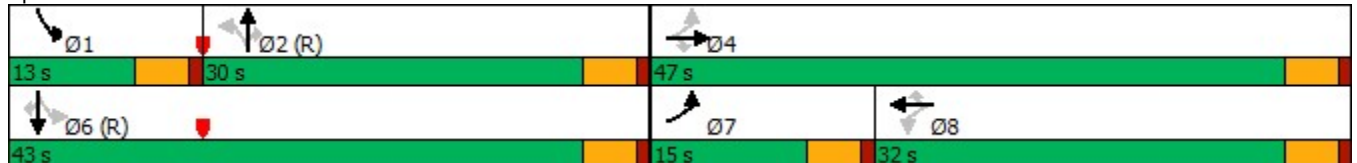
6501 Lowell Blvd
06/07/2021

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	131	331	103	81	266	44	51	148	63	90	307	137
Future Volume (vph)	131	331	103	81	266	44	51	148	63	90	307	137
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4			8			2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	7	4	4	8	8	8	2	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	15.0	47.0	47.0	32.0	32.0	32.0	30.0	30.0	30.0	13.0	43.0	43.0
Total Split (%)	16.7%	52.2%	52.2%	35.6%	35.6%	35.6%	33.3%	33.3%	33.3%	14.4%	47.8%	47.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead			Lag	Lag	Lag	Lag	Lag	Lag	Lag	Lead	
Lead-Lag Optimize?	Yes			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	33.9	33.9	33.9	19.6	19.6	19.6	36.9	36.9	36.9	47.1	47.1	47.1
Actuated g/C Ratio	0.38	0.38	0.38	0.22	0.22	0.22	0.41	0.41	0.41	0.52	0.52	0.52
v/c Ratio	0.44	0.51	0.17	0.40	0.71	0.11	0.13	0.21	0.09	0.16	0.34	0.17
Control Delay	35.5	38.3	15.3	31.8	37.9	3.0	22.8	21.7	0.8	13.5	15.2	3.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.5	38.3	15.3	31.8	37.9	3.0	22.8	21.7	0.8	13.5	15.2	3.1
LOS	D	D	B	C	D	A	C	C	A	B	B	A
Approach Delay		33.4			32.7			16.9			11.8	
Approach LOS		C			C			B			B	

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 65
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.71
 Intersection Signal Delay: 24.2
 Intersection Capacity Utilization 57.2%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service B

Splits and Phases: 5: W 64th Ave./W. 64th Ave. & Lowell Blvd.





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	142	360	112	88	289	48	55	161	68	98	334	149
v/c Ratio	0.44	0.51	0.17	0.40	0.71	0.11	0.13	0.21	0.09	0.16	0.34	0.17
Control Delay	35.5	38.3	15.3	31.8	37.9	3.0	22.8	21.7	0.8	13.5	15.2	3.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.5	38.3	15.3	31.8	37.9	3.0	22.8	21.7	0.8	13.5	15.2	3.1
Queue Length 50th (ft)	77	203	19	44	155	1	20	61	0	27	105	0
Queue Length 95th (ft)	114	256	49	m58	m178	m2	55	125	5	63	198	33
Internal Link Dist (ft)		1354			1188			683			528	
Turn Bay Length (ft)	200		150	150		75	200		150	200		100
Base Capacity (vph)	331	879	806	310	569	571	426	763	723	623	975	899
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.41	0.14	0.28	0.51	0.08	0.13	0.21	0.09	0.16	0.34	0.17

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM 6th Signalized Intersection Summary
 5: W 64th Ave./W. 64th Ave. & Lowell Blvd.

6501 Lowell Blvd
 06/07/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↘	↖	↗	↘	↖	↗	↘	↖	↗	↘
Traffic Volume (veh/h)	131	331	103	81	266	44	51	148	63	90	307	137
Future Volume (veh/h)	131	331	103	81	266	44	51	148	63	90	307	137
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	142	360	112	88	289	48	55	161	68	98	334	149
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	270	611	518	212	364	309	511	884	749	658	1073	909
Arrive On Green	0.03	0.11	0.11	0.06	0.06	0.06	0.47	0.47	0.47	0.05	0.57	0.57
Sat Flow, veh/h	1781	1870	1585	922	1870	1585	912	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	142	360	112	88	289	48	55	161	68	98	334	149
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	922	1870	1585	912	1870	1585	1781	1870	1585
Q Serve(g_s), s	5.5	16.5	5.8	8.5	13.7	2.6	3.0	4.5	2.1	2.4	8.3	4.0
Cycle Q Clear(g_c), s	5.5	16.5	5.8	13.1	13.7	2.6	3.0	4.5	2.1	2.4	8.3	4.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	270	611	518	212	364	309	511	884	749	658	1073	909
V/C Ratio(X)	0.53	0.59	0.22	0.42	0.79	0.16	0.11	0.18	0.09	0.15	0.31	0.16
Avail Cap(c_a), veh/h	332	883	748	314	571	484	511	884	749	735	1073	909
HCM Platoon Ratio	0.33	0.33	0.33	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.79	0.79	0.79	0.71	0.71	0.71	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.2	34.4	29.6	42.3	40.3	35.1	13.3	13.7	13.1	10.1	10.0	9.0
Incr Delay (d2), s/veh	1.3	0.7	0.2	0.9	2.9	0.2	0.4	0.5	0.2	0.1	0.8	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	4.5	12.5	4.2	3.8	10.8	1.8	1.2	3.5	1.4	1.6	6.1	2.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.4	35.1	29.8	43.2	43.2	35.3	13.7	14.1	13.3	10.2	10.7	9.4
LnGrp LOS	C	D	C	D	D	D	B	B	B	B	B	A
Approach Vol, veh/h		614			425			284			581	
Approach Delay, s/veh		32.6			42.3			13.9			10.3	
Approach LOS		C			D			B			B	
Timer - Assigned Phs	1	2		4		6	7	8				
Phs Duration (G+Y+Rc), s	9.1	47.0		33.9		56.1	11.9	22.0				
Change Period (Y+Rc), s	4.5	4.5		4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s	8.5	25.5		42.5		38.5	10.5	27.5				
Max Q Clear Time (g_c+I1), s	4.4	6.5		18.5		10.3	7.5	15.7				
Green Ext Time (p_c), s	0.1	1.3		2.6		2.6	0.1	1.8				

Intersection Summary

HCM 6th Ctrl Delay	25.2
HCM 6th LOS	C



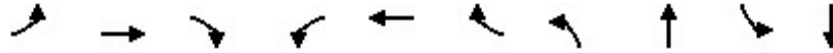
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	100		150	150		100	600		0	250		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor			0.850			0.850		0.987			0.990	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	5019	0	1770	5034	0
Flt Permitted	0.386			0.430			0.085			0.193		
Satd. Flow (perm)	719	1863	1583	801	1863	1583	158	5019	0	360	5034	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			127			127		23			17	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1268			424			903			562	
Travel Time (s)		28.8			9.6			20.5			12.8	

Intersection Summary

Area Type: Other

Timings
6: Federal Blvd. & W. 64th Ave.

6501 Lowell Blvd
06/07/2021

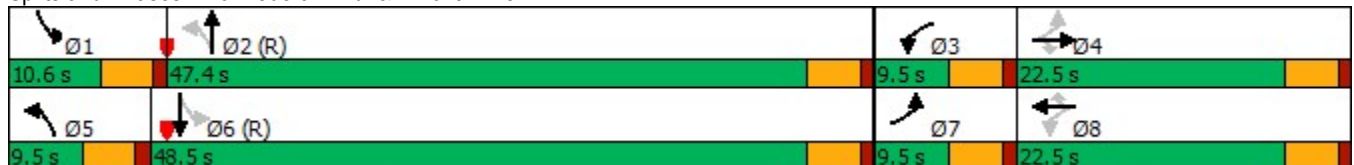


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	119	182	185	157	198	48	104	974	76	2553
Future Volume (vph)	119	182	185	157	198	48	104	974	76	2553
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA
Protected Phases	7	4		3	8		5	2	1	6
Permitted Phases	4		4	8		8	2		6	
Detector Phase	7	4	4	3	8	8	5	2	1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	9.5	22.5
Total Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	47.4	10.6	48.5
Total Split (%)	10.6%	25.0%	25.0%	10.6%	25.0%	25.0%	10.6%	52.7%	11.8%	53.9%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)	19.9	14.9	14.9	19.9	14.9	14.9	52.8	47.8	52.2	45.9
Actuated g/C Ratio	0.22	0.17	0.17	0.22	0.17	0.17	0.59	0.53	0.58	0.51
v/c Ratio	0.59	0.64	0.55	0.74	0.70	0.14	0.56	0.43	0.27	1.15
Control Delay	30.0	33.5	11.9	48.3	47.4	0.8	23.7	14.2	9.7	98.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.0	33.5	11.9	48.3	47.4	0.8	23.7	14.2	9.7	98.2
LOS	C	C	B	D	D	A	C	B	A	F
Approach Delay		24.4			42.2			15.1		95.8
Approach LOS		C			D			B		F

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 120
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.15
 Intersection Signal Delay: 64.8
 Intersection LOS: E
 Intersection Capacity Utilization 92.4%
 ICU Level of Service F
 Analysis Period (min) 15

Splits and Phases: 6: Federal Blvd. & W. 64th Ave.





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	129	198	201	171	215	52	113	1158	83	2972
v/c Ratio	0.59	0.64	0.55	0.74	0.70	0.14	0.56	0.43	0.27	1.15
Control Delay	30.0	33.5	11.9	48.3	47.4	0.8	23.7	14.2	9.7	98.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.0	33.5	11.9	48.3	47.4	0.8	23.7	14.2	9.7	98.2
Queue Length 50th (ft)	33	55	0	78	116	0	24	148	17	~763
Queue Length 95th (ft)	70	106	0	#140	185	0	#91	191	37	#858
Internal Link Dist (ft)		1188			344			823		482
Turn Bay Length (ft)	100		150	150		100	600		250	
Base Capacity (vph)	217	372	418	231	372	418	203	2676	309	2574
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.59	0.53	0.48	0.74	0.58	0.12	0.56	0.43	0.27	1.15

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

HCM 6th Signalized Intersection Summary
6: Federal Blvd. & W. 64th Ave.
























6501 Lowell Blvd
06/07/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	119	182	185	157	198	48	104	974	91	76	2553	181
Future Volume (veh/h)	119	182	185	157	198	48	104	974	91	76	2553	181
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	129	198	201	171	215	52	113	1059	99	83	2775	197
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	231	293	248	231	293	248	173	2562	239	364	2612	181
Arrive On Green	0.02	0.05	0.05	0.06	0.16	0.16	0.05	0.54	0.54	0.05	0.54	0.54
Sat Flow, veh/h	1781	1870	1585	1781	1870	1585	1781	4751	444	1781	4875	338
Grp Volume(v), veh/h	129	198	201	171	215	52	113	758	400	83	1918	1054
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	1585	1781	1702	1791	1781	1702	1809
Q Serve(g_s), s	5.0	9.4	11.3	5.0	9.9	2.6	2.5	11.9	11.9	1.8	48.2	48.2
Cycle Q Clear(g_c), s	5.0	9.4	11.3	5.0	9.9	2.6	2.5	11.9	11.9	1.8	48.2	48.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.25	1.00		0.19
Lane Grp Cap(c), veh/h	231	293	248	231	293	248	173	1836	966	364	1823	969
V/C Ratio(X)	0.56	0.68	0.81	0.74	0.73	0.21	0.65	0.41	0.41	0.23	1.05	1.09
Avail Cap(c_a), veh/h	231	374	317	231	374	317	179	1836	966	398	1823	969
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.93	0.93	0.93	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.7	40.4	41.4	34.7	36.2	33.1	21.1	12.3	12.3	9.1	20.9	20.9
Incr Delay (d2), s/veh	2.8	3.1	10.9	12.0	5.4	0.4	7.9	0.7	1.3	0.3	36.3	55.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	4.7	8.3	9.2	3.7	8.5	1.8	2.8	7.8	8.4	1.2	36.1	45.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	35.5	43.5	52.2	46.7	41.6	33.5	28.9	13.0	13.6	9.4	57.2	76.5
LnGrp LOS	D	D	D	D	D	C	C	B	B	A	F	F
Approach Vol, veh/h		528			438			1271			3055	
Approach Delay, s/veh		44.9			42.6			14.6			62.5	
Approach LOS		D			D			B			E	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.9	53.0	9.5	18.6	9.2	52.7	9.5	18.6				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	6.1	42.9	5.0	18.0	5.0	44.0	5.0	18.0				
Max Q Clear Time (g_c+I1), s	3.8	13.9	7.0	13.3	4.5	50.2	7.0	11.9				
Green Ext Time (p_c), s	0.0	9.4	0.0	0.8	0.0	0.0	0.0	0.7				

Intersection Summary

HCM 6th Ctrl Delay	47.6
HCM 6th LOS	D

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		150	150		0	225		250	150		150
Storage Lanes	1		1	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850		0.904				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1684	0	1770	1863	1583	1770	1863	1583
Flt Permitted	0.719			0.747			0.497			0.281		
Satd. Flow (perm)	1339	1863	1583	1391	1684	0	926	1863	1583	523	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			85		37				27			98
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		549			716			667			367	
Travel Time (s)		12.5			16.3			15.2			8.3	

Intersection Summary

Area Type: Other

Timings
1: Lowell Blvd. & W. 68th Ave.

6501 Lowell Blvd
06/07/2021

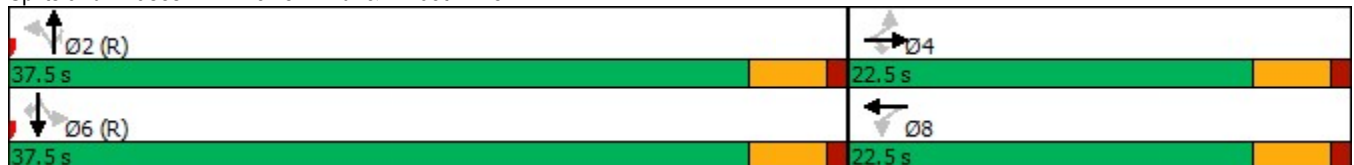


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑	↗	↖	↗	↖	↑	↗	↖	↑	↗
Traffic Volume (vph)	59	15	78	13	19	135	758	22	15	408	90
Future Volume (vph)	59	15	78	13	19	135	758	22	15	408	90
Turn Type	Perm	NA	Perm	Perm	NA	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8		2			6	
Permitted Phases	4		4	8		2		2	6		6
Detector Phase	4	4	4	8	8	2	2	2	6	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	22.5	22.5	22.5	22.5	22.5	37.5	37.5	37.5	37.5	37.5	37.5
Total Split (%)	37.5%	37.5%	37.5%	37.5%	37.5%	62.5%	62.5%	62.5%	62.5%	62.5%	62.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag											
Lead-Lag Optimize?											
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	8.3	8.3	8.3	8.3	8.3	45.6	45.6	45.6	45.6	45.6	45.6
Actuated g/C Ratio	0.14	0.14	0.14	0.14	0.14	0.76	0.76	0.76	0.76	0.76	0.76
v/c Ratio	0.35	0.06	0.29	0.07	0.22	0.21	0.58	0.02	0.04	0.31	0.08
Control Delay	27.7	21.3	8.8	21.8	13.6	4.3	6.9	1.5	3.7	4.2	1.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.7	21.3	8.8	21.8	13.6	4.3	6.9	1.5	3.7	4.2	1.1
LOS	C	C	A	C	B	A	A	A	A	A	A
Approach Delay		17.3			15.2		6.4			3.6	
Approach LOS		B			B		A			A	

Intersection Summary

Cycle Length: 60
 Actuated Cycle Length: 60
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.58
 Intersection Signal Delay: 6.9
 Intersection Capacity Utilization 65.2%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service C

Splits and Phases: 1: Lowell Blvd. & W. 68th Ave.



Queues

6501 Lowell Blvd

1: Lowell Blvd. & W. 68th Ave.

06/07/2021

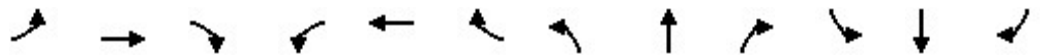


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	64	16	85	14	58	147	824	24	16	443	98
v/c Ratio	0.35	0.06	0.29	0.07	0.22	0.21	0.58	0.02	0.04	0.31	0.08
Control Delay	27.7	21.3	8.8	21.8	13.6	4.3	6.9	1.5	3.7	4.2	1.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.7	21.3	8.8	21.8	13.6	4.3	6.9	1.5	3.7	4.2	1.1
Queue Length 50th (ft)	21	5	0	5	7	14	115	0	1	45	0
Queue Length 95th (ft)	49	18	30	17	32	39	256	5	7	99	11
Internal Link Dist (ft)		469			636		587			287	
Turn Bay Length (ft)	150		150	150		225		250	150		150
Base Capacity (vph)	401	558	534	417	531	703	1414	1208	397	1414	1225
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.03	0.16	0.03	0.11	0.21	0.58	0.02	0.04	0.31	0.08

Intersection Summary

HCM 6th Signalized Intersection Summary
 1: Lowell Blvd. & W. 68th Ave.

6501 Lowell Blvd
 06/07/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	59	15	78	13	19	34	135	758	22	15	408	90
Future Volume (veh/h)	59	15	78	13	19	34	135	758	22	15	408	90
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	64	16	85	14	21	37	147	824	24	16	443	98
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	232	214	182	258	70	123	685	1375	1166	462	1375	1166
Arrive On Green	0.11	0.11	0.11	0.11	0.11	0.11	0.74	0.74	0.74	0.74	0.74	0.74
Sat Flow, veh/h	1345	1870	1585	1294	607	1070	865	1870	1585	650	1870	1585
Grp Volume(v), veh/h	64	16	85	14	0	58	147	824	24	16	443	98
Grp Sat Flow(s),veh/h/ln	1345	1870	1585	1294	0	1678	865	1870	1585	650	1870	1585
Q Serve(g_s), s	2.7	0.5	3.0	0.6	0.0	1.9	4.3	12.5	0.2	0.7	4.9	1.0
Cycle Q Clear(g_c), s	4.7	0.5	3.0	1.0	0.0	1.9	9.2	12.5	0.2	13.2	4.9	1.0
Prop In Lane	1.00		1.00	1.00		0.64	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	232	214	182	258	0	192	685	1375	1166	462	1375	1166
V/C Ratio(X)	0.28	0.07	0.47	0.05	0.00	0.30	0.21	0.60	0.02	0.03	0.32	0.08
Avail Cap(c_a), veh/h	481	561	476	498	0	503	685	1375	1166	462	1375	1166
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.5	23.7	24.8	24.2	0.0	24.4	4.3	3.8	2.1	6.9	2.8	2.2
Incr Delay (d2), s/veh	0.6	0.1	1.9	0.1	0.0	0.9	0.7	1.9	0.0	0.1	0.6	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.6	0.4	2.1	0.3	0.0	1.4	1.2	5.4	0.1	0.2	2.0	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.1	23.9	26.7	24.3	0.0	25.2	5.1	5.7	2.2	7.0	3.4	2.4
LnGrp LOS	C	C	C	C	A	C	A	A	A	A	A	A
Approach Vol, veh/h		165			72			995				557
Approach Delay, s/veh		26.6			25.0			5.5				3.3
Approach LOS		C			C			A				A
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		48.6		11.4		48.6		11.4				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		33.0		18.0		33.0		18.0				
Max Q Clear Time (g_c+I1), s		14.5		6.7		15.2		3.9				
Green Ext Time (p_c), s		7.0		0.4		3.1		0.2				

Intersection Summary

HCM 6th Ctrl Delay	7.6
HCM 6th LOS	A



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↘		↗	↘	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	100		0	100		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.961			0.941			0.996			0.992	
Flt Protected		0.971			0.986		0.950			0.950		
Satd. Flow (prot)	0	1738	0	0	1728	0	1770	1855	0	1770	1848	0
Flt Permitted		0.971			0.986		0.950			0.950		
Satd. Flow (perm)	0	1738	0	0	1728	0	1770	1855	0	1770	1848	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		458			470			732			667	
Travel Time (s)		10.4			10.7			16.6			15.2	

Intersection Summary

Area Type: Other

Intersection												
Int Delay, s/veh	5.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↔	↔		↔	↔	
Traffic Vol, veh/h	38	7	18	10	10	16	32	848	26	19	448	25
Future Vol, veh/h	38	7	18	10	10	16	32	848	26	19	448	25
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	41	8	20	11	11	17	35	922	28	21	487	27

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1563	1563	501	1563	1562	936	514	0	0	950	0	0
Stage 1	543	543	-	1006	1006	-	-	-	-	-	-	-
Stage 2	1020	1020	-	557	556	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	91	112	570	91	112	321	1052	-	-	723	-	-
Stage 1	524	520	-	291	319	-	-	-	-	-	-	-
Stage 2	285	314	-	515	513	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	76	105	570	79	105	321	1052	-	-	723	-	-
Mov Cap-2 Maneuver	76	105	-	79	105	-	-	-	-	-	-	-
Stage 1	507	505	-	281	308	-	-	-	-	-	-	-
Stage 2	251	304	-	476	498	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	88.3		43		0.3		0.4	
HCM LOS	F		E					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1052	-	-	105	133	723	-	-
HCM Lane V/C Ratio	0.033	-	-	0.652	0.294	0.029	-	-
HCM Control Delay (s)	8.5	-	-	88.3	43	10.1	-	-
HCM Lane LOS	A	-	-	F	E	B	-	-
HCM 95th %tile Q(veh)	0.1	-	-	3.3	1.1	0.1	-	-



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↘		↗	↘	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	100		0	100		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt					0.932			0.998				
Flt Protected					0.976					0.950		
Satd. Flow (prot)	0	1863	0	0	1694	0	1863	1859	0	1770	1863	0
Flt Permitted					0.976					0.950		
Satd. Flow (perm)	0	1863	0	0	1694	0	1863	1859	0	1770	1863	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		319			430			608			732	
Travel Time (s)		7.3			9.8			13.8			16.6	

Intersection Summary

Area Type: Other

Intersection												
Int Delay, s/veh	0.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↔	↔		↔	↔	
Traffic Vol, veh/h	0	0	0	15	0	15	0	859	13	19	488	0
Future Vol, veh/h	0	0	0	15	0	15	0	859	13	19	488	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	16	0	16	0	934	14	21	530	0

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	1521	1520	530	1513	1513	941	530	0	0	948	0	0
Stage 1	572	572	-	941	941	-	-	-	-	-	-	-
Stage 2	949	948	-	572	572	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	97	119	549	98	120	319	1037	-	-	724	-	-
Stage 1	505	504	-	316	342	-	-	-	-	-	-	-
Stage 2	313	339	-	505	504	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	90	116	549	96	117	319	1037	-	-	724	-	-
Mov Cap-2 Maneuver	90	116	-	96	117	-	-	-	-	-	-	-
Stage 1	505	489	-	316	342	-	-	-	-	-	-	-
Stage 2	297	339	-	490	489	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	36.1	0	0.4
HCM LOS	A	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1037	-	-	-	148	724	-
HCM Lane V/C Ratio	-	-	-	-	0.22	0.029	-
HCM Control Delay (s)	0	-	-	0	36.1	10.1	-
HCM Lane LOS	A	-	-	A	E	B	-
HCM 95th %tile Q(veh)	0	-	-	-	0.8	0.1	-

Lanes and Geometrics
 4: Tennyson St. & W 64th Ave.

6501 Lowell Blvd
 06/07/2021



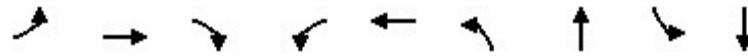
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		100	150		0	0		0	0		0
Storage Lanes	1		1	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850		0.994			0.920				0.952
Flt Protected	0.950			0.950				0.984				0.983
Satd. Flow (prot)	1770	1863	1583	1770	1852	0	0	1686	0	0	1743	0
Flt Permitted	0.217			0.095				0.878				0.841
Satd. Flow (perm)	404	1863	1583	177	1852	0	0	1505	0	0	1491	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			61		4			93				17
Link Speed (mph)		30			30			30				30
Link Distance (ft)		501			1329			646				482
Travel Time (s)		11.4			30.2			14.7				11.0

Intersection Summary

Area Type: Other

Timings
4: Tennyson St. & W 64th Ave.

6501 Lowell Blvd
06/07/2021

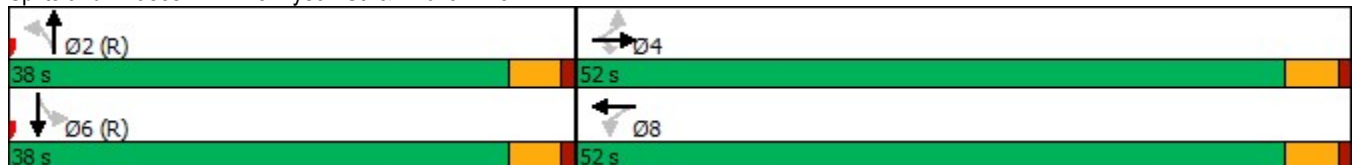


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↖	↑	↗	↖	↗		↕		↕
Traffic Volume (vph)	25	761	110	95	585	137	40	16	13
Future Volume (vph)	25	761	110	95	585	137	40	16	13
Turn Type	Perm	NA	Perm	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4			8		2		6
Permitted Phases	4		4	8		2		6	
Detector Phase	4	4	4	8	8	2	2	6	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	52.0	52.0	52.0	52.0	52.0	38.0	38.0	38.0	38.0
Total Split (%)	57.8%	57.8%	57.8%	57.8%	57.8%	42.2%	42.2%	42.2%	42.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	45.5	45.5	45.5	45.5	45.5		35.5		35.5
Actuated g/C Ratio	0.51	0.51	0.51	0.51	0.51		0.39		0.39
v/c Ratio	0.13	0.88	0.14	1.16	0.71		0.73		0.08
Control Delay	12.8	31.7	6.2	166.4	32.9		27.0		13.7
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	12.8	31.7	6.2	166.4	32.9		27.0		13.7
LOS	B	C	A	F	C		C		B
Approach Delay		28.1			50.8		27.0		13.7
Approach LOS		C			D		C		B

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 65
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.16
 Intersection Signal Delay: 35.3
 Intersection Capacity Utilization 88.5%
 Analysis Period (min) 15
 Intersection LOS: D
 ICU Level of Service E

Splits and Phases: 4: Tennyson St. & W 64th Ave.





Lane Group	EBL	EBT	EBR	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	27	827	120	103	664	471	48
v/c Ratio	0.13	0.88	0.14	1.16	0.71	0.73	0.08
Control Delay	12.8	31.7	6.2	166.4	32.9	27.0	13.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.8	31.7	6.2	166.4	32.9	27.0	13.7
Queue Length 50th (ft)	7	378	16	~64	330	187	11
Queue Length 95th (ft)	23	#623	42	m#116	m413	#324	34
Internal Link Dist (ft)		421			1249	566	402
Turn Bay Length (ft)	150		100	150			
Base Capacity (vph)	213	983	864	93	979	649	597
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.84	0.14	1.11	0.68	0.73	0.08

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

HCM 6th Signalized Intersection Summary
 4: Tennyson St. & W 64th Ave.

6501 Lowell Blvd
 06/07/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	25	761	110	95	585	26	137	40	257	16	13	16
Future Volume (veh/h)	25	761	110	95	585	26	137	40	257	16	13	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	27	827	120	103	636	28	149	43	279	17	14	17
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	487	987	837	171	938	41	219	69	341	197	164	168
Arrive On Green	0.53	0.53	0.53	1.00	1.00	1.00	0.37	0.37	0.37	0.37	0.37	0.37
Sat Flow, veh/h	772	1870	1585	592	1778	78	446	184	916	384	440	451
Grp Volume(v), veh/h	27	827	120	103	0	664	471	0	0	48	0	0
Grp Sat Flow(s),veh/h/ln	772	1870	1585	592	0	1856	1546	0	0	1275	0	0
Q Serve(g_s), s	1.5	33.7	3.5	13.8	0.0	0.0	22.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	1.5	33.7	3.5	47.5	0.0	0.0	24.6	0.0	0.0	1.6	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.04	0.32		0.59	0.35		0.35
Lane Grp Cap(c), veh/h	487	987	837	171	0	980	628	0	0	529	0	0
V/C Ratio(X)	0.06	0.84	0.14	0.60	0.00	0.68	0.75	0.00	0.00	0.09	0.00	0.00
Avail Cap(c_a), veh/h	487	987	837	171	0	980	628	0	0	529	0	0
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	0.69	0.00	0.69	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	10.4	18.0	10.9	17.7	0.0	0.0	25.4	0.0	0.0	18.2	0.0	0.0
Incr Delay (d2), s/veh	0.0	6.5	0.1	4.1	0.0	1.3	8.0	0.0	0.0	0.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.5	21.3	2.1	3.7	0.0	0.6	15.2	0.0	0.0	1.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	10.4	24.4	10.9	21.7	0.0	1.3	33.4	0.0	0.0	18.6	0.0	0.0
LnGrp LOS	B	C	B	C	A	A	C	A	A	B	A	A
Approach Vol, veh/h		974			767			471			48	
Approach Delay, s/veh		22.4			4.0			33.4			18.6	
Approach LOS		C			A			C			B	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		38.0		52.0		38.0		52.0				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		33.5		47.5		33.5		47.5				
Max Q Clear Time (g_c+I1), s		26.6		35.7		3.6		49.5				
Green Ext Time (p_c), s		1.8		5.2		0.2		0.0				

Intersection Summary		
HCM 6th Ctrl Delay		18.4
HCM 6th LOS		B



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	200		150	150		75	200		150	200		100
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.135			0.451			0.586			0.129		
Satd. Flow (perm)	251	1863	1583	840	1863	1583	1092	1863	1583	240	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			93			127			127			197
Link Speed (mph)		30			30			30				30
Link Distance (ft)		1329			1480			763				608
Travel Time (s)		30.2			33.6			17.3				13.8

Intersection Summary

Area Type: Other



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	293	524	95	64	486	78	166	565	136	54	284	197
v/c Ratio	1.01	0.63	0.13	0.27	0.93	0.15	0.41	0.82	0.20	0.28	0.34	0.24
Control Delay	76.4	30.6	9.0	28.7	59.1	1.9	26.4	38.9	5.6	17.9	17.5	3.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	76.4	30.6	9.0	28.7	59.1	1.9	26.4	38.9	5.6	17.9	17.5	3.1
Queue Length 50th (ft)	~148	262	10	28	266	0	72	300	3	17	102	0
Queue Length 95th (ft)	m#213	m323	m19	63	#451	11	133	#494	41	38	161	37
Internal Link Dist (ft)		1249			1400			683			528	
Turn Bay Length (ft)	200		150	150		75	200		150	200		100
Base Capacity (vph)	289	844	768	240	534	544	403	688	664	195	846	826
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.01	0.62	0.12	0.27	0.91	0.14	0.41	0.82	0.20	0.28	0.34	0.24

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

HCM 6th Signalized Intersection Summary
 5: W 64th Ave./W. 64th Ave. & Lowell Blvd.

6501 Lowell Blvd
 06/07/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	270	482	87	59	447	72	153	520	125	50	261	181
Future Volume (veh/h)	270	482	87	59	447	72	153	520	125	50	261	181
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	293	524	95	64	486	78	166	565	136	54	284	197
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	311	835	708	266	523	443	405	678	574	218	848	719
Arrive On Green	0.12	0.45	0.45	0.28	0.28	0.28	0.36	0.36	0.36	0.04	0.45	0.45
Sat Flow, veh/h	1781	1870	1585	804	1870	1585	914	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	293	524	95	64	486	78	166	565	136	54	284	197
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	804	1870	1585	914	1870	1585	1781	1870	1585
Q Serve(g_s), s	10.3	19.4	3.2	6.0	22.8	3.4	12.9	24.8	5.4	1.6	8.8	7.0
Cycle Q Clear(g_c), s	10.3	19.4	3.2	10.4	22.8	3.4	13.5	24.8	5.4	1.6	8.8	7.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	311	835	708	266	523	443	405	678	574	218	848	719
V/C Ratio(X)	0.94	0.63	0.13	0.24	0.93	0.18	0.41	0.83	0.24	0.25	0.33	0.27
Avail Cap(c_a), veh/h	311	848	719	271	536	454	405	678	574	243	848	719
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	0.36	0.36	0.36	0.09	0.09	0.09	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.2	19.2	14.7	28.9	31.5	24.6	22.8	26.2	20.0	19.6	15.8	15.3
Incr Delay (d2), s/veh	18.4	0.5	0.0	0.0	3.1	0.0	3.0	11.5	1.0	0.6	1.1	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	8.0	10.9	2.0	1.7	12.0	1.8	5.4	18.6	3.8	1.2	6.9	4.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	40.6	19.7	14.7	29.0	34.7	24.6	25.9	37.7	21.0	20.2	16.9	16.3
LnGrp LOS	D	B	B	C	C	C	C	D	C	C	B	B
Approach Vol, veh/h		912			628			867			535	
Approach Delay, s/veh		25.9			32.8			32.8			17.0	
Approach LOS		C			C			C			B	
Timer - Assigned Phs	1	2		4		6	7	8				
Phs Duration (G+Y+Rc), s	8.2	37.1		44.7		45.3	15.0	29.7				
Change Period (Y+Rc), s	4.5	4.5		4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s	5.0	30.7		40.8		40.2	10.5	25.8				
Max Q Clear Time (g_c+I1), s	3.6	26.8		21.4		10.8	12.3	24.8				
Green Ext Time (p_c), s	0.0	1.8		3.6		2.5	0.0	0.4				

Intersection Summary

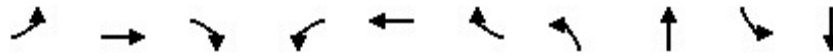
HCM 6th Ctrl Delay	27.8
HCM 6th LOS	C



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	100		150	150		100	600		0	250		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor			0.850			0.850		0.993			0.988	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	5050	0	1770	5024	0
Flt Permitted	0.180			0.505			0.072			0.079		
Satd. Flow (perm)	335	1863	1583	941	1863	1583	134	5050	0	147	5024	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			193			177		9			14	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1480			550			1046			611	
Travel Time (s)		33.6			12.5			23.8			13.9	

Intersection Summary

Area Type: Other

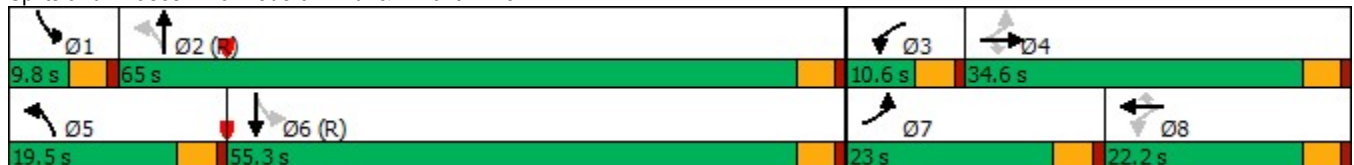


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations	↖	↑	↗	↖	↑	↗	↖	↑↑↑	↖	↑↑↑
Traffic Volume (vph)	339	288	206	135	251	116	260	2230	101	1826
Future Volume (vph)	339	288	206	135	251	116	260	2230	101	1826
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA
Protected Phases	7	4		3	8		5	2	1	6
Permitted Phases	4		4	8		8	2		6	
Detector Phase	7	4	4	3	8	8	5	2	1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	20.6	20.6	9.5	22.5	9.5	22.5
Total Split (s)	23.0	34.6	34.6	10.6	22.2	22.2	19.5	65.0	9.8	55.3
Total Split (%)	19.2%	28.8%	28.8%	8.8%	18.5%	18.5%	16.3%	54.2%	8.2%	46.1%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)	40.7	30.1	30.1	23.8	17.7	17.7	70.3	60.5	56.1	50.8
Actuated g/C Ratio	0.34	0.25	0.25	0.20	0.15	0.15	0.59	0.50	0.47	0.42
v/c Ratio	1.10	0.67	0.41	0.64	1.00	0.33	1.00	1.00	0.79	1.01
Control Delay	112.4	48.6	10.2	48.0	105.0	4.2	87.9	47.1	56.5	56.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	112.4	48.6	10.2	48.0	105.0	4.2	87.9	47.1	56.5	56.4
LOS	F	D	B	D	F	A	F	D	E	E
Approach Delay		65.1			66.4			51.2		56.4
Approach LOS		E			E			D		E

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 120
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.10
 Intersection Signal Delay: 56.2
 Intersection Capacity Utilization 100.1%
 Analysis Period (min) 15
 Intersection LOS: E
 ICU Level of Service G

Splits and Phases: 6: Federal Blvd. & W. 64th Ave.





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	368	313	224	147	273	126	283	2544	110	2155
v/c Ratio	1.10	0.67	0.41	0.64	1.00	0.33	1.00	1.00	0.79	1.01
Control Delay	112.4	48.6	10.2	48.0	105.0	4.2	87.9	47.1	56.5	56.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	112.4	48.6	10.2	48.0	105.0	4.2	87.9	47.1	56.5	56.4
Queue Length 50th (ft)	~273	219	18	82	214	0	170	694	36	~613
Queue Length 95th (ft)	#468	321	85	#136	#391	18	#355	#840	#133	#736
Internal Link Dist (ft)		1400			470			966		531
Turn Bay Length (ft)	100		150	150		100	600		250	
Base Capacity (vph)	334	467	541	228	274	384	283	2550	140	2134
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.10	0.67	0.41	0.64	1.00	0.33	1.00	1.00	0.79	1.01

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

HCM 6th Signalized Intersection Summary
6: Federal Blvd. & W. 64th Ave.

6501 Lowell Blvd
06/07/2021


























Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	339	288	206	135	251	116	260	2230	110	101	1826	156
Future Volume (veh/h)	339	288	206	135	251	116	260	2230	110	101	1826	156
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	368	313	224	147	273	126	283	2424	120	110	1985	170
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	336	469	398	238	276	234	285	2514	123	142	2029	173
Arrive On Green	0.15	0.25	0.25	0.05	0.15	0.15	0.13	0.50	0.50	0.04	0.42	0.42
Sat Flow, veh/h	1781	1870	1585	1781	1870	1585	1781	4986	245	1781	4793	408
Grp Volume(v), veh/h	368	313	224	147	273	126	283	1648	896	110	1406	749
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	1585	1781	1702	1826	1781	1702	1797
Q Serve(g_s), s	18.5	18.1	14.8	6.1	17.5	8.8	14.9	55.8	57.3	4.2	48.7	49.5
Cycle Q Clear(g_c), s	18.5	18.1	14.8	6.1	17.5	8.8	14.9	55.8	57.3	4.2	48.7	49.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.13	1.00		0.23
Lane Grp Cap(c), veh/h	336	469	398	238	276	234	285	1716	921	142	1441	761
V/C Ratio(X)	1.09	0.67	0.56	0.62	0.99	0.54	0.99	0.96	0.97	0.77	0.98	0.98
Avail Cap(c_a), veh/h	336	469	398	238	276	234	285	1716	921	142	1441	761
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	0.84	0.84	0.84	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.4	40.4	39.2	44.2	51.1	47.4	39.4	28.6	29.0	28.8	34.0	34.2
Incr Delay (d2), s/veh	72.7	3.0	1.5	4.8	51.2	2.5	51.6	14.2	23.8	22.9	18.6	29.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	21.7	13.1	9.6	2.7	17.8	6.6	18.3	33.4	39.0	4.8	31.2	35.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	109.1	43.5	40.8	49.0	102.2	49.8	90.9	42.8	52.8	51.8	52.6	63.3
LnGrp LOS	F	D	D	D	F	D	F	D	D	D	D	E
Approach Vol, veh/h		905			546			2827			2265	
Approach Delay, s/veh		69.5			75.8			50.7			56.1	
Approach LOS		E			E			D			E	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.8	65.0	10.6	34.6	19.5	55.3	23.0	22.2				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	5.3	60.5	6.1	30.1	15.0	50.8	18.5	17.7				
Max Q Clear Time (g_c+I1), s	6.2	59.3	8.1	20.1	16.9	51.5	20.5	19.5				
Green Ext Time (p_c), s	0.0	1.2	0.0	1.9	0.0	0.0	0.0	0.0				

Intersection Summary

HCM 6th Ctrl Delay	57.3
HCM 6th LOS	E

Notes

User approved pedestrian interval to be less than phase max green.

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		150	150		0	225		250	150		150
Storage Lanes	1		1	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850		0.931				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1734	0	1770	1863	1583	1770	1863	1583
Flt Permitted	0.742			0.750			0.535			0.619		
Satd. Flow (perm)	1382	1863	1583	1397	1734	0	997	1863	1583	1153	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			136		11				27			65
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		594			990			699			502	
Travel Time (s)		13.5			22.5			15.9			11.4	

Intersection Summary

Area Type: Other

Timings
1: Lowell Blvd. & W. 68th Ave.

6501 Lowell Blvd
06/07/2021



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	56	10	125	3	12	71	205	1	18	352	60
Future Volume (vph)	56	10	125	3	12	71	205	1	18	352	60
Turn Type	Perm	NA	Perm	Perm	NA	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8		2			6	
Permitted Phases	4		4	8		2		2	6		6
Detector Phase	4	4	4	8	8	2	2	2	6	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	26.0	26.0	26.0	26.0	26.0	34.0	34.0	34.0	34.0	34.0	34.0
Total Split (%)	43.3%	43.3%	43.3%	43.3%	43.3%	56.7%	56.7%	56.7%	56.7%	56.7%	56.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag											
Lead-Lag Optimize?											
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	8.2	8.2	8.2	8.2	8.2	45.7	45.7	45.7	45.7	45.7	45.7
Actuated g/C Ratio	0.14	0.14	0.14	0.14	0.14	0.76	0.76	0.76	0.76	0.76	0.76
v/c Ratio	0.32	0.04	0.41	0.02	0.10	0.10	0.16	0.00	0.02	0.27	0.05
Control Delay	27.2	21.3	8.9	21.0	16.5	3.6	3.4	0.0	3.2	3.9	1.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.2	21.3	8.9	21.0	16.5	3.6	3.4	0.0	3.2	3.9	1.2
LOS	C	C	A	C	B	A	A	A	A	A	A
Approach Delay		14.9			17.0		3.4			3.5	
Approach LOS		B			B		A			A	

Intersection Summary

Cycle Length: 60
 Actuated Cycle Length: 60
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 45
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.41
 Intersection Signal Delay: 6.2
 Intersection Capacity Utilization 43.7%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service A

Splits and Phases: 1: Lowell Blvd. & W. 68th Ave.



Queues

6501 Lowell Blvd

1: Lowell Blvd. & W. 68th Ave.

06/07/2021



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	61	11	136	3	24	77	223	1	20	383	65
v/c Ratio	0.32	0.04	0.41	0.02	0.10	0.10	0.16	0.00	0.02	0.27	0.05
Control Delay	27.2	21.3	8.9	21.0	16.5	3.6	3.4	0.0	3.2	3.9	1.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.2	21.3	8.9	21.0	16.5	3.6	3.4	0.0	3.2	3.9	1.2
Queue Length 50th (ft)	20	4	0	1	4	6	19	0	2	37	0
Queue Length 95th (ft)	48	15	39	7	20	20	46	0	7	82	9
Internal Link Dist (ft)		514			910		619			422	
Turn Bay Length (ft)	150		150	150		225		250	150		150
Base Capacity (vph)	495	667	654	500	628	759	1419	1212	878	1419	1221
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.12	0.02	0.21	0.01	0.04	0.10	0.16	0.00	0.02	0.27	0.05

Intersection Summary

HCM 6th Signalized Intersection Summary
 1: Lowell Blvd. & W. 68th Ave.

6501 Lowell Blvd
 06/07/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	56	10	125	3	12	10	71	205	1	18	352	60
Future Volume (veh/h)	56	10	125	3	12	10	71	205	1	18	352	60
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	61	11	136	3	13	11	77	223	1	20	383	65
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	272	229	194	265	114	97	740	1361	1154	919	1361	1154
Arrive On Green	0.12	0.12	0.12	0.12	0.12	0.12	0.73	0.73	0.73	0.73	0.73	0.73
Sat Flow, veh/h	1387	1870	1585	1241	936	792	942	1870	1585	1157	1870	1585
Grp Volume(v), veh/h	61	11	136	3	0	24	77	223	1	20	383	65
Grp Sat Flow(s),veh/h/ln	1387	1870	1585	1241	0	1728	942	1870	1585	1157	1870	1585
Q Serve(g_s), s	2.5	0.3	4.9	0.1	0.0	0.7	1.8	2.2	0.0	0.3	4.2	0.7
Cycle Q Clear(g_c), s	3.2	0.3	4.9	0.4	0.0	0.7	6.0	2.2	0.0	2.5	4.2	0.7
Prop In Lane	1.00		1.00	1.00		0.46	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	272	229	194	265	0	211	740	1361	1154	919	1361	1154
V/C Ratio(X)	0.22	0.05	0.70	0.01	0.00	0.11	0.10	0.16	0.00	0.02	0.28	0.06
Avail Cap(c_a), veh/h	600	670	568	558	0	619	740	1361	1154	919	1361	1154
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.9	23.3	25.3	23.4	0.0	23.4	3.8	2.5	2.2	2.9	2.8	2.3
Incr Delay (d2), s/veh	0.4	0.1	4.6	0.0	0.0	0.2	0.3	0.3	0.0	0.0	0.5	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.4	0.2	3.6	0.1	0.0	0.5	0.5	0.9	0.0	0.1	1.8	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.3	23.3	29.9	23.5	0.0	23.7	4.1	2.8	2.2	3.0	3.3	2.4
LnGrp LOS	C	C	C	C	A	C	A	A	A	A	A	A
Approach Vol, veh/h		208			27			301			468	
Approach Delay, s/veh		28.2			23.7			3.1			3.2	
Approach LOS		C			C			A			A	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		48.2		11.8		48.2		11.8				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		29.5		21.5		29.5		21.5				
Max Q Clear Time (g_c+I1), s		8.0		6.9		6.2		2.7				
Green Ext Time (p_c), s		1.6		0.5		2.7		0.1				

Intersection Summary

HCM 6th Ctrl Delay	8.9
HCM 6th LOS	A



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↘		↗	↘	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	100		0	100		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.921			0.940			0.996			0.993	
Flt Protected		0.986			0.978		0.950		0.950		0.950	
Satd. Flow (prot)	0	1692	0	0	1712	0	1770	1855	0	1770	1850	0
Flt Permitted		0.986			0.978		0.950		0.950		0.950	
Satd. Flow (perm)	0	1692	0	0	1712	0	1770	1855	0	1770	1850	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		458			470			732			699	
Travel Time (s)		10.4			10.7			16.6			15.9	

Intersection Summary

Area Type: Other

Intersection												
Int Delay, s/veh	1.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	15	6	29	16	4	16	12	366	10	4	490	24
Future Vol, veh/h	15	6	29	16	4	16	12	366	10	4	490	24
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	16	7	32	17	4	17	13	398	11	4	533	26

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	994	989	546	1004	997	404	559	0	0	409	0	0
Stage 1	554	554	-	430	430	-	-	-	-	-	-	-
Stage 2	440	435	-	574	567	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	224	247	538	220	244	647	1012	-	-	1150	-	-
Stage 1	517	514	-	603	583	-	-	-	-	-	-	-
Stage 2	596	580	-	504	507	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	212	243	538	200	240	647	1012	-	-	1150	-	-
Mov Cap-2 Maneuver	212	243	-	200	240	-	-	-	-	-	-	-
Stage 1	510	512	-	595	575	-	-	-	-	-	-	-
Stage 2	568	572	-	467	505	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	17.8		19		0.3		0.1	
HCM LOS	C		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1012	-	-	335	297	1150	-	-
HCM Lane V/C Ratio	0.013	-	-	0.162	0.132	0.004	-	-
HCM Control Delay (s)	8.6	-	-	17.8	19	8.1	-	-
HCM Lane LOS	A	-	-	C	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.6	0.4	0	-	-



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↘		↗	↘	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	100		0	100		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.916			0.921			0.996			0.999	
Flt Protected		0.986			0.983		0.950		0.950			
Satd. Flow (prot)	0	1682	0	0	1686	0	1770	1855	0	1770	1861	0
Flt Permitted		0.986			0.983		0.950		0.950			
Satd. Flow (perm)	0	1682	0	0	1686	0	1770	1855	0	1770	1861	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		319			430			608			732	
Travel Time (s)		7.3			9.8			13.8			16.6	

Intersection Summary

Area Type: Other

Intersection												
Int Delay, s/veh	1.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	11	4	24	9	2	16	8	363	10	13	520	4
Future Vol, veh/h	11	4	24	9	2	16	8	363	10	13	520	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	12	4	26	10	2	17	9	395	11	14	565	4

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1023	1019	567	1029	1016	401	569	0	0	406	0	0
Stage 1	595	595	-	419	419	-	-	-	-	-	-	-
Stage 2	428	424	-	610	597	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	214	237	523	212	238	649	1003	-	-	1153	-	-
Stage 1	491	492	-	612	590	-	-	-	-	-	-	-
Stage 2	605	587	-	482	491	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	204	232	523	195	233	649	1003	-	-	1153	-	-
Mov Cap-2 Maneuver	204	232	-	195	233	-	-	-	-	-	-	-
Stage 1	487	486	-	606	585	-	-	-	-	-	-	-
Stage 2	581	582	-	448	485	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	17.4		16.6		0.2		0.2	
HCM LOS	C		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1003	-	-	333	340	1153	-	-
HCM Lane V/C Ratio	0.009	-	-	0.127	0.086	0.012	-	-
HCM Control Delay (s)	8.6	-	-	17.4	16.6	8.2	-	-
HCM Lane LOS	A	-	-	C	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.4	0.3	0	-	-

Lanes and Geometrics
 4: Tennyson St. & W 64th Ave.

6501 Lowell Blvd
 06/07/2021



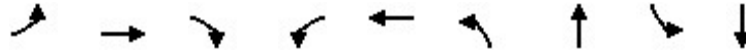
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		100	150		0	0		0	0		0
Storage Lanes	1		1	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850		0.995			0.919				0.949
Flt Protected	0.950			0.950				0.984				0.993
Satd. Flow (prot)	1770	1863	1583	1770	1853	0	0	1684	0	0	1755	0
Flt Permitted	0.220			0.349				0.899				0.966
Satd. Flow (perm)	410	1863	1583	650	1853	0	0	1539	0	0	1708	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			74		3			93				21
Link Speed (mph)		30			30			30				30
Link Distance (ft)		700			838			502				485
Travel Time (s)		15.9			19.0			11.4				11.0

Intersection Summary

Area Type: Other

Timings
4: Tennyson St. & W 64th Ave.

6501 Lowell Blvd
06/07/2021

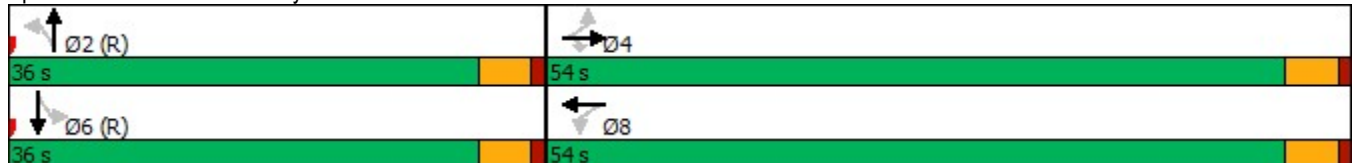


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↖	↑	↗	↖	↗		↕		↕
Traffic Volume (vph)	13	359	68	180	450	63	16	7	25
Future Volume (vph)	13	359	68	180	450	63	16	7	25
Turn Type	Perm	NA	Perm	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4			8		2		6
Permitted Phases	4		4	8		2		6	
Detector Phase	4	4	4	8	8	2	2	6	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	54.0	54.0	54.0	54.0	54.0	36.0	36.0	36.0	36.0
Total Split (%)	60.0%	60.0%	60.0%	60.0%	60.0%	40.0%	40.0%	40.0%	40.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5		4.5		4.5
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	32.9	32.9	32.9	32.9	32.9		48.1		48.1
Actuated g/C Ratio	0.37	0.37	0.37	0.37	0.37		0.53		0.53
v/c Ratio	0.09	0.57	0.12	0.83	0.74		0.25		0.06
Control Delay	16.6	25.3	4.0	63.2	42.2		8.7		9.7
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	16.6	25.3	4.0	63.2	42.2		8.7		9.7
LOS	B	C	A	E	D		A		A
Approach Delay		21.7			48.1		8.7		9.7
Approach LOS		C			D		A		A

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 50
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.83
 Intersection Signal Delay: 32.1
 Intersection Capacity Utilization 58.4%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service B

Splits and Phases: 4: Tennyson St. & W 64th Ave.





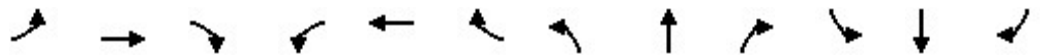
Lane Group	EBL	EBT	EBR	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	14	390	74	196	505	214	56
v/c Ratio	0.09	0.57	0.12	0.83	0.74	0.25	0.06
Control Delay	16.6	25.3	4.0	63.2	42.2	8.7	9.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.6	25.3	4.0	63.2	42.2	8.7	9.7
Queue Length 50th (ft)	5	174	0	113	283	33	9
Queue Length 95th (ft)	15	212	22	176	357	92	34
Internal Link Dist (ft)		620			758	422	405
Turn Bay Length (ft)	150		100	150			
Base Capacity (vph)	225	1024	903	357	1020	866	922
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.38	0.08	0.55	0.50	0.25	0.06
Intersection Summary							

HCM 6th Signalized Intersection Summary
4: Tennyson St. & W 64th Ave.

6501 Lowell Blvd
06/07/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	13	359	68	180	450	15	63	16	119	7	25	19
Future Volume (veh/h)	13	359	68	180	450	15	63	16	119	7	25	19
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	14	390	74	196	489	16	68	17	129	8	27	21
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	259	780	661	325	751	25	263	85	448	129	421	302
Arrive On Green	0.42	0.42	0.42	0.42	0.42	0.42	0.48	0.48	0.48	0.48	0.48	0.48
Sat Flow, veh/h	894	1870	1585	928	1801	59	436	175	928	172	872	626
Grp Volume(v), veh/h	14	390	74	196	0	505	214	0	0	56	0	0
Grp Sat Flow(s),veh/h/ln	894	1870	1585	928	0	1860	1539	0	0	1671	0	0
Q Serve(g_s), s	1.1	13.8	2.6	17.7	0.0	19.6	2.8	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	20.7	13.8	2.6	31.6	0.0	19.6	7.1	0.0	0.0	1.5	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.03	0.32		0.60	0.14		0.37
Lane Grp Cap(c), veh/h	259	780	661	325	0	776	795	0	0	852	0	0
V/C Ratio(X)	0.05	0.50	0.11	0.60	0.00	0.65	0.27	0.00	0.00	0.07	0.00	0.00
Avail Cap(c_a), veh/h	377	1029	872	448	0	1023	795	0	0	852	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	29.3	19.3	16.0	30.9	0.0	21.0	13.8	0.0	0.0	12.4	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.5	0.1	1.8	0.0	0.9	0.8	0.0	0.0	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.4	9.8	1.7	7.2	0.0	13.0	4.8	0.0	0.0	1.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	29.3	19.8	16.1	32.7	0.0	21.9	14.6	0.0	0.0	12.6	0.0	0.0
LnGrp LOS	C	B	B	C	A	C	B	A	A	B	A	A
Approach Vol, veh/h		478			701			214			56	
Approach Delay, s/veh		19.5			24.9			14.6			12.6	
Approach LOS		B			C			B			B	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		47.9		42.1		47.9		42.1				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		31.5		49.5		31.5		49.5				
Max Q Clear Time (g_c+I1), s		9.1		22.7		3.5		33.6				
Green Ext Time (p_c), s		1.3		2.9		0.2		4.0				
Intersection Summary												
HCM 6th Ctrl Delay				21.1								
HCM 6th LOS				C								



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)	0%		0%		0%		0%		0%		0%	
Storage Length (ft)	200		150	150		75	200		150	200		100
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.850			0.850			0.850			0.850		
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.253			0.539			0.556			0.565		
Satd. Flow (perm)	471	1863	1583	1004	1863	1583	1036	1863	1583	1052	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			115			127			127			153
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		596			1268			763			608	
Travel Time (s)		13.5			28.8			17.3			13.8	

Intersection Summary

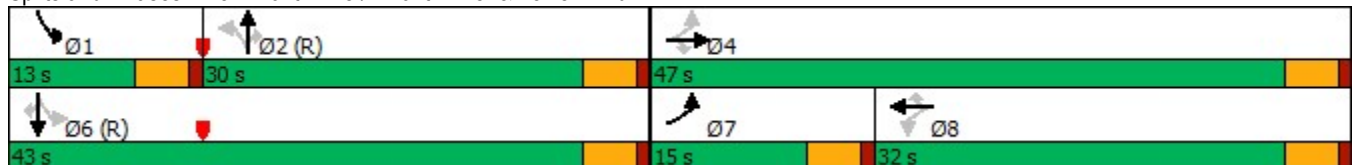
Area Type: Other

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	132	345	106	81	271	49	52	150	63	104	314	141
Future Volume (vph)	132	345	106	81	271	49	52	150	63	104	314	141
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4			8			2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	7	4	4	8	8	8	2	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	15.0	47.0	47.0	32.0	32.0	32.0	30.0	30.0	30.0	13.0	43.0	43.0
Total Split (%)	16.7%	52.2%	52.2%	35.6%	35.6%	35.6%	33.3%	33.3%	33.3%	14.4%	47.8%	47.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead			Lag	Lag	Lag	Lag	Lag	Lag	Lag	Lead	
Lead-Lag Optimize?	Yes			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	34.2	34.2	34.2	19.9	19.9	19.9	36.4	36.4	36.4	46.8	46.8	46.8
Actuated g/C Ratio	0.38	0.38	0.38	0.22	0.22	0.22	0.40	0.40	0.40	0.52	0.52	0.52
v/c Ratio	0.45	0.53	0.17	0.40	0.72	0.12	0.14	0.22	0.10	0.18	0.35	0.17
Control Delay	34.8	38.0	14.6	31.5	37.6	3.6	23.1	22.1	0.8	13.8	15.5	3.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.8	38.0	14.6	31.5	37.6	3.6	23.1	22.1	0.8	13.8	15.5	3.1
LOS	C	D	B	C	D	A	C	C	A	B	B	A
Approach Delay		33.0			32.3			17.3			12.1	
Approach LOS		C			C			B			B	

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 65
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.72
 Intersection Signal Delay: 24.1
 Intersection Capacity Utilization 58.3%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service B

Splits and Phases: 5: W 64th Ave./W. 64th Ave. & Lowell Blvd.





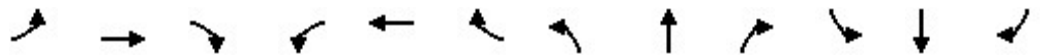
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	143	375	115	88	295	53	57	163	68	113	341	153
v/c Ratio	0.45	0.53	0.17	0.40	0.72	0.12	0.14	0.22	0.10	0.18	0.35	0.17
Control Delay	34.8	38.0	14.6	31.5	37.6	3.6	23.1	22.1	0.8	13.8	15.5	3.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.8	38.0	14.6	31.5	37.6	3.6	23.1	22.1	0.8	13.8	15.5	3.1
Queue Length 50th (ft)	77	210	19	43	158	2	21	63	0	31	109	0
Queue Length 95th (ft)	111	261	48	m57	m182	m3	56	126	5	72	204	34
Internal Link Dist (ft)		516			1188			683			528	
Turn Bay Length (ft)	200		150	150		75	200		150	200		100
Base Capacity (vph)	330	879	808	306	569	571	418	753	715	617	969	896
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.43	0.14	0.29	0.52	0.09	0.14	0.22	0.10	0.18	0.35	0.17

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM 6th Signalized Intersection Summary
 5: W 64th Ave./W. 64th Ave. & Lowell Blvd.

6501 Lowell Blvd
 06/07/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↶	↷	↷	↶	↷	↷	↶	↷	↷	↶	↷	↷
Traffic Volume (veh/h)	132	345	106	81	271	49	52	150	63	104	314	141
Future Volume (veh/h)	132	345	106	81	271	49	52	150	63	104	314	141
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	143	375	115	88	295	53	57	163	68	113	341	153
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	270	618	523	206	371	314	502	874	741	652	1066	903
Arrive On Green	0.03	0.11	0.11	0.07	0.07	0.07	0.47	0.47	0.47	0.05	0.57	0.57
Sat Flow, veh/h	1781	1870	1585	906	1870	1585	903	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	143	375	115	88	295	53	57	163	68	113	341	153
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	906	1870	1585	903	1870	1585	1781	1870	1585
Q Serve(g_s), s	5.5	17.2	6.0	8.6	14.0	2.8	3.2	4.6	2.1	2.8	8.6	4.1
Cycle Q Clear(g_c), s	5.5	17.2	6.0	14.0	14.0	2.8	3.2	4.6	2.1	2.8	8.6	4.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	270	618	523	206	371	314	502	874	741	652	1066	903
V/C Ratio(X)	0.53	0.61	0.22	0.43	0.80	0.17	0.11	0.19	0.09	0.17	0.32	0.17
Avail Cap(c_a), veh/h	332	883	748	303	571	484	502	874	741	727	1066	903
HCM Platoon Ratio	0.33	0.33	0.33	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	0.70	0.70	0.70	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.0	34.5	29.5	42.9	40.3	35.0	13.6	14.0	13.3	10.3	10.2	9.2
Incr Delay (d2), s/veh	1.6	1.0	0.2	1.0	3.1	0.2	0.5	0.5	0.2	0.1	0.8	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	4.5	13.6	4.3	3.8	11.0	2.0	1.3	3.6	1.4	1.9	6.3	2.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.6	35.5	29.7	43.9	43.3	35.2	14.1	14.4	13.6	10.5	11.0	9.6
LnGrp LOS	C	D	C	D	D	D	B	B	B	B	B	A
Approach Vol, veh/h		633			436			288			607	
Approach Delay, s/veh		32.9			42.5			14.2			10.5	
Approach LOS		C			D			B			B	
Timer - Assigned Phs	1	2		4		6	7	8				
Phs Duration (G+Y+Rc), s	9.2	46.6		34.2		55.8	11.9	22.4				
Change Period (Y+Rc), s	4.5	4.5		4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s	8.5	25.5		42.5		38.5	10.5	27.5				
Max Q Clear Time (g_c+l1), s	4.8	6.6		19.2		10.6	7.5	16.0				
Green Ext Time (p_c), s	0.1	1.3		2.7		2.7	0.1	1.9				

Intersection Summary

HCM 6th Ctrl Delay	25.4
HCM 6th LOS	C



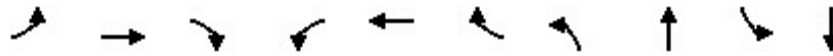
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	100		150	150		100	600		0	250		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor			0.850			0.850		0.987			0.990	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	5019	0	1770	5034	0
Flt Permitted	0.380			0.414			0.085			0.194		
Satd. Flow (perm)	708	1863	1583	771	1863	1583	158	5019	0	361	5034	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			127			127		23			18	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1268			424			903			562	
Travel Time (s)		28.8			9.6			20.5			12.8	

Intersection Summary

Area Type: Other

Timings
6: Federal Blvd. & W. 64th Ave.

6501 Lowell Blvd
06/07/2021

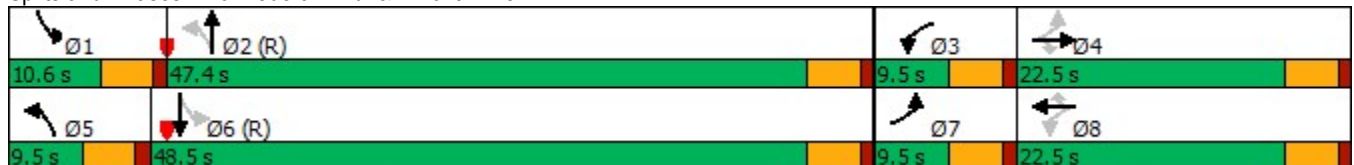


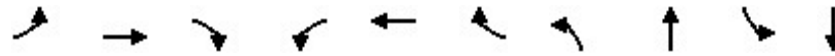
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations	↖	↑	↗	↖	↑	↗	↖	↑↑↑	↖	↑↑↑
Traffic Volume (vph)	130	189	195	157	201	48	108	974	76	2553
Future Volume (vph)	130	189	195	157	201	48	108	974	76	2553
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA
Protected Phases	7	4		3	8		5	2	1	6
Permitted Phases	4		4	8		8	2		6	
Detector Phase	7	4	4	3	8	8	5	2	1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	9.5	22.5
Total Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	47.4	10.6	48.5
Total Split (%)	10.6%	25.0%	25.0%	10.6%	25.0%	25.0%	10.6%	52.7%	11.8%	53.9%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)	20.0	15.0	15.0	20.0	15.0	15.0	52.6	47.7	52.1	45.8
Actuated g/C Ratio	0.22	0.17	0.17	0.22	0.17	0.17	0.58	0.53	0.58	0.51
v/c Ratio	0.65	0.66	0.57	0.75	0.70	0.14	0.58	0.43	0.27	1.16
Control Delay	34.1	35.4	13.7	49.8	47.4	0.8	25.4	14.3	9.7	99.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.1	35.4	13.7	49.8	47.4	0.8	25.4	14.3	9.7	99.6
LOS	C	D	B	D	D	A	C	B	A	F
Approach Delay		26.8			42.8			15.3		97.2
Approach LOS		C			D			B		F

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 120
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.16
 Intersection Signal Delay: 65.7
 Intersection Capacity Utilization 93.1%
 Analysis Period (min) 15
 Intersection LOS: E
 ICU Level of Service F

Splits and Phases: 6: Federal Blvd. & W. 64th Ave.





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	141	205	212	171	218	52	117	1158	83	2976
v/c Ratio	0.65	0.66	0.57	0.75	0.70	0.14	0.58	0.43	0.27	1.16
Control Delay	34.1	35.4	13.7	49.8	47.4	0.8	25.4	14.3	9.7	99.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.1	35.4	13.7	49.8	47.4	0.8	25.4	14.3	9.7	99.6
Queue Length 50th (ft)	38	60	0	77	117	0	25	148	17	~765
Queue Length 95th (ft)	79	119	19	#144	187	0	#98	191	37	#860
Internal Link Dist (ft)		1188			344			823		482
Turn Bay Length (ft)	100		150	150		100	600		250	
Base Capacity (vph)	216	372	418	227	372	418	202	2672	308	2570
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.65	0.55	0.51	0.75	0.59	0.12	0.58	0.43	0.27	1.16

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

HCM 6th Signalized Intersection Summary
6: Federal Blvd. & W. 64th Ave.

6501 Lowell Blvd
06/07/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	130	189	195	157	201	48	108	974	91	76	2553	185
Future Volume (veh/h)	130	189	195	157	201	48	108	974	91	76	2553	185
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	141	205	212	171	218	52	117	1059	99	83	2775	201
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	237	305	258	233	305	258	174	2532	236	360	2575	182
Arrive On Green	0.02	0.05	0.05	0.06	0.16	0.16	0.05	0.53	0.53	0.05	0.53	0.53
Sat Flow, veh/h	1781	1870	1585	1781	1870	1585	1781	4751	444	1781	4868	344
Grp Volume(v), veh/h	141	205	212	171	218	52	117	758	400	83	1921	1055
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	1585	1781	1702	1791	1781	1702	1808
Q Serve(g_s), s	5.0	9.7	11.9	5.0	9.9	2.6	2.6	12.0	12.1	1.9	47.6	47.6
Cycle Q Clear(g_c), s	5.0	9.7	11.9	5.0	9.9	2.6	2.6	12.0	12.1	1.9	47.6	47.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.25	1.00		0.19
Lane Grp Cap(c), veh/h	237	305	258	233	305	258	174	1814	954	360	1801	957
V/C Ratio(X)	0.59	0.67	0.82	0.74	0.72	0.20	0.67	0.42	0.42	0.23	1.07	1.10
Avail Cap(c_a), veh/h	237	374	317	233	374	317	179	1814	954	394	1801	957
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	0.92	0.92	0.92	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.2	40.2	41.3	34.3	35.7	32.6	21.0	12.6	12.6	9.3	21.2	21.2
Incr Delay (d2), s/veh	3.7	3.2	12.3	11.5	4.9	0.4	9.2	0.7	1.4	0.3	41.6	61.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.3	8.6	9.7	3.7	8.5	1.8	3.0	7.9	8.5	1.3	37.8	47.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	36.8	43.4	53.5	45.7	40.6	33.0	30.2	13.3	14.0	9.7	62.8	82.8
LnGrp LOS	D	D	D	D	D	C	C	B	B	A	F	F
Approach Vol, veh/h		558			441			1275			3059	
Approach Delay, s/veh		45.6			41.7			15.1			68.2	
Approach LOS		D			D			B			E	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.9	52.5	9.5	19.2	9.2	52.1	9.5	19.2				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	6.1	42.9	5.0	18.0	5.0	44.0	5.0	18.0				
Max Q Clear Time (g_c+I1), s	3.9	14.1	7.0	13.9	4.6	49.6	7.0	11.9				
Green Ext Time (p_c), s	0.0	9.3	0.0	0.7	0.0	0.0	0.0	0.7				
Intersection Summary												
HCM 6th Ctrl Delay			51.0									
HCM 6th LOS			D									



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)		0%	0%		0%	
Storage Length (ft)	100			0	0	0
Storage Lanes	1			0	1	0
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.998		0.942	
Flt Protected	0.950				0.972	
Satd. Flow (prot)	1770	1863	1859	0	1706	0
Flt Permitted	0.950				0.972	
Satd. Flow (perm)	1770	1863	1859	0	1706	0
Link Speed (mph)		30	30		30	
Link Distance (ft)		838	596		267	
Travel Time (s)		19.0	13.5		6.1	

Intersection Summary
























Area Type: Other

Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	5	565	458	6	18	14
Future Vol, veh/h	5	565	458	6	18	14
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	614	498	7	20	15

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	505	0	-	0	1126 502
Stage 1	-	-	-	-	502 -
Stage 2	-	-	-	-	624 -
Critical Hdwy	4.12	-	-	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.218	-	-	-	3.518 3.318
Pot Cap-1 Maneuver	1060	-	-	-	227 569
Stage 1	-	-	-	-	608 -
Stage 2	-	-	-	-	534 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1060	-	-	-	226 569
Mov Cap-2 Maneuver	-	-	-	-	226 -
Stage 1	-	-	-	-	605 -
Stage 2	-	-	-	-	534 -

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	18.2
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1060	-	-	-	307
HCM Lane V/C Ratio	0.005	-	-	-	0.113
HCM Control Delay (s)	8.4	-	-	-	18.2
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	0.4

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		150	150		0	225		250	150		150
Storage Lanes	1		1	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850		0.904				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1684	0	1770	1863	1583	1770	1863	1583
Flt Permitted	0.719			0.747			0.488			0.277		
Satd. Flow (perm)	1339	1863	1583	1391	1684	0	909	1863	1583	516	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			85		37				27			98
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		549			716			667			367	
Travel Time (s)		12.5			16.3			15.2			8.3	

Intersection Summary

Area Type: Other

Timings
1: Lowell Blvd. & W. 68th Ave.

6501 Lowell Blvd
06/07/2021

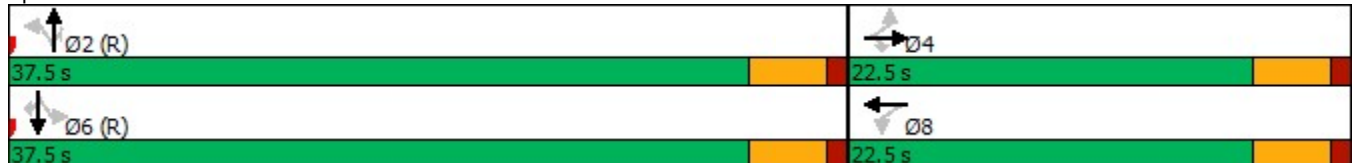


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑	↗	↖	↗	↖	↑	↗	↖	↑	↗
Traffic Volume (vph)	59	15	78	13	19	135	765	22	15	420	90
Future Volume (vph)	59	15	78	13	19	135	765	22	15	420	90
Turn Type	Perm	NA	Perm	Perm	NA	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8		2			6	
Permitted Phases	4		4	8		2		2	6		6
Detector Phase	4	4	4	8	8	2	2	2	6	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	22.5	22.5	22.5	22.5	22.5	37.5	37.5	37.5	37.5	37.5	37.5
Total Split (%)	37.5%	37.5%	37.5%	37.5%	37.5%	62.5%	62.5%	62.5%	62.5%	62.5%	62.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag											
Lead-Lag Optimize?											
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	8.3	8.3	8.3	8.3	8.3	45.6	45.6	45.6	45.6	45.6	45.6
Actuated g/C Ratio	0.14	0.14	0.14	0.14	0.14	0.76	0.76	0.76	0.76	0.76	0.76
v/c Ratio	0.35	0.06	0.29	0.07	0.22	0.21	0.59	0.02	0.04	0.32	0.08
Control Delay	27.7	21.3	8.8	21.8	13.6	4.4	7.0	1.5	3.7	4.3	1.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.7	21.3	8.8	21.8	13.6	4.4	7.0	1.5	3.7	4.3	1.1
LOS	C	C	A	C	B	A	A	A	A	A	A
Approach Delay		17.3			15.2		6.5			3.7	
Approach LOS		B			B		A			A	

Intersection Summary

Cycle Length: 60
 Actuated Cycle Length: 60
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.59
 Intersection Signal Delay: 6.9
 Intersection Capacity Utilization 65.6%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service C

Splits and Phases: 1: Lowell Blvd. & W. 68th Ave.



Queues

6501 Lowell Blvd

1: Lowell Blvd. & W. 68th Ave.

06/07/2021



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	64	16	85	14	58	147	832	24	16	457	98
v/c Ratio	0.35	0.06	0.29	0.07	0.22	0.21	0.59	0.02	0.04	0.32	0.08
Control Delay	27.7	21.3	8.8	21.8	13.6	4.4	7.0	1.5	3.7	4.3	1.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.7	21.3	8.8	21.8	13.6	4.4	7.0	1.5	3.7	4.3	1.1
Queue Length 50th (ft)	21	5	0	5	7	14	117	0	1	47	0
Queue Length 95th (ft)	49	18	30	17	32	39	261	5	7	103	11
Internal Link Dist (ft)		469			636		587			287	
Turn Bay Length (ft)	150		150	150		225		250	150		150
Base Capacity (vph)	401	558	534	417	531	690	1414	1208	392	1414	1225
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.03	0.16	0.03	0.11	0.21	0.59	0.02	0.04	0.32	0.08

Intersection Summary

HCM 6th Signalized Intersection Summary
 1: Lowell Blvd. & W. 68th Ave.

6501 Lowell Blvd
 06/07/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↶	↷	↷	↶	↷		↶	↷	↷	↶	↷	↷
Traffic Volume (veh/h)	59	15	78	13	19	34	135	765	22	15	420	90
Future Volume (veh/h)	59	15	78	13	19	34	135	765	22	15	420	90
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	64	16	85	14	21	37	147	832	24	16	457	98
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	232	214	182	258	70	123	675	1375	1166	458	1375	1166
Arrive On Green	0.11	0.11	0.11	0.11	0.11	0.11	0.74	0.74	0.74	0.74	0.74	0.74
Sat Flow, veh/h	1345	1870	1585	1294	607	1070	854	1870	1585	645	1870	1585
Grp Volume(v), veh/h	64	16	85	14	0	58	147	832	24	16	457	98
Grp Sat Flow(s),veh/h/ln	1345	1870	1585	1294	0	1678	854	1870	1585	645	1870	1585
Q Serve(g_s), s	2.7	0.5	3.0	0.6	0.0	1.9	4.4	12.7	0.2	0.7	5.1	1.0
Cycle Q Clear(g_c), s	4.7	0.5	3.0	1.0	0.0	1.9	9.5	12.7	0.2	13.4	5.1	1.0
Prop In Lane	1.00		1.00	1.00		0.64	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	232	214	182	258	0	192	675	1375	1166	458	1375	1166
V/C Ratio(X)	0.28	0.07	0.47	0.05	0.00	0.30	0.22	0.60	0.02	0.03	0.33	0.08
Avail Cap(c_a), veh/h	481	561	476	498	0	503	675	1375	1166	458	1375	1166
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.5	23.7	24.8	24.2	0.0	24.4	4.4	3.8	2.1	7.0	2.8	2.2
Incr Delay (d2), s/veh	0.6	0.1	1.9	0.1	0.0	0.9	0.7	2.0	0.0	0.1	0.6	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.6	0.4	2.1	0.3	0.0	1.4	1.2	5.5	0.1	0.2	2.1	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.1	23.9	26.7	24.3	0.0	25.2	5.2	5.8	2.2	7.1	3.4	2.4
LnGrp LOS	C	C	C	C	A	C	A	A	A	A	A	A
Approach Vol, veh/h		165			72			1003			571	
Approach Delay, s/veh		26.6			25.0			5.6			3.4	
Approach LOS		C			C			A			A	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		48.6		11.4		48.6		11.4				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		33.0		18.0		33.0		18.0				
Max Q Clear Time (g_c+I1), s		14.7		6.7		15.4		3.9				
Green Ext Time (p_c), s		7.1		0.4		3.2		0.2				

Intersection Summary

HCM 6th Ctrl Delay	7.6
HCM 6th LOS	A



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↘		↗	↘	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	100		0	100		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.961			0.941			0.996			0.992	
Flt Protected		0.971			0.986		0.950			0.950		
Satd. Flow (prot)	0	1738	0	0	1728	0	1770	1855	0	1770	1848	0
Flt Permitted		0.971			0.986		0.950			0.950		
Satd. Flow (perm)	0	1738	0	0	1728	0	1770	1855	0	1770	1848	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		458			470			732			667	
Travel Time (s)		10.4			10.7			16.6			15.2	

Intersection Summary

Area Type: Other

Intersection												
Int Delay, s/veh	5.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	38	7	18	10	10	16	32	855	26	19	460	25
Future Vol, veh/h	38	7	18	10	10	16	32	855	26	19	460	25
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	41	8	20	11	11	17	35	929	28	21	500	27

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1583	1583	514	1583	1582	943	527	0	0	957	0	0
Stage 1	556	556	-	1013	1013	-	-	-	-	-	-	-
Stage 2	1027	1027	-	570	569	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	88	109	560	88	109	318	1040	-	-	719	-	-
Stage 1	515	513	-	288	316	-	-	-	-	-	-	-
Stage 2	283	312	-	506	506	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	73	102	560	76	102	318	1040	-	-	719	-	-
Mov Cap-2 Maneuver	73	102	-	76	102	-	-	-	-	-	-	-
Stage 1	497	498	-	278	305	-	-	-	-	-	-	-
Stage 2	249	301	-	467	491	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	95.2		44.6		0.3		0.4	
HCM LOS	F		E					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1040	-	-	101	129	719	-
HCM Lane V/C Ratio	0.033	-	-	0.678	0.303	0.029	-
HCM Control Delay (s)	8.6	-	-	95.2	44.6	10.2	-
HCM Lane LOS	A	-	-	F	E	B	-
HCM 95th %tile Q(veh)	0.1	-	-	3.4	1.2	0.1	-



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↗	↘		↗	↘	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	100		0	100		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.915			0.940			0.998			0.996	
Flt Protected		0.985			0.978		0.950		0.950		0.950	
Satd. Flow (prot)	0	1679	0	0	1712	0	1770	1859	0	1770	1855	0
Flt Permitted		0.985			0.978		0.950		0.950		0.950	
Satd. Flow (perm)	0	1679	0	0	1712	0	1770	1859	0	1770	1855	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		319			430			608			732	
Travel Time (s)		7.3			9.8			13.8			16.6	

Intersection Summary

Area Type: Other

Intersection												
Int Delay, s/veh	1.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	7	2	16	15	4	15	28	859	13	19	488	12
Future Vol, veh/h	7	2	16	15	4	15	28	859	13	19	488	12
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	8	2	17	16	4	16	30	934	14	21	530	13

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1590	1587	537	1589	1586	941	543	0	0	948	0	0
Stage 1	579	579	-	1001	1001	-	-	-	-	-	-	-
Stage 2	1011	1008	-	588	585	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	87	108	544	87	108	319	1026	-	-	724	-	-
Stage 1	501	501	-	293	321	-	-	-	-	-	-	-
Stage 2	289	318	-	495	498	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	76	102	544	79	102	319	1026	-	-	724	-	-
Mov Cap-2 Maneuver	76	102	-	79	102	-	-	-	-	-	-	-
Stage 1	486	486	-	285	312	-	-	-	-	-	-	-
Stage 2	263	309	-	463	484	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	29	46.4	0.3	0.4
HCM LOS	D	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1026	-	-	177	123	724	-
HCM Lane V/C Ratio	0.03	-	-	0.154	0.3	0.029	-
HCM Control Delay (s)	8.6	-	-	29	46.4	10.1	-
HCM Lane LOS	A	-	-	D	E	B	-
HCM 95th %tile Q(veh)	0.1	-	-	0.5	1.2	0.1	-

Lanes and Geometrics
 4: Tennyson St. & W 64th Ave.

6501 Lowell Blvd
 06/07/2021



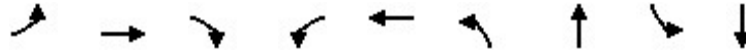
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		100	150		0	0		0	0		0
Storage Lanes	1		1	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850		0.994			0.919				0.952
Flt Protected	0.950			0.950				0.985				0.983
Satd. Flow (prot)	1770	1863	1583	1770	1852	0	0	1686	0	0	1743	0
Flt Permitted	0.229			0.106				0.878				0.838
Satd. Flow (perm)	427	1863	1583	197	1852	0	0	1503	0	0	1486	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			60		4			94				17
Link Speed (mph)		30			30			30				30
Link Distance (ft)		501			853			646				482
Travel Time (s)		11.4			19.4			14.7				11.0

Intersection Summary

Area Type: Other

Timings
4: Tennyson St. & W 64th Ave.

6501 Lowell Blvd
06/07/2021

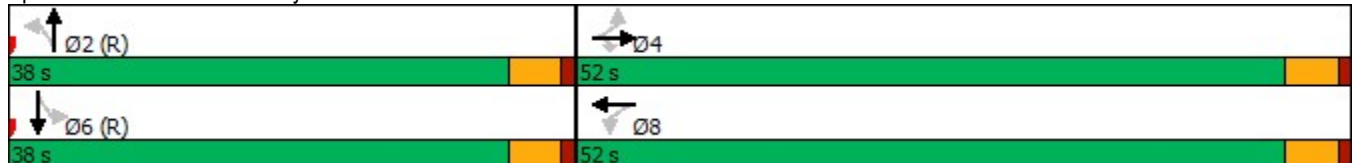


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↖	↑	↗	↖	↗		↕		↕
Traffic Volume (vph)	25	777	110	97	594	137	40	16	13
Future Volume (vph)	25	777	110	97	594	137	40	16	13
Turn Type	Perm	NA	Perm	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4			8		2		6
Permitted Phases	4		4	8		2		6	
Detector Phase	4	4	4	8	8	2	2	6	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	52.0	52.0	52.0	52.0	52.0	38.0	38.0	38.0	38.0
Total Split (%)	57.8%	57.8%	57.8%	57.8%	57.8%	42.2%	42.2%	42.2%	42.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0		0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5		4.5		4.5
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	47.5	47.5	47.5	47.5	47.5		33.5		33.5
Actuated g/C Ratio	0.53	0.53	0.53	0.53	0.53		0.37		0.37
v/c Ratio	0.12	0.86	0.14	1.02	0.69		0.77		0.09
Control Delay	12.5	29.4	6.3	118.7	29.9		29.7		13.8
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	12.5	29.4	6.3	118.7	29.9		29.7		13.8
LOS	B	C	A	F	C		C		B
Approach Delay		26.1			41.8		29.7		13.8
Approach LOS		C			D		C		B

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.02
 Intersection Signal Delay: 31.9
 Intersection Capacity Utilization 89.7%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service E

Splits and Phases: 4: Tennyson St. & W 64th Ave.





Lane Group	EBL	EBT	EBR	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	27	845	120	105	674	476	48
v/c Ratio	0.12	0.86	0.14	1.02	0.69	0.77	0.09
Control Delay	12.5	29.4	6.3	118.7	29.9	29.7	13.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.5	29.4	6.3	118.7	29.9	29.7	13.8
Queue Length 50th (ft)	7	392	16	~58	332	190	11
Queue Length 95th (ft)	22	#646	42	m#111	m410	#350	34
Internal Link Dist (ft)		421			773	566	402
Turn Bay Length (ft)	150		100	150			
Base Capacity (vph)	225	983	863	103	979	618	563
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.12	0.86	0.14	1.02	0.69	0.77	0.09

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

HCM 6th Signalized Intersection Summary
 4: Tennyson St. & W 64th Ave.

6501 Lowell Blvd
 06/07/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	25	777	110	97	594	26	137	40	261	16	13	16
Future Volume (veh/h)	25	777	110	97	594	26	137	40	261	16	13	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	27	845	120	105	646	28	149	43	284	17	14	17
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	483	987	837	161	939	41	217	68	343	196	163	167
Arrive On Green	0.53	0.53	0.53	1.00	1.00	1.00	0.37	0.37	0.37	0.37	0.37	0.37
Sat Flow, veh/h	764	1870	1585	582	1779	77	442	182	923	381	437	448
Grp Volume(v), veh/h	27	845	120	105	0	674	476	0	0	48	0	0
Grp Sat Flow(s),veh/h/ln	764	1870	1585	582	0	1856	1547	0	0	1266	0	0
Q Serve(g_s), s	1.6	35.0	3.5	12.5	0.0	0.0	22.3	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	1.6	35.0	3.5	47.5	0.0	0.0	25.0	0.0	0.0	1.6	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.04	0.31		0.60	0.35		0.35
Lane Grp Cap(c), veh/h	483	987	837	161	0	980	628	0	0	525	0	0
V/C Ratio(X)	0.06	0.86	0.14	0.65	0.00	0.69	0.76	0.00	0.00	0.09	0.00	0.00
Avail Cap(c_a), veh/h	483	987	837	161	0	980	628	0	0	525	0	0
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	10.4	18.3	10.9	19.0	0.0	0.0	25.5	0.0	0.0	18.2	0.0	0.0
Incr Delay (d2), s/veh	0.0	7.5	0.1	9.1	0.0	2.0	8.3	0.0	0.0	0.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.5	22.3	2.1	4.4	0.0	1.0	15.5	0.0	0.0	1.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	10.4	25.8	10.9	28.1	0.0	2.0	33.8	0.0	0.0	18.6	0.0	0.0
LnGrp LOS	B	C	B	C	A	A	C	A	A	B	A	A
Approach Vol, veh/h		992			779			476			48	
Approach Delay, s/veh		23.6			5.5			33.8			18.6	
Approach LOS		C			A			C			B	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		38.0		52.0		38.0		52.0				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		33.5		47.5		33.5		47.5				
Max Q Clear Time (g_c+I1), s		27.0		37.0		3.6		49.5				
Green Ext Time (p_c), s		1.7		4.9		0.2		0.0				

Intersection Summary

HCM 6th Ctrl Delay	19.5
HCM 6th LOS	B



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)	0%		0%		0%		0%		0%		0%	
Storage Length (ft)	200		150	150		75	200		150	200		100
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.850			0.850			0.850			0.850		
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.132			0.465			0.583			0.116		
Satd. Flow (perm)	246	1863	1583	866	1863	1583	1086	1863	1583	216	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			97			127			127			199
Link Speed (mph)		30			30			30				30
Link Distance (ft)		476			1480			763				608
Travel Time (s)		10.8			33.6			17.3				13.8

Intersection Summary

Area Type: Other

Timings
5: W 64th Ave./W. 64th Ave. & Lowell Blvd.

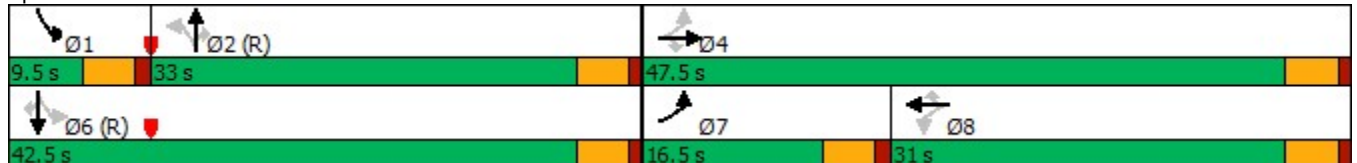
6501 Lowell Blvd
06/07/2021

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	274	491	89	59	463	88	157	528	125	59	266	183
Future Volume (vph)	274	491	89	59	463	88	157	528	125	59	266	183
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4			8			2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	7	4	4	8	8	8	2	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	16.5	47.5	47.5	31.0	31.0	31.0	33.0	33.0	33.0	9.5	42.5	42.5
Total Split (%)	18.3%	52.8%	52.8%	34.4%	34.4%	34.4%	36.7%	36.7%	36.7%	10.6%	47.2%	47.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead			Lag	Lag	Lag	Lag	Lag	Lag	Lag	Lead	
Lead-Lag Optimize?	Yes			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	42.4	42.4	42.4	25.9	25.9	25.9	31.0	31.0	31.0	38.6	38.6	38.6
Actuated g/C Ratio	0.47	0.47	0.47	0.29	0.29	0.29	0.34	0.34	0.34	0.43	0.43	0.43
v/c Ratio	0.94	0.61	0.12	0.26	0.94	0.18	0.46	0.90	0.22	0.36	0.36	0.25
Control Delay	55.3	27.9	8.0	27.7	59.1	3.1	29.3	48.5	6.1	21.3	19.3	3.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.3	27.9	8.0	27.7	59.1	3.1	29.3	48.5	6.1	21.3	19.3	3.4
LOS	E	C	A	C	E	A	C	D	A	C	B	A
Approach Delay		34.6			47.9			38.2			13.8	
Approach LOS		C			D			D			B	

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.94
 Intersection Signal Delay: 34.8
 Intersection LOS: C
 Intersection Capacity Utilization 86.5%
 ICU Level of Service E
 Analysis Period (min) 15

Splits and Phases: 5: W 64th Ave./W. 64th Ave. & Lowell Blvd.





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	298	534	97	64	503	96	171	574	136	64	289	199
v/c Ratio	0.94	0.61	0.12	0.26	0.94	0.18	0.46	0.90	0.22	0.36	0.36	0.25
Control Delay	55.3	27.9	8.0	27.7	59.1	3.1	29.3	48.5	6.1	21.3	19.3	3.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.3	27.9	8.0	27.7	59.1	3.1	29.3	48.5	6.1	21.3	19.3	3.4
Queue Length 50th (ft)	144	259	10	28	275	0	78	320	3	21	109	0
Queue Length 95th (ft)	m#190	m317	m18	62	#463	21	143	#533	43	46	173	39
Internal Link Dist (ft)		396			1400			683			528	
Turn Bay Length (ft)	200		150	150		75	200		150	200		100
Base Capacity (vph)	318	890	806	254	548	555	373	641	628	180	798	792
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.94	0.60	0.12	0.25	0.92	0.17	0.46	0.90	0.22	0.36	0.36	0.25

Intersection Summary

- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

HCM 6th Signalized Intersection Summary
 5: W 64th Ave./W. 64th Ave. & Lowell Blvd.

6501 Lowell Blvd
 06/07/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	274	491	89	59	463	88	157	528	125	59	266	183
Future Volume (veh/h)	274	491	89	59	463	88	157	528	125	59	266	183
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	298	534	97	64	503	96	171	574	136	64	289	199
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	339	882	748	287	540	457	374	624	529	188	801	679
Arrive On Green	0.13	0.47	0.47	0.29	0.29	0.29	0.33	0.33	0.33	0.04	0.43	0.43
Sat Flow, veh/h	1781	1870	1585	796	1870	1585	908	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	298	534	97	64	503	96	171	574	136	64	289	199
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	796	1870	1585	908	1870	1585	1781	1870	1585
Q Serve(g_s), s	10.1	19.0	3.1	5.8	23.6	4.1	14.1	26.5	5.6	2.0	9.4	7.4
Cycle Q Clear(g_c), s	10.1	19.0	3.1	8.3	23.6	4.1	15.0	26.5	5.6	2.0	9.4	7.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	339	882	748	287	540	457	374	624	529	188	801	679
V/C Ratio(X)	0.88	0.61	0.13	0.22	0.93	0.21	0.46	0.92	0.26	0.34	0.36	0.29
Avail Cap(c_a), veh/h	339	894	757	292	551	467	374	624	529	208	801	679
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.09	0.09	0.09	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.0	17.6	13.4	26.7	31.2	24.3	25.4	28.8	21.8	21.7	17.4	16.8
Incr Delay (d2), s/veh	22.0	1.1	0.1	0.0	3.2	0.0	4.0	20.8	1.2	1.1	1.3	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	10.0	12.6	1.9	1.6	12.4	2.1	6.1	21.4	4.0	1.5	7.5	5.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	43.0	18.7	13.5	26.8	34.4	24.3	29.3	49.7	23.0	22.8	18.7	17.9
LnGrp LOS	D	B	B	C	C	C	C	D	C	C	B	B
Approach Vol, veh/h		929			663			881			552	
Approach Delay, s/veh		26.0			32.2			41.6			18.9	
Approach LOS		C			C			D			B	
Timer - Assigned Phs	1	2		4		6	7	8				
Phs Duration (G+Y+Rc), s	8.5	34.5		47.0		43.0	16.5	30.5				
Change Period (Y+Rc), s	4.5	4.5		4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s	5.0	28.5		43.0		38.0	12.0	26.5				
Max Q Clear Time (g_c+I1), s	4.0	28.5		21.0		11.4	12.1	25.6				
Green Ext Time (p_c), s	0.0	0.0		3.9		2.5	0.0	0.4				

Intersection Summary

HCM 6th Ctrl Delay	30.6
HCM 6th LOS	C



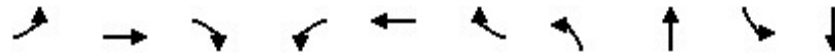
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	100		150	150		100	600		0	250		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor			0.850			0.850		0.993			0.988	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	5050	0	1770	5024	0
Flt Permitted	0.180			0.539			0.075			0.081		
Satd. Flow (perm)	335	1863	1583	1004	1863	1583	140	5050	0	151	5024	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			209			177		9			15	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1480			550			1046			611	
Travel Time (s)		33.6			12.5			23.8			13.9	

Intersection Summary

Area Type: Other

Timings
6: Federal Blvd. & W. 64th Ave.

6501 Lowell Blvd
06/07/2021

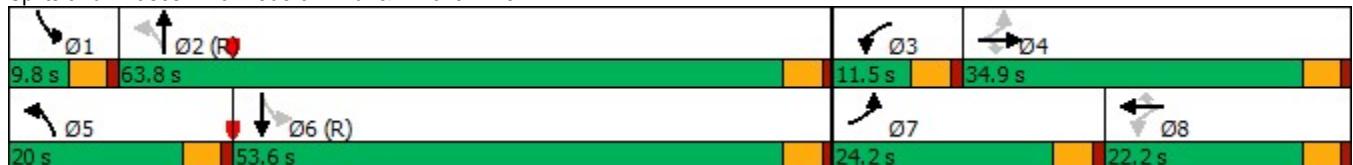


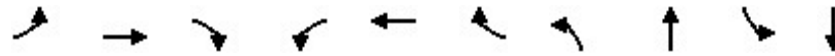
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations	↖	↑	↗	↖	↑	↗	↖	↑↑↑	↖	↑↑↑
Traffic Volume (vph)	346	293	213	135	259	116	272	2230	101	1826
Future Volume (vph)	346	293	213	135	259	116	272	2230	101	1826
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA
Protected Phases	7	4		3	8		5	2	1	6
Permitted Phases	4		4	8		8	2		6	
Detector Phase	7	4	4	3	8	8	5	2	1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	20.6	20.6	9.5	22.5	9.5	22.5
Total Split (s)	24.2	34.9	34.9	11.5	22.2	22.2	20.0	63.8	9.8	53.6
Total Split (%)	20.2%	29.1%	29.1%	9.6%	18.5%	18.5%	16.7%	53.2%	8.2%	44.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)	41.9	30.4	30.4	24.7	17.7	17.7	69.1	59.3	54.4	49.1
Actuated g/C Ratio	0.35	0.25	0.25	0.21	0.15	0.15	0.58	0.49	0.45	0.41
v/c Ratio	1.07	0.65	0.42	0.59	1.01	0.33	1.02	0.99	0.79	1.03
Control Delay	100.8	47.4	9.1	42.1	107.4	4.2	91.3	47.1	57.7	61.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	100.8	47.4	9.1	42.1	107.4	4.2	91.3	47.1	57.7	61.8
LOS	F	D	A	D	F	A	F	D	E	E
Approach Delay		59.7			66.3			51.8		61.6
Approach LOS		E			E			D		E

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 120
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.07
 Intersection Signal Delay: 57.5
 Intersection LOS: E
 Intersection Capacity Utilization 101.9%
 ICU Level of Service G
 Analysis Period (min) 15

Splits and Phases: 6: Federal Blvd. & W. 64th Ave.





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	376	305	232	147	276	126	296	2487	110	2118
v/c Ratio	1.07	0.65	0.42	0.59	1.01	0.33	1.02	0.99	0.79	1.03
Control Delay	100.8	47.4	9.1	42.1	107.4	4.2	91.3	47.1	57.7	61.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	100.8	47.4	9.1	42.1	107.4	4.2	91.3	47.1	57.7	61.8
Queue Length 50th (ft)	~271	212	14	80	~218	0	~186	679	37	~638
Queue Length 95th (ft)	#468	311	79	132	#396	18	#371	#821	#134	#736
Internal Link Dist (ft)		1400			470			966		531
Turn Bay Length (ft)	100		150	150		100	600		250	
Base Capacity (vph)	352	471	557	251	274	384	291	2500	139	2064
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.07	0.65	0.42	0.59	1.01	0.33	1.02	0.99	0.79	1.03

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

HCM 6th Signalized Intersection Summary
6: Federal Blvd. & W. 64th Ave.

6501 Lowell Blvd
06/07/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	346	293	213	135	259	116	272	2230	110	101	1826	168
Future Volume (veh/h)	346	293	213	135	259	116	272	2230	110	101	1826	168
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	376	305	232	147	276	126	296	2372	115	110	1943	175
Peak Hour Factor	0.92	0.96	0.92	0.92	0.94	0.92	0.92	0.94	0.96	0.92	0.94	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	352	474	402	258	276	234	290	2466	119	143	1952	175
Arrive On Green	0.16	0.25	0.25	0.06	0.15	0.15	0.13	0.49	0.49	0.04	0.41	0.41
Sat Flow, veh/h	1781	1870	1585	1781	1870	1585	1781	4991	240	1781	4770	427
Grp Volume(v), veh/h	376	305	232	147	276	126	296	1612	875	110	1383	735
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	1585	1781	1702	1827	1781	1702	1793
Q Serve(g_s), s	19.7	17.5	15.4	7.0	17.7	8.8	15.5	54.6	55.8	4.3	48.5	49.1
Cycle Q Clear(g_c), s	19.7	17.5	15.4	7.0	17.7	8.8	15.5	54.6	55.8	4.3	48.5	49.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.13	1.00		0.24
Lane Grp Cap(c), veh/h	352	474	402	258	276	234	290	1682	903	143	1393	734
V/C Ratio(X)	1.07	0.64	0.58	0.57	1.00	0.54	1.02	0.96	0.97	0.77	0.99	1.00
Avail Cap(c_a), veh/h	352	474	402	258	276	234	290	1682	903	143	1393	734
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	0.85	0.85	0.85	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.5	40.0	39.2	42.3	51.2	47.4	39.6	29.2	29.5	29.1	35.3	35.5
Incr Delay (d2), s/veh	63.1	2.5	1.7	3.0	54.3	2.5	58.2	14.0	23.4	22.5	22.5	33.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	21.2	12.7	9.9	1.4	18.2	6.6	19.5	32.8	38.2	4.8	32.0	36.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	98.6	42.5	40.9	45.3	105.4	49.8	97.8	43.2	52.8	51.6	57.8	69.0
LnGrp LOS	F	D	D	D	F	D	F	D	D	D	E	F
Approach Vol, veh/h		913			549			2783			2228	
Approach Delay, s/veh		65.2			76.6			52.0			61.2	
Approach LOS		E			E			D			E	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.8	63.8	11.5	34.9	20.0	53.6	24.2	22.2				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	5.3	59.3	7.0	30.4	15.5	49.1	19.7	17.7				
Max Q Clear Time (g_c+I1), s	6.3	57.8	9.0	19.5	17.5	51.1	21.7	19.7				
Green Ext Time (p_c), s	0.0	1.4	0.0	2.0	0.0	0.0	0.0	0.0				

Intersection Summary

HCM 6th Ctrl Delay	59.1
HCM 6th LOS	E

Notes

User approved pedestrian interval to be less than phase max green.



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)		0%	0%		0%	
Storage Length (ft)	100			0	0	0
Storage Lanes	1			0	1	0
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.996		0.936	
Flt Protected	0.950				0.974	
Satd. Flow (prot)	1770	1863	1855	0	1698	0
Flt Permitted	0.950				0.974	
Satd. Flow (perm)	1770	1863	1855	0	1698	0
Link Speed (mph)		30	30		30	
Link Distance (ft)		853	476		311	
Travel Time (s)		19.4	10.8		7.1	

Intersection Summary

Area Type: Other

Intersection						
Int Delay, s/veh	0.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	16	823	752	20	10	9
Future Vol, veh/h	16	823	752	20	10	9
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	17	895	817	22	11	10

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	839	0	-	0	1757 828
Stage 1	-	-	-	-	828 -
Stage 2	-	-	-	-	929 -
Critical Hdwy	4.12	-	-	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.218	-	-	-	3.518 3.318
Pot Cap-1 Maneuver	796	-	-	-	93 371
Stage 1	-	-	-	-	429 -
Stage 2	-	-	-	-	385 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	796	-	-	-	91 371
Mov Cap-2 Maneuver	-	-	-	-	91 -
Stage 1	-	-	-	-	420 -
Stage 2	-	-	-	-	385 -

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	34.6
HCM LOS			D

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	796	-	-	-	142
HCM Lane V/C Ratio	0.022	-	-	-	0.145
HCM Control Delay (s)	9.6	-	-	-	34.6
HCM Lane LOS	A	-	-	-	D
HCM 95th %tile Q(veh)	0.1	-	-	-	0.5

June 11, 2021

Adams County
Attn: Layla Bajelan
4430 S. Adams County Parkway
Brighton, CO 80601

Re: TTLC Denver – Lowell – 1st Review Comments
Project Number: PRC2021-00002

Dear Ms. Bajelan:

Thank you for taking the time to review the TTLC Denver-Lowell Rezone, Planned Unit Development-Preliminary Development Plan and Major Subdivision Preliminary Plat along with County staff. Valuable feedback was received on April 23, 2021. Detailed responses to comments made can be found on the following pages. Please feel free to reach out should you have any questions or concerns by phone, 303-892-1166 or by email, emather@norris-design.com.

We look forward to working with Adams County to make this project a success.

Thank you,



Eva Mather
Principal

Commenting Division: Development Services, Planning
Name of Reviewer: Layla Bajelan, Planner II – Long Range Planning
Email: lbajelan@adcogov.org / 720-523-6863

PLN01: Request

Planned Unit Development-Preliminary Development Plan, Major Subdivision Preliminary Plat and Rezone from C-4 and R-1-A to PUD to establish a Planned Unit Development (PUD). The PUD will consist of 124 duplex lots on approximately 6.8 acres. (18 dwelling units/acre)

PLN02: Site Characteristics

- Parcel Number / Address: 01825064000046 / 6501 Lowell
- Parcel Size: 6.83 Acres
- Current Zoning: R-1-A and C-4
- Future Land Use: Urban Residential

PLN03: Rezone:

Planned Unit Development Requirements

1. Minimum Site Area: 1 acre, Parcel is 6.83 acres Planning has no concern with the rezone.
Response: Comment noted, thank you.

PLN04: Preliminary Plat

1. Please address the comments provided by the Department of Water Resources. "If well no. 19349 is located on the property, the applicant must clarify if the well will be covered by a court-approved augmentation plan or plugged and abandoned prior to subdivision approval." The Department of Water Resources must sign off on the ability for Crestview to provide an adequate water supply.
Response: There is no well on the ALTA and doesn't show up in the State's well registry. We think this comment may be an error.
2. Applicant submitted a Land Survey Plat and not a Preliminary Plat. Preliminary Plat must include dimensions of the individual lots, signature blocks, location of easements, labels for each individual lot, detail on the proposed roadways, etc.
Response: Preliminary Plat has been included with this submittal
3. Staff will have additional comments once the preliminary plat is submitted.
Response: Noted, thank you.
4. All common areas must be in separate tracts. Dimensions and square footage/ acreage of all lots and tracts must be included in the Preliminary Plat.
Response: Tracts have been added. Tract table added to Preliminary Plat cover sheet.
5. Applicant is encouraged to review all of Chapter 5 for the Subdivision Design Standards. Any standard that cannot be met, the applicant will need to apply for a Waiver. I have included only a select few below.
 - 5-03-02-02-01 MINIMUM SETBACKS/BUFFERS TO ACHIEVE COMPATIBILITY
At a minimum, residences in new subdivisions shall be setback one-hundred (100) feet from a common property line with a non-residential use, and thirty (30) feet from a common property line with an adjacent residential use. Where the setback required by this section is greater than the setback required by the zone district standard, the setback required by this section shall govern.
Response: As discussed with Planning Staff on 4/23/2021, this standard is not applicable.

- 5-03-03-10 ACCESS TO LOTS BY PRIVATE ROADS
If the Board of County Commissioners finds the most logical development of land requires lots be created which front and are accessed by a private road or other means of access, the Board of County Commissioners shall make written findings supporting the use of private roads in the form of a waiver from these standards and regulations. Private roads, if approved, shall be constructed and maintained by the property owners. Provisions shall be made to guarantee the roads are maintained for the life of the development through mechanisms approved by the Board of County Commissioners. A maintenance plan shall be submitted as part of the development process.
Response: Comment noted, the private road will be owned and maintained by a Home Owners Association. A Maintenance Plan will be included at time of site plan.

The need for private roads will be evaluated on a case-by-case basis by the Director of Community and Economic Development. The Director of Community and Economic Development will make a recommendation on the approval and construction of private roads to the Board of County Commissioners as part of the development process. The use of private roads will not be permitted at intersection with public roads if the geometric design of the private road can create a road safety hazard. In addition, intersections of public and private roads shall conform to the Chapter 8 Access Design and Traffic Requirements.

Response: A waiver for a private road is included with the second submission.

- 5-03-05-03 DETENTION POND LANDSCAPING
Any areas within a detention pond above that required to accommodate a 50-year, 2-hour storm shall be landscaped in accordance with the landscaping standards contained in the performance standards section of these standards and regulations.
Response: Noted, the detention pond will be landscape per the performance standards outlined in this section. Specific plant types, sizes, and quantities will be provided at the time of the FDP.

PLN05: Preliminary Development Plan

Preliminary Development Plan (PDP) that was submitted is missing several details that are required for approval. I have attached an example of a preliminary development plan that demonstrates what should be included with the PDP. The applicant should be aware that staff will have additional comments after the second review because the first submittal was missing several details.

- The site plan that was submitted by the applicant still shows townhouses. Please revise.
Response: This was an extra sheet that was mistakenly inserted. Please disregard. Per the project description and site plan, the project is proposing townhomes.
- 2-02-11-01-01 PRELIMINARY DEVELOPMENT PLAN (PDP) The PDP should include the proposed land uses, the layout of landscaping, circulation, architectural elevations, buildings and, if required, a preliminary plat.
Response: Proposed land uses, landscaping, circulation, elevations and a preliminary plat are all included as a part of this Second Submission.

Development Layout - Staff has significant concerns about walkability within this development.

- How will pedestrians safely access the interior lots from the open space on the perimeter?
Response: Per the attached site plan and detailed open space illustrations and descriptions, pedestrians will have access through the site via sidewalks as well as sidewalks connecting the community to the trail and neighborhood to the west.

- The applicant must include additional explanation and detail on the PDP to demonstrate safe access to all areas of the development.

Response: Per the attached site plan and detailed open space illustrations and descriptions, pedestrians will have access through the site via sidewalks as well as sidewalks connecting the community to the trail and neighborhood to the west.

Signage - Please include more detail on the materials, height, etc.

- PDP shows the location of two signs. Will only two signs be included with this development?

Response: Yes, only two signs will be used on the site. One at Lowell and the second at 64th avenue entrance which will meet Adams County standards.

- Landscaping plan should address landscaping around the signs.

Response: Enhanced landscape will be required at entries and around signage and monumentation. Landscape design will be defined at the time of FDP.

Lot Layout - Applicant must demonstrate that all lots will meet the setbacks proposed within this PUD.

- Staff has concerns with the setbacks that are being proposed.

Response: Lot typical A and B and the building footprints shown on the lots now help to demonstrate how our buildings meet the proposed setbacks in the development standards.

- Please indicate what units will have the water meter on the side vs. the water meter on the rear. These should be two different “types” of units.

Response: Water meters are no longer proposed in the side yard, now both lot types A and B show the typical meter location and they are at the rear of the lot by apron/curb and back corner of the lot.

- The range of rear setbacks should be avoided. The applicant must demonstrate which units would have the 3-foot setbacks, vs. the 8-foot setbacks and why.

Response: The PUD has been revised to identify A lots and B lots.

- Notes numbers 3 and 4 make reviewing building permits very difficult. Applicant should consider refining this list.

Response: Notes 3 and 4 are now 1 and 2 in the development standards footnotes and are typical standards for encroachments into setbacks that our buildings will meet.

- While the setbacks do not allow for almost any additional structures, the PDP should include details on if accessory structures are allowed within this PUD.

Response: Accessory structures will be reviewed and approved by the community HOA.

Open Space - Staff has very significant concerns over the proposed open space and active open space. I have attached the PUD section to this document. The applicant is encouraged to review Section 3-30-03-05, as Staff believes this proposal is not meeting many of the requirements. I have included only a few of the sections below. Individual yards are not being provided per lot and staff does not feel that the proposal is providing sufficient open space or active open space.

- Section 3-30-03-05-06 PERCENTAGE OF OPEN SPACE REQUIRED;
A minimum of 30% Open Space shall be required in all P.U.D.s or as determined by the Board of County Commissioners. The subject property is 6.8 acres, requiring a minimum of 2.04 acres of open space. PDP appears to be meeting this requirement; however Section 3-30-03-05-03 USE OF OPEN SPACE should be reviewed. At least twenty-five percent (25%) of the minimum required open space

shall be designated for active recreation purposes, and no more than fifty percent (50%) shall be so utilized, in order to preserve a reasonable proportion of natural areas on the site. The purposes for which open space areas are proposed shall be documented.

Response: Noted, the site plan has been adjusted to conform with the 25% active open space requirement and the less than 50% open space utilization requirement. Labels have also been added to the site plan to document the purpose of each area.

- 3-30-03-05-01 ACCEPTABLE OPEN SPACE; No open area may be accepted as common open space within a planned unit development unless it meets the following requirements:
 1. The location, size and character of the common open space is suitable for the planned unit development; and
 2. The common open space is for preservation of natural flora and fauna, amenity or recreational purposes, and the uses authorized are appropriate to the scale and character of the planned unit development, considering its size, density, expected population, topography and the number and type of dwellings provided.

Response: Noted.

- 3-30-03-05-03 USE OF OPEN SPACE;
 At least twenty-five percent (25%) of the minimum required open space shall be designated for active recreation purposes, and no more than fifty percent (50%) shall be so utilized, in order to preserve a reasonable proportion of natural areas on the site. The purposes for which open space areas are proposed shall be documented.

Response: Noted, the site plan has been adjusted to conform with the 25% active open space requirement and the less than 50% open space utilization requirement. Labels have also been added to the site plan to document the purpose of each area.

- 3-30-03-05-04 CONCENTRATION OF OPEN SPACE;
 Where practical, open space shall be concentrated in large usable areas.

Response: Noted, the open spaces have been strategically located to maximize the usable area.

- 3-30-03-05-05 CONTIGUITY OF OPEN SPACE;
 Where possible, open space shall connect to adjacent off-site open space areas and designated greenways.

Response: The Site Plan makes three connections to the Jim Baker Regional Trail – on the north end of the site, the south end of the site, and at the main entry from Lowell Boulevard. Bike facilities and benches are provided as community amenities for cyclists, pedestrians, and passerby.

- 3-30-03-05-07 PRIORITIZATION OF OPEN SPACE TYPES; The following list represents the relative desirability of different types of open space, and should be used as the basis for determining the optimum location for open space areas within a proposed P.U.D.

1. Critical areas including riparian areas and floodplain.
2. Pastures and farmland currently or traditionally used for agriculture.
3. Trails and greenways.
4. Significant stands of trees.
5. Mature vegetation on ridgelines.
6. Former solid and/or hazardous waste disposal sites.

Response: The Site Plan makes three connections to the Jim Baker Regional Trail – on the north end of the site, the south end of the site, and at the main entry from Lowell Boulevard. Bike facilities and benches are provided as community amenities for

cyclists, pedestrians, and passerby. The other open space types are not applicable to the existing conditions on the site.

Landscaping - Landscaping Plan must include detail on specific plants and number of plants. Section 4-17-10 of the Adams County Development Standards and Regulations outlines what is typically required with a landscape plan.

Response: The specific number of plants will be provided at time of Final Development Plan. This level of detail is not conducive for a PUD level application.

- Will there be restrictions on what plant materials can be used per lot?
Response: NDLA
- Will there be landscaping requirements per lot?
Response: NDLA
- An HOA must be established for maintenance of the landscaping. Please include details on the landscape maintenance.
Response: An HOA will be established to maintain the common area landscape. This is addressed in the revised PUD.
- Staff has concerns with ability to provide landscaping in common areas considering the proposed setback and proposed height of the buildings.
Response: Landscape in the common areas is shown as currently envisioned, however it is subject to change at time of FDP.
- It appears that the applicant is proposing some of the landscaping on Adams County property near the entrance off of Lowell?
Response: This was shown in error and has been removed.

Additional Landscaping - 4-17-06-02 SPECIAL BUFFERYARDS Any new development abutting any portion of the designated Adams County Trail System, a public park, or limited access highway, shall be buffered from the trail, or park, using a Type C Bufferyard, unless increased or decreased by the Director of Community and Economic Development.

Bufferyard C: Fifteen (15) foot minimum bufferyard width with two (2) trees per eighty (80) linear feet of lot line and six (6) foot high sight obscuring fence or wall located on the interior line of the bufferyard.*

Response: Standards have been written to allow for Bufferyard A minimums.

3-30-03-01-04 SCREENING REQUIRED: Improvements on the site shall be sight-screened with adequate landscaping so as to provide a compatible visual effect as seen from the adjoining properties. Please demonstrate how you plan to screen from adjacent properties.

Response: Perimeter screening will be accomplished by using a mix of deciduous and evergreen trees and shrubs which will be designed at the time of the FDP. Perimeter screening notes have been added to the site plan in areas where a sight-screen will be provided.

Elevations - Please provide elevations for each proposed unit type.

Response: Elevations for each proposed building composite type have been provided in the set.

Fencing - A fencing plan must be submitted with the PDP. The plan should include location of fencing, fencing details, and materials.

- Will fencing be installed around the perimeter?
- Will fencing be allowed per individual lot?
Response: Fencing requirements are included in the revised Submission.

Trash Enclosures - The proposed development does not provide driveways per unit. How will trash be handled?

Response: Trash will be managed by a third party and trash/recycle bins will be provided to residents to store in garages.

Mailbox Kiosks - Will there be mail kiosks provided with this development? Where will they be located? Will a structure be used to house the kiosks?

Response: Mail kiosks are shown in the revised submission.

Use Restrictions - The Preliminary Development plan should include what uses are allowed and what uses are prohibited. Will performance standards not outlined in the PUD fall back onto one of Adams County zone districts?

Response: Uses allowed and prohibited have been added. Remaining uses will fall back on Adams County Zone Districts.

Ownership and Maintenance of Common Areas - An HOA will be required for this development. The PDP and the Preliminary Plat will need to have details outlining responsibility of the common area.

- 3-30-03-05-10 MAINTENANCE OF OPEN SPACE; A maintenance plan shall be submitted and approved as part of the P.U.D process. The maintenance plan shall meet the landscape and open space maintenance requirements contained in Chapter 4.

Response: An HOA will own and maintain common area landscaping. This is addressed in the revised PUD. A maintenance plan will be provided as a part of the PUD process at time of FDP.

Bicycle Facilities - Bicycle facilities should be provided in accordance with Section 3-30-03-03.

Response: The site plan has been adjusted to maximize pedestrian and bicycle access and connectivity by add 3 connections the Jim Baker Regional Trail and adding a mountable curb and walk around the inter loop of the site.

Lot Coverage - Preliminary Plat should include the allowable maximum lot coverage per lot.

Response: Preliminary Plat includes allowable maximum lot coverage.

Parking - A parking plan should be included with the PDP. The applicant is proposing 2.25 spaces per unit. Please see section 4-13-04-05 for parking space size requirements.

- Please include the dimensions of all spaces and details on if curb stops will be provided.
- ADA accessible spaces will be required within this development.
- What road base will be used for the drive aisles?

Response: Parking will meet ADA requirements, road base and curb stops will be addressed at time of Final Site Plan.

Commenting Division: Development Services, Engineering, Civil Engineering II

Name of Reviewer: Eden Steele

Email: esteele@adcogov.org / 720-523-6897

ENG1: The proposed detention pond inlets must include forebays and be placed on the opposite end of the EDB from the outlet, so the water quality benefits of the pond are not short circuited.

Response: Detention Pond inlets have been updated to provide more distance from the outlet and forebays have been added.

ENG2: The 65% percent imperviousness figure seems low given the portion of the site occupied by roadways, rooftops, and sidewalks/concrete drives. Create a table that itemizes the surface types, to ensure sufficient space is reserved for drainage infrastructure on the preliminary plat.

Response: Table itemizing surface types has been added to preliminary grading plan.

ENG3: What are the pond side slopes? Can MHFD and County recommended side slopes (4H:1V) be achieved while providing sufficient volume in the area designated for detention on the proposed site plan/grading plan? The detention facility also needs an access road for maintenance of the trickle channel, outlet structure, etc.

Response: *Pond side slopes are 4:1 and an access road for maintenance of the pond has been added.*

ENG4: The site design must incorporate LID standards, and infiltrate water as close to the impervious source as possible. Roof drain downspouts must outfall to the ground and opportunities for infiltration must be provided before runoff enters the street inlets/storm sewer system.

Response: *Infiltration opportunities for roof drain downspout runoff will be provided in landscaping areas before entering the street inlets and storm sewer system.*

ENG5: Mile High Flood District (MHFD) maintains the Hidden Lake Drainageway and will be a referral agency for the proposed outfall. MHFD recommendations will need to be incorporated into the outfall design.

Response: *Noted, MHFD recommendations will be incorporated into the outfall design.*

ENG6: Adams County own's the property encompassing Hidden Lake Drainageway. The developer would need to obtain a non-exclusive drainage easement from the County to allow for construction and maintenance of the proposed outfall. County Facilities & Fleet Management Department handles the negotiations for such easements and development on County property. If permitted, there would likely be restrictions on the timing and manner by which the outfall could be constructed, especially given the adjacent Jim Baker Trail system. The County would prefer the use of the existing onsite inlet or connecting with the storm sewer in the W 64th Ave right-of-way.

Response: *Connection to the existing onsite inlet and storm sewer system in the W 64th Ave right-of-way not feasible. Restrictions on timing and manner of outfall construction will be followed if proposed outfall permitted.*

ENG7: The proposed detention pond must be in a separate drainage tract dedicated to the County for inspection and enforcement purposes. Drainage infrastructure in the tract shall be maintained by the HOA. Standard County stormwater note(s) should be included on the plat.

Response: *Noted, stormwater notes have been included on the plat.*

ENG8: The detention pond cannot be placed in the future right-of-way identified by the Adams County Transportation Plan adopted in 2012 (<https://www.adcogov.org/sites/default/files/2776.pdf>) without approval from Adams County Public Works Department.

Response: *The detention pond is located outside of the future right-of-way.*

ENG9: Preliminary Drainage Report discussion over existing conditions should identify existing onsite drainage infrastructure, including the County owned Permanent Drainage Easement (Rec. No. 2009000001130) and the areas that drain to the associated inlet. What are the plans for the easement and infrastructure with the development?

Response: *It is not feasible to use the existing drainage infrastructure, easement to be vacated and infrastructure to be removed. Discussion over existing conditions updated include existing onsite drainage infrastructure.*

ENG10: The plat should show lot lines and existing/proposed entitlements. Infrastructure and structural features should be removed, such as curb, gutter, striping, building footprints, etc. It is unclear whether roadways are intended to be public right-of-way or private tracts. The County will not accept public right-of-way dedications for roadway cross-sections that don't meet County standards. This includes parking areas for the development.

Response: *Preliminary Plat updated. Roads will be private, not ROW.*

ENG11: Disabled parking should be placed conscientiously and have direct connection to ADA facilities that grant access to pedestrian travel routes throughout the site, adjacent right-of way, and the Jim Baker Trail.

Response: *Accessible routes have been provided in alleys for increased accessibility.*

ENG12: The Traffic Impact Study should analyze the short-term horizon year, defined in Chapter 8 Section 8-02-05 as five years after occupancy of the project. The second planning horizon shall be based on the most current Adams County Transportation Plan 20 to 25-year planning horizon. The intent of the second planning horizon is to evaluate implications of the proposed project on the long-range traffic condition. The County Transportation Plan for adjacent roadways should be discussed in the report.

Response: *TIS analysis years updated per County TIS requirements.*

ENG13: The Final TIS should discuss Chapter 8 criteria such as access spacing, auxiliary lane warrants, street capacity thresholds, etc. The W 64th Ave access does not meet County spacing requirements for public direct access to a Minor Arterial roadway. There is a portion of the site adjacent to Newton St, which is a local roadway where spacing requirements could be met. Site access off of Newton Street should be considered, as a full turn movement access to W 64th Ave will not be supported by Adams County Public Works Department. Furthermore, local streets are only permitted to connect with arterial roadways when other connections are unavailable.

Response: *Noted. TIS updated per County requirements.*

ENG14: A Level 3 TIS area of analysis should extend 1-mile outside of the project limits. At a minimum the study area should include all major signalized or potentially future signalized intersections within a mile of the site.

Response: *Additional intersections added to TIS, per discussion with County.*

ENG15: The County will not support a narrowing or realignment of the W 65th Ave cross-section within the public right-of-way.

Response: *Noted. No improvements to 65th are proposed.*

ENG16: If the curb ramps at the crosswalk in W 65th Ave do not meet current ADA Proposed Public Rights-of-Way Accessibility Guidelines (PROWAG), then the ramps will need to be updated as a part of the site development plans.

Response: *Noted. ADA ramps will be detailed during CD phase.*

Commenting Division: Development Services, Right-of-Way Agent

Name of Reviewer: David Dittmer

Email: ddittmer@adcogov.org / 720-523-6811

ROW1: Lowell Blvd is classified as a Minor Arterial and per the 2012 Adams County Master Transportation Plan a half right-of-way width of 60' is required. It appears that the dimension from the centerline of Lowell Blvd satisfies this requirement.

Response: *Comment noted, thank you.*

ROW2: West 64th Avenue classified as a Minor Arterial and per the 2012 Adams County Master Transportation Plan a half right-of-way width of 60' is required. Additional right-of-way is required along W. 64th Ave. as it currently appears to only have a 30' setback from the centerline. This right-of-way can be dedicated by subdivision plat.

Response: *Noted. 30' dedication via plat is proposed.*

ROW3: Dedication of storm water drainage easements must be completed by separate instrument per the Dedication Application Guidelines for Easements. Subject to engineering review.

Response: *Comment noted, thank you.*

ROW4: Both Lowell Blvd. and W. 64th Ave. are Section Lines. This may affect setback requirements as well.

Response: Comment noted, thank you.

ROW5: Provide a Site Plan which provides location of any easements or encumbrances affecting the subject lands, and ownership of all abutting properties.

Response: Noted. Preliminary Plat provided.

ROW6: Any interior roads that are to privately owned and maintained will need to shown as Tracts. A Tract Table will be required to provide ownership and maintenance to these tracts with an acknowledgement of such executed on plat.

Response: Noted. Shown as tracts.

ROW7: All common areas need to shown as tracts, and ownership and maintenance provided in Tract Table.

Response: Tracts added to Preliminary Plan, tract table provided.

ROW8: Provide actual dimensions for Lowell Blvd. and 64th Ave. instead of "Varies" on plats.

Response: Revised to provide actual ROW width.

ROW9: Provide location of easements within 5' of property boundary by recording information and identify any conflict of interest.

Response: Easements within PL shown.

ROW10: Add case number PRC2021-00002 to top right-hand corner of all sheets.

Response: Added to sheets

ROW12: Add sheet numbers below titles

Response: Sheet numbers have been added.

ROW13: Add match lines to sheets

Response: Match lines have been added.

ROW14: Arrange plats running North to South for clarity and readability

Response: Plats have been aligned to North to South.

ROW15: Provide square footage and acreage of Parcel A and Parcel B on Alta

Response: Parcel areas have been added to Site Plan sheets in the Preliminary Plat.

ROW16: Provide plats in black and white only. No colors for recording.

Response: Black and white only sheets have been provided.

Commenting Division: Environmental Programs, Environmental Programs Manager

Name of Reviewer: Katie Keefe

Email: kkeefe@adcogov.org / 720-523-6986

ENV1. The eastern portion of the parcel is partially covered by the 100-year floodplain of Hidden Lake drainage.

Response: Noted. MHFD will be consulted for proposed outfall into drainageway.

ENV2. Associated with the floodplain is the Natural Resource Conservation Overlay (NRCO), which aims to protect important wildlife areas and designated floodplains and their riparian areas, among other things. See Sections 3-39 and 4-12-02 of the Adams County Development Standards and Regulations for more details.

Response: Comment noted, thank you.

ENV3. If the land area disturbance is greater than one (1) acre, then a Resources Review must be completed by a qualified professional consultant prior to application submittal so that it may be taken into consideration. See Section 4-12-02-03-04 for Resources Review methodology.

Response: Comment noted, thank you.

ENV4. Prior to import of fill material for site grading/preparation and development, a separate permit for inert fill must be obtained from the County.

Response: Comment noted, thank you.

Commenting Division: Parks and Open Space, Natural Resource Specialist

Name of Reviewer: Aaron Clark

Email: aclark@adcogov.org / 720-523-8005

PRK1: Access to neighborhood from Lowell on 65th Way crosses County trail; crossing will need to follow AASHTO requirements, which may include a striped crossing and signage on the trail.

Response: Comment has been noted, thank you.

Commenting Division: Building Safety Division, Chief Building Official

Name of Reviewer: Justin Blair

Email: jblair@adcogov.org / 720-523-6843

Building Safety Comments will be emailed prior to RCC meeting.

Response: Comment noted, thank you.



June 10, 2021

Adams County
Community & Economic Development Department
4430 South Adams County Parkway
1st Floor, Suite W2000
Brighton, CO 80601-8204

Re: TTLC Denver - Lowell Preliminary Drainage Analysis

To Whom it May Concern,

As a part of the Rezoning Map Amendment process, Harris Kocher Smith (“HKS”) has conducted a Preliminary Drainage Analysis for the proposed development at the address of 6501 North Lowell Boulevard (“Site”). The following letter includes a summary of findings by HKS regarding the existing and proposed drainage and storm sewer infrastructure serving the Site.

Existing Conditions

The Site is located at 6501 Lowell Blvd. in Adams County, Colorado. The Site is at the northwest corner of 64th Avenue and Lowell Boulevard. Hidden Lake Drainageway borders the Site’s eastern property boundary. The Site is approximately 7.16 acres and consists of native grasses and a small, condemned structure. The Site topography slopes from northwest to southeast at approximately 2%. The Site drainage consists of overland flows, out falling into the Hidden Lake Drainageway. The Site contains no known existing stormwater conveyance, treatment or detention facilities.

An existing stormwater area inlet exists on site and is located on the east edge of the property near the southeast corner of the site. The existing inlet and associated storm system are located at a position and elevation that makes it unfeasible to utilize within the proposed site storm drainage system. The easement associated with this inlet will be vacated and the existing storm infrastructure removed.

Proposed Conditions

The Site is proposed to be developed into a single-family residential neighborhood (“Development”). The Development will contain duplex homes, alleys, active open spaces, and associated infrastructure to serve the Site. The Development will increase the imperiousness of the Site from approximately 2% to 65%. Representatives from Adams County have stated the Development must (1) detain on-site stormwater runoff and (2) release the detained and treated stormwater at the historical rate. Correspondence with Adams County has been included in the Appendix of this letter.



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In accordance with Adams County and Mile High Flood District (“MHFD”) requirements, the Development will propose infrastructure to capture, convey, treat and detain on-site runoff. An Extended Detention Basin (“EDB”) is proposed in the southeast corner of the Site, which is also the low point, for water quality and detention purposes. The EDB and associated stormwater infrastructure will be designed in accordance with MHFD requirements. Initial calculations determined that the EDB will contain approximately 0.75 ac-ft of stormwater runoff. The EDB will release the runoff, after treatment and detention, into the Hidden Lake Drainageway at the pre-developed rate for the Site. A Preliminary Drainage Plan has been included to the Appendix of this letter.

Conclusions

HKS has analyzed the existing and proposed drainage conditions of the Site. The increase of impervious surfaces will require a water quality and detention facility in accordance with requirements of local jurisdictions. The Development has proposed an EDB and stormwater infrastructure which will meet these requirements.

Thank you,

Kevin Blumhardt, PE
Project Engineer

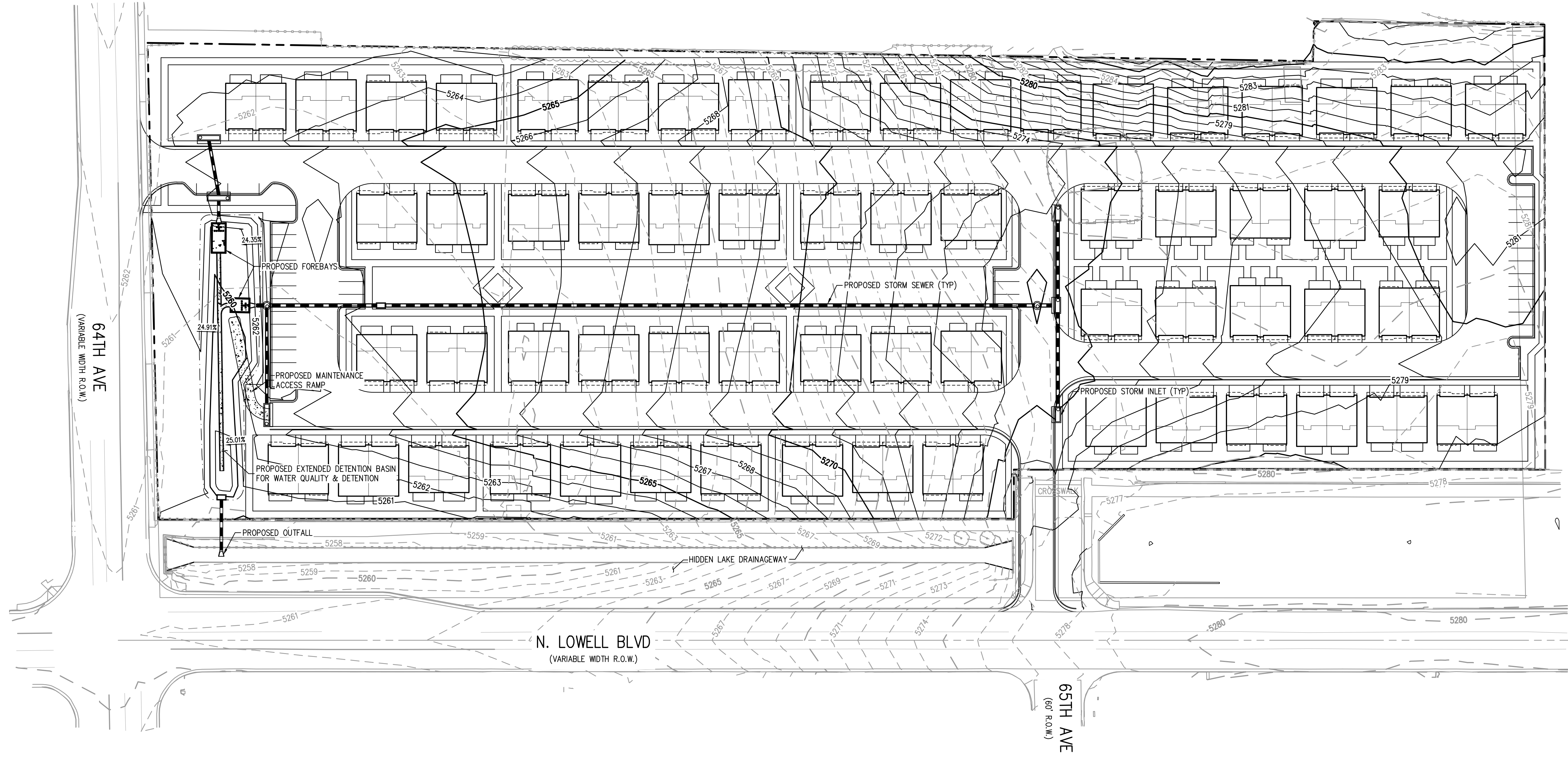


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NO CHANGES ARE TO BE MADE TO THIS DRAWING WITHOUT WRITTEN PERMISSION OF HARRIS KOCHER SMITH.

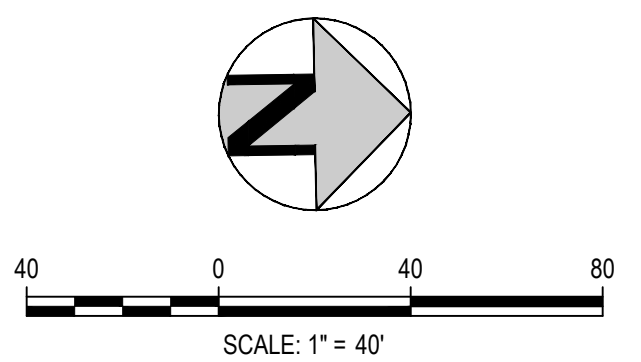
SURFACE TYPE TABLE		
SURFACE TYPE	AREA (SQUARE FEET)	% OF TOTAL SITE
ROOF	98,000 SF	31.45%
DRIVE AISLE	62,115 SF	19.93%
SIDEWALK	31,176 SF	10.00%
LANDSCAPING AREA/ OPEN SPACE	120,343 SF	38.62%
TOTAL SITE AREA	311,634 SF	100%



LEGEND

- PROPERTY BOUNDARY
- PROPOSED CONTOUR
- EXISTING CONTOUR
- PROPOSED STORM SEWER
- PROPOSED STORM SEWER INLET
- EXISTING STORM SEWER

PRELIMINARY GRADING EXHIBIT
SCALE: 1"=40'

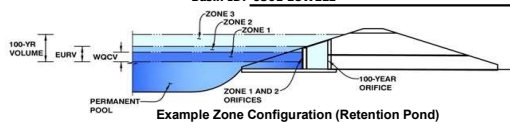


DETENTION BASIN STAGE-STORAGE TABLE BUILDER

MHFD-Detention, Version 4.04 (February 2021)

Project: TTLIC DENVER - LOWELL

Basin ID: 6501 LOWELL



Example Zone Configuration (Retention Pond)

Watershed Information

Selected BMP Type =	EDB
Watershed Area =	7.15 acres
Watershed Length =	960 ft
Watershed Length to Centroid =	165 ft
Watershed Slope =	0.020 ft/ft
Watershed Imperviousness =	65.00% percent
Percentage Hydrologic Soil Group A =	0.0% percent
Percentage Hydrologic Soil Group B =	100.0% percent
Percentage Hydrologic Soil Groups C/D =	0.0% percent
Target WQCV Drain Time =	40.0 hours
Location for 1-hr Rainfall Depths =	Denver - Capitol Building

After providing required inputs above including 1-hour rainfall depths, click "Run CUHP" to generate runoff hydrographs using the embedded Colorado Urban Hydrograph Procedure.

Water Quality Capture Volume (WQCV) =	0.151 acre-feet
Excess Urban Runoff Volume (EURV) =	0.507 acre-feet
2-yr Runoff Volume (P1 = 0.83 in.) =	0.275 acre-feet
5-yr Runoff Volume (P1 = 1.09 in.) =	0.384 acre-feet
10-yr Runoff Volume (P1 = 1.33 in.) =	0.504 acre-feet
25-yr Runoff Volume (P1 = 1.69 in.) =	0.725 acre-feet
50-yr Runoff Volume (P1 = 1.99 in.) =	0.895 acre-feet
100-yr Runoff Volume (P1 = 2.31 in.) =	1.098 acre-feet
500-yr Runoff Volume (P1 = 3.14 in.) =	1.585 acre-feet
Approximate 2-yr Detention Volume =	0.273 acre-feet
Approximate 5-yr Detention Volume =	0.383 acre-feet
Approximate 10-yr Detention Volume =	0.511 acre-feet
Approximate 25-yr Detention Volume =	0.612 acre-feet
Approximate 50-yr Detention Volume =	0.667 acre-feet
Approximate 100-yr Detention Volume =	0.747 acre-feet

Optional User Overrides

acre-feet	
acre-feet	
inches	
inches	
inches	
inches	
inches	
inches	

Define Zones and Basin Geometry

Zone 1 Volume (WQCV) =	0.151 acre-feet
Zone 2 Volume (EURV - Zone 1) =	0.356 acre-feet
Zone 3 Volume (100-year - Zones 1 & 2) =	0.240 acre-feet
Total Detention Basin Volume =	0.747 acre-feet
Initial Surcharge Volume (ISV) =	20 ft ³
Initial Surcharge Depth (ISD) =	0.40 ft
Total Available Detention Depth (H _{total}) =	5.00 ft
Depth of Trickle Channel (H _{TC}) =	0.50 ft
Slope of Trickle Channel (S _{TC}) =	0.010 ft/ft
Slopes of Main Basin Sides (S _{main}) =	4 H:V
Basin Length-to-Width Ratio (R _{L/W}) =	2
Initial Surcharge Area (A _{ISV}) =	49 ft ²
Surcharge Volume Length (L _{ISV}) =	7.0 ft
Surcharge Volume Width (W _{ISV}) =	7.0 ft
Depth of Basin Floor (H _{FLOOR}) =	1.09 ft
Length of Basin Floor (L _{FLOOR}) =	120.4 ft
Width of Basin Floor (W _{FLOOR}) =	61.5 ft
Area of Basin Floor (A _{FLOOR}) =	7,408 ft ²
Volume of Basin Floor (V _{FLOOR}) =	2,930 ft ³
Depth of Main Basin (H _{MAIN}) =	3.01 ft
Length of Main Basin (L _{MAIN}) =	144.5 ft
Width of Main Basin (W _{MAIN}) =	85.6 ft
Area of Main Basin (A _{MAIN}) =	12,369 ft ²
Volume of Main Basin (V _{MAIN}) =	29,447 ft ³
Calculated Total Basin Volume (V _{total}) =	0.744 acre-feet

Stage - Storage Description	Stage (ft)	Optional Override Stage (ft)	Length (ft)	Width (ft)	Area (ft ²)	Optional Override Area (ft ²)	Area (acre)	Volume (ft ³)	Volume (ac-ft)
Top of Micropool	0.00		7.0	7.0	49		0.001		
ISV	0.40		7.0	7.0	49		0.001	20	0.000
	0.50		7.0	7.0	49		0.001	25	0.001
	0.60		7.0	7.0	49		0.001	30	0.001
	0.70		7.0	7.0	49		0.001	35	0.001
	0.80		7.0	7.0	49		0.001	40	0.001
	0.90		7.0	7.0	49		0.001	45	0.001
	1.00		17.4	12.0	210		0.005	57	0.001
	1.10		27.8	17.0	474		0.011	90	0.002
	1.20		38.2	22.0	842		0.019	155	0.004
	1.30		48.6	27.0	1,315		0.030	262	0.006
	1.40		59.0	32.0	1,891		0.043	421	0.010
	1.50		69.4	37.0	2,571		0.059	644	0.015
	1.60		79.8	42.0	3,356		0.077	939	0.022
	1.70		90.2	47.0	4,244		0.097	1,318	0.030
	1.80		100.6	52.0	5,236		0.120	1,791	0.041
	1.90		111.0	57.0	6,333		0.145	2,369	0.054
Floor	1.99		120.4	61.5	7,408		0.170	2,987	0.069
	2.00		120.5	61.6	7,423		0.170	3,061	0.070
	2.10		121.3	62.4	7,569		0.174	3,810	0.087
	2.20		122.1	63.2	7,717		0.177	4,575	0.105
	2.30		122.9	64.0	7,866		0.181	5,354	0.123
	2.40		123.7	64.8	8,016		0.184	6,148	0.141
Zone 1 (WQCV)	2.46		124.2	65.3	8,106		0.186	6,631	0.152
	2.50		124.5	65.6	8,167		0.187	6,957	0.160
	2.60		125.3	66.4	8,320		0.191	7,781	0.179
	2.70		126.1	67.2	8,474		0.195	8,621	0.198
	2.80		126.9	68.0	8,629		0.198	9,476	0.218
	2.90		127.7	68.8	8,786		0.202	10,347	0.238
	3.00		128.5	69.6	8,943		0.205	11,233	0.258
	3.10		129.3	70.4	9,103		0.209	12,136	0.279
	3.20		130.1	71.2	9,263		0.213	13,054	0.300
	3.30		130.9	72.0	9,425		0.216	13,988	0.321
	3.40		131.7	72.8	9,588		0.220	14,939	0.343
	3.50		132.5	73.6	9,752		0.224	15,906	0.365
	3.60		133.3	74.4	9,917		0.228	16,889	0.388
	3.70		134.1	75.2	10,084		0.231	17,889	0.411
	3.80		134.9	76.0	10,252		0.235	18,906	0.434
	3.90		135.7	76.8	10,422		0.239	19,940	0.458
	4.00		136.5	77.6	10,592		0.243	20,990	0.482
	4.10		137.3	78.4	10,764		0.247	22,058	0.506
Zone 2 (EURV)	4.11		137.4	78.5	10,781		0.248	22,166	0.509
	4.20		138.1	79.2	10,937		0.251	23,143	0.531
	4.30		138.9	80.0	11,112		0.255	24,246	0.557
	4.40		139.7	80.8	11,287		0.259	25,366	0.582
	4.50		140.5	81.6	11,465		0.263	26,503	0.608
	4.60		141.3	82.4	11,643		0.267	27,659	0.635
	4.70		142.1	83.2	11,822		0.271	28,832	0.662
	4.80		142.9	84.0	12,003		0.276	30,023	0.689
	4.90		143.7	84.8	12,185		0.280	31,233	0.717
	5.00		144.5	85.6	12,369		0.284	32,460	0.745
Zone 3 (100-year)	5.01		144.6	85.7	12,387		0.284	32,584	0.748
	5.10		145.3	86.4	12,554		0.288	33,706	0.774
	5.20		146.1	87.2	12,740		0.292	34,971	0.803
	5.30		146.9	88.0	12,927		0.297	36,254	0.832
	5.40		147.7	88.8	13,115		0.301	37,556	0.862
	5.50		148.5	89.6	13,305		0.305	38,877	0.893
	5.60		149.3	90.4	13,496		0.310	40,217	0.923
	5.70		150.1	91.2	13,689		0.314	41,577	0.954
	5.80		150.9	92.0	13,882		0.319	42,955	0.986
	5.90		151.7	92.8	14,077		0.323	44,353	1.018
	6.00		152.5	93.6	14,274		0.328	45,771	1.051
	6.10		153.3	94.4	14,471		0.332	47,208	1.084
	6.20		154.1	95.2	14,670		0.337	48,665	1.117
	6.30		154.9	96.0	14,870		0.341	50,142	1.151
	6.40		155.7	96.8	15,071		0.346	51,639	1.185
	6.50		156.5	97.6	15,274		0.351	53,156	1.220
	6.60		157.3	98.4	15,478		0.355	54,694	1.256
	6.70		158.1	99.2	15,683		0.360	56,252	1.291
	6.80		158.9	100.0	15,889		0.365	57,831	1.328
	6.90		159.7	100.8	16,097		0.370	59,430	1.364
	7.00		160.5	101.6	16,306		0.374	61,050	1.402
	7.10		161.3	102.4	16,517		0.379	62,691	1.439
	7.20		162.1	103.2	16,728		0.384	64,353	1.477
	7.30		162.9	104.0	16,941		0.389	66,037	1.516
	7.40		163.7	104.8	17,155		0.394	67,742	1.555
	7.50		164.5	105.6	17,371		0.399	69,468	1.595
	7.60		165.3	106.4	17,587		0.404	71,216	1.635
	7.70		166.1	107.2	17,805		0.409	72,985	1.676
	7.80		166.9	108.0	18,025		0.414	74,777	1.717
	7.90		167.7	108.8	18,245		0.419	76,590	1.758
	8.00		168.5	109.6	18,467		0.424	78,426	1.800
	8.10		169.3	110.4	18,690		0.429	80,284	1.843
	8.20		170.1	111.2	18,914		0.434	82,164	1.886
	8.30		170.9	112.0	19,140		0.439	84,067	1.930
	8.40		171.7	112.8	19,367		0.445	85,992	1.974
	8.50		172.5	113.6	19,595		0.450	87,940	2.019
	8.60		173.3	114.4	19,825		0.455	89,911	2.064
	8.70		174.1	115.2	20,056		0.460	91,905	2.110
	8.80		174.9	116.0	20,288		0.466	93,922	2.156
	8.90		175.7	116.8	20,521		0.471	95,963	2.203
	9.00		176.5	117.6	20,756		0.476	98,027	2.250
	9.10		177.3	118.4	20,992		0.482	100,114	2.298
	9.20		178.1	119.2	21,229		0.487	102,225	2.347
	9.30		178.9	120.0	21,467		0.493	104,360	2.396
	9.40		179.7	120.8	21,707		0.498	106,518	2.445
	9.50		180.5	121.6	21,948		0.504	108,701	2.495
	9.60		181.3	122.4	22,190		0.509	110,908	2.546
	9.70		182.1	123.2	22,434		0.515	113,139	2.597

Kevin Blumhardt

From: Matthew Emmens <MEmmens@adcogov.org>
Sent: Tuesday, September 29, 2020 3:00 PM
To: Kevin Blumhardt
Cc: Steve J. Krawczyk
Subject: RE: Hidden Lake Drainageway
Attachments: 64th and Lowell - Floodplain.pdf; 64th and Lowell - Topo.pdf

Categories: Filed by Newforma

Hello Kevin,

I did not make those comments, Steve Krawczyk made them.

I can tell you a few things about that channel, though. Its not a natural channel, it was constructed as an outfall for Hidden Lake. I'm pretty sure it is at capacity, too. The 100-year floodplain elevation appears to be right at the top of the banks (see attached GIS maps). Given those conditions, we couldn't approve an exemption to detention for the site. But, you would be allowed to release stormwater into the channel at historic rates.

I think our Public Works Department has more information on the channel. I'll see what I can dig up and give to you.

Sincerely,
Matt Emmens

Senior Engineer, *Community and Economic Development*
ADAMS COUNTY, COLORADO
4430 S. Adams County Parkway, W2000B
Brighton, CO 80601
o: 720.523.6826 | memmens@adcogov.org
www.adcogov.org

From: Kevin Blumhardt <kblumhardt@hkseng.com>
Sent: Tuesday, September 29, 2020 12:26 PM
To: Matthew Emmens <MEmmens@adcogov.org>
Cc: Steve J. Krawczyk <SKrawczyk@adcogov.org>
Subject: Hidden Lake Drainageway

Please be cautious: This email was sent from outside Adams County

Good Afternoon Matt,

You recently provided Concept Plan comments on a proposed development for TTLC Management Inc. (PRE2020-00056) at 64th and Lowell. Comment ENG11 states that the drainageway accepting the site's detention outfall must have capacity. Do you know of any capacity concerns of the Hidden Lake drainageway adjacent to the eastern property boundary of the site? Will this site be able to discharge to the drainageway?

Once our team gets more in depth with design we can provide a capacity analysis. But for now, the developer would like to know of any general capacity concerns.

Thank you,

Kevin Blumhardt, PE

Project Engineer




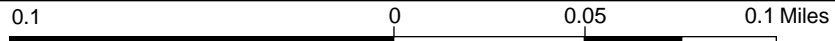
1120 Lincoln St, Suite 1000 • Denver, Colorado 80203
P:303.623.6300 • F:303.623.6311
kblumhardt@hkseng.com • www.harriskochersmith.com



Legend

- Address
- Highways
 - Interstate
 - Highway
 - Tollway
- Streets
 - Streets
 - Ramp
- Building
 - Building
- County Parks and Open Space
 - County Parks and Open Space
- Small Lakes
 - Small Lakes
- Major Lakes
 - Major Lakes
- Rivers
 - Canal
 - Ditch
 - Primary Creek
 - River
 - Secondary Creek
 - Stream
- Parcels
 - Parcels
- County Boundary
 - County Boundary
- Contours-2014
 - TENS
 - TWOS

1: 2,895 



Notes

This map is a user generated static output from an Internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable. THIS MAP IS NOT TO BE USED FOR NAVIGATION



Legend

- Address
- Highways
 - Interstate
 - Highway
 - Tollway
- Streets
 - Streets
 - Ramp
- Building
- County Parks and Open Space
- Small Lakes
- Major Lakes
- Rivers
 - Canal
 - Ditch
 - Primary Creek
 - River
 - Secondary Creek
 - Stream
- FIRM Panels below 100k
 - FIRM Panels below 100k
- FEMA Floodplain
 - 100 Year Floodplain
 - 100 Year Floodway
 - 500 Year Floodplain
- Parcels
- County Boundary

0.1 0 0.05 0.1 Miles

This map is a user generated static output from an Internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable. THIS MAP IS NOT TO BE USED FOR NAVIGATION

Notes

Kevin Blumhardt

From: Matthew Emmens <MEmmens@adcogov.org>
Sent: Tuesday, October 6, 2020 2:58 PM
To: Kevin Blumhardt
Cc: Steve J. Krawczyk
Subject: RE: Hidden Lake Drainageway and W 64th Ave

Hello Kevin,

The County doesn't provide will-serve letter for storm sewer. State law requires that downstream property owners accept upstream historical flows. Your development will be allowed to release stormwater into the channel at historic rates. And, detention will be required with this site.

Sincerely,
Matt Emmens

Matt Emmens, P.E., CFM
Senior Engineer, *Community and Economic Development*
ADAMS COUNTY, COLORADO
4430 S. Adams County Parkway, W2000B
Brighton, CO 80601
o: 720.523.6826 | memmens@adcogov.org
www.adcogov.org

From: Kevin Blumhardt <kblumhardt@hkseng.com>
Sent: Tuesday, October 06, 2020 12:03 PM
To: Matthew Emmens <MEmmens@adcogov.org>
Cc: Steve J. Krawczyk <SKrawczyk@adcogov.org>
Subject: RE: Hidden Lake Drainageway and W 64th Ave

Please be cautious: This email was sent from outside Adams County

Thanks Matt, this is really helpful. Our client is in the due diligence phase and would like to confirm capacity. Is there a way you could produce a will-serve letter for our storm sewer connection/outfall? It would be conditional that we provide detention, release at historic rates, and prove capacity of the existing channel at the proposed tie-in. I attached a site plan and plat for reference.

Thank you,

Kevin Blumhardt, PE
Project Engineer



1120 Lincoln St, Suite 1000 • Denver, Colorado 80203
P:303.623.6300 • F:303.623.6311
kblumhardt@hkseng.com • www.harriskochersmith.com

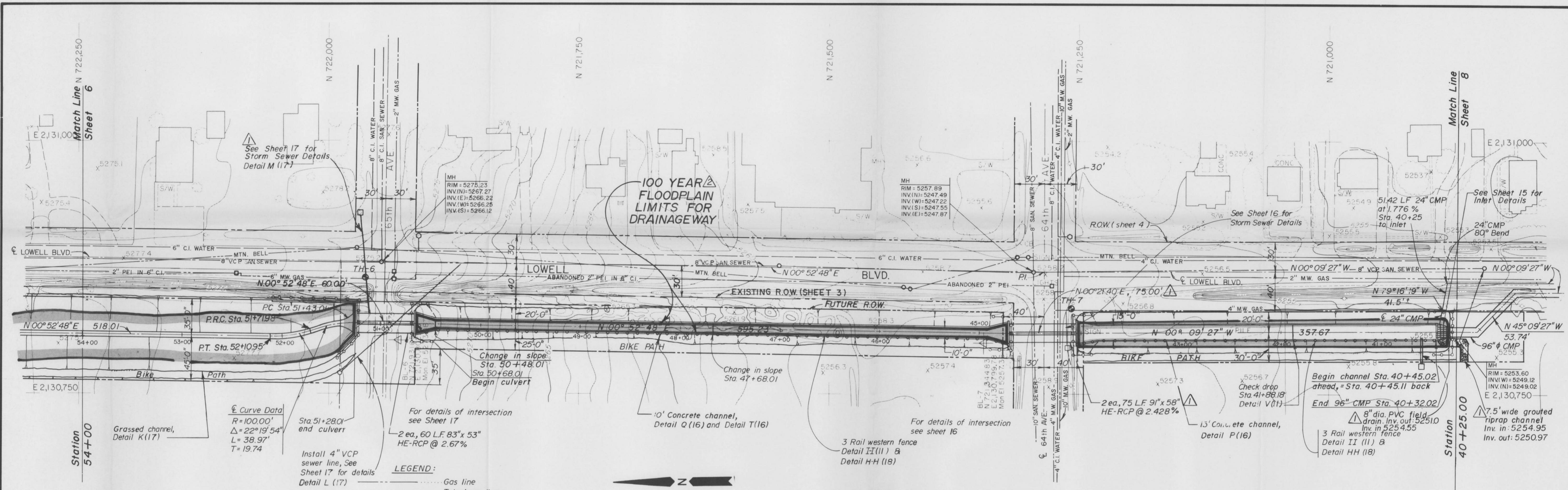
From: Matthew Emmens <MEmmens@adcogov.org>
Sent: Wednesday, September 30, 2020 3:18 PM
To: Kevin Blumhardt <kblumhardt@hkseng.com>
Cc: Steve J. Krawczyk <SKrawczyk@adcogov.org>
Subject: FW: Hidden Lake Drainageway and W 64th Ave

Kevin,

I was able to dig up some information on the Hidden Lake outfall channel. See attached.

Sincerely,
Matt Emmens

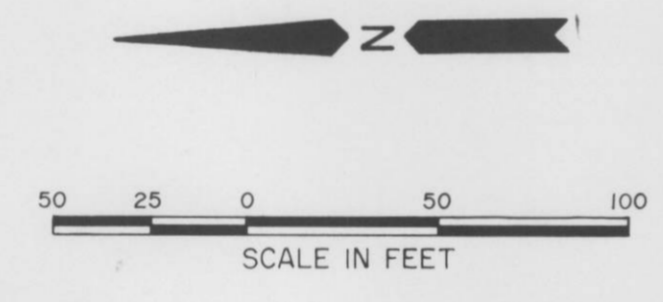
Senior Engineer, *Community and Economic Development*
ADAMS COUNTY, COLORADO
4430 S. Adams County Parkway, W2000B
Brighton, CO 80601
o: 720.523.6826 | memmens@adcogov.org
www.adcogov.org



Curve Data
 R=100.00'
 $\Delta=22^{\circ}19'54''$
 L=38.97'
 T=19.74

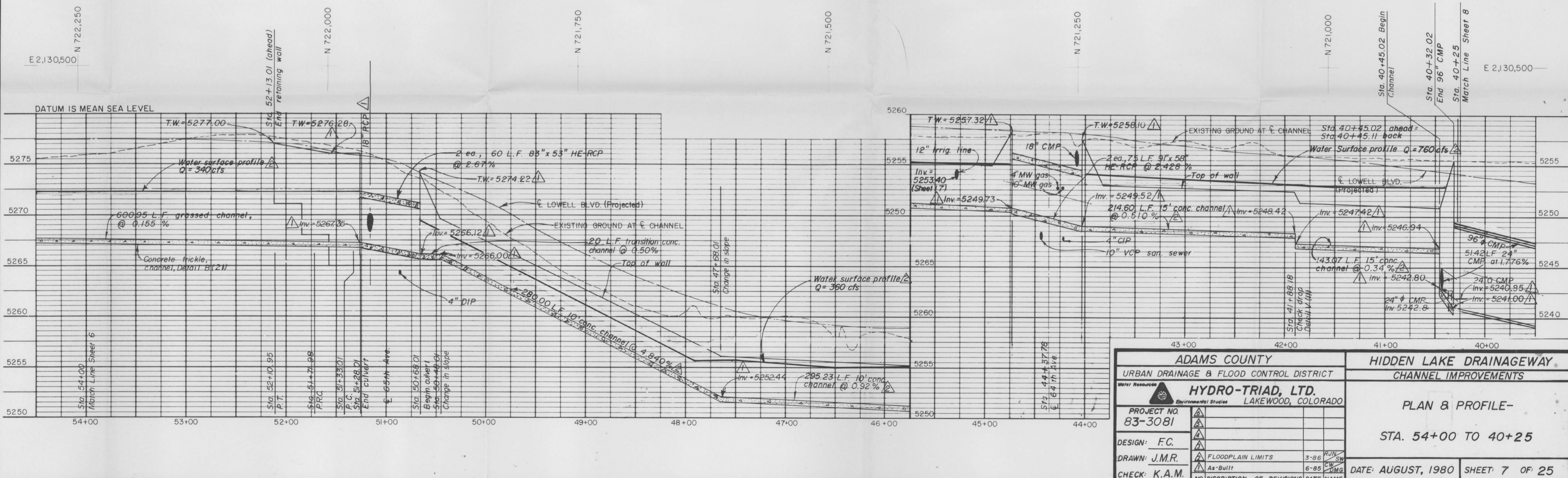
For details of intersection see sheet 17
 2 ea. 60 L.F. 83" x 53" HE-RCP @ 2.67%
 10' concrete channel, Detail Q (16) and Detail T (16)
 3 Rail western fence Detail II (11) & Detail HH (18)

- LEGEND:
- Gas line
 - Telephone line
 - Sanitary sewer line
 - Water line
 - Manhole
 - Fire hydrant
 - Tee
 - 3 Rail western fence



Station	Slope %	"n"	Q cfs	V (fps)
54+00 to 51+28.01	0.155	0.028	340	3.7
50+48.01 to 47+68.01	4.840	0.021	360	19.2
47+68.01 to 44+72.78	0.920	0.013	360	12.4
44+02.78 to 40+45.02	0.51-0.34	0.013	760	12.5

NOTE:
 Contractor shall preserve or restore Harry Holmes ditch to present condition from station 67+71.63 to station 45+30.



ADAMS COUNTY		HIDDEN LAKE DRAINAGEWAY	
URBAN DRAINAGE & FLOOD CONTROL DISTRICT		CHANNEL IMPROVEMENTS	
PROJECT NO. 83-3081		PLAN & PROFILE - STA. 54+00 TO 40+25	
DESIGN: F.C.		DATE: AUGUST, 1980 SHEET: 7 OF 25	
DRAWN: J.M.R.		NO DISCREPANCY OF REVISIONS DATE NAME	
CHECK: K.A.M.		FLOODPLAIN LIMITS 3-86 As-Built 6-85	

"AS-BUILT"

TTLC DENVER - LOWELL

IN THE COUNTY OF ADAMS, COLORADO

PLANNED UNIT DEVELOPMENT / PRELIMINARY DEVELOPMENT PLAN

VICINITY MAP



SITE

LEGAL DESCRIPTION

PARCEL A:

THAT PART OF THE SOUTHEAST ONE-QUARTER OF THE SOUTHEAST ONE-QUARTER OF SECTION 6, TOWNSHIP 3 SOUTH, RANGE 68 WEST OF THE SIXTH PRINCIPAL MERIDIAN, COUNTY OF ADAMS, STATE OF COLORADO, DESCRIBED AS:

BEGINNING AT THE NORTHEAST CORNER OF THE SOUTHEAST ONE-QUARTER OF THE SOUTHEAST ONE-QUARTER OF SAID SECTION 6; THENCE SOUTH 00°52'48" WEST ALONG THE EAST LINE OF THE SOUTHEAST ONE-QUARTER A DISTANCE OF 330.00 FEET TO A POINT ON THE EASTERLY EXTENSION OF THE SOUTH LINE OF A PARCEL DESCRIBED IN BOOK 2838 AT PAGE 601, ADAMS COUNTY RECORDS; THENCE SOUTH 89°34'06" WEST ALONG SAID EASTERLY EXTENSION A DISTANCE OF 120.02 FEET TO THE SOUTHEAST CORNER OF SAID PARCEL, SAID CORNER ALSO BEING THE TRUE POINT OF BEGINNING; THENCE CONTINUING SOUTH 89°34'06" WEST ALONG THE SOUTH LINE OF SAID PARCEL DESCRIBED IN BOOK 2838 AT PAGE 601, DISTANCE OF 312.42 FEET TO A POINT ON AN OLD EXISTING FENCE LINE AS SHOWN IN BOOK 176 AT PAGE 93, ADAMS COUNTY RECORDS; THENCE NORTH 00°31'17" WEST ALONG SAID OLD EXISTING FENCE LINE A DISTANCE OF 22.50 FEET TO AN OLD EXISTING (EAST-WEST) FENCE LINE; THENCE SOUTH 89°12'14" EAST ALONG SAID OLD EXISTING (EAST-WEST) FENCE LINE A DISTANCE OF 312.89 FEET TO A POINT ON THE EAST LINE OF A PARCEL DESCRIBED IN BOOK 2838 AT PAGE 601; THENCE SOUTH 00°52'48" WEST ALONG SAID EAST LINE A DISTANCE OF 15.80 FEET TO THE TRUE POINT OF BEGINNING,
 COUNTY OF ADAMS,
 STATE OF COLORADO.

PARCEL B:

THAT PART OF THE SE1/4 SE 1/4 OF SECTION 6, TOWNSHIP 3 SOUTH, RANGE 68 WEST OF THE 6TH P.M., DESCRIBED AS FOLLOWS: BEGINNING AT THE SOUTHEAST CORNER OF SAID SECTION 6; THENCE WEST, A DISTANCE OF 420.58 FEET, MORE OR LESS, TO THE SOUTHEAST CORNER OF TRACT OF LAND DESCRIBED IN DECREE RECORDED IN BOOK 367 AT PAGE 43; THENCE NORTHEASTERLY, ALONG THE EAST LINE OF SAID TRACT DESCRIBED IN BOOK 367 AT PAGE 43, A DISTANCE OF 849 FEET TO THE TERMINAL POINT OF COURSE NO. 5 OF SAID TRACT DESCRIBED IN BOOK 367 AT PAGE 43; THENCE NORTH 89°50' WEST, ALONG SAID COURSE NO. 5, A DISTANCE OF 28.5 FEET TO THE TERMINAL POINT OF COURSE NO. 4 OF SAID TRACT DESCRIBED IN BOOK 367 AT PAGE 43; THENCE NORTH 0°40' EAST, ALONG SAID COURSE NO. 4, TO A POINT 330 FEET SOUTH OF THE NORTH LINE OF THE SE 1/4 SE 1/4 OF SAID SECTION 6; THENCE EAST, ALONG A LINE 330 FEET SOUTH OF AND PARALLEL TO THE NORTH LINE OF THE SE 1/4 SE 1/4 OF SAID SECTION 6, TO A POINT ON THE EAST LINE OF SAID SECTION 6; THENCE SOUTH, ALONG THE EAST LINE OF SAID SECTION 6, TO THE POINT OF BEGINNING,
 COUNTY OF ADAMS,
 STATE OF COLORADO.

EXCLUDING THEREFROM THAT PORTION AS DESCRIBED IN RULE, ORDER, JUDGEMENT AND DECREE RECORDED AUGUST 16, 1985 AT RECEPTION NO. 593561.

NOTE: THE ABOVE LEGAL DESCRIPTION WILL BE AMENDED UPON SATISFACTION OF THE REQUIREMENTS HEREIN SET FORTH.

CERTIFICATE OF OWNERSHIP

Linnette Brozovich, being the owner of 6501 Lowell Boulevard, located in the County of Adams, State of Colorado, hereby submits this Planned Unit Development - Preliminary Development Plan and agrees to perform under the terms noted heron.

Owner: _____

State: _____

County: _____

City: _____

The forgoing instrument was acknowledged before me this ____ day of _____ 20__.

Notary Public _____

My commission expires: _____

PLANNING COMMISSION APPROVAL

Approved by Adams County Planning Commission this ____ day of _____ 20__.

Chair _____

BOARD OF COUNTY COMMISSIONS APPROVAL

Approved by Adams County Planning Commission this ____ day of _____ 20__.

Chair _____

CERTIFICATE OF CLERK AND RECORDER

This Amended Preliminary Development Plan was filed for the record in the Office of Adams County County Clerk and Recorder in the State of Colorado at __m, on the ____ day of _____ 20__.

SHEET INDEX	
1	COVER SHEET
2	WRITTEN NARRATIVE
3	TRAIL AMENITIES
4	SITE PLAN
5	LOT TYPICALS
6	STREET SECTIONS
7	TYPICAL PASEO SCENE
8	BUILDING 1-1 A ELEVATION
9	BUILDING 1-1 B ELEVATION
10	BUILDING 1-1 C ELEVATION
11	BUILDING 2-2 A ELEVATION
12	BUILDING 2-2 B ELEVATION
13	BUILDING 2-2 C ELEVATION
14	BUILDING 3-3 A ELEVATION
15	BUILDING 3-3 B ELEVATION
16	BUILDING 3-3 C ELEVATION
17	BUILDING PLAN 1-1
18	BUILDING PLAN 2-2
19	BUILDING PLAN3-3
20	UNIT PLAN 1
21	UNIT PLAN 2
22	UNIT PLAN 3

TTLC DENVER - LOWELL PUD/PDP
ADAMS COUNTY, COLORADO

OWNER:
TTLC MANAGEMENT, INC
DAVID CLOCK
1350 17TH ST, STE 350
DENVER, CO 80202

NOT FOR
CONSTRUCTION

DATE:
03/19/2021
06/11/2021

SHEET TITLE:
COVER
SHEET

SHEET NUMBER:
1 OF 22

LAND OWNER

Linnette Brozovich
12633 Irving Circle
Broomfield, CO 80020
720-971-7283
linnetmae@aol.com

APPLICANT

The True Life Companies
1350 17th Street, Suite 350
Denver, CO 80202
Contact: David Clock
720-330-9211
dclock@thetruelifecompanies.com

LANDSCAPE ARCHITECT & ENTITLEMENTS

Norris Design
1101 Bannock St
Denver, CO 80202
Contact: John Norris & Eva Mather
303-892-1166
jnorris@norris-design.com
emather@norris-design.com

CIVIL ENGINEER

Harris Kocher Smith
1120 Lincoln St
Denver, CO 80203
Contact: John Stafford
jstafford@hkseng.com
303-623-6300

ARCHITECT

KTGY Architects
820 16th St Mall, Suite 500
Denver, CO 80202
Contact: Doug Heaton
dheaton@ktgy.com
303-825-6400

TTLC DENVER - LOWELL

IN THE COUNTY OF ADAMS, COLORADO

PLANNED UNIT DEVELOPMENT / PRELIMINARY DEVELOPMENT PLAN

A. Explanation of the Characteristics of the PUD and its Potential Impact on the Surrounding Area

TTLC Denver proposes a new residential subdivision to provide new homes to the burgeoning area within Adams County that is identified in the future land use area plan and comprehensive plan as Urban Residential. This property is approximately 6.8 acres located at the northwest corner of 64th Avenue and Lowell Boulevard. These applications propose 124 residential duplex lots that will provide new homes to help relieve some of the current housing demand within the County. The new community is designed to attract a broad spectrum of residents with access to the existing Jim Baker Trail and Hidden Lake Park. The neighborhood will have convenient access to major transportation corridors as well as direct access to several RTD FastTrack Stations

The abutting neighborhoods to the west and north are zoned R-1-C with other neighbors zoned PUD, R-4 and R-2 and R-3. This development provides a residential transition from the single-family detached homes to the north and the west, to the multi-family development on the northeast corner of 64th and Lowell Boulevard.

The applications for TTLC Denver - Lowell rezone to rezone the site from R-1-A and C-4 to Planned Unit Development (PUD) to create standards to allow this product at this location. The proposal draws from several other neighboring zones to provide compatibility. The applicant's PUD is requesting a density of 18.2 du/ac, which is consistent with R-4 zoning and height restriction of 35' which is consistent with R-3 zoning.

The property is located near several key transit areas creating great opportunity for transition to higher density residential and per the Southwest Adams County Making Connections plan is an area that is anticipated to be very urbanized. The site is within 1.4 miles of the Clear Creek-Federal RTD Station, 1.5 miles of the 60th & Sheridan / Arvada Gold Strike RTD Station on the Gold Line, and within 0.8 miles from the Westminster RTD Station on the B Line.

B. Provisions for Parking

The Site Plan accommodates a minimum of two (2) resident parking spaces per single-family attached unit in garages plus 0.25 guest parking spaces.

C. Circulation and Road Patterns

The primary entrance to the site will be from Lowell Boulevard with a second access point from West 64th Avenue. A system of internal 30' private streets and walkways will provide access through the neighborhood. The private streets shall be constructed and maintained by the Developer and HOA.

D. Type, Location, Examples of Copy and Monument Signs

The community will have entry monumentation signage at key intersections. Signage may have the name of the community. General Character and materials for monumentation and signage will be included with Final Development Plan applications.

E. Type and Allocation of All Uses Including Permitted Uses, Uses Permitted After Amendment to the PUD and Prohibited Uses

This neighborhood provides for single-family duplex homes, private access drives, and landscape amenities, and necessary detention facilities and other uses that may be typical in a residential neighborhood. Other residential types may be proposed at time of Final Development Plan if they meet a similar density and design aesthetic.

F. Location and Types of Landscaping and Maintenance Provisions

A Conceptual Landscape Plan has been included as part of this submittal that demonstrates the general intent in the key landscaped spaces within the community. This landscape plan is conceptual and subject to change. Detailed designs will be prepared during the Final Development Plan stage of County approval for these areas as they are Final Platted. Common area landscaping and landscape amenities will be owned and maintained by the HOA.

Homes will be designed to front on Lowell Boulevard to provide a uniform urban streetscape with front doors facing outwards towards the larger community. Internal homes will front a green court facing the center of the community or oriented towards the west to capture westerly views. Native landscaping will surround the detention pond to mirror the existing landscape.

The proposed density achieves the Urban Residential land use designation. The proposed neighborhood provides open space areas consistent with this type of urban infill development. This neighborhood will make use of the adjacent Jim Baker Regional trail, connection people to parks throughout the community - and adding to the trail amenity with bike repair stations and benches for residents and passerby.

G. Bufferyard and Landscaping Requirements

Five (5) foot minimum bufferyard width with one (1) tree per eighty (80) linear feet of lot line.

Right-of-Way landscaping requires a minimum of one (1) shade tree and two (2) shrubs per one-thousand (1000) square feet of right-of-way landscape area shall be provided.

Plant size minimum required in the right-of-way and detention areas are a 2 1/2" caliper deciduous or ornamental trees, 6' evergreens, and 5-gallon shrubs or better. Twenty (20) percent of trees shall be 3" caliper deciduous or ornamental trees and 8' evergreen or better. The caliper of all trees shall be measured at at point one (1) foot above grade level.

The property owner's association is responsible for maintenance of the right-of-way landscaping along arterial and collector roads and all detention pond landscaping.

H. Fencing

Fencing will be allowed by review and approval of HOA.

I. Accessory Structures

Accessory structures are prohibited from front yards. All other accessory structures must be approved by the HOA.

J. Utility Service Providers

The Crestview Water and Sanitation District has indicated that they have adequate capability to serve this property with both water and sewer. Xcel Energy will provide gas and electric services to the property.

K. Estimated Timetable for Development

Depended on the final government approvals, the proposed development work will begin in approximately two (2) years with completion in four (4) to six (6) years.

L. Fire Protection District

Adams County Fire Station No. 12 will serve this property.

M. Phasing

This property will be developed in one (1) total phase.

N. HOA

The homeowners association will be established for care and maintenance of this subdivision.

DEVELOPMENT STANDARDS

SINGLE-FAMILY ATTACHED DUPLEX HOMES WITH REAR LOADED GARAGE									
USE	MINIMUM LOT SIZE	MINIMUM LOT WIDTH	MAXIMUM DENSITY	MINIMUM SETBACK TO PORCH	MINIMUM FRONT YARD SETBACK FOR PRINCIPAL STRUCTURE	MINIMUM SIDE YARD SETBACK FOR ALL STRUCTURES	MINIMUM REAR YARD SETBACK FOR PRINCIPAL STRUCTURES	MAXIMUM BUILDING HEIGHT	MAXIMUM LOT COVERAGE
LOT TYPE A	747 sq ft	24'-8"	18.2 du/ac	5'	10'	3'-6"	5'	38'-6"	70%
LOT TYPE B		26'-2"		3'	8'	5'	2'		

NOTES:

- Bay windows, cantilevers, chimneys, exterior posts/columns, solar panels, mechanical equipment, light fixtures, balconies, stairs and other similar architectural features are allowed to extend outward from the principal structure in front, side and rear yards. In no instance may an encroachment cross the property line or be located less than six-feet from the finished material of the encroachment to the adjacent property. When an encroachment is less than 5' from the property line, then the current ICB and/or IRC code requirements and amendments within the governing municipality will be enforced with regard to exterior wall fire-resistant rating and minimum fire-separation distance requirements.
- Roof overhangs are permitted in the building setback and are not included as a part of lot coverage. In no instance may an encroachment cross the property line or be located less than six-feet from the building face of the adjacent property. When an encroachment is less than 5' from the property line, then the current IBC and/or IRC code requirements and amendments within the governing municipality will be enforced with regard to exterior wall fire-resistant and minimum fire-separation distance requirements. All building components such as roof overhangs, desks, sidewall bump-out / chimneys, that are less than 5' from a property line must meet all current building code requirements. Roof overhangs shall not exceed 12" into the areas where openings are prohibited as noted in current building code.

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ADAMS COUNTY, COLORADO

OWNER:
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DAVID CLOCK
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NOT FOR CONSTRUCTION

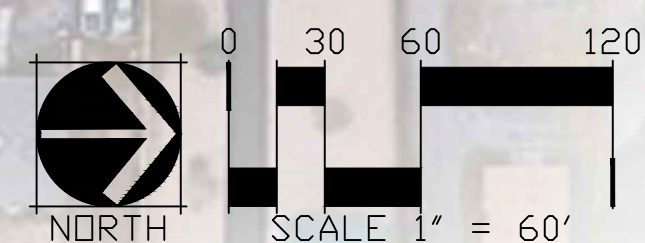
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06/11/2021

SHEET TITLE:
WRITTEN NARRATIVE
SHEET NUMBER:

TTLC DENVER - LOWELL

IN THE COUNTY OF ADAMS, COLORADO

PLANNED UNIT DEVELOPMENT / PRELIMINARY DEVELOPMENT PLAN



LAND USE SUMMARY				
LAND USE	ACREAGE	% TOTAL	UNITS	DENSITY
BUILDING AREAS				
RESIDENTIAL LOTS	3.4	50%	124	
OPEN AREAS				
PRIVATE ACCESS DRIVES	1.6	24%		
LANDSCAPE BUFFER AREAS	1.7 (0.5 ACTIVE)	26%		
OPEN AREAS SUBTOTAL	3.4	50%		
TOTAL	6.8	100%	124	18.2 DU/AC

* NOTE: AT LEAST THIRTY PERCENT (30%) OF THE SITE SHALL BE OPEN AREA (2.2AC). TWENTY FIVE PERCENT (25%) OF THE OPEN AREA MUST BE ACTIVE OPEN SPACE (0.5AC).

NOTES:

1. Site plan is shown is conceptual and may change at time of Final Development Plan.
2. Active land uses, landscape areas, and amenities are conceptual and subject to change with the Final Development Plan.
3. Signage locations are conceptual and subject to change at time of Final Development Plan.

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 06/11/2021

SHEET TITLE:
 SITE PLAN

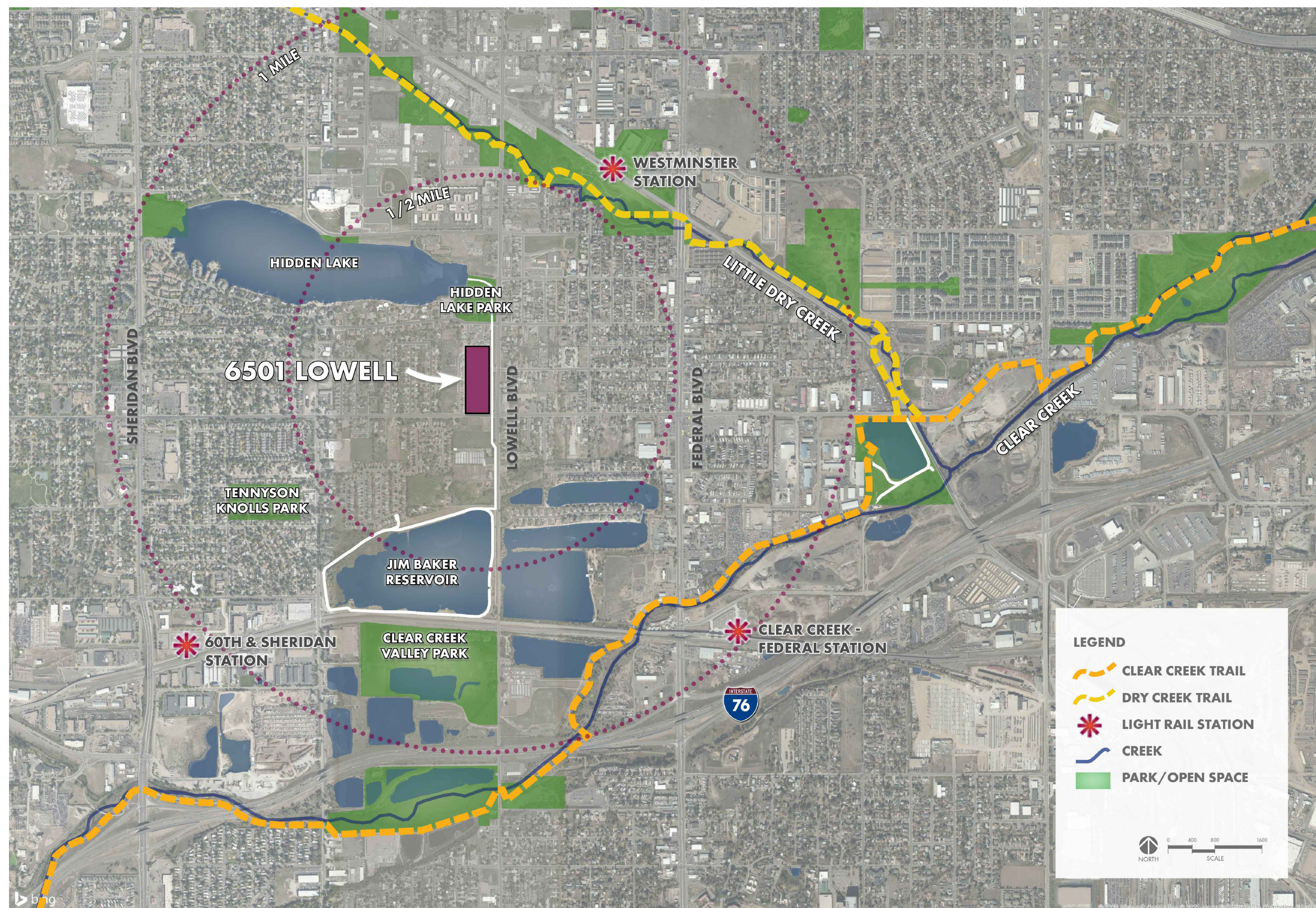
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TTLC DENVER - LOWELL

IN THE COUNTY OF ADAMS, COLORADO

PLANNED UNIT DEVELOPMENT / PRELIMINARY DEVELOPMENT PLAN



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 ADAMS COUNTY, COLORADO

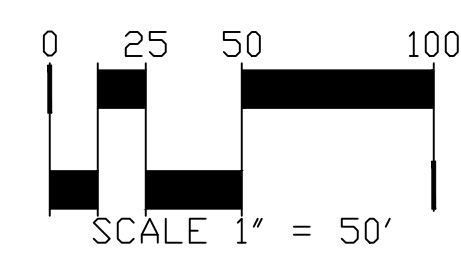
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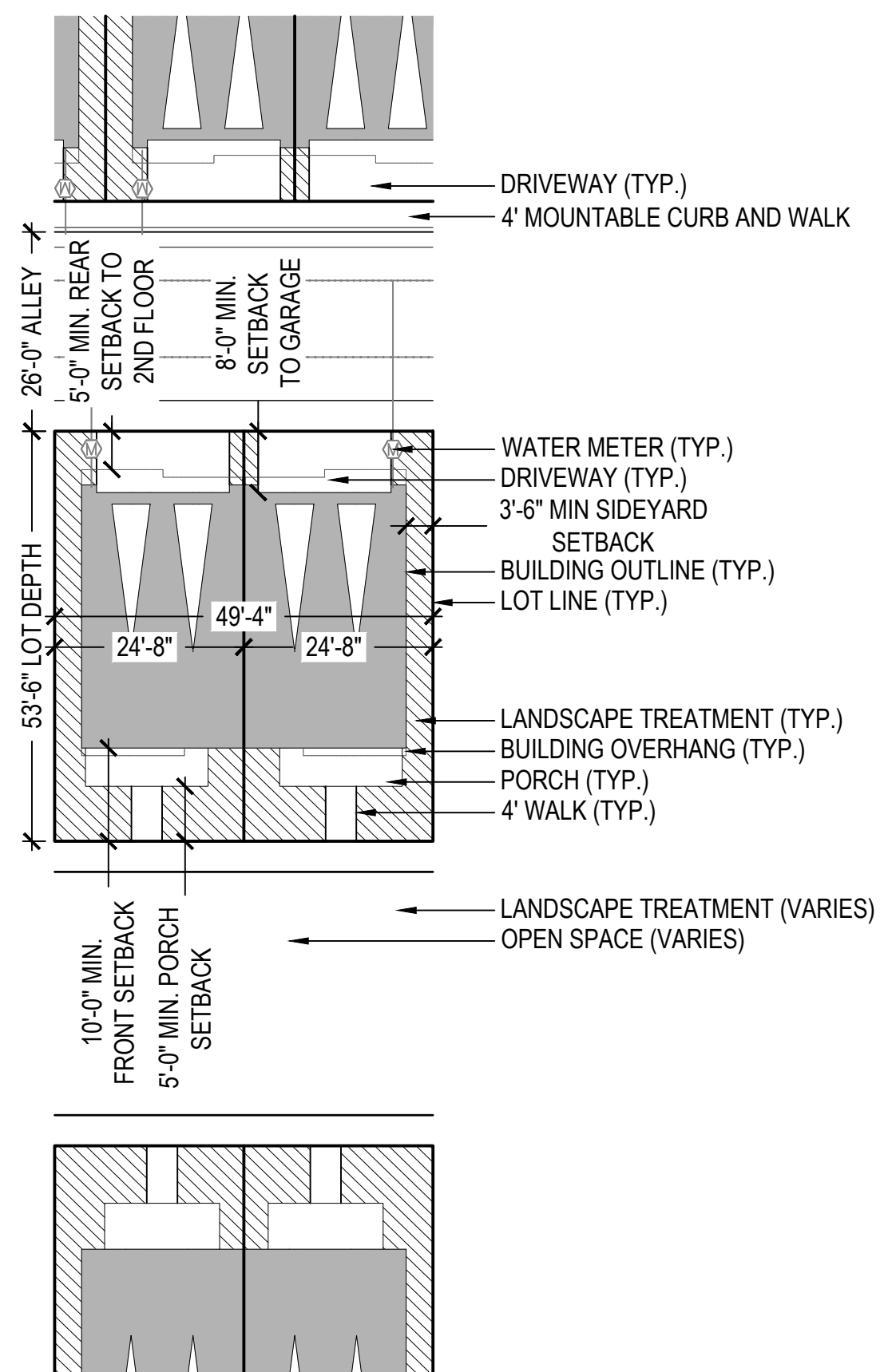
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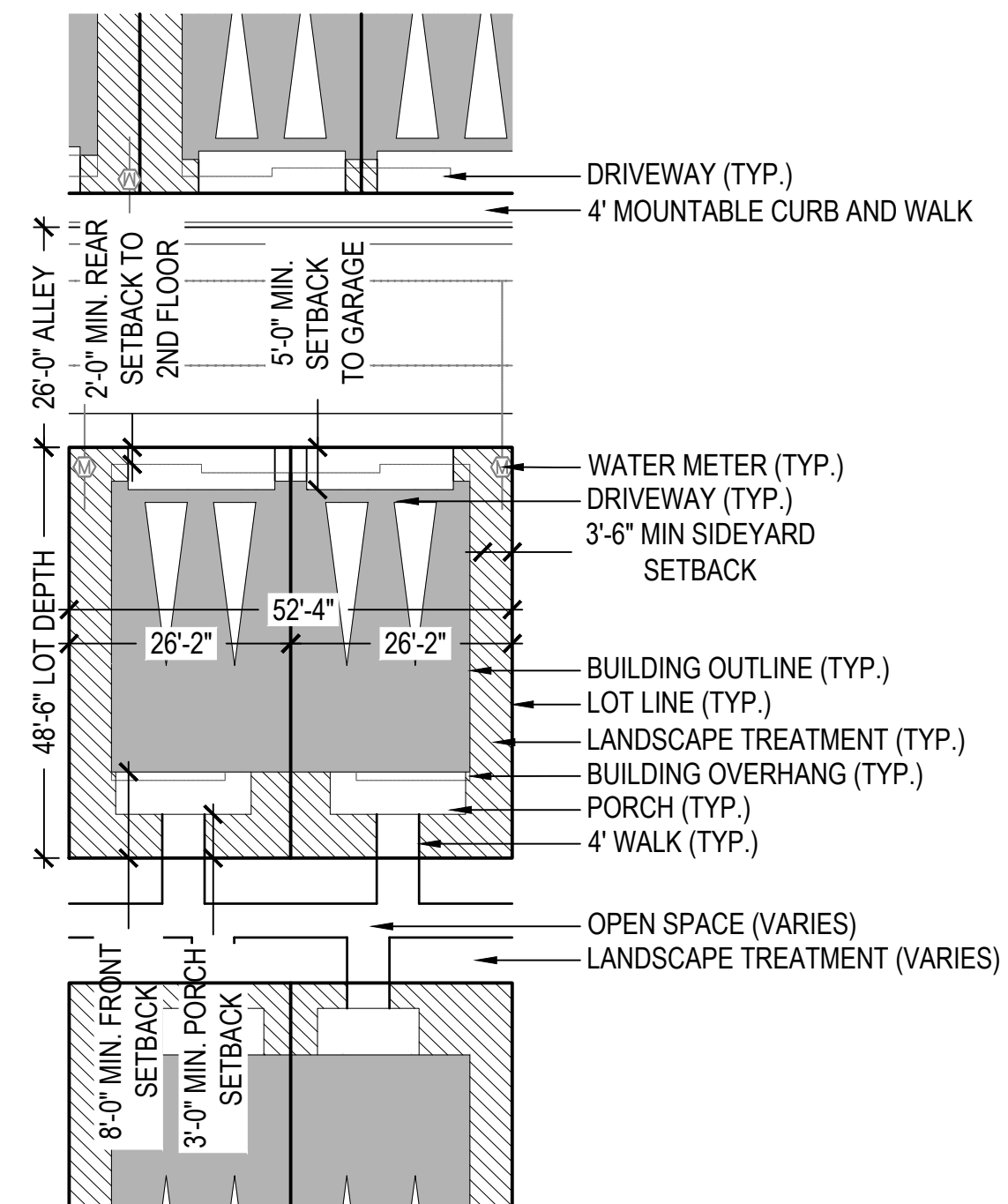
PLANNED UNIT DEVELOPMENT / PRELIMINARY DEVELOPMENT PLAN

PLAN VIEW - LOT TYPICALS

LOT A TYPICAL



LOT B TYPICAL

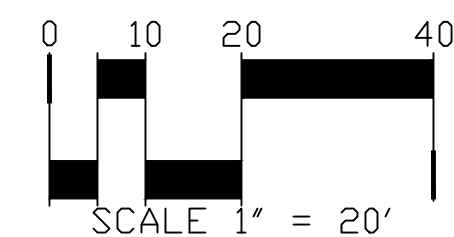


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LOT
TYPICALS
SHEET NUMBER:
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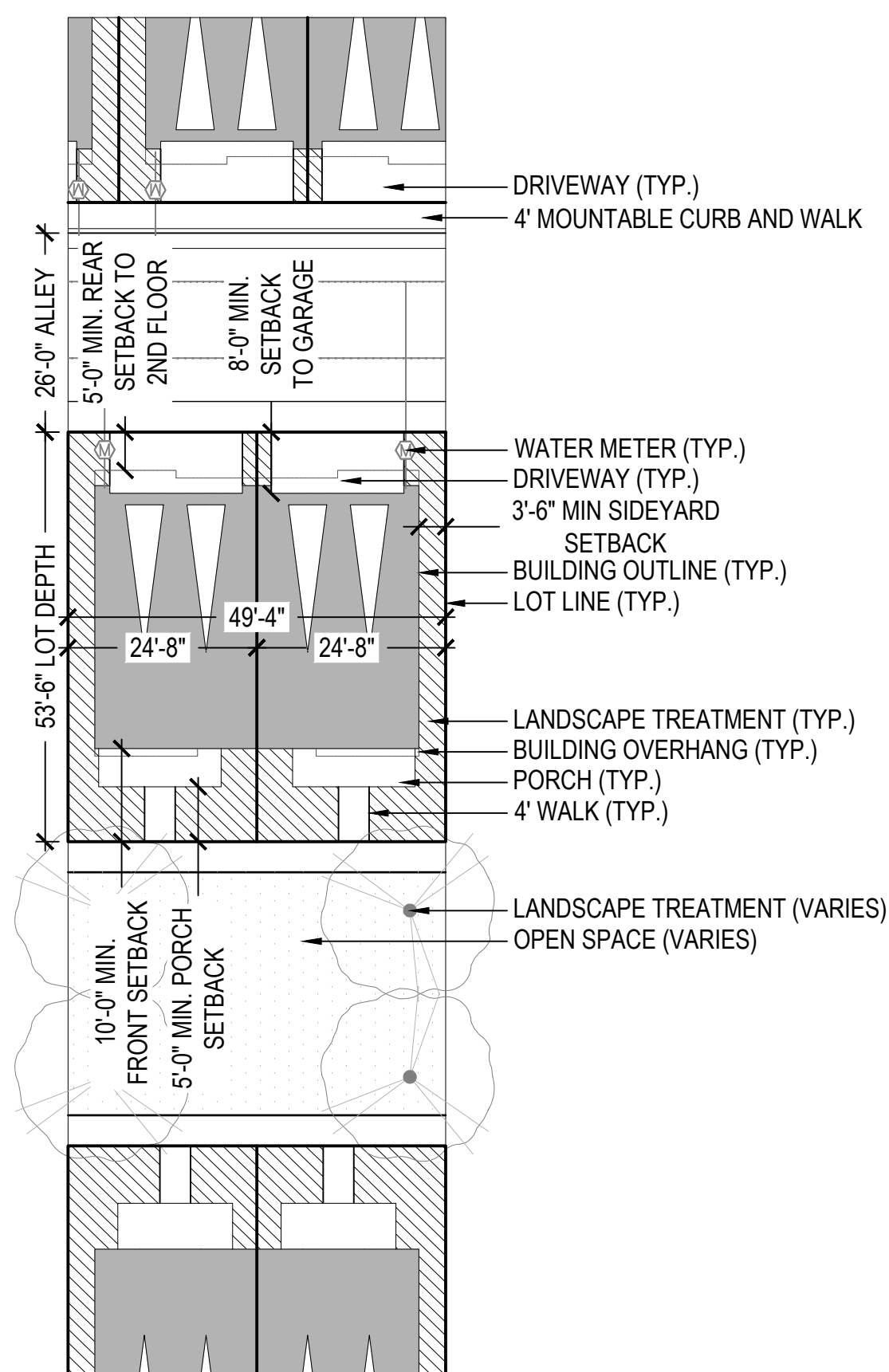
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PLANNED UNIT DEVELOPMENT / PRELIMINARY DEVELOPMENT PLAN

PLAN VIEW - LANDSCAPE LOT TYPICALS



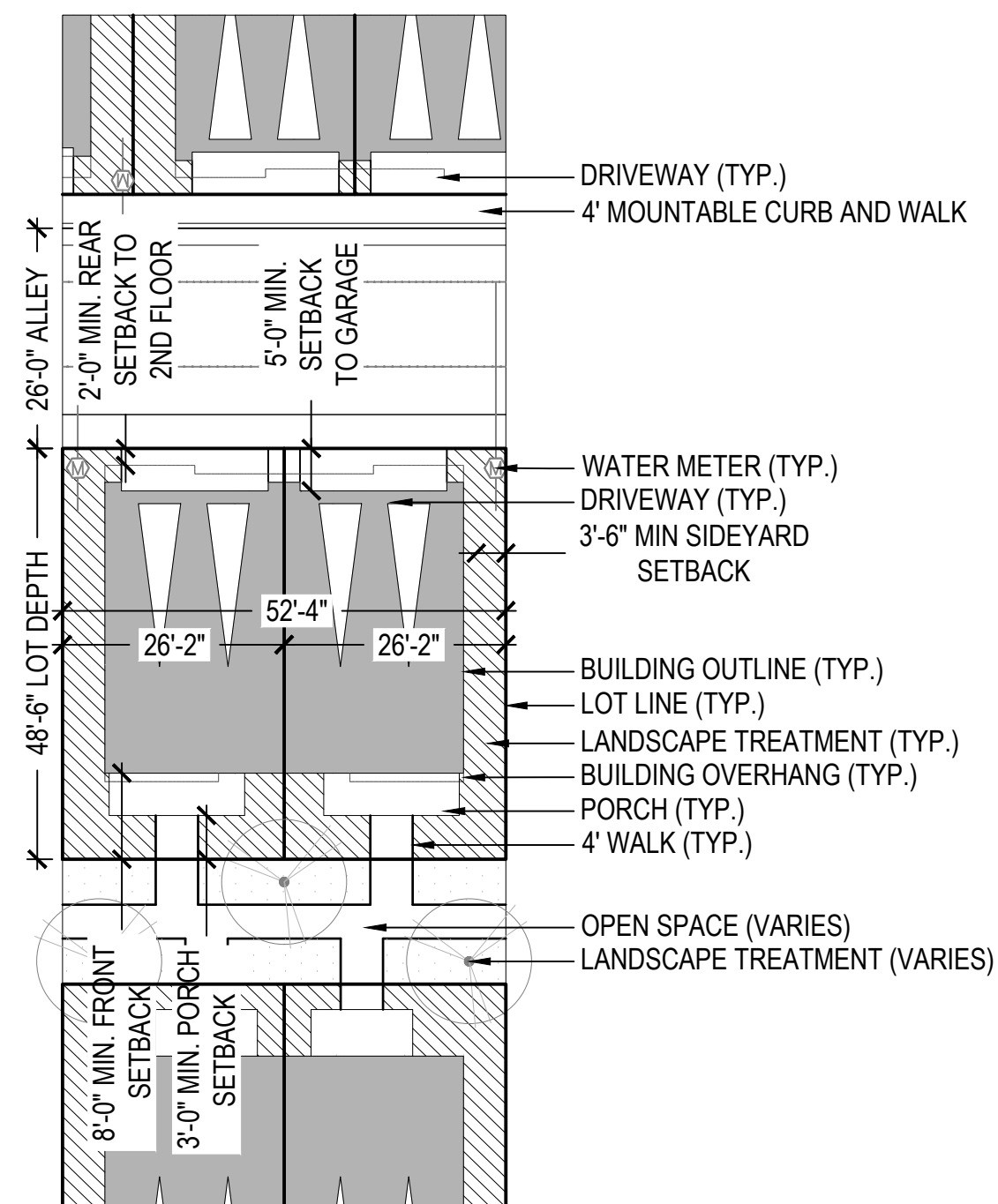
TYPE A

FRONT YARD LANDSCAPING - TYPE A

- (1) TREE - ORNAMENTAL (2"), CLUMP (6'-8"), OR EVERGREEN (6')
- (8) SHRUBS- DECIDUOUS OR EVERGREEN (#5 CONTAINER)

SIDE YARD LANDSCAPING - TYPE A

- INTERNAL SIDE YARD, NOT EXPOSED TO PUBLIC VIEW- NO PLANT MATERIALS REQUIRED BUT MULCHES ARE REQUIRED FOR SOIL STABILITY.
- EXTERNAL SIDE YARDS ON CORNER LOTS EXPOSED TO PUBLIC VIEW- SHALL BE LANDSCAPED BY COMBINING VISIBLE SIDE AND FRONT YARD AREAS AND APPLYING FRONT YARD STANDARDS.



TYPE B

FRONT YARD LANDSCAPING - TYPE A

- (1) TREE - ORNAMENTAL (2"), CLUMP (6'-8"), OR EVERGREEN (6')
- (6) SHRUBS- DECIDUOUS OR EVERGREEN (#5 CONTAINER)

SIDE YARD LANDSCAPING - TYPE A

- INTERNAL SIDE YARD, NOT EXPOSED TO PUBLIC VIEW- NO PLANT MATERIALS REQUIRED BUT MULCHES ARE REQUIRED FOR SOIL STABILITY.
- EXTERNAL SIDE YARDS ON CORNER LOTS EXPOSED TO PUBLIC VIEW- SHALL BE LANDSCAPED BY COMBINING VISIBLE SIDE AND FRONT YARD AREAS AND APPLYING FRONT YARD STANDARDS.

ON-LOT PLANT LIST

<p>ORNAMENTAL TREE</p> <ul style="list-style-type: none"> AUTUMN BRILLIANCE SERVICEBERRY CHANTICLEER PEAR HOT WINGS MAPLE JAPANESE LILAC TREE PRAIRIEFIRE CRABAPPLE SPRING SNOW CRABAPPLE
<p>EVERGREEN TREE</p> <ul style="list-style-type: none"> BABY BLUE EYES SPRUCE BOSNIAN PINE PINYON PINE VANDERWOLF'S PYRAMID PINE
<p>DECIDUOUS SHRUB</p> <ul style="list-style-type: none"> AUTUMN AMBER SUMAC DWARF BUTTERFLY BUSH BLUE MIST SPIREA DARKKNIGHT SPIREA CRIMSON PIGMY BARBERRY COMMON PURPLE LILAC MISS KIM LILAC RUSSIAN SAGE RED TWIG DOGWOOD SAND CHERRY PAWNEE BUTTES
<p>EVERGREEN SHRUB</p> <ul style="list-style-type: none"> BLUE CHIP JUNIPER BUFFALO JUNIPER GLOBE SPRUCE MOPS MUGO PINE
<p>ORNAMENTAL GRASS/ PERENNIAL</p> <ul style="list-style-type: none"> STELLA D'ORO DAYLILY ICE PLANT FEATHER REED GRASS LITTLE BUNNY FOUNTAIN GRASS PURPLE MAIDEN GRASS

* ON-LOT PLANTS ARE SUBJECT TO CHANGE AT THE TIME OF THE FDP.

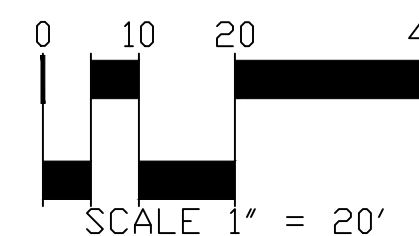
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SHEET TITLE:
LANDSCAPE
LOT TYPICALS
SHEET NUMBER:
6 OF 22

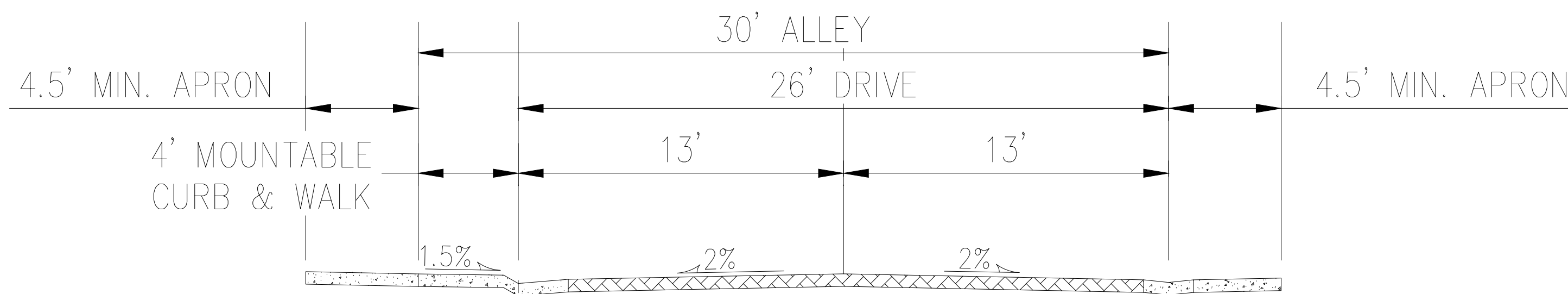
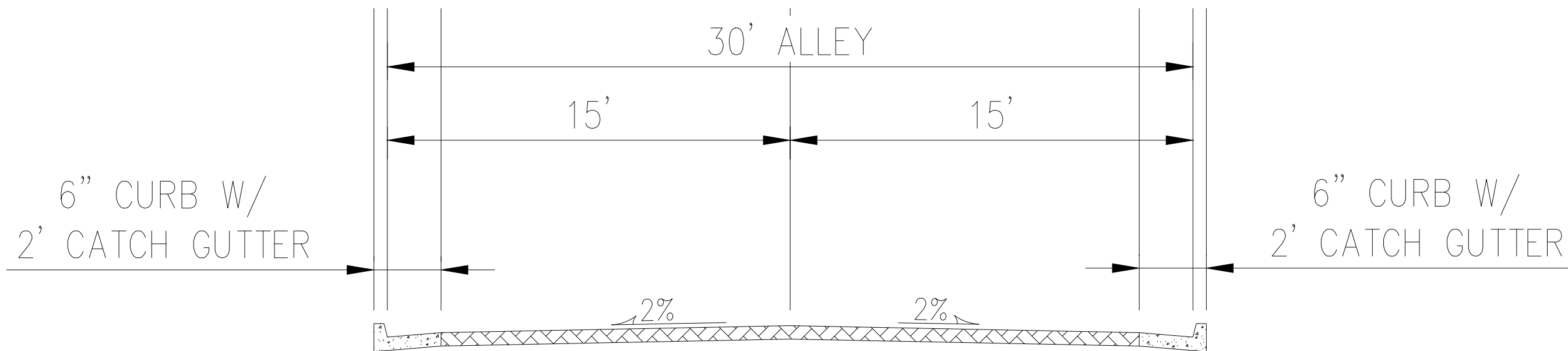


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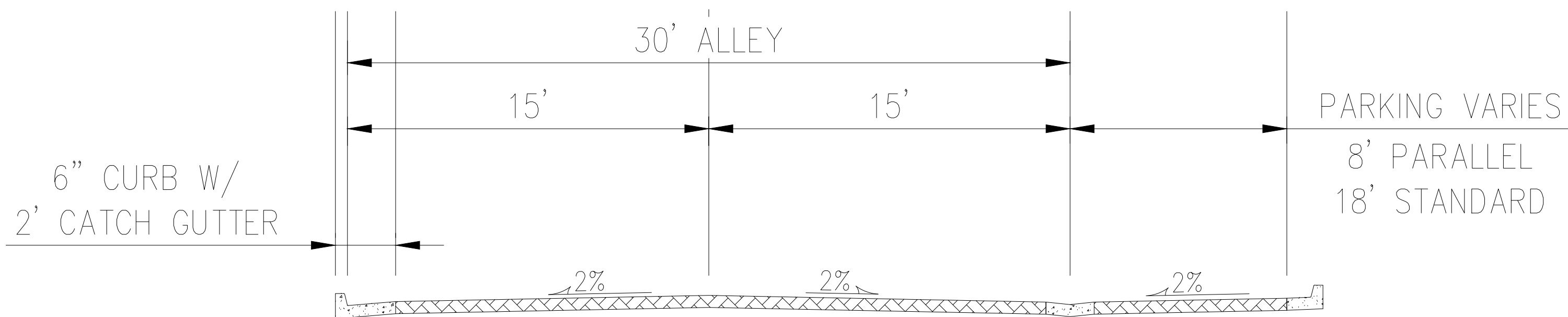
IN THE COUNTY OF ADAMS, COLORADO

PLANNED UNIT DEVELOPMENT / PRELIMINARY DEVELOPMENT PLAN

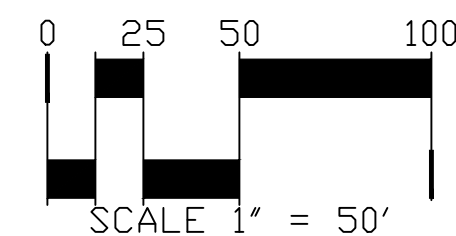
ACCESS DRIVES



30' ALLEY W/ ATTACHED WALK
SCALE: N.T.S.



30' ALLEY W/ PARKING
SCALE: N.T.S.



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SECTIONS
SHEET NUMBER:
7 OF 22

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PLANNED UNIT DEVELOPMENT / PRELIMINARY DEVELOPMENT PLAN



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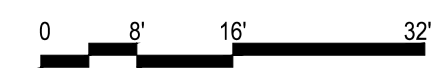


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TYPICAL
PASEO SCENE

SHEET NUMBER:



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IN THE COUNTY OF ADAMS, COLORADO

PLANNED UNIT DEVELOPMENT / PRELIMINARY DEVELOPMENT PLAN

MATERIAL LEGEND

- 1A ASPHALT COMPOSITION TILE ROOFING
- 1B STANDING SEAM METAL ROOFING
- 2 WOOD FASCIA BOARD
- 3 FIBER CEMENT VERTICAL SIDING
- 4 FIBER CEMENT LAP SIDING
- 5 NOT USED
- 6 BOARD AND BATTEN SIDING
- 7 WOOD OR FIBER CEMENT BOARD TRIM
- 8 MASONRY VENEER WHERE SHOWN
- 9 VINYL WINDOW SYSTEM
- 10 METAL GUARDRAIL
- 11 METAL TRELLIS
- 12 METAL SECTIONAL GARAGE DOOR
- 13 DECORATIVE EXTERIOR LIGHT FIXTURE
- 14 WOOD PORCH POST
-



UNIT 1R

RIGHT



UNIT 1

UNIT 1R

FRONT



UNIT 1

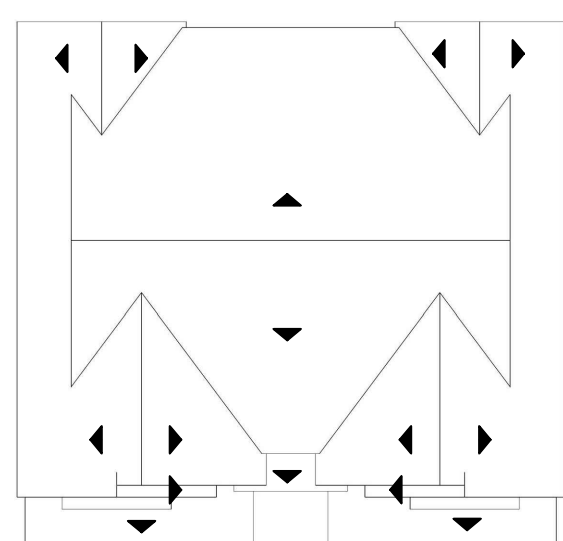
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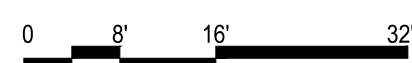
UNIT 1R

UNIT 1

BACK



ROOF PLAN



EXTERIOR ELEVATIONS



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ADAMS COUNTY, COLORADO

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DATE:
03/19/2021
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SHEET NUMBER:

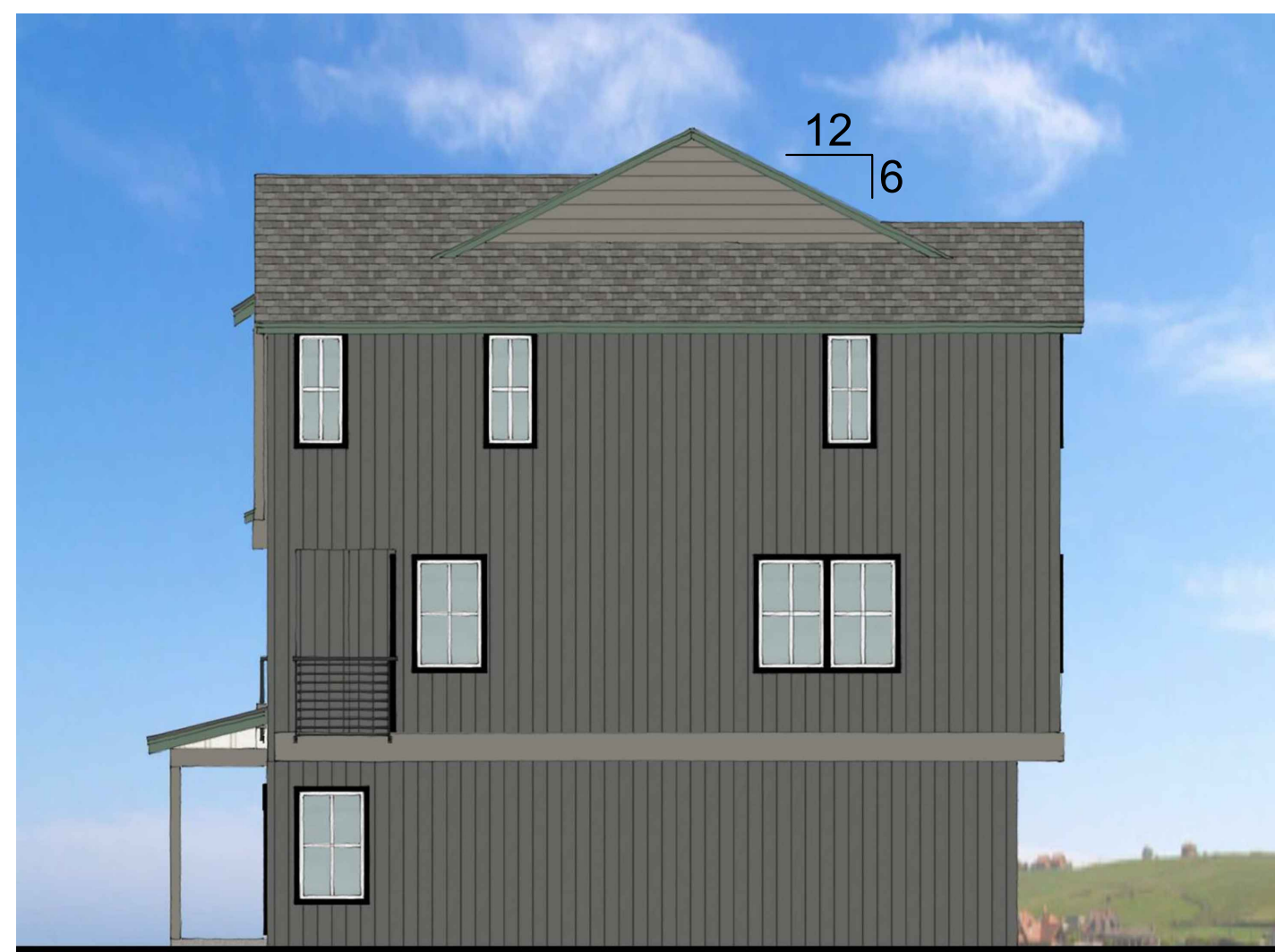
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IN THE COUNTY OF ADAMS, COLORADO

PLANNED UNIT DEVELOPMENT / PRELIMINARY DEVELOPMENT PLAN

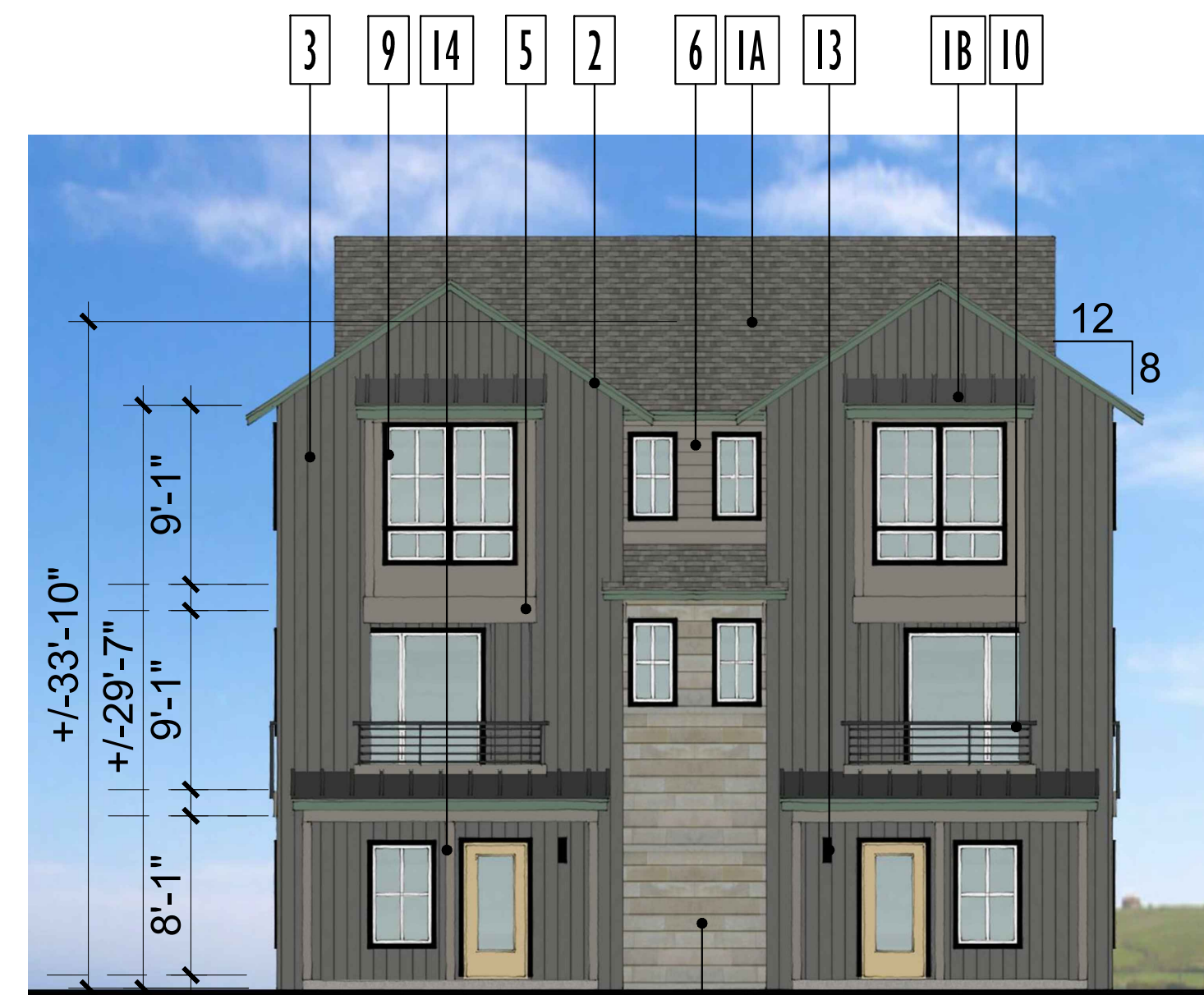
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-



UNIT 1R

RIGHT



UNIT 1

UNIT 1R

FRONT



UNIT 1

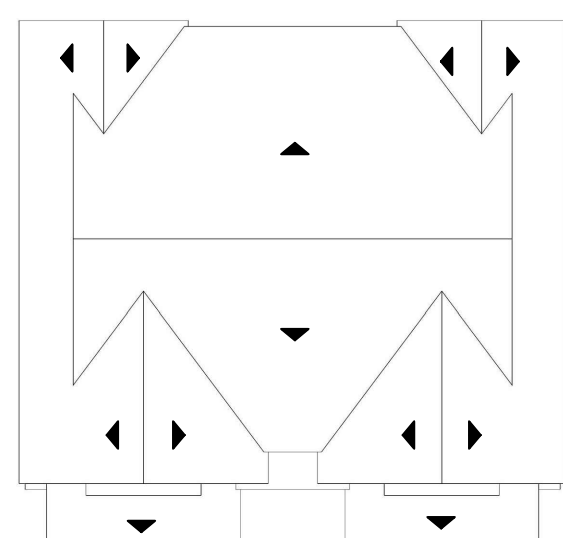
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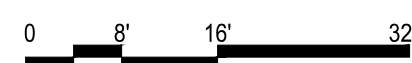
UNIT 1R

UNIT 1

BACK



ROOF PLAN



EXTERIOR ELEVATIONS



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DATE:
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06/11/2021

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SHEET NUMBER:

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IN THE COUNTY OF ADAMS, COLORADO

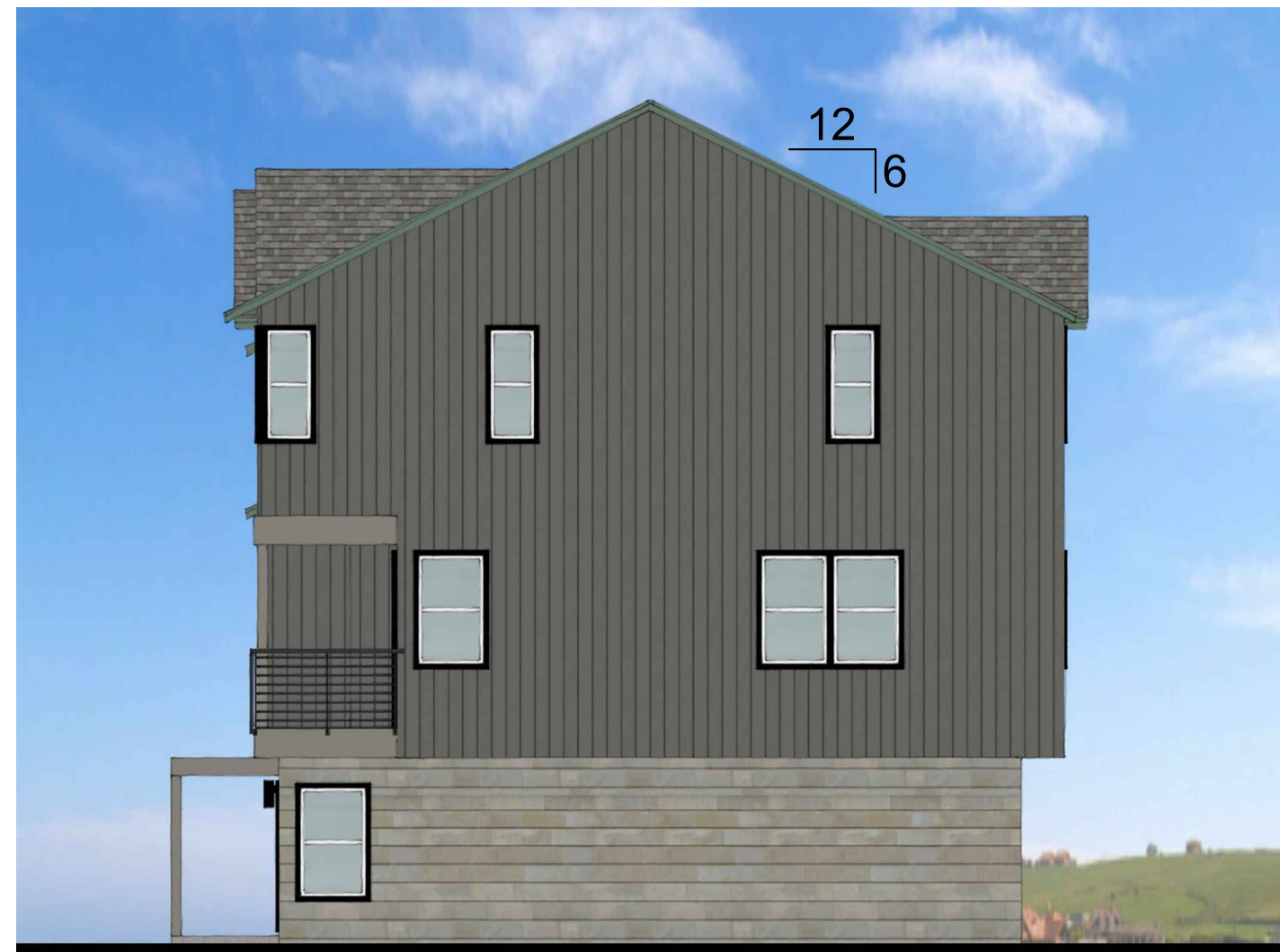
PLANNED UNIT DEVELOPMENT / PRELIMINARY DEVELOPMENT PLAN



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MATERIAL LEGEND

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- 14 WOOD PORCH POST
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UNIT 1R

RIGHT



UNIT 1

UNIT 1R

FRONT



UNIT 1

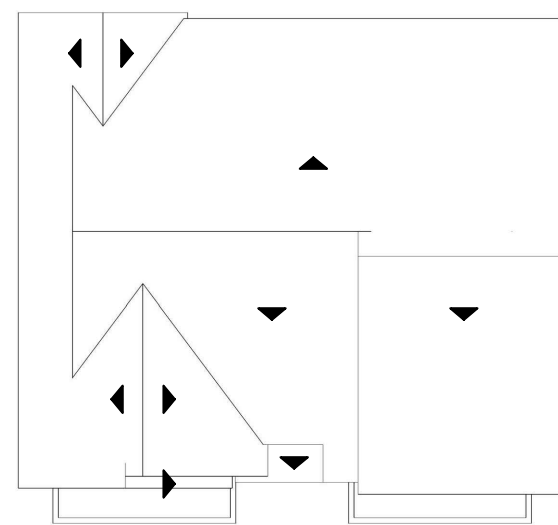
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UNIT 1R

UNIT 1

BACK



ROOF PLAN



EXTERIOR ELEVATIONS



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C ELEVATION

SHEET NUMBER:

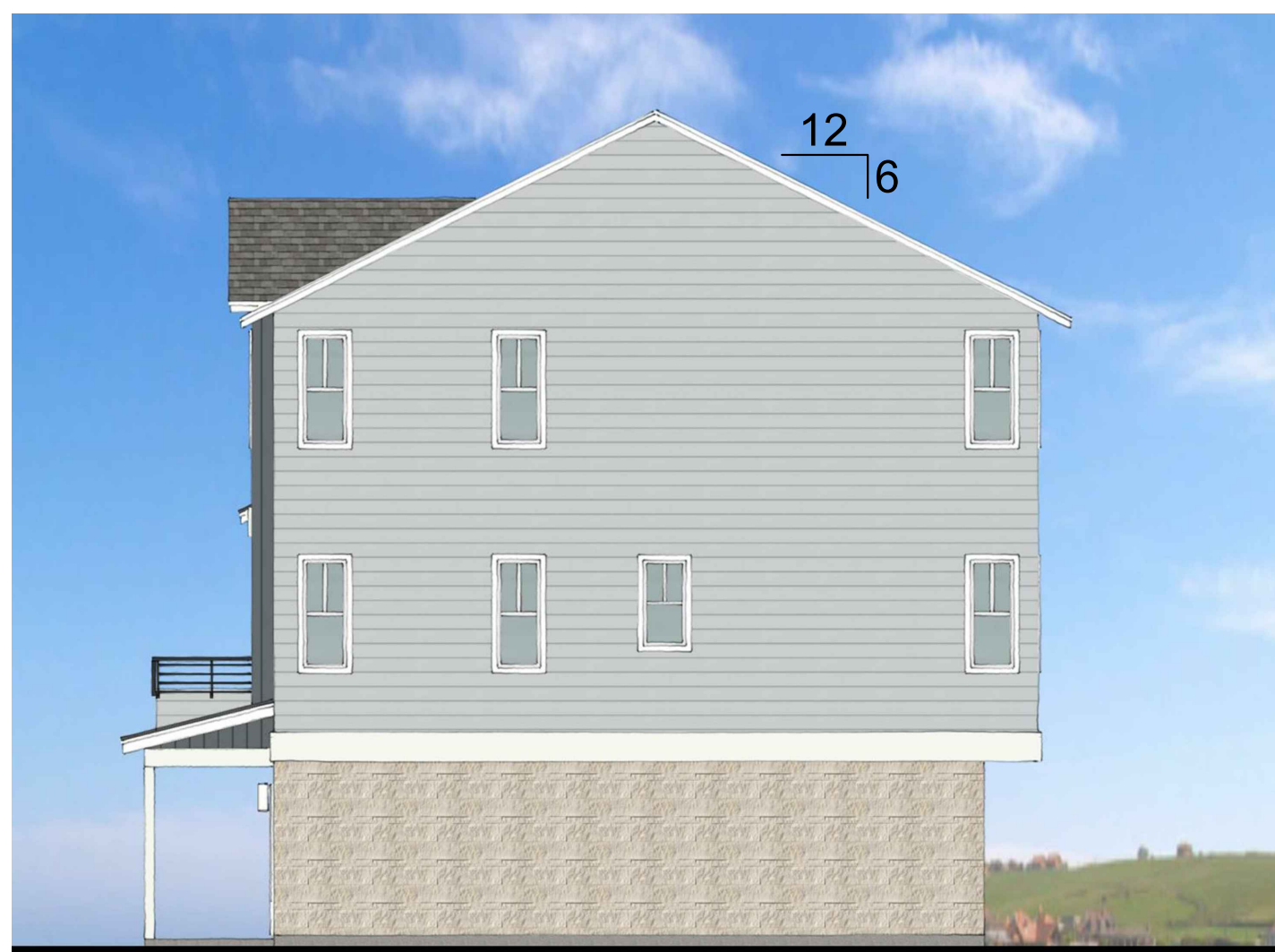
TTLC DENVER - LOWELL

IN THE COUNTY OF ADAMS, COLORADO

PLANNED UNIT DEVELOPMENT / PRELIMINARY DEVELOPMENT PLAN

MATERIAL LEGEND

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UNIT 2R

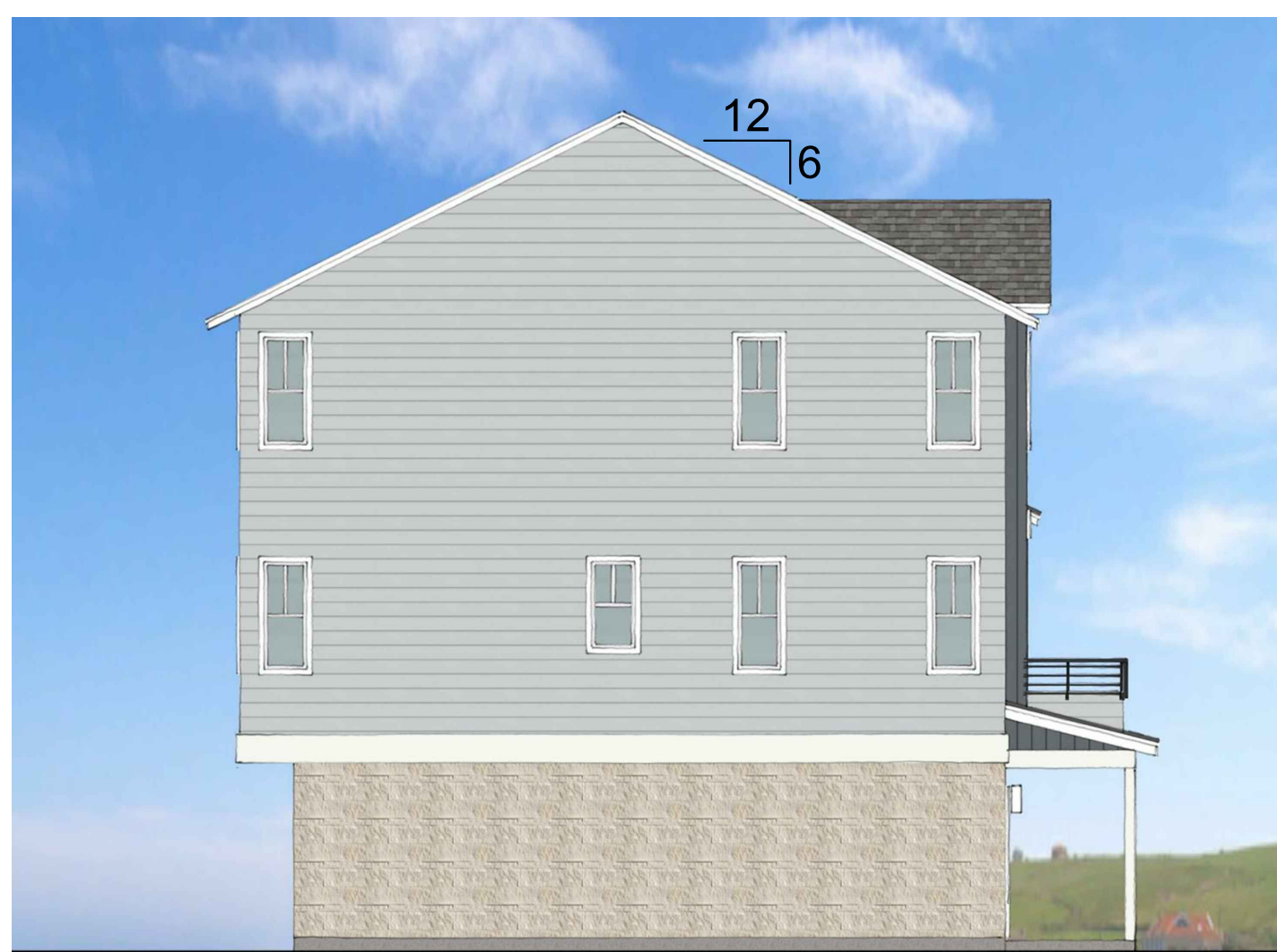
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UNIT 2

UNIT 2R

FRONT



UNIT 2

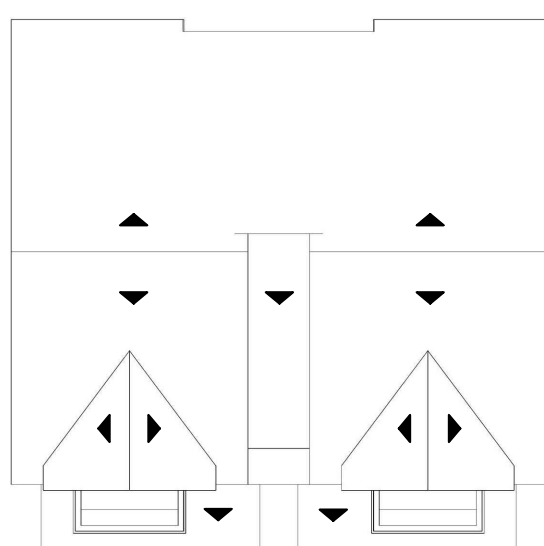
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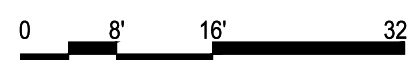
UNIT 2R

UNIT 2

BACK



ROOF PLAN



EXTERIOR ELEVATIONS



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SHEET TITLE:
BUILDING 2-2
A ELEVATION

SHEET NUMBER:
11 OF 22

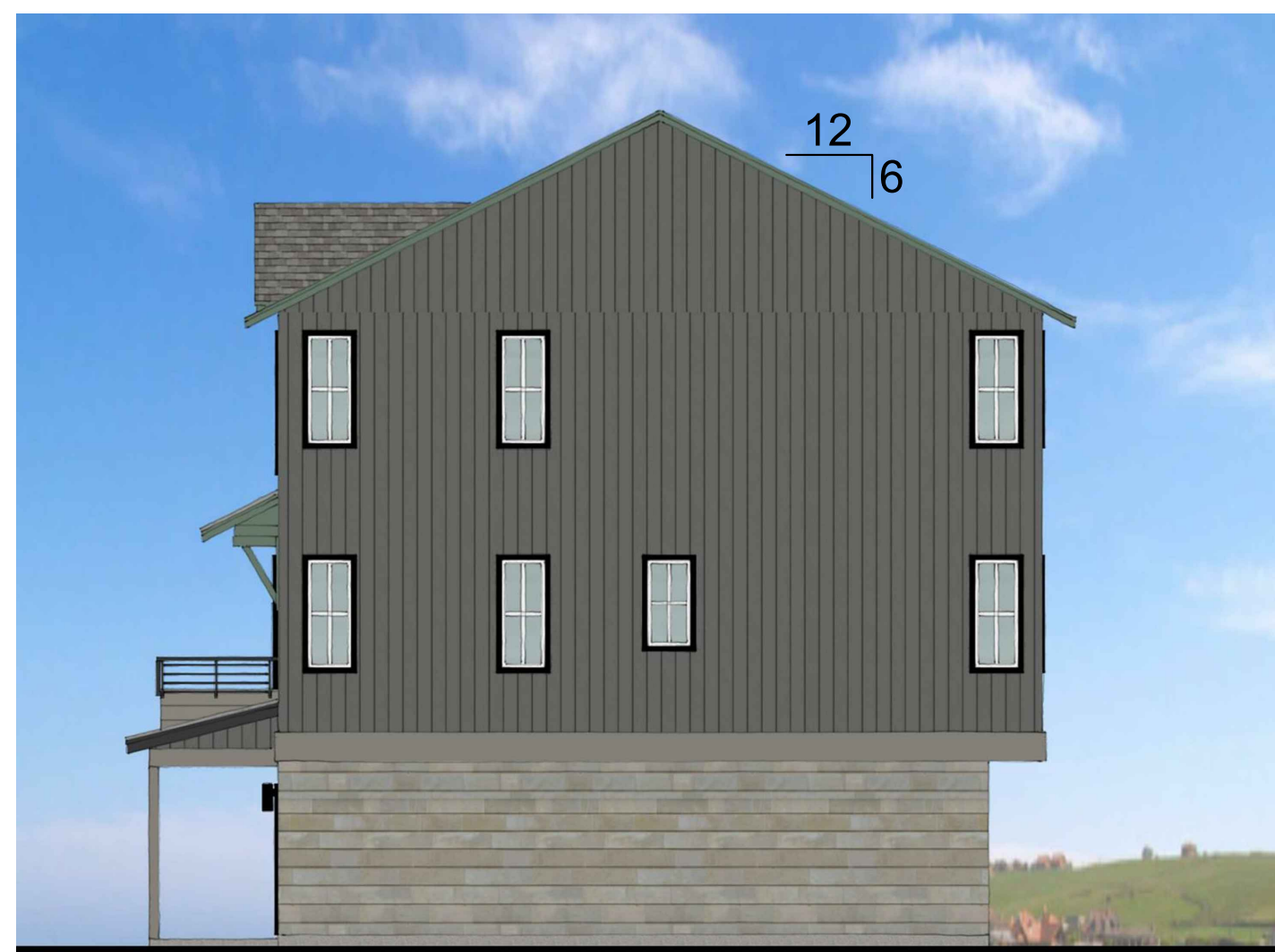
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MATERIAL LEGEND

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- 1B STANDING SEAM METAL ROOFING
- 2 WOOD FASCIA BOARD
- 3 FIBER CEMENT VERTICAL SIDING
- 4 FIBER CEMENT LAP SIDING
- 5 NOT USED
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- 7 WOOD OR FIBER CEMENT BOARD TRIM
- 8 MASONRY VENEER WHERE SHOWN
- 9 VINYL WINDOW SYSTEM
- 10 METAL GUARDRAIL
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- 12 METAL SECTIONAL GARAGE DOOR
- 13 DECORATIVE EXTERIOR LIGHT FIXTURE
- 14 WOOD PORCH POST
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UNIT 2R

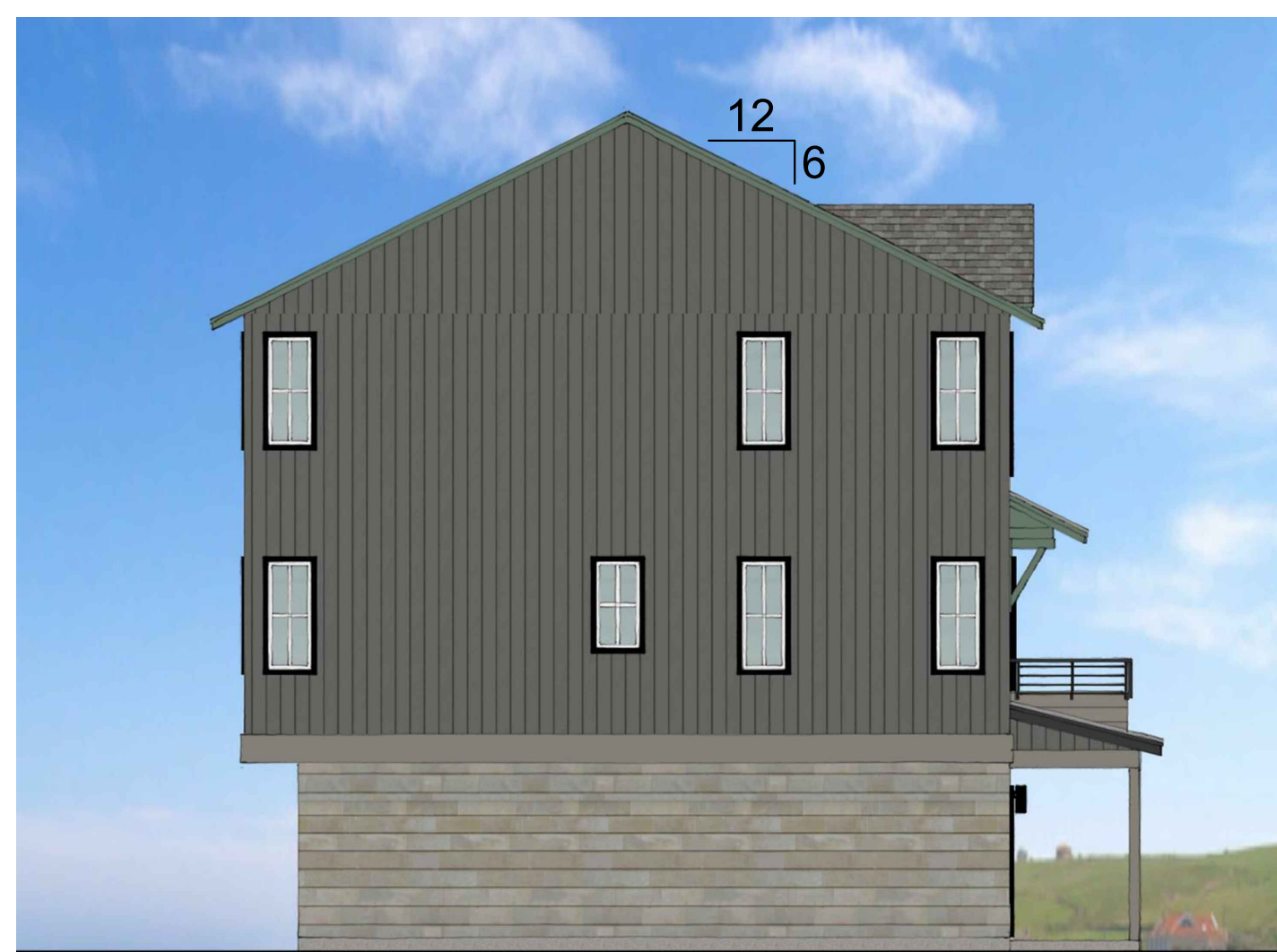
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UNIT 2

UNIT 2R

FRONT



UNIT 2

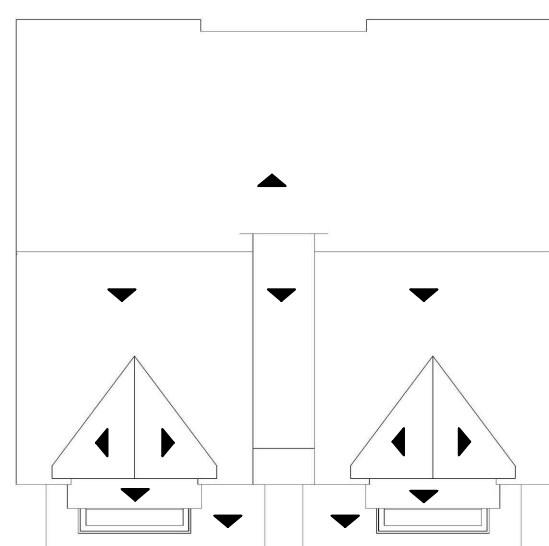
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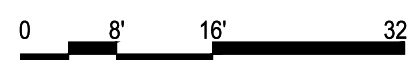
UNIT 2R

UNIT 2

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ROOF PLAN



EXTERIOR ELEVATIONS



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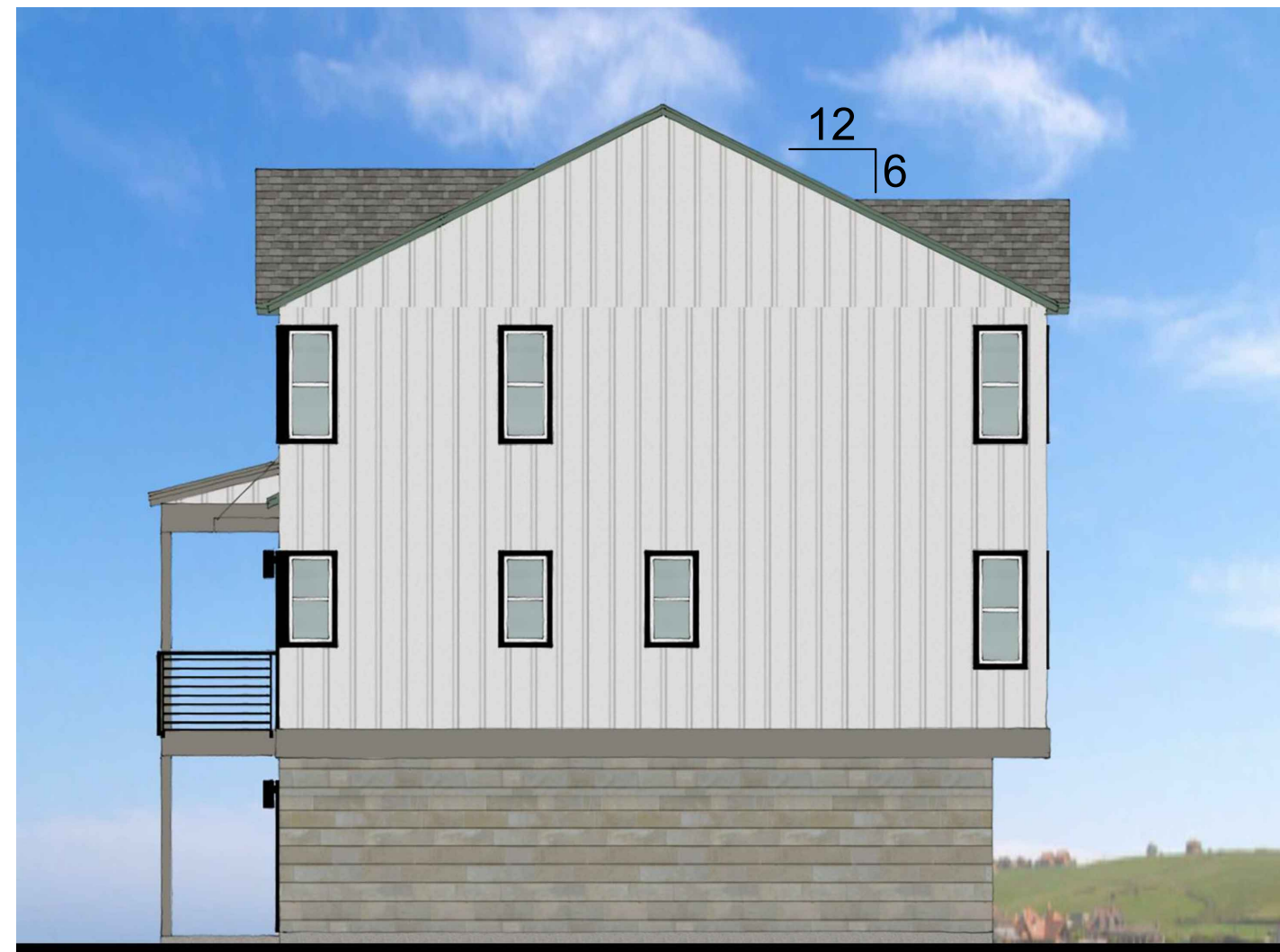
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UNIT 2R

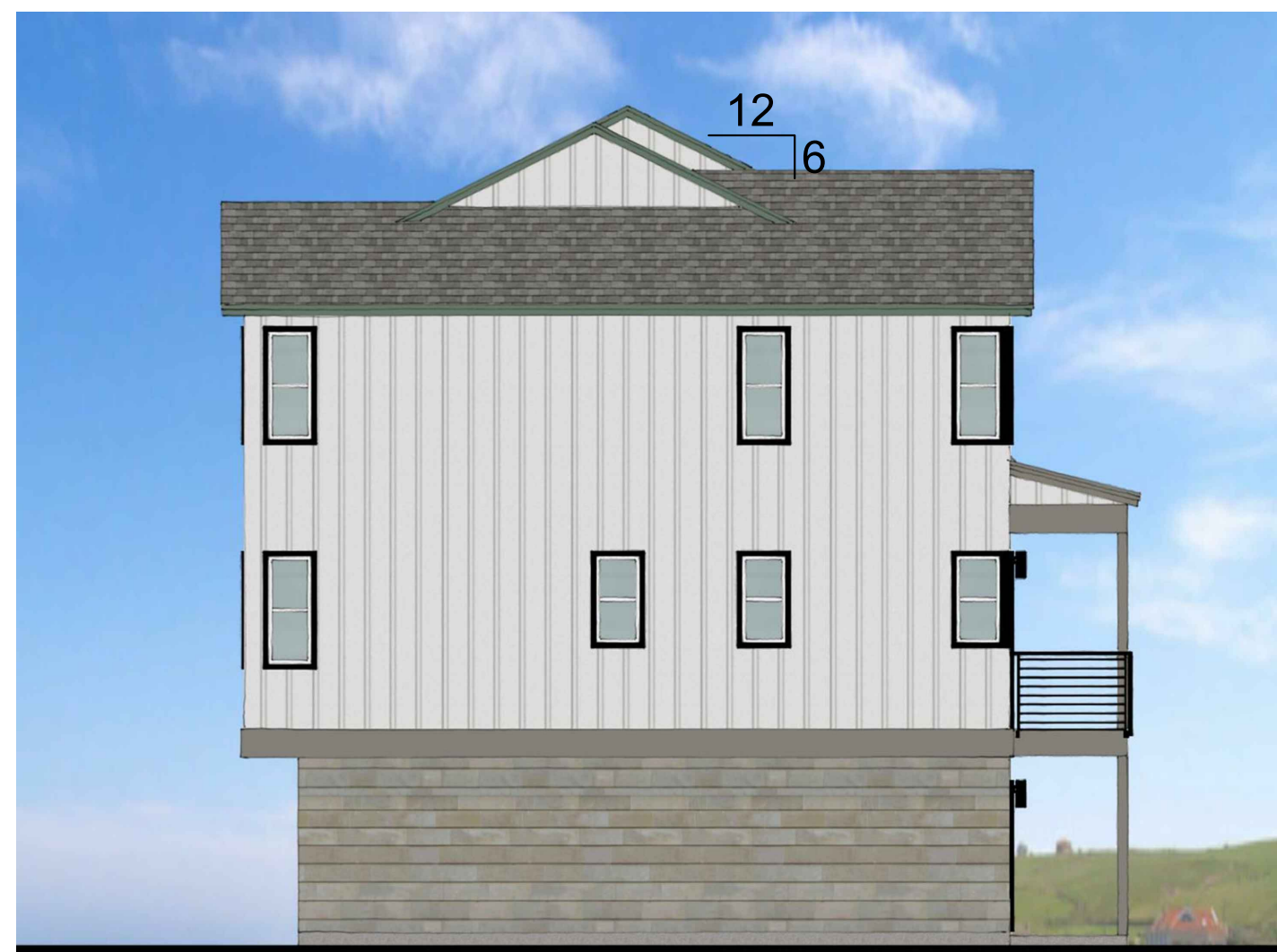
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UNIT 2

UNIT 2R

FRONT



UNIT 2

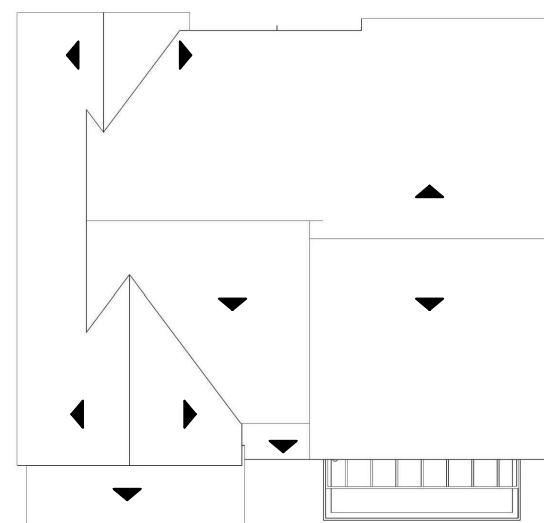
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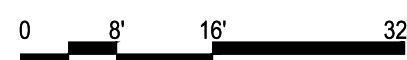
UNIT 2R

UNIT 2

BACK



ROOF PLAN



EXTERIOR ELEVATIONS



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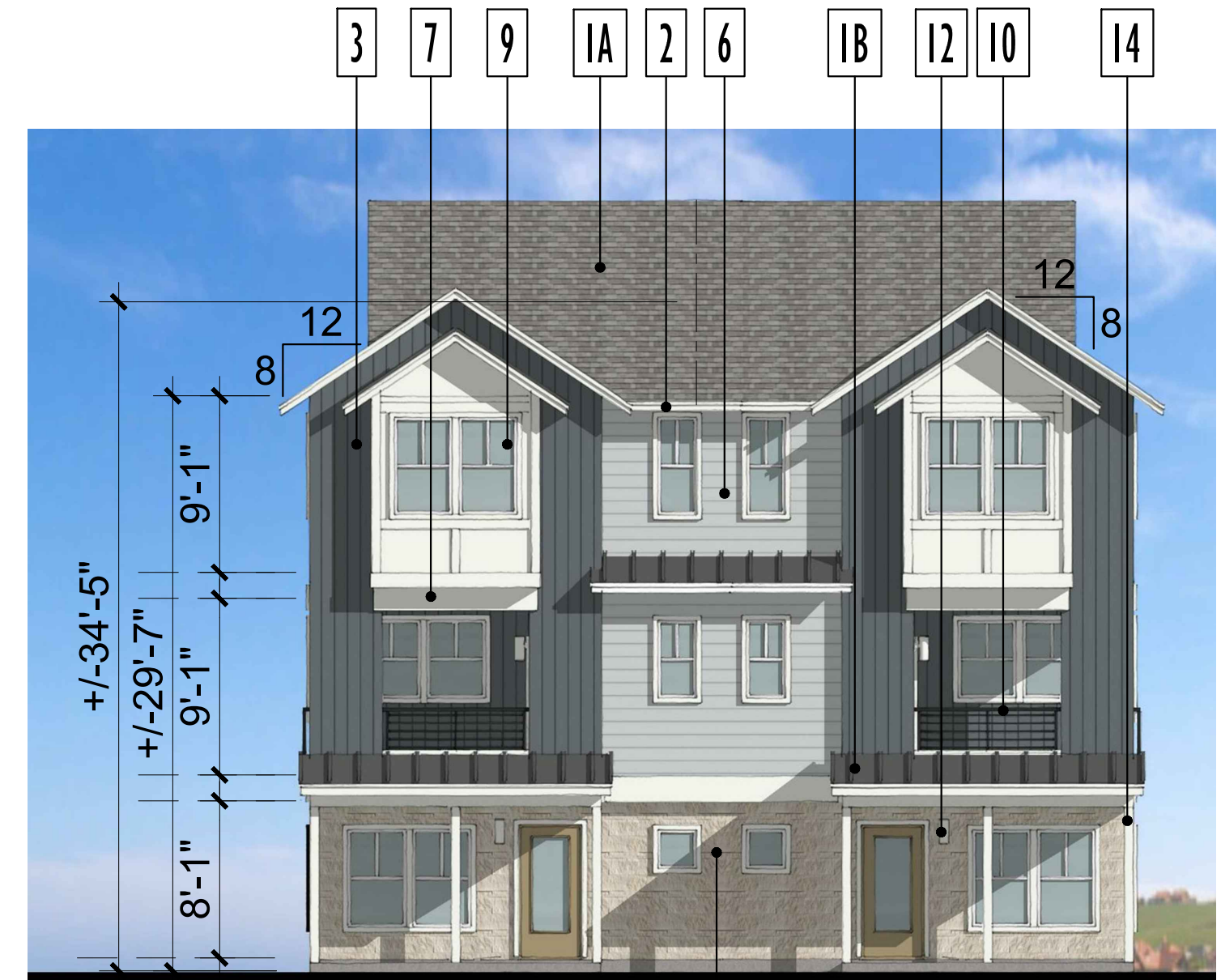
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- 14 WOOD PORCH POST
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UNIT 3R

RIGHT



UNIT 3

UNIT 3R

FRONT



UNIT 3

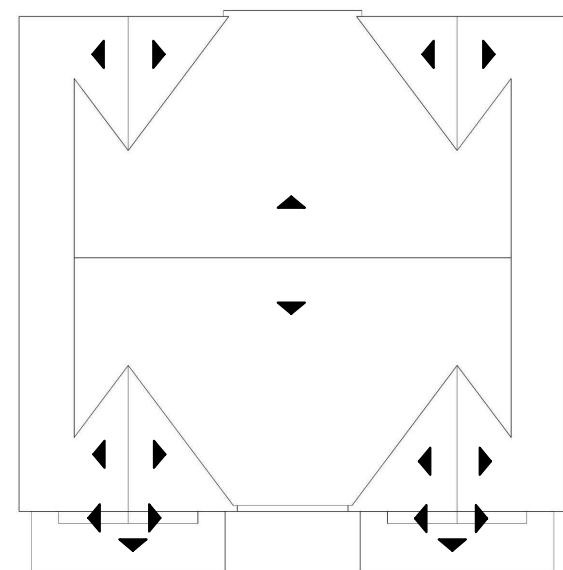
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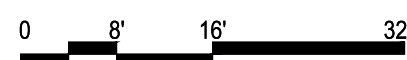
UNIT 3R

UNIT 3

BACK



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UNIT 3R

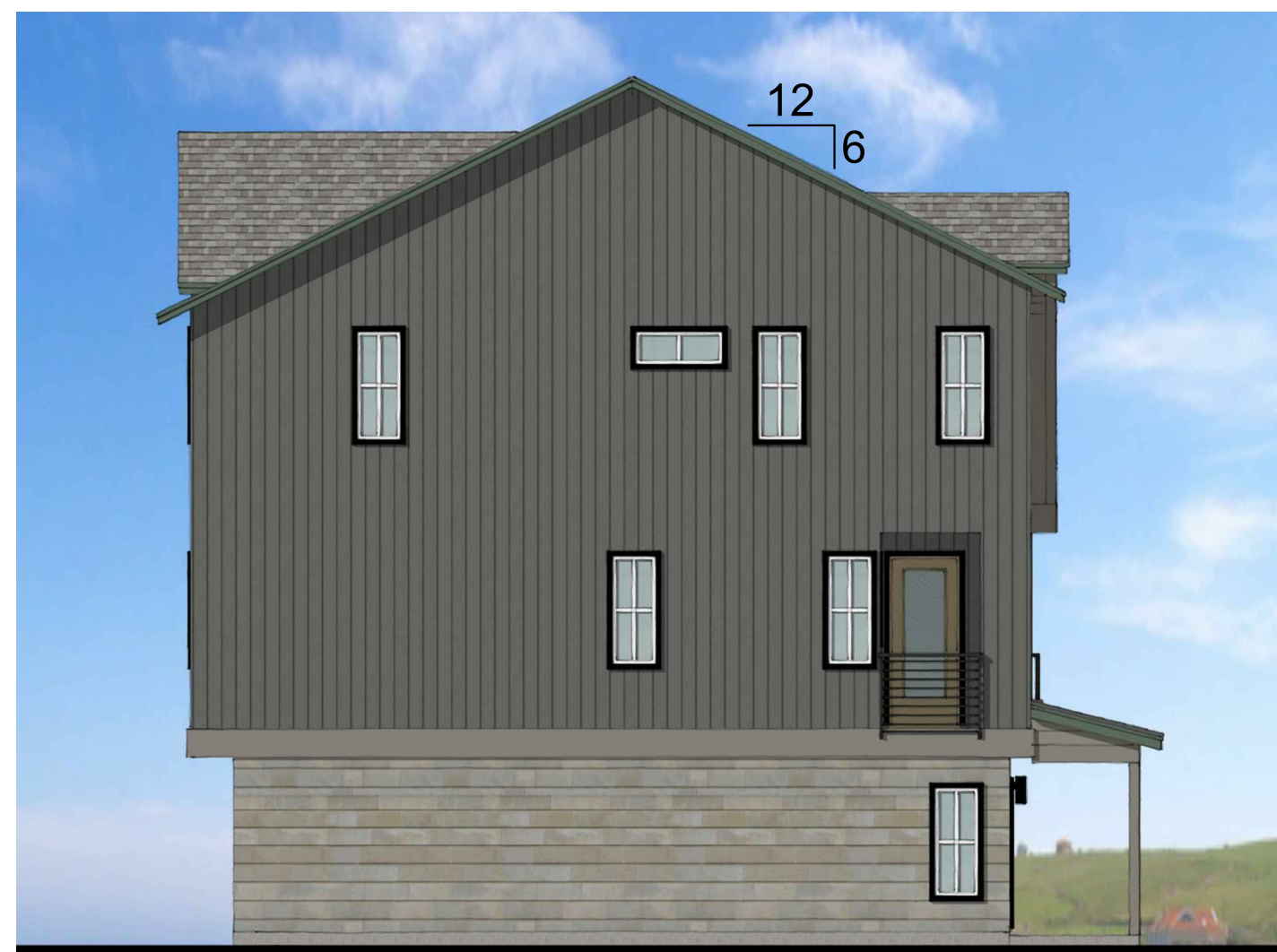
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UNIT 3

UNIT 3R

FRONT



UNIT 3

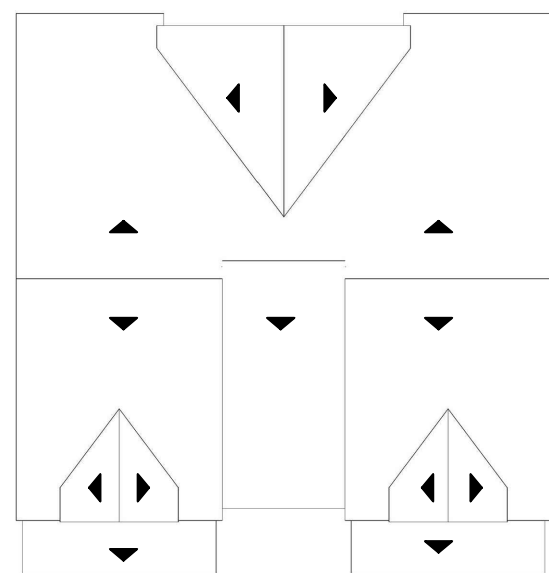
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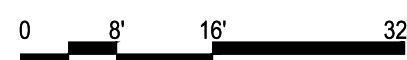
UNIT 3R

UNIT 3

BACK



ROOF PLAN



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- 14 WOOD PORCH POST
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UNIT 3R

RIGHT



UNIT 3

UNIT 3R

FRONT



UNIT 3

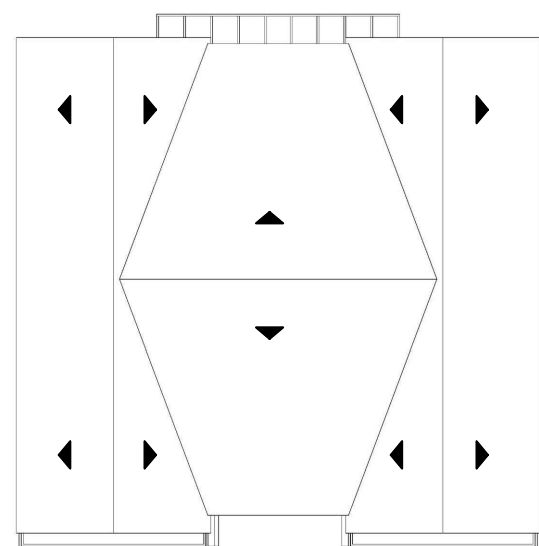
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UNIT 3R

UNIT 3

BACK



ROOF PLAN



EXTERIOR ELEVATIONS



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SHEET TITLE:
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C ELEVATION

SHEET NUMBER:

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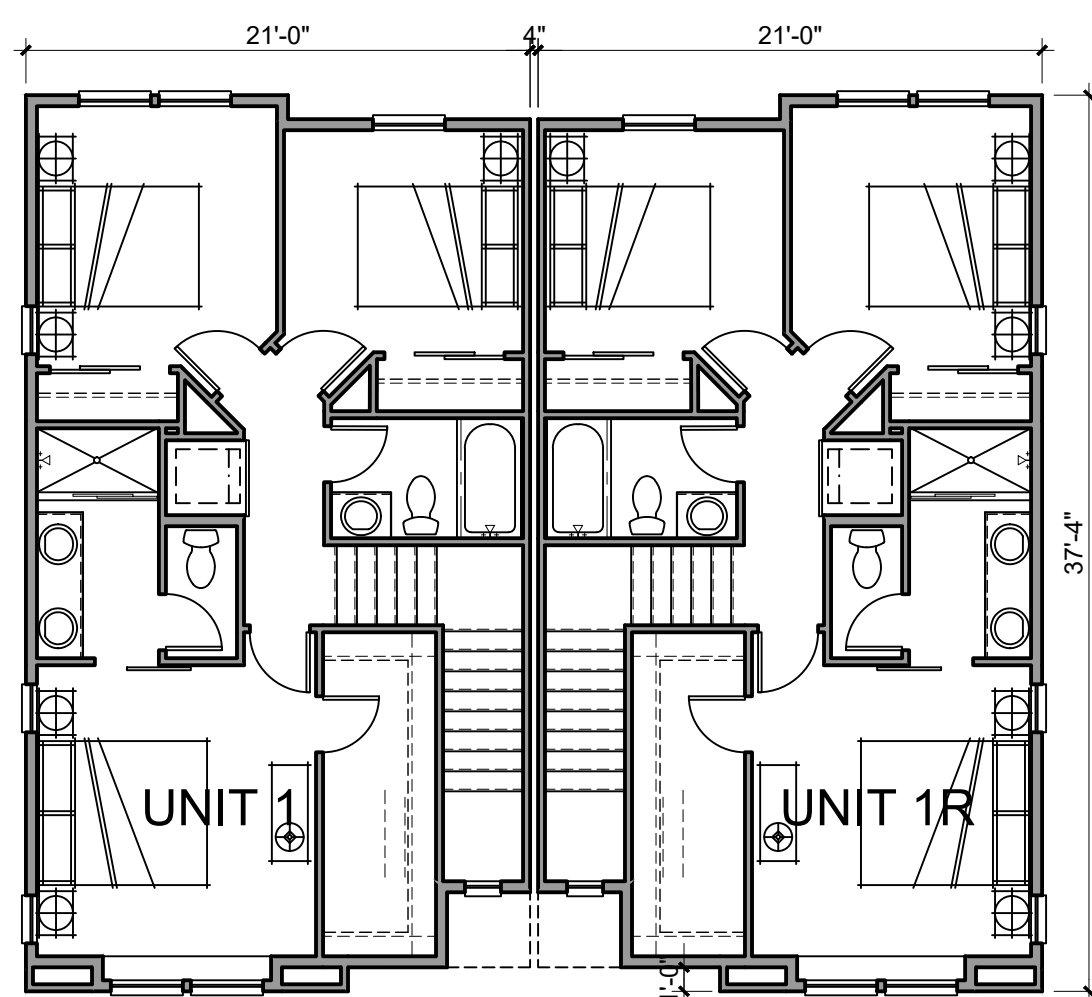
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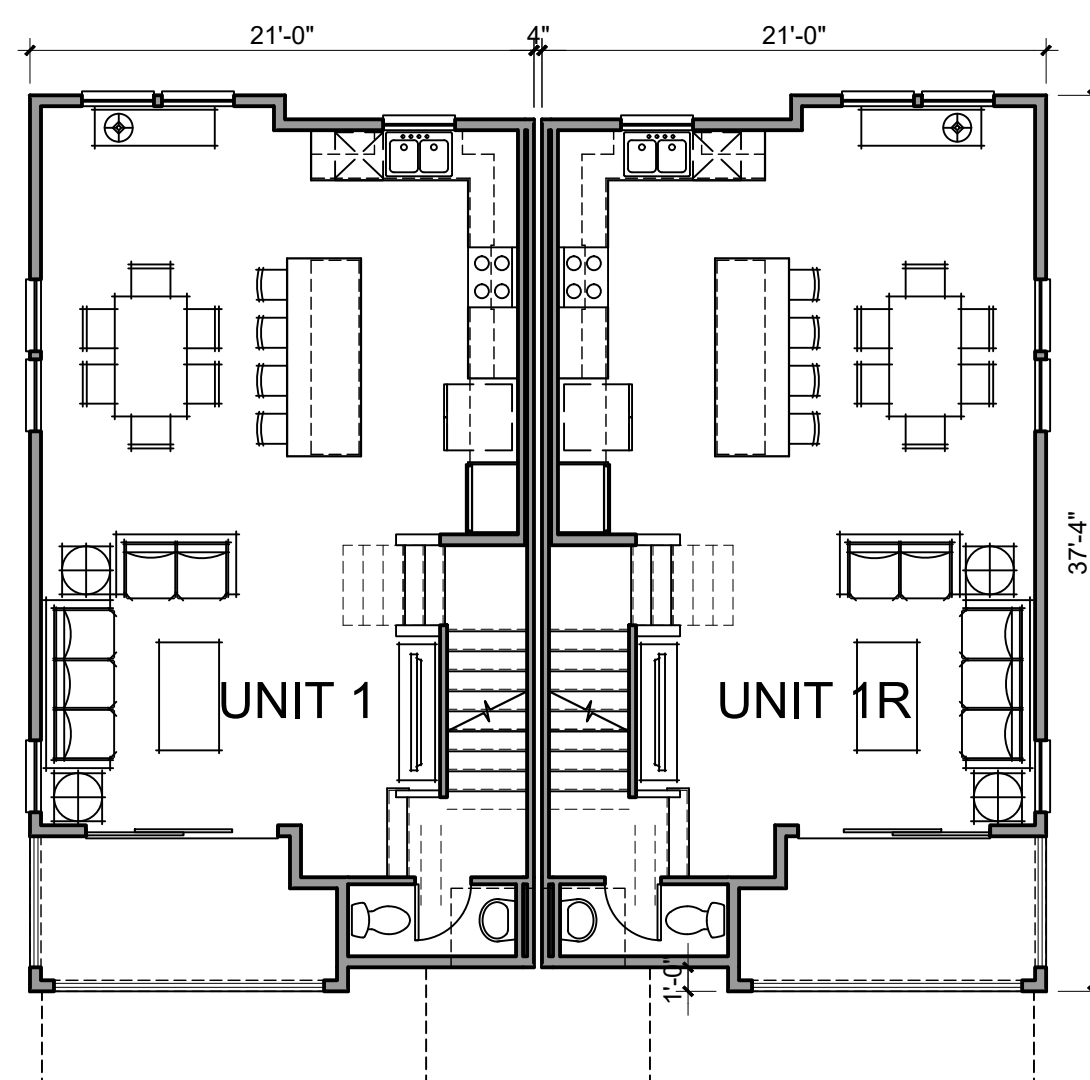
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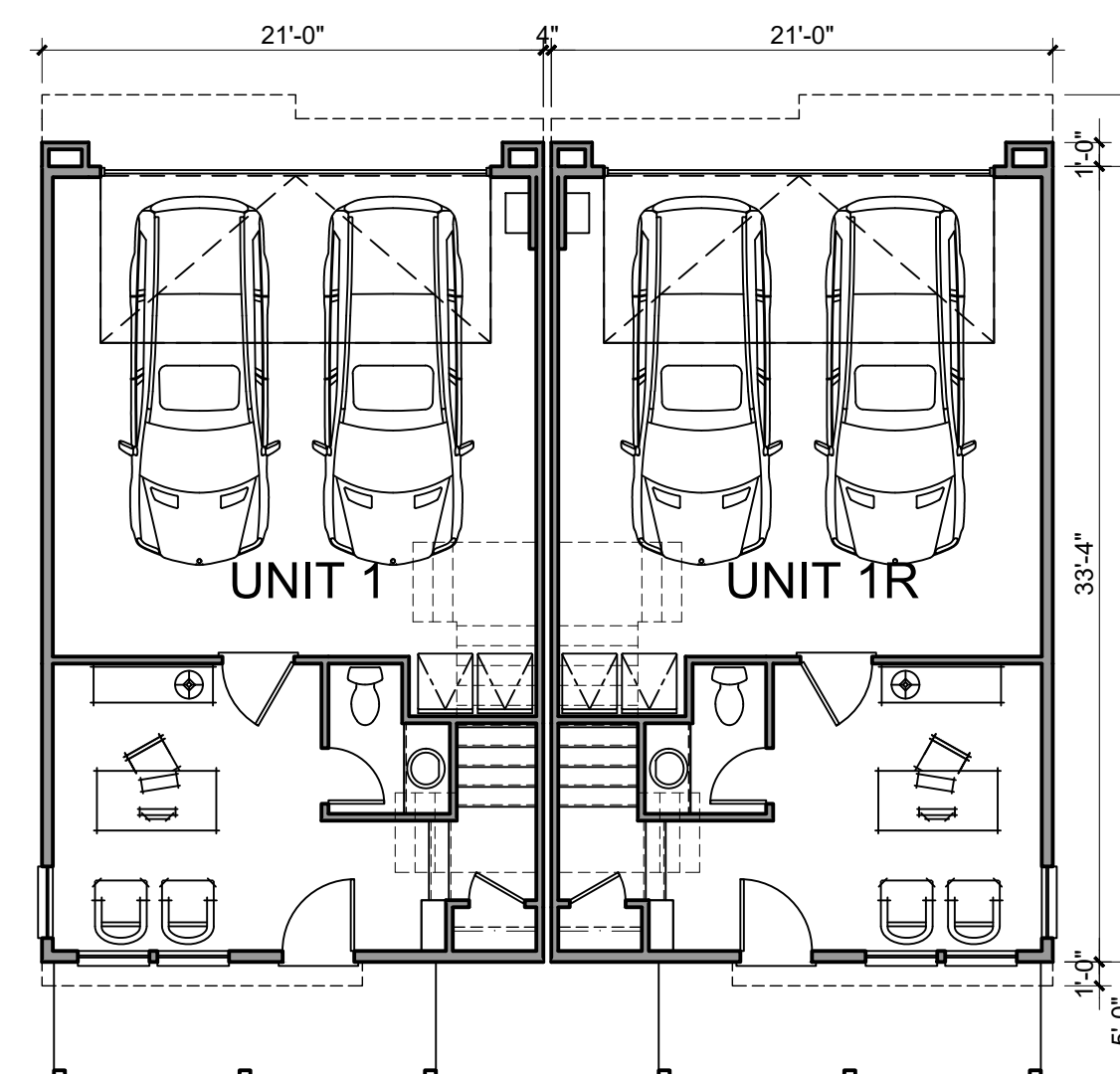
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LEVEL 3



LEVEL 2



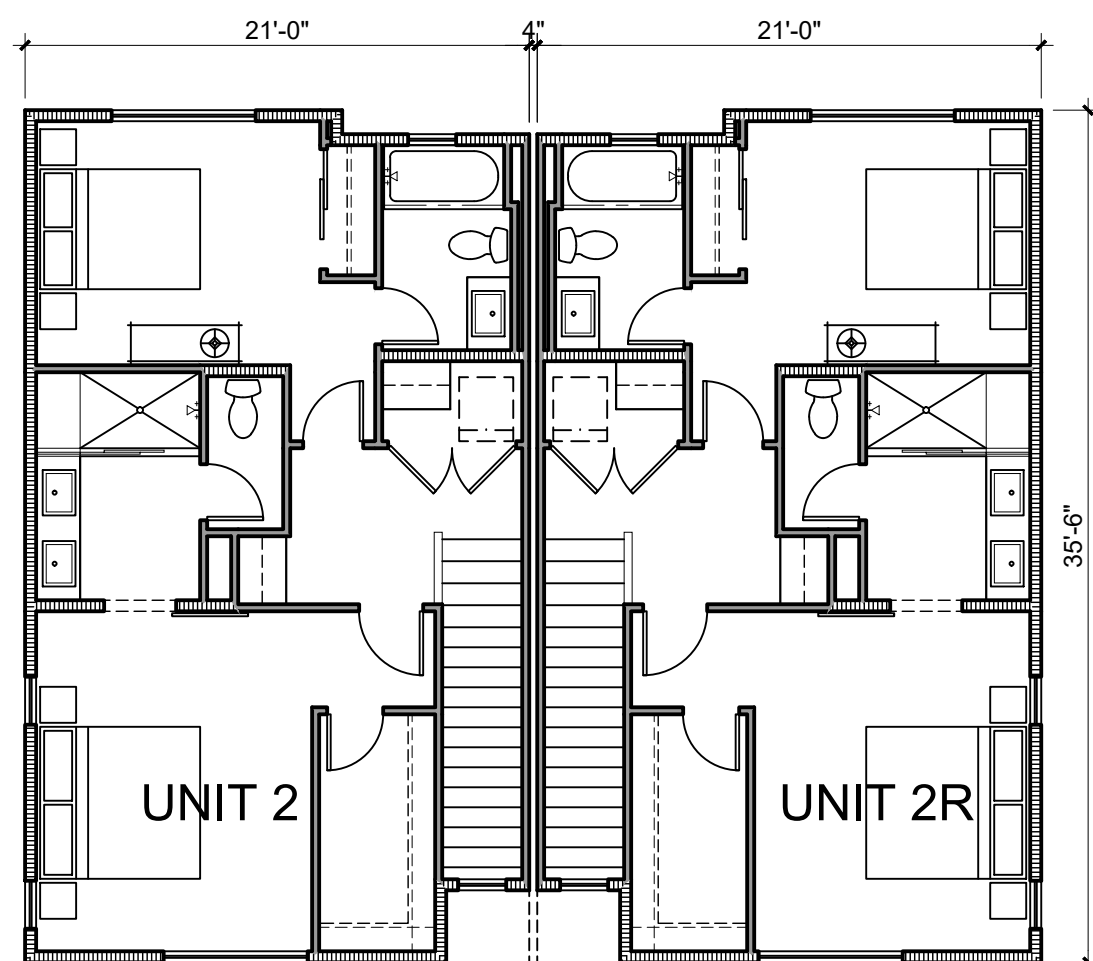
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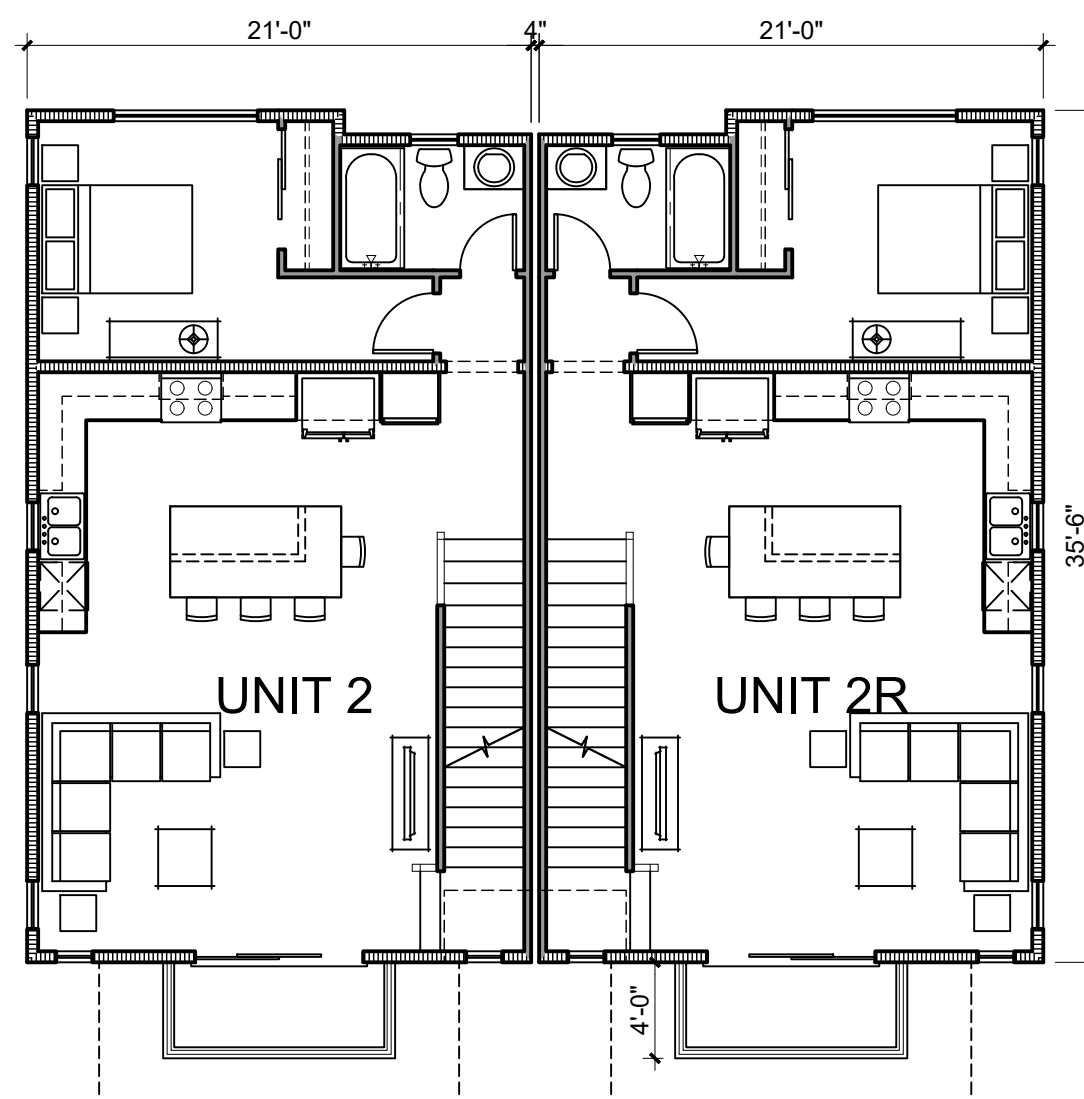
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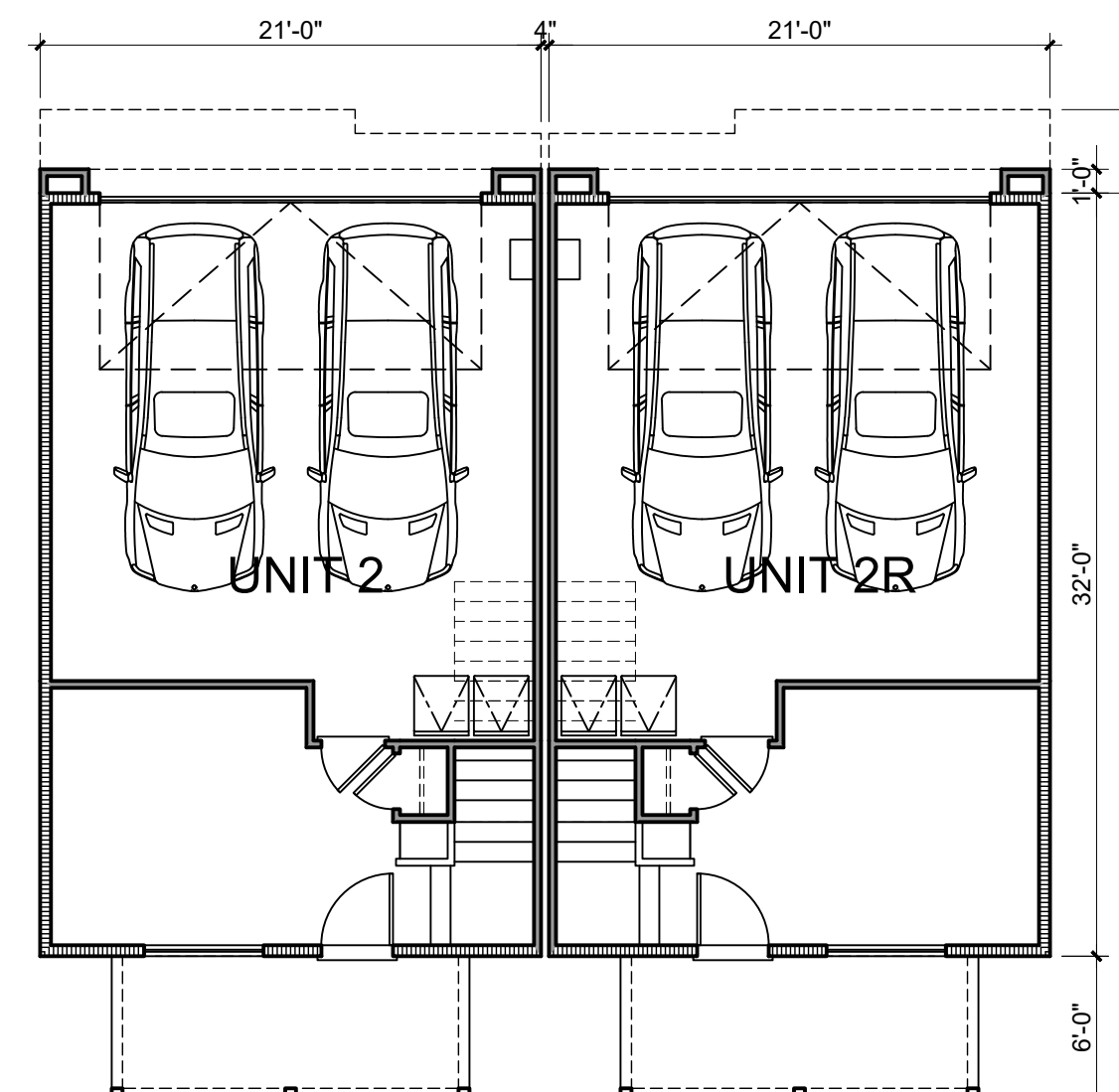
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LEVEL 3



LEVEL 2



LEVEL 1

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PLAN 2-2

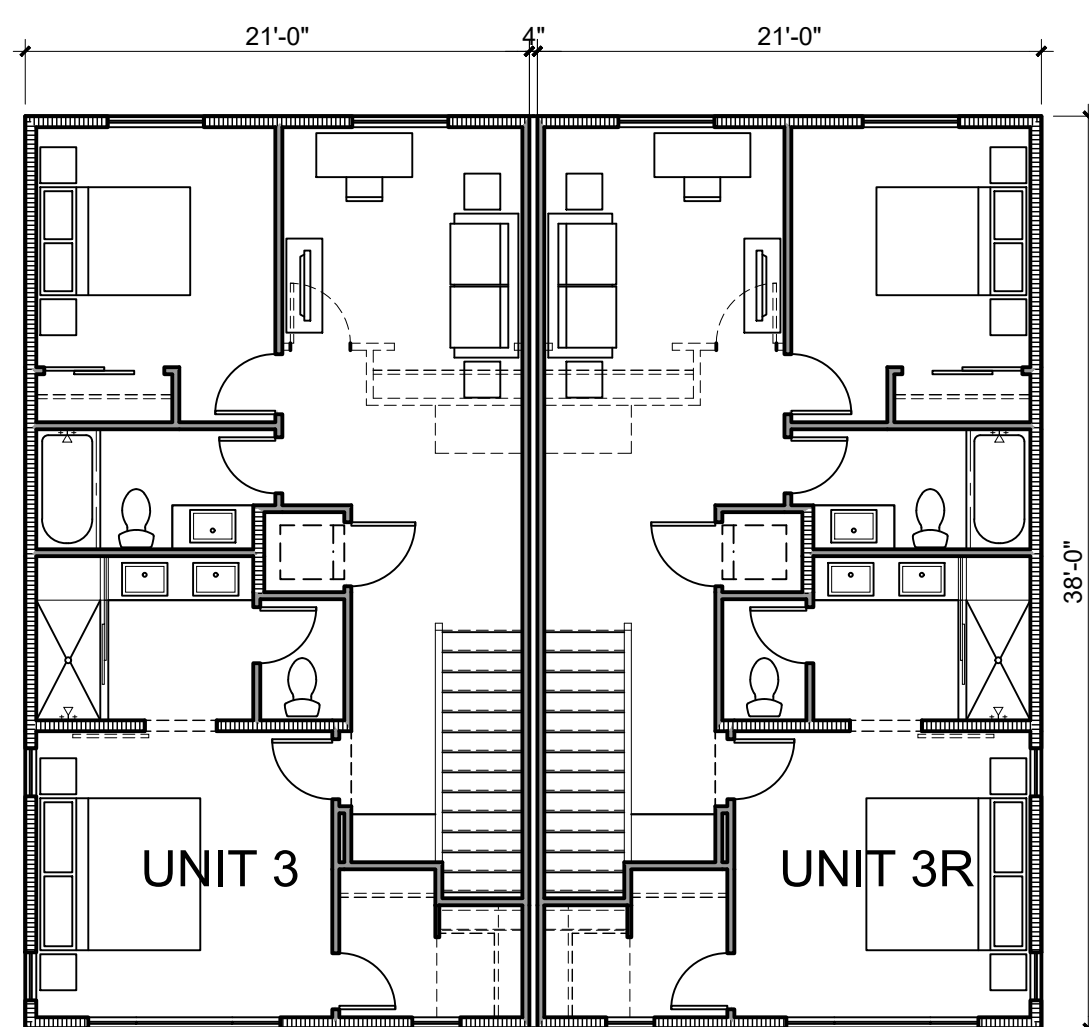
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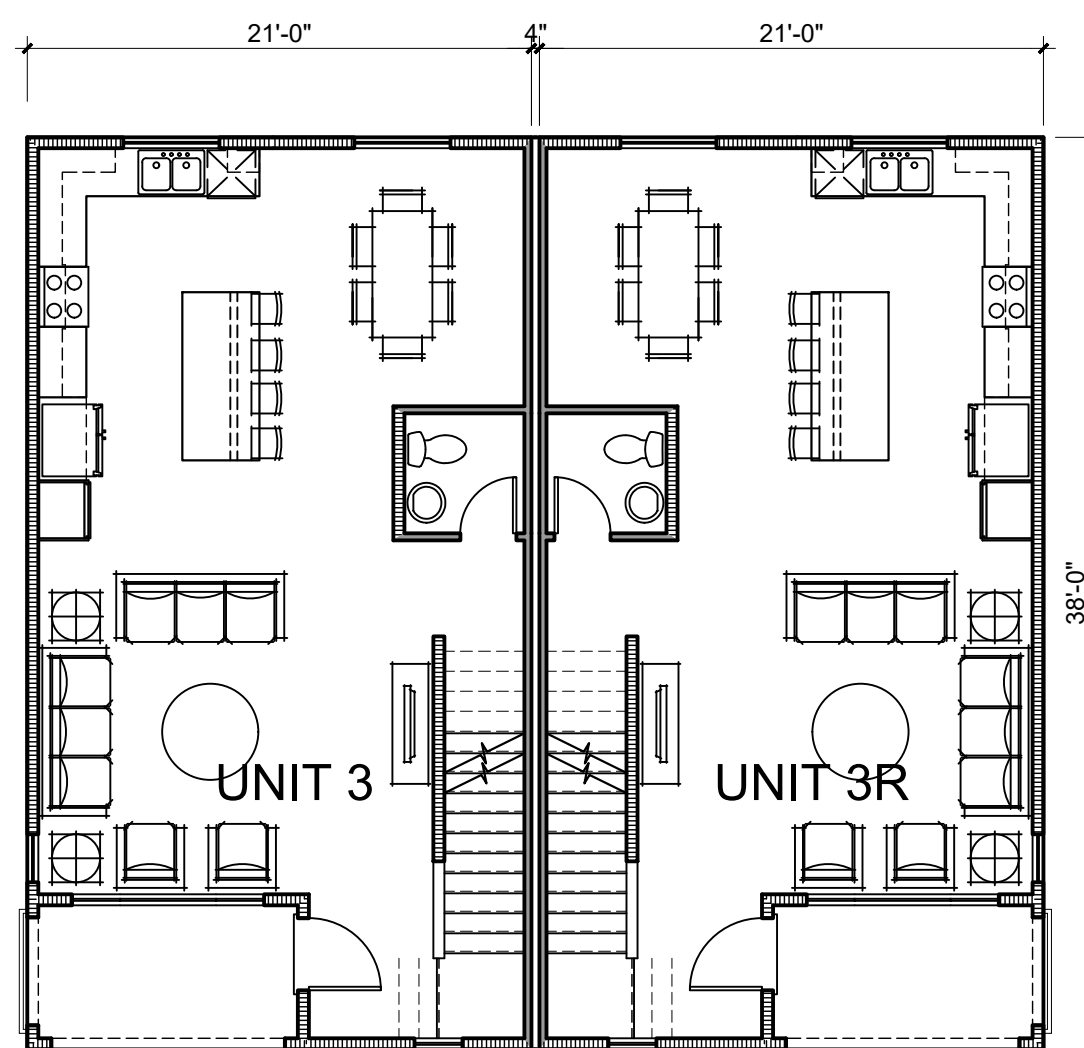
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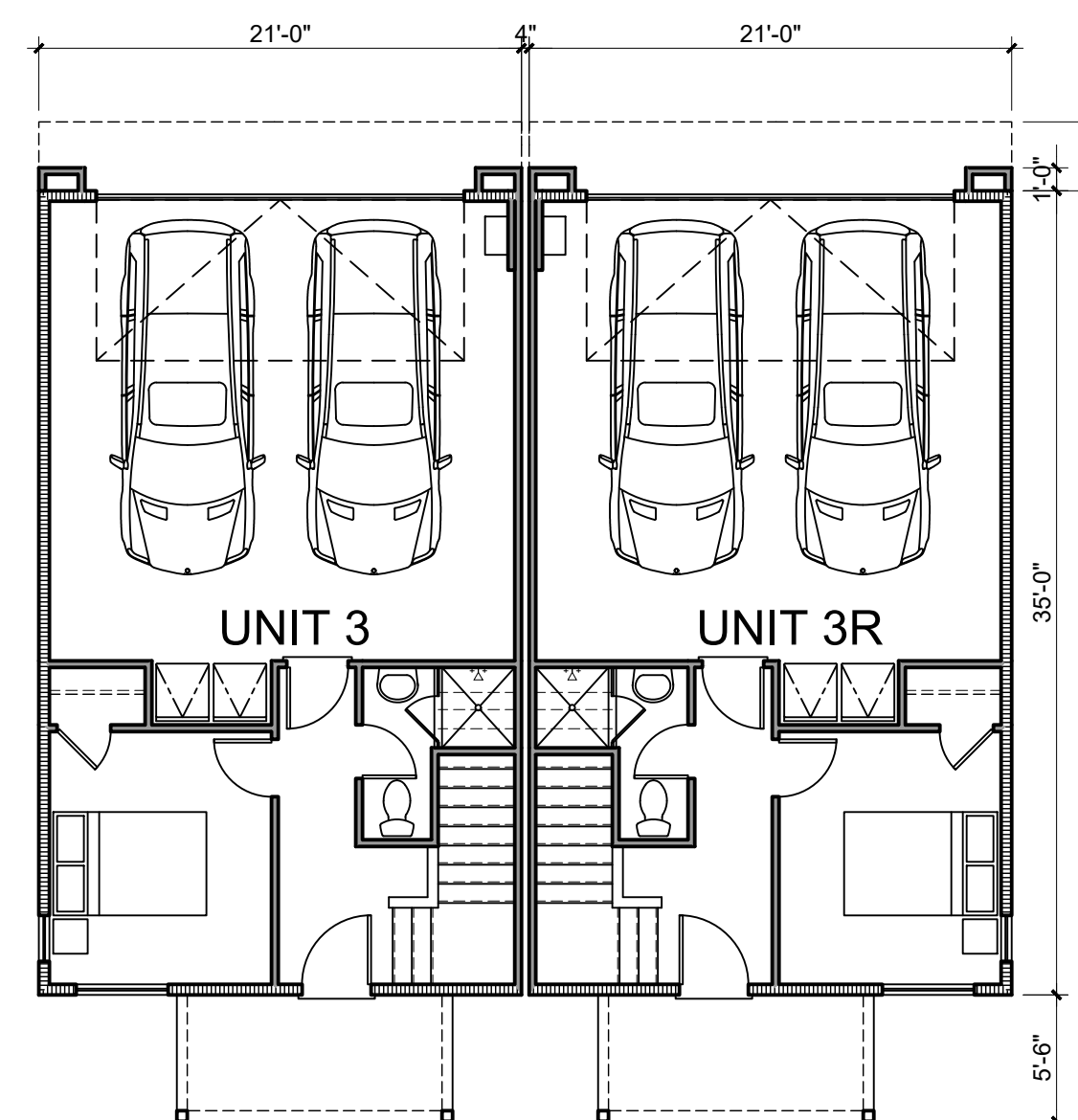


Third Floor 758 SQ. FT. .TF .02 827 100LF birtT

LEVEL 3



LEVEL 2



LEVEL 1

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PLAN 3-3

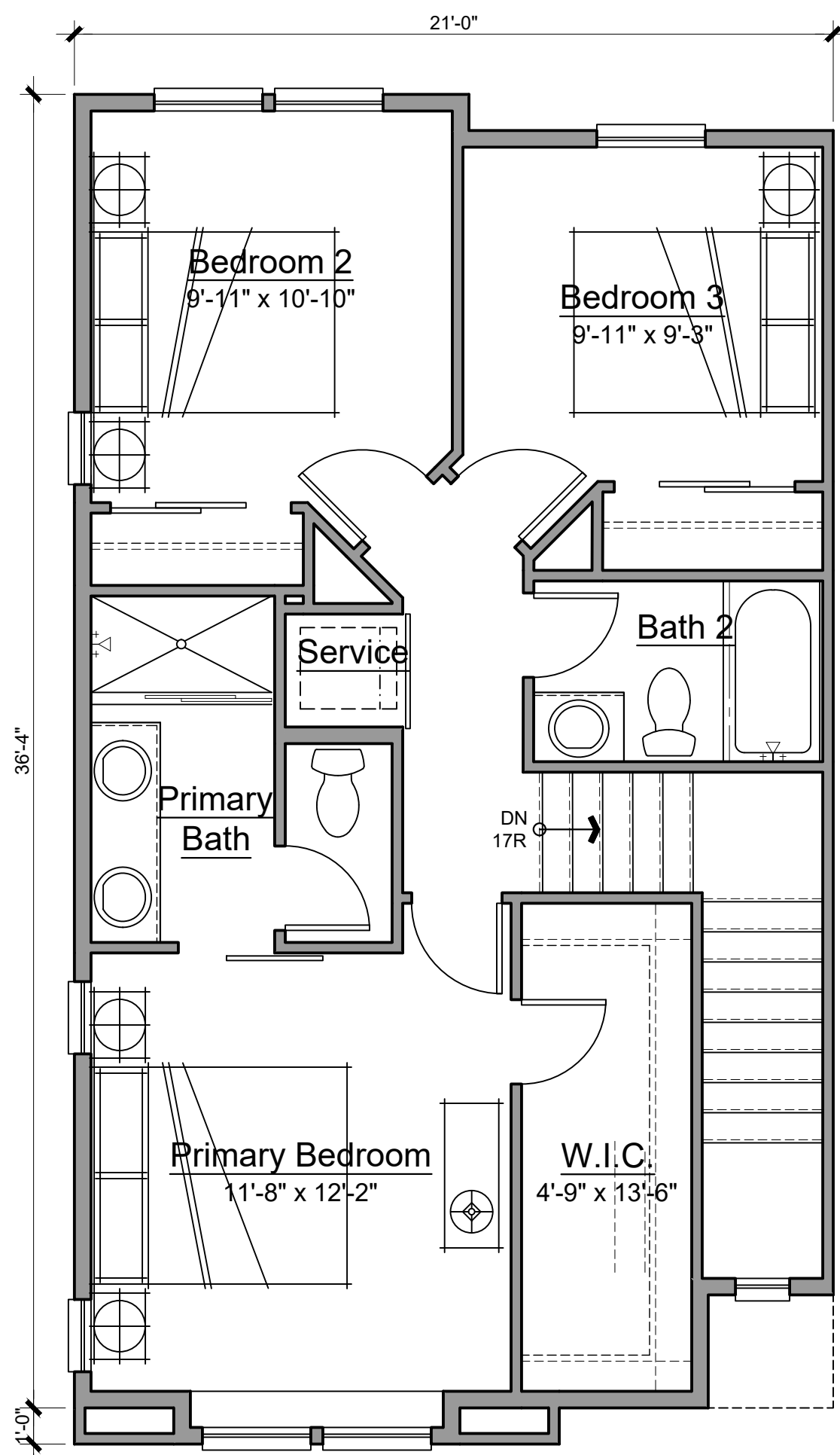
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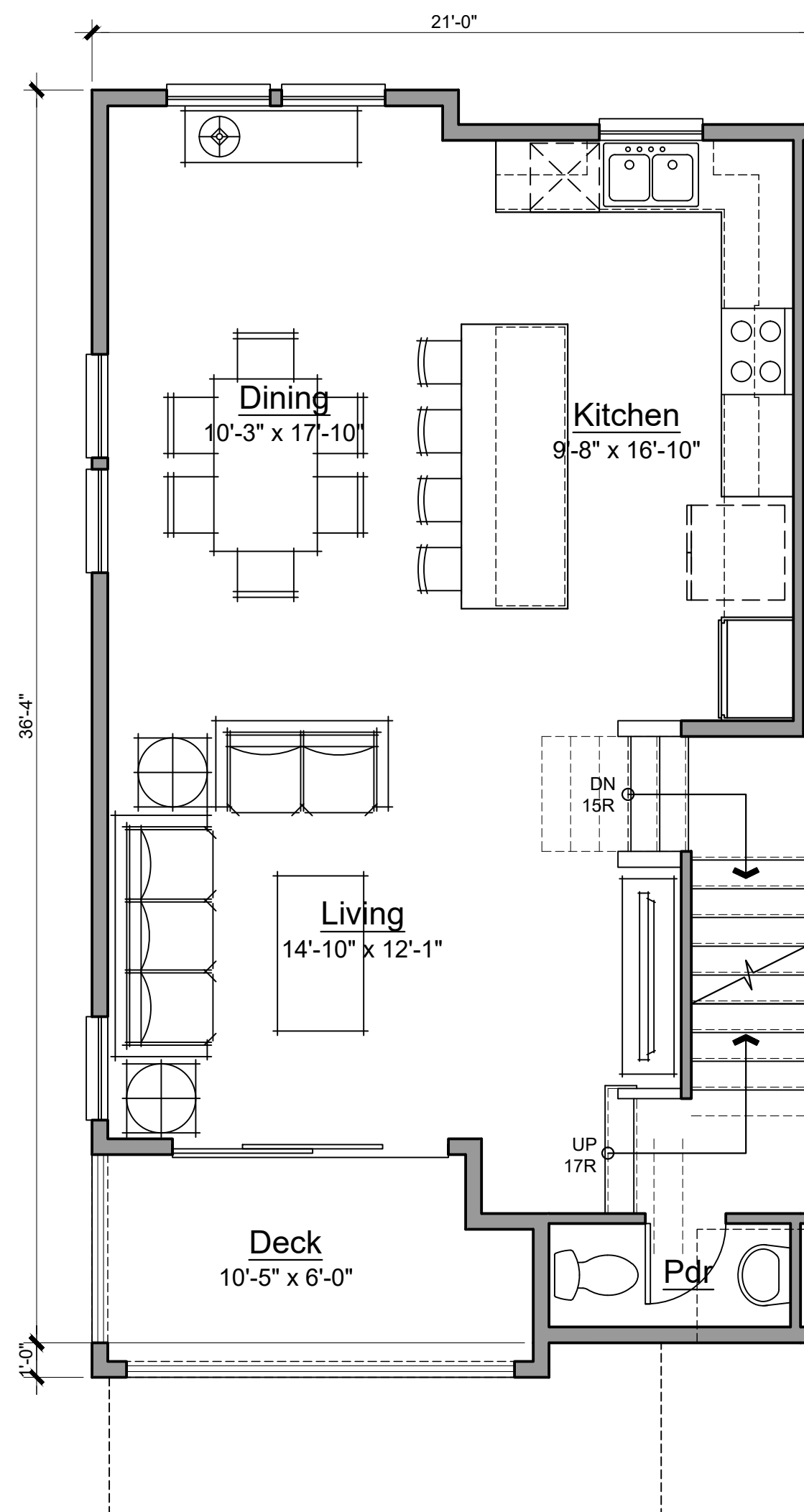
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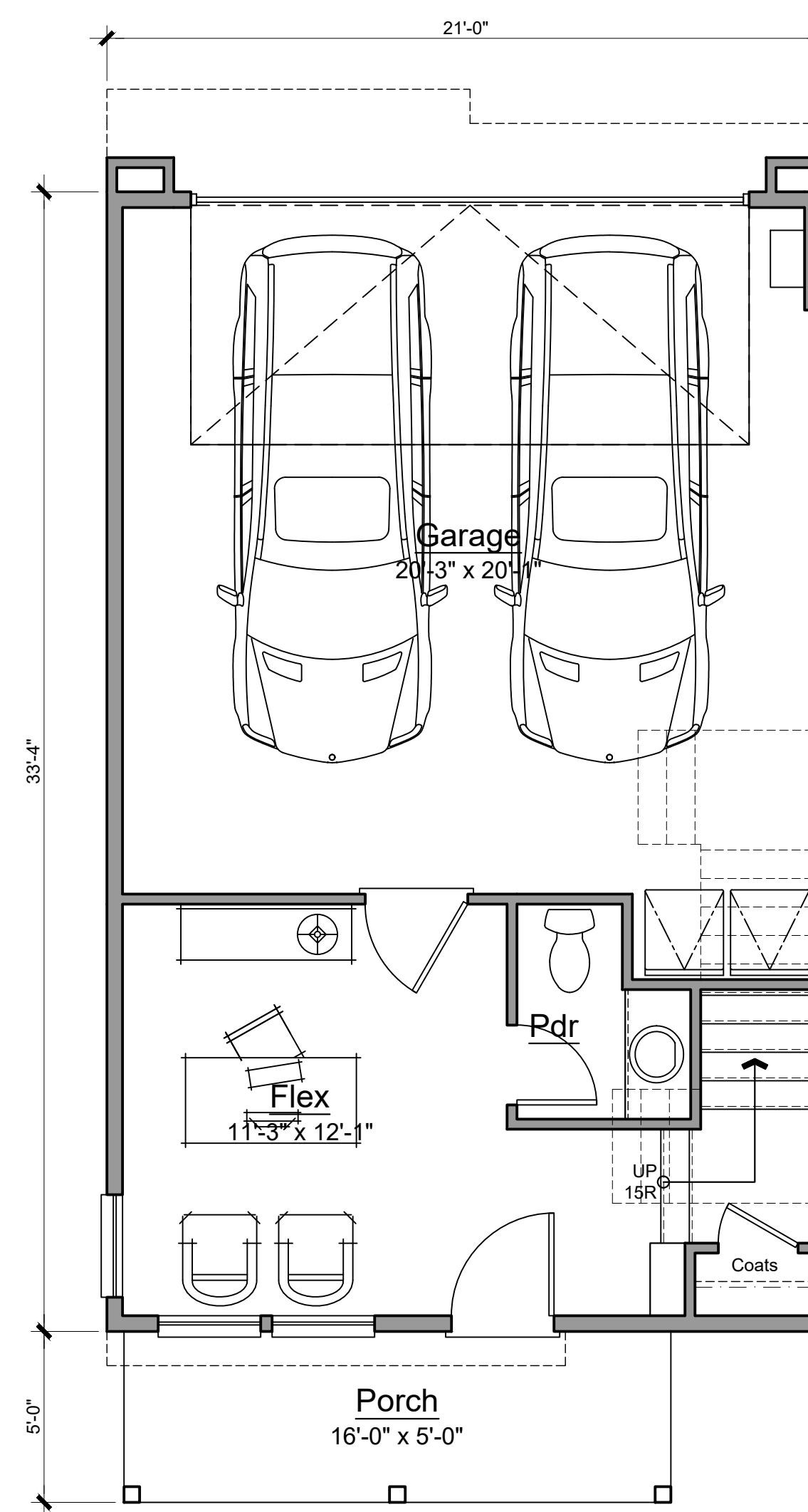
PLANNED UNIT DEVELOPMENT / PRELIMINARY DEVELOPMENT PLAN



Third Floor
675 SQ. FT.



Second Floor
687 SQ. FT.
Deck 79 SQ. FT.



First Floor
255 SQ. FT.
Garage 445 SQ. FT.
Porch 80 SQ. FT.

3 Bedroom + Flex
2 Bath, 2 Pdr
Total 1622 SQ. FT.



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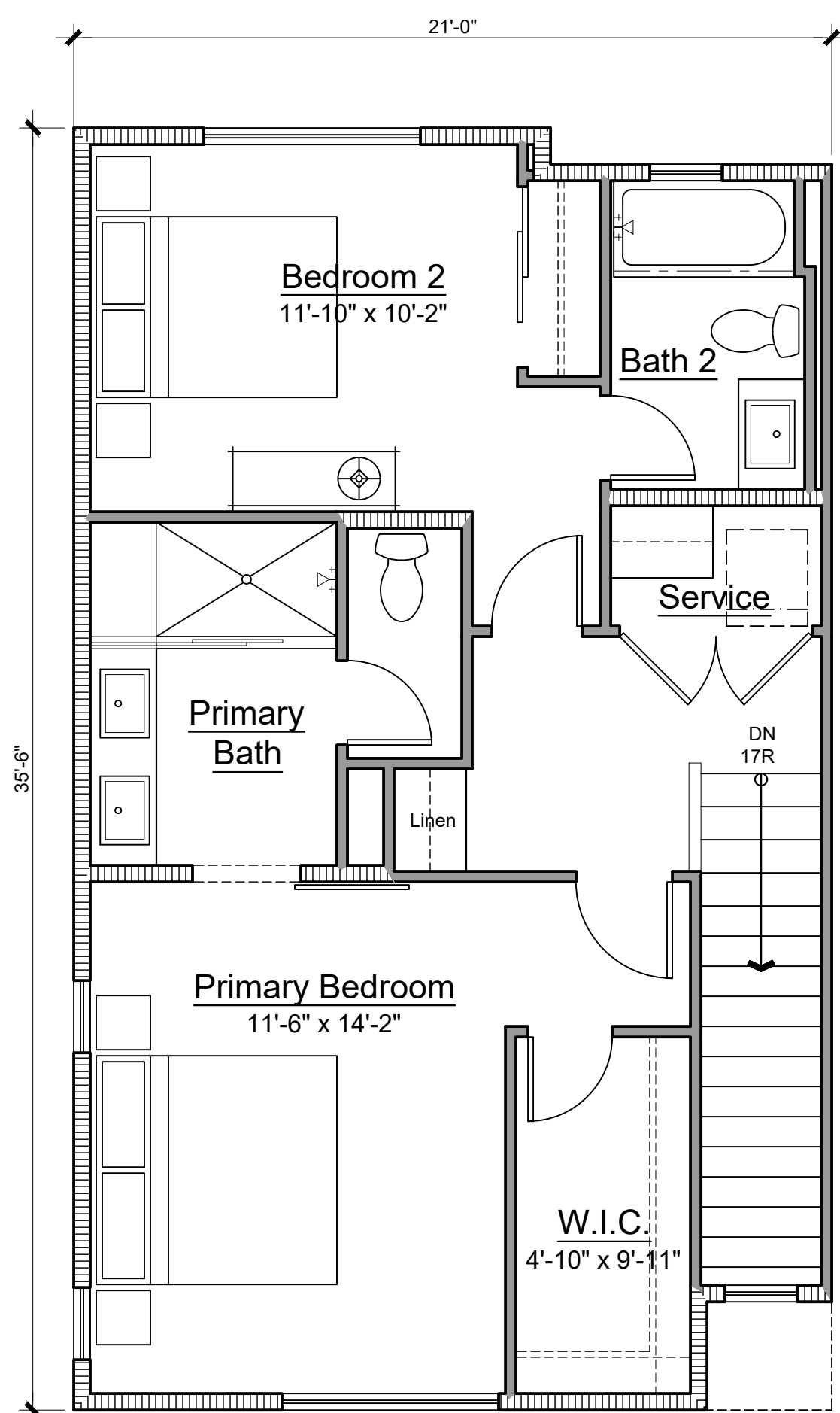
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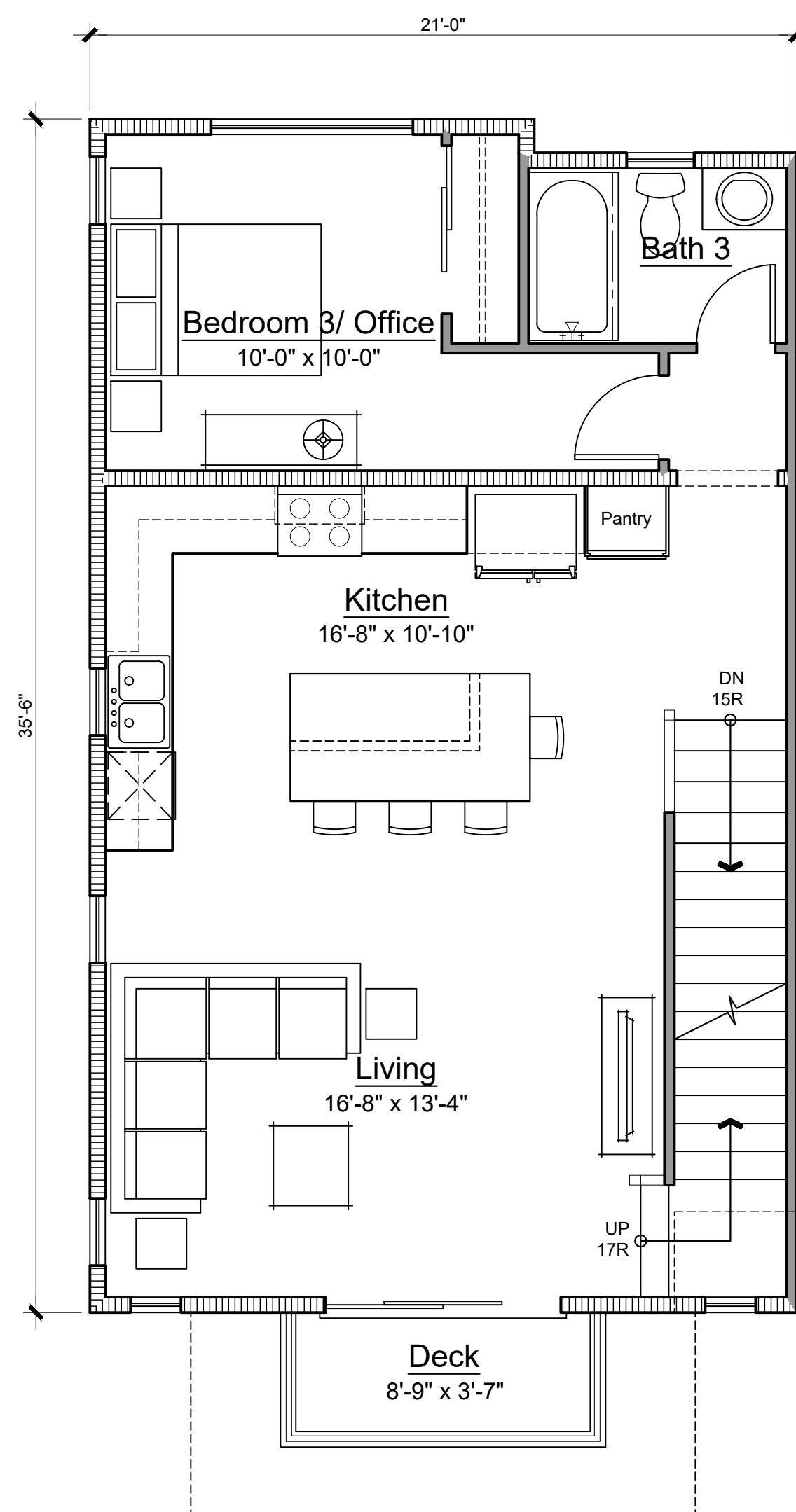
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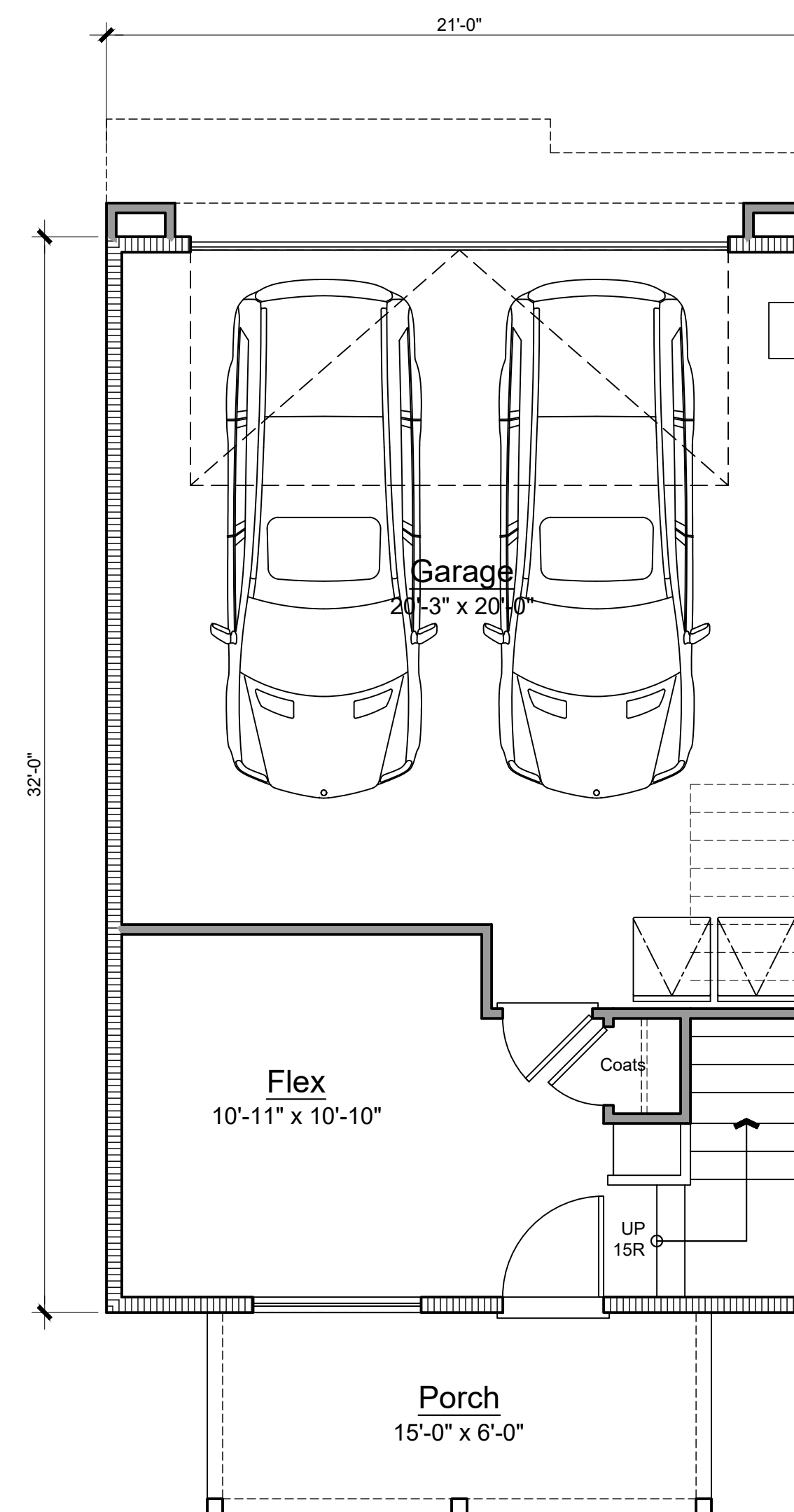
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Third Floor
674 SQ. FT.



Second Floor
738 SQ. FT.
Deck 31 SQ. FT.



First Floor
219 SQ. FT.
Garage 453 SQ. FT.
Porch 90 SQ. FT.
3 Bedroom + Flex
3 Bath
Total 1647 SQ. FT.



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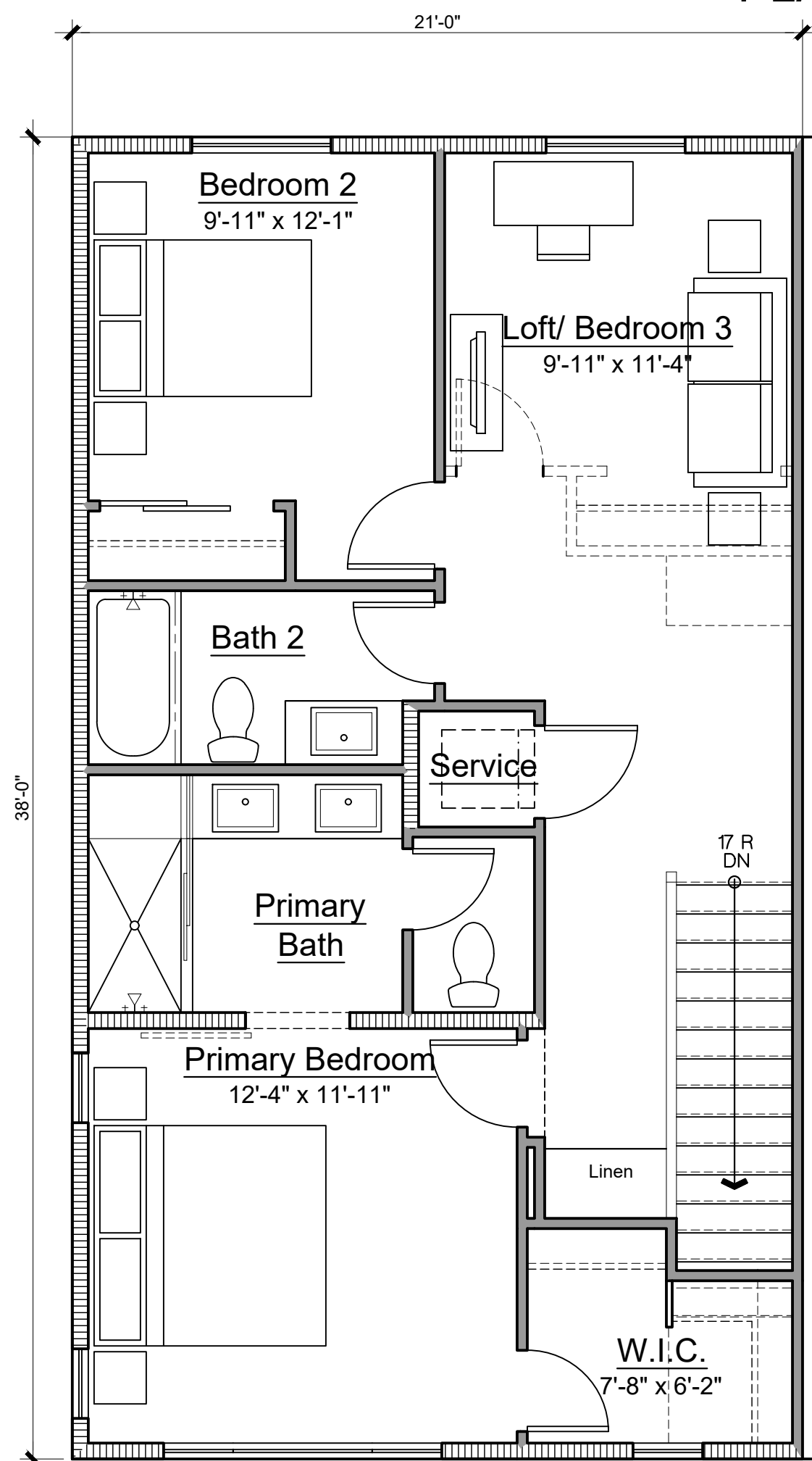
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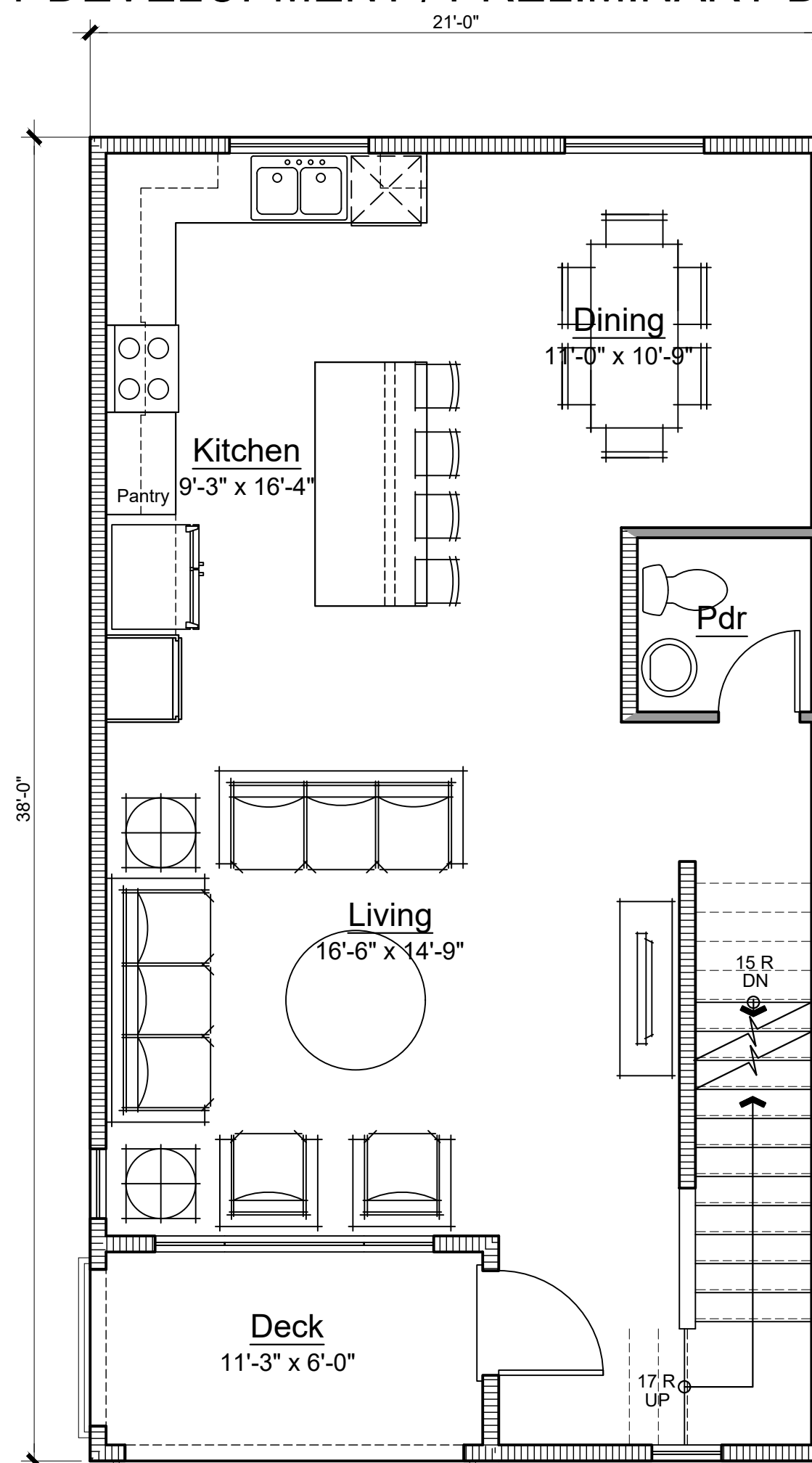
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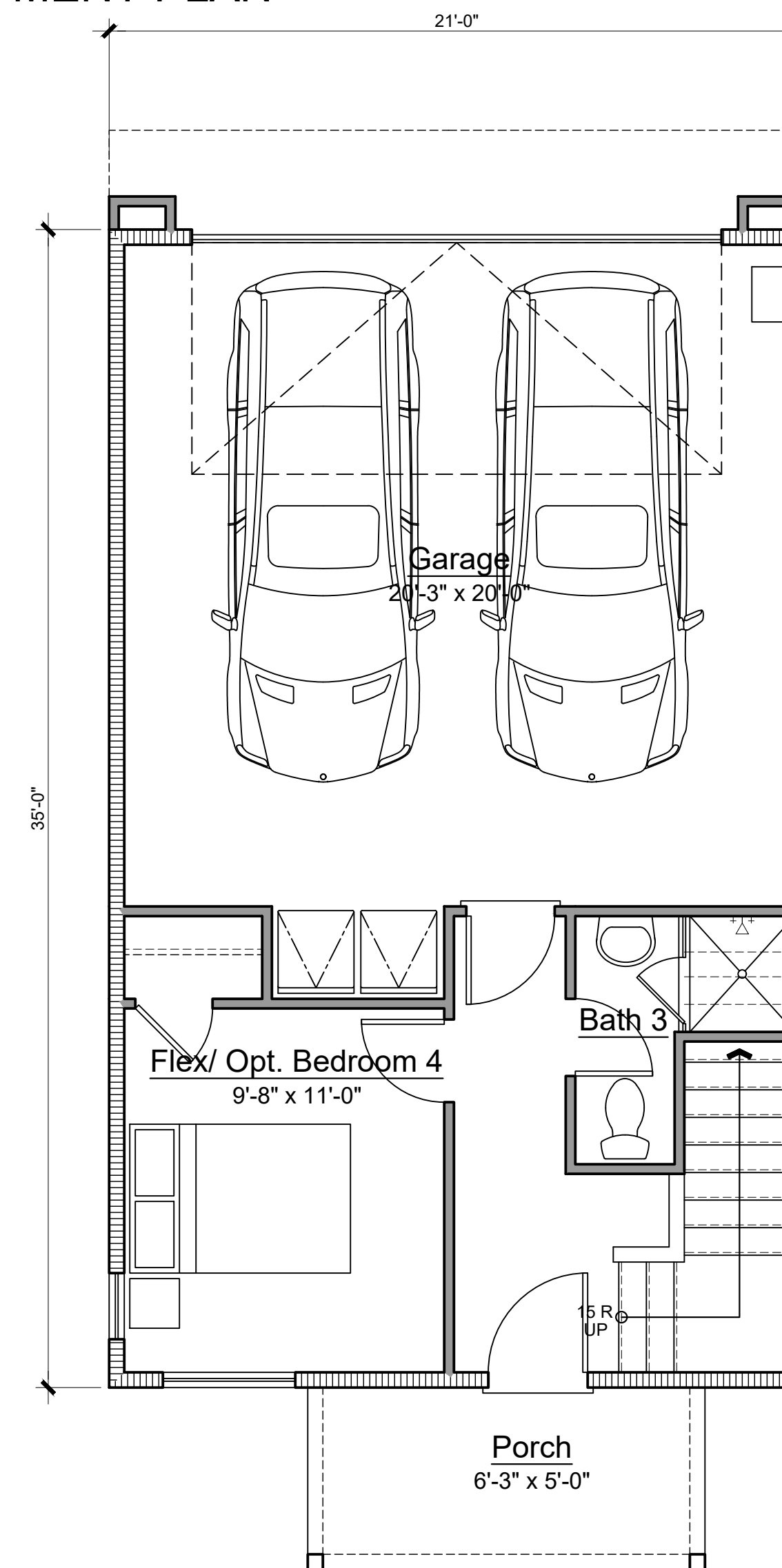
PLANNED UNIT DEVELOPMENT / PRELIMINARY DEVELOPMENT PLAN



Third Floor 758 SQ. FT.



Second Floor 730 SQ. FT.
Deck 68 SQ. FT.



First Floor 291 SQ. FT.
Garage 444 SQ. FT.
Porch 66 SQ. FT.

2 Bedroom + Loft/ Bedroom 3
+ Flex/ Bedroom 4
3.5 Bath
Total 1779 SQ. FT.



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UNIT PLAN 3

SHEET NUMBER:

22 OF 22

TRAFFIC IMPACT REPORT

6501 LOWELL BLVD
ADAMS COUNTY, COLORADO

June 9, 2021

Prepared for:
The True Life Companies
1350 17th St., Suite 350
Denver, CO 80202

Prepared by:



1120 Lincoln Street
Denver, CO 80203
Ph: 303-623-6300

Harris Kocher Smith Project No. 200917

TABLE OF CONTENTS

I.	INTRODUCTION.....	3
A.	Project Overview.....	3
B.	Purpose of Study.....	3
C.	Study Area.....	3
II.	EXISTING CONDITIONS.....	3
A.	Existing Traffic Volumes.....	3
B.	Existing Roadway System.....	4
III.	BACKGROUND TRAFFIC.....	7
A.	Background Traffic Volumes.....	7
B.	Background Traffic Operational Analysis.....	7
IV.	PROJECT DEVELOPMENT.....	8
A.	Trip Generation.....	8
B.	Trip Distribution.....	9
C.	Trip Assignment.....	9
V.	TOTAL TRAFFIC.....	9
VI.	PROJECT ANALYSIS.....	9
A.	Operational Analysis.....	9
B.	Queue Lengths and Storage Required.....	13
VII.	SUMMARY.....	15

LIST OF TABLES

Table 1: Trip Generation.....	8
Table 2: Summary of Results – Intersection Capacity Analysis.....	12
Table 3: Summary of Results – Queue Analysis.....	14
Table 4: Summary of Recommendations.....	15

FIGURES

- 1 Site Location Map
- 2 Conceptual Site Plan
- 3 2021 Existing (COVID Adjusted) Traffic Volumes
- 4 2028 Background Traffic Volumes
- 5 2040 Background Traffic Volumes
- 6 2021 Existing Traffic Operational Conditions
- 7 2028 Background Traffic Operational Conditions
- 8 2040 Background Traffic Operational Conditions
- 9 Site-Generated Trip Distribution
- 10 Site-Generated Trip Assignment
- 11 2028 Total Traffic Volumes (Background + Site Generated)
- 12 2040 Total Traffic Volumes (Background + Site Generated)
- 13 2028 Total Traffic Operational Conditions
- 14 2040 Total Traffic Operational Conditions

APPENDIX "A" 2021 EXISTING TRAFFIC VOLUME COUNTS

APPENDIX "B" INTERSECTION CAPACITY ANALYSIS WORKSHEETS

I. INTRODUCTION

A. Project Overview

The True Life Companies is proposing to develop a parcel of land containing approximately 7.15 acres located within the jurisdictional boundaries of Adams County, Colorado. The undeveloped property is bound on the south by W. 64th Ave., on the east by Lowell Blvd., on the north by residential properties fronting Meade Ct., and on the west by residential properties fronting Newton St. Upon buildout, the proposed development will contain 126 3-story duplex housing units. The proposed development will be known as 6501 Lowell Blvd. Figure 1 provides a site location map of the proposed project and surrounding transportation system.

The proposed development will have two access points. One access point will be the existing west leg of the Lowell Blvd./W. 65th Ave. intersection. The existing west leg will be extended to provide access into the proposed site. The second access point will be a proposed “T” intersection with W. 64th Ave. located west of Lowell Blvd. Figure 2 illustrates the conceptual site plan for the development.

B. Purpose of Study

The purpose of this study is to evaluate the impacts of the vehicular trips projected to be generated by the proposed 6501 Lowell Blvd development on the study area intersections and roadway system. The study includes 2021 (existing), 2028 (short-term), and 2040 (long-range) analysis horizons. The 2028 (short-term) analysis horizon is five years after the proposed occupancy year (2023) for this project. The 2040 (long-range) analysis horizon evaluates implications of the proposed project on the long-range traffic condition.

C. Study Area

The study area encompasses the existing roadway system in the vicinity of the project site. Specifically, the following existing intersections are included in the study:

- W. 68th Ave./Lowell Blvd.
- W. 66th Ave./Lowell Blvd.
- W. 65th Ave./Lowell Blvd.
- W. 64th Ave./Tennyson St.
- W. 64th Ave./Lowell Blvd.
- W. 64th Ave./Federal Blvd. (SH 287)

II. EXISTING CONDITIONS

A. Existing Traffic Volumes

Existing peak hour intersection turning movement traffic volume counts were collected for this study at the following intersections on Thursday, March 4, 2021:

- W. 66th Ave./Lowell Blvd.
- W. 65th Ave./Lowell Blvd.
- W. 64th Ave./Lowell Blvd.

24-hour directional traffic volume counts were collected for this study at the following locations on March 4, 2021:

- Lowell Blvd. north of W. 64th Ave.
- W. 64th Ave. west of Lowell Blvd.

Existing peak hour intersection turning movement traffic volume counts were collected for this study at the additional following intersections on Wednesday, June 2, 2021:

- W. 68th Ave./Lowell Blvd.
- W. 64th Ave./Tennyson St.
- W. 64th Ave./Federal Blvd. (SH 287)

In order to account for the ongoing COVID-19 pandemic and its impact on current traffic volumes, the 2021 (existing) traffic volume counts collected for this study were adjusted based on the following methodology. Utilizing the Denver Regional Council of Governments (DRCOG) travel models for 2015 and 2040 daily traffic volume forecasts it was determined that the average annual traffic volume growth rate (AGR) for Lowell Blvd. and W. 64th Ave. within the study limits is 1.0%. This AGR was applied to a DRCOG Regional Count Map daily traffic count collected on W. 64th Ave. just west of Lowell Blvd. in 2010 (12,100vpd) to project the expected non-COVID 2021 (existing) traffic volume (13,500vpd). The projected non-COVID 2021 (existing) average daily traffic for W. 64th Ave. was found to be 21.6% higher than the daily traffic volume counted in March 2021. Based on this methodology, the 2021 (existing) traffic volume counts were increased by 21.6% to project the equivalent non-COVID 2021 (existing) traffic volumes.

A summary of the 2021 (existing) COVID adjusted peak hour intersection turning movement traffic volume counts and 24-hour directional traffic volume counts collected for this study are illustrated in Figure 3. Detailed traffic volume count data collected for this study is provided in Appendix "A".

B. Existing Roadway System

The existing transportation network in the vicinity of the subject property is graphically illustrated in Figure 1. The following narrative provides a description of the study area roadways and associated intersections as they currently exist in 2021:

Study Area Roadways:

- **Federal Blvd. (SH 287)** – Federal Blvd. (SH 287) is classified as a Non-Rural Regional Arterial (NR-A) roadway under the jurisdiction of the Colorado Department of Transportation (CDOT) within the study area. The roadway section consists of three travel lanes in each direction with a raised center median. There is curb and gutter along both sides of the roadway. There are intermittent sections of attached sidewalk along both sides of the roadway. The posted speed limit is 45 mph within the study area. Per the *Adams County Transportation Plan*, Federal Blvd. (SH 287) within the study area is not anticipated to undergo any modifications through the 2040 (long-range) analysis horizon.
- **Lowell Blvd.** – Lowell Blvd. is classified as a Minor Arterial roadway under the jurisdiction of Adams County within the study area. The roadway section consists of one travel lane in each direction with a striped center two-way continuous left turn lane.

There is curb and gutter along both sides of the roadway. There is attached sidewalk along the east side of the roadway, and a detached sidewalk along the west side of the roadway. The posted speed limit is 30 mph within the study area. Lowell Blvd. within the study area is not anticipated to undergo any modifications through the 2040 (long-range) analysis horizon.

- **Tennyson St.** – Tennyson St. is classified as a Local roadway under the jurisdiction of Adams County within the study area. The roadway section consists of one travel lane in each direction. South of W. 64th Ave., there is curb and gutter on both sides of the roadway. There is attached sidewalk along the east side of the roadway and detached sidewalk along the west side of the roadway. North of W. 64th Ave., there is curb and gutter and attached sidewalk only along the east side of the roadway. The posted speed limit is 25 mph within the study area.
- **W. 64th Ave.** – W. 64th Ave. is classified as a Minor Arterial roadway under the jurisdiction of Adams County within the study area. The roadway section consists of one travel lane in each direction with a striped center two-way continuous left turn lane. There is curb and gutter and attached sidewalk along both sides of the roadway. The posted speed limit is 30 mph within the study area. W. 64th Ave. within the study area is not anticipated to undergo any modifications through the 2040 (long-range) analysis horizon.
- **W. 65th Ave.** – W. 65th Ave. is classified as a Local roadway under the jurisdiction of Adams County within the study area. The roadway section consists of one travel lane in each direction with no striping. There is curb and gutter and attached sidewalk along both sides of the roadway. The posted speed limit is 25 mph within the study area.
- **W. 66th Ave.** – W. 66th Ave. is classified as a Local roadway under the jurisdiction of Adams County within the study area. The roadway section consists of one travel lane in each direction with no striping. There is curb and gutter and attached sidewalk along both sides of the roadway. The posted speed limit is 25 mph within the study area.
- **W. 68th Ave.** – W. 68th Ave. is classified as a Local roadway under the jurisdiction of Adams County within the study area. The roadway section consists of one travel lane in each direction with a striped center two-way continuous left turn lane west of Lowell Blvd., and one travel lane in each direction with no median east of Lowell Blvd. There is curb and gutter along both sides of the roadway. West of Lowell Blvd., there is attached sidewalk along the north side of the roadway and detached sidewalk along the south side of the roadway. East of Lowell Blvd., there is attached sidewalk along both sides of the roadway. The posted speed limit is 25 mph within the study area.

Study Area Intersections:

- **W. 68th Ave./Lowell Blvd.** - The W. 68th Ave./Lowell Blvd. intersection is a four-legged signalized intersection operating under actuated/coordinated control with permissive only left turn phasing on all approaches. The east leg of the intersection has one left turn lane with approximately 150 feet of storage and one shared through/right turn lane on the westbound approach, and one eastbound departure lane. The west leg of the intersection has one left turn lane with approximately 150 feet of storage, one through lane, and one right turn lane with approximately 150 feet of storage on the eastbound approach, and one westbound departure lane. The north leg of the intersection has one left turn lane with approximately 150 feet of storage, one through lane, and one right turn

lane with approximately 150 feet of storage on the southbound approach, and one northbound departure lane. The south leg of the intersection has one left turn lane with approximately 225 feet of storage, one through lane, and one right turn lane with approximately 250 feet of storage on the northbound approach, and one southbound departure lane.

- **W. 66th Ave./Lowell Blvd.** - The W. 66th Ave./Lowell Blvd. intersection is a four-legged intersection operating under stop sign control on the eastbound and westbound approaches. The east leg of the intersection has one shared left/through/right turn lane on the westbound approach, and one eastbound departure lane. The west leg of the intersection has one shared left/through/right turn lane on the eastbound approach, and one westbound departure lane. The north leg of the intersection has one left turn lane with approximately 575 feet of storage and one shared through/right turn lane on the southbound approach, and one northbound departure lane. The south leg of the intersection has one left turn lane with approximately 200 feet of storage and one shared through/right turn lane on the northbound approach, and one southbound departure lane.
- **W. 65th Ave./Lowell Blvd.** – The W. 65th Ave./Lowell Blvd. intersection is a four-legged intersection operating under stop sign control on the eastbound and westbound approaches. The east leg of the intersection has one shared left/through/right turn lane on the westbound approach, and one eastbound departure lane. The west leg of the intersection has one shared left/through/right turn lane on the eastbound approach, and one westbound departure lane. The west leg currently does not carry any traffic as it dead-ends to undeveloped land, but is proposed to be extended as an access road as part of the 6501 Lowell Blvd development. The north leg of the intersection has one left turn lane with approximately 300 feet of storage and one shared through/right turn lane on the southbound approach, and one northbound departure lane. The south leg of the intersection has one left turn lane with approximately 150 feet of storage and one shared through/right turn lane on the northbound approach, and one southbound departure lane.
- **W. 64th Ave./Tennyson St.** – The W. 64th Ave./Tennyson St. intersection is a four-legged signalized intersection operating under actuated/coordinated control with permissive only left turn phasing on the eastbound and westbound approaches. The east leg of the intersection has one left turn lane with approximately 225 feet of storage, and one shared through/right turn lane on the westbound approach, and one eastbound departure lane. The west leg of the intersection has one left turn lane with approximately 150 feet of storage, one through lane, and one right turn lane with approximately 100 feet of storage on the eastbound approach, and one westbound departure lane. The north leg of the intersection has one shared left/through/right turn lane on the southbound approach, and one northbound departure lane. The south leg of the intersection has one shared left/through/right turn lane on the northbound approach, and one southbound departure lane.
- **W. 64th Ave./Lowell Blvd.** – The W. 64th Ave./Lowell Blvd. intersection is a four-legged signalized intersection operating under actuated/coordinated control with protected/permissive left turn phasing on the eastbound and southbound approaches, and permissive only left turn phasing on the westbound and northbound approaches. The east leg of the intersection has one left turn lane with approximately 270 feet of storage, one through lane, and one right turn lane with approximately 75 feet of storage on the westbound approach, and one eastbound departure lane. The west leg of the

intersection has one left turn lane with approximately 500 feet of storage, one through lane, and one right turn lane with approximately 200 feet of storage on the eastbound approach, and one westbound departure lane. The north leg of the intersection has one left turn lane with approximately 220 feet of storage, one through lane, and one right turn lane with approximately 150 feet of storage on the southbound approach, and one northbound departure lane. The south leg of the intersection has one left turn lane with approximately 200 feet of storage, one through lane, and one right turn lane with approximately 150 feet of storage on the northbound approach, and one southbound departure lane.

- **W. 64th Ave./Federal Blvd. (SH 287)** – The W. 64th Ave./Federal Blvd. (SH 287) intersection is a four-legged signalized intersection operating under actuated/coordinated control with protected/permissive left turn phasing on all four approaches. The east leg of the intersection has one left turn lane with approximately 150 feet of storage, one through lane, and one right turn lane with approximately 100 feet of storage on the westbound approach, and two eastbound departure lanes. The west leg of the intersection has one left turn lane with approximately 100 feet of storage, one through lane, and one right turn lane with approximately 150 feet of storage on the eastbound approach, and two westbound departure lanes. The north leg of the intersection has one left turn lane with approximately 250 feet of storage, two through lanes, and one shared through/right turn lane on the southbound approach, and three northbound departure lanes. The south leg of the intersection has one left turn lane with approximately 600 feet of storage, two through lanes, and one shared through/right turn lane on the northbound approach, and three southbound departure lanes.

III. BACKGROUND TRAFFIC

A. Background Traffic Volumes

Background traffic volume forecasts for the 2028 (short-term) and 2040 (long-range) analysis horizons were developed for this study utilizing the following strategy:

- For the purposes of this study it is assumed that peak-hour distribution of background intersection approach traffic (left turn, through, right turn) will remain constant through the 2028 and 2040 analysis horizons.
- Utilizing the Denver Regional Council of Governments (DRCOG) travel models for 2015 and 2040 daily traffic volume forecasts it was determined that the average annual traffic volume growth rate (AGR) for both Lowell Blvd. and W. 64th Ave. within the study limits is 1.0%. This traffic volume growth rate was applied to all peak hour 2021 (existing) COVID adjusted traffic volumes to determine the 2028 (short-term) and 2040 (long-range) background traffic volumes. A 1.0% growth rate equates to a 7-year (2021 to 2028) growth factor of 1.072 and a 19-year (2021 to 2040) growth factor of 1.21.

Figures 4 and 5 graphically illustrate the projected background traffic volumes for the 2028 (short-term) and 2040 (long-range) analysis horizons, respectively.

B. Background Traffic Operational Analysis

In order to establish a base condition in which to evaluate the impact of the traffic generated by the proposed development on the study area intersections, peak hour capacity analyses were performed for the 2021 (existing), 2028 (short-term) and 2040 (long-range) background traffic

conditions. These analyses utilized the methodologies contained in the *Highway Capacity Manual 6th Edition* (HCM 6) employing *Synchro 10* software and resulted in a qualitative measure of the operational characteristics of the intersection described by a letter designation ranging from “A” to “F” known as “Level of Service” (LOS). LOS “A” represents ideal free flow operating conditions, whereas LOS “F” represents excessive congestion and delay. Un-signalized intersection capacity analysis reports a LOS designation for each impeded intersection movement. Signalized intersection capacity analysis reports the overall LOS designation for the intersection as well as for each lane group and approach. LOS “D” is considered the minimum acceptable standard of operation.

The following study area intersections were analyzed for the 2021 (existing) traffic conditions, as well as for the 2028 (short-term) and 2040 (long-range) background traffic analysis horizons:

- W. 68th Ave./Lowell Blvd.
- W. 66th Ave./Lowell Blvd.
- W. 65th Ave./Lowell Blvd.
- W. 64th Ave./Tennyson St.
- W. 64th Ave./Lowell Blvd.
- W. 64th Ave./Federal Blvd. (SH 287)

The results of these background traffic operational analyses are summarized graphically for the 2021 (existing) COVID adjusted traffic conditions, as well as for the 2028 (short-term) and 2040 (long-range) background traffic analysis horizons in Figures 6, 7, and 8, respectively. A summary of the results of the intersection capacity analyses is provided in Table 2 and detailed *Synchro 10* software intersection capacity analysis reports in Appendix “B”.

IV. PROJECT DEVELOPMENT

A. Trip Generation

Site generated vehicular trip projections for the proposed 6501 Lowell Blvd development were forecast using the publication *Trip Generation, 10th Edition*, by the Institute of Transportation Engineers (ITE). Estimates of total daily traffic volumes and a.m. and p.m. peak hour traffic volumes were calculated. Trip generation reductions due to transportation demand management, internal trip capture, or transit use were not considered.

For the purposes of this study it was assumed that the subject parcel will be fully developed by 2023 and consist of 126 3-story duplex housing units. Based on these parameters, at build-out, the proposed 6501 Lowell Blvd development is projected to generate 1,286 daily vehicle trips of which 94 are projected to be generated during the a.m. peak hour and 127 during the p.m. peak hour. Trip generation projections for the proposed 6501 Lowell Blvd development are provided in Table 1.

**TABLE 1
TRIP GENERATION**

Land Use	Intensity	ITE Code	Daily (vpd)	AM Peak Hour (vph)				PM Peak Hour (vph)					
				Total	% In	% Out	In	Out	Total	% In	% Out	In	Out
Single-Family Detached Housing	126 DU	210	1286	94	25%	75%	24	70	127	63%	37%	80	47
		Total	1,286	94			24	70	127			80	47

B. Trip Distribution

The distribution of the projected site generated vehicle trips by the proposed 6501 Lowell Blvd development was established based on current and projected future traffic patterns on the surrounding transportation system, efficiency of access to the principal transportation corridors serving the proposed development, and the potential trip origins/destinations for the proposed land uses within the development. Figure 9 graphically illustrates the projected trip distribution patterns for the proposed development.

C. Trip Assignment

The site generated vehicular trips projected to be generated by the proposed 6501 Lowell Blvd development were assigned to the study area roadways and intersections utilizing the trip distribution analysis described above. Figure 10 graphically illustrates the site generated trip assignment for the proposed development.

V. TOTAL TRAFFIC

Total traffic forecasts for the 2028 (short-term) and 2040 (long-range) analysis horizons were computed by combining the associated 2028 (short-term) and 2040 (long-range) background traffic volumes with the projected site generated traffic volumes. Figures 11 and 12 graphically illustrate the total traffic projections for the study area intersections for the 2028 (short-term) and 2040 (long-range) analysis horizons, respectively.

VI. PROJECT ANALYSIS

A. Operational Analysis

In order to evaluate the impact of the proposed 6501 Lowell Blvd development on the study area roadway system, peak hour intersection capacity analyses for total traffic conditions (projected site generated trips + background traffic) were performed for the 2028 (short-term) and 2040 (long-range) analysis horizons at each of the study area intersections listed below.

- W. 68th Ave./Lowell Blvd.
- W. 66th Ave./Lowell Blvd.
- W. 65th Ave./Lowell Blvd.
- W. 64th Ave./Tennyson St.
- W. 64th Ave./Lowell Blvd.
- W. 64th Ave./Federal Blvd. (SH 287)
- W. 64th Ave./South Site Access

A narrative of the summary of the analysis and comparison to background traffic conditions for the 2028 (short-term) and 2040 (long-range) analysis horizons is provided below. The results of the total traffic operational analyses are summarized graphically for the 2028 (short-term) and 2040 (long-range) analysis horizons in Figures 13 and 14, respectively. A summary of the results of the intersection capacity analysis is provided in Table 2 and detailed *Synchro 10* software intersection capacity analysis reports in Appendix "B".

Study-Area Intersections – Summary of Results:

- **W. 68th Ave./Lowell Blvd.** – The W. 68th Ave./Lowell Blvd. intersection is not anticipated to undergo any significant geometric or operational modifications through the 2040 (long-range) analysis horizon. Therefore, the intersection is anticipated to remain under actuated/coordinated signalized control with permissive only left turn phasing on all four approaches. Based on these parameters, it is projected that the intersection, as well as all lane groups will operate at an acceptable level of service (LOS “D” or better) through the 2040 (long-range) analysis horizon. No operational modifications are recommended as a result of the proposed 6501 Lowell Blvd development.
- **W. 66th Ave./Lowell Blvd.** – The W. 66th Ave./Lowell Blvd. intersection is not anticipated to undergo any significant geometric or operational modifications through the 2040 (long-range) analysis horizon. Therefore, the intersection is anticipated to remain under stop sign control on the eastbound and westbound approaches. Based on these parameters, it is projected that the intersection, as well as all lane groups will operate at an acceptable level of service (LOS “D” or better) through the 2028 (short-term) analysis horizon, with the exception of the eastbound shared left/through/right turn lane which is experiencing a failing level of service in the p.m. peak hour under current conditions. This failing level of service is projected to continue in the p.m. peak hour through 2028. The failing level of service on the eastbound approach is due to high north/south through volumes on Lowell Blvd., causing substantial delay for vehicles on the eastbound and westbound approaches attempting to turn left or go straight through the intersection. By the 2040 (long-range) background analysis horizon, it is projected that the westbound shared left/through/right turn lane will have a failing level of service in the p.m. peak hour as well due to the background through traffic volumes on Lowell Blvd. These failing levels of service for 66th Ave are typical for stop controlled minor street approaches along Lowell Blvd. due to the high background traffic through volumes on Lowell Blvd causing substantial delay. No operational modifications are recommended as a result of the proposed 6501 Lowell Blvd development.
- **W. 65th Ave./Lowell Blvd.** – The W. 65th Ave./Lowell Blvd. intersection is not anticipated to undergo any significant geometric or operational modifications through the 2028 (short-term) background analysis horizon. Therefore, the intersection is anticipated to remain under stop sign control on the eastbound and westbound approaches. Based on these parameters, it is projected that the intersection, as well as all lane groups will operate at an acceptable level of service (LOS “D” or better) through the 2028 (short-term) background analysis horizon.

Concurrent with construction of the proposed 6501 Lowell Blvd development, the west leg of this intersection will be extended and serve as an access for the proposed development. With the addition of site traffic on the west leg, the intersection is projected to continue operating with an acceptable level of service for all impeded movements. By the 2040 (long-range) analysis horizon, it is projected that in the background traffic scenario, the westbound shared left/through/right turn lane will experience a failing level of service in the p.m. peak hour. The failing level of service on the westbound approach is typical for stop controlled minor street approaches along Lowell Blvd. due to the high background traffic through volumes on Lowell Blvd. causing substantial delay for vehicles on the minor approaches attempting to turn left or go straight through the intersection.

- **W. 64th Ave./Tennyson St.** – The W. 64th Ave./Tennyson St. intersection is not anticipated to undergo any significant geometric or operational modifications through the

2040 (long-range) analysis horizon. Therefore, the intersection is anticipated to remain under actuated/coordinated signalized control with permissive only left turn phasing on the eastbound and westbound approach. Based on these parameters, it is projected that the intersection, as well as all lane groups will operate at an acceptable level of service (LOS "D" or better) through the 2040 (long-range) analysis horizon. No operational modifications are recommended as a result of the proposed 6501 Lowell Blvd development.

- **W. 64th Ave./Lowell Blvd.** – The W. 64th Ave./Lowell Blvd. Dr. intersection is not anticipated to undergo any significant geometric or operational modifications through the 2040 (long-range) analysis horizon. Therefore, the intersection is anticipated to remain under actuated/coordinated signalized control with protected/permissive left turn phasing on the eastbound and southbound approaches, and permissive only left turn phasing on the northbound and westbound approaches. Based on these parameters, it is projected that the intersection, as well as all lane groups will operate at acceptable levels of service (LOS "D" or better) through the 2040 (long-range) analysis horizon. No operational modifications are recommended as a result of the proposed 6501 Lowell Blvd development.
- **W. 64th Ave./Federal Blvd. (SH 287)** – The W. 64th Ave./Federal Blvd. (SH 287) intersection is not anticipated to undergo any significant geometric or operational modifications through the 2040 (long-range) analysis horizon. Therefore, the intersection is anticipated to remain under actuated/coordinated signalized control with protected/permissive left turn phasing on all four approaches. Based on these parameters, it is projected that by the 2040 (long-range) analysis horizon, the intersection overall will have a failing level of service (LOS "E" or worse) in the p.m. peak hour, and multiple lane groups will also have a failing level of service in the a.m. and p.m. peak hour. This is due to high background traffic through volumes on Federal Blvd. (SH 287). No operational modifications are recommended as a result of the proposed 6501 Lowell Blvd development.
- **W. 64th Ave./South Site Access** – The W. 64th Ave./ South Site Access intersection will be constructed concurrently with the proposed 6501 Lowell Blvd. development. The intersection will be a "T" intersection under stop sign control on the southbound approach. The east leg of the intersection will have one shared through/right turn lane on the westbound approach, and one eastbound departure lane. The west leg of the intersection will have one left turn lane with approximately 250 feet of storage and one through lane on the eastbound approach, and one westbound departure lane. The north leg of the intersection will be constructed to have one shared left/right turn lane on the southbound approach, and one northbound departure lane. Based on these parameters, it is projected that all impeded lane groups will operate with acceptable levels of service (LOS "D" or better) through the 2040 (long-range) analysis horizon total traffic scenario.

**TABLE 2
SUMMARY OF RESULTS - INTERSECTION CAPACITY ANALYSIS**

INTERSECTION	INTERSECTION CONTROL	2021 EXISTING TRAFFIC		2028 BACKGROUND TRAFFIC		2028 TOTAL TRAFFIC		2040 BACKGROUND TRAFFIC		2040 TOTAL TRAFFIC	
		AM PEAK	PM PEAK	AM PEAK	PM PEAK	AM PEAK	PM PEAK	AM PEAK	PM PEAK	AM PEAK	PM PEAK
		LOS	LOS	LOS	LOS	LOS	LOS	LOS	LOS	LOS	LOS
1. W. 68th Ave./Lowell Blvd. a. EB L (Perm) b. EB T c. EB R d. WB L (Perm) e. WB TR f. NB L (Perm) g. NB T h. NB R i. SBL (Perm) j. SBT k. SBR l. INTERSECTION	Signal	C	C	C	C	C	C	C	C	C	C
		C	C	C	C	C	C	C	C	C	C
		C	C	C	C	C	C	C	C	C	C
		C	C	C	C	C	C	C	C	C	C
		C	C	C	C	C	C	C	C	C	C
		A	A	A	A	A	A	A	A	A	A
		A	A	A	A	A	A	A	A	A	A
		A	A	A	A	A	A	A	A	A	A
		A	A	A	A	A	A	A	A	A	A
		A	A	A	A	A	A	A	A	A	A
		A	A	A	A	A	A	A	A	A	A
		A	A	A	A	A	A	A	A	A	A
		A	A	A	A	A	A	A	A	A	A
2. W. 66th Ave./Lowell Blvd. a. EB LTR b. WB LTR c. NB L d. SBL e. INTERSECTION	TWSC										
	Stop	B	E	C	E	C	F	C	F	C	F
	Stop	C	D	C	D	C	D	C	E	C	E
		A	A	A	A	A	A	A	A	A	A
		A	A	A	A	A	A	A	B	A	B
		A	A	A	A	A	A	A	A	A	A
3. W. 65th Ave./Lowell Blvd. a. EB LTR b. WB LTR c. NB L d. SBL e. INTERSECTION	TWSC										
	Stop	A	A	A	A	C	C	A	A	C	D
	Stop	B	C	B	D	B	D	C	E	C	E
		A	A	A	A	A	A	A	A	A	A
		A	A	A	A	A	A	A	B	A	B
		A	A	A	A	A	A	A	A	A	A
4. W. 64th Ave./Tennyson St. a. EB L (Perm) b. EB T c. EB R d. WB L (Perm) e. WB TR f. NB LTR g. SB LTR h. INTERSECTION	Signal	C	B	C	B	C	B	C	B	C	B
		C	C	C	C	C	C	C	C	C	C
		C	B	C	B	C	B	C	B	C	B
		D	B	D	B	D	B	D	C	D	C
		C	A	C	A	C	A	C	A	C	A
		B	C	B	C	B	C	B	C	B	C
		A	B	B	B	B	B	B	B	B	B
		C	B	C	B	C	B	C	B	C	B
		C	B	C	B	C	B	C	B	C	B
5. W. 64th Ave./Lowell Blvd. a. EB L (Prot+Perm) b. EB T c. EB R d. WB L (Perm) e. WB T f. WB R g. NB L (Perm) h. NB T i. NB R j. SBL (Prot+Perm) k. SBT l. SBR m. INTERSECTION	Signal	C	C	C	C	C	D	C	D	C	D
		C	B	D	B	D	B	D	B	D	B
		C	B	C	B	C	B	C	B	C	B
		D	C	D	C	D	C	D	C	D	C
		D	D	D	D	D	D	D	D	D	D
		D	C	D	C	D	C	D	C	D	C
		B	C	B	C	B	C	B	C	B	C
		B	C	B	C	B	C	B	D	B	D
		B	B	B	B	B	C	B	C	B	C
		A	B	A	B	A	B	B	C	B	C
		A	B	A	B	A	B	B	B	B	B
		A	B	A	B	A	B	A	B	A	B
		C	C	C	C	C	C	C	C	C	C
		C	C	C	C	C	C	C	C	C	C
		C	C	C	C	C	C	C	C	C	C
6. W. 64th Ave./Federal Blvd. (SH 287) a. EB L (Prot+Perm) b. EB T c. EB R d. WB L (Prot+Perm) e. WB T f. WB R g. NB L (Prot+Perm) h. NB TR i. SBL (Prot+Perm) j. SB TR k. INTERSECTION	Signal	C	D	C	D	C	D	D	F	D	F
		D	D	D	D	D	D	D	D	D	D
		D	D	D	D	D	D	D	D	D	D
		D	C	D	C	D	C	D	D	D	D
		D	D	D	D	D	D	D	F	D	F
		C	D	C	D	C	C	C	D	C	D
		C	D	C	D	C	D	C	F	C	F
		B	C	B	D	B	D	B	D	B	D
		A	C	A	C	A	C	A	D	A	D
		C	C	D	D	D	D	F	E	F	F
		C	C	C	D	C	D	D	E	D	E
		C	C	C	D	C	D	D	E	D	E
		C	C	C	D	C	D	D	E	D	E
7. W. 64th Ave./South Site Access a. EB L b. SB LR c. INTERSECTION	TWSC										
	Stop	-	-	-	-	A	A	-	-	A	A
		-	-	-	-	C	D	-	-	C	D
		-	-	-	-	A	A	-	-	A	A

B. Queue Lengths and Storage Required

Queue lengths and associated storage requirements for auxiliary lanes (turn bays) at the study area intersections were calculated for the 2021 (existing) and 2028 (short-term) and 2040 (long-range) analysis horizon background and total traffic scenarios using the results of the *Synchro* 10⁹⁵th percentile reported queue lengths. Queue lengths are based on a 25-foot vehicle length. All queue lengths are reported in total feet. Results of the queue length/turn bay storage length requirement calculations are provided in Table 3. A narrative of the summary of the queue length/storage analysis and comparison to existing turn bay storage is provided below.

- **W. 68th Ave./Lowell Blvd.** - Based on the results of the queuing analysis, it is projected that all turn bays will have adequate capacity to serve the intersection through the 2040 (long-range) analysis horizon total traffic scenario.
- **W. 66th Ave./Lowell Blvd.** – Based on the results of the queuing analysis, it is projected that there will not be any queuing impacts associated with this intersection through the 2040 (long-range) analysis horizon total traffic scenario.
- **W. 65th Ave./Lowell Blvd.** – Based on the results of the queuing analysis, it is projected that there will not be any queuing impacts associated with this intersection through the 2040 (long-range) analysis horizon total traffic scenario. Right-turning traffic volumes at this intersection do not warrant the construction of any right turn auxiliary lanes per the *Adams County Development Standards*.
- **W. 64th Ave./Tennyson St.** - Based on the results of the queuing analysis, it is projected that all turn bays will have adequate capacity to serve the intersection through the 2040 (long-range) analysis horizon total traffic scenario.
- **W. 64th Ave./Lowell Blvd.** - Based on the results of the queuing analysis, it is projected that all turn bays will have adequate capacity to serve the intersection through the 2040 (long-range) analysis horizon total traffic scenario, with the exception of the westbound right turn lane queue, which is projected to spill back into the westbound through lane in the 2040 (long-range) p.m. peak hour. Also, by the 2040 (long-range) background analysis horizon, it is projected the westbound through lane queue will spill back through the W. 64th Ave./Knox Ct. intersection during the p.m. peak hour.
- **W. 64th Ave./Federal Blvd. (SH 287)** - Based on the results of the queuing analysis, it is projected under existing conditions, the eastbound left turn bay exceeds its capacity in the p.m. peak hour, blocking access to driveways along W. 64th Ave. This will continue through the 2040 (long-range) analysis horizon. All other turn bays will have adequate capacity to serve the intersection through the 2040 (long-range) analysis horizon total traffic scenario. However, by the 2040 (long-range) background analysis horizon, it is projected the southbound through lane queue will spill back through the W. Hawthorne Pl./Federal Blvd. (SH 287) intersection during the a.m. peak hour.
- **W. 64th Ave./South Site Access** - Based on the results of the queuing analysis, it is projected that there will not be any queuing impacts associated with this intersection through the 2040 (long-range) analysis horizon total traffic scenario. Right-turning traffic volumes at this intersection do not warrant the construction of any right turn auxiliary lanes per the *Adams County Development Standards*.

**TABLE 3
SUMMARY OF RESULTS - QUEUE ANALYSIS**

INTERSECTION (# OF LANES IN LANE GROUP)	EXISTING STORAGE (CUMULATIVE) (FT)	2021 EXISTING TRAFFIC		2028 BACKGROUND TRAFFIC		2028 TOTAL TRAFFIC		2040 BACKGROUND TRAFFIC		2040 TOTAL TRAFFIC	
		QUEUE LENGTH (FT) 95TH%		QUEUE LENGTH (FT) 95TH%		QUEUE LENGTH (FT) 95TH%		QUEUE LENGTH (FT) 95TH%		QUEUE LENGTH (FT) 95TH%	
		AM PEAK	PM PEAK	AM PEAK	PM PEAK	AM PEAK	PM PEAK	AM PEAK	PM PEAK	AM PEAK	PM PEAK
1. W. 68th Ave./Lowell Blvd.											
a. EB L (1)	150	42	44	44	46	44	46	48	49	48	49
b. EB T (1)	500	14	16	14	17	14	17	15	18	15	18
c. EB R (1)	150	36	28	37	29	37	29	39	30	39	30
d. WB L (1)	150	6	16	7	16	7	16	7	17	7	17
e. WB TR (1)	275	19	29	19	30	19	30	20	32	20	32
f. NB L (1)	225	16	30	18	32	18	33	20	39	20	39
g. NB T (1)	320	35	172	38	198	40	202	44	256	46	261
h. NB R (1)	250	25	4	25	5	25	5	25	5	25	5
i. SB L (1)	150	6	6	6	6	6	6	7	7	7	7
j. SB T (1)	150	61	75	68	83	69	87	80	99	82	103
k. SB R (1)	150	8	10	8	10	8	10	9	11	9	11
2. W. 66th Ave./Lowell Blvd.											
a. EB LTR (1)	180	10	38	10	48	10	50	15	83	15	85
b. WB LTR (1)	285	8	15	8	18	8	20	10	28	10	30
c. NB L (1)	200	0	3	0	3	0	3	0	3	0	3
d. SB L (1)	575	0	3	0	3	0	3	0	3	0	3
3. W. 65th Ave./Lowell Blvd.											
a. EB LTR (1)	-	0	0	0	0	10	10	0	0	10	13
b. WB LTR (1)	115	3	10	5	13	5	18	5	20	8	30
c. NB L (1)	150	0	0	0	0	0	3	0	0	0	3
d. SB L (1)	300	0	3	0	3	0	3	0	3	0	3
4. W. 64th Ave./Tennyson St.											
a. EB L (1)	150	15	19	16	20	16	20	16	23	16	22
b. EB T (1)	250	196	406	202	455	200	473	213	623	212	646
c. EB R (1)	100	23	34	23	37	22	37	22	42	22	42
d. WB L (1)	225	156	74	164	85	167	89	177	116	176	111
e. WB TR (1)	310	314	383	333	394	342	390	358	413	357	410
f. NB LTR (1)	300	61	235	71	260	73	264	90	324	92	350
g. SB LTR (1)	700	26	30	29	32	30	32	34	34	34	34
5. W. 64th Ave./Lowell Blvd.											
a. EB L (1)	500	111	177	115	193	110	195	114	213	111	290
b. EB T (1)	500	242	294	249	314	248	318	256	323	261	317
c. EB R (1)	200	59	25	59	23	53	23	49	50	48	50
d. WB L (1)	270	58	35	60	37	59	36	58	63	57	62
e. WB T (1)	385	167	312	173	320	173	336	178	451	182	463
f. WB R (1)	75	30	50	33	50	33	75	45	85	50	90
g. NB L (1)	200	46	109	50	118	51	121	55	133	56	143
h. NB T (1)	1250	101	346	110	410	115	422	125	494	126	533
i. NB R (1)	150	25	28	28	33	28	33	35	41	35	43
j. SB L (1)	220	49	34	54	35	63	40	63	38	72	46
k. SB T (1)	600	149	134	164	143	172	147	198	161	204	173
l. SB R (1)	150	28	34	30	35	31	35	33	37	34	39
6. W. 64th Ave./Federal Blvd. (SH 287)											
a. EB L (1)	100	48	247	55	276	64	292	70	468	79	468
b. EB T (1)	1220	73	217	83	236	92	242	106	321	119	311
c. EB R (1)	150	25	76	27	84	28	84	75	85	19	79
d. WB L (1)	150	108	86	114	88	114	88	140	136	144	132
e. WB T (1)	1250	154	212	165	236	167	243	185	391	187	396
f. WB R (1)	100	38	25	40	50	40	50	45	90	45	18
g. NB L (1)	600	53	214	68	227	77	246	91	355	98	371
h. NB TR (3)	2275	152	546	164	631	164	632	191	840	191	821
i. SB L (1)	250	32	48	35	54	35	54	37	133	37	134
j. SB TR (3)	750	638	458	717	544	718	531	858	736	860	736
7. W. 64th Ave./South Site Access											
a. EB L (1)	-	-	-	-	-	0	3	-	-	0	3
b. SB LR (1)	-	-	-	-	-	8	10	-	-	10	13

VII. SUMMARY

The True Life Companies is proposing to develop a parcel of land containing approximately 7.15 acres located within the jurisdictional boundaries of Adams County, Colorado. The undeveloped property is bound on the south by W. 64th Ave., on the east by Lowell Blvd., on the north by residential properties fronting Meade Ct., and on the west by residential properties fronting Newton St. Upon buildout, the proposed development will contain 126 3-story duplex housing units. The proposed development will be known as 6501 Lowell Blvd.

The proposed development will have two access points. One access point will be the existing west leg of the Lowell Blvd./W. 65th Ave. intersection. The existing west leg will be extended to provide access into the proposed site. The second access point will be a proposed “T” intersection with W. 64th Ave. located west of Lowell Blvd.

Upon buildout, the proposed 6501 Lowell Blvd development is projected to generate 1,286 daily vehicle trips of which 94 are projected to be generated during the a.m. peak hour and 127 during the p.m. peak hour.

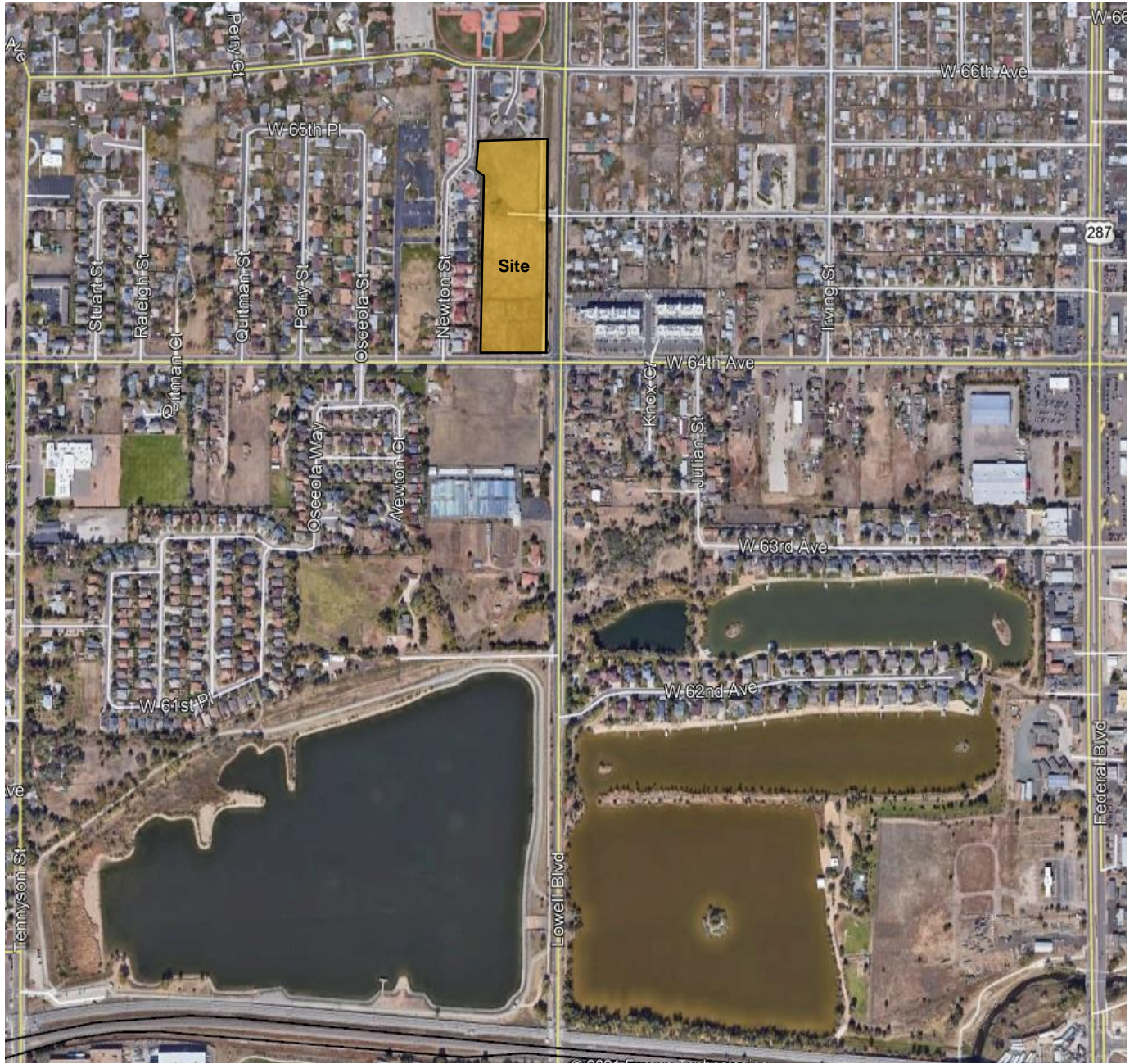
Based on the analyses contained herein, Table 4 presents the summary of recommendations for the study area intersections required to accommodate the proposed 6501 Lowell Blvd development project.

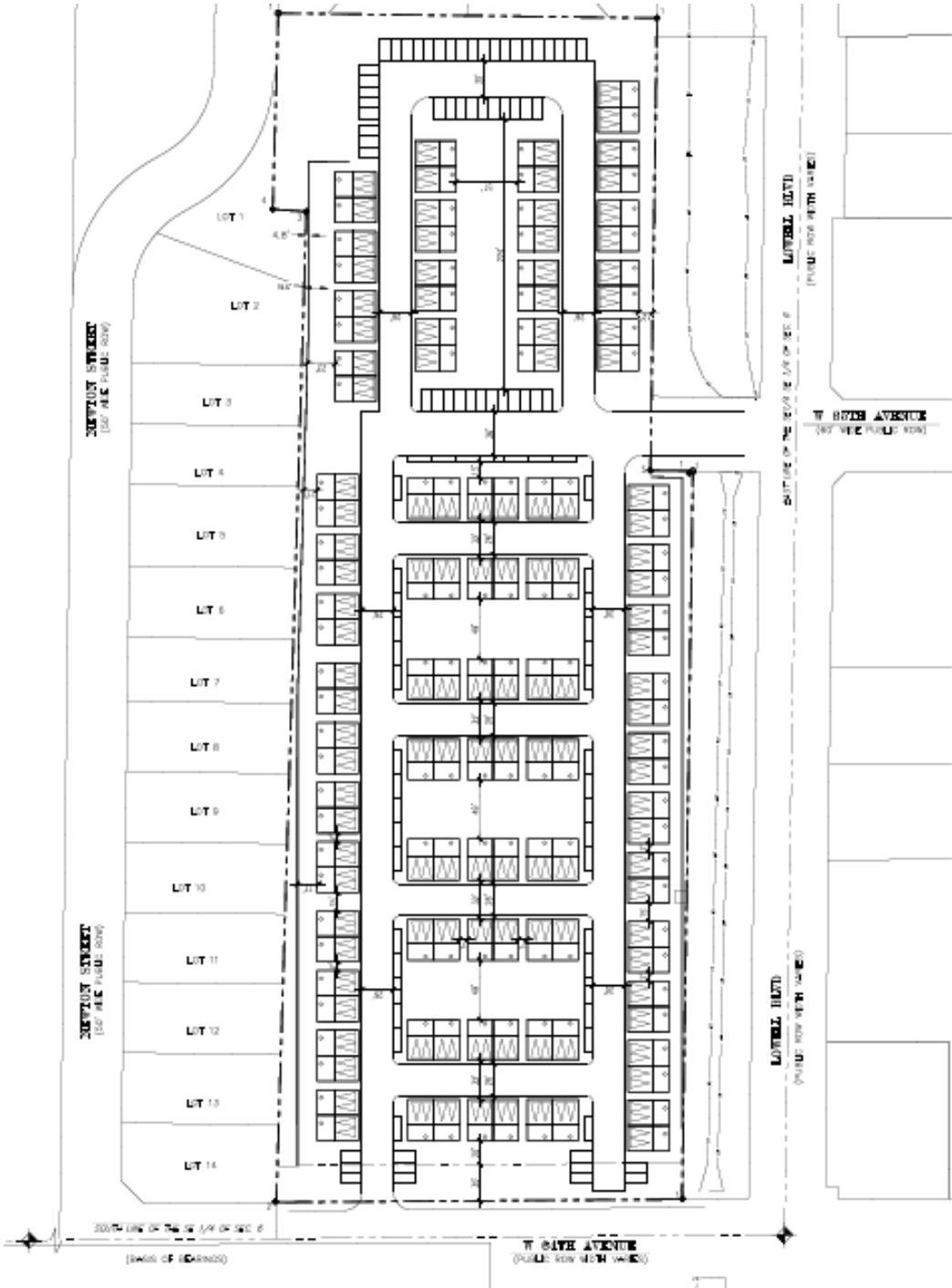
**TABLE 4
SUMMARY OF RECOMMENDATIONS**

Intersection	Recommendations	Responsible	Timing
W. 68 th Ave./Lowell Blvd.	No geometric or operational modifications are recommended as a result of the development of the proposed project.	N/A	N/A
W. 66 th Ave./Lowell Blvd.	No geometric or operational modifications are recommended as a result of the development of the proposed project.	N/A	N/A
W. 65 th Ave./Lowell Blvd.	Extend the west leg of the intersection to serve as an access for the proposed development.	Developer	Concurrently with Project
W. 64 th Ave./Tennyson St.	No geometric or operational modifications are recommended as a result of the development of the proposed project.	N/A	N/A
W. 64 th Ave./Lowell Blvd.	No geometric or operational modifications are recommended as a result of the development of the proposed project.	N/A	N/A

**TABLE 4 (CONTINUED)
SUMMARY OF RECOMMENDATIONS**

Intersection	Recommendations	Responsible	Timing
W. 64 th Ave./Federal Blvd. (SH 287)	No geometric or operational modifications are recommended as a result of the development of the proposed project.	N/A	N/A
W. 64 th Ave./South Site Access	Construct concurrently with the proposed 6501 Lowell Blvd development. The intersection will be under stop sign control on the southbound approach. The east leg of the intersection will have one shared through/right turn lane on the westbound approach, and one eastbound departure lane. The west leg of the intersection will have one left turn lane with approximately 250 feet of storage and one through lane on the eastbound approach, and one westbound departure lane. The north leg of the intersection will be constructed to have one shared left/right turn lane on the southbound approach, and one northbound departure lane.	Developer	Concurrently with Project

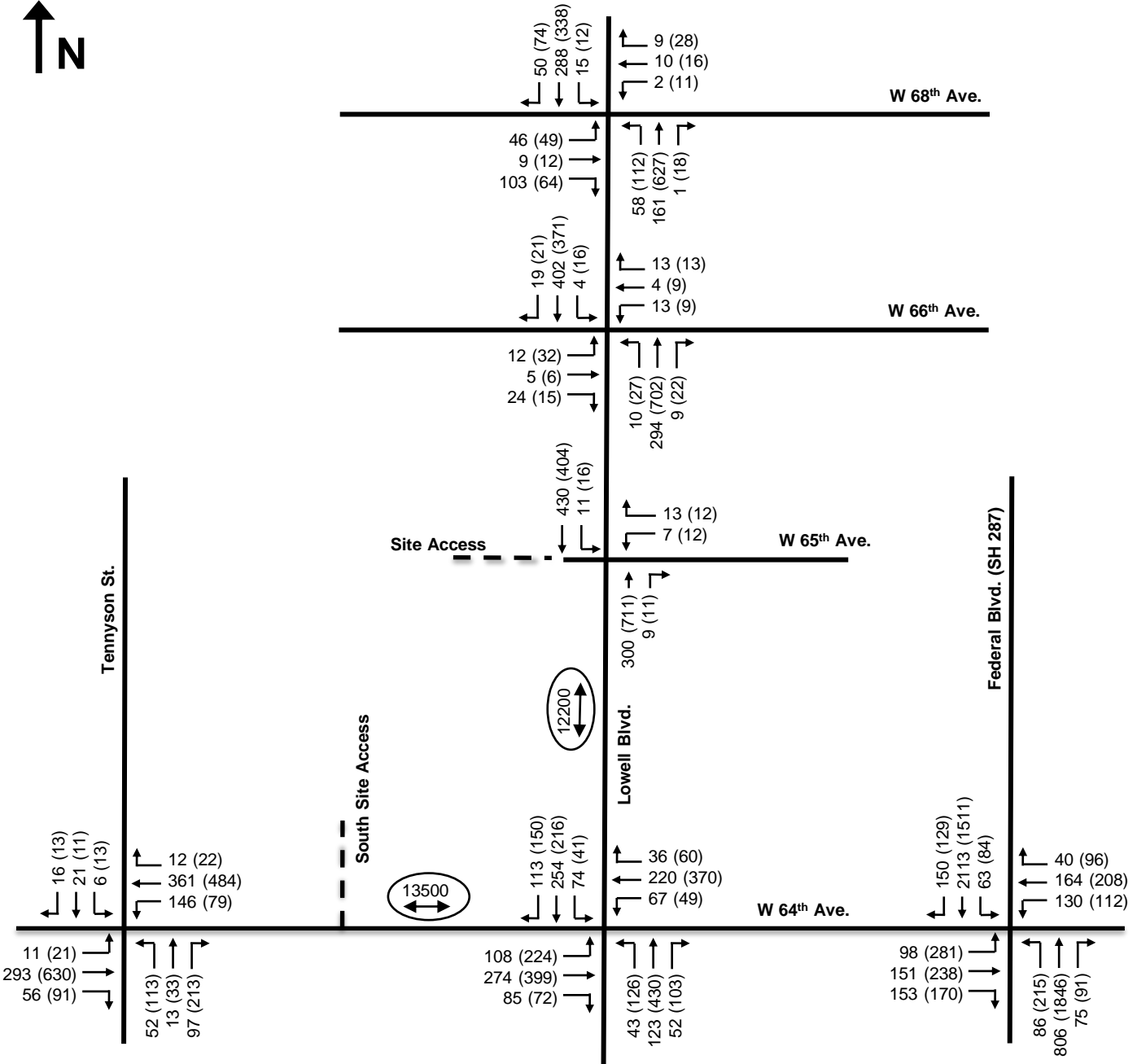




Conceptual Site Plan

6501 Lowell Blvd
The True Life Companies
HKS #200917

Figure 2



Legend: Drawing Not To Scale

- ↖ 5 (8) Weekday AM (PM)
- ← 64 (50) Peak Hour
- ↙ 8 (7) Traffic Volumes, vph
- ↔ 3200 Daily Traffic Volumes, vpd

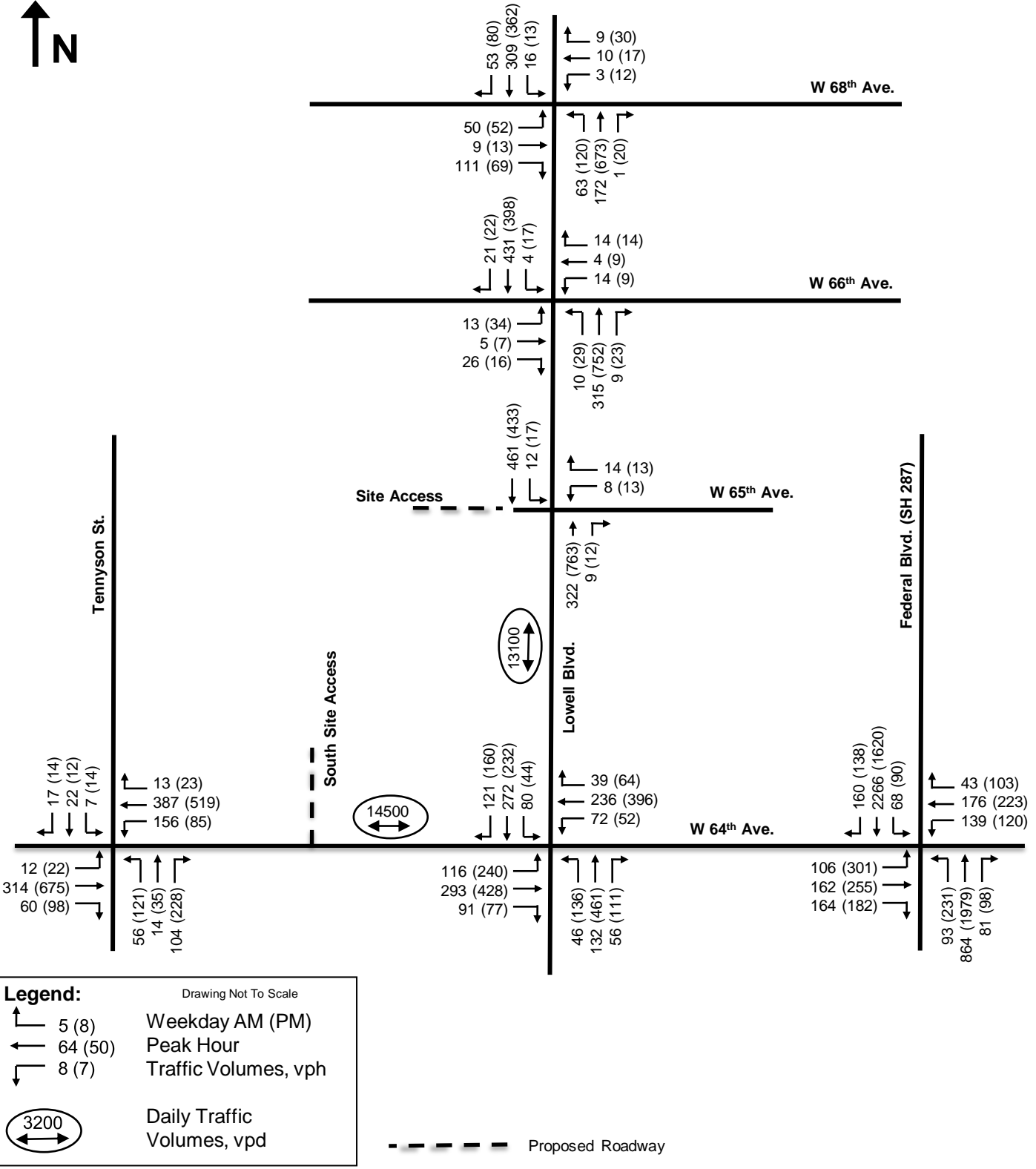
- - - - - Proposed Roadway



2021 Existing (COVID Adjusted) Traffic Volumes

6501 Lowell Blvd
 The True Life Companies
 HKS #200917

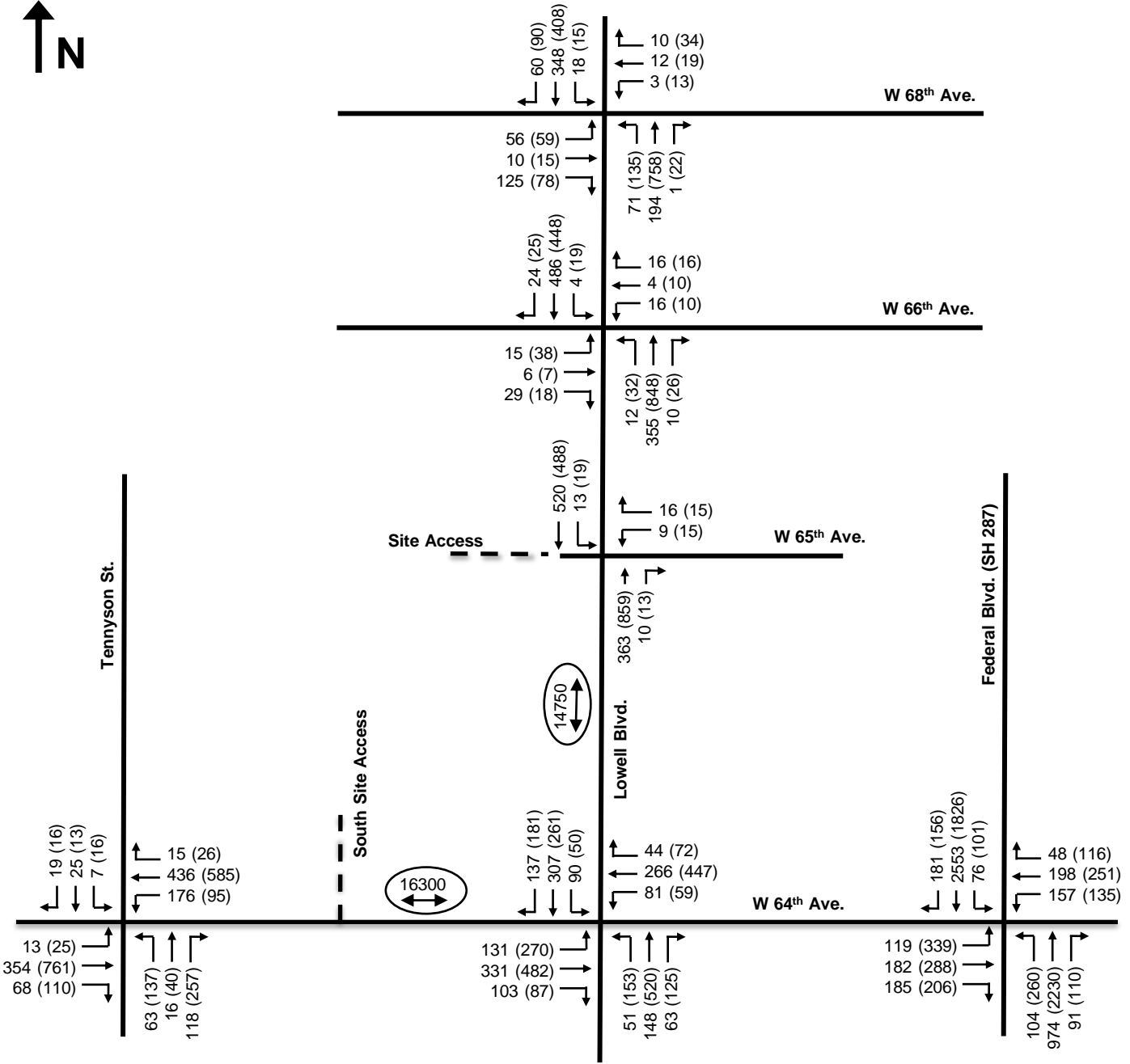
Figure 3



2028 Background Traffic Volumes

6501 Lowell Blvd
 The True Life Companies
 HKS #200917

Figure 4



Legend: Drawing Not To Scale

- 5 (8) Weekday AM (PM)
- 64 (50) Peak Hour
- 8 (7) Traffic Volumes, vph
- 3200 Daily Traffic Volumes, vpd

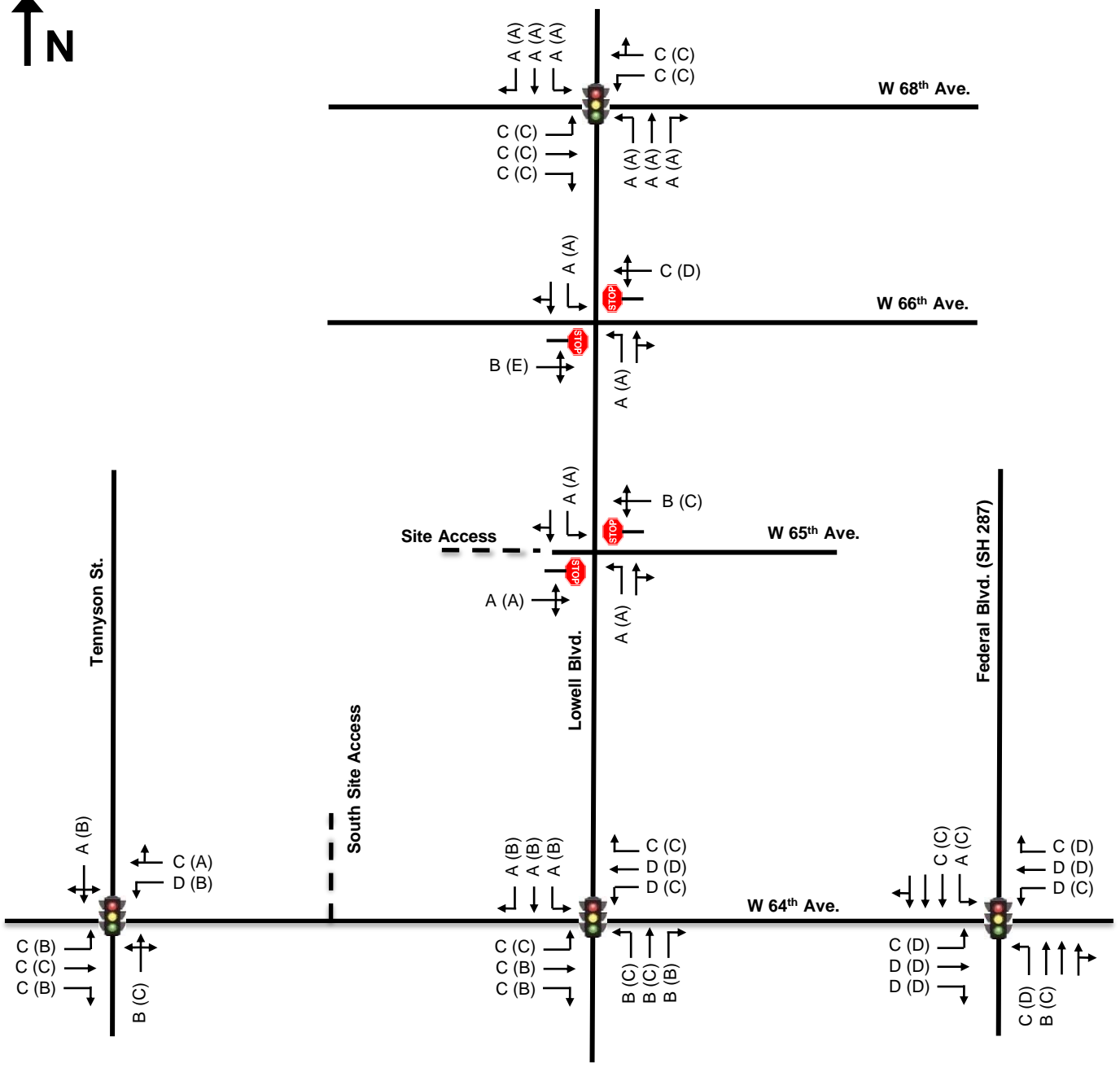
- - - - - Proposed Roadway



2040 Background Traffic Volumes

6501 Lowell Blvd
 The True Life Companies
 HKS #200917

Figure 5



Legend: Drawing Not To Scale

	A (B)	Weekday AM (PM)
	B (C)	Peak Hour
	D (D)	Level of Service

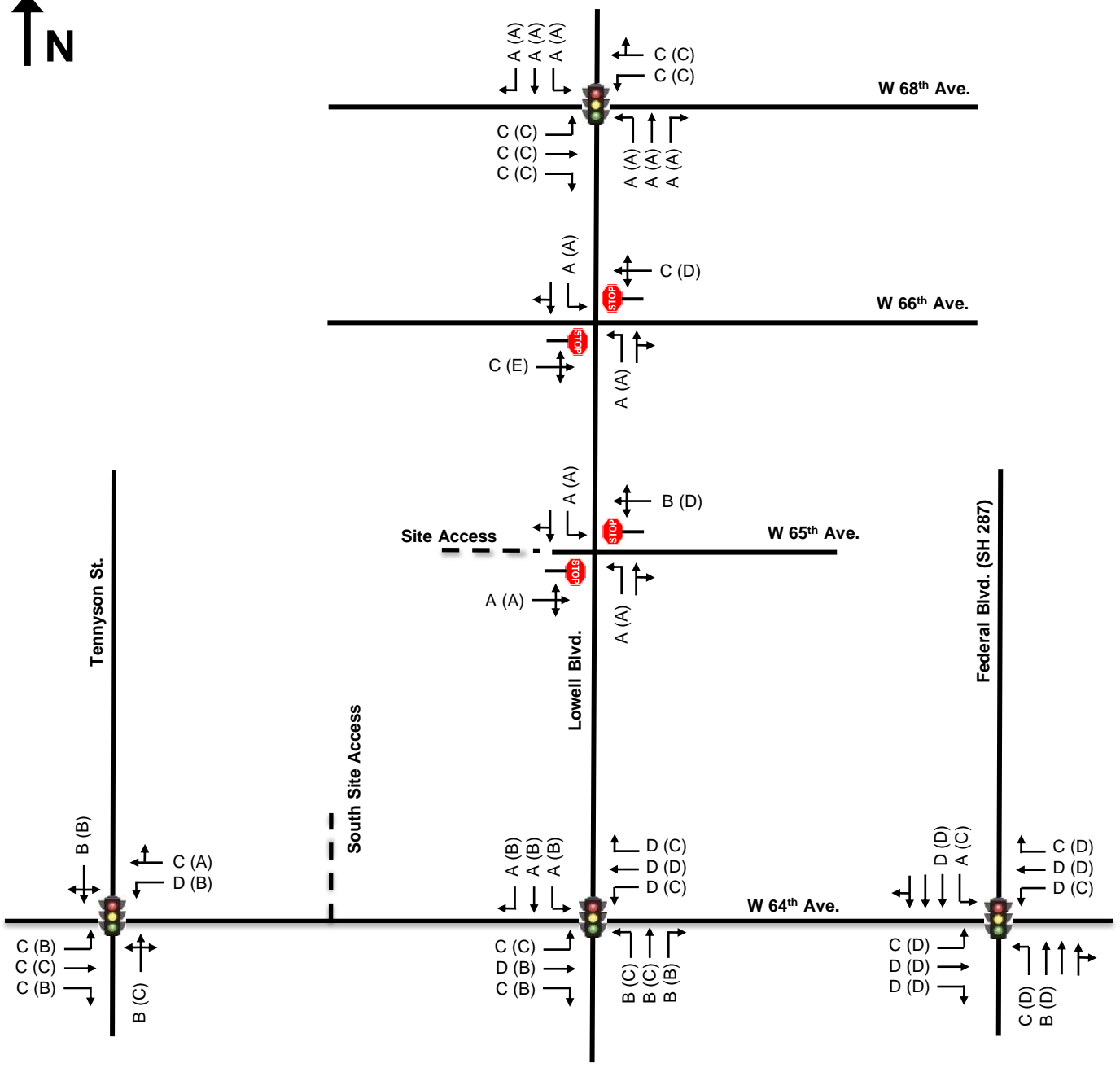
- - - - - Proposed Roadway



6501 Lowell Blvd
 The True Life Companies
 HKS #200917

2021 Existing Traffic Operational Conditions

Figure 6



Legend: Drawing Not To Scale

	A (B)	Weekday AM (PM)
	B (C)	Peak Hour
	D (D)	Level of Service

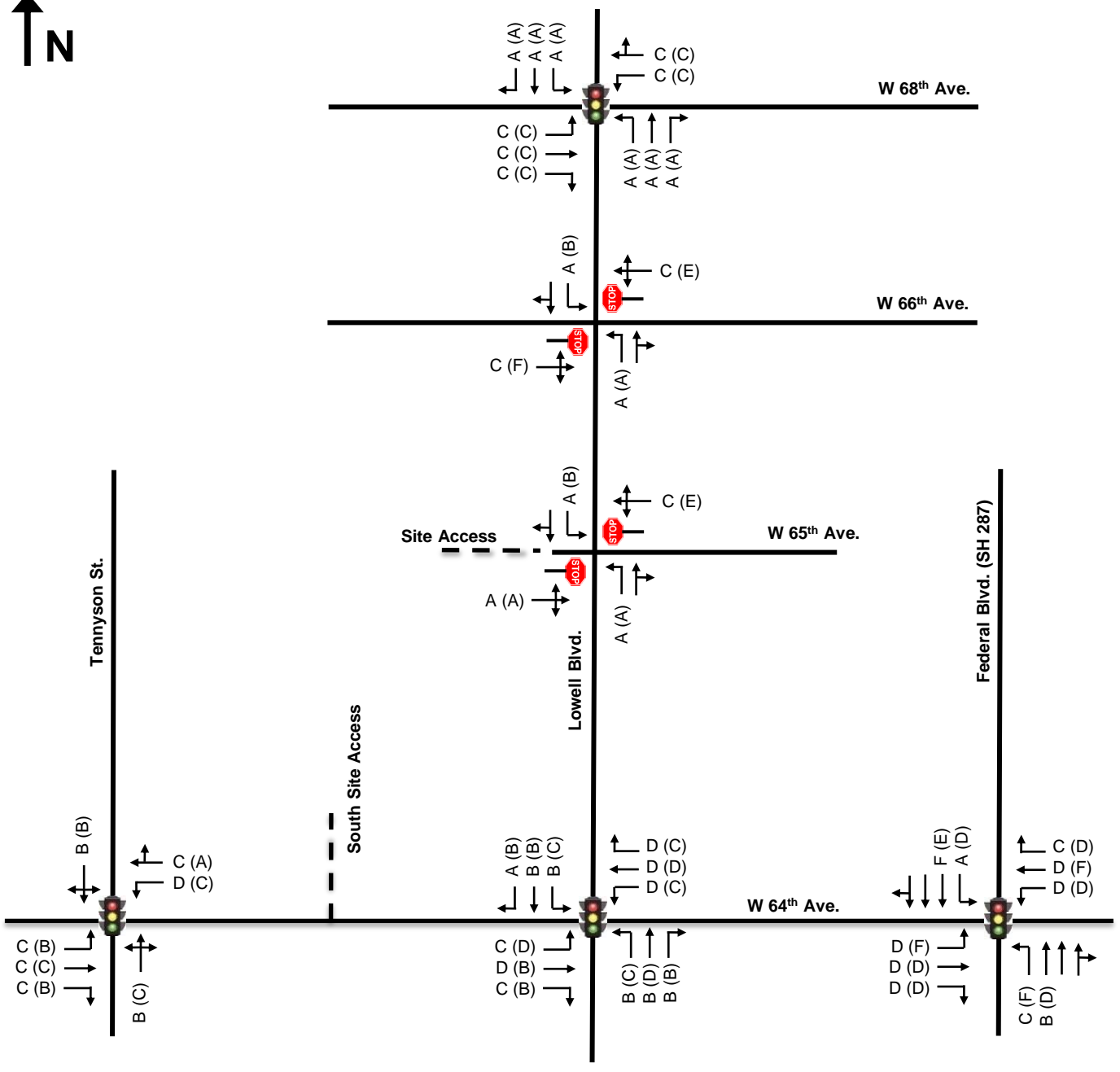
- - - - - Proposed Roadway



2028 Background Traffic Operational Conditions

6501 Lowell Blvd
 The True Life Companies
 HKS #200917

Figure 7



Legend: Drawing Not To Scale

	A (B)	Weekday AM (PM)
	B (C)	Peak Hour
	D (D)	Level of Service

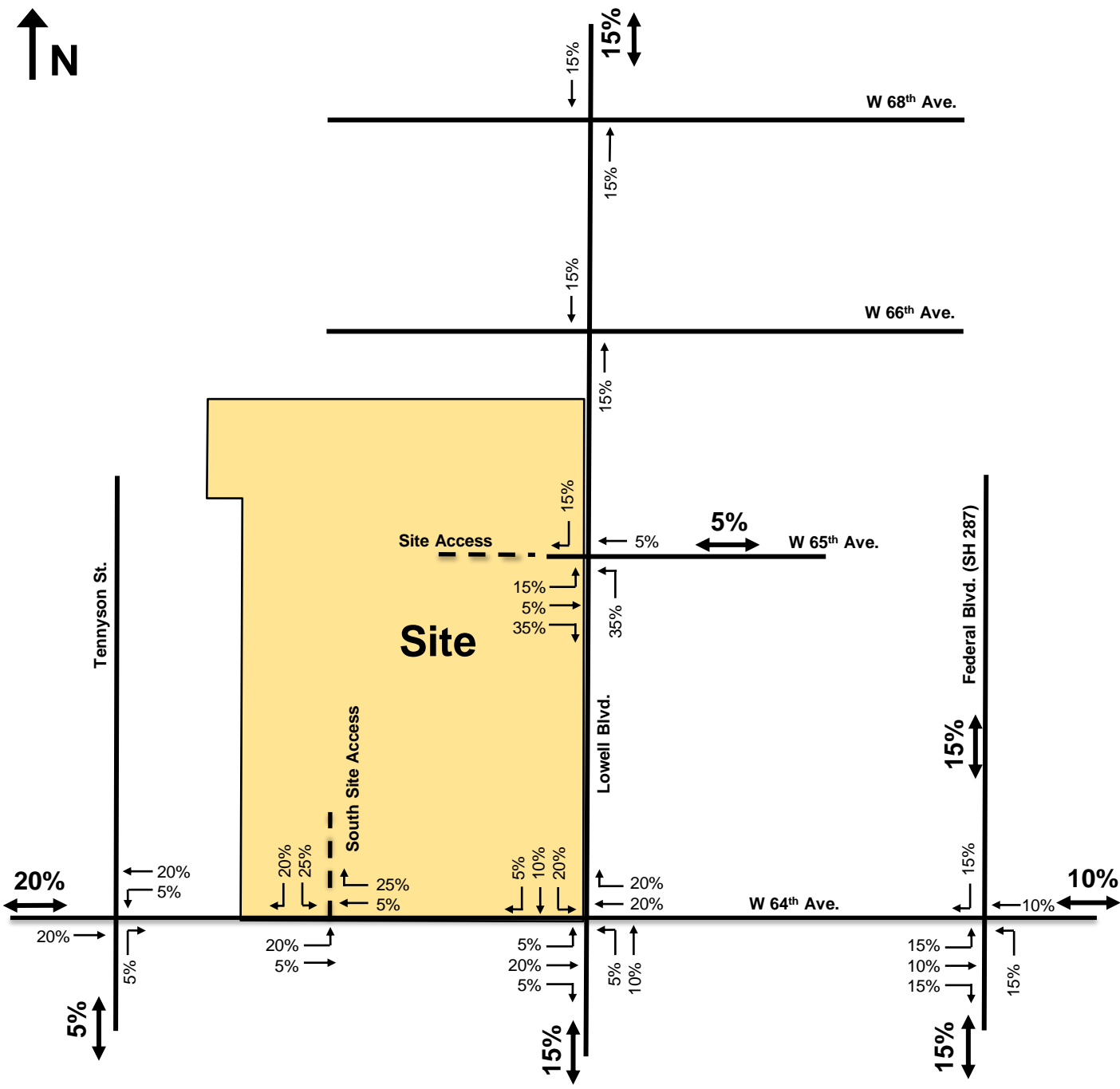
----- Proposed Roadway



2040 Background Traffic Operational Conditions

6501 Lowell Blvd
 The True Life Companies
 HKS #200917

Figure 8



Legend: Drawing Not To Scale

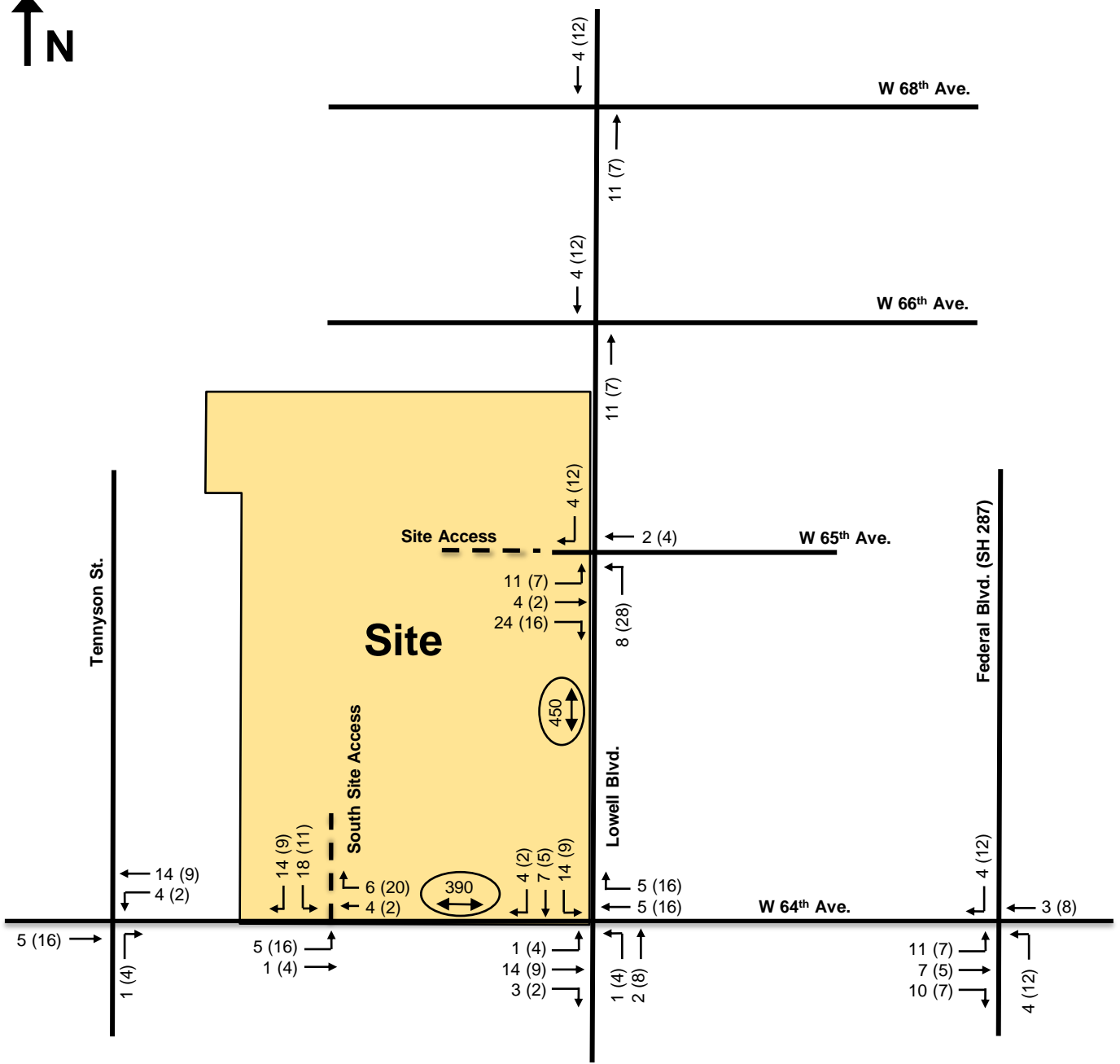
XX% Site-Generated Trip Distribution
 Proposed Roadway



6501 Lowell Blvd
 The True Life Companies
 HKS #200917

Site Generated Trip Distribution

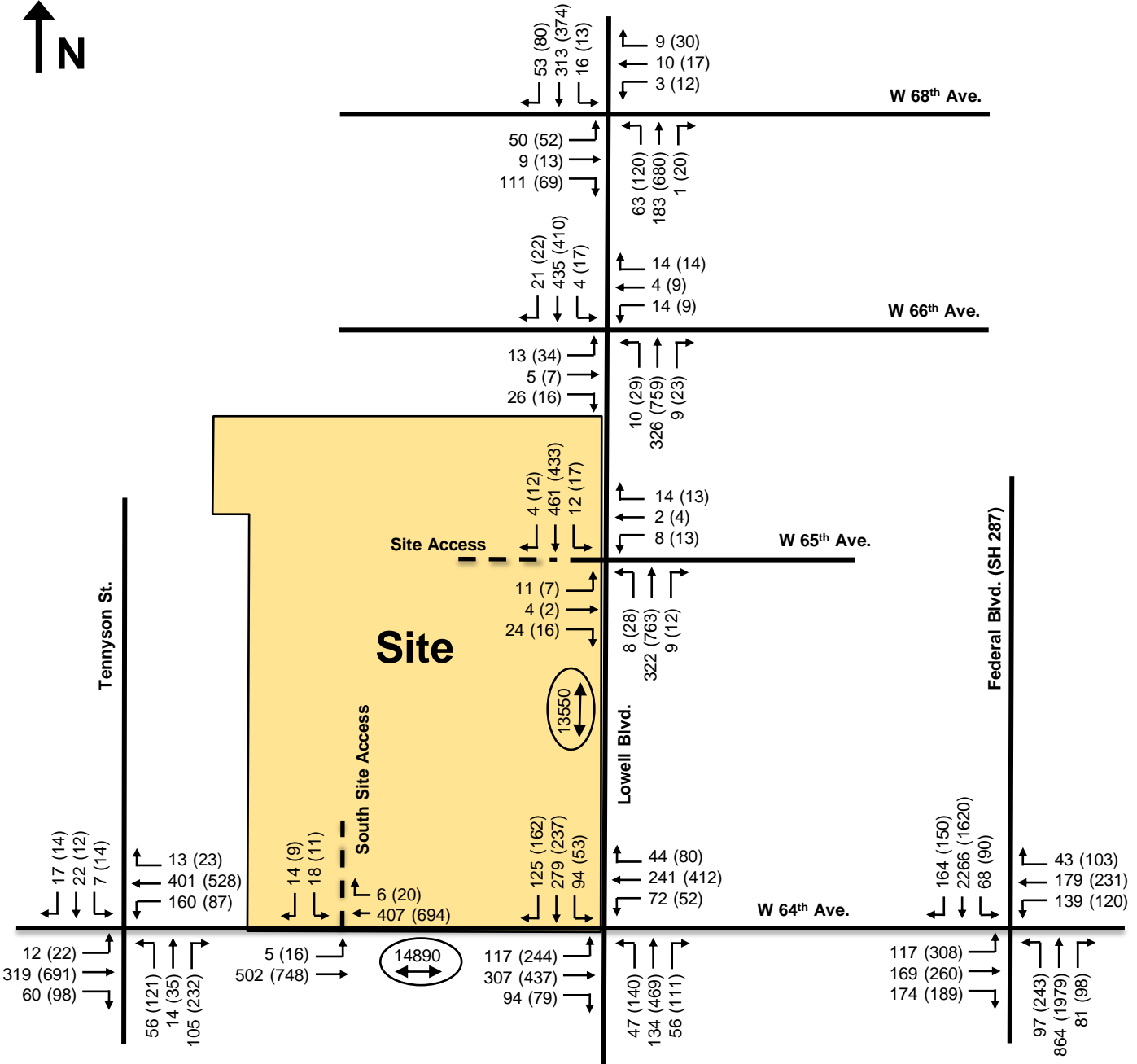
Figure 9

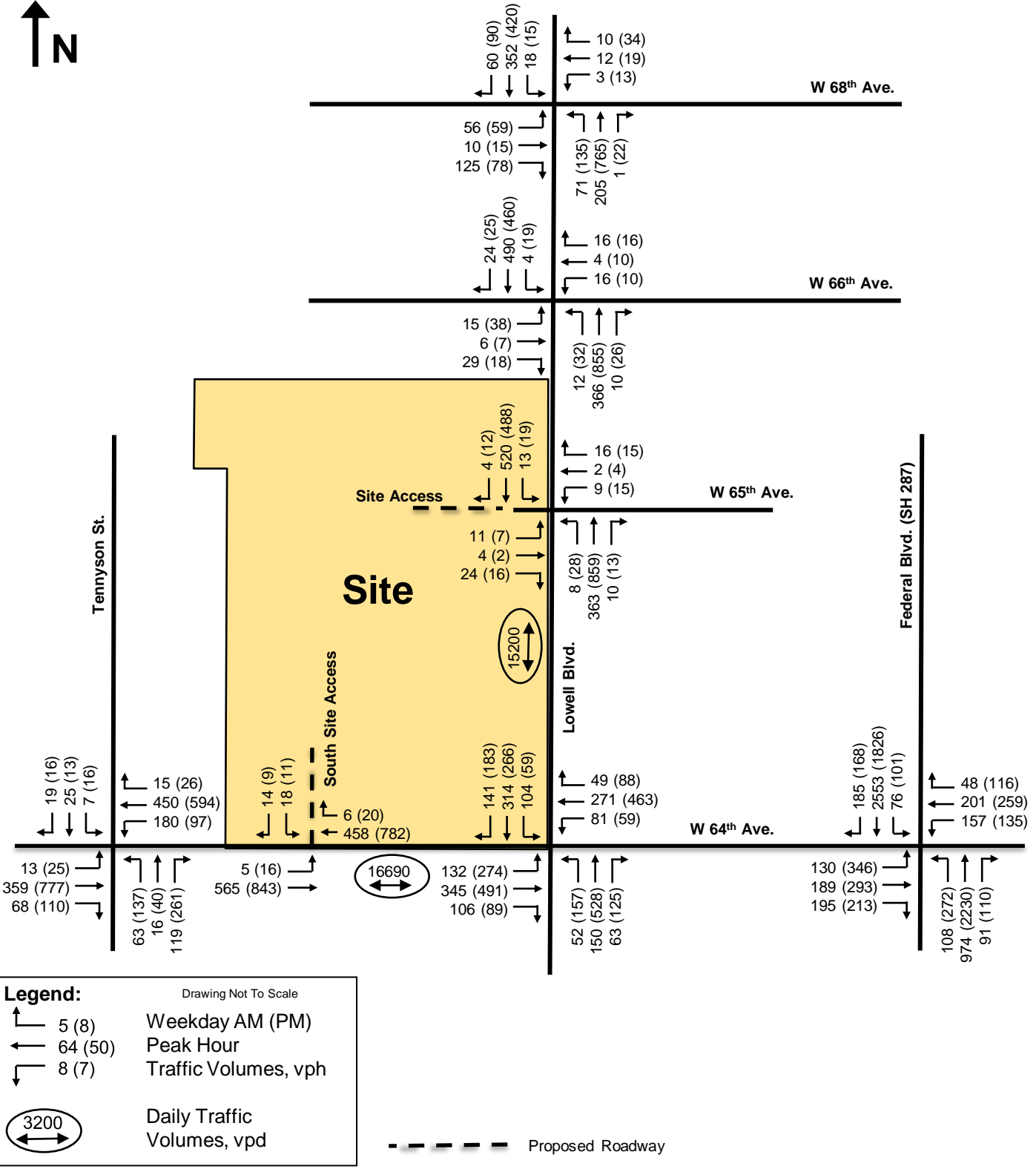


Legend: Drawing Not To Scale

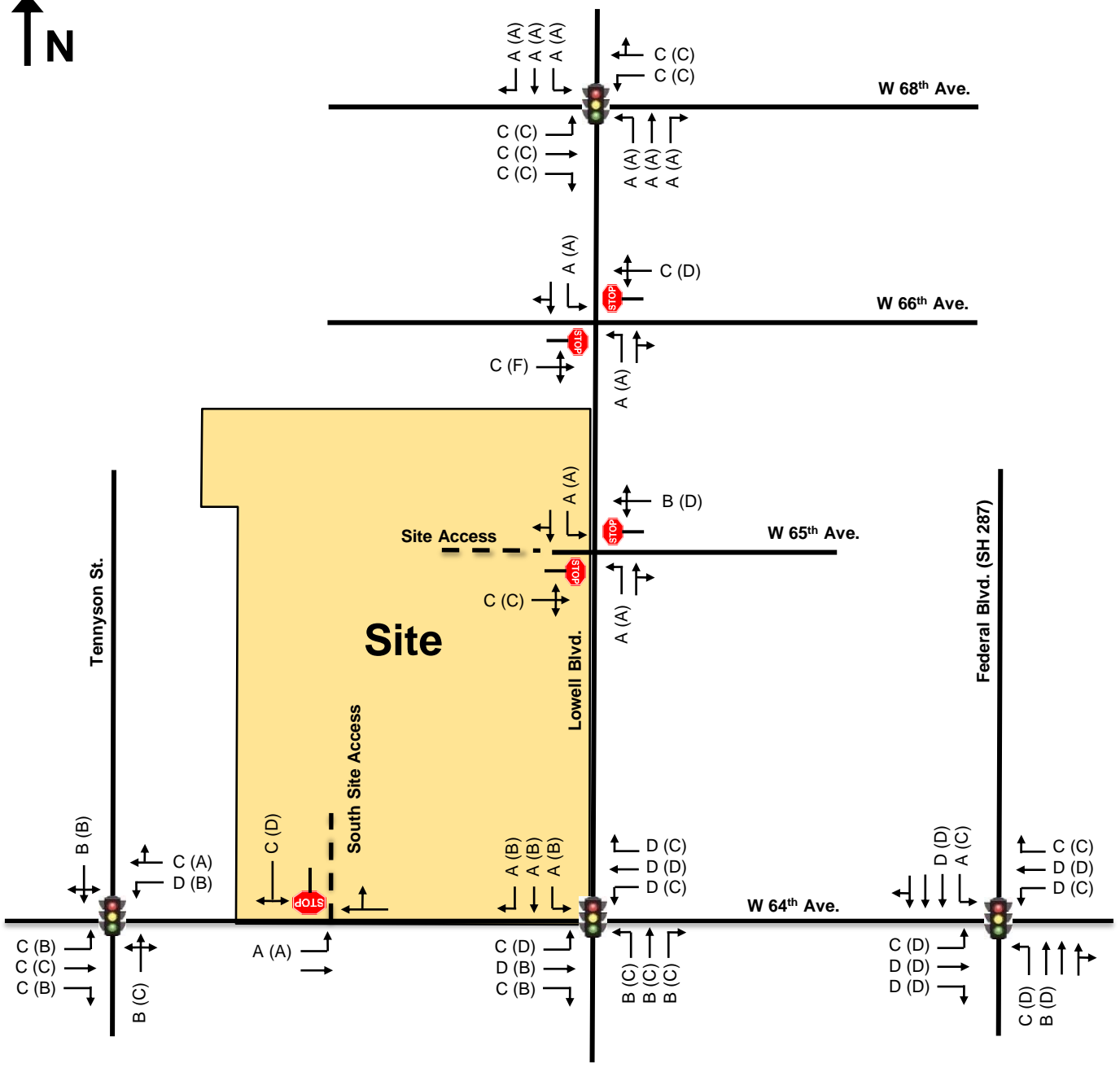
- 5 (8) Weekday AM (PM)
- 64 (50) Peak Hour
- 8 (7) Traffic Volumes, vph
- 3200 Daily Traffic Volumes, vpd

--- Proposed Roadway





2040 Total Traffic Volumes (Background + Site Generated)



Legend: Drawing Not To Scale

	A (B)	Weekday AM (PM)
	B (C)	Peak Hour
	D (D)	Level of Service

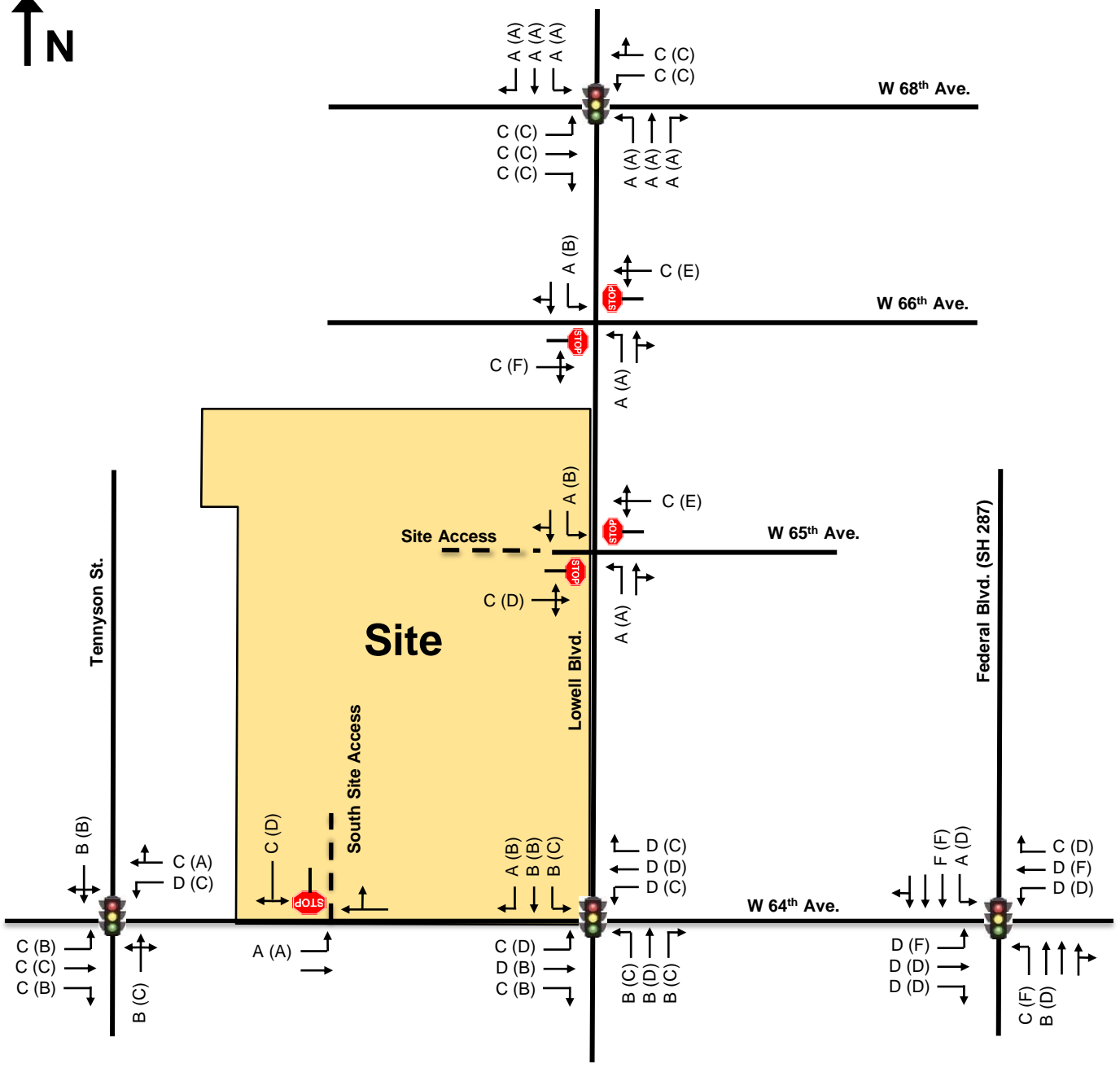
- - - - - Proposed Roadway



6501 Lowell Blvd
 The True Life Companies
 HKS #200917

2028 Total Traffic Operational Conditions

Figure 13



Legend: Drawing Not To Scale

	A (B)	Weekday AM (PM)
	B (C)	Peak Hour
	D (D)	Level of Service

- - - - - Proposed Roadway



6501 Lowell Blvd
 The True Life Companies
 HKS #200917

2040 Total Traffic Operational Conditions

Figure 14

APPENDIX “A”

**2021 EXISTING
TRAFFIC VOLUME COUNTS**

All Traffic Data Services

www.alltrafficdata.net

Date Start: 04-Mar-21
 Site Code: 4
 Station ID: 4
 LOWELL BLVD N.O. 64TH AVE

Start Time	04-Mar-21 Thu	NB	SB	Total						
12:00 AM		63	33	96						
01:00		26	25	51						
02:00		24	16	40						
03:00		8	10	18						
04:00		13	17	30						
05:00		23	28	51						
06:00		63	108	171						
07:00		118	277	395						
08:00		266	428	694						
09:00		295	377	672						
10:00		244	245	489						
11:00		212	239	451						
12:00 PM		243	270	513						
01:00		301	279	580						
02:00		346	258	604						
03:00		434	292	726						
04:00		516	327	843						
05:00		590	335	925						
06:00		726	328	1054						
07:00		386	255	641						
08:00		224	171	395						
09:00		159	87	246						
10:00		111	73	184						
11:00		76	59	135						
Total		5467	4537	10004						
Percent		54.6%	45.4%							
AM Peak	-	09:00	08:00	-	-	-	-	-	-	08:00
Vol.	-	295	428	-	-	-	-	-	-	694
PM Peak	-	18:00	17:00	-	-	-	-	-	-	18:00
Vol.	-	726	335	-	-	-	-	-	-	1054
Grand Total		5467	4537							10004
Percent		54.6%	45.4%							
ADT		ADT 10,004	AADT 10,004							

All Traffic Data Services
www.alltrafficdata.net

Date Start: 04-Mar-21
Site Code: 5
Station ID: 5
64TH AVE W.O. LOWELL BLVD

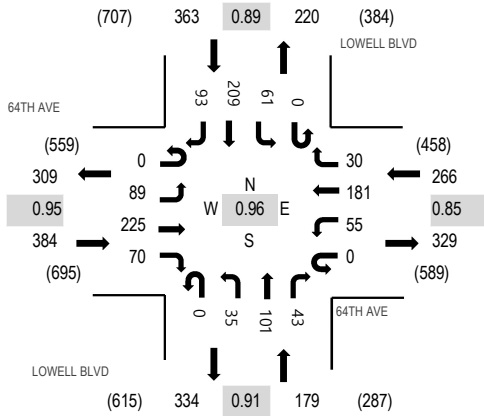
Start Time	04-Mar-21 Thu	EB	WB	Total						
12:00 AM		20	24	44						
01:00		13	20	33						
02:00		13	8	21						
03:00		19	18	37						
04:00		37	22	59						
05:00		79	94	173						
06:00		228	134	362						
07:00		347	266	613						
08:00		354	286	640						
09:00		269	216	485						
10:00		266	268	534						
11:00		328	324	652						
12:00 PM		371	370	741						
01:00		380	342	722						
02:00		448	416	864						
03:00		519	468	987						
04:00		538	466	1004						
05:00		534	516	1050						
06:00		366	353	719						
07:00		239	233	472						
08:00		181	163	344						
09:00		128	121	249						
10:00		93	90	183						
11:00		55	40	95						
Total		5825	5258	11083						
Percent		52.6%	47.4%							
AM Peak	-	08:00	11:00	-	-	-	-	-	-	11:00
Vol.	-	354	324	-	-	-	-	-	-	652
PM Peak	-	16:00	17:00	-	-	-	-	-	-	17:00
Vol.	-	538	516	-	-	-	-	-	-	1050
Grand Total		5825	5258							11083
Percent		52.6%	47.4%							
ADT		ADT 11,083	AADT 11,083							



(303) 216-2439
www.alltrafficdata.net

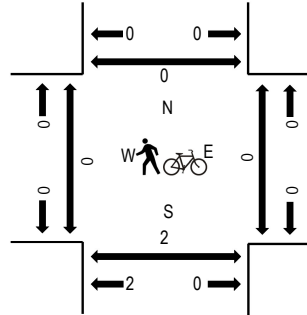
Location: 1 LOWELL BLVD & 64TH AVE AM
Date: Thursday, March 4, 2021
Peak Hour: 07:30 AM - 08:30 AM
Peak 15-Minutes: 07:45 AM - 08:00 AM

Peak Hour - All Vehicles



Note: Total study counts contained in parentheses.

Peak Hour - Pedestrians/Bicycles on Crosswalk



Traffic Counts

Interval Start Time	64TH AVE Eastbound				64TH AVE Westbound				LOWELL BLVD Northbound				LOWELL BLVD Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
7:00 AM	0	19	38	14	0	12	21	4	0	4	14	4	0	25	39	17	211	1,073	0	0	0	0
7:15 AM	0	11	46	16	0	8	34	4	0	7	17	5	0	17	55	35	255	1,166	0	0	1	0
7:30 AM	0	16	63	21	0	14	35	6	0	6	22	12	0	19	69	14	297	1,192	0	0	2	0
7:45 AM	0	23	57	18	0	21	47	11	0	13	26	10	0	16	42	26	310	1,171	0	0	0	0
8:00 AM	0	22	58	21	0	8	57	6	0	4	27	11	0	16	52	22	304	1,074	0	0	0	0
8:15 AM	0	28	47	10	0	12	42	7	0	12	26	10	0	10	46	31	281		0	0	0	0
8:30 AM	0	32	47	15	0	8	40	9	0	6	21	2	0	15	48	33	276		0	0	0	0
8:45 AM	0	13	38	22	0	14	33	5	0	5	15	8	0	15	30	15	213		0	0	0	0
Count Total	0	164	394	137	0	97	309	52	0	57	168	62	0	133	381	193	2,147		0	0	3	0
Peak Hour	0	89	225	70	0	55	181	30	0	35	101	43	0	61	209	93	1,192		0	0	2	0



(303) 216-2439
www.alltrafficdata.net

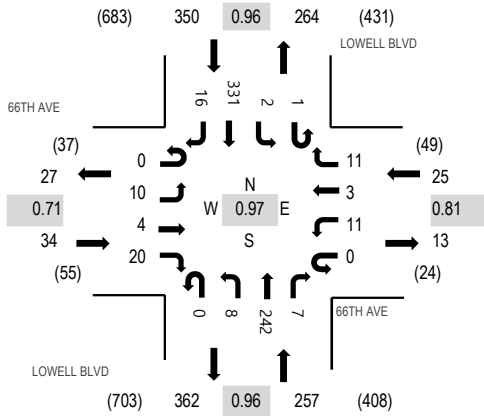
Location: 3 LOWELL BLVD & 66TH AVE AM

Date: Thursday, March 4, 2021

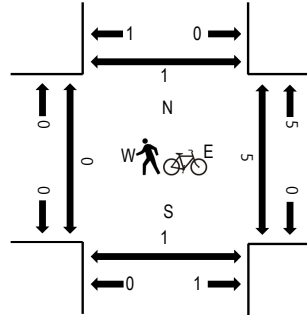
Peak Hour: 07:45 AM - 08:45 AM

Peak 15-Minutes: 08:15 AM - 08:30 AM

Peak Hour - All Vehicles



Peak Hour - Pedestrians/Bicycles on Crosswalk



Note: Total study counts contained in parentheses.

Traffic Counts

Interval Start Time	66TH AVE Eastbound				66TH AVE Westbound				LOWELL BLVD Northbound				LOWELL BLVD Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
7:00 AM	0	1	0	2	0	1	1	4	0	0	36	0	0	4	83	3	135	592	0	0	3	0
7:15 AM	0	0	2	4	0	2	1	2	0	0	34	1	0	0	93	1	140	620	0	1	0	0
7:30 AM	0	3	1	3	0	2	0	6	0	0	43	2	0	0	95	0	155	652	0	0	0	2
7:45 AM	0	2	0	5	0	1	1	3	0	3	60	1	0	0	80	6	162	666	0	0	0	1
8:00 AM	0	2	2	9	0	1	2	3	0	2	63	2	1	1	73	2	163	603	0	0	0	0
8:15 AM	0	5	1	4	0	5	0	2	0	1	59	3	0	0	86	6	172	666	0	5	1	0
8:30 AM	0	1	1	2	0	4	0	3	0	2	60	1	0	1	92	2	169	603	0	0	0	0
8:45 AM	0	2	0	3	0	2	0	3	0	2	33	0	0	1	51	2	99	603	0	0	0	0
Count Total	0	16	7	32	0	18	5	26	0	10	388	10	1	7	653	22	1,195	6,666	0	6	4	3
Peak Hour	0	10	4	20	0	11	3	11	0	8	242	7	1	2	331	16	666	6,666	0	5	1	1

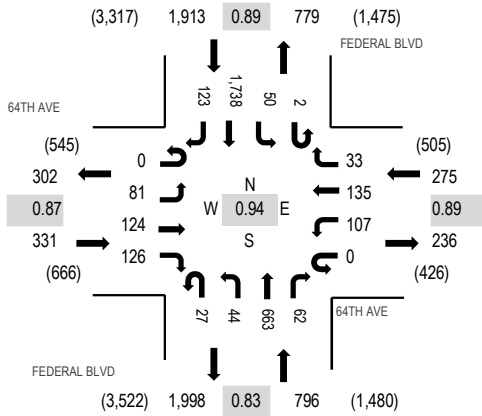
Location: 1 FEDERAL BLVD & 64TH AVE AM

Date: Wednesday, June 2, 2021

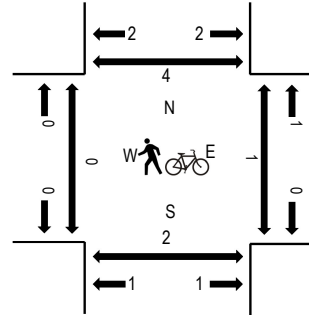
Peak Hour: 07:15 AM - 08:15 AM

Peak 15-Minutes: 07:30 AM - 07:45 AM

Peak Hour - All Vehicles



Peak Hour - Pedestrians/Bicycles on Crosswalk

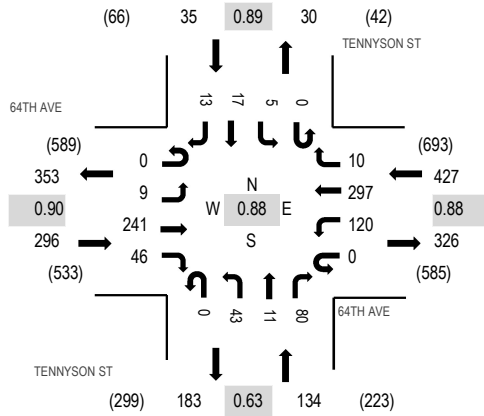


Note: Total study counts contained in parentheses.

Traffic Counts

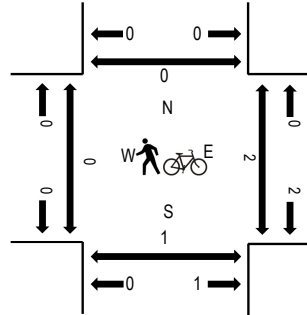
Interval Start Time	64TH AVE Eastbound				64TH AVE Westbound				FEDERAL BLVD Northbound				FEDERAL BLVD Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
7:00 AM	0	20	38	33	0	25	14	9	2	11	102	11	0	9	376	13	663	3,253	0	0	0	0
7:15 AM	0	15	18	25	0	22	24	8	7	14	168	18	1	11	500	14	845	3,315	0	0	0	1
7:30 AM	0	25	32	40	0	29	34	10	9	8	149	6	0	13	487	38	880	3,150	0	0	0	2
7:45 AM	0	21	42	27	0	29	40	8	4	10	201	25	1	13	399	45	865	2,961	0	0	0	0
8:00 AM	0	20	32	34	0	27	37	7	7	12	145	13	0	13	352	26	725	2,715	0	0	1	0
8:15 AM	0	14	19	33	0	18	25	9	4	17	169	7	1	8	332	24	680		1	1	0	1
8:30 AM	1	20	26	40	0	20	40	13	9	15	152	6	2	17	310	20	691		1	0	0	1
8:45 AM	0	27	31	33	0	22	32	3	8	10	151	10	4	8	259	21	619		0	1	2	2
Count Total	1	162	238	265	0	192	246	67	50	97	1,237	96	9	92	3,015	201	5,968		2	2	3	7
Peak Hour	0	81	124	126	0	107	135	33	27	44	663	62	2	50	1,738	123	3,315		0	0	1	3

Peak Hour - All Vehicles



Note: Total study counts contained in parentheses.

Peak Hour - Pedestrians/Bicycles on Crosswalk



Traffic Counts

Interval Start Time	64TH AVE Eastbound				64TH AVE Westbound				TENNYSON ST Northbound				TENNYSON ST Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
7:00 AM	0	0	47	4	0	21	35	1	0	5	2	15	0	2	0	3	135	698	1	0	0	0
7:15 AM	0	0	48	12	0	11	45	1	0	3	0	9	0	2	3	5	139	771	0	0	0	0
7:30 AM	0	3	51	9	0	28	52	2	0	14	0	18	0	3	3	2	185	824	0	0	0	0
7:45 AM	0	2	62	15	0	39	80	2	0	5	2	22	0	0	6	4	239	892	0	0	1	0
8:00 AM	0	1	62	9	0	27	71	4	0	5	2	16	0	2	6	3	208	817	0	0	0	0
8:15 AM	0	3	49	11	0	24	69	1	0	12	2	15	0	2	0	4	192		0	1	0	0
8:30 AM	0	3	68	11	0	30	77	3	0	21	5	27	0	1	5	2	253		0	0	0	0
8:45 AM	0	1	50	12	0	10	59	1	0	10	1	12	0	2	3	3	164		0	1	0	0
Count Total	0	13	437	83	0	190	488	15	0	75	14	134	0	14	26	26	1,515		1	2	1	0
Peak Hour	0	9	241	46	0	120	297	10	0	43	11	80	0	5	17	13	892		0	1	1	0

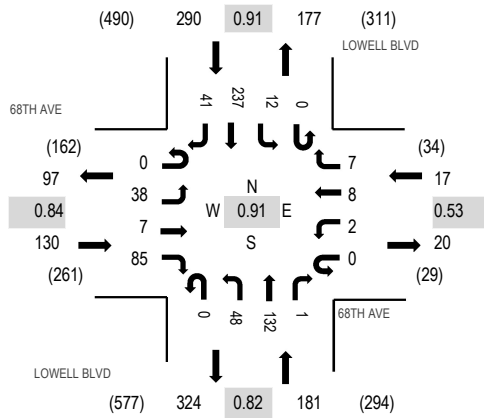
Location: 3 LOWELL BLVD & 68TH AVE AM

Date: Wednesday, June 2, 2021

Peak Hour: 08:00 AM - 09:00 AM

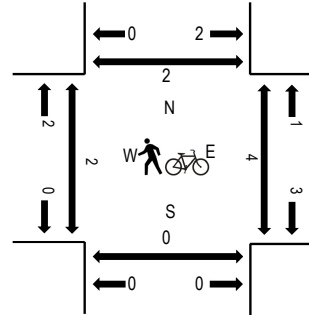
Peak 15-Minutes: 08:45 AM - 09:00 AM

Peak Hour - All Vehicles



Note: Total study counts contained in parentheses.

Peak Hour - Pedestrians/Bicycles on Crosswalk



Traffic Counts

Interval Start Time	68TH AVE Eastbound				68TH AVE Westbound				LOWELL BLVD Northbound				LOWELL BLVD Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
7:00 AM	0	15	0	18	0	0	0	0	0	4	14	0	0	0	30	7	88	461	0	3	0	2
7:15 AM	0	12	3	24	0	0	2	0	0	5	21	0	0	2	36	3	108	506	0	0	0	0
7:30 AM	0	12	1	23	0	2	0	3	0	6	22	0	0	2	48	9	128	550	0	1	0	1
7:45 AM	0	6	0	17	0	2	5	3	0	14	26	1	0	0	53	10	137	586	0	0	0	0
8:00 AM	0	5	0	22	0	1	0	3	0	11	30	0	0	4	45	12	133	618	0	0	0	0
8:15 AM	0	16	2	17	0	0	0	2	0	15	25	1	0	3	57	14	152		1	1	0	1
8:30 AM	0	7	3	31	0	0	2	2	0	12	32	0	0	2	68	5	164		1	0	0	1
8:45 AM	0	10	2	15	0	1	6	0	0	10	45	0	0	3	67	10	169		0	0	0	0
Count Total	0	83	11	167	0	6	15	13	0	77	215	2	0	16	404	70	1,079		2	5	0	5
Peak Hour	0	38	7	85	0	2	8	7	0	48	132	1	0	12	237	41	618		2	1	0	2



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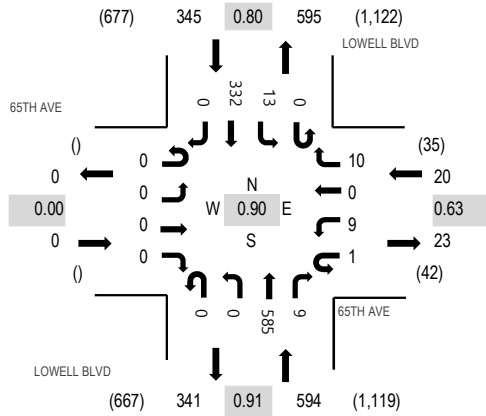
Location: 2 LOWELL BLVD & 65TH AVE PM

Date: Thursday, March 4, 2021

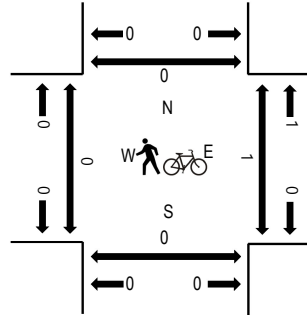
Peak Hour: 04:30 PM - 05:30 PM

Peak 15-Minutes: 05:00 PM - 05:15 PM

Peak Hour - All Vehicles



Peak Hour - Pedestrians/Bicycles on Crosswalk



Note: Total study counts contained in parentheses.

Traffic Counts

Interval Start Time	65TH AVE Eastbound				65TH AVE Westbound				LOWELL BLVD Northbound				LOWELL BLVD Southbound				Total	Rolling Hour	Pedestrian Crossings				
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North	
4:00 PM	0	0	0	0	0	0	0	0	4	0	0	110	3	0	3	108	0	228	873	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	1	0	0	117	2	0	1	86	0	207	911	0	0	0	0
4:30 PM	0	0	0	0	0	1	0	3	0	0	0	149	0	0	3	80	0	236	959	0	0	0	0
4:45 PM	0	0	0	0	0	5	0	2	0	0	0	121	2	0	1	71	0	202	948	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	1	0	0	0	165	4	0	3	93	0	266	958	0	0	0	0
5:15 PM	0	0	0	0	1	3	0	4	0	0	0	150	3	0	6	88	0	255		0	1	0	0
5:30 PM	0	0	0	0	0	1	0	3	1	0	0	148	1	0	6	65	0	225		0	0	0	0
5:45 PM	0	0	0	0	0	3	0	3	0	0	0	141	2	0	1	62	0	212		0	0	0	0
Count Total	0	0	0	0	1	13	0	21	1	0	0	1,101	17	0	24	653	0	1,831		0	1	0	0
Peak Hour	0	0	0	0	1	9	0	10	0	0	0	585	9	0	13	332	0	959		0	1	0	0



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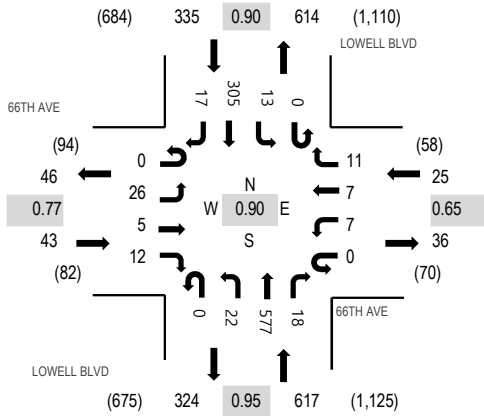
Location: 3 LOWELL BLVD & 66TH AVE PM

Date: Thursday, March 4, 2021

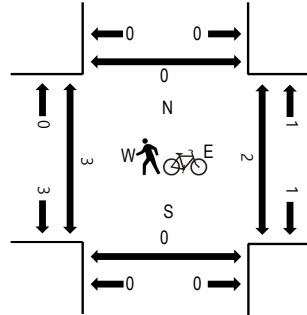
Peak Hour: 05:00 PM - 06:00 PM

Peak 15-Minutes: 05:00 PM - 05:15 PM

Peak Hour - All Vehicles



Peak Hour - Pedestrians/Bicycles on Crosswalk



Note: Total study counts contained in parentheses.

Traffic Counts

Interval Start Time	66TH AVE Eastbound			66TH AVE Westbound			LOWELL BLVD Northbound			LOWELL BLVD Southbound			Total	Rolling Hour	Pedestrian Crossings							
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North				
4:00 PM	0	2	0	9	0	3	2	1	0	5	101	9	0	2	98	6	238	929	0	0	0	0
4:15 PM	0	5	1	7	0	5	3	5	0	4	109	4	0	0	76	9	228	974	0	1	1	2
4:30 PM	0	6	1	2	0	3	0	4	0	6	140	5	0	5	76	4	252	1,019	0	0	0	0
4:45 PM	0	3	1	2	0	4	1	2	0	3	118	4	0	2	66	5	211	998	0	1	0	0
5:00 PM	0	9	2	3	0	1	2	4	0	9	150	4	0	3	92	4	283	1,020	1	0	0	0
5:15 PM	0	5	1	5	0	3	3	0	0	6	152	0	0	6	88	4	273		2	1	0	0
5:30 PM	0	4	2	3	0	0	1	4	0	3	135	6	0	4	66	3	231		0	0	0	0
5:45 PM	0	8	0	1	0	3	1	3	0	4	140	8	0	0	59	6	233		0	1	0	0
Count Total	0	42	8	32	0	22	13	23	0	40	1,045	40	0	22	621	41	1,949		3	4	1	2
Peak Hour	0	26	5	12	0	7	7	11	0	22	577	18	0	13	305	17	1,020		3	2	0	0

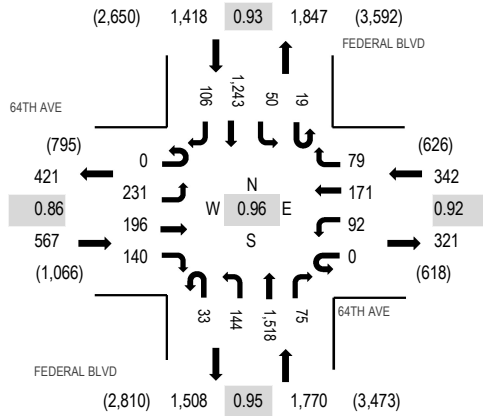
Location: 1 FEDERAL BLVD & 64TH AVE PM

Date: Wednesday, June 2, 2021

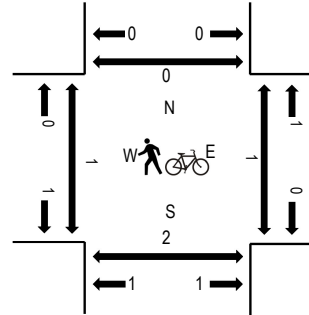
Peak Hour: 04:30 PM - 05:30 PM

Peak 15-Minutes: 05:00 PM - 05:15 PM

Peak Hour - All Vehicles



Peak Hour - Pedestrians/Bicycles on Crosswalk

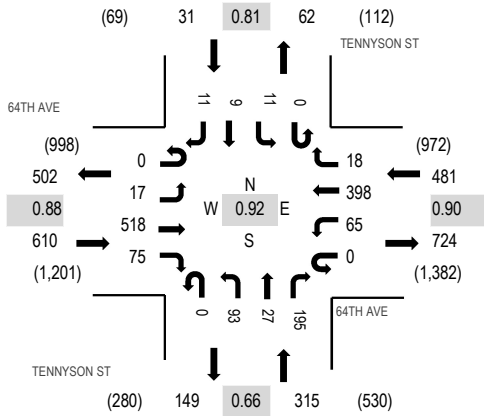


Note: Total study counts contained in parentheses.

Traffic Counts

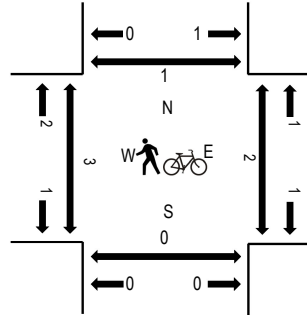
Interval Start Time	64TH AVE Eastbound				64TH AVE Westbound				FEDERAL BLVD Northbound				FEDERAL BLVD Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
4:00 PM	0	44	46	39	0	20	34	17	3	24	359	26	3	15	288	30	948	3,939	3	0	0	0
4:15 PM	0	51	42	38	0	25	43	20	7	33	350	19	5	12	256	41	942	4,062	0	0	0	0
4:30 PM	0	62	43	37	0	22	35	21	1	34	365	25	2	10	331	24	1,012	4,097	0	0	0	0
4:45 PM	0	66	65	35	0	26	46	21	12	33	381	17	6	12	298	19	1,037	4,031	0	0	2	0
5:00 PM	0	51	46	33	0	21	43	18	12	37	408	22	6	11	326	37	1,071	3,876	0	0	0	0
5:15 PM	0	52	42	35	0	23	47	19	8	40	364	11	5	17	288	26	977		0	0	0	0
5:30 PM	0	36	33	31	0	24	29	9	5	30	433	15	4	14	257	26	946		0	0	0	0
5:45 PM	0	53	48	38	0	15	38	10	5	28	349	17	2	10	251	18	882		0	2	0	0
Count Total	0	415	365	286	0	176	315	135	53	259	3,009	152	33	101	2,295	221	7,815		3	2	2	0
Peak Hour	0	231	196	140	0	92	171	79	33	144	1,518	75	19	50	1,243	106	4,097		0	0	2	0

Peak Hour - All Vehicles



Note: Total study counts contained in parentheses.

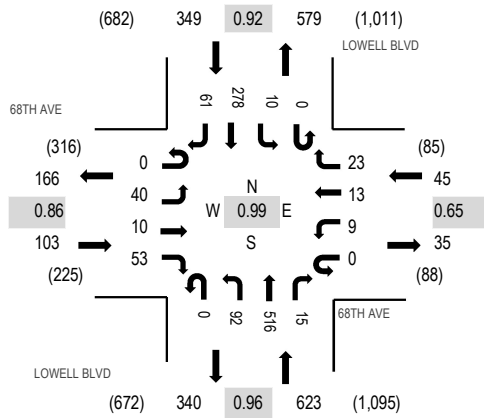
Peak Hour - Pedestrians/Bicycles on Crosswalk



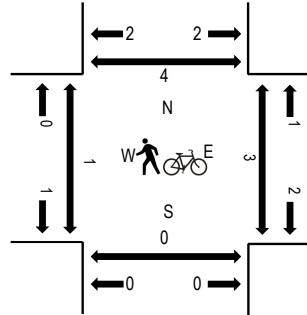
Traffic Counts

Interval Start Time	64TH AVE Eastbound				64TH AVE Westbound				TENNYSON ST Northbound				TENNYSON ST Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
4:00 PM	0	3	129	25	0	17	96	2	0	20	7	42	0	4	1	4	350	1,437	2	0	0	0
4:15 PM	0	7	108	20	0	19	115	6	0	19	2	44	0	1	5	2	348	1,427	1	1	0	1
4:30 PM	0	3	126	16	0	14	104	3	0	35	7	78	0	2	2	2	392	1,436	0	0	0	0
4:45 PM	0	4	155	14	0	15	83	7	0	19	11	31	0	4	1	3	347	1,356	0	0	0	0
5:00 PM	0	5	111	14	0	16	118	2	0	16	6	43	0	2	3	4	340	1,335	0	0	0	1
5:15 PM	0	2	135	18	0	12	121	3	0	15	2	39	0	5	1	4	357		0	0	0	0
5:30 PM	0	7	117	16	0	11	93	4	0	12	5	35	0	0	7	5	312		0	1	1	0
5:45 PM	0	7	146	13	0	16	90	5	0	17	2	23	0	2	4	1	326		0	0	0	0
Count Total	0	38	1,027	136	0	120	820	32	0	153	42	335	0	20	24	25	2,772		3	2	1	2
Peak Hour	0	17	518	75	0	65	398	18	0	93	27	195	0	11	9	11	1,437		3	1	0	1

Peak Hour - All Vehicles



Peak Hour - Pedestrians/Bicycles on Crosswalk



Note: Total study counts contained in parentheses.

Traffic Counts

Interval Start Time	68TH AVE Eastbound				68TH AVE Westbound				LOWELL BLVD Northbound				LOWELL BLVD Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
4:00 PM	0	8	3	13	0	1	2	5	0	12	78	6	0	5	66	16	215	967	1	0	0	0
4:15 PM	0	6	0	21	0	1	2	1	0	17	102	5	0	8	61	16	240	1,022	2	2	0	1
4:30 PM	0	7	4	24	0	1	1	1	0	18	97	5	0	7	69	12	246	1,065	0	0	0	3
4:45 PM	0	17	2	17	0	4	7	14	0	36	96	0	0	8	54	11	266	1,102	3	2	1	17
5:00 PM	0	8	1	12	0	1	3	8	0	17	127	7	0	4	70	12	270	1,120	0	0	0	0
5:15 PM	0	14	4	14	0	4	6	6	0	18	131	4	0	3	61	18	283		1	2	0	1
5:30 PM	0	9	0	13	0	4	3	5	0	32	128	3	0	0	70	16	283		0	0	0	0
5:45 PM	0	9	5	14	0	0	1	4	0	25	130	1	0	3	77	15	284		0	1	0	0
Count Total	0	78	19	128	0	16	25	44	0	175	889	31	0	38	528	116	2,087		7	7	1	22
Peak Hour	0	40	10	53	0	9	13	23	0	92	516	15	0	10	278	61	1,120		1	3	0	1

APPENDIX “B”

**INTERSECTION
CAPACITY ANALYSIS
WORKSHEETS**



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		150	150		0	225		250	150		150
Storage Lanes	1		1	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850		0.929				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1730	0	1770	1863	1583	1770	1863	1583
Flt Permitted	0.744			0.751			0.570			0.647		
Satd. Flow (perm)	1386	1863	1583	1399	1730	0	1062	1863	1583	1205	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			112		10				27			54
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		594			990			699			502	
Travel Time (s)		13.5			22.5			15.9			11.4	

Intersection Summary

Area Type: Other

Timings
1: Lowell Blvd. & W. 68th Ave.

6501 Lowell Blvd
06/07/2021



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑	↗	↖	↗	↖	↑	↗	↖	↑	↗
Traffic Volume (vph)	46	9	103	2	10	58	161	1	15	288	50
Future Volume (vph)	46	9	103	2	10	58	161	1	15	288	50
Turn Type	Perm	NA	Perm	Perm	NA	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8		2			6	
Permitted Phases	4		4	8		2		2	6		6
Detector Phase	4	4	4	8	8	2	2	2	6	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	26.0	26.0	26.0	26.0	26.0	34.0	34.0	34.0	34.0	34.0	34.0
Total Split (%)	43.3%	43.3%	43.3%	43.3%	43.3%	56.7%	56.7%	56.7%	56.7%	56.7%	56.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag											
Lead-Lag Optimize?											
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	7.7	7.7	7.7	7.7	7.7	46.2	46.2	46.2	46.2	46.2	46.2
Actuated g/C Ratio	0.13	0.13	0.13	0.13	0.13	0.77	0.77	0.77	0.77	0.77	0.77
v/c Ratio	0.28	0.04	0.37	0.01	0.09	0.08	0.12	0.00	0.02	0.22	0.04
Control Delay	26.9	21.9	9.4	21.5	17.1	3.2	3.1	0.0	3.0	3.4	1.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.9	21.9	9.4	21.5	17.1	3.2	3.1	0.0	3.0	3.4	1.2
LOS	C	C	A	C	B	A	A	A	A	A	A
Approach Delay		15.2			17.5		3.1			3.1	
Approach LOS		B			B		A			A	

Intersection Summary

Cycle Length: 60
 Actuated Cycle Length: 60
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 45
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.37
 Intersection Signal Delay: 6.0
 Intersection LOS: A
 Intersection Capacity Utilization 39.8%
 ICU Level of Service A
 Analysis Period (min) 15

Splits and Phases: 1: Lowell Blvd. & W. 68th Ave.



Queues

6501 Lowell Blvd

1: Lowell Blvd. & W. 68th Ave.

06/07/2021


























Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	50	10	112	2	21	63	175	1	16	313	54
v/c Ratio	0.28	0.04	0.37	0.01	0.09	0.08	0.12	0.00	0.02	0.22	0.04
Control Delay	26.9	21.9	9.4	21.5	17.1	3.2	3.1	0.0	3.0	3.4	1.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.9	21.9	9.4	21.5	17.1	3.2	3.1	0.0	3.0	3.4	1.2
Queue Length 50th (ft)	17	3	0	1	4	5	14	0	1	28	0
Queue Length 95th (ft)	42	14	36	6	19	16	35	0	6	61	8
Internal Link Dist (ft)		514			910		619			422	
Turn Bay Length (ft)	150		150	150		225		250	150		150
Base Capacity (vph)	496	667	639	501	626	817	1433	1224	927	1433	1231
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.01	0.18	0.00	0.03	0.08	0.12	0.00	0.02	0.22	0.04

Intersection Summary

HCM 6th Signalized Intersection Summary
 1: Lowell Blvd. & W. 68th Ave.

6501 Lowell Blvd
 06/07/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	46	9	103	2	10	9	58	161	1	15	288	50
Future Volume (veh/h)	46	9	103	2	10	9	58	161	1	15	288	50
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	50	10	112	2	11	10	63	175	1	16	313	54
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	250	195	166	247	94	86	825	1394	1182	989	1394	1182
Arrive On Green	0.10	0.10	0.10	0.10	0.10	0.10	0.75	0.75	0.75	0.75	0.75	0.75
Sat Flow, veh/h	1391	1870	1585	1269	902	820	1015	1870	1585	1209	1870	1585
Grp Volume(v), veh/h	50	10	112	2	0	21	63	175	1	16	313	54
Grp Sat Flow(s),veh/h/ln	1391	1870	1585	1269	0	1723	1015	1870	1585	1209	1870	1585
Q Serve(g_s), s	2.0	0.3	4.1	0.1	0.0	0.7	1.2	1.6	0.0	0.2	3.1	0.5
Cycle Q Clear(g_c), s	2.7	0.3	4.1	0.4	0.0	0.7	4.3	1.6	0.0	1.8	3.1	0.5
Prop In Lane	1.00		1.00	1.00		0.48	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	250	195	166	247	0	180	825	1394	1182	989	1394	1182
V/C Ratio(X)	0.20	0.05	0.68	0.01	0.00	0.12	0.08	0.13	0.00	0.02	0.22	0.05
Avail Cap(c_a), veh/h	603	670	568	569	0	617	825	1394	1182	989	1394	1182
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.6	24.2	25.9	24.4	0.0	24.4	3.0	2.1	1.9	2.4	2.3	2.0
Incr Delay (d2), s/veh	0.4	0.1	4.8	0.0	0.0	0.3	0.2	0.2	0.0	0.0	0.4	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.2	0.2	3.0	0.0	0.0	0.5	0.3	0.6	0.0	0.1	1.2	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.0	24.3	30.6	24.4	0.0	24.6	3.2	2.3	1.9	2.4	2.7	2.1
LnGrp LOS	C	C	C	C	A	C	A	A	A	A	A	A
Approach Vol, veh/h		172			23			239			383	
Approach Delay, s/veh		28.9			24.6			2.5			2.6	
Approach LOS		C			C			A			A	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		49.2		10.8		49.2		10.8				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		29.5		21.5		29.5		21.5				
Max Q Clear Time (g_c+I1), s		6.3		6.1		5.1		2.7				
Green Ext Time (p_c), s		1.2		0.4		2.1		0.0				
Intersection Summary												
HCM 6th Ctrl Delay			8.7									
HCM 6th LOS			A									



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↖		↗	↖	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	100		0	100		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.920			0.941			0.995				0.993
Flt Protected		0.985			0.979		0.950			0.950		
Satd. Flow (prot)	0	1688	0	0	1716	0	1770	1853	0	1770	1850	0
Flt Permitted		0.985			0.979		0.950			0.950		
Satd. Flow (perm)	0	1688	0	0	1716	0	1770	1853	0	1770	1850	0
Link Speed (mph)		30			30			30				30
Link Distance (ft)		458			470			732				699
Travel Time (s)		10.4			10.7			16.6				15.9

Intersection Summary

Area Type: Other

Intersection												
Int Delay, s/veh	1.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	12	5	24	13	4	13	10	294	9	4	402	19
Future Vol, veh/h	12	5	24	13	4	13	10	294	9	4	402	19
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	13	5	26	14	4	14	11	320	10	4	437	21

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	812	808	448	818	813	325	458	0	0	330	0	0
Stage 1	456	456	-	347	347	-	-	-	-	-	-	-
Stage 2	356	352	-	471	466	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	298	315	611	295	313	716	1103	-	-	1229	-	-
Stage 1	584	568	-	669	635	-	-	-	-	-	-	-
Stage 2	661	632	-	573	562	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	286	311	611	276	309	716	1103	-	-	1229	-	-
Mov Cap-2 Maneuver	286	311	-	276	309	-	-	-	-	-	-	-
Stage 1	578	566	-	662	629	-	-	-	-	-	-	-
Stage 2	637	626	-	542	560	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	14.6		15.2		0.3		0.1	
HCM LOS	B		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1103	-	-	421	384	1229	-
HCM Lane V/C Ratio	0.01	-	-	0.106	0.085	0.004	-
HCM Control Delay (s)	8.3	-	-	14.6	15.2	7.9	-
HCM Lane LOS	A	-	-	B	C	A	-
HCM 95th %tile Q(veh)	0	-	-	0.4	0.3	0	-



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↘		↗	↘	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	100		0	100		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt					0.914			0.996				
Flt Protected					0.982					0.950		
Satd. Flow (prot)	0	1863	0	0	1672	0	1863	1855	0	1770	1863	0
Flt Permitted					0.982					0.950		
Satd. Flow (perm)	0	1863	0	0	1672	0	1863	1855	0	1770	1863	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		319			430			608			732	
Travel Time (s)		7.3			9.8			13.8			16.6	

Intersection Summary

Area Type: Other

Intersection												
Int Delay, s/veh	0.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	0	0	0	7	0	13	0	300	9	11	430	0
Future Vol, veh/h	0	0	0	7	0	13	0	300	9	11	430	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	8	0	14	0	326	10	12	467	0

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	829	827	467	822	822	331	467	0	0	336	0	0
Stage 1	491	491	-	331	331	-	-	-	-	-	-	-
Stage 2	338	336	-	491	491	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	290	307	596	293	309	711	1094	-	-	1223	-	-
Stage 1	559	548	-	682	645	-	-	-	-	-	-	-
Stage 2	676	642	-	559	548	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	282	304	596	291	306	711	1094	-	-	1223	-	-
Mov Cap-2 Maneuver	282	304	-	291	306	-	-	-	-	-	-	-
Stage 1	559	543	-	682	645	-	-	-	-	-	-	-
Stage 2	663	642	-	554	543	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	13	0	0.2
HCM LOS	A	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1094	-	-	-	472	1223	-
HCM Lane V/C Ratio	-	-	-	-	0.046	0.01	-
HCM Control Delay (s)	0	-	-	0	13	8	-
HCM Lane LOS	A	-	-	A	B	A	-
HCM 95th %tile Q(veh)	0	-	-	-	0.1	0	-

Lanes and Geometrics
 4: Tennyson St. & W 64th Ave.

6501 Lowell Blvd
 06/07/2021



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%				0%
Storage Length (ft)	150		100	150		0	0		0	0		0
Storage Lanes	1		1	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850		0.995			0.919				0.951
Flt Protected	0.950			0.950				0.984				0.993
Satd. Flow (prot)	1770	1863	1583	1770	1853	0	0	1684	0	0	1759	0
Flt Permitted	0.258			0.379				0.906				0.970
Satd. Flow (perm)	481	1863	1583	706	1853	0	0	1551	0	0	1718	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			61		3			91				17
Link Speed (mph)		30			30			30				30
Link Distance (ft)		700			1434			502				485
Travel Time (s)		15.9			32.6			11.4				11.0

Intersection Summary

Area Type: Other



Lane Group	EBL	EBT	EBR	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	12	318	61	159	405	176	47
v/c Ratio	0.08	0.57	0.12	0.75	0.72	0.18	0.05
Control Delay	19.9	29.4	5.4	59.4	45.5	5.9	7.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.9	29.4	5.4	59.4	45.5	5.9	7.6
Queue Length 50th (ft)	5	152	0	91	228	19	6
Queue Length 95th (ft)	15	196	23	156	314	61	26
Internal Link Dist (ft)		620			1354	422	405
Turn Bay Length (ft)	150		100	150			
Base Capacity (vph)	264	1024	898	388	1020	965	1035
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.31	0.07	0.41	0.40	0.18	0.05

Intersection Summary

HCM 6th Signalized Intersection Summary
 4: Tennyson St. & W 64th Ave.

6501 Lowell Blvd
 06/07/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	11	293	56	146	361	12	52	13	97	6	21	16
Future Volume (veh/h)	11	293	56	146	361	12	52	13	97	6	21	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	12	318	61	159	392	13	57	14	105	7	23	17
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	227	646	548	292	622	21	304	93	509	151	486	335
Arrive On Green	0.35	0.35	0.35	0.23	0.23	0.23	0.55	0.55	0.55	0.55	0.55	0.55
Sat Flow, veh/h	980	1870	1585	1004	1800	60	453	168	918	190	877	605
Grp Volume(v), veh/h	12	318	61	159	0	405	176	0	0	47	0	0
Grp Sat Flow(s),veh/h/ln	980	1870	1585	1004	0	1860	1539	0	0	1672	0	0
Q Serve(g_s), s	0.9	12.1	2.4	13.7	0.0	17.6	0.5	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	18.6	12.1	2.4	25.8	0.0	17.6	4.7	0.0	0.0	1.1	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.03	0.32		0.60	0.15		0.36
Lane Grp Cap(c), veh/h	227	646	548	292	0	642	906	0	0	973	0	0
V/C Ratio(X)	0.05	0.49	0.11	0.54	0.00	0.63	0.19	0.00	0.00	0.05	0.00	0.00
Avail Cap(c_a), veh/h	427	1029	872	498	0	1023	906	0	0	973	0	0
HCM Platoon Ratio	1.00	1.00	1.00	0.67	0.67	0.67	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	0.90	0.00	0.90	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	33.0	23.2	20.1	38.3	0.0	29.4	10.0	0.0	0.0	9.2	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.6	0.1	1.4	0.0	0.9	0.5	0.0	0.0	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.4	9.0	1.6	6.5	0.0	12.9	3.1	0.0	0.0	0.8	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.1	23.8	20.1	39.7	0.0	30.3	10.4	0.0	0.0	9.3	0.0	0.0
LnGrp LOS	C	C	C	D	A	C	B	A	A	A	A	A
Approach Vol, veh/h		391			564			176				47
Approach Delay, s/veh		23.5			33.0			10.4				9.3
Approach LOS		C			C			B				A
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		54.4		35.6		54.4		35.6				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		31.5		49.5		31.5		49.5				
Max Q Clear Time (g_c+I1), s		6.7		20.6		3.1		27.8				
Green Ext Time (p_c), s		1.0		2.3		0.2		3.3				
Intersection Summary												
HCM 6th Ctrl Delay				25.5								
HCM 6th LOS				C								



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	200		150	150		75	200		150	200		100
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.300			0.578			0.590			0.604		
Satd. Flow (perm)	559	1863	1583	1077	1863	1583	1099	1863	1583	1125	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			92			127			127			123
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1434			1268			763			608	
Travel Time (s)		32.6			28.8			17.3			13.8	

Intersection Summary

Area Type: Other

Timings
5: W 64th Ave./W. 64th Ave. & Lowell Blvd.

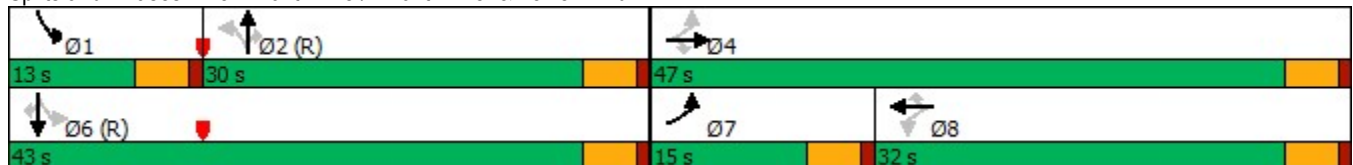
6501 Lowell Blvd
06/07/2021

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	108	274	85	67	220	36	43	123	52	74	254	113
Future Volume (vph)	108	274	85	67	220	36	43	123	52	74	254	113
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4			8			2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	7	4	4	8	8	8	2	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	15.0	47.0	47.0	32.0	32.0	32.0	30.0	30.0	30.0	13.0	43.0	43.0
Total Split (%)	16.7%	52.2%	52.2%	35.6%	35.6%	35.6%	33.3%	33.3%	33.3%	14.4%	47.8%	47.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead			Lag	Lag	Lag	Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes			Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	29.1	29.1	29.1	17.4	17.4	17.4	41.8	41.8	41.8	51.9	51.9	51.9
Actuated g/C Ratio	0.32	0.32	0.32	0.19	0.19	0.19	0.46	0.46	0.46	0.58	0.58	0.58
v/c Ratio	0.38	0.49	0.16	0.35	0.66	0.10	0.09	0.15	0.07	0.11	0.26	0.13
Control Delay	38.0	41.6	19.0	33.5	39.8	2.2	20.0	19.0	0.2	11.6	12.3	2.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.0	41.6	19.0	33.5	39.8	2.2	20.0	19.0	0.2	11.6	12.3	2.9
LOS	D	D	B	C	D	A	C	B	A	B	B	A
Approach Delay		36.7			34.3			14.7			9.7	
Approach LOS		D			C			B			A	

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 65
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.66
 Intersection Signal Delay: 24.6
 Intersection Capacity Utilization 51.1%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service A

Splits and Phases: 5: W 64th Ave./W. 64th Ave. & Lowell Blvd.





























Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	117	298	92	73	239	39	47	134	57	80	276	123
v/c Ratio	0.38	0.49	0.16	0.35	0.66	0.10	0.09	0.15	0.07	0.11	0.26	0.13
Control Delay	38.0	41.6	19.0	33.5	39.8	2.2	20.0	19.0	0.2	11.6	12.3	2.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.0	41.6	19.0	33.5	39.8	2.2	20.0	19.0	0.2	11.6	12.3	2.9
Queue Length 50th (ft)	64	167	16	37	128	1	16	47	0	20	79	0
Queue Length 95th (ft)	111	242	59	m58	m167	m3	46	101	0	49	149	28
Internal Link Dist (ft)		1354			1188			683			528	
Turn Bay Length (ft)	200		150	150		75	200		150	200		100
Base Capacity (vph)	322	879	796	329	569	571	511	866	803	711	1073	964
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.36	0.34	0.12	0.22	0.42	0.07	0.09	0.15	0.07	0.11	0.26	0.13

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM 6th Signalized Intersection Summary
 5: W 64th Ave./W. 64th Ave. & Lowell Blvd.

6501 Lowell Blvd
 06/07/2021

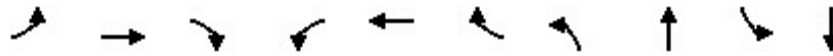
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	108	274	85	67	220	36	43	123	52	74	254	113
Future Volume (veh/h)	108	274	85	67	220	36	43	123	52	74	254	113
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	117	298	92	73	239	39	47	134	57	80	276	123
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	251	537	455	214	310	263	588	963	816	735	1146	972
Arrive On Green	0.02	0.09	0.09	0.05	0.05	0.05	0.51	0.51	0.51	0.05	0.61	0.61
Sat Flow, veh/h	1781	1870	1585	994	1870	1585	986	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	117	298	92	73	239	39	47	134	57	80	276	123
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	994	1870	1585	986	1870	1585	1781	1870	1585
Q Serve(g_s), s	4.7	13.7	4.8	6.5	11.4	2.1	2.2	3.4	1.6	1.8	6.0	2.9
Cycle Q Clear(g_c), s	4.7	13.7	4.8	9.2	11.4	2.1	2.2	3.4	1.6	1.8	6.0	2.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	251	537	455	214	310	263	588	963	816	735	1146	972
V/C Ratio(X)	0.47	0.56	0.20	0.34	0.77	0.15	0.08	0.14	0.07	0.11	0.24	0.13
Avail Cap(c_a), veh/h	331	883	748	353	571	484	588	963	816	817	1146	972
HCM Platoon Ratio	0.33	0.33	0.33	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.80	0.80	0.80	0.85	0.85	0.85	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.0	35.2	31.2	41.2	40.9	36.5	11.1	11.4	11.0	8.3	7.9	7.3
Incr Delay (d2), s/veh	1.1	0.7	0.2	0.8	3.5	0.2	0.3	0.3	0.2	0.1	0.5	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	3.8	10.8	3.4	3.1	9.6	1.5	0.9	2.5	1.1	1.1	4.2	1.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	30.0	36.0	31.4	42.0	44.3	36.7	11.4	11.7	11.1	8.3	8.4	7.6
LnGrp LOS	C	D	C	D	D	D	B	B	B	A	A	A
Approach Vol, veh/h		507			351			238			479	
Approach Delay, s/veh		33.8			43.0			11.5			8.2	
Approach LOS		C			D			B			A	
Timer - Assigned Phs	1	2		4		6	7	8				
Phs Duration (G+Y+Rc), s	8.8	50.8		30.3		59.7	10.9	19.4				
Change Period (Y+Rc), s	4.5	4.5		4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s	8.5	25.5		42.5		38.5	10.5	27.5				
Max Q Clear Time (g_c+I1), s	3.8	5.4		15.7		8.0	6.7	13.4				
Green Ext Time (p_c), s	0.1	1.1		2.1		2.1	0.1	1.6				
Intersection Summary												
HCM 6th Ctrl Delay				24.7								
HCM 6th LOS				C								



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	100		150	150		100	600		0	250		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor			0.850			0.850		0.987			0.990	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	5019	0	1770	5034	0
Flt Permitted	0.535			0.474			0.085			0.251		
Satd. Flow (perm)	997	1863	1583	883	1863	1583	158	5019	0	468	5034	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			139			127		23			17	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1268			424			903			562	
Travel Time (s)		28.8			9.6			20.5			12.8	

Intersection Summary

Area Type: Other

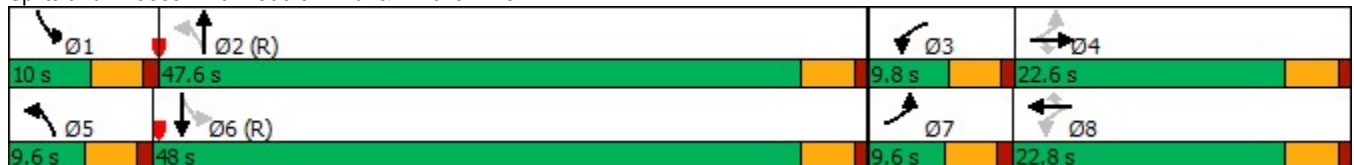


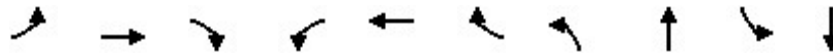
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations	↖	↑	↗	↖	↑	↗	↖	↑↑↑	↖	↑↑↑
Traffic Volume (vph)	98	151	153	130	164	40	86	806	63	2113
Future Volume (vph)	98	151	153	130	164	40	86	806	63	2113
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA
Protected Phases	7	4		3	8		5	2	1	6
Permitted Phases	4		4	8		8	2		6	
Detector Phase	7	4	4	3	8	8	5	2	1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	9.5	22.5
Total Split (s)	9.6	22.6	22.6	9.8	22.8	22.8	9.6	47.6	10.0	48.0
Total Split (%)	10.7%	25.1%	25.1%	10.9%	25.3%	25.3%	10.7%	52.9%	11.1%	53.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)	18.6	13.5	13.5	19.8	15.6	15.6	54.2	49.0	54.0	48.9
Actuated g/C Ratio	0.21	0.15	0.15	0.22	0.17	0.17	0.60	0.54	0.60	0.54
v/c Ratio	0.43	0.59	0.47	0.57	0.55	0.11	0.44	0.35	0.18	0.90
Control Delay	20.9	28.7	6.5	36.9	41.2	0.6	16.5	12.7	8.3	25.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.9	28.7	6.5	36.9	41.2	0.6	16.5	12.7	8.3	25.8
LOS	C	C	A	D	D	A	B	B	A	C
Approach Delay		18.4			34.7			13.1		25.3
Approach LOS		B			C			B		C

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.90
 Intersection Signal Delay: 22.5
 Intersection LOS: C
 Intersection Capacity Utilization 79.1%
 ICU Level of Service D
 Analysis Period (min) 15

Splits and Phases: 6: Federal Blvd. & W. 64th Ave.





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	107	164	166	141	178	43	93	958	68	2460
v/c Ratio	0.43	0.59	0.47	0.57	0.55	0.11	0.44	0.35	0.18	0.90
Control Delay	20.9	28.7	6.5	36.9	41.2	0.6	16.5	12.7	8.3	25.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.9	28.7	6.5	36.9	41.2	0.6	16.5	12.7	8.3	25.8
Queue Length 50th (ft)	24	41	0	65	96	0	18	110	13	462
Queue Length 95th (ft)	48	73	0	108	154	0	53	152	32	#638
Internal Link Dist (ft)		1188			344			823		482
Turn Bay Length (ft)	100		150	150		100	600		250	
Base Capacity (vph)	249	374	429	246	378	423	209	2741	371	2741
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.44	0.39	0.57	0.47	0.10	0.44	0.35	0.18	0.90

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM 6th Signalized Intersection Summary
6: Federal Blvd. & W. 64th Ave.

6501 Lowell Blvd
06/07/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	98	151	153	130	164	40	86	806	75	63	2113	150
Future Volume (veh/h)	98	151	153	130	164	40	86	806	75	63	2113	150
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	107	164	166	141	178	43	93	876	82	68	2297	163
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	235	252	214	236	256	217	190	2665	249	431	2709	190
Arrive On Green	0.02	0.04	0.04	0.06	0.14	0.14	0.05	0.56	0.56	0.05	0.56	0.56
Sat Flow, veh/h	1781	1870	1585	1781	1870	1585	1781	4751	443	1781	4871	342
Grp Volume(v), veh/h	107	164	166	141	178	43	93	627	331	68	1598	862
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	1585	1781	1702	1791	1781	1702	1809
Q Serve(g_s), s	4.6	7.8	9.3	5.3	8.2	2.2	2.0	8.9	9.0	1.4	35.3	36.4
Cycle Q Clear(g_c), s	4.6	7.8	9.3	5.3	8.2	2.2	2.0	8.9	9.0	1.4	35.3	36.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.25	1.00		0.19
Lane Grp Cap(c), veh/h	235	252	214	236	256	217	190	1909	1004	431	1893	1006
V/C Ratio(X)	0.46	0.65	0.78	0.60	0.69	0.20	0.49	0.33	0.33	0.16	0.84	0.86
Avail Cap(c_a), veh/h	235	376	319	236	380	322	202	1909	1004	459	1893	1006
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.94	0.94	0.94	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.0	40.9	41.7	33.3	37.0	34.4	19.8	10.6	10.7	7.9	16.7	16.9
Incr Delay (d2), s/veh	1.3	2.6	6.4	4.1	3.4	0.4	1.9	0.5	0.9	0.2	4.8	9.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	3.8	7.1	7.5	1.2	7.0	1.5	2.0	5.8	6.4	0.9	19.7	22.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.2	43.6	48.1	37.4	40.4	34.9	21.7	11.1	11.5	8.1	21.5	26.3
LnGrp LOS	C	D	D	D	D	C	C	B	B	A	C	C
Approach Vol, veh/h		437			362			1051			2528	
Approach Delay, s/veh		43.0			38.6			12.2			22.8	
Approach LOS		D			D			B			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.6	55.0	9.8	16.6	9.0	54.5	9.6	16.8				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	5.5	43.1	5.3	18.1	5.1	43.5	5.1	18.3				
Max Q Clear Time (g_c+I1), s	3.4	11.0	7.3	11.3	4.0	38.4	6.6	10.2				
Green Ext Time (p_c), s	0.0	7.5	0.0	0.8	0.0	4.8	0.0	0.6				
Intersection Summary												
HCM 6th Ctrl Delay			23.6									
HCM 6th LOS			C									



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		150	150		0	225		250	150		150
Storage Lanes	1		1	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850		0.904				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1684	0	1770	1863	1583	1770	1863	1583
Flt Permitted	0.726			0.749			0.543			0.359		
Satd. Flow (perm)	1352	1863	1583	1395	1684	0	1011	1863	1583	669	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			70		30				27			80
Link Speed (mph)		30			30			30				30
Link Distance (ft)		549			716			667				367
Travel Time (s)		12.5			16.3			15.2				8.3

Intersection Summary

Area Type: Other

Timings
1: Lowell Blvd. & W. 68th Ave.

6501 Lowell Blvd
06/07/2021

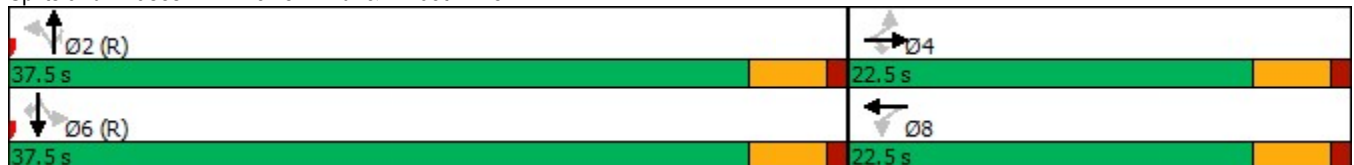


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑	↗	↖	↗	↖	↑	↗	↖	↑	↗
Traffic Volume (vph)	49	12	64	11	16	112	627	18	12	338	74
Future Volume (vph)	49	12	64	11	16	112	627	18	12	338	74
Turn Type	Perm	NA	Perm	Perm	NA	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8		2			6	
Permitted Phases	4		4	8		2		2	6		6
Detector Phase	4	4	4	8	8	2	2	2	6	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	22.5	22.5	22.5	22.5	22.5	37.5	37.5	37.5	37.5	37.5	37.5
Total Split (%)	37.5%	37.5%	37.5%	37.5%	37.5%	62.5%	62.5%	62.5%	62.5%	62.5%	62.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag											
Lead-Lag Optimize?											
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	7.9	7.9	7.9	7.9	7.9	46.0	46.0	46.0	46.0	46.0	46.0
Actuated g/C Ratio	0.13	0.13	0.13	0.13	0.13	0.77	0.77	0.77	0.77	0.77	0.77
v/c Ratio	0.30	0.05	0.26	0.07	0.19	0.16	0.48	0.02	0.03	0.26	0.06
Control Delay	27.2	21.8	9.3	22.2	14.2	3.7	5.3	1.3	3.2	3.7	1.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.2	21.8	9.3	22.2	14.2	3.7	5.3	1.3	3.2	3.7	1.1
LOS	C	C	A	C	B	A	A	A	A	A	A
Approach Delay		17.5			15.8		4.9			3.2	
Approach LOS		B			B		A			A	

Intersection Summary

Cycle Length: 60
 Actuated Cycle Length: 60
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.48
 Intersection Signal Delay: 6.0
 Intersection Capacity Utilization 57.8%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service B

Splits and Phases: 1: Lowell Blvd. & W. 68th Ave.



Queues

6501 Lowell Blvd

1: Lowell Blvd. & W. 68th Ave.

06/07/2021


























Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	53	13	70	12	47	122	682	20	13	367	80
v/c Ratio	0.30	0.05	0.26	0.07	0.19	0.16	0.48	0.02	0.03	0.26	0.06
Control Delay	27.2	21.8	9.3	22.2	14.2	3.7	5.3	1.3	3.2	3.7	1.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.2	21.8	9.3	22.2	14.2	3.7	5.3	1.3	3.2	3.7	1.1
Queue Length 50th (ft)	18	4	0	4	6	10	80	0	1	34	0
Queue Length 95th (ft)	44	16	28	16	29	30	172	4	6	75	10
Internal Link Dist (ft)		469			636		587			287	
Turn Bay Length (ft)	150		150	150		225		250	150		150
Base Capacity (vph)	405	558	523	418	526	775	1429	1220	513	1429	1233
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.02	0.13	0.03	0.09	0.16	0.48	0.02	0.03	0.26	0.06

Intersection Summary

HCM 6th Signalized Intersection Summary
 1: Lowell Blvd. & W. 68th Ave.

6501 Lowell Blvd
 06/07/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	49	12	64	11	16	28	112	627	18	12	338	74
Future Volume (veh/h)	49	12	64	11	16	28	112	627	18	12	338	74
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	53	13	70	12	17	30	122	682	20	13	367	80
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	218	183	155	240	59	105	772	1407	1192	574	1407	1192
Arrive On Green	0.10	0.10	0.10	0.10	0.10	0.10	0.75	0.75	0.75	0.75	0.75	0.75
Sat Flow, veh/h	1359	1870	1585	1315	607	1071	943	1870	1585	745	1870	1585
Grp Volume(v), veh/h	53	13	70	12	0	47	122	682	20	13	367	80
Grp Sat Flow(s),veh/h/ln	1359	1870	1585	1315	0	1678	943	1870	1585	745	1870	1585
Q Serve(g_s), s	2.3	0.4	2.5	0.5	0.0	1.6	2.7	8.5	0.2	0.4	3.6	0.8
Cycle Q Clear(g_c), s	3.8	0.4	2.5	0.9	0.0	1.6	6.4	8.5	0.2	9.0	3.6	0.8
Prop In Lane	1.00		1.00	1.00		0.64	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	218	183	155	240	0	164	772	1407	1192	574	1407	1192
V/C Ratio(X)	0.24	0.07	0.45	0.05	0.00	0.29	0.16	0.48	0.02	0.02	0.26	0.07
Avail Cap(c_a), veh/h	492	561	476	506	0	503	772	1407	1192	574	1407	1192
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.9	24.6	25.5	25.0	0.0	25.1	3.3	2.9	1.9	4.6	2.3	1.9
Incr Delay (d2), s/veh	0.6	0.2	2.0	0.1	0.0	0.9	0.4	1.2	0.0	0.1	0.5	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.3	0.3	1.8	0.3	0.0	1.1	0.7	3.2	0.1	0.1	1.3	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.5	24.7	27.6	25.1	0.0	26.1	3.7	4.1	1.9	4.7	2.7	2.0
LnGrp LOS	C	C	C	C	A	C	A	A	A	A	A	A
Approach Vol, veh/h		136			59			824			460	
Approach Delay, s/veh		27.3			25.9			4.0			2.7	
Approach LOS		C			C			A			A	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		49.6		10.4		49.6		10.4				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		33.0		18.0		33.0		18.0				
Max Q Clear Time (g_c+I1), s		10.5		5.8		11.0		3.6				
Green Ext Time (p_c), s		5.8		0.3		2.6		0.2				
Intersection Summary												
HCM 6th Ctrl Delay			6.6									
HCM 6th LOS			A									



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↘		↗	↘	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	100		0	100		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.963			0.944			0.995			0.992	
Flt Protected		0.971			0.986		0.950		0.950		0.950	
Satd. Flow (prot)	0	1742	0	0	1734	0	1770	1853	0	1770	1848	0
Flt Permitted		0.971			0.986		0.950		0.950		0.950	
Satd. Flow (perm)	0	1742	0	0	1734	0	1770	1853	0	1770	1848	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		458			470			732			667	
Travel Time (s)		10.4			10.7			16.6			15.2	

Intersection Summary

Area Type: Other

Intersection												
Int Delay, s/veh	2.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↔	↔		↔	↔	
Traffic Vol, veh/h	32	6	15	9	9	13	27	702	22	16	371	21
Future Vol, veh/h	32	6	15	9	9	13	27	702	22	16	371	21
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	35	7	16	10	10	14	29	763	24	17	403	23

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1294	1294	415	1293	1293	775	426	0	0	787	0	0
Stage 1	449	449	-	833	833	-	-	-	-	-	-	-
Stage 2	845	845	-	460	460	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	139	163	637	140	163	398	1133	-	-	832	-	-
Stage 1	589	572	-	363	384	-	-	-	-	-	-	-
Stage 2	357	379	-	581	566	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	123	156	637	128	156	398	1133	-	-	832	-	-
Mov Cap-2 Maneuver	123	156	-	128	156	-	-	-	-	-	-	-
Stage 1	574	561	-	354	374	-	-	-	-	-	-	-
Stage 2	327	369	-	548	555	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	38.1		27.6		0.3		0.4	
HCM LOS	E		D					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1133	-	-	165	193	832	-	-
HCM Lane V/C Ratio	0.026	-	-	0.349	0.175	0.021	-	-
HCM Control Delay (s)	8.3	-	-	38.1	27.6	9.4	-	-
HCM Lane LOS	A	-	-	E	D	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	1.5	0.6	0.1	-	-



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↘		↗	↘	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	100		0	100		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt					0.932			0.998				
Flt Protected					0.976					0.950		
Satd. Flow (prot)	0	1863	0	0	1694	0	1863	1859	0	1770	1863	0
Flt Permitted					0.976					0.950		
Satd. Flow (perm)	0	1863	0	0	1694	0	1863	1859	0	1770	1863	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		319			430			608			732	
Travel Time (s)		7.3			9.8			13.8			16.6	

Intersection Summary

Area Type: Other

Intersection												
Int Delay, s/veh	0.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	0	0	0	12	0	12	0	711	11	16	404	0
Future Vol, veh/h	0	0	0	12	0	12	0	711	11	16	404	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	13	0	13	0	773	12	17	439	0

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1259	1258	439	1252	1252	779	439	0	0	785	0	0
Stage 1	473	473	-	779	779	-	-	-	-	-	-	-
Stage 2	786	785	-	473	473	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	147	171	618	149	172	396	1121	-	-	834	-	-
Stage 1	572	558	-	389	406	-	-	-	-	-	-	-
Stage 2	385	404	-	572	558	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	140	168	618	147	169	396	1121	-	-	834	-	-
Mov Cap-2 Maneuver	140	168	-	147	169	-	-	-	-	-	-	-
Stage 1	572	547	-	389	406	-	-	-	-	-	-	-
Stage 2	372	404	-	560	547	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	24.1	0	0.4
HCM LOS	A	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1121	-	-	-	214	834	-
HCM Lane V/C Ratio	-	-	-	-	0.122	0.021	-
HCM Control Delay (s)	0	-	-	0	24.1	9.4	-
HCM Lane LOS	A	-	-	A	C	A	-
HCM 95th %tile Q(veh)	0	-	-	-	0.4	0.1	-



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%				0%
Storage Length (ft)	150		100	150		0	0		0	0		0
Storage Lanes	1		1	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850		0.993			0.920				0.953
Flt Protected	0.950			0.950				0.985				0.983
Satd. Flow (prot)	1770	1863	1583	1770	1850	0	0	1688	0	0	1745	0
Flt Permitted	0.265			0.148				0.887				0.872
Satd. Flow (perm)	494	1863	1583	276	1850	0	0	1520	0	0	1548	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			61		4			93				14
Link Speed (mph)		30			30			30				30
Link Distance (ft)		501			1329			646				482
Travel Time (s)		11.4			30.2			14.7				11.0

Intersection Summary

Area Type: Other



Lane Group	EBL	EBT	EBR	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	23	685	99	86	550	391	40
v/c Ratio	0.10	0.81	0.13	0.69	0.66	0.53	0.06
Control Delay	13.0	29.3	5.8	59.8	37.0	18.2	12.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.0	29.3	5.8	59.8	37.0	18.2	12.9
Queue Length 50th (ft)	7	315	11	51	320	121	8
Queue Length 95th (ft)	19	406	34	m74	m383	235	30
Internal Link Dist (ft)		421			1249	566	402
Turn Bay Length (ft)	150		100	150			
Base Capacity (vph)	260	983	864	145	978	732	701
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.70	0.11	0.59	0.56	0.53	0.06

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM 6th Signalized Intersection Summary
 4: Tennyson St. & W 64th Ave.

6501 Lowell Blvd
 06/07/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	21	630	91	79	484	22	113	33	213	13	11	13
Future Volume (veh/h)	21	630	91	79	484	22	113	33	213	13	11	13
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	23	685	99	86	526	24	123	36	232	14	12	14
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	445	879	745	193	834	38	237	87	397	241	207	212
Arrive On Green	0.47	0.47	0.47	0.94	0.94	0.94	0.43	0.43	0.43	0.43	0.43	0.43
Sat Flow, veh/h	858	1870	1585	690	1775	81	429	203	922	434	481	493
Grp Volume(v), veh/h	23	685	99	86	0	550	391	0	0	40	0	0
Grp Sat Flow(s),veh/h/ln	858	1870	1585	690	0	1856	1554	0	0	1407	0	0
Q Serve(g_s), s	1.4	27.6	3.2	10.1	0.0	4.0	12.6	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	5.4	27.6	3.2	37.6	0.0	4.0	16.9	0.0	0.0	1.2	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.04	0.31		0.59	0.35		0.35
Lane Grp Cap(c), veh/h	445	879	745	193	0	872	721	0	0	660	0	0
V/C Ratio(X)	0.05	0.78	0.13	0.45	0.00	0.63	0.54	0.00	0.00	0.06	0.00	0.00
Avail Cap(c_a), veh/h	495	987	837	233	0	979	721	0	0	660	0	0
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	0.78	0.00	0.78	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	15.3	20.0	13.5	15.0	0.0	1.6	19.3	0.0	0.0	14.9	0.0	0.0
Incr Delay (d2), s/veh	0.0	3.6	0.1	1.3	0.0	0.9	2.9	0.0	0.0	0.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.5	17.8	2.0	2.4	0.0	1.6	10.6	0.0	0.0	0.9	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	15.3	23.6	13.6	16.2	0.0	2.4	22.2	0.0	0.0	15.1	0.0	0.0
LnGrp LOS	B	C	B	B	A	A	C	A	A	B	A	A
Approach Vol, veh/h		807			636			391			40	
Approach Delay, s/veh		22.1			4.3			22.2			15.1	
Approach LOS		C			A			C			B	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		43.2		46.8		43.2		46.8				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		33.5		47.5		33.5		47.5				
Max Q Clear Time (g_c+I1), s		18.9		29.6		3.2		39.6				
Green Ext Time (p_c), s		2.2		5.1		0.2		2.6				

Intersection Summary

HCM 6th Ctrl Delay	15.9
HCM 6th LOS	B



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	200		150	150		75	200		150	200		100
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.154			0.510			0.612			0.251		
Satd. Flow (perm)	287	1863	1583	950	1863	1583	1140	1863	1583	468	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			78			127			127			163
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1329			1480			763			608	
Travel Time (s)		30.2			33.6			17.3			13.8	

Intersection Summary

Area Type: Other

Timings
5: W 64th Ave./W. 64th Ave. & Lowell Blvd.

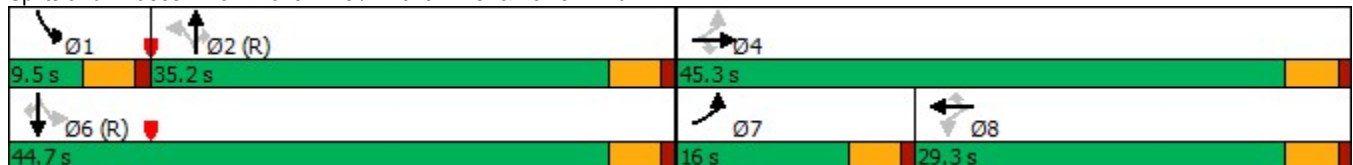
6501 Lowell Blvd
06/07/2021

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	224	399	72	49	370	60	126	430	103	41	216	150
Future Volume (vph)	224	399	72	49	370	60	126	430	103	41	216	150
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4			8			2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	7	4	4	8	8	8	2	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	16.0	45.3	45.3	29.3	29.3	29.3	35.2	35.2	35.2	9.5	44.7	44.7
Total Split (%)	17.8%	50.3%	50.3%	32.6%	32.6%	32.6%	39.1%	39.1%	39.1%	10.6%	49.7%	49.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead			Lag	Lag	Lag	Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes			Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	38.7	38.7	38.7	22.7	22.7	22.7	36.6	36.6	36.6	42.3	42.3	42.3
Actuated g/C Ratio	0.43	0.43	0.43	0.25	0.25	0.25	0.41	0.41	0.41	0.47	0.47	0.47
v/c Ratio	0.78	0.54	0.11	0.22	0.86	0.13	0.30	0.62	0.16	0.15	0.27	0.20
Control Delay	46.1	32.3	10.4	30.8	47.6	6.8	22.8	27.6	3.8	15.3	16.2	3.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.1	32.3	10.4	30.8	47.6	6.8	22.8	27.6	3.8	15.3	16.2	3.2
LOS	D	C	B	C	D	A	C	C	A	B	B	A
Approach Delay		34.5			40.8			23.0			11.3	
Approach LOS		C			D			C			B	

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 70
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.86
 Intersection Signal Delay: 28.2
 Intersection Capacity Utilization 73.7%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service D

Splits and Phases: 5: W 64th Ave./W. 64th Ave. & Lowell Blvd.





























Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	243	434	78	53	402	65	137	467	112	45	235	163
v/c Ratio	0.78	0.54	0.11	0.22	0.86	0.13	0.30	0.62	0.16	0.15	0.27	0.20
Control Delay	46.1	32.3	10.4	30.8	47.6	6.8	22.8	27.6	3.8	15.3	16.2	3.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.1	32.3	10.4	30.8	47.6	6.8	22.8	27.6	3.8	15.3	16.2	3.2
Queue Length 50th (ft)	125	207	9	27	247	2	58	231	0	14	82	0
Queue Length 95th (ft)	m#177	294	m25	m35	m312	m4	109	346	28	34	134	34
Internal Link Dist (ft)		1249			1400			683			528	
Turn Bay Length (ft)	200		150	150		75	200		150	200		100
Base Capacity (vph)	312	844	760	261	513	528	463	758	719	297	876	831
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.78	0.51	0.10	0.20	0.78	0.12	0.30	0.62	0.16	0.15	0.27	0.20

Intersection Summary

- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

HCM 6th Signalized Intersection Summary
 5: W 64th Ave./W. 64th Ave. & Lowell Blvd.

6501 Lowell Blvd
 06/07/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	224	399	72	49	370	60	126	430	103	41	216	150
Future Volume (veh/h)	224	399	72	49	370	60	126	430	103	41	216	150
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	243	434	78	53	402	65	137	467	112	45	235	163
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	325	779	660	299	461	391	471	741	628	310	905	767
Arrive On Green	0.16	0.55	0.55	0.08	0.08	0.08	0.40	0.40	0.40	0.04	0.48	0.48
Sat Flow, veh/h	1781	1870	1585	888	1870	1585	987	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	243	434	78	53	402	65	137	467	112	45	235	163
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	888	1870	1585	987	1870	1585	1781	1870	1585
Q Serve(g_s), s	8.8	13.5	2.1	5.0	19.1	3.4	8.8	18.1	4.1	1.3	6.7	5.3
Cycle Q Clear(g_c), s	8.8	13.5	2.1	5.0	19.1	3.4	8.8	18.1	4.1	1.3	6.7	5.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	325	779	660	299	461	391	471	741	628	310	905	767
V/C Ratio(X)	0.75	0.56	0.12	0.18	0.87	0.17	0.29	0.63	0.18	0.15	0.26	0.21
Avail Cap(c_a), veh/h	339	848	719	325	515	437	471	741	628	342	905	767
HCM Platoon Ratio	1.33	1.33	1.33	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.48	0.48	0.48	0.51	0.51	0.51	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.5	14.7	12.2	33.5	39.9	32.7	19.1	21.9	17.7	16.0	13.7	13.4
Incr Delay (d2), s/veh	4.2	0.3	0.0	0.1	7.8	0.1	1.6	4.0	0.6	0.2	0.7	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	5.9	7.3	1.3	2.0	14.3	2.4	3.9	13.2	2.8	0.9	5.2	3.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.8	15.1	12.2	33.6	47.8	32.8	20.6	25.9	18.3	16.3	14.4	14.0
LnGrp LOS	C	B	B	C	D	C	C	C	B	B	B	B
Approach Vol, veh/h		755			520			716				443
Approach Delay, s/veh		18.2			44.5			23.7				14.5
Approach LOS		B			D			C				B
Timer - Assigned Phs	1	2		4		6	7	8				
Phs Duration (G+Y+Rc), s	7.9	40.2		42.0		48.0	15.3	26.7				
Change Period (Y+Rc), s	4.5	4.5		4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s	5.0	30.7		40.8		40.2	11.5	24.8				
Max Q Clear Time (g_c+I1), s	3.3	20.1		15.5		8.7	10.8	21.1				
Green Ext Time (p_c), s	0.0	3.0		3.1		2.0	0.1	1.1				
Intersection Summary												
HCM 6th Ctrl Delay				24.8								
HCM 6th LOS				C								



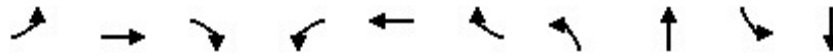
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	100		150	150		100	600		0	250		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor			0.850			0.850		0.993			0.988	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	5050	0	1770	5024	0
Flt Permitted	0.265			0.531			0.102			0.115		
Satd. Flow (perm)	494	1863	1583	989	1863	1583	190	5050	0	214	5024	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			185			182		10			17	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1480			550			1046			611	
Travel Time (s)		33.6			12.5			23.8			13.9	

Intersection Summary

Area Type: Other

Timings
6: Federal Blvd. & W. 64th Ave.

6501 Lowell Blvd
06/07/2021



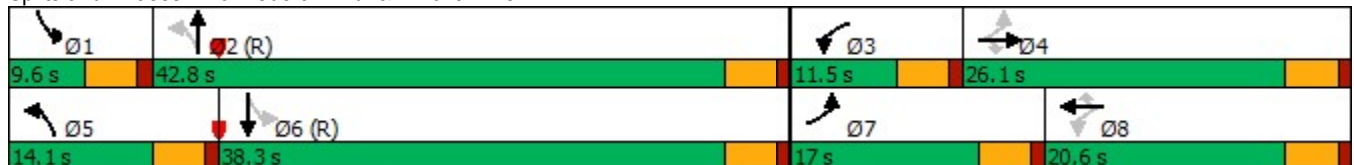
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations	↖	↑	↗	↖	↑	↗	↖	↑↑↑	↖	↑↑↑
Traffic Volume (vph)	281	238	170	112	208	96	215	1846	84	1511
Future Volume (vph)	281	238	170	112	208	96	215	1846	84	1511
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA
Protected Phases	7	4		3	8		5	2	1	6
Permitted Phases	4		4	8		8	2		6	
Detector Phase	7	4	4	3	8	8	5	2	1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	20.6	20.6	9.5	22.5	9.5	22.5
Total Split (s)	17.0	26.1	26.1	11.5	20.6	20.6	14.1	42.8	9.6	38.3
Total Split (%)	18.9%	29.0%	29.0%	12.8%	22.9%	22.9%	15.7%	47.6%	10.7%	42.6%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)	31.5	20.1	20.1	21.5	14.5	14.5	49.5	41.4	40.5	34.9
Actuated g/C Ratio	0.35	0.22	0.22	0.24	0.16	0.16	0.55	0.46	0.45	0.39
v/c Ratio	0.87	0.62	0.37	0.41	0.75	0.25	0.84	0.90	0.47	0.91
Control Delay	64.1	52.6	18.0	25.3	52.1	1.8	44.8	30.6	19.9	34.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	64.1	52.6	18.0	25.3	52.1	1.8	44.8	30.6	19.9	34.6
LOS	E	D	B	C	D	A	D	C	B	C
Approach Delay		48.7			33.3			32.0		33.9
Approach LOS		D			C			C		C

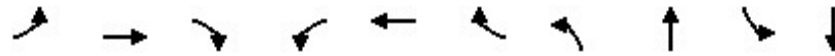
Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.91
 Intersection Signal Delay: 35.1
 Intersection Capacity Utilization 85.5%
 Analysis Period (min) 15

Intersection LOS: D
 ICU Level of Service E

Splits and Phases: 6: Federal Blvd. & W. 64th Ave.





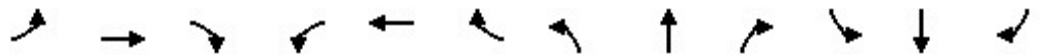
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	305	259	185	122	226	104	234	2106	91	1782
v/c Ratio	0.87	0.62	0.37	0.41	0.75	0.25	0.84	0.90	0.47	0.91
Control Delay	64.1	52.6	18.0	25.3	52.1	1.8	44.8	30.6	19.9	34.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	64.1	52.6	18.0	25.3	52.1	1.8	44.8	30.6	19.9	34.6
Queue Length 50th (ft)	161	139	24	46	121	0	81	418	24	348
Queue Length 95th (ft)	#247	217	76	86	#212	3	#214	#546	48	#458
Internal Link Dist (ft)		1400			470			966		531
Turn Bay Length (ft)	100		150	150		100	600		250	
Base Capacity (vph)	350	447	520	297	333	432	280	2330	192	1958
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.87	0.58	0.36	0.41	0.68	0.24	0.84	0.90	0.47	0.91

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM 6th Signalized Intersection Summary
6: Federal Blvd. & W. 64th Ave.

6501 Lowell Blvd
06/07/2021


























Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	281	238	170	112	208	96	215	1846	91	84	1511	129
Future Volume (veh/h)	281	238	170	112	208	96	215	1846	91	84	1511	129
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	305	259	185	122	226	104	234	2007	99	91	1642	140
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	357	391	331	285	272	231	279	2321	114	189	2021	172
Arrive On Green	0.05	0.07	0.07	0.08	0.15	0.15	0.09	0.47	0.47	0.05	0.42	0.42
Sat Flow, veh/h	1781	1870	1585	1781	1870	1585	1781	4985	245	1781	4793	408
Grp Volume(v), veh/h	305	259	185	122	226	104	234	1368	738	91	1166	616
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	1585	1781	1702	1826	1781	1702	1797
Q Serve(g_s), s	12.5	12.2	10.2	5.2	10.6	5.4	6.4	32.3	32.6	2.6	27.1	27.2
Cycle Q Clear(g_c), s	12.5	12.2	10.2	5.2	10.6	5.4	6.4	32.3	32.6	2.6	27.1	27.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.13	1.00		0.23
Lane Grp Cap(c), veh/h	357	391	331	285	272	231	279	1585	850	189	1436	758
V/C Ratio(X)	0.85	0.66	0.56	0.43	0.83	0.45	0.84	0.86	0.87	0.48	0.81	0.81
Avail Cap(c_a), veh/h	357	449	380	288	335	284	302	1585	850	201	1436	758
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.90	0.90	0.90	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.1	38.8	37.9	29.6	37.4	35.2	19.3	21.5	21.6	20.2	22.9	22.9
Incr Delay (d2), s/veh	16.4	2.7	1.3	1.0	13.5	1.4	17.5	6.5	11.6	1.9	5.1	9.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	11.8	10.3	7.6	4.0	9.7	3.9	6.7	19.4	22.2	2.0	16.8	18.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	46.5	41.5	39.2	30.6	50.8	36.5	36.8	28.0	33.1	22.1	28.0	32.2
LnGrp LOS	D	D	D	C	D	D	D	C	C	C	C	C
Approach Vol, veh/h		749			452			2340			1873	
Approach Delay, s/veh		43.0			42.1			30.5			29.1	
Approach LOS		D			D			C			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.0	46.4	11.3	23.3	12.9	42.5	17.0	17.6				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	5.1	38.3	7.0	21.6	9.6	33.8	12.5	16.1				
Max Q Clear Time (g_c+I1), s	4.6	34.6	7.2	14.2	8.4	29.2	14.5	12.6				
Green Ext Time (p_c), s	0.0	3.4	0.0	1.3	0.1	3.8	0.0	0.5				

Intersection Summary

HCM 6th Ctrl Delay	32.7
HCM 6th LOS	C

Notes

User approved pedestrian interval to be less than phase max green.

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		150	150		0	225		250	150		150
Storage Lanes	1		1	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850		0.929				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1730	0	1770	1863	1583	1770	1863	1583
Flt Permitted	0.744			0.751			0.558			0.640		
Satd. Flow (perm)	1386	1863	1583	1399	1730	0	1039	1863	1583	1192	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			121		10				27			58
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		594			990			699			502	
Travel Time (s)		13.5			22.5			15.9			11.4	

Intersection Summary

Area Type: Other

Timings
1: Lowell Blvd. & W. 68th Ave.

6501 Lowell Blvd
06/07/2021



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑	↗	↖	↗	↖	↑	↗	↖	↑	↗
Traffic Volume (vph)	50	9	111	3	10	63	172	1	16	309	53
Future Volume (vph)	50	9	111	3	10	63	172	1	16	309	53
Turn Type	Perm	NA	Perm	Perm	NA	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8		2			6	
Permitted Phases	4		4	8		2		2	6		6
Detector Phase	4	4	4	8	8	2	2	2	6	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	26.0	26.0	26.0	26.0	26.0	34.0	34.0	34.0	34.0	34.0	34.0
Total Split (%)	43.3%	43.3%	43.3%	43.3%	43.3%	56.7%	56.7%	56.7%	56.7%	56.7%	56.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag											
Lead-Lag Optimize?											
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	7.9	7.9	7.9	7.9	7.9	46.0	46.0	46.0	46.0	46.0	46.0
Actuated g/C Ratio	0.13	0.13	0.13	0.13	0.13	0.77	0.77	0.77	0.77	0.77	0.77
v/c Ratio	0.30	0.04	0.39	0.02	0.09	0.09	0.13	0.00	0.02	0.24	0.05
Control Delay	27.0	21.7	9.2	21.3	16.9	3.3	3.2	0.0	3.1	3.5	1.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.0	21.7	9.2	21.3	16.9	3.3	3.2	0.0	3.1	3.5	1.2
LOS	C	C	A	C	B	A	A	A	A	A	A
Approach Delay		15.1			17.4		3.2			3.2	
Approach LOS		B			B		A			A	

Intersection Summary

Cycle Length: 60
 Actuated Cycle Length: 60
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 45
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.39
 Intersection Signal Delay: 6.1
 Intersection Capacity Utilization 41.1%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service A

Splits and Phases: 1: Lowell Blvd. & W. 68th Ave.



Queues

6501 Lowell Blvd

1: Lowell Blvd. & W. 68th Ave.

06/07/2021



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	54	10	121	3	21	68	187	1	17	336	58
v/c Ratio	0.30	0.04	0.39	0.02	0.09	0.09	0.13	0.00	0.02	0.24	0.05
Control Delay	27.0	21.7	9.2	21.3	16.9	3.3	3.2	0.0	3.1	3.5	1.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.0	21.7	9.2	21.3	16.9	3.3	3.2	0.0	3.1	3.5	1.2
Queue Length 50th (ft)	18	3	0	1	4	5	16	0	1	30	0
Queue Length 95th (ft)	44	14	37	7	19	18	38	0	6	68	8
Internal Link Dist (ft)		514			910		619			422	
Turn Bay Length (ft)	150		150	150		225		250	150		150
Base Capacity (vph)	496	667	644	501	626	797	1429	1220	914	1429	1227
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.01	0.19	0.01	0.03	0.09	0.13	0.00	0.02	0.24	0.05

Intersection Summary

HCM 6th Signalized Intersection Summary
 1: Lowell Blvd. & W. 68th Ave.

6501 Lowell Blvd
 06/07/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	9	111	3	10	9	63	172	1	16	309	53
Future Volume (veh/h)	50	9	111	3	10	9	63	172	1	16	309	53
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	54	10	121	3	11	10	68	187	1	17	336	58
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	259	208	176	254	100	91	795	1382	1171	969	1382	1171
Arrive On Green	0.11	0.11	0.11	0.11	0.11	0.11	0.74	0.74	0.74	0.74	0.74	0.74
Sat Flow, veh/h	1391	1870	1585	1259	902	820	990	1870	1585	1195	1870	1585
Grp Volume(v), veh/h	54	10	121	3	0	21	68	187	1	17	336	58
Grp Sat Flow(s),veh/h/ln	1391	1870	1585	1259	0	1723	990	1870	1585	1195	1870	1585
Q Serve(g_s), s	2.2	0.3	4.4	0.1	0.0	0.7	1.4	1.7	0.0	0.3	3.4	0.6
Cycle Q Clear(g_c), s	2.8	0.3	4.4	0.4	0.0	0.7	4.8	1.7	0.0	2.0	3.4	0.6
Prop In Lane	1.00		1.00	1.00		0.48	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	259	208	176	254	0	191	795	1382	1171	969	1382	1171
V/C Ratio(X)	0.21	0.05	0.69	0.01	0.00	0.11	0.09	0.14	0.00	0.02	0.24	0.05
Avail Cap(c_a), veh/h	603	670	568	565	0	617	795	1382	1171	969	1382	1171
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.3	23.8	25.7	24.0	0.0	24.0	3.3	2.3	2.0	2.6	2.5	2.1
Incr Delay (d2), s/veh	0.4	0.1	4.7	0.0	0.0	0.3	0.2	0.2	0.0	0.0	0.4	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.3	0.2	3.2	0.1	0.0	0.5	0.4	0.7	0.0	0.1	1.4	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.7	23.9	30.3	24.0	0.0	24.2	3.5	2.5	2.0	2.6	2.9	2.2
LnGrp LOS	C	C	C	C	A	C	A	A	A	A	A	A
Approach Vol, veh/h		185			24			256			411	
Approach Delay, s/veh		28.6			24.2			2.7			2.8	
Approach LOS		C			C			A			A	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		48.8		11.2		48.8		11.2				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		29.5		21.5		29.5		21.5				
Max Q Clear Time (g_c+I1), s		6.8		6.4		5.4		2.7				
Green Ext Time (p_c), s		1.3		0.5		2.3		0.1				
Intersection Summary												
HCM 6th Ctrl Delay				8.8								
HCM 6th LOS				A								



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↘		↗	↘	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	100		0	100		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.920			0.940			0.996			0.993	
Flt Protected		0.985			0.978		0.950		0.950			
Satd. Flow (prot)	0	1688	0	0	1712	0	1770	1855	0	1770	1850	0
Flt Permitted		0.985			0.978		0.950		0.950			
Satd. Flow (perm)	0	1688	0	0	1712	0	1770	1855	0	1770	1850	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		458			470			732			699	
Travel Time (s)		10.4			10.7			16.6			15.9	

Intersection Summary

Area Type: Other

Intersection												
Int Delay, s/veh	1.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	13	5	26	14	4	14	10	315	9	4	431	21
Future Vol, veh/h	13	5	26	14	4	14	10	315	9	4	431	21
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	14	5	28	15	4	15	11	342	10	4	468	23

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	867	862	480	873	868	347	491	0	0	352	0	0
Stage 1	488	488	-	369	369	-	-	-	-	-	-	-
Stage 2	379	374	-	504	499	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	273	293	586	271	290	696	1072	-	-	1207	-	-
Stage 1	561	550	-	651	621	-	-	-	-	-	-	-
Stage 2	643	618	-	550	544	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	261	289	586	251	286	696	1072	-	-	1207	-	-
Mov Cap-2 Maneuver	261	289	-	251	286	-	-	-	-	-	-	-
Stage 1	555	548	-	644	615	-	-	-	-	-	-	-
Stage 2	618	612	-	517	542	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	15.4		16.2		0.3		0.1	
HCM LOS	C		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1072	-	-	395	356	1207	-
HCM Lane V/C Ratio	0.01	-	-	0.121	0.098	0.004	-
HCM Control Delay (s)	8.4	-	-	15.4	16.2	8	-
HCM Lane LOS	A	-	-	C	C	A	-
HCM 95th %tile Q(veh)	0	-	-	0.4	0.3	0	-



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↘		↗	↘	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	100		0	100		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt					0.916			0.996				
Flt Protected					0.982					0.950		
Satd. Flow (prot)	0	1863	0	0	1676	0	1863	1855	0	1770	1863	0
Flt Permitted					0.982					0.950		
Satd. Flow (perm)	0	1863	0	0	1676	0	1863	1855	0	1770	1863	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		319			430			608			732	
Travel Time (s)		7.3			9.8			13.8			16.6	

Intersection Summary

Area Type: Other

Intersection												
Int Delay, s/veh	0.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	0	0	0	8	0	14	0	322	9	12	461	0
Future Vol, veh/h	0	0	0	8	0	14	0	322	9	12	461	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	9	0	15	0	350	10	13	501	0

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	890	887	501	882	882	355	501	0	0	360	0	0
Stage 1	527	527	-	355	355	-	-	-	-	-	-	-
Stage 2	363	360	-	527	527	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	264	283	570	267	285	689	1063	-	-	1199	-	-
Stage 1	535	528	-	662	630	-	-	-	-	-	-	-
Stage 2	656	626	-	535	528	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	256	280	570	265	282	689	1063	-	-	1199	-	-
Mov Cap-2 Maneuver	256	280	-	265	282	-	-	-	-	-	-	-
Stage 1	535	522	-	662	630	-	-	-	-	-	-	-
Stage 2	642	626	-	529	522	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	13.7	0	0.2
HCM LOS	A	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1063	-	-	-	436	1199	-
HCM Lane V/C Ratio	-	-	-	-	0.055	0.011	-
HCM Control Delay (s)	0	-	-	0	13.7	8	-
HCM Lane LOS	A	-	-	A	B	A	-
HCM 95th %tile Q(veh)	0	-	-	-	0.2	0	-

Lanes and Geometrics
 4: Tennyson St. & W 64th Ave.

6501 Lowell Blvd
 06/07/2021



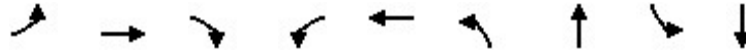
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%				0%
Storage Length (ft)	150		100	150		0	0		0	0		0
Storage Lanes	1		1	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850		0.995			0.919				0.951
Flt Protected	0.950			0.950				0.984				0.992
Satd. Flow (prot)	1770	1863	1583	1770	1853	0	0	1684	0	0	1757	0
Flt Permitted	0.246			0.368				0.903				0.965
Satd. Flow (perm)	458	1863	1583	685	1853	0	0	1546	0	0	1709	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			65		3			91				18
Link Speed (mph)		30			30			30				30
Link Distance (ft)		700			1434			502				485
Travel Time (s)		15.9			32.6			11.4				11.0

Intersection Summary

Area Type: Other

Timings
4: Tennyson St. & W 64th Ave.

6501 Lowell Blvd
06/07/2021

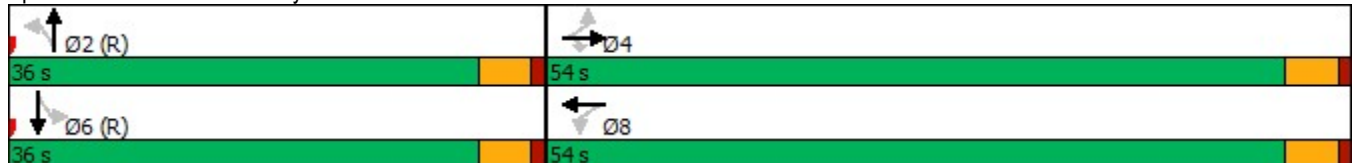


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↖	↑	↗	↖	↗		↕		↕
Traffic Volume (vph)	12	314	60	156	387	56	14	7	22
Future Volume (vph)	12	314	60	156	387	56	14	7	22
Turn Type	Perm	NA	Perm	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4			8		2		6
Permitted Phases	4		4	8		2		6	
Detector Phase	4	4	4	8	8	2	2	6	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	54.0	54.0	54.0	54.0	54.0	36.0	36.0	36.0	36.0
Total Split (%)	60.0%	60.0%	60.0%	60.0%	60.0%	40.0%	40.0%	40.0%	40.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5		4.5		4.5
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	28.9	28.9	28.9	28.9	28.9		52.1		52.1
Actuated g/C Ratio	0.32	0.32	0.32	0.32	0.32		0.58		0.58
v/c Ratio	0.09	0.57	0.12	0.78	0.73		0.20		0.05
Control Delay	19.1	28.2	5.0	60.8	44.3		6.7		8.2
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	19.1	28.2	5.0	60.8	44.3		6.7		8.2
LOS	B	C	A	E	D		A		A
Approach Delay		24.3			49.0		6.7		8.2
Approach LOS		C			D		A		A

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 45
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.78
 Intersection Signal Delay: 32.8
 Intersection Capacity Utilization 53.5%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service A

Splits and Phases: 4: Tennyson St. & W 64th Ave.





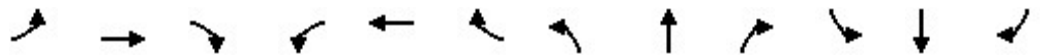
Lane Group	EBL	EBT	EBR	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	13	341	65	170	435	189	50
v/c Ratio	0.09	0.57	0.12	0.78	0.73	0.20	0.05
Control Delay	19.1	28.2	5.0	60.8	44.3	6.7	8.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.1	28.2	5.0	60.8	44.3	6.7	8.2
Queue Length 50th (ft)	5	160	0	98	246	23	7
Queue Length 95th (ft)	16	202	23	164	333	71	29
Internal Link Dist (ft)		620			1354	422	405
Turn Bay Length (ft)	150		100	150			
Base Capacity (vph)	251	1024	899	376	1020	933	997
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.33	0.07	0.45	0.43	0.20	0.05
Intersection Summary							

HCM 6th Signalized Intersection Summary
 4: Tennyson St. & W 64th Ave.

6501 Lowell Blvd
 06/07/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	314	60	156	387	13	56	14	104	7	22	17
Future Volume (veh/h)	12	314	60	156	387	13	56	14	104	7	22	17
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	13	341	65	170	421	14	61	15	113	8	24	18
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	233	690	585	304	664	22	291	90	488	155	456	318
Arrive On Green	0.37	0.37	0.37	0.25	0.25	0.25	0.53	0.53	0.53	0.53	0.53	0.53
Sat Flow, veh/h	954	1870	1585	979	1800	60	449	170	920	205	859	599
Grp Volume(v), veh/h	13	341	65	170	0	435	189	0	0	50	0	0
Grp Sat Flow(s),veh/h/ln	954	1870	1585	979	0	1860	1539	0	0	1664	0	0
Q Serve(g_s), s	1.0	12.7	2.4	15.0	0.0	18.8	1.3	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	19.8	12.7	2.4	27.6	0.0	18.8	5.5	0.0	0.0	1.2	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.03	0.32		0.60	0.16		0.36
Lane Grp Cap(c), veh/h	233	690	585	304	0	686	870	0	0	930	0	0
V/C Ratio(X)	0.06	0.49	0.11	0.56	0.00	0.63	0.22	0.00	0.00	0.05	0.00	0.00
Avail Cap(c_a), veh/h	405	1029	872	481	0	1023	870	0	0	930	0	0
HCM Platoon Ratio	1.00	1.00	1.00	0.67	0.67	0.67	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	0.89	0.00	0.89	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	32.2	21.9	18.7	37.9	0.0	28.5	11.2	0.0	0.0	10.2	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.5	0.1	1.4	0.0	0.9	0.6	0.0	0.0	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.4	9.3	1.6	6.8	0.0	13.5	3.6	0.0	0.0	0.9	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	32.3	22.5	18.8	39.3	0.0	29.3	11.7	0.0	0.0	10.3	0.0	0.0
LnGrp LOS	C	C	B	D	A	C	B	A	A	B	A	A
Approach Vol, veh/h		419			605			189			50	
Approach Delay, s/veh		22.2			32.1			11.7			10.3	
Approach LOS		C			C			B			B	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		52.3		37.7		52.3		37.7				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		31.5		49.5		31.5		49.5				
Max Q Clear Time (g_c+I1), s		7.5		21.8		3.2		29.6				
Green Ext Time (p_c), s		1.1		2.4		0.2		3.6				
Intersection Summary												
HCM 6th Ctrl Delay				24.9								
HCM 6th LOS				C								



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	200		150	150		75	200		150	200		100
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.280			0.568			0.579			0.595		
Satd. Flow (perm)	522	1863	1583	1058	1863	1583	1079	1863	1583	1108	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			99			127			127			132
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1434			1268			763			608	
Travel Time (s)		32.6			28.8			17.3			13.8	

Intersection Summary

Area Type: Other

Timings
5: W 64th Ave./W. 64th Ave. & Lowell Blvd.

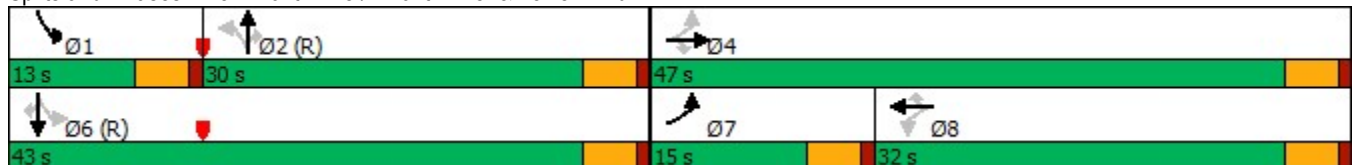
6501 Lowell Blvd
06/07/2021

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	116	293	91	72	236	39	46	132	56	80	272	121
Future Volume (vph)	116	293	91	72	236	39	46	132	56	80	272	121
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4			8			2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	7	4	4	8	8	8	2	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	15.0	47.0	47.0	32.0	32.0	32.0	30.0	30.0	30.0	13.0	43.0	43.0
Total Split (%)	16.7%	52.2%	52.2%	35.6%	35.6%	35.6%	33.3%	33.3%	33.3%	14.4%	47.8%	47.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead			Lag	Lag	Lag	Lag	Lag	Lag	Lag	Lead	
Lead-Lag Optimize?	Yes			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	32.1	32.1	32.1	18.0	18.0	18.0	38.7	38.7	38.7	48.9	48.9	48.9
Actuated g/C Ratio	0.36	0.36	0.36	0.20	0.20	0.20	0.43	0.43	0.43	0.54	0.54	0.54
v/c Ratio	0.40	0.48	0.16	0.37	0.69	0.10	0.11	0.18	0.08	0.13	0.29	0.14
Control Delay	37.0	40.0	17.6	33.2	40.4	2.5	21.2	20.3	0.2	12.3	13.5	3.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.0	40.0	17.6	33.2	40.4	2.5	21.2	20.3	0.2	12.3	13.5	3.0
LOS	D	D	B	C	D	A	C	C	A	B	B	A
Approach Delay		35.2			34.7			15.7			10.6	
Approach LOS		D			C			B			B	

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 65
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.69
 Intersection Signal Delay: 24.6
 Intersection Capacity Utilization 53.1%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service A

Splits and Phases: 5: W 64th Ave./W. 64th Ave. & Lowell Blvd.





























Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	126	318	99	78	257	42	50	143	61	87	296	132
v/c Ratio	0.40	0.48	0.16	0.37	0.69	0.10	0.11	0.18	0.08	0.13	0.29	0.14
Control Delay	37.0	40.0	17.6	33.2	40.4	2.5	21.2	20.3	0.2	12.3	13.5	3.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.0	40.0	17.6	33.2	40.4	2.5	21.2	20.3	0.2	12.3	13.5	3.0
Queue Length 50th (ft)	68	179	17	39	139	1	17	51	0	23	87	0
Queue Length 95th (ft)	115	249	59	m60	m173	m3	50	110	0	54	164	30
Internal Link Dist (ft)		1354			1188			683			528	
Turn Bay Length (ft)	200		150	150		75	200		150	200		100
Base Capacity (vph)	331	879	799	323	569	571	463	800	752	668	1013	921
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.38	0.36	0.12	0.24	0.45	0.07	0.11	0.18	0.08	0.13	0.29	0.14

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM 6th Signalized Intersection Summary
 5: W 64th Ave./W. 64th Ave. & Lowell Blvd.

6501 Lowell Blvd
 06/07/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	116	293	91	72	236	39	46	132	56	80	272	121
Future Volume (veh/h)	116	293	91	72	236	39	46	132	56	80	272	121
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	126	318	99	78	257	42	50	143	61	87	296	132
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	258	564	478	215	330	279	559	934	791	707	1119	949
Arrive On Green	0.02	0.10	0.10	0.06	0.06	0.06	0.50	0.50	0.50	0.05	0.60	0.60
Sat Flow, veh/h	1781	1870	1585	969	1870	1585	960	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	126	318	99	78	257	42	50	143	61	87	296	132
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	969	1870	1585	960	1870	1585	1781	1870	1585
Q Serve(g_s), s	5.0	14.6	5.2	7.1	12.2	2.3	2.5	3.7	1.8	2.0	6.8	3.3
Cycle Q Clear(g_c), s	5.0	14.6	5.2	10.4	12.2	2.3	2.5	3.7	1.8	2.0	6.8	3.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	258	564	478	215	330	279	559	934	791	707	1119	949
V/C Ratio(X)	0.49	0.56	0.21	0.36	0.78	0.15	0.09	0.15	0.08	0.12	0.26	0.14
Avail Cap(c_a), veh/h	332	883	748	340	571	484	559	934	791	788	1119	949
HCM Platoon Ratio	0.33	0.33	0.33	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.80	0.80	0.80	0.82	0.82	0.82	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.3	34.9	30.6	41.4	40.7	36.0	11.9	12.2	11.7	8.9	8.6	7.9
Incr Delay (d2), s/veh	1.1	0.7	0.2	0.8	3.3	0.2	0.3	0.3	0.2	0.1	0.6	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	4.1	11.4	3.7	3.4	10.1	1.6	1.0	2.8	1.2	1.3	4.9	2.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	29.4	35.6	30.8	42.3	44.0	36.2	12.2	12.6	11.9	9.0	9.2	8.2
LnGrp LOS	C	D	C	D	D	D	B	B	B	A	A	A
Approach Vol, veh/h		543			377			254			515	
Approach Delay, s/veh		33.3			42.8			12.3			8.9	
Approach LOS		C			D			B			A	
Timer - Assigned Phs	1	2		4		6	7	8				
Phs Duration (G+Y+Rc), s	8.9	49.4		31.6		58.4	11.3	20.4				
Change Period (Y+Rc), s	4.5	4.5		4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s	8.5	25.5		42.5		38.5	10.5	27.5				
Max Q Clear Time (g_c+I1), s	4.0	5.7		16.6		8.8	7.0	14.2				
Green Ext Time (p_c), s	0.1	1.1		2.3		2.3	0.1	1.7				
Intersection Summary												
HCM 6th Ctrl Delay				24.8								
HCM 6th LOS				C								



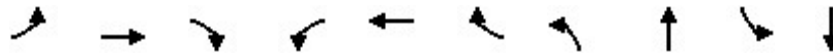
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	100		150	150		100	600		0	250		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor			0.850			0.850		0.987			0.990	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	5019	0	1770	5034	0
Flt Permitted	0.505			0.450			0.086			0.227		
Satd. Flow (perm)	941	1863	1583	838	1863	1583	160	5019	0	423	5034	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			134			127			23			17
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1268			424			903			562	
Travel Time (s)		28.8			9.6			20.5			12.8	

Intersection Summary

Area Type: Other

Timings
6: Federal Blvd. & W. 64th Ave.

6501 Lowell Blvd
06/07/2021

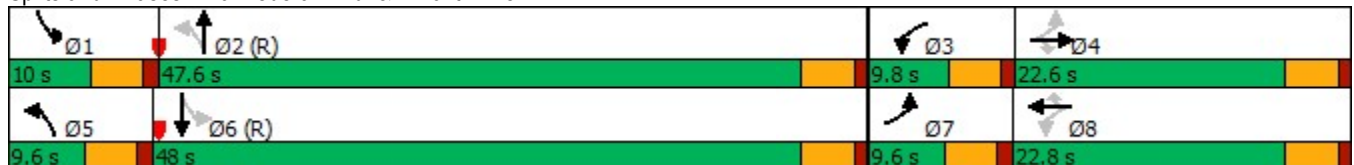


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations	↖	↑	↗	↖	↑	↗	↖	↑↑↑	↖	↑↑↑
Traffic Volume (vph)	106	162	164	139	176	43	93	864	68	2266
Future Volume (vph)	106	162	164	139	176	43	93	864	68	2266
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA
Protected Phases	7	4		3	8		5	2	1	6
Permitted Phases	4		4	8		8	2		6	
Detector Phase	7	4	4	3	8	8	5	2	1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	9.5	22.5
Total Split (s)	9.6	22.6	22.6	9.8	22.8	22.8	9.6	47.6	10.0	48.0
Total Split (%)	10.7%	25.1%	25.1%	10.9%	25.3%	25.3%	10.7%	52.9%	11.1%	53.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)	19.0	13.9	13.9	20.2	16.0	16.0	53.7	48.5	53.7	48.5
Actuated g/C Ratio	0.21	0.15	0.15	0.22	0.18	0.18	0.60	0.54	0.60	0.54
v/c Ratio	0.47	0.61	0.50	0.62	0.58	0.12	0.48	0.38	0.21	0.97
Control Delay	22.8	30.5	8.1	39.2	41.5	0.7	18.5	13.3	8.8	34.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.8	30.5	8.1	39.2	41.5	0.7	18.5	13.3	8.8	34.0
LOS	C	C	A	D	D	A	B	B	A	C
Approach Delay		20.1			35.7			13.7		33.3
Approach LOS		C			D			B		C

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.97
 Intersection Signal Delay: 27.5
 Intersection Capacity Utilization 83.7%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service E

Splits and Phases: 6: Federal Blvd. & W. 64th Ave.





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	115	176	178	151	191	47	101	1027	74	2637
v/c Ratio	0.47	0.61	0.50	0.62	0.58	0.12	0.48	0.38	0.21	0.97
Control Delay	22.8	30.5	8.1	39.2	41.5	0.7	18.5	13.3	8.8	34.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.8	30.5	8.1	39.2	41.5	0.7	18.5	13.3	8.8	34.0
Queue Length 50th (ft)	27	45	0	69	103	0	20	123	14	~599
Queue Length 95th (ft)	55	83	0	114	165	0	#68	164	35	#717
Internal Link Dist (ft)		1188			344			823		482
Turn Bay Length (ft)	100		150	150		100	600		250	
Base Capacity (vph)	245	374	425	243	378	423	209	2717	346	2721
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.47	0.47	0.42	0.62	0.51	0.11	0.48	0.38	0.21	0.97

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

HCM 6th Signalized Intersection Summary
6: Federal Blvd. & W. 64th Ave.

6501 Lowell Blvd
06/07/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	106	162	164	139	176	43	93	864	81	68	2266	160
Future Volume (veh/h)	106	162	164	139	176	43	93	864	81	68	2266	160
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	115	176	178	151	191	47	101	939	88	74	2463	174
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	235	267	226	236	271	229	179	2621	245	406	2668	186
Arrive On Green	0.02	0.05	0.05	0.06	0.14	0.14	0.05	0.55	0.55	0.05	0.55	0.55
Sat Flow, veh/h	1781	1870	1585	1781	1870	1585	1781	4750	444	1781	4874	339
Grp Volume(v), veh/h	115	176	178	151	191	47	101	672	355	74	1709	928
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	1585	1781	1702	1790	1781	1702	1809
Q Serve(g_s), s	4.9	8.3	10.0	5.3	8.8	2.4	2.2	9.9	10.0	1.6	41.1	42.9
Cycle Q Clear(g_c), s	4.9	8.3	10.0	5.3	8.8	2.4	2.2	9.9	10.0	1.6	41.1	42.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.25	1.00		0.19
Lane Grp Cap(c), veh/h	235	267	226	236	271	229	179	1878	988	406	1864	991
V/C Ratio(X)	0.49	0.66	0.79	0.64	0.71	0.20	0.56	0.36	0.36	0.18	0.92	0.94
Avail Cap(c_a), veh/h	235	376	319	236	380	322	189	1878	988	431	1864	991
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.94	0.94	0.94	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.6	40.7	41.5	33.5	36.7	33.9	20.9	11.3	11.3	8.3	18.5	18.9
Incr Delay (d2), s/veh	1.5	2.6	7.9	5.7	3.4	0.4	3.4	0.5	1.0	0.2	8.7	16.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	4.1	7.5	8.1	1.8	7.5	1.7	2.3	6.5	7.1	1.0	23.4	28.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.0	43.4	49.4	39.2	40.1	34.4	24.4	11.8	12.3	8.5	27.2	35.8
LnGrp LOS	C	D	D	D	D	C	C	B	B	A	C	D
Approach Vol, veh/h		469			389			1128			2711	
Approach Delay, s/veh		43.4			39.0			13.1			29.6	
Approach LOS		D			D			B			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.7	54.2	9.8	17.3	9.1	53.8	9.6	17.5				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	5.5	43.1	5.3	18.1	5.1	43.5	5.1	18.3				
Max Q Clear Time (g_c+I1), s	3.6	12.0	7.3	12.0	4.2	44.9	6.9	10.8				
Green Ext Time (p_c), s	0.0	8.2	0.0	0.8	0.0	0.0	0.0	0.7				
Intersection Summary												
HCM 6th Ctrl Delay				27.8								
HCM 6th LOS				C								



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		150	150		0	225		250	150		150
Storage Lanes	1		1	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850		0.903				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1682	0	1770	1863	1583	1770	1863	1583
Flt Permitted	0.724			0.748			0.530			0.330		
Satd. Flow (perm)	1349	1863	1583	1393	1682	0	987	1863	1583	615	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			75		33				27			87
Link Speed (mph)		30			30			30				30
Link Distance (ft)		549			716			667				367
Travel Time (s)		12.5			16.3			15.2				8.3

Intersection Summary

Area Type: Other

Timings
1: Lowell Blvd. & W. 68th Ave.

6501 Lowell Blvd
06/07/2021

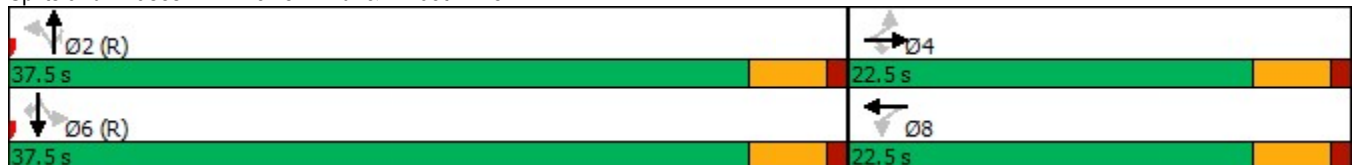


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑	↗	↖	↗	↖	↑	↗	↖	↑	↗
Traffic Volume (vph)	52	13	69	12	17	120	673	20	13	362	80
Future Volume (vph)	52	13	69	12	17	120	673	20	13	362	80
Turn Type	Perm	NA	Perm	Perm	NA	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8		2			6	
Permitted Phases	4		4	8		2		2	6		6
Detector Phase	4	4	4	8	8	2	2	2	6	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	22.5	22.5	22.5	22.5	22.5	37.5	37.5	37.5	37.5	37.5	37.5
Total Split (%)	37.5%	37.5%	37.5%	37.5%	37.5%	62.5%	62.5%	62.5%	62.5%	62.5%	62.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag											
Lead-Lag Optimize?											
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	8.1	8.1	8.1	8.1	8.1	45.8	45.8	45.8	45.8	45.8	45.8
Actuated g/C Ratio	0.14	0.14	0.14	0.14	0.14	0.76	0.76	0.76	0.76	0.76	0.76
v/c Ratio	0.31	0.06	0.27	0.07	0.20	0.17	0.51	0.02	0.03	0.28	0.07
Control Delay	27.3	21.6	9.1	22.1	13.9	3.9	5.8	1.4	3.4	3.8	1.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.3	21.6	9.1	22.1	13.9	3.9	5.8	1.4	3.4	3.8	1.1
LOS	C	C	A	C	B	A	A	A	A	A	A
Approach Delay		17.4			15.5		5.4			3.3	
Approach LOS		B			B		A			A	

Intersection Summary

Cycle Length: 60
 Actuated Cycle Length: 60
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.51
 Intersection Signal Delay: 6.3
 Intersection Capacity Utilization 60.4%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service B

Splits and Phases: 1: Lowell Blvd. & W. 68th Ave.





Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	57	14	75	13	51	130	732	22	14	393	87
v/c Ratio	0.31	0.06	0.27	0.07	0.20	0.17	0.51	0.02	0.03	0.28	0.07
Control Delay	27.3	21.6	9.1	22.1	13.9	3.9	5.8	1.4	3.4	3.8	1.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.3	21.6	9.1	22.1	13.9	3.9	5.8	1.4	3.4	3.8	1.1
Queue Length 50th (ft)	19	5	0	4	6	11	91	0	1	38	0
Queue Length 95th (ft)	46	17	29	16	30	32	198	5	6	83	10
Internal Link Dist (ft)		469			636		587			287	
Turn Bay Length (ft)	150		150	150		225		250	150		150
Base Capacity (vph)	404	558	527	417	527	754	1423	1215	469	1423	1230
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.03	0.14	0.03	0.10	0.17	0.51	0.02	0.03	0.28	0.07

Intersection Summary

HCM 6th Signalized Intersection Summary
 1: Lowell Blvd. & W. 68th Ave.

6501 Lowell Blvd
 06/07/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	52	13	69	12	17	30	120	673	20	13	362	80
Future Volume (veh/h)	52	13	69	12	17	30	120	673	20	13	362	80
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	57	14	75	13	18	33	130	732	22	14	393	87
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	223	195	165	247	62	113	741	1395	1182	533	1395	1182
Arrive On Green	0.10	0.10	0.10	0.10	0.10	0.10	0.75	0.75	0.75	0.75	0.75	0.75
Sat Flow, veh/h	1354	1870	1585	1308	591	1084	915	1870	1585	710	1870	1585
Grp Volume(v), veh/h	57	14	75	13	0	51	130	732	22	14	393	87
Grp Sat Flow(s),veh/h/ln	1354	1870	1585	1308	0	1675	915	1870	1585	710	1870	1585
Q Serve(g_s), s	2.4	0.4	2.7	0.5	0.0	1.7	3.2	9.8	0.2	0.5	4.1	0.9
Cycle Q Clear(g_c), s	4.1	0.4	2.7	0.9	0.0	1.7	7.3	9.8	0.2	10.3	4.1	0.9
Prop In Lane	1.00		1.00	1.00		0.65	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	223	195	165	247	0	174	741	1395	1182	533	1395	1182
V/C Ratio(X)	0.26	0.07	0.45	0.05	0.00	0.29	0.18	0.52	0.02	0.03	0.28	0.07
Avail Cap(c_a), veh/h	488	561	476	504	0	503	741	1395	1182	533	1395	1182
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.7	24.3	25.3	24.7	0.0	24.8	3.6	3.2	2.0	5.3	2.5	2.0
Incr Delay (d2), s/veh	0.6	0.2	2.0	0.1	0.0	0.9	0.5	1.4	0.0	0.1	0.5	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.4	0.3	1.9	0.3	0.0	1.2	0.9	3.9	0.1	0.1	1.6	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.3	24.4	27.2	24.8	0.0	25.8	4.1	4.6	2.0	5.4	3.0	2.2
LnGrp LOS	C	C	C	C	A	C	A	A	A	A	A	A
Approach Vol, veh/h		146			64			884			494	
Approach Delay, s/veh		27.0			25.6			4.5			2.9	
Approach LOS		C			C			A			A	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		49.3		10.7		49.3		10.7				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		33.0		18.0		33.0		18.0				
Max Q Clear Time (g_c+I1), s		11.8		6.1		12.3		3.7				
Green Ext Time (p_c), s		6.3		0.3		2.8		0.2				

Intersection Summary

HCM 6th Ctrl Delay	6.9
HCM 6th LOS	A



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↘		↗	↘	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	100		0	100		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.963			0.942			0.996			0.992	
Flt Protected		0.971			0.986		0.950		0.950		0.950	
Satd. Flow (prot)	0	1742	0	0	1730	0	1770	1855	0	1770	1848	0
Flt Permitted		0.971			0.986		0.950		0.950		0.950	
Satd. Flow (perm)	0	1742	0	0	1730	0	1770	1855	0	1770	1848	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		458			470			732			667	
Travel Time (s)		10.4			10.7			16.6			15.2	

Intersection Summary

Area Type: Other

Intersection												
Int Delay, s/veh	3.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	34	7	16	9	9	14	29	752	23	17	398	22
Future Vol, veh/h	34	7	16	9	9	14	29	752	23	17	398	22
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	37	8	17	10	10	15	32	817	25	18	433	24

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1387	1387	445	1388	1387	830	457	0	0	842	0	0
Stage 1	481	481	-	894	894	-	-	-	-	-	-	-
Stage 2	906	906	-	494	493	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	120	143	613	120	143	370	1104	-	-	794	-	-
Stage 1	566	554	-	336	360	-	-	-	-	-	-	-
Stage 2	331	355	-	557	547	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	105	136	613	107	136	370	1104	-	-	794	-	-
Mov Cap-2 Maneuver	105	136	-	107	136	-	-	-	-	-	-	-
Stage 1	550	541	-	326	350	-	-	-	-	-	-	-
Stage 2	300	345	-	521	534	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	48.7		31.5		0.3		0.4	
HCM LOS	E		D					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1104	-	-	142	170	794	-
HCM Lane V/C Ratio	0.029	-	-	0.436	0.205	0.023	-
HCM Control Delay (s)	8.4	-	-	48.7	31.5	9.6	-
HCM Lane LOS	A	-	-	E	D	A	-
HCM 95th %tile Q(veh)	0.1	-	-	1.9	0.7	0.1	-



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕		↗	↖		↗	↖	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	100		0	100		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt					0.932			0.998				
Flt Protected					0.976					0.950		
Satd. Flow (prot)	0	1863	0	0	1694	0	1863	1859	0	1770	1863	0
Flt Permitted					0.976					0.950		
Satd. Flow (perm)	0	1863	0	0	1694	0	1863	1859	0	1770	1863	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		319			430			608			732	
Travel Time (s)		7.3			9.8			13.8			16.6	

Intersection Summary

Area Type: Other

Intersection												
Int Delay, s/veh	0.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	0	0	0	13	0	13	0	763	12	17	433	0
Future Vol, veh/h	0	0	0	13	0	13	0	763	12	17	433	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	14	0	14	0	829	13	18	471	0

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	1350	1349	471	1343	1343	836	471	0	0	842	0	0
Stage 1	507	507	-	836	836	-	-	-	-	-	-	-
Stage 2	843	842	-	507	507	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	128	151	593	129	152	367	1091	-	-	794	-	-
Stage 1	548	539	-	362	382	-	-	-	-	-	-	-
Stage 2	358	380	-	548	539	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	121	148	593	127	149	367	1091	-	-	794	-	-
Mov Cap-2 Maneuver	121	148	-	127	149	-	-	-	-	-	-	-
Stage 1	548	527	-	362	382	-	-	-	-	-	-	-
Stage 2	344	380	-	536	527	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	27.4	0	0.4
HCM LOS	A	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1091	-	-	-	189	794	-
HCM Lane V/C Ratio	-	-	-	-	0.15	0.023	-
HCM Control Delay (s)	0	-	-	0	27.4	9.6	-
HCM Lane LOS	A	-	-	A	D	A	-
HCM 95th %tile Q(veh)	0	-	-	-	0.5	0.1	-

Lanes and Geometrics
 4: Tennyson St. & W 64th Ave.

6501 Lowell Blvd
 06/07/2021



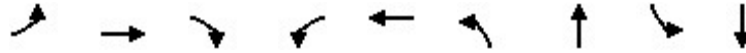
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%				0%
Storage Length (ft)	150		100	150		0	0		0	0		0
Storage Lanes	1		1	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850		0.994			0.920				0.953
Flt Protected	0.950			0.950				0.984				0.983
Satd. Flow (prot)	1770	1863	1583	1770	1852	0	0	1686	0	0	1745	0
Flt Permitted	0.247			0.128				0.884				0.863
Satd. Flow (perm)	460	1863	1583	238	1852	0	0	1515	0	0	1532	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			62		4			93				15
Link Speed (mph)		30			30			30				30
Link Distance (ft)		501			1329			646				482
Travel Time (s)		11.4			30.2			14.7				11.0

Intersection Summary

Area Type: Other

Timings
4: Tennyson St. & W 64th Ave.

6501 Lowell Blvd
06/07/2021

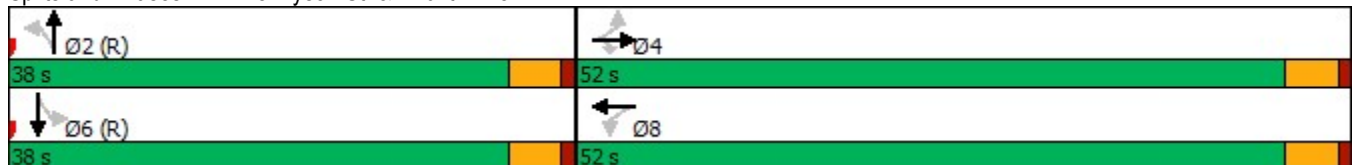


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↖	↑	↗	↖	↗		↕		↕
Traffic Volume (vph)	22	675	98	85	519	121	35	14	12
Future Volume (vph)	22	675	98	85	519	121	35	14	12
Turn Type	Perm	NA	Perm	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4			8		2		6
Permitted Phases	4		4	8		2		6	
Detector Phase	4	4	4	8	8	2	2	6	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	52.0	52.0	52.0	52.0	52.0	38.0	38.0	38.0	38.0
Total Split (%)	57.8%	57.8%	57.8%	57.8%	57.8%	42.2%	42.2%	42.2%	42.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0		0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5		4.5		4.5
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	42.3	42.3	42.3	42.3	42.3		38.7		38.7
Actuated g/C Ratio	0.47	0.47	0.47	0.47	0.47		0.43		0.43
v/c Ratio	0.11	0.84	0.14	0.83	0.68		0.59		0.06
Control Delay	12.8	30.1	5.9	79.7	36.4		20.5		13.3
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	12.8	30.1	5.9	79.7	36.4		20.5		13.3
LOS	B	C	A	E	D		C		B
Approach Delay		26.6			42.2		20.5		13.3
Approach LOS		C			D		C		B

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 55
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.84
 Intersection Signal Delay: 30.4
 Intersection Capacity Utilization 80.0%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service D

Splits and Phases: 4: Tennyson St. & W 64th Ave.





Lane Group	EBL	EBT	EBR	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	24	734	107	92	589	418	43
v/c Ratio	0.11	0.84	0.14	0.83	0.68	0.59	0.06
Control Delay	12.8	30.1	5.9	79.7	36.4	20.5	13.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.8	30.1	5.9	79.7	36.4	20.5	13.3
Queue Length 50th (ft)	7	336	13	54	335	142	9
Queue Length 95th (ft)	20	455	37	m#85	m394	260	32
Internal Link Dist (ft)		421			1249	566	402
Turn Bay Length (ft)	150		100	150			
Base Capacity (vph)	242	983	864	125	979	705	667
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.75	0.12	0.74	0.60	0.59	0.06

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

HCM 6th Signalized Intersection Summary
 4: Tennyson St. & W 64th Ave.

6501 Lowell Blvd
 06/07/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	22	675	98	85	519	23	121	35	228	14	12	14
Future Volume (veh/h)	22	675	98	85	519	23	121	35	228	14	12	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	24	734	107	92	564	25	132	38	248	15	13	15
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	487	930	788	193	883	39	227	80	371	220	192	192
Arrive On Green	0.50	0.50	0.50	0.99	0.99	0.99	0.40	0.40	0.40	0.40	0.40	0.40
Sat Flow, veh/h	827	1870	1585	654	1777	79	433	198	921	413	476	476
Grp Volume(v), veh/h	24	734	107	92	0	589	418	0	0	43	0	0
Grp Sat Flow(s),veh/h/ln	827	1870	1585	654	0	1856	1552	0	0	1366	0	0
Q Serve(g_s), s	1.4	29.2	3.3	11.5	0.0	0.5	15.7	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	1.8	29.2	3.3	40.8	0.0	0.5	19.6	0.0	0.0	1.3	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.04	0.32		0.59	0.35		0.35
Lane Grp Cap(c), veh/h	487	930	788	193	0	923	678	0	0	604	0	0
V/C Ratio(X)	0.05	0.79	0.14	0.48	0.00	0.64	0.62	0.00	0.00	0.07	0.00	0.00
Avail Cap(c_a), veh/h	512	987	837	213	0	980	678	0	0	604	0	0
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.75	0.00	0.75	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	12.0	18.7	12.2	13.6	0.0	0.1	21.8	0.0	0.0	16.4	0.0	0.0
Incr Delay (d2), s/veh	0.0	4.2	0.1	1.4	0.0	1.0	4.2	0.0	0.0	0.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.4	18.6	2.0	2.6	0.0	0.6	12.2	0.0	0.0	1.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	12.0	22.9	12.3	15.0	0.0	1.1	25.9	0.0	0.0	16.7	0.0	0.0
LnGrp LOS	B	C	B	B	A	A	C	A	A	B	A	A
Approach Vol, veh/h		865			681			418				43
Approach Delay, s/veh		21.3			3.0			25.9				16.7
Approach LOS		C			A			C				B
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		40.8		49.2		40.8		49.2				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		33.5		47.5		33.5		47.5				
Max Q Clear Time (g_c+I1), s		21.6		31.2		3.3		42.8				
Green Ext Time (p_c), s		2.2		5.3		0.2		1.9				

Intersection Summary

HCM 6th Ctrl Delay	15.9
HCM 6th LOS	B



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	200		150	150		75	200		150	200		100
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.143			0.496			0.603			0.212		
Satd. Flow (perm)	266	1863	1583	924	1863	1583	1123	1863	1583	395	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			84			127			127			174
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1329			1480			763			608	
Travel Time (s)		30.2			33.6			17.3			13.8	

Intersection Summary

Area Type: Other



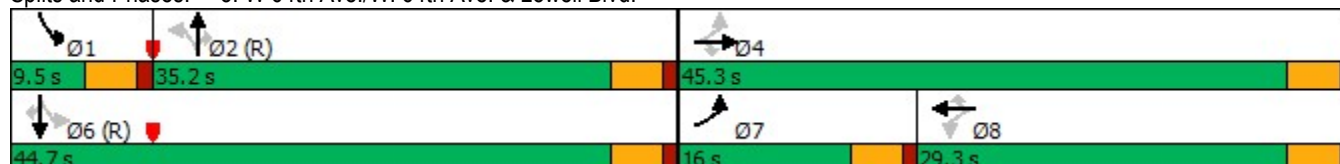
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	240	428	77	52	396	64	136	461	111	44	232	160
Future Volume (vph)	240	428	77	52	396	64	136	461	111	44	232	160
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4			8			2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	7	4	4	8	8	8	2	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	16.0	45.3	45.3	29.3	29.3	29.3	35.2	35.2	35.2	9.5	44.7	44.7
Total Split (%)	17.8%	50.3%	50.3%	32.6%	32.6%	32.6%	39.1%	39.1%	39.1%	10.6%	49.7%	49.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead			Lag	Lag	Lag	Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes			Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	39.4	39.4	39.4	23.4	23.4	23.4	35.9	35.9	35.9	41.6	41.6	41.6
Actuated g/C Ratio	0.44	0.44	0.44	0.26	0.26	0.26	0.40	0.40	0.40	0.46	0.46	0.46
v/c Ratio	0.85	0.57	0.11	0.24	0.89	0.14	0.33	0.67	0.17	0.18	0.29	0.21
Control Delay	50.5	31.4	9.7	31.6	49.9	7.6	23.6	29.9	4.4	15.8	16.7	3.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.5	31.4	9.7	31.6	49.9	7.6	23.6	29.9	4.4	15.8	16.7	3.1
LOS	D	C	A	C	D	A	C	C	A	B	B	A
Approach Delay		35.3			42.7			24.7			11.6	
Approach LOS		D			D			C			B	

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.89
 Intersection Signal Delay: 29.4
 Intersection Capacity Utilization 77.6%
 Analysis Period (min) 15

Intersection LOS: C
 ICU Level of Service D

Splits and Phases: 5: W 64th Ave./W. 64th Ave. & Lowell Blvd.





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	261	465	84	57	430	70	148	501	121	48	252	174
v/c Ratio	0.85	0.57	0.11	0.24	0.89	0.14	0.33	0.67	0.17	0.18	0.29	0.21
Control Delay	50.5	31.4	9.7	31.6	49.9	7.6	23.6	29.9	4.4	15.8	16.7	3.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.5	31.4	9.7	31.6	49.9	7.6	23.6	29.9	4.4	15.8	16.7	3.1
Queue Length 50th (ft)	134	227	9	30	270	3	63	254	0	15	89	0
Queue Length 95th (ft)	m#193	314	m23	m37	m320	m4	118	#410	33	35	143	35
Internal Link Dist (ft)		1249			1400			683			528	
Turn Bay Length (ft)	200		150	150		75	200		150	200		100
Base Capacity (vph)	308	844	763	254	513	528	448	743	708	263	861	825
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.85	0.55	0.11	0.22	0.84	0.13	0.33	0.67	0.17	0.18	0.29	0.21

Intersection Summary

- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

HCM 6th Signalized Intersection Summary
 5: W 64th Ave./W. 64th Ave. & Lowell Blvd.

6501 Lowell Blvd
 06/07/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	240	428	77	52	396	64	136	461	111	44	232	160
Future Volume (veh/h)	240	428	77	52	396	64	136	461	111	44	232	160
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	261	465	84	57	430	70	148	501	121	48	252	174
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	329	810	686	290	483	409	444	708	600	270	874	740
Arrive On Green	0.12	0.43	0.43	0.09	0.09	0.09	0.38	0.38	0.38	0.04	0.47	0.47
Sat Flow, veh/h	1781	1870	1585	858	1870	1585	961	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	261	465	84	57	430	70	148	501	121	48	252	174
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	858	1870	1585	961	1870	1585	1781	1870	1585
Q Serve(g_s), s	9.2	16.9	2.9	5.6	20.5	3.7	10.2	20.5	4.6	1.4	7.5	5.9
Cycle Q Clear(g_c), s	9.2	16.9	2.9	6.8	20.5	3.7	10.2	20.5	4.6	1.4	7.5	5.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	329	810	686	290	483	409	444	708	600	270	874	740
V/C Ratio(X)	0.79	0.57	0.12	0.20	0.89	0.17	0.33	0.71	0.20	0.18	0.29	0.23
Avail Cap(c_a), veh/h	335	848	719	305	515	437	444	708	600	300	874	740
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.43	0.43	0.43	0.46	0.46	0.46	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.1	19.3	15.3	34.2	39.9	32.2	20.6	23.8	18.8	17.5	14.8	14.4
Incr Delay (d2), s/veh	5.5	0.4	0.0	0.2	8.7	0.1	2.0	5.9	0.8	0.3	0.8	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	6.3	9.9	1.8	2.2	15.1	2.6	4.4	15.0	3.2	1.0	5.8	3.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.6	19.6	15.3	34.3	48.6	32.3	22.6	29.7	19.6	17.8	15.6	15.1
LnGrp LOS	C	B	B	C	D	C	C	C	B	B	B	B
Approach Vol, veh/h		810			557			770				474
Approach Delay, s/veh		21.8			45.1			26.7				15.6
Approach LOS		C			D			C				B
Timer - Assigned Phs	1	2		4		6	7	8				
Phs Duration (G+Y+Rc), s	8.0	38.6		43.5		46.5	15.7	27.8				
Change Period (Y+Rc), s	4.5	4.5		4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s	5.0	30.7		40.8		40.2	11.5	24.8				
Max Q Clear Time (g_c+I1), s	3.4	22.5		18.9		9.5	11.2	22.5				
Green Ext Time (p_c), s	0.0	2.8		3.3		2.2	0.0	0.8				

Intersection Summary

HCM 6th Ctrl Delay	27.1
HCM 6th LOS	C



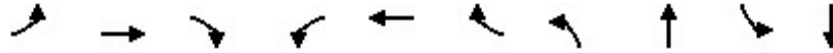
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	100		150	150		100	600		0	250		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor			0.850			0.850		0.993			0.988	
Flt Protected	0.950			0.950			0.950		0.950			
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	5050	0	1770	5024	0
Flt Permitted	0.243			0.498			0.108		0.123			
Satd. Flow (perm)	453	1863	1583	928	1863	1583	201	5050	0	229	5024	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			198			236		10			17	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1480			550			1046			611	
Travel Time (s)		33.6			12.5			23.8			13.9	

Intersection Summary

Area Type: Other

Timings
6: Federal Blvd. & W. 64th Ave.

6501 Lowell Blvd
06/07/2021

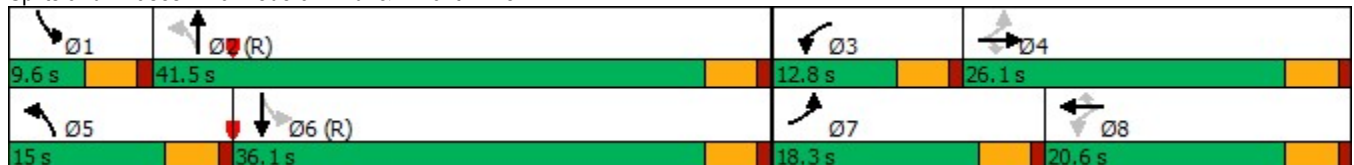


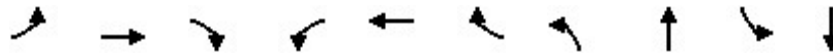
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations	↖	↑	↗	↖	↑	↗	↖	↑↑↑	↖	↑↑↑
Traffic Volume (vph)	301	255	182	120	223	103	231	1979	90	1620
Future Volume (vph)	301	255	182	120	223	103	231	1979	90	1620
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA
Protected Phases	7	4		3	8		5	2	1	6
Permitted Phases	4		4	8		8	2		6	
Detector Phase	7	4	4	3	8	8	5	2	1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	20.6	20.6	9.5	22.5	9.5	22.5
Total Split (s)	18.3	26.1	26.1	12.8	20.6	20.6	15.0	41.5	9.6	36.1
Total Split (%)	20.3%	29.0%	29.0%	14.2%	22.9%	22.9%	16.7%	46.1%	10.7%	40.1%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)	33.2	20.7	20.7	22.9	14.9	14.9	47.8	39.9	38.1	32.6
Actuated g/C Ratio	0.37	0.23	0.23	0.25	0.17	0.17	0.53	0.44	0.42	0.36
v/c Ratio	0.89	0.65	0.38	0.42	0.79	0.24	0.86	1.01	0.51	1.04
Control Delay	63.9	53.7	18.4	24.0	54.8	1.3	47.1	47.8	22.4	62.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.9	53.7	18.4	24.0	54.8	1.3	47.1	47.8	22.4	62.9
LOS	E	D	B	C	D	A	D	D	C	E
Approach Delay		49.1			34.1			47.8		60.9
Approach LOS		D			C			D		E

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.04
 Intersection Signal Delay: 51.4
 Intersection LOS: D
 Intersection Capacity Utilization 90.6%
 ICU Level of Service E
 Analysis Period (min) 15

Splits and Phases: 6: Federal Blvd. & W. 64th Ave.





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	327	277	198	130	242	112	251	2258	98	1911
v/c Ratio	0.89	0.65	0.38	0.42	0.79	0.24	0.86	1.01	0.51	1.04
Control Delay	63.9	53.7	18.4	24.0	54.8	1.3	47.1	47.8	22.4	62.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.9	53.7	18.4	24.0	54.8	1.3	47.1	47.8	22.4	62.9
Queue Length 50th (ft)	176	154	30	48	131	0	91	~533	27	~446
Queue Length 95th (ft)	#276	236	84	88	#236	0	#227	#631	#54	#544
Internal Link Dist (ft)		1400			470			966		531
Turn Bay Length (ft)	100		150	150		100	600		250	
Base Capacity (vph)	369	447	530	316	333	476	294	2243	191	1832
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.89	0.62	0.37	0.41	0.73	0.24	0.85	1.01	0.51	1.04

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM 6th Signalized Intersection Summary
6: Federal Blvd. & W. 64th Ave.

6501 Lowell Blvd
06/07/2021


























Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	301	255	182	120	223	103	231	1979	98	90	1620	138
Future Volume (veh/h)	301	255	182	120	223	103	231	1979	98	90	1620	138
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	327	277	198	130	242	112	251	2151	107	98	1761	150
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	381	425	360	298	287	243	285	2205	109	173	1825	155
Arrive On Green	0.05	0.07	0.07	0.08	0.15	0.15	0.11	0.44	0.44	0.05	0.38	0.38
Sat Flow, veh/h	1781	1870	1585	1781	1870	1585	1781	4983	247	1781	4794	407
Grp Volume(v), veh/h	327	277	198	130	242	112	251	1466	792	98	1249	662
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	1585	1781	1702	1826	1781	1702	1797
Q Serve(g_s), s	13.2	13.0	10.8	5.4	11.3	5.8	8.1	38.0	38.4	3.0	32.3	32.5
Cycle Q Clear(g_c), s	13.2	13.0	10.8	5.4	11.3	5.8	8.1	38.0	38.4	3.0	32.3	32.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.14	1.00		0.23
Lane Grp Cap(c), veh/h	381	425	360	298	287	243	285	1506	808	173	1296	684
V/C Ratio(X)	0.86	0.65	0.55	0.44	0.84	0.46	0.88	0.97	0.98	0.57	0.96	0.97
Avail Cap(c_a), veh/h	381	449	380	321	335	284	292	1506	808	184	1296	684
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	0.88	0.88	0.88	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.2	38.2	37.2	28.8	37.0	34.7	23.0	24.6	24.7	21.9	27.3	27.3
Incr Delay (d2), s/veh	15.6	2.7	1.3	1.0	15.7	1.4	24.7	17.6	27.2	3.6	17.7	27.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	12.2	10.8	8.1	4.3	10.4	4.1	8.9	24.9	29.2	2.4	22.1	25.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	44.7	40.9	38.5	29.8	52.7	36.1	47.7	42.2	51.9	25.5	45.0	54.7
LnGrp LOS	D	D	D	C	D	D	D	D	D	C	D	D
Approach Vol, veh/h		802			484			2509			2009	
Approach Delay, s/veh		41.9			42.7			45.8			47.2	
Approach LOS		D			D			D			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.1	44.3	11.7	24.9	14.6	38.8	18.3	18.3				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	5.1	37.0	8.3	21.6	10.5	31.6	13.8	16.1				
Max Q Clear Time (g_c+I1), s	5.0	40.4	7.4	15.0	10.1	34.5	15.2	13.3				
Green Ext Time (p_c), s	0.0	0.0	0.0	1.3	0.0	0.0	0.0	0.5				

Intersection Summary

HCM 6th Ctrl Delay	45.5
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		150	150		0	225		250	150		150
Storage Lanes	1		1	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850		0.929				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1730	0	1770	1863	1583	1770	1863	1583
Flt Permitted	0.744			0.751			0.556			0.633		
Satd. Flow (perm)	1386	1863	1583	1399	1730	0	1036	1863	1583	1179	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			121		10				27			58
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		594			990			699			502	
Travel Time (s)		13.5			22.5			15.9			11.4	

Intersection Summary

Area Type: Other

Timings
1: Lowell Blvd. & W. 68th Ave.

6501 Lowell Blvd
06/07/2021



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	50	9	111	3	10	63	183	1	16	313	53
Future Volume (vph)	50	9	111	3	10	63	183	1	16	313	53
Turn Type	Perm	NA	Perm	Perm	NA	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8		2			6	
Permitted Phases	4		4	8		2		2	6		6
Detector Phase	4	4	4	8	8	2	2	2	6	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	26.0	26.0	26.0	26.0	26.0	34.0	34.0	34.0	34.0	34.0	34.0
Total Split (%)	43.3%	43.3%	43.3%	43.3%	43.3%	56.7%	56.7%	56.7%	56.7%	56.7%	56.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag											
Lead-Lag Optimize?											
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	7.9	7.9	7.9	7.9	7.9	46.0	46.0	46.0	46.0	46.0	46.0
Actuated g/C Ratio	0.13	0.13	0.13	0.13	0.13	0.77	0.77	0.77	0.77	0.77	0.77
v/c Ratio	0.30	0.04	0.39	0.02	0.09	0.09	0.14	0.00	0.02	0.24	0.05
Control Delay	27.0	21.7	9.2	21.3	16.9	3.3	3.2	0.0	3.1	3.6	1.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.0	21.7	9.2	21.3	16.9	3.3	3.2	0.0	3.1	3.6	1.2
LOS	C	C	A	C	B	A	A	A	A	A	A
Approach Delay		15.1			17.4		3.2			3.2	
Approach LOS		B			B		A			A	

Intersection Summary

Cycle Length: 60
 Actuated Cycle Length: 60
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 45
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.39
 Intersection Signal Delay: 6.1
 Intersection Capacity Utilization 41.3%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service A

Splits and Phases: 1: Lowell Blvd. & W. 68th Ave.



Queues

6501 Lowell Blvd

1: Lowell Blvd. & W. 68th Ave.

06/07/2021



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	54	10	121	3	21	68	199	1	17	340	58
v/c Ratio	0.30	0.04	0.39	0.02	0.09	0.09	0.14	0.00	0.02	0.24	0.05
Control Delay	27.0	21.7	9.2	21.3	16.9	3.3	3.2	0.0	3.1	3.6	1.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.0	21.7	9.2	21.3	16.9	3.3	3.2	0.0	3.1	3.6	1.2
Queue Length 50th (ft)	18	3	0	1	4	5	17	0	1	31	0
Queue Length 95th (ft)	44	14	37	7	19	18	40	0	6	69	8
Internal Link Dist (ft)		514			910		619			422	
Turn Bay Length (ft)	150		150	150		225		250	150		150
Base Capacity (vph)	496	667	644	501	626	794	1429	1220	904	1429	1227
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.01	0.19	0.01	0.03	0.09	0.14	0.00	0.02	0.24	0.05

Intersection Summary

HCM 6th Signalized Intersection Summary
 1: Lowell Blvd. & W. 68th Ave.

6501 Lowell Blvd
 06/07/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	9	111	3	10	9	63	183	1	16	313	53
Future Volume (veh/h)	50	9	111	3	10	9	63	183	1	16	313	53
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	54	10	121	3	11	10	68	199	1	17	340	58
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	259	208	176	254	100	91	792	1382	1171	957	1382	1171
Arrive On Green	0.11	0.11	0.11	0.11	0.11	0.11	0.74	0.74	0.74	0.74	0.74	0.74
Sat Flow, veh/h	1391	1870	1585	1259	902	820	987	1870	1585	1182	1870	1585
Grp Volume(v), veh/h	54	10	121	3	0	21	68	199	1	17	340	58
Grp Sat Flow(s),veh/h/ln	1391	1870	1585	1259	0	1723	987	1870	1585	1182	1870	1585
Q Serve(g_s), s	2.2	0.3	4.4	0.1	0.0	0.7	1.4	1.9	0.0	0.3	3.5	0.6
Cycle Q Clear(g_c), s	2.8	0.3	4.4	0.4	0.0	0.7	4.9	1.9	0.0	2.1	3.5	0.6
Prop In Lane	1.00		1.00	1.00		0.48	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	259	208	176	254	0	191	792	1382	1171	957	1382	1171
V/C Ratio(X)	0.21	0.05	0.69	0.01	0.00	0.11	0.09	0.14	0.00	0.02	0.25	0.05
Avail Cap(c_a), veh/h	603	670	568	565	0	617	792	1382	1171	957	1382	1171
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.3	23.8	25.7	24.0	0.0	24.0	3.3	2.3	2.0	2.6	2.5	2.1
Incr Delay (d2), s/veh	0.4	0.1	4.7	0.0	0.0	0.3	0.2	0.2	0.0	0.0	0.4	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.3	0.2	3.2	0.1	0.0	0.5	0.4	0.7	0.0	0.1	1.4	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.7	23.9	30.3	24.0	0.0	24.2	3.5	2.5	2.0	2.6	2.9	2.2
LnGrp LOS	C	C	C	C	A	C	A	A	A	A	A	A
Approach Vol, veh/h		185			24			268			415	
Approach Delay, s/veh		28.6			24.2			2.8			2.8	
Approach LOS		C			C			A			A	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		48.8		11.2		48.8		11.2				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		29.5		21.5		29.5		21.5				
Max Q Clear Time (g_c+I1), s		6.9		6.4		5.5		2.7				
Green Ext Time (p_c), s		1.4		0.5		2.3		0.1				

Intersection Summary

HCM 6th Ctrl Delay	8.7
HCM 6th LOS	A



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↙	↘		↙	↘	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	100		0	100		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.920			0.940			0.996			0.993	
Flt Protected		0.985			0.978		0.950		0.950		0.950	
Satd. Flow (prot)	0	1688	0	0	1712	0	1770	1855	0	1770	1850	0
Flt Permitted		0.985			0.978		0.950		0.950		0.950	
Satd. Flow (perm)	0	1688	0	0	1712	0	1770	1855	0	1770	1850	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		458			470			732			699	
Travel Time (s)		10.4			10.7			16.6			15.9	

Intersection Summary

Area Type: Other

Intersection												
Int Delay, s/veh	1.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	13	5	26	14	4	14	10	326	9	4	435	21
Future Vol, veh/h	13	5	26	14	4	14	10	326	9	4	435	21
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	14	5	28	15	4	15	11	354	10	4	473	23

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	884	879	485	890	885	359	496	0	0	364	0	0
Stage 1	493	493	-	381	381	-	-	-	-	-	-	-
Stage 2	391	386	-	509	504	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	266	286	582	264	284	685	1068	-	-	1195	-	-
Stage 1	558	547	-	641	613	-	-	-	-	-	-	-
Stage 2	633	610	-	547	541	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	254	282	582	245	280	685	1068	-	-	1195	-	-
Mov Cap-2 Maneuver	254	282	-	245	280	-	-	-	-	-	-	-
Stage 1	552	545	-	635	607	-	-	-	-	-	-	-
Stage 2	608	604	-	514	539	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	15.6		16.5		0.2		0.1	
HCM LOS	C		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1068	-	-	387	348	1195	-
HCM Lane V/C Ratio	0.01	-	-	0.124	0.1	0.004	-
HCM Control Delay (s)	8.4	-	-	15.6	16.5	8	-
HCM Lane LOS	A	-	-	C	C	A	-
HCM 95th %tile Q(veh)	0	-	-	0.4	0.3	0	-



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↘		↗	↘	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	100		0	100		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.916			0.922			0.996				0.999
Flt Protected		0.986			0.983		0.950			0.950		
Satd. Flow (prot)	0	1682	0	0	1688	0	1770	1855	0	1770	1861	0
Flt Permitted		0.986			0.983		0.950			0.950		
Satd. Flow (perm)	0	1682	0	0	1688	0	1770	1855	0	1770	1861	0
Link Speed (mph)		30			30			30				30
Link Distance (ft)		319			430			608				732
Travel Time (s)		7.3			9.8			13.8				16.6

Intersection Summary

Area Type: Other

Intersection												
Int Delay, s/veh	1.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	11	4	24	8	2	14	8	322	9	12	461	4
Future Vol, veh/h	11	4	24	8	2	14	8	322	9	12	461	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	12	4	26	9	2	15	9	350	10	13	501	4

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	911	907	503	917	904	355	505	0	0	360	0	0
Stage 1	529	529	-	373	373	-	-	-	-	-	-	-
Stage 2	382	378	-	544	531	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	255	276	569	253	277	689	1060	-	-	1199	-	-
Stage 1	533	527	-	648	618	-	-	-	-	-	-	-
Stage 2	640	615	-	523	526	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	244	271	569	235	272	689	1060	-	-	1199	-	-
Mov Cap-2 Maneuver	244	271	-	235	272	-	-	-	-	-	-	-
Stage 1	529	521	-	643	613	-	-	-	-	-	-	-
Stage 2	618	610	-	489	520	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	15.6		14.9		0.2		0.2	
HCM LOS	C		B					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1060	-	-	382	389	1199	-	-
HCM Lane V/C Ratio	0.008	-	-	0.111	0.067	0.011	-	-
HCM Control Delay (s)	8.4	-	-	15.6	14.9	8	-	-
HCM Lane LOS	A	-	-	C	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.4	0.2	0	-	-

Lanes and Geometrics
 4: Tennyson St. & W 64th Ave.

6501 Lowell Blvd
 06/07/2021



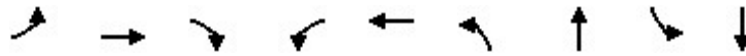
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%				0%
Storage Length (ft)	150		100	150		0	0		0	0		0
Storage Lanes	1		1	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850		0.995			0.919				0.951
Flt Protected	0.950			0.950				0.984				0.992
Satd. Flow (prot)	1770	1863	1583	1770	1853	0	0	1684	0	0	1757	0
Flt Permitted	0.239			0.368				0.904				0.965
Satd. Flow (perm)	445	1863	1583	685	1853	0	0	1548	0	0	1709	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			65		3			92				18
Link Speed (mph)		30			30			30				30
Link Distance (ft)		700			838			502				485
Travel Time (s)		15.9			19.0			11.4				11.0

Intersection Summary

Area Type: Other

Timings
4: Tennyson St. & W 64th Ave.

6501 Lowell Blvd
06/07/2021

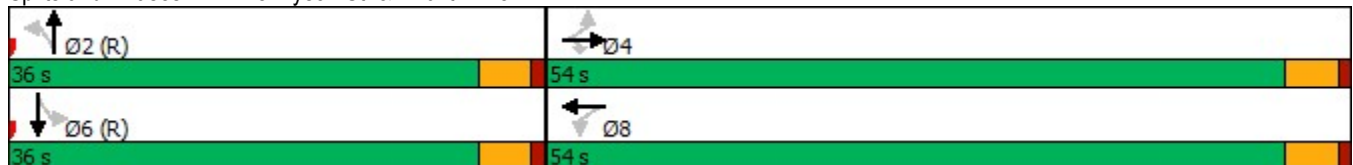


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↖	↑	↗	↖	↗		↕		↕
Traffic Volume (vph)	12	319	60	160	401	56	14	7	22
Future Volume (vph)	12	319	60	160	401	56	14	7	22
Turn Type	Perm	NA	Perm	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4			8		2		6
Permitted Phases	4		4	8		2		6	
Detector Phase	4	4	4	8	8	2	2	6	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	54.0	54.0	54.0	54.0	54.0	36.0	36.0	36.0	36.0
Total Split (%)	60.0%	60.0%	60.0%	60.0%	60.0%	40.0%	40.0%	40.0%	40.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0		0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5		4.5		4.5
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	29.7	29.7	29.7	29.7	29.7		51.3		51.3
Actuated g/C Ratio	0.33	0.33	0.33	0.33	0.33		0.57		0.57
v/c Ratio	0.09	0.56	0.11	0.77	0.73		0.21		0.05
Control Delay	18.3	27.3	4.8	59.3	43.8		7.0		8.6
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	18.3	27.3	4.8	59.3	43.8		7.0		8.6
LOS	B	C	A	E	D		A		A
Approach Delay		23.6			48.2		7.0		8.6
Approach LOS		C			D		A		A

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 45
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.77
 Intersection Signal Delay: 32.5
 Intersection LOS: C
 Intersection Capacity Utilization 54.3%
 ICU Level of Service A
 Analysis Period (min) 15

Splits and Phases: 4: Tennyson St. & W 64th Ave.





Lane Group	EBL	EBT	EBR	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	13	347	65	174	450	190	50
v/c Ratio	0.09	0.56	0.11	0.77	0.73	0.21	0.05
Control Delay	18.3	27.3	4.8	59.3	43.8	7.0	8.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.3	27.3	4.8	59.3	43.8	7.0	8.6
Queue Length 50th (ft)	5	161	0	99	254	24	7
Queue Length 95th (ft)	16	200	22	167	342	73	30
Internal Link Dist (ft)		620			758	422	405
Turn Bay Length (ft)	150		100	150			
Base Capacity (vph)	244	1024	899	376	1020	921	981
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.34	0.07	0.46	0.44	0.21	0.05

Intersection Summary

HCM 6th Signalized Intersection Summary
 4: Tennyson St. & W 64th Ave.

6501 Lowell Blvd
 06/07/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	319	60	160	401	13	56	14	105	7	22	17
Future Volume (veh/h)	12	319	60	160	401	13	56	14	105	7	22	17
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	13	347	65	174	436	14	61	15	114	8	24	18
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	231	704	596	308	678	22	286	89	484	154	450	314
Arrive On Green	0.38	0.38	0.38	0.25	0.25	0.25	0.52	0.52	0.52	0.52	0.52	0.52
Sat Flow, veh/h	940	1870	1585	974	1802	58	446	170	923	205	860	599
Grp Volume(v), veh/h	13	347	65	174	0	450	190	0	0	50	0	0
Grp Sat Flow(s),veh/h/ln	940	1870	1585	974	0	1860	1539	0	0	1664	0	0
Q Serve(g_s), s	1.1	12.8	2.4	15.4	0.0	19.4	1.4	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	20.5	12.8	2.4	28.2	0.0	19.4	5.6	0.0	0.0	1.3	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.03	0.32		0.60	0.16		0.36
Lane Grp Cap(c), veh/h	231	704	596	308	0	700	859	0	0	918	0	0
V/C Ratio(X)	0.06	0.49	0.11	0.56	0.00	0.64	0.22	0.00	0.00	0.05	0.00	0.00
Avail Cap(c_a), veh/h	394	1029	872	477	0	1023	859	0	0	918	0	0
HCM Platoon Ratio	1.00	1.00	1.00	0.67	0.67	0.67	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	32.2	21.5	18.3	37.7	0.0	28.3	11.5	0.0	0.0	10.5	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.5	0.1	1.6	0.0	1.0	0.6	0.0	0.0	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.4	9.4	1.6	7.1	0.0	14.2	3.7	0.0	0.0	0.9	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	32.3	22.0	18.3	39.3	0.0	29.3	12.1	0.0	0.0	10.6	0.0	0.0
LnGrp LOS	C	C	B	D	A	C	B	A	A	B	A	A
Approach Vol, veh/h		425			624			190			50	
Approach Delay, s/veh		21.8			32.0			12.1			10.6	
Approach LOS		C			C			B			B	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		51.6		38.4		51.6		38.4				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		31.5		49.5		31.5		49.5				
Max Q Clear Time (g_c+I1), s		7.6		22.5		3.3		30.2				
Green Ext Time (p_c), s		1.1		2.5		0.2		3.7				
Intersection Summary												
HCM 6th Ctrl Delay				24.9								
HCM 6th LOS				C								



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	200		150	150		75	200		150	200		100
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.279			0.559			0.575			0.589		
Satd. Flow (perm)	520	1863	1583	1041	1863	1583	1071	1863	1583	1097	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			102			127			127			136
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		596			1268			763			608	
Travel Time (s)		13.5			28.8			17.3			13.8	

Intersection Summary

Area Type: Other

Timings
5: W 64th Ave./W. 64th Ave. & Lowell Blvd.

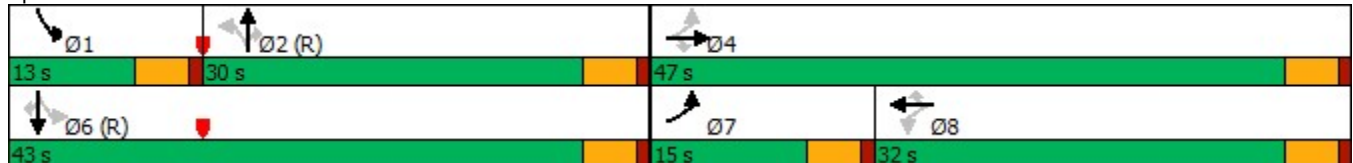
6501 Lowell Blvd
06/07/2021

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	117	307	94	72	241	44	47	134	56	94	279	125
Future Volume (vph)	117	307	94	72	241	44	47	134	56	94	279	125
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4			8			2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	7	4	4	8	8	8	2	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	15.0	47.0	47.0	32.0	32.0	32.0	30.0	30.0	30.0	13.0	43.0	43.0
Total Split (%)	16.7%	52.2%	52.2%	35.6%	35.6%	35.6%	33.3%	33.3%	33.3%	14.4%	47.8%	47.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead			Lag	Lag	Lag	Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes			Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	32.5	32.5	32.5	18.4	18.4	18.4	38.0	38.0	38.0	48.5	48.5	48.5
Actuated g/C Ratio	0.36	0.36	0.36	0.20	0.20	0.20	0.42	0.42	0.42	0.54	0.54	0.54
v/c Ratio	0.40	0.50	0.16	0.37	0.69	0.11	0.11	0.19	0.08	0.16	0.30	0.15
Control Delay	35.6	39.1	16.4	32.6	39.4	3.2	22.0	21.0	0.2	12.7	13.9	3.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.6	39.1	16.4	32.6	39.4	3.2	22.0	21.0	0.2	12.7	13.9	3.0
LOS	D	D	B	C	D	A	C	C	A	B	B	A
Approach Delay		34.2			33.5			16.3			10.9	
Approach LOS		C			C			B			B	

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 65
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.69
 Intersection Signal Delay: 24.2
 Intersection Capacity Utilization 54.2%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service A

Splits and Phases: 5: W 64th Ave./W. 64th Ave. & Lowell Blvd.





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	127	334	102	78	262	48	51	146	61	102	303	136
v/c Ratio	0.40	0.50	0.16	0.37	0.69	0.11	0.11	0.19	0.08	0.16	0.30	0.15
Control Delay	35.6	39.1	16.4	32.6	39.4	3.2	22.0	21.0	0.2	12.7	13.9	3.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.6	39.1	16.4	32.6	39.4	3.2	22.0	21.0	0.2	12.7	13.9	3.0
Queue Length 50th (ft)	68	187	17	39	141	1	18	53	0	27	91	0
Queue Length 95th (ft)	110	248	53	m59	m173	m4	51	115	0	63	172	31
Internal Link Dist (ft)		516			1188			683			528	
Turn Bay Length (ft)	200		150	150		75	200		150	200		100
Base Capacity (vph)	333	879	801	318	569	571	452	786	741	659	1004	916
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.38	0.38	0.13	0.25	0.46	0.08	0.11	0.19	0.08	0.15	0.30	0.15

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM 6th Signalized Intersection Summary
 5: W 64th Ave./W. 64th Ave. & Lowell Blvd.

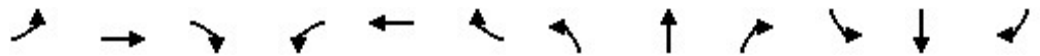
6501 Lowell Blvd
 06/07/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↘	↖	↗	↘	↖	↗	↘	↖	↗	↘
Traffic Volume (veh/h)	117	307	94	72	241	44	47	134	56	94	279	125
Future Volume (veh/h)	117	307	94	72	241	44	47	134	56	94	279	125
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	127	334	102	78	262	48	51	146	61	102	303	136
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	259	570	483	208	335	284	549	924	783	701	1113	943
Arrive On Green	0.02	0.10	0.10	0.06	0.06	0.06	0.49	0.49	0.49	0.05	0.60	0.60
Sat Flow, veh/h	1781	1870	1585	953	1870	1585	950	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	127	334	102	78	262	48	51	146	61	102	303	136
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	953	1870	1585	950	1870	1585	1781	1870	1585
Q Serve(g_s), s	5.0	15.4	5.3	7.2	12.4	2.6	2.6	3.9	1.8	2.4	7.0	3.4
Cycle Q Clear(g_c), s	5.0	15.4	5.3	11.3	12.4	2.6	2.6	3.9	1.8	2.4	7.0	3.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	259	570	483	208	335	284	549	924	783	701	1113	943
V/C Ratio(X)	0.49	0.59	0.21	0.38	0.78	0.17	0.09	0.16	0.08	0.15	0.27	0.14
Avail Cap(c_a), veh/h	332	883	748	328	571	484	549	924	783	778	1113	943
HCM Platoon Ratio	0.33	0.33	0.33	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	0.76	0.76	0.76	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.1	35.0	30.5	42.1	40.6	36.0	12.2	12.5	12.0	9.1	8.8	8.1
Incr Delay (d2), s/veh	1.4	1.0	0.2	0.9	3.1	0.2	0.3	0.4	0.2	0.1	0.6	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	4.1	12.4	3.8	3.4	10.1	1.8	1.0	3.0	1.2	1.6	5.0	2.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	29.6	36.0	30.7	42.9	43.7	36.2	12.5	12.9	12.2	9.2	9.4	8.4
LnGrp LOS	C	D	C	D	D	D	B	B	B	A	A	A
Approach Vol, veh/h		563			388			258			541	
Approach Delay, s/veh		33.6			42.6			12.6			9.1	
Approach LOS		C			D			B			A	
Timer - Assigned Phs	1	2		4		6	7	8				
Phs Duration (G+Y+Rc), s	9.1	49.0		31.9		58.1	11.3	20.6				
Change Period (Y+Rc), s	4.5	4.5		4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s	8.5	25.5		42.5		38.5	10.5	27.5				
Max Q Clear Time (g_c+l1), s	4.4	5.9		17.4		9.0	7.0	14.4				
Green Ext Time (p_c), s	0.1	1.2		2.4		2.4	0.1	1.7				

Intersection Summary

HCM 6th Ctrl Delay	24.9
HCM 6th LOS	C



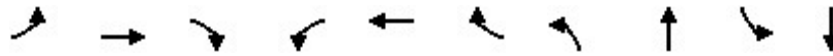
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	100		150	150		100	600		0	250		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor			0.850			0.850		0.987			0.990	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	5019	0	1770	5034	0
Flt Permitted	0.433			0.447			0.084			0.229		
Satd. Flow (perm)	807	1863	1583	833	1863	1583	156	5019	0	427	5034	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			134			127			23			17
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1268			424			903			562	
Travel Time (s)		28.8			9.6			20.5			12.8	

Intersection Summary

Area Type: Other

Timings
6: Federal Blvd. & W. 64th Ave.

6501 Lowell Blvd
06/07/2021

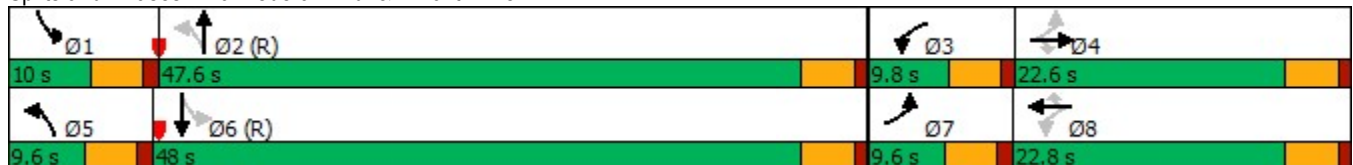


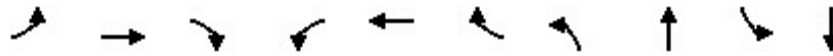
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations	↖	↑	↗	↖	↑	↗	↖	↑↑↑	↖	↑↑↑
Traffic Volume (vph)	117	169	174	139	179	43	97	864	68	2266
Future Volume (vph)	117	169	174	139	179	43	97	864	68	2266
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA
Protected Phases	7	4		3	8		5	2	1	6
Permitted Phases	4		4	8		8	2		6	
Detector Phase	7	4	4	3	8	8	5	2	1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	9.5	22.5
Total Split (s)	9.6	22.6	22.6	9.8	22.8	22.8	9.6	47.6	10.0	48.0
Total Split (%)	10.7%	25.1%	25.1%	10.9%	25.3%	25.3%	10.7%	52.9%	11.1%	53.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)	19.2	14.1	14.1	19.6	14.3	14.3	53.6	48.4	53.4	48.3
Actuated g/C Ratio	0.21	0.16	0.16	0.22	0.16	0.16	0.60	0.54	0.59	0.54
v/c Ratio	0.56	0.63	0.53	0.64	0.66	0.13	0.50	0.38	0.21	0.98
Control Delay	27.3	32.6	9.7	40.3	46.1	0.8	20.1	13.3	8.8	35.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.3	32.6	9.7	40.3	46.1	0.8	20.1	13.3	8.8	35.2
LOS	C	C	A	D	D	A	C	B	A	D
Approach Delay		22.6			38.5			14.0		34.5
Approach LOS		C			D			B		C

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.98
 Intersection Signal Delay: 28.7
 Intersection LOS: C
 Intersection Capacity Utilization 84.4%
 ICU Level of Service E
 Analysis Period (min) 15

Splits and Phases: 6: Federal Blvd. & W. 64th Ave.





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	127	184	189	151	195	47	105	1027	74	2641
v/c Ratio	0.56	0.63	0.53	0.64	0.66	0.13	0.50	0.38	0.21	0.98
Control Delay	27.3	32.6	9.7	40.3	46.1	0.8	20.1	13.3	8.8	35.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.3	32.6	9.7	40.3	46.1	0.8	20.1	13.3	8.8	35.2
Queue Length 50th (ft)	32	50	0	69	105	0	21	123	15	~606
Queue Length 95th (ft)	64	92	0	114	167	0	#77	164	35	#718
Internal Link Dist (ft)		1188			344			823		482
Turn Bay Length (ft)	100		150	150		100	600		250	
Base Capacity (vph)	226	374	425	236	378	423	208	2707	346	2708
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.49	0.44	0.64	0.52	0.11	0.50	0.38	0.21	0.98

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

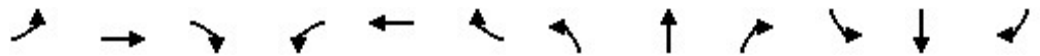
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

HCM 6th Signalized Intersection Summary
6: Federal Blvd. & W. 64th Ave.

6501 Lowell Blvd
06/07/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	117	169	174	139	179	43	97	864	81	68	2266	164
Future Volume (veh/h)	117	169	174	139	179	43	97	864	81	68	2266	164
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	127	184	189	151	195	47	105	939	88	74	2463	178
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	241	279	237	238	283	240	178	2589	242	401	2629	187
Arrive On Green	0.02	0.05	0.05	0.06	0.15	0.15	0.05	0.55	0.55	0.05	0.54	0.54
Sat Flow, veh/h	1781	1870	1585	1781	1870	1585	1781	4750	444	1781	4866	346
Grp Volume(v), veh/h	127	184	189	151	195	47	105	672	355	74	1712	929
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	1585	1781	1702	1790	1781	1702	1808
Q Serve(g_s), s	5.1	8.7	10.6	5.3	8.9	2.3	2.3	10.1	10.1	1.6	41.8	43.8
Cycle Q Clear(g_c), s	5.1	8.7	10.6	5.3	8.9	2.3	2.3	10.1	10.1	1.6	41.8	43.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.25	1.00		0.19
Lane Grp Cap(c), veh/h	241	279	237	238	283	240	178	1855	976	401	1839	977
V/C Ratio(X)	0.53	0.66	0.80	0.63	0.69	0.20	0.59	0.36	0.36	0.18	0.93	0.95
Avail Cap(c_a), veh/h	241	376	319	238	380	322	187	1855	976	426	1839	977
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	0.93	0.93	0.93	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.7	40.5	41.4	33.0	36.2	33.4	21.0	11.6	11.6	8.6	19.1	19.6
Incr Delay (d2), s/veh	2.0	2.5	9.2	5.4	3.2	0.4	4.4	0.6	1.1	0.2	10.0	19.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	4.6	7.8	8.6	1.7	7.6	1.6	2.4	6.7	7.3	1.1	24.2	29.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.7	43.0	50.7	38.4	39.4	33.8	25.4	12.2	12.7	8.8	29.1	38.8
LnGrp LOS	C	D	D	D	D	C	C	B	B	A	C	D
Approach Vol, veh/h		500			393			1132			2715	
Approach Delay, s/veh		43.8			38.4			13.5			31.8	
Approach LOS		D			D			B			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.7	53.6	9.8	17.9	9.1	53.1	9.6	18.1				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	5.5	43.1	5.3	18.1	5.1	43.5	5.1	18.3				
Max Q Clear Time (g_c+I1), s	3.6	12.1	7.3	12.6	4.3	45.8	7.1	10.9				
Green Ext Time (p_c), s	0.0	8.2	0.0	0.8	0.0	0.0	0.0	0.7				
Intersection Summary												
HCM 6th Ctrl Delay				29.3								
HCM 6th LOS				C								



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)		0%	0%		0%	
Storage Length (ft)	100			0	0	0
Storage Lanes	1			0	1	0
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.998		0.942	
Flt Protected	0.950				0.972	
Satd. Flow (prot)	1770	1863	1859	0	1706	0
Flt Permitted	0.950				0.972	
Satd. Flow (perm)	1770	1863	1859	0	1706	0
Link Speed (mph)		30	30		30	
Link Distance (ft)		838	596		267	
Travel Time (s)		19.0	13.5		6.1	

Intersection Summary

Area Type: Other

Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	5	502	407	6	18	14
Future Vol, veh/h	5	502	407	6	18	14
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	546	442	7	20	15

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	449	0	-	0	1002 446
Stage 1	-	-	-	-	446 -
Stage 2	-	-	-	-	556 -
Critical Hdwy	4.12	-	-	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.218	-	-	-	3.518 3.318
Pot Cap-1 Maneuver	1111	-	-	-	269 612
Stage 1	-	-	-	-	645 -
Stage 2	-	-	-	-	574 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1111	-	-	-	268 612
Mov Cap-2 Maneuver	-	-	-	-	268 -
Stage 1	-	-	-	-	642 -
Stage 2	-	-	-	-	574 -

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	16.2
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1111	-	-	-	355
HCM Lane V/C Ratio	0.005	-	-	-	0.098
HCM Control Delay (s)	8.3	-	-	-	16.2
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	0.3



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		150	150		0	225		250	150		150
Storage Lanes	1		1	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850		0.903				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1682	0	1770	1863	1583	1770	1863	1583
Flt Permitted	0.724			0.748			0.521			0.327		
Satd. Flow (perm)	1349	1863	1583	1393	1682	0	970	1863	1583	609	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			75		33				27			87
Link Speed (mph)		30			30			30				30
Link Distance (ft)		549			716			667				367
Travel Time (s)		12.5			16.3			15.2				8.3

Intersection Summary

Area Type: Other

Timings
1: Lowell Blvd. & W. 68th Ave.

6501 Lowell Blvd
06/07/2021

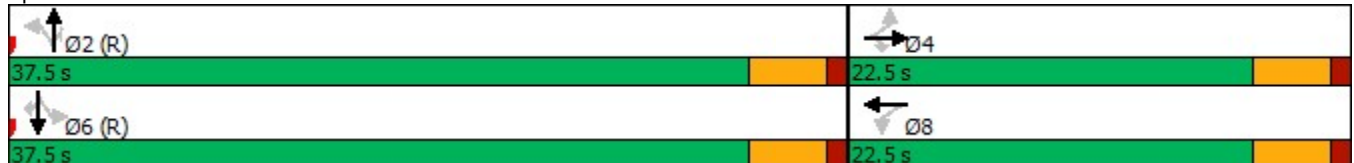


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑	↗	↖	↗	↖	↑	↗	↖	↑	↗
Traffic Volume (vph)	52	13	69	12	17	120	680	20	13	374	80
Future Volume (vph)	52	13	69	12	17	120	680	20	13	374	80
Turn Type	Perm	NA	Perm	Perm	NA	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8		2			6	
Permitted Phases	4		4	8		2		2	6		6
Detector Phase	4	4	4	8	8	2	2	2	6	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	22.5	22.5	22.5	22.5	22.5	37.5	37.5	37.5	37.5	37.5	37.5
Total Split (%)	37.5%	37.5%	37.5%	37.5%	37.5%	62.5%	62.5%	62.5%	62.5%	62.5%	62.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag											
Lead-Lag Optimize?											
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	8.1	8.1	8.1	8.1	8.1	45.8	45.8	45.8	45.8	45.8	45.8
Actuated g/C Ratio	0.14	0.14	0.14	0.14	0.14	0.76	0.76	0.76	0.76	0.76	0.76
v/c Ratio	0.31	0.06	0.27	0.07	0.20	0.18	0.52	0.02	0.03	0.29	0.07
Control Delay	27.3	21.6	9.1	22.1	13.9	3.9	5.8	1.4	3.4	3.9	1.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.3	21.6	9.1	22.1	13.9	3.9	5.8	1.4	3.4	3.9	1.1
LOS	C	C	A	C	B	A	A	A	A	A	A
Approach Delay		17.4			15.5		5.4			3.4	
Approach LOS		B			B		A			A	

Intersection Summary

Cycle Length: 60
 Actuated Cycle Length: 60
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.52
 Intersection Signal Delay: 6.3
 Intersection Capacity Utilization 60.8%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service B

Splits and Phases: 1: Lowell Blvd. & W. 68th Ave.



Queues

6501 Lowell Blvd

1: Lowell Blvd. & W. 68th Ave.

06/07/2021



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	57	14	75	13	51	130	739	22	14	407	87
v/c Ratio	0.31	0.06	0.27	0.07	0.20	0.18	0.52	0.02	0.03	0.29	0.07
Control Delay	27.3	21.6	9.1	22.1	13.9	3.9	5.8	1.4	3.4	3.9	1.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.3	21.6	9.1	22.1	13.9	3.9	5.8	1.4	3.4	3.9	1.1
Queue Length 50th (ft)	19	5	0	4	6	11	93	0	1	39	0
Queue Length 95th (ft)	46	17	29	16	30	33	202	5	6	87	10
Internal Link Dist (ft)		469			636		587			287	
Turn Bay Length (ft)	150		150	150		225		250	150		150
Base Capacity (vph)	404	558	527	417	527	741	1423	1215	465	1423	1230
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.03	0.14	0.03	0.10	0.18	0.52	0.02	0.03	0.29	0.07

Intersection Summary

HCM 6th Signalized Intersection Summary
 1: Lowell Blvd. & W. 68th Ave.

6501 Lowell Blvd
 06/07/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	52	13	69	12	17	30	120	680	20	13	374	80
Future Volume (veh/h)	52	13	69	12	17	30	120	680	20	13	374	80
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	57	14	75	13	18	33	130	739	22	14	407	87
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	223	195	165	247	62	113	730	1395	1182	529	1395	1182
Arrive On Green	0.10	0.10	0.10	0.10	0.10	0.10	0.75	0.75	0.75	0.75	0.75	0.75
Sat Flow, veh/h	1354	1870	1585	1308	591	1084	903	1870	1585	705	1870	1585
Grp Volume(v), veh/h	57	14	75	13	0	51	130	739	22	14	407	87
Grp Sat Flow(s),veh/h/ln	1354	1870	1585	1308	0	1675	903	1870	1585	705	1870	1585
Q Serve(g_s), s	2.4	0.4	2.7	0.5	0.0	1.7	3.3	10.0	0.2	0.5	4.2	0.9
Cycle Q Clear(g_c), s	4.1	0.4	2.7	0.9	0.0	1.7	7.5	10.0	0.2	10.5	4.2	0.9
Prop In Lane	1.00		1.00	1.00		0.65	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	223	195	165	247	0	174	730	1395	1182	529	1395	1182
V/C Ratio(X)	0.26	0.07	0.45	0.05	0.00	0.29	0.18	0.53	0.02	0.03	0.29	0.07
Avail Cap(c_a), veh/h	488	561	476	504	0	503	730	1395	1182	529	1395	1182
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.7	24.3	25.3	24.7	0.0	24.8	3.7	3.2	2.0	5.4	2.5	2.0
Incr Delay (d2), s/veh	0.6	0.2	2.0	0.1	0.0	0.9	0.5	1.4	0.0	0.1	0.5	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.4	0.3	1.9	0.3	0.0	1.2	0.9	4.0	0.1	0.1	1.6	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.3	24.4	27.2	24.8	0.0	25.8	4.2	4.6	2.0	5.5	3.0	2.2
LnGrp LOS	C	C	C	C	A	C	A	A	A	A	A	A
Approach Vol, veh/h		146			64			891			508	
Approach Delay, s/veh		27.0			25.6			4.5			2.9	
Approach LOS		C			C			A			A	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		49.3		10.7		49.3		10.7				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		33.0		18.0		33.0		18.0				
Max Q Clear Time (g_c+I1), s		12.0		6.1		12.5		3.7				
Green Ext Time (p_c), s		6.3		0.3		2.9		0.2				
Intersection Summary												
HCM 6th Ctrl Delay				6.9								
HCM 6th LOS				A								



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↘		↗	↘	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	100		0	100		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.963			0.942			0.996			0.992	
Flt Protected		0.971			0.986		0.950		0.950			
Satd. Flow (prot)	0	1742	0	0	1730	0	1770	1855	0	1770	1848	0
Flt Permitted		0.971			0.986		0.950		0.950			
Satd. Flow (perm)	0	1742	0	0	1730	0	1770	1855	0	1770	1848	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		458			470			732			667	
Travel Time (s)		10.4			10.7			16.6			15.2	

Intersection Summary

Area Type: Other

Intersection												
Int Delay, s/veh	3.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	34	7	16	9	9	14	29	759	23	17	410	22
Future Vol, veh/h	34	7	16	9	9	14	29	759	23	17	410	22
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	37	8	17	10	10	15	32	825	25	18	446	24

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1408	1408	458	1409	1408	838	470	0	0	850	0	0
Stage 1	494	494	-	902	902	-	-	-	-	-	-	-
Stage 2	914	914	-	507	506	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	116	139	603	116	139	366	1092	-	-	788	-	-
Stage 1	557	546	-	332	356	-	-	-	-	-	-	-
Stage 2	327	352	-	548	540	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	101	132	603	103	132	366	1092	-	-	788	-	-
Mov Cap-2 Maneuver	101	132	-	103	132	-	-	-	-	-	-	-
Stage 1	541	533	-	322	346	-	-	-	-	-	-	-
Stage 2	296	342	-	513	528	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	51.3		32.6		0.3		0.4	
HCM LOS	F		D					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1092	-	-	137	165	788	-
HCM Lane V/C Ratio	0.029	-	-	0.452	0.211	0.023	-
HCM Control Delay (s)	8.4	-	-	51.3	32.6	9.7	-
HCM Lane LOS	A	-	-	F	D	A	-
HCM 95th %tile Q(veh)	0.1	-	-	2	0.8	0.1	-



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕		↗	↖		↗	↖	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	100		0	100		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.915			0.941			0.998			0.996	
Flt Protected		0.985			0.979		0.950		0.950			
Satd. Flow (prot)	0	1679	0	0	1716	0	1770	1859	0	1770	1855	0
Flt Permitted		0.985			0.979		0.950		0.950			
Satd. Flow (perm)	0	1679	0	0	1716	0	1770	1859	0	1770	1855	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		319			430			608			732	
Travel Time (s)		7.3			9.8			13.8			16.6	

Intersection Summary

Area Type: Other

Intersection												
Int Delay, s/veh	1.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	7	2	16	13	4	13	28	763	12	17	433	12
Future Vol, veh/h	7	2	16	13	4	13	28	763	12	17	433	12
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	8	2	17	14	4	14	30	829	13	18	471	13

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1419	1416	478	1419	1416	836	484	0	0	842	0	0
Stage 1	514	514	-	896	896	-	-	-	-	-	-	-
Stage 2	905	902	-	523	520	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	114	137	587	114	137	367	1079	-	-	794	-	-
Stage 1	543	535	-	335	359	-	-	-	-	-	-	-
Stage 2	331	356	-	537	532	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	103	130	587	105	130	367	1079	-	-	794	-	-
Mov Cap-2 Maneuver	103	130	-	105	130	-	-	-	-	-	-	-
Stage 1	528	523	-	326	349	-	-	-	-	-	-	-
Stage 2	306	346	-	507	520	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	23.1		33.6		0.3		0.4	
HCM LOS	C		D					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1079	-	-	226	158	794	-	-
HCM Lane V/C Ratio	0.028	-	-	0.12	0.206	0.023	-	-
HCM Control Delay (s)	8.4	-	-	23.1	33.6	9.6	-	-
HCM Lane LOS	A	-	-	C	D	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.4	0.7	0.1	-	-



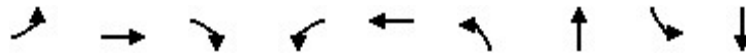
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		100	150		0	0		0	0		0
Storage Lanes	1		1	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850		0.994			0.919				0.953
Flt Protected	0.950			0.950				0.985				0.983
Satd. Flow (prot)	1770	1863	1583	1770	1852	0	0	1686	0	0	1745	0
Flt Permitted	0.243			0.120				0.884				0.862
Satd. Flow (perm)	453	1863	1583	224	1852	0	0	1513	0	0	1530	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			60		4			94				15
Link Speed (mph)		30			30			30				30
Link Distance (ft)		501			853			646				482
Travel Time (s)		11.4			19.4			14.7				11.0

Intersection Summary

Area Type: Other

Timings
4: Tennyson St. & W 64th Ave.

6501 Lowell Blvd
06/07/2021

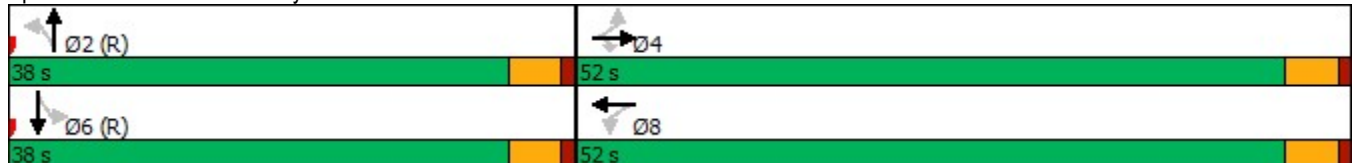


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↖	↑	↗	↖	↗		↕		↕
Traffic Volume (vph)	22	691	98	87	528	121	35	14	12
Future Volume (vph)	22	691	98	87	528	121	35	14	12
Turn Type	Perm	NA	Perm	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4			8		2		6
Permitted Phases	4		4	8		2		6	
Detector Phase	4	4	4	8	8	2	2	6	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	52.0	52.0	52.0	52.0	52.0	38.0	38.0	38.0	38.0
Total Split (%)	57.8%	57.8%	57.8%	57.8%	57.8%	42.2%	42.2%	42.2%	42.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	42.8	42.8	42.8	42.8	42.8		38.2		38.2
Actuated g/C Ratio	0.48	0.48	0.48	0.48	0.48		0.42		0.42
v/c Ratio	0.11	0.85	0.14	0.90	0.68		0.61		0.07
Control Delay	12.7	30.5	6.0	92.7	35.7		21.0		13.4
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	12.7	30.5	6.0	92.7	35.7		21.0		13.4
LOS	B	C	A	F	D		C		B
Approach Delay		27.0			43.5		21.0		13.4
Approach LOS		C			D		C		B

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 55
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.90
 Intersection Signal Delay: 31.1
 Intersection Capacity Utilization 81.1%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service D

Splits and Phases: 4: Tennyson St. & W 64th Ave.





Lane Group	EBL	EBT	EBR	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	24	751	107	95	599	422	43
v/c Ratio	0.11	0.85	0.14	0.90	0.68	0.61	0.07
Control Delay	12.7	30.5	6.0	92.7	35.7	21.0	13.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.7	30.5	6.0	92.7	35.7	21.0	13.4
Queue Length 50th (ft)	7	343	13	55	334	145	9
Queue Length 95th (ft)	20	473	37	m#89	m390	264	32
Internal Link Dist (ft)		421			773	566	402
Turn Bay Length (ft)	150		100	150			
Base Capacity (vph)	239	983	863	118	979	696	658
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.76	0.12	0.81	0.61	0.61	0.07

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

HCM 6th Signalized Intersection Summary
 4: Tennyson St. & W 64th Ave.

6501 Lowell Blvd
 06/07/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	22	691	98	87	528	23	121	35	232	14	12	14
Future Volume (veh/h)	22	691	98	87	528	23	121	35	232	14	12	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	24	751	107	95	574	25	132	38	252	15	13	15
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	495	947	803	193	901	39	222	77	365	214	186	186
Arrive On Green	0.51	0.51	0.51	1.00	1.00	1.00	0.39	0.39	0.39	0.39	0.39	0.39
Sat Flow, veh/h	820	1870	1585	644	1779	77	430	195	927	407	474	472
Grp Volume(v), veh/h	24	751	107	95	0	599	422	0	0	43	0	0
Grp Sat Flow(s),veh/h/ln	820	1870	1585	644	0	1856	1552	0	0	1353	0	0
Q Serve(g_s), s	1.3	29.8	3.2	12.3	0.0	0.0	16.4	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	1.3	29.8	3.2	42.1	0.0	0.0	20.2	0.0	0.0	1.4	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.04	0.31		0.60	0.35		0.35
Lane Grp Cap(c), veh/h	495	947	803	193	0	940	663	0	0	586	0	0
V/C Ratio(X)	0.05	0.79	0.13	0.49	0.00	0.64	0.64	0.00	0.00	0.07	0.00	0.00
Avail Cap(c_a), veh/h	513	987	837	207	0	980	663	0	0	586	0	0
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	11.3	18.3	11.8	13.7	0.0	0.0	22.5	0.0	0.0	17.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	4.3	0.1	1.9	0.0	1.3	4.6	0.0	0.0	0.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.4	18.9	2.0	2.7	0.0	0.6	12.5	0.0	0.0	1.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	11.3	22.7	11.8	15.7	0.0	1.3	27.2	0.0	0.0	17.2	0.0	0.0
LnGrp LOS	B	C	B	B	A	A	C	A	A	B	A	A
Approach Vol, veh/h		882			694			422				43
Approach Delay, s/veh		21.0			3.3			27.2				17.2
Approach LOS		C			A			C				B
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		39.9		50.1		39.9		50.1				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		33.5		47.5		33.5		47.5				
Max Q Clear Time (g_c+I1), s		22.2		31.8		3.4		44.1				
Green Ext Time (p_c), s		2.1		5.4		0.2		1.5				
Intersection Summary												
HCM 6th Ctrl Delay				16.2								
HCM 6th LOS				B								



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	200		150	150		75	200		150	200		100
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.141			0.491			0.600			0.185		
Satd. Flow (perm)	263	1863	1583	915	1863	1583	1118	1863	1583	345	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			86			127			127			176
Link Speed (mph)		30			30			30				30
Link Distance (ft)		476			1480			763				608
Travel Time (s)		10.8			33.6			17.3				13.8

Intersection Summary

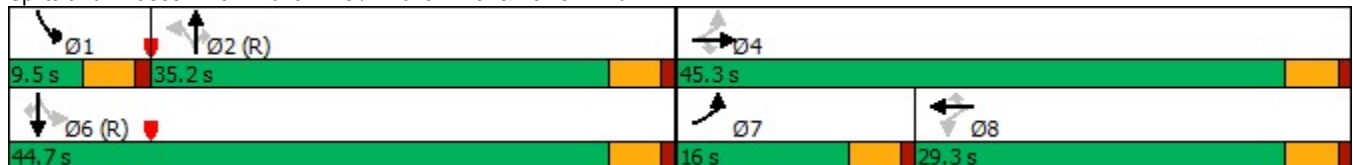
Area Type: Other

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	244	437	79	52	412	80	140	469	111	53	237	162
Future Volume (vph)	244	437	79	52	412	80	140	469	111	53	237	162
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4			8			2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	7	4	4	8	8	8	2	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	16.0	45.3	45.3	29.3	29.3	29.3	35.2	35.2	35.2	9.5	44.7	44.7
Total Split (%)	17.8%	50.3%	50.3%	32.6%	32.6%	32.6%	39.1%	39.1%	39.1%	10.6%	49.7%	49.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead			Lag	Lag	Lag	Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes			Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	39.9	39.9	39.9	23.9	23.9	23.9	33.5	33.5	33.5	41.1	41.1	41.1
Actuated g/C Ratio	0.44	0.44	0.44	0.27	0.27	0.27	0.37	0.37	0.37	0.46	0.46	0.46
v/c Ratio	0.86	0.58	0.11	0.23	0.91	0.17	0.37	0.74	0.18	0.24	0.30	0.22
Control Delay	50.9	30.6	9.4	31.7	51.3	9.7	25.3	33.6	4.5	16.9	17.0	3.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.9	30.6	9.4	31.7	51.3	9.7	25.3	33.6	4.5	16.9	17.0	3.1
LOS	D	C	A	C	D	A	C	C	A	B	B	A
Approach Delay		34.9			43.3			27.5			12.0	
Approach LOS		C			D			C			B	

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.91
 Intersection Signal Delay: 30.4
 Intersection Capacity Utilization 79.1%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service D

Splits and Phases: 5: W 64th Ave./W. 64th Ave. & Lowell Blvd.





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	265	475	86	57	448	87	152	510	121	58	258	176
v/c Ratio	0.86	0.58	0.11	0.23	0.91	0.17	0.37	0.74	0.18	0.24	0.30	0.22
Control Delay	50.9	30.6	9.4	31.7	51.3	9.7	25.3	33.6	4.5	16.9	17.0	3.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.9	30.6	9.4	31.7	51.3	9.7	25.3	33.6	4.5	16.9	17.0	3.1
Queue Length 50th (ft)	135	233	9	30	280	5	65	260	0	18	91	0
Queue Length 95th (ft)	m#195	m318	m23	m36	m#336	m7	121	#422	33	40	147	35
Internal Link Dist (ft)		396			1400			683			528	
Turn Bay Length (ft)	200		150	150		75	200		150	200		100
Base Capacity (vph)	308	844	764	252	513	528	416	693	668	238	851	818
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.86	0.56	0.11	0.23	0.87	0.16	0.37	0.74	0.18	0.24	0.30	0.22

Intersection Summary

- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

HCM 6th Signalized Intersection Summary
 5: W 64th Ave./W. 64th Ave. & Lowell Blvd.

6501 Lowell Blvd
 06/07/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↘	↖	↗	↘	↖	↗	↘	↖	↗	↘
Traffic Volume (veh/h)	244	437	79	52	412	80	140	469	111	53	237	162
Future Volume (veh/h)	244	437	79	52	412	80	140	469	111	53	237	162
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	265	475	86	57	448	87	152	510	121	58	258	176
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	327	824	698	292	496	421	430	687	582	259	860	728
Arrive On Green	0.12	0.44	0.44	0.09	0.09	0.09	0.37	0.37	0.37	0.04	0.46	0.46
Sat Flow, veh/h	1781	1870	1585	849	1870	1585	954	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	265	475	86	57	448	87	152	510	121	58	258	176
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	849	1870	1585	954	1870	1585	1781	1870	1585
Q Serve(g_s), s	9.2	17.1	2.9	5.7	21.4	4.6	10.8	21.4	4.7	1.7	7.8	6.1
Cycle Q Clear(g_c), s	9.2	17.1	2.9	7.1	21.4	4.6	10.8	21.4	4.7	1.7	7.8	6.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	327	824	698	292	496	421	430	687	582	259	860	728
V/C Ratio(X)	0.81	0.58	0.12	0.20	0.90	0.21	0.35	0.74	0.21	0.22	0.30	0.24
Avail Cap(c_a), veh/h	332	848	719	301	515	437	430	687	582	282	860	728
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.43	0.43	0.43	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.8	18.9	14.9	34.0	39.9	32.3	21.4	24.8	19.5	18.3	15.2	14.8
Incr Delay (d2), s/veh	13.8	0.9	0.1	0.1	9.4	0.1	2.3	7.1	0.8	0.4	0.9	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	8.6	11.7	1.8	2.2	15.7	3.2	4.7	15.7	3.3	1.3	6.1	4.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	35.7	19.8	15.0	34.2	49.3	32.4	23.7	31.9	20.3	18.7	16.1	15.6
LnGrp LOS	D	B	B	C	D	C	C	C	C	B	B	B
Approach Vol, veh/h		826			592			783			492	
Approach Delay, s/veh		24.4			45.4			28.5			16.2	
Approach LOS		C			D			C			B	
Timer - Assigned Phs	1	2		4		6	7	8				
Phs Duration (G+Y+Rc), s	8.3	37.5		44.1		45.9	15.7	28.4				
Change Period (Y+Rc), s	4.5	4.5		4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s	5.0	30.7		40.8		40.2	11.5	24.8				
Max Q Clear Time (g_c+I1), s	3.7	23.4		19.1		9.8	11.2	23.4				
Green Ext Time (p_c), s	0.0	2.7		3.3		2.2	0.0	0.5				
Intersection Summary												
HCM 6th Ctrl Delay				28.7								
HCM 6th LOS				C								



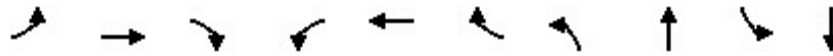
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	100		150	150		100	600		0	250		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor			0.850			0.850		0.993			0.988	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	5050	0	1770	5024	0
Flt Permitted	0.235			0.470			0.109			0.124		
Satd. Flow (perm)	438	1863	1583	875	1863	1583	203	5050	0	231	5024	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			205			236		10			18	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1480			550			1046			611	
Travel Time (s)		33.6			12.5			23.8			13.9	

Intersection Summary

Area Type: Other

Timings
6: Federal Blvd. & W. 64th Ave.

6501 Lowell Blvd
06/07/2021

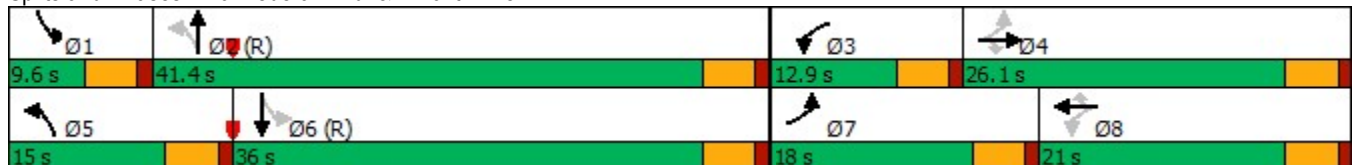


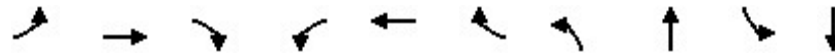
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations	↖	↑	↗	↖	↑	↗	↖	↑↑↑	↖	↑↑↑
Traffic Volume (vph)	308	260	189	120	231	103	243	1979	90	1620
Future Volume (vph)	308	260	189	120	231	103	243	1979	90	1620
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA
Protected Phases	7	4		3	8		5	2	1	6
Permitted Phases	4		4	8		8	2		6	
Detector Phase	7	4	4	3	8	8	5	2	1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	20.6	20.6	9.5	22.5	9.5	22.5
Total Split (s)	18.0	26.1	26.1	12.9	21.0	21.0	15.0	41.4	9.6	36.0
Total Split (%)	20.0%	29.0%	29.0%	14.3%	23.3%	23.3%	16.7%	46.0%	10.7%	40.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)	33.3	20.7	20.7	23.4	15.3	15.3	47.7	39.8	37.7	32.2
Actuated g/C Ratio	0.37	0.23	0.23	0.26	0.17	0.17	0.53	0.44	0.42	0.36
v/c Ratio	0.93	0.66	0.39	0.42	0.79	0.24	0.89	1.01	0.51	1.04
Control Delay	70.3	53.9	18.1	24.0	54.9	1.2	51.6	48.6	22.4	61.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	70.3	53.9	18.1	24.0	54.9	1.2	51.6	48.6	22.4	61.2
LOS	E	D	B	C	D	A	D	D	C	E
Approach Delay		51.7			34.5			48.9		59.3
Approach LOS		D			C			D		E

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.04
 Intersection Signal Delay: 51.6
 Intersection Capacity Utilization 92.3%
 Analysis Period (min) 15
 Intersection LOS: D
 ICU Level of Service F

Splits and Phases: 6: Federal Blvd. & W. 64th Ave.





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	335	283	205	130	251	112	264	2258	98	1879
v/c Ratio	0.93	0.66	0.39	0.42	0.79	0.24	0.89	1.01	0.51	1.04
Control Delay	70.3	53.9	18.1	24.0	54.9	1.2	51.6	48.6	22.4	61.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	70.3	53.9	18.1	24.0	54.9	1.2	51.6	48.6	22.4	61.2
Queue Length 50th (ft)	181	158	31	48	136	0	99	~534	27	~433
Queue Length 95th (ft)	#292	242	84	88	#243	0	#246	#632	54	#531
Internal Link Dist (ft)		1400			470			966		531
Turn Bay Length (ft)	100		150	150		100	600		250	
Base Capacity (vph)	361	447	535	313	341	482	298	2237	191	1811
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.93	0.63	0.38	0.42	0.74	0.23	0.89	1.01	0.51	1.04

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

HCM 6th Signalized Intersection Summary
6: Federal Blvd. & W. 64th Ave.

6501 Lowell Blvd
06/07/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	308	260	189	120	231	103	243	1979	98	90	1620	150
Future Volume (veh/h)	308	260	189	120	231	103	243	1979	98	90	1620	150
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	335	283	205	130	251	112	264	2151	107	98	1723	156
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.94	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	375	428	363	295	296	251	293	2197	109	173	1788	161
Arrive On Green	0.05	0.08	0.08	0.08	0.16	0.16	0.12	0.44	0.44	0.05	0.38	0.38
Sat Flow, veh/h	1781	1870	1585	1781	1870	1585	1781	4983	247	1781	4766	430
Grp Volume(v), veh/h	335	283	205	130	251	112	264	1466	792	98	1229	650
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	1585	1781	1702	1826	1781	1702	1793
Q Serve(g_s), s	13.5	13.3	11.2	5.4	11.7	5.8	8.8	38.1	38.5	3.0	31.8	32.0
Cycle Q Clear(g_c), s	13.5	13.3	11.2	5.4	11.7	5.8	8.8	38.1	38.5	3.0	31.8	32.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.14	1.00		0.24
Lane Grp Cap(c), veh/h	375	428	363	295	296	251	293	1501	805	173	1277	673
V/C Ratio(X)	0.89	0.66	0.57	0.44	0.85	0.45	0.90	0.98	0.98	0.57	0.96	0.97
Avail Cap(c_a), veh/h	375	449	380	320	343	291	293	1501	805	183	1277	673
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.88	0.88	0.88	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.2	38.2	37.3	28.5	36.8	34.3	23.5	24.7	24.8	22.0	27.5	27.6
Incr Delay (d2), s/veh	20.4	3.0	1.6	1.0	16.0	1.2	28.9	18.3	28.0	3.6	17.7	27.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	12.9	11.0	8.3	4.2	10.8	4.1	9.7	25.1	29.5	2.4	21.8	25.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	49.6	41.2	38.8	29.6	52.8	35.6	52.5	43.0	52.8	25.7	45.2	54.9
LnGrp LOS	D	D	D	C	D	D	D	D	D	C	D	D
Approach Vol, veh/h		823			493			2522			1977	
Approach Delay, s/veh		44.0			42.8			47.1			47.4	
Approach LOS		D			D			D			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.1	44.2	11.6	25.1	15.0	38.3	18.0	18.7				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	5.1	36.9	8.4	21.6	10.5	31.5	13.5	16.5				
Max Q Clear Time (g_c+I1), s	5.0	40.5	7.4	15.3	10.8	34.0	15.5	13.7				
Green Ext Time (p_c), s	0.0	0.0	0.0	1.3	0.0	0.0	0.0	0.5				

Intersection Summary

HCM 6th Ctrl Delay	46.4
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)		0%	0%		0%	
Storage Length (ft)	100			0	0	0
Storage Lanes	1			0	1	0
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.996		0.939	
Flt Protected	0.950				0.973	
Satd. Flow (prot)	1770	1863	1855	0	1702	0
Flt Permitted	0.950				0.973	
Satd. Flow (perm)	1770	1863	1855	0	1702	0
Link Speed (mph)		30	30		30	
Link Distance (ft)		853	476		311	
Travel Time (s)		19.4	10.8		7.1	

Intersection Summary

Area Type: Other

Intersection						
Int Delay, s/veh	0.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	16	748	694	20	11	9
Future Vol, veh/h	16	748	694	20	11	9
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	17	813	754	22	12	10

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	776	0	-	0	1612 765
Stage 1	-	-	-	-	765 -
Stage 2	-	-	-	-	847 -
Critical Hdwy	4.12	-	-	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.218	-	-	-	3.518 3.318
Pot Cap-1 Maneuver	840	-	-	-	115 403
Stage 1	-	-	-	-	459 -
Stage 2	-	-	-	-	420 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	840	-	-	-	113 403
Mov Cap-2 Maneuver	-	-	-	-	113 -
Stage 1	-	-	-	-	450 -
Stage 2	-	-	-	-	420 -

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	29.8
HCM LOS			D

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	840	-	-	-	167
HCM Lane V/C Ratio	0.021	-	-	-	0.13
HCM Control Delay (s)	9.4	-	-	-	29.8
HCM Lane LOS	A	-	-	-	D
HCM 95th %tile Q(veh)	0.1	-	-	-	0.4



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		150	150		0	225		250	150		150
Storage Lanes	1		1	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850		0.931				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1734	0	1770	1863	1583	1770	1863	1583
Flt Permitted	0.742			0.750			0.537			0.626		
Satd. Flow (perm)	1382	1863	1583	1397	1734	0	1000	1863	1583	1166	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			136		11				27			65
Link Speed (mph)		30			30			30				30
Link Distance (ft)		594			990			699				502
Travel Time (s)		13.5			22.5			15.9				11.4

Intersection Summary

Area Type: Other

Timings
1: Lowell Blvd. & W. 68th Ave.

6501 Lowell Blvd
06/07/2021



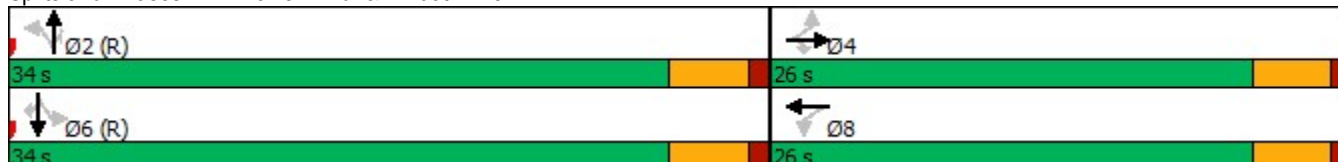
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑	↗	↖	↗	↖	↑	↗	↖	↑	↗
Traffic Volume (vph)	56	10	125	3	12	71	194	1	18	348	60
Future Volume (vph)	56	10	125	3	12	71	194	1	18	348	60
Turn Type	Perm	NA	Perm	Perm	NA	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8		2			6	
Permitted Phases	4		4	8		2		2	6		6
Detector Phase	4	4	4	8	8	2	2	2	6	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	26.0	26.0	26.0	26.0	26.0	34.0	34.0	34.0	34.0	34.0	34.0
Total Split (%)	43.3%	43.3%	43.3%	43.3%	43.3%	56.7%	56.7%	56.7%	56.7%	56.7%	56.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag											
Lead-Lag Optimize?											
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	8.2	8.2	8.2	8.2	8.2	45.7	45.7	45.7	45.7	45.7	45.7
Actuated g/C Ratio	0.14	0.14	0.14	0.14	0.14	0.76	0.76	0.76	0.76	0.76	0.76
v/c Ratio	0.32	0.04	0.41	0.02	0.10	0.10	0.15	0.00	0.02	0.27	0.05
Control Delay	27.2	21.3	8.9	21.0	16.5	3.6	3.4	0.0	3.2	3.8	1.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.2	21.3	8.9	21.0	16.5	3.6	3.4	0.0	3.2	3.8	1.2
LOS	C	C	A	C	B	A	A	A	A	A	A
Approach Delay		14.9			17.0		3.4			3.4	
Approach LOS		B			B		A			A	

Intersection Summary

Cycle Length: 60
 Actuated Cycle Length: 60
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 45
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.41
 Intersection Signal Delay: 6.2
 Intersection Capacity Utilization 43.5%
 Analysis Period (min) 15

Intersection LOS: A
 ICU Level of Service A

Splits and Phases: 1: Lowell Blvd. & W. 68th Ave.




























Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	61	11	136	3	24	77	211	1	20	378	65
v/c Ratio	0.32	0.04	0.41	0.02	0.10	0.10	0.15	0.00	0.02	0.27	0.05
Control Delay	27.2	21.3	8.9	21.0	16.5	3.6	3.4	0.0	3.2	3.8	1.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.2	21.3	8.9	21.0	16.5	3.6	3.4	0.0	3.2	3.8	1.2
Queue Length 50th (ft)	20	4	0	1	4	6	18	0	2	36	0
Queue Length 95th (ft)	48	15	39	7	20	20	44	0	7	80	9
Internal Link Dist (ft)		514			910		619			422	
Turn Bay Length (ft)	150		150	150		225		250	150		150
Base Capacity (vph)	495	667	654	500	628	762	1419	1212	888	1419	1221
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.12	0.02	0.21	0.01	0.04	0.10	0.15	0.00	0.02	0.27	0.05

Intersection Summary

HCM 6th Signalized Intersection Summary
 1: Lowell Blvd. & W. 68th Ave.

6501 Lowell Blvd
 06/07/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	56	10	125	3	12	10	71	194	1	18	348	60
Future Volume (veh/h)	56	10	125	3	12	10	71	194	1	18	348	60
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	61	11	136	3	13	11	77	211	1	20	378	65
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	272	229	194	265	114	97	744	1361	1154	931	1361	1154
Arrive On Green	0.12	0.12	0.12	0.12	0.12	0.12	0.73	0.73	0.73	0.73	0.73	0.73
Sat Flow, veh/h	1387	1870	1585	1241	936	792	947	1870	1585	1170	1870	1585
Grp Volume(v), veh/h	61	11	136	3	0	24	77	211	1	20	378	65
Grp Sat Flow(s),veh/h/ln	1387	1870	1585	1241	0	1728	947	1870	1585	1170	1870	1585
Q Serve(g_s), s	2.5	0.3	4.9	0.1	0.0	0.7	1.8	2.1	0.0	0.3	4.1	0.7
Cycle Q Clear(g_c), s	3.2	0.3	4.9	0.4	0.0	0.7	5.9	2.1	0.0	2.4	4.1	0.7
Prop In Lane	1.00		1.00	1.00		0.46	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	272	229	194	265	0	211	744	1361	1154	931	1361	1154
V/C Ratio(X)	0.22	0.05	0.70	0.01	0.00	0.11	0.10	0.16	0.00	0.02	0.28	0.06
Avail Cap(c_a), veh/h	600	670	568	558	0	619	744	1361	1154	931	1361	1154
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.9	23.3	25.3	23.4	0.0	23.4	3.8	2.5	2.2	2.9	2.8	2.3
Incr Delay (d2), s/veh	0.4	0.1	4.6	0.0	0.0	0.2	0.3	0.2	0.0	0.0	0.5	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.4	0.2	3.6	0.1	0.0	0.5	0.5	0.9	0.0	0.1	1.8	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.3	23.3	29.9	23.5	0.0	23.7	4.1	2.7	2.2	2.9	3.3	2.4
LnGrp LOS	C	C	C	C	A	C	A	A	A	A	A	A
Approach Vol, veh/h		208			27			289			463	
Approach Delay, s/veh		28.2			23.7			3.1			3.2	
Approach LOS		C			C			A			A	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		48.2		11.8		48.2		11.8				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		29.5		21.5		29.5		21.5				
Max Q Clear Time (g_c+I1), s		7.9		6.9		6.1		2.7				
Green Ext Time (p_c), s		1.6		0.5		2.6		0.1				
Intersection Summary												
HCM 6th Ctrl Delay				9.0								
HCM 6th LOS				A								



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↘		↗	↘	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	100		0	100		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.921			0.940			0.996			0.993	
Flt Protected		0.986			0.978		0.950		0.950		0.950	
Satd. Flow (prot)	0	1692	0	0	1712	0	1770	1855	0	1770	1850	0
Flt Permitted		0.986			0.978		0.950		0.950		0.950	
Satd. Flow (perm)	0	1692	0	0	1712	0	1770	1855	0	1770	1850	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		458			470			732			699	
Travel Time (s)		10.4			10.7			16.6			15.9	

Intersection Summary

Area Type: Other

Intersection												
Int Delay, s/veh	1.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↗	↘		↗	↘	
Traffic Vol, veh/h	15	6	29	16	4	16	12	355	10	4	486	24
Future Vol, veh/h	15	6	29	16	4	16	12	355	10	4	486	24
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	16	7	32	17	4	17	13	386	11	4	528	26

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	977	972	541	987	980	392	554	0	0	397	0	0
Stage 1	549	549	-	418	418	-	-	-	-	-	-	-
Stage 2	428	423	-	569	562	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	230	252	541	226	250	657	1016	-	-	1162	-	-
Stage 1	520	516	-	612	591	-	-	-	-	-	-	-
Stage 2	605	588	-	507	510	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	218	248	541	206	246	657	1016	-	-	1162	-	-
Mov Cap-2 Maneuver	218	248	-	206	246	-	-	-	-	-	-	-
Stage 1	513	514	-	604	583	-	-	-	-	-	-	-
Stage 2	577	580	-	470	508	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	17.5		18.6		0.3		0.1	
HCM LOS	C		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1016	-	-	341	304	1162	-
HCM Lane V/C Ratio	0.013	-	-	0.159	0.129	0.004	-
HCM Control Delay (s)	8.6	-	-	17.5	18.6	8.1	-
HCM Lane LOS	A	-	-	C	C	A	-
HCM 95th %tile Q(veh)	0	-	-	0.6	0.4	0	-



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↘		↗	↘	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	100		0	100		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt					0.915			0.996				
Flt Protected					0.982					0.950		
Satd. Flow (prot)	0	1863	0	0	1674	0	1863	1855	0	1770	1863	0
Flt Permitted					0.982					0.950		
Satd. Flow (perm)	0	1863	0	0	1674	0	1863	1855	0	1770	1863	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		319			430			608			732	
Travel Time (s)		7.3			9.8			13.8			16.6	

Intersection Summary

Area Type: Other

Intersection												
Int Delay, s/veh	0.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↔	↔		↔	↔	
Traffic Vol, veh/h	0	0	0	9	0	16	0	363	10	13	520	0
Future Vol, veh/h	0	0	0	9	0	16	0	363	10	13	520	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	10	0	17	0	395	11	14	565	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1002	999	565	994	994	401	565	0	0	406	0	0
Stage 1	593	593	-	401	401	-	-	-	-	-	-	-
Stage 2	409	406	-	593	593	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	221	243	524	224	245	649	1007	-	-	1153	-	-
Stage 1	492	493	-	626	601	-	-	-	-	-	-	-
Stage 2	619	598	-	492	493	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	213	240	524	222	242	649	1007	-	-	1153	-	-
Mov Cap-2 Maneuver	213	240	-	222	242	-	-	-	-	-	-	-
Stage 1	492	487	-	626	601	-	-	-	-	-	-	-
Stage 2	602	598	-	486	487	-	-	-	-	-	-	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			15.1			0			0.2		
HCM LOS	A			C								

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1007	-	-	-	383	1153	-	-
HCM Lane V/C Ratio	-	-	-	-	0.071	0.012	-	-
HCM Control Delay (s)	0	-	-	0	15.1	8.2	-	-
HCM Lane LOS	A	-	-	A	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	-	0.2	0	-	-



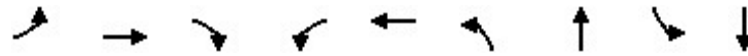
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		100	150		0	0		0	0		0
Storage Lanes	1		1	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850		0.995			0.919				0.949
Flt Protected	0.950			0.950				0.984				0.993
Satd. Flow (prot)	1770	1863	1583	1770	1853	0	0	1684	0	0	1755	0
Flt Permitted	0.226			0.347				0.899				0.966
Satd. Flow (perm)	421	1863	1583	646	1853	0	0	1539	0	0	1708	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			74		3			93				21
Link Speed (mph)		30			30			30				30
Link Distance (ft)		700			1434			502				485
Travel Time (s)		15.9			32.6			11.4				11.0

Intersection Summary

Area Type: Other

Timings
4: Tennyson St. & W 64th Ave.

6501 Lowell Blvd
06/07/2021

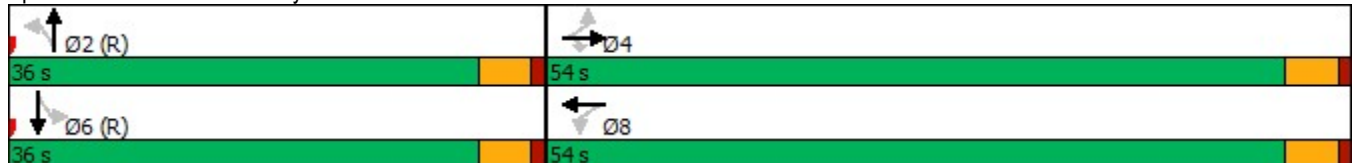


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	13	354	68	176	436	63	16	7	25
Future Volume (vph)	13	354	68	176	436	63	16	7	25
Turn Type	Perm	NA	Perm	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4			8		2		6
Permitted Phases	4		4	8		2		6	
Detector Phase	4	4	4	8	8	2	2	6	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	54.0	54.0	54.0	54.0	54.0	36.0	36.0	36.0	36.0
Total Split (%)	60.0%	60.0%	60.0%	60.0%	60.0%	40.0%	40.0%	40.0%	40.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0		0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5		4.5		4.5
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	32.1	32.1	32.1	32.1	32.1		48.9		48.9
Actuated g/C Ratio	0.36	0.36	0.36	0.36	0.36		0.54		0.54
v/c Ratio	0.09	0.58	0.12	0.83	0.74		0.24		0.06
Control Delay	17.0	26.0	4.1	65.2	42.8		8.4		9.4
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	17.0	26.0	4.1	65.2	42.8		8.4		9.4
LOS	B	C	A	E	D		A		A
Approach Delay		22.3			49.1		8.4		9.4
Approach LOS		C			D		A		A

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 50
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.83
 Intersection Signal Delay: 32.5
 Intersection Capacity Utilization 57.9%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service B

Splits and Phases: 4: Tennyson St. & W 64th Ave.





Lane Group	EBL	EBT	EBR	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	14	385	74	191	490	213	56
v/c Ratio	0.09	0.58	0.12	0.83	0.74	0.24	0.06
Control Delay	17.0	26.0	4.1	65.2	42.8	8.4	9.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.0	26.0	4.1	65.2	42.8	8.4	9.4
Queue Length 50th (ft)	5	174	0	111	275	32	9
Queue Length 95th (ft)	16	213	22	177	358	90	34
Internal Link Dist (ft)		620			1354	422	405
Turn Bay Length (ft)	150		100	150			
Base Capacity (vph)	231	1024	903	355	1020	878	937
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.38	0.08	0.54	0.48	0.24	0.06
Intersection Summary							

HCM 6th Signalized Intersection Summary
 4: Tennyson St. & W 64th Ave.

6501 Lowell Blvd
 06/07/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	13	354	68	176	436	15	63	16	118	7	25	19
Future Volume (veh/h)	13	354	68	176	436	15	63	16	118	7	25	19
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	14	385	74	191	474	16	68	17	128	8	27	21
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	260	767	650	320	737	25	268	86	453	130	427	307
Arrive On Green	0.41	0.41	0.41	0.41	0.41	0.41	0.49	0.49	0.49	0.49	0.49	0.49
Sat Flow, veh/h	906	1870	1585	933	1799	61	439	175	924	173	871	626
Grp Volume(v), veh/h	14	385	74	191	0	490	213	0	0	56	0	0
Grp Sat Flow(s),veh/h/ln	906	1870	1585	933	0	1859	1538	0	0	1670	0	0
Q Serve(g_s), s	1.1	13.8	2.6	17.2	0.0	19.0	2.7	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	20.1	13.8	2.6	31.0	0.0	19.0	6.9	0.0	0.0	1.5	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.03	0.32		0.60	0.14		0.37
Lane Grp Cap(c), veh/h	260	767	650	320	0	762	806	0	0	864	0	0
V/C Ratio(X)	0.05	0.50	0.11	0.60	0.00	0.64	0.26	0.00	0.00	0.06	0.00	0.00
Avail Cap(c_a), veh/h	387	1029	872	450	0	1023	806	0	0	864	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	0.87	0.00	0.87	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	29.3	19.7	16.4	31.2	0.0	21.3	13.4	0.0	0.0	12.1	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.5	0.1	1.6	0.0	0.8	0.8	0.0	0.0	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.4	9.8	1.7	6.9	0.0	12.4	4.7	0.0	0.0	1.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	29.4	20.2	16.5	32.8	0.0	22.1	14.2	0.0	0.0	12.2	0.0	0.0
LnGrp LOS	C	C	B	C	A	C	B	A	A	B	A	A
Approach Vol, veh/h		473			681			213			56	
Approach Delay, s/veh		19.9			25.1			14.2			12.2	
Approach LOS		B			C			B			B	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		48.6		41.4		48.6		41.4				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		31.5		49.5		31.5		49.5				
Max Q Clear Time (g_c+I1), s		8.9		22.1		3.5		33.0				
Green Ext Time (p_c), s		1.3		2.8		0.2		3.9				
Intersection Summary												
HCM 6th Ctrl Delay				21.2								
HCM 6th LOS				C								



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	200		150	150		75	200		150	200		100
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.257			0.546			0.559			0.569		
Satd. Flow (perm)	479	1863	1583	1017	1863	1583	1041	1863	1583	1060	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			112			127			127			149
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1434			1268			763			608	
Travel Time (s)		32.6			28.8			17.3			13.8	

Intersection Summary

Area Type: Other

Timings
5: W 64th Ave./W. 64th Ave. & Lowell Blvd.

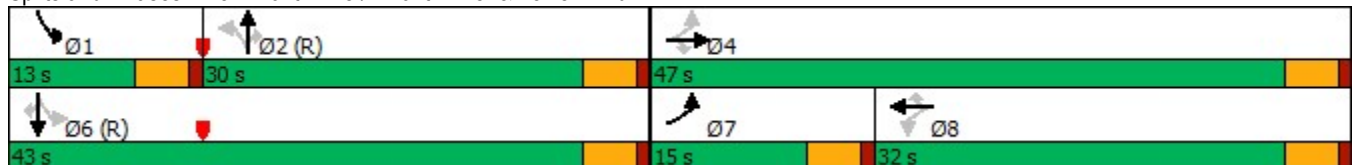
6501 Lowell Blvd
06/07/2021

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	131	331	103	81	266	44	51	148	63	90	307	137
Future Volume (vph)	131	331	103	81	266	44	51	148	63	90	307	137
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4			8			2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	7	4	4	8	8	8	2	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	15.0	47.0	47.0	32.0	32.0	32.0	30.0	30.0	30.0	13.0	43.0	43.0
Total Split (%)	16.7%	52.2%	52.2%	35.6%	35.6%	35.6%	33.3%	33.3%	33.3%	14.4%	47.8%	47.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead			Lag	Lag	Lag	Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes			Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	33.9	33.9	33.9	19.6	19.6	19.6	36.9	36.9	36.9	47.1	47.1	47.1
Actuated g/C Ratio	0.38	0.38	0.38	0.22	0.22	0.22	0.41	0.41	0.41	0.52	0.52	0.52
v/c Ratio	0.44	0.51	0.17	0.40	0.71	0.11	0.13	0.21	0.09	0.16	0.34	0.17
Control Delay	35.5	38.3	15.3	31.8	37.9	3.0	22.8	21.7	0.8	13.5	15.2	3.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.5	38.3	15.3	31.8	37.9	3.0	22.8	21.7	0.8	13.5	15.2	3.1
LOS	D	D	B	C	D	A	C	C	A	B	B	A
Approach Delay		33.4			32.7			16.9			11.8	
Approach LOS		C			C			B			B	

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 65
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.71
 Intersection Signal Delay: 24.2
 Intersection Capacity Utilization 57.2%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service B

Splits and Phases: 5: W 64th Ave./W. 64th Ave. & Lowell Blvd.





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	142	360	112	88	289	48	55	161	68	98	334	149
v/c Ratio	0.44	0.51	0.17	0.40	0.71	0.11	0.13	0.21	0.09	0.16	0.34	0.17
Control Delay	35.5	38.3	15.3	31.8	37.9	3.0	22.8	21.7	0.8	13.5	15.2	3.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.5	38.3	15.3	31.8	37.9	3.0	22.8	21.7	0.8	13.5	15.2	3.1
Queue Length 50th (ft)	77	203	19	44	155	1	20	61	0	27	105	0
Queue Length 95th (ft)	114	256	49	m58	m178	m2	55	125	5	63	198	33
Internal Link Dist (ft)		1354			1188			683			528	
Turn Bay Length (ft)	200		150	150		75	200		150	200		100
Base Capacity (vph)	331	879	806	310	569	571	426	763	723	623	975	899
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.41	0.14	0.28	0.51	0.08	0.13	0.21	0.09	0.16	0.34	0.17

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM 6th Signalized Intersection Summary
 5: W 64th Ave./W. 64th Ave. & Lowell Blvd.

6501 Lowell Blvd
 06/07/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↘	↖	↗	↘	↖	↗	↘	↖	↗	↘
Traffic Volume (veh/h)	131	331	103	81	266	44	51	148	63	90	307	137
Future Volume (veh/h)	131	331	103	81	266	44	51	148	63	90	307	137
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	142	360	112	88	289	48	55	161	68	98	334	149
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	270	611	518	212	364	309	511	884	749	658	1073	909
Arrive On Green	0.03	0.11	0.11	0.06	0.06	0.06	0.47	0.47	0.47	0.05	0.57	0.57
Sat Flow, veh/h	1781	1870	1585	922	1870	1585	912	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	142	360	112	88	289	48	55	161	68	98	334	149
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	922	1870	1585	912	1870	1585	1781	1870	1585
Q Serve(g_s), s	5.5	16.5	5.8	8.5	13.7	2.6	3.0	4.5	2.1	2.4	8.3	4.0
Cycle Q Clear(g_c), s	5.5	16.5	5.8	13.1	13.7	2.6	3.0	4.5	2.1	2.4	8.3	4.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	270	611	518	212	364	309	511	884	749	658	1073	909
V/C Ratio(X)	0.53	0.59	0.22	0.42	0.79	0.16	0.11	0.18	0.09	0.15	0.31	0.16
Avail Cap(c_a), veh/h	332	883	748	314	571	484	511	884	749	735	1073	909
HCM Platoon Ratio	0.33	0.33	0.33	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.79	0.79	0.79	0.71	0.71	0.71	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.2	34.4	29.6	42.3	40.3	35.1	13.3	13.7	13.1	10.1	10.0	9.0
Incr Delay (d2), s/veh	1.3	0.7	0.2	0.9	2.9	0.2	0.4	0.5	0.2	0.1	0.8	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	4.5	12.5	4.2	3.8	10.8	1.8	1.2	3.5	1.4	1.6	6.1	2.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.4	35.1	29.8	43.2	43.2	35.3	13.7	14.1	13.3	10.2	10.7	9.4
LnGrp LOS	C	D	C	D	D	D	B	B	B	B	B	A
Approach Vol, veh/h		614			425			284			581	
Approach Delay, s/veh		32.6			42.3			13.9			10.3	
Approach LOS		C			D			B			B	
Timer - Assigned Phs	1	2		4		6	7	8				
Phs Duration (G+Y+Rc), s	9.1	47.0		33.9		56.1	11.9	22.0				
Change Period (Y+Rc), s	4.5	4.5		4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s	8.5	25.5		42.5		38.5	10.5	27.5				
Max Q Clear Time (g_c+I1), s	4.4	6.5		18.5		10.3	7.5	15.7				
Green Ext Time (p_c), s	0.1	1.3		2.6		2.6	0.1	1.8				

Intersection Summary

HCM 6th Ctrl Delay	25.2
HCM 6th LOS	C



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	100		150	150		100	600		0	250		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor			0.850			0.850		0.987			0.990	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	5019	0	1770	5034	0
Flt Permitted	0.386			0.430			0.085			0.193		
Satd. Flow (perm)	719	1863	1583	801	1863	1583	158	5019	0	360	5034	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			127			127		23			17	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1268			424			903			562	
Travel Time (s)		28.8			9.6			20.5			12.8	

Intersection Summary

Area Type: Other

Timings
6: Federal Blvd. & W. 64th Ave.

6501 Lowell Blvd
06/07/2021

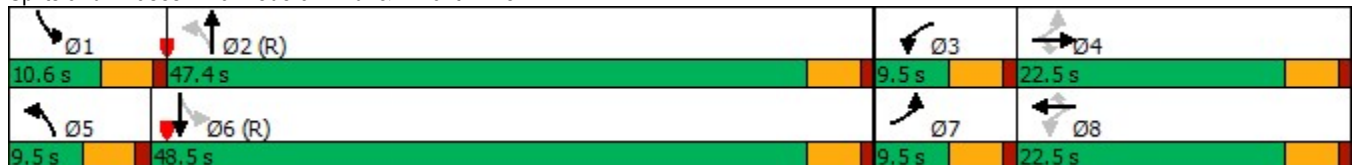


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	119	182	185	157	198	48	104	974	76	2553
Future Volume (vph)	119	182	185	157	198	48	104	974	76	2553
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA
Protected Phases	7	4		3	8		5	2	1	6
Permitted Phases	4		4	8		8	2		6	
Detector Phase	7	4	4	3	8	8	5	2	1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	9.5	22.5
Total Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	47.4	10.6	48.5
Total Split (%)	10.6%	25.0%	25.0%	10.6%	25.0%	25.0%	10.6%	52.7%	11.8%	53.9%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)	19.9	14.9	14.9	19.9	14.9	14.9	52.8	47.8	52.2	45.9
Actuated g/C Ratio	0.22	0.17	0.17	0.22	0.17	0.17	0.59	0.53	0.58	0.51
v/c Ratio	0.59	0.64	0.55	0.74	0.70	0.14	0.56	0.43	0.27	1.15
Control Delay	30.0	33.5	11.9	48.3	47.4	0.8	23.7	14.2	9.7	98.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.0	33.5	11.9	48.3	47.4	0.8	23.7	14.2	9.7	98.2
LOS	C	C	B	D	D	A	C	B	A	F
Approach Delay		24.4			42.2			15.1		95.8
Approach LOS		C			D			B		F

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 120
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.15
 Intersection Signal Delay: 64.8
 Intersection LOS: E
 Intersection Capacity Utilization 92.4%
 ICU Level of Service F
 Analysis Period (min) 15

Splits and Phases: 6: Federal Blvd. & W. 64th Ave.





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	129	198	201	171	215	52	113	1158	83	2972
v/c Ratio	0.59	0.64	0.55	0.74	0.70	0.14	0.56	0.43	0.27	1.15
Control Delay	30.0	33.5	11.9	48.3	47.4	0.8	23.7	14.2	9.7	98.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.0	33.5	11.9	48.3	47.4	0.8	23.7	14.2	9.7	98.2
Queue Length 50th (ft)	33	55	0	78	116	0	24	148	17	~763
Queue Length 95th (ft)	70	106	0	#140	185	0	#91	191	37	#858
Internal Link Dist (ft)		1188			344			823		482
Turn Bay Length (ft)	100		150	150		100	600		250	
Base Capacity (vph)	217	372	418	231	372	418	203	2676	309	2574
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.59	0.53	0.48	0.74	0.58	0.12	0.56	0.43	0.27	1.15

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

HCM 6th Signalized Intersection Summary
6: Federal Blvd. & W. 64th Ave.

6501 Lowell Blvd
06/07/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	119	182	185	157	198	48	104	974	91	76	2553	181
Future Volume (veh/h)	119	182	185	157	198	48	104	974	91	76	2553	181
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	129	198	201	171	215	52	113	1059	99	83	2775	197
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	231	293	248	231	293	248	173	2562	239	364	2612	181
Arrive On Green	0.02	0.05	0.05	0.06	0.16	0.16	0.05	0.54	0.54	0.05	0.54	0.54
Sat Flow, veh/h	1781	1870	1585	1781	1870	1585	1781	4751	444	1781	4875	338
Grp Volume(v), veh/h	129	198	201	171	215	52	113	758	400	83	1918	1054
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	1585	1781	1702	1791	1781	1702	1809
Q Serve(g_s), s	5.0	9.4	11.3	5.0	9.9	2.6	2.5	11.9	11.9	1.8	48.2	48.2
Cycle Q Clear(g_c), s	5.0	9.4	11.3	5.0	9.9	2.6	2.5	11.9	11.9	1.8	48.2	48.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.25	1.00		0.19
Lane Grp Cap(c), veh/h	231	293	248	231	293	248	173	1836	966	364	1823	969
V/C Ratio(X)	0.56	0.68	0.81	0.74	0.73	0.21	0.65	0.41	0.41	0.23	1.05	1.09
Avail Cap(c_a), veh/h	231	374	317	231	374	317	179	1836	966	398	1823	969
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	0.93	0.93	0.93	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.7	40.4	41.4	34.7	36.2	33.1	21.1	12.3	12.3	9.1	20.9	20.9
Incr Delay (d2), s/veh	2.8	3.1	10.9	12.0	5.4	0.4	7.9	0.7	1.3	0.3	36.3	55.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	4.7	8.3	9.2	3.7	8.5	1.8	2.8	7.8	8.4	1.2	36.1	45.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	35.5	43.5	52.2	46.7	41.6	33.5	28.9	13.0	13.6	9.4	57.2	76.5
LnGrp LOS	D	D	D	D	D	C	C	B	B	A	F	F
Approach Vol, veh/h		528			438			1271			3055	
Approach Delay, s/veh		44.9			42.6			14.6			62.5	
Approach LOS		D			D			B			E	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.9	53.0	9.5	18.6	9.2	52.7	9.5	18.6				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	6.1	42.9	5.0	18.0	5.0	44.0	5.0	18.0				
Max Q Clear Time (g_c+I1), s	3.8	13.9	7.0	13.3	4.5	50.2	7.0	11.9				
Green Ext Time (p_c), s	0.0	9.4	0.0	0.8	0.0	0.0	0.0	0.7				

Intersection Summary

HCM 6th Ctrl Delay	47.6
HCM 6th LOS	D



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		150	150		0	225		250	150		150
Storage Lanes	1		1	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850		0.904				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1684	0	1770	1863	1583	1770	1863	1583
Flt Permitted	0.719			0.747			0.497			0.281		
Satd. Flow (perm)	1339	1863	1583	1391	1684	0	926	1863	1583	523	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			85		37				27			98
Link Speed (mph)		30			30			30				30
Link Distance (ft)		549			716			667				367
Travel Time (s)		12.5			16.3			15.2				8.3

Intersection Summary

Area Type: Other

Timings
1: Lowell Blvd. & W. 68th Ave.

6501 Lowell Blvd
06/07/2021

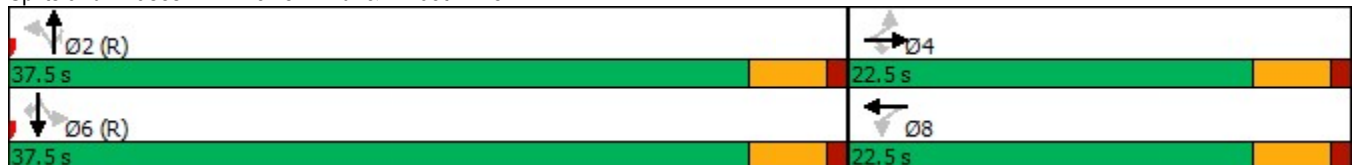


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑	↗	↖	↗	↖	↑	↗	↖	↑	↗
Traffic Volume (vph)	59	15	78	13	19	135	758	22	15	408	90
Future Volume (vph)	59	15	78	13	19	135	758	22	15	408	90
Turn Type	Perm	NA	Perm	Perm	NA	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8		2			6	
Permitted Phases	4		4	8		2		2	6		6
Detector Phase	4	4	4	8	8	2	2	2	6	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	22.5	22.5	22.5	22.5	22.5	37.5	37.5	37.5	37.5	37.5	37.5
Total Split (%)	37.5%	37.5%	37.5%	37.5%	37.5%	62.5%	62.5%	62.5%	62.5%	62.5%	62.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag											
Lead-Lag Optimize?											
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	8.3	8.3	8.3	8.3	8.3	45.6	45.6	45.6	45.6	45.6	45.6
Actuated g/C Ratio	0.14	0.14	0.14	0.14	0.14	0.76	0.76	0.76	0.76	0.76	0.76
v/c Ratio	0.35	0.06	0.29	0.07	0.22	0.21	0.58	0.02	0.04	0.31	0.08
Control Delay	27.7	21.3	8.8	21.8	13.6	4.3	6.9	1.5	3.7	4.2	1.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.7	21.3	8.8	21.8	13.6	4.3	6.9	1.5	3.7	4.2	1.1
LOS	C	C	A	C	B	A	A	A	A	A	A
Approach Delay		17.3			15.2		6.4			3.6	
Approach LOS		B			B		A			A	

Intersection Summary

Cycle Length: 60
 Actuated Cycle Length: 60
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.58
 Intersection Signal Delay: 6.9
 Intersection Capacity Utilization 65.2%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service C

Splits and Phases: 1: Lowell Blvd. & W. 68th Ave.



Queues

6501 Lowell Blvd

1: Lowell Blvd. & W. 68th Ave.

06/07/2021



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	64	16	85	14	58	147	824	24	16	443	98
v/c Ratio	0.35	0.06	0.29	0.07	0.22	0.21	0.58	0.02	0.04	0.31	0.08
Control Delay	27.7	21.3	8.8	21.8	13.6	4.3	6.9	1.5	3.7	4.2	1.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.7	21.3	8.8	21.8	13.6	4.3	6.9	1.5	3.7	4.2	1.1
Queue Length 50th (ft)	21	5	0	5	7	14	115	0	1	45	0
Queue Length 95th (ft)	49	18	30	17	32	39	256	5	7	99	11
Internal Link Dist (ft)		469			636		587			287	
Turn Bay Length (ft)	150		150	150		225		250	150		150
Base Capacity (vph)	401	558	534	417	531	703	1414	1208	397	1414	1225
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.03	0.16	0.03	0.11	0.21	0.58	0.02	0.04	0.31	0.08

Intersection Summary

HCM 6th Signalized Intersection Summary
 1: Lowell Blvd. & W. 68th Ave.

6501 Lowell Blvd
 06/07/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	59	15	78	13	19	34	135	758	22	15	408	90
Future Volume (veh/h)	59	15	78	13	19	34	135	758	22	15	408	90
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	64	16	85	14	21	37	147	824	24	16	443	98
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	232	214	182	258	70	123	685	1375	1166	462	1375	1166
Arrive On Green	0.11	0.11	0.11	0.11	0.11	0.11	0.74	0.74	0.74	0.74	0.74	0.74
Sat Flow, veh/h	1345	1870	1585	1294	607	1070	865	1870	1585	650	1870	1585
Grp Volume(v), veh/h	64	16	85	14	0	58	147	824	24	16	443	98
Grp Sat Flow(s),veh/h/ln	1345	1870	1585	1294	0	1678	865	1870	1585	650	1870	1585
Q Serve(g_s), s	2.7	0.5	3.0	0.6	0.0	1.9	4.3	12.5	0.2	0.7	4.9	1.0
Cycle Q Clear(g_c), s	4.7	0.5	3.0	1.0	0.0	1.9	9.2	12.5	0.2	13.2	4.9	1.0
Prop In Lane	1.00		1.00	1.00		0.64	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	232	214	182	258	0	192	685	1375	1166	462	1375	1166
V/C Ratio(X)	0.28	0.07	0.47	0.05	0.00	0.30	0.21	0.60	0.02	0.03	0.32	0.08
Avail Cap(c_a), veh/h	481	561	476	498	0	503	685	1375	1166	462	1375	1166
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.5	23.7	24.8	24.2	0.0	24.4	4.3	3.8	2.1	6.9	2.8	2.2
Incr Delay (d2), s/veh	0.6	0.1	1.9	0.1	0.0	0.9	0.7	1.9	0.0	0.1	0.6	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.6	0.4	2.1	0.3	0.0	1.4	1.2	5.4	0.1	0.2	2.0	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.1	23.9	26.7	24.3	0.0	25.2	5.1	5.7	2.2	7.0	3.4	2.4
LnGrp LOS	C	C	C	C	A	C	A	A	A	A	A	A
Approach Vol, veh/h		165			72			995				557
Approach Delay, s/veh		26.6			25.0			5.5				3.3
Approach LOS		C			C			A				A
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		48.6		11.4		48.6		11.4				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		33.0		18.0		33.0		18.0				
Max Q Clear Time (g_c+I1), s		14.5		6.7		15.2		3.9				
Green Ext Time (p_c), s		7.0		0.4		3.1		0.2				

Intersection Summary

HCM 6th Ctrl Delay	7.6
HCM 6th LOS	A



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕		↗	↖		↗	↖	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	100		0	100		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.961			0.941			0.996			0.992	
Flt Protected		0.971			0.986		0.950			0.950		
Satd. Flow (prot)	0	1738	0	0	1728	0	1770	1855	0	1770	1848	0
Flt Permitted		0.971			0.986		0.950			0.950		
Satd. Flow (perm)	0	1738	0	0	1728	0	1770	1855	0	1770	1848	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		458			470			732			667	
Travel Time (s)		10.4			10.7			16.6			15.2	

Intersection Summary

Area Type: Other

Intersection												
Int Delay, s/veh	5.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↔	↔		↔	↔	
Traffic Vol, veh/h	38	7	18	10	10	16	32	848	26	19	448	25
Future Vol, veh/h	38	7	18	10	10	16	32	848	26	19	448	25
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	41	8	20	11	11	17	35	922	28	21	487	27

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1563	1563	501	1563	1562	936	514	0	0	950	0	0
Stage 1	543	543	-	1006	1006	-	-	-	-	-	-	-
Stage 2	1020	1020	-	557	556	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	91	112	570	91	112	321	1052	-	-	723	-	-
Stage 1	524	520	-	291	319	-	-	-	-	-	-	-
Stage 2	285	314	-	515	513	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	76	105	570	79	105	321	1052	-	-	723	-	-
Mov Cap-2 Maneuver	76	105	-	79	105	-	-	-	-	-	-	-
Stage 1	507	505	-	281	308	-	-	-	-	-	-	-
Stage 2	251	304	-	476	498	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	88.3		43		0.3		0.4	
HCM LOS	F		E					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1052	-	-	105	133	723	-	-
HCM Lane V/C Ratio	0.033	-	-	0.652	0.294	0.029	-	-
HCM Control Delay (s)	8.5	-	-	88.3	43	10.1	-	-
HCM Lane LOS	A	-	-	F	E	B	-	-
HCM 95th %tile Q(veh)	0.1	-	-	3.3	1.1	0.1	-	-



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↘		↗	↘	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	100		0	100		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt					0.932			0.998				
Flt Protected					0.976					0.950		
Satd. Flow (prot)	0	1863	0	0	1694	0	1863	1859	0	1770	1863	0
Flt Permitted					0.976					0.950		
Satd. Flow (perm)	0	1863	0	0	1694	0	1863	1859	0	1770	1863	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		319			430			608			732	
Travel Time (s)		7.3			9.8			13.8			16.6	

Intersection Summary

Area Type: Other

Intersection												
Int Delay, s/veh	0.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	0	0	0	15	0	15	0	859	13	19	488	0
Future Vol, veh/h	0	0	0	15	0	15	0	859	13	19	488	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	16	0	16	0	934	14	21	530	0

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	1521	1520	530	1513	1513	941	530	0	0	948	0	0
Stage 1	572	572	-	941	941	-	-	-	-	-	-	-
Stage 2	949	948	-	572	572	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	97	119	549	98	120	319	1037	-	-	724	-	-
Stage 1	505	504	-	316	342	-	-	-	-	-	-	-
Stage 2	313	339	-	505	504	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	90	116	549	96	117	319	1037	-	-	724	-	-
Mov Cap-2 Maneuver	90	116	-	96	117	-	-	-	-	-	-	-
Stage 1	505	489	-	316	342	-	-	-	-	-	-	-
Stage 2	297	339	-	490	489	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	36.1	0	0.4
HCM LOS	A	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1037	-	-	-	148	724	-
HCM Lane V/C Ratio	-	-	-	-	0.22	0.029	-
HCM Control Delay (s)	0	-	-	0	36.1	10.1	-
HCM Lane LOS	A	-	-	A	E	B	-
HCM 95th %tile Q(veh)	0	-	-	-	0.8	0.1	-

Lanes and Geometrics
 4: Tennyson St. & W 64th Ave.

6501 Lowell Blvd
 06/07/2021



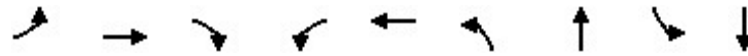
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%				0%
Storage Length (ft)	150		100	150		0	0		0	0		0
Storage Lanes	1		1	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850		0.994			0.920				0.952
Flt Protected	0.950			0.950				0.984				0.983
Satd. Flow (prot)	1770	1863	1583	1770	1852	0	0	1686	0	0	1743	0
Flt Permitted	0.217			0.095				0.878				0.841
Satd. Flow (perm)	404	1863	1583	177	1852	0	0	1505	0	0	1491	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			61		4			93				17
Link Speed (mph)		30			30			30				30
Link Distance (ft)		501			1329			646				482
Travel Time (s)		11.4			30.2			14.7				11.0

Intersection Summary

Area Type: Other

Timings
4: Tennyson St. & W 64th Ave.

6501 Lowell Blvd
06/07/2021

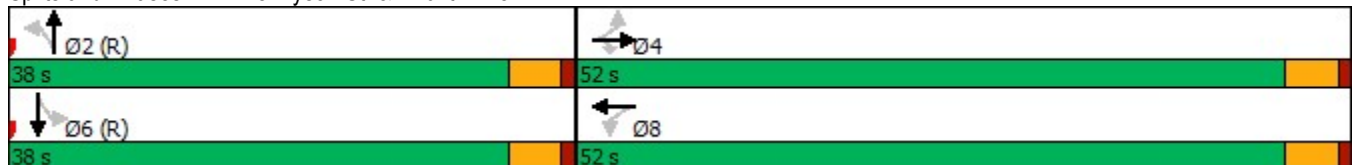


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↖	↑	↗	↖	↗		↕		↕
Traffic Volume (vph)	25	761	110	95	585	137	40	16	13
Future Volume (vph)	25	761	110	95	585	137	40	16	13
Turn Type	Perm	NA	Perm	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4			8		2		6
Permitted Phases	4		4	8		2		6	
Detector Phase	4	4	4	8	8	2	2	6	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	52.0	52.0	52.0	52.0	52.0	38.0	38.0	38.0	38.0
Total Split (%)	57.8%	57.8%	57.8%	57.8%	57.8%	42.2%	42.2%	42.2%	42.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	45.5	45.5	45.5	45.5	45.5		35.5		35.5
Actuated g/C Ratio	0.51	0.51	0.51	0.51	0.51		0.39		0.39
v/c Ratio	0.13	0.88	0.14	1.16	0.71		0.73		0.08
Control Delay	12.8	31.7	6.2	166.4	32.9		27.0		13.7
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	12.8	31.7	6.2	166.4	32.9		27.0		13.7
LOS	B	C	A	F	C		C		B
Approach Delay		28.1			50.8		27.0		13.7
Approach LOS		C			D		C		B

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 65
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.16
 Intersection Signal Delay: 35.3
 Intersection Capacity Utilization 88.5%
 Analysis Period (min) 15
 Intersection LOS: D
 ICU Level of Service E

Splits and Phases: 4: Tennyson St. & W 64th Ave.





Lane Group	EBL	EBT	EBR	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	27	827	120	103	664	471	48
v/c Ratio	0.13	0.88	0.14	1.16	0.71	0.73	0.08
Control Delay	12.8	31.7	6.2	166.4	32.9	27.0	13.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.8	31.7	6.2	166.4	32.9	27.0	13.7
Queue Length 50th (ft)	7	378	16	~64	330	187	11
Queue Length 95th (ft)	23	#623	42	m#116	m413	#324	34
Internal Link Dist (ft)		421			1249	566	402
Turn Bay Length (ft)	150		100	150			
Base Capacity (vph)	213	983	864	93	979	649	597
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.84	0.14	1.11	0.68	0.73	0.08

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

HCM 6th Signalized Intersection Summary
 4: Tennyson St. & W 64th Ave.

6501 Lowell Blvd
 06/07/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	25	761	110	95	585	26	137	40	257	16	13	16
Future Volume (veh/h)	25	761	110	95	585	26	137	40	257	16	13	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	27	827	120	103	636	28	149	43	279	17	14	17
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	487	987	837	171	938	41	219	69	341	197	164	168
Arrive On Green	0.53	0.53	0.53	1.00	1.00	1.00	0.37	0.37	0.37	0.37	0.37	0.37
Sat Flow, veh/h	772	1870	1585	592	1778	78	446	184	916	384	440	451
Grp Volume(v), veh/h	27	827	120	103	0	664	471	0	0	48	0	0
Grp Sat Flow(s),veh/h/ln	772	1870	1585	592	0	1856	1546	0	0	1275	0	0
Q Serve(g_s), s	1.5	33.7	3.5	13.8	0.0	0.0	22.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	1.5	33.7	3.5	47.5	0.0	0.0	24.6	0.0	0.0	1.6	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.04	0.32		0.59	0.35		0.35
Lane Grp Cap(c), veh/h	487	987	837	171	0	980	628	0	0	529	0	0
V/C Ratio(X)	0.06	0.84	0.14	0.60	0.00	0.68	0.75	0.00	0.00	0.09	0.00	0.00
Avail Cap(c_a), veh/h	487	987	837	171	0	980	628	0	0	529	0	0
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	0.69	0.00	0.69	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	10.4	18.0	10.9	17.7	0.0	0.0	25.4	0.0	0.0	18.2	0.0	0.0
Incr Delay (d2), s/veh	0.0	6.5	0.1	4.1	0.0	1.3	8.0	0.0	0.0	0.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.5	21.3	2.1	3.7	0.0	0.6	15.2	0.0	0.0	1.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	10.4	24.4	10.9	21.7	0.0	1.3	33.4	0.0	0.0	18.6	0.0	0.0
LnGrp LOS	B	C	B	C	A	A	C	A	A	B	A	A
Approach Vol, veh/h		974			767			471				48
Approach Delay, s/veh		22.4			4.0			33.4				18.6
Approach LOS		C			A			C				B
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		38.0		52.0		38.0		52.0				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		33.5		47.5		33.5		47.5				
Max Q Clear Time (g_c+I1), s		26.6		35.7		3.6		49.5				
Green Ext Time (p_c), s		1.8		5.2		0.2		0.0				
Intersection Summary												
HCM 6th Ctrl Delay				18.4								
HCM 6th LOS				B								



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	200		150	150		75	200		150	200		100
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.135			0.451			0.586			0.129		
Satd. Flow (perm)	251	1863	1583	840	1863	1583	1092	1863	1583	240	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			93			127			127			197
Link Speed (mph)		30			30			30				30
Link Distance (ft)		1329			1480			763				608
Travel Time (s)		30.2			33.6			17.3				13.8

Intersection Summary

Area Type: Other

Timings
5: W 64th Ave./W. 64th Ave. & Lowell Blvd.

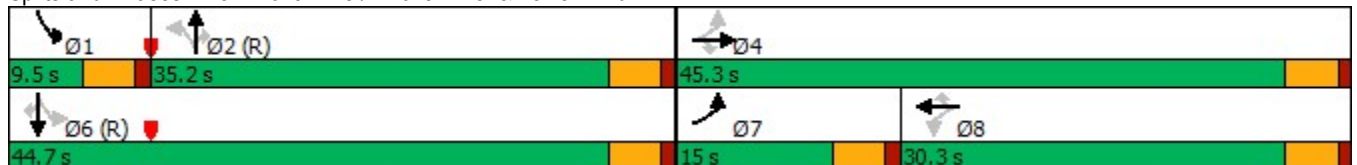
6501 Lowell Blvd
06/07/2021

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	270	482	87	59	447	72	153	520	125	50	261	181
Future Volume (vph)	270	482	87	59	447	72	153	520	125	50	261	181
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4			8			2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	7	4	4	8	8	8	2	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	15.0	45.3	45.3	30.3	30.3	30.3	35.2	35.2	35.2	9.5	44.7	44.7
Total Split (%)	16.7%	50.3%	50.3%	33.7%	33.7%	33.7%	39.1%	39.1%	39.1%	10.6%	49.7%	49.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead			Lag	Lag	Lag	Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes			Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	40.1	40.1	40.1	25.1	25.1	25.1	33.3	33.3	33.3	40.9	40.9	40.9
Actuated g/C Ratio	0.45	0.45	0.45	0.28	0.28	0.28	0.37	0.37	0.37	0.45	0.45	0.45
v/c Ratio	1.01	0.63	0.13	0.27	0.93	0.15	0.41	0.82	0.20	0.28	0.34	0.24
Control Delay	76.4	30.6	9.0	28.7	59.1	1.9	26.4	38.9	5.6	17.9	17.5	3.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	76.4	30.6	9.0	28.7	59.1	1.9	26.4	38.9	5.6	17.9	17.5	3.1
LOS	E	C	A	C	E	A	C	D	A	B	B	A
Approach Delay		43.0			48.9			31.3			12.2	
Approach LOS		D			D			C			B	

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.01
 Intersection Signal Delay: 35.2
 Intersection LOS: D
 Intersection Capacity Utilization 85.0%
 ICU Level of Service E
 Analysis Period (min) 15

Splits and Phases: 5: W 64th Ave./W. 64th Ave. & Lowell Blvd.





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	293	524	95	64	486	78	166	565	136	54	284	197
v/c Ratio	1.01	0.63	0.13	0.27	0.93	0.15	0.41	0.82	0.20	0.28	0.34	0.24
Control Delay	76.4	30.6	9.0	28.7	59.1	1.9	26.4	38.9	5.6	17.9	17.5	3.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	76.4	30.6	9.0	28.7	59.1	1.9	26.4	38.9	5.6	17.9	17.5	3.1
Queue Length 50th (ft)	~148	262	10	28	266	0	72	300	3	17	102	0
Queue Length 95th (ft)	m#213	m323	m19	63	#451	11	133	#494	41	38	161	37
Internal Link Dist (ft)		1249			1400			683			528	
Turn Bay Length (ft)	200		150	150		75	200		150	200		100
Base Capacity (vph)	289	844	768	240	534	544	403	688	664	195	846	826
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.01	0.62	0.12	0.27	0.91	0.14	0.41	0.82	0.20	0.28	0.34	0.24

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

HCM 6th Signalized Intersection Summary
 5: W 64th Ave./W. 64th Ave. & Lowell Blvd.

6501 Lowell Blvd
 06/07/2021



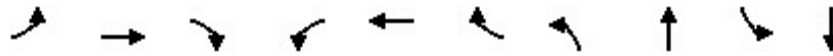
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	270	482	87	59	447	72	153	520	125	50	261	181
Future Volume (veh/h)	270	482	87	59	447	72	153	520	125	50	261	181
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	293	524	95	64	486	78	166	565	136	54	284	197
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	311	835	708	266	523	443	405	678	574	218	848	719
Arrive On Green	0.12	0.45	0.45	0.28	0.28	0.28	0.36	0.36	0.36	0.04	0.45	0.45
Sat Flow, veh/h	1781	1870	1585	804	1870	1585	914	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	293	524	95	64	486	78	166	565	136	54	284	197
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	804	1870	1585	914	1870	1585	1781	1870	1585
Q Serve(g_s), s	10.3	19.4	3.2	6.0	22.8	3.4	12.9	24.8	5.4	1.6	8.8	7.0
Cycle Q Clear(g_c), s	10.3	19.4	3.2	10.4	22.8	3.4	13.5	24.8	5.4	1.6	8.8	7.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	311	835	708	266	523	443	405	678	574	218	848	719
V/C Ratio(X)	0.94	0.63	0.13	0.24	0.93	0.18	0.41	0.83	0.24	0.25	0.33	0.27
Avail Cap(c_a), veh/h	311	848	719	271	536	454	405	678	574	243	848	719
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.36	0.36	0.36	0.09	0.09	0.09	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.2	19.2	14.7	28.9	31.5	24.6	22.8	26.2	20.0	19.6	15.8	15.3
Incr Delay (d2), s/veh	18.4	0.5	0.0	0.0	3.1	0.0	3.0	11.5	1.0	0.6	1.1	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	8.0	10.9	2.0	1.7	12.0	1.8	5.4	18.6	3.8	1.2	6.9	4.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	40.6	19.7	14.7	29.0	34.7	24.6	25.9	37.7	21.0	20.2	16.9	16.3
LnGrp LOS	D	B	B	C	C	C	C	D	C	C	B	B
Approach Vol, veh/h		912			628			867			535	
Approach Delay, s/veh		25.9			32.8			32.8			17.0	
Approach LOS		C			C			C			B	
Timer - Assigned Phs	1	2		4		6	7	8				
Phs Duration (G+Y+Rc), s	8.2	37.1		44.7		45.3	15.0	29.7				
Change Period (Y+Rc), s	4.5	4.5		4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s	5.0	30.7		40.8		40.2	10.5	25.8				
Max Q Clear Time (g_c+I1), s	3.6	26.8		21.4		10.8	12.3	24.8				
Green Ext Time (p_c), s	0.0	1.8		3.6		2.5	0.0	0.4				
Intersection Summary												
HCM 6th Ctrl Delay				27.8								
HCM 6th LOS				C								



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	100		150	150		100	600		0	250		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor			0.850			0.850		0.993			0.988	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	5050	0	1770	5024	0
Flt Permitted	0.180			0.505			0.072			0.079		
Satd. Flow (perm)	335	1863	1583	941	1863	1583	134	5050	0	147	5024	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			193			177		9			14	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1480			550			1046			611	
Travel Time (s)		33.6			12.5			23.8			13.9	

Intersection Summary

Area Type: Other

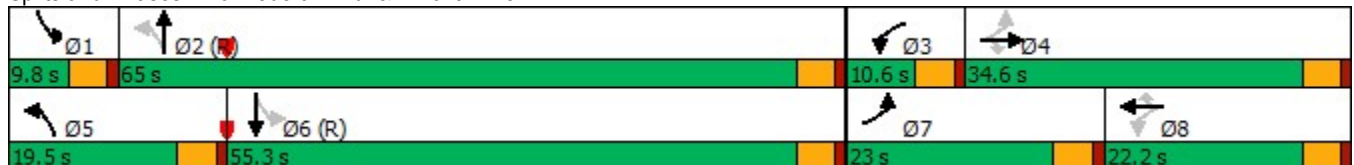


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations	↖	↑	↗	↖	↑	↗	↖	↑↑↑	↖	↑↑↑
Traffic Volume (vph)	339	288	206	135	251	116	260	2230	101	1826
Future Volume (vph)	339	288	206	135	251	116	260	2230	101	1826
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA
Protected Phases	7	4		3	8		5	2	1	6
Permitted Phases	4		4	8		8	2		6	
Detector Phase	7	4	4	3	8	8	5	2	1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	20.6	20.6	9.5	22.5	9.5	22.5
Total Split (s)	23.0	34.6	34.6	10.6	22.2	22.2	19.5	65.0	9.8	55.3
Total Split (%)	19.2%	28.8%	28.8%	8.8%	18.5%	18.5%	16.3%	54.2%	8.2%	46.1%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)	40.7	30.1	30.1	23.8	17.7	17.7	70.3	60.5	56.1	50.8
Actuated g/C Ratio	0.34	0.25	0.25	0.20	0.15	0.15	0.59	0.50	0.47	0.42
v/c Ratio	1.10	0.67	0.41	0.64	1.00	0.33	1.00	1.00	0.79	1.01
Control Delay	112.4	48.6	10.2	48.0	105.0	4.2	87.9	47.1	56.5	56.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	112.4	48.6	10.2	48.0	105.0	4.2	87.9	47.1	56.5	56.4
LOS	F	D	B	D	F	A	F	D	E	E
Approach Delay		65.1			66.4			51.2		56.4
Approach LOS		E			E			D		E

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 120
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.10
 Intersection Signal Delay: 56.2
 Intersection LOS: E
 Intersection Capacity Utilization 100.1%
 ICU Level of Service G
 Analysis Period (min) 15

Splits and Phases: 6: Federal Blvd. & W. 64th Ave.





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	368	313	224	147	273	126	283	2544	110	2155
v/c Ratio	1.10	0.67	0.41	0.64	1.00	0.33	1.00	1.00	0.79	1.01
Control Delay	112.4	48.6	10.2	48.0	105.0	4.2	87.9	47.1	56.5	56.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	112.4	48.6	10.2	48.0	105.0	4.2	87.9	47.1	56.5	56.4
Queue Length 50th (ft)	~273	219	18	82	214	0	170	694	36	~613
Queue Length 95th (ft)	#468	321	85	#136	#391	18	#355	#840	#133	#736
Internal Link Dist (ft)		1400			470			966		531
Turn Bay Length (ft)	100		150	150		100	600		250	
Base Capacity (vph)	334	467	541	228	274	384	283	2550	140	2134
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.10	0.67	0.41	0.64	1.00	0.33	1.00	1.00	0.79	1.01

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

HCM 6th Signalized Intersection Summary
6: Federal Blvd. & W. 64th Ave.

6501 Lowell Blvd
06/07/2021


























Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	339	288	206	135	251	116	260	2230	110	101	1826	156
Future Volume (veh/h)	339	288	206	135	251	116	260	2230	110	101	1826	156
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	368	313	224	147	273	126	283	2424	120	110	1985	170
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	336	469	398	238	276	234	285	2514	123	142	2029	173
Arrive On Green	0.15	0.25	0.25	0.05	0.15	0.15	0.13	0.50	0.50	0.04	0.42	0.42
Sat Flow, veh/h	1781	1870	1585	1781	1870	1585	1781	4986	245	1781	4793	408
Grp Volume(v), veh/h	368	313	224	147	273	126	283	1648	896	110	1406	749
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	1585	1781	1702	1826	1781	1702	1797
Q Serve(g_s), s	18.5	18.1	14.8	6.1	17.5	8.8	14.9	55.8	57.3	4.2	48.7	49.5
Cycle Q Clear(g_c), s	18.5	18.1	14.8	6.1	17.5	8.8	14.9	55.8	57.3	4.2	48.7	49.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.13	1.00		0.23
Lane Grp Cap(c), veh/h	336	469	398	238	276	234	285	1716	921	142	1441	761
V/C Ratio(X)	1.09	0.67	0.56	0.62	0.99	0.54	0.99	0.96	0.97	0.77	0.98	0.98
Avail Cap(c_a), veh/h	336	469	398	238	276	234	285	1716	921	142	1441	761
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	0.84	0.84	0.84	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.4	40.4	39.2	44.2	51.1	47.4	39.4	28.6	29.0	28.8	34.0	34.2
Incr Delay (d2), s/veh	72.7	3.0	1.5	4.8	51.2	2.5	51.6	14.2	23.8	22.9	18.6	29.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	21.7	13.1	9.6	2.7	17.8	6.6	18.3	33.4	39.0	4.8	31.2	35.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	109.1	43.5	40.8	49.0	102.2	49.8	90.9	42.8	52.8	51.8	52.6	63.3
LnGrp LOS	F	D	D	D	F	D	F	D	D	D	D	E
Approach Vol, veh/h		905			546			2827			2265	
Approach Delay, s/veh		69.5			75.8			50.7			56.1	
Approach LOS		E			E			D			E	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.8	65.0	10.6	34.6	19.5	55.3	23.0	22.2				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	5.3	60.5	6.1	30.1	15.0	50.8	18.5	17.7				
Max Q Clear Time (g_c+I1), s	6.2	59.3	8.1	20.1	16.9	51.5	20.5	19.5				
Green Ext Time (p_c), s	0.0	1.2	0.0	1.9	0.0	0.0	0.0	0.0				

Intersection Summary

HCM 6th Ctrl Delay	57.3
HCM 6th LOS	E

Notes

User approved pedestrian interval to be less than phase max green.

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		150	150		0	225		250	150		150
Storage Lanes	1		1	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850		0.931				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1734	0	1770	1863	1583	1770	1863	1583
Flt Permitted	0.742			0.750			0.535			0.619		
Satd. Flow (perm)	1382	1863	1583	1397	1734	0	997	1863	1583	1153	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			136		11				27			65
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		594			990			699			502	
Travel Time (s)		13.5			22.5			15.9			11.4	

Intersection Summary

Area Type: Other

Timings
1: Lowell Blvd. & W. 68th Ave.

6501 Lowell Blvd
06/07/2021



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑	↗	↖	↗	↖	↑	↗	↖	↑	↗
Traffic Volume (vph)	56	10	125	3	12	71	205	1	18	352	60
Future Volume (vph)	56	10	125	3	12	71	205	1	18	352	60
Turn Type	Perm	NA	Perm	Perm	NA	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8		2			6	
Permitted Phases	4		4	8		2		2	6		6
Detector Phase	4	4	4	8	8	2	2	2	6	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	26.0	26.0	26.0	26.0	26.0	34.0	34.0	34.0	34.0	34.0	34.0
Total Split (%)	43.3%	43.3%	43.3%	43.3%	43.3%	56.7%	56.7%	56.7%	56.7%	56.7%	56.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag											
Lead-Lag Optimize?											
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	8.2	8.2	8.2	8.2	8.2	45.7	45.7	45.7	45.7	45.7	45.7
Actuated g/C Ratio	0.14	0.14	0.14	0.14	0.14	0.76	0.76	0.76	0.76	0.76	0.76
v/c Ratio	0.32	0.04	0.41	0.02	0.10	0.10	0.16	0.00	0.02	0.27	0.05
Control Delay	27.2	21.3	8.9	21.0	16.5	3.6	3.4	0.0	3.2	3.9	1.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.2	21.3	8.9	21.0	16.5	3.6	3.4	0.0	3.2	3.9	1.2
LOS	C	C	A	C	B	A	A	A	A	A	A
Approach Delay		14.9			17.0		3.4			3.5	
Approach LOS		B			B		A			A	

Intersection Summary

Cycle Length: 60
 Actuated Cycle Length: 60
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 45
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.41
 Intersection Signal Delay: 6.2
 Intersection Capacity Utilization 43.7%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service A

Splits and Phases: 1: Lowell Blvd. & W. 68th Ave.



Queues

6501 Lowell Blvd

1: Lowell Blvd. & W. 68th Ave.

06/07/2021



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	61	11	136	3	24	77	223	1	20	383	65
v/c Ratio	0.32	0.04	0.41	0.02	0.10	0.10	0.16	0.00	0.02	0.27	0.05
Control Delay	27.2	21.3	8.9	21.0	16.5	3.6	3.4	0.0	3.2	3.9	1.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.2	21.3	8.9	21.0	16.5	3.6	3.4	0.0	3.2	3.9	1.2
Queue Length 50th (ft)	20	4	0	1	4	6	19	0	2	37	0
Queue Length 95th (ft)	48	15	39	7	20	20	46	0	7	82	9
Internal Link Dist (ft)		514			910		619			422	
Turn Bay Length (ft)	150		150	150		225		250	150		150
Base Capacity (vph)	495	667	654	500	628	759	1419	1212	878	1419	1221
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.12	0.02	0.21	0.01	0.04	0.10	0.16	0.00	0.02	0.27	0.05

Intersection Summary

HCM 6th Signalized Intersection Summary
 1: Lowell Blvd. & W. 68th Ave.

6501 Lowell Blvd
 06/07/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	56	10	125	3	12	10	71	205	1	18	352	60
Future Volume (veh/h)	56	10	125	3	12	10	71	205	1	18	352	60
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	61	11	136	3	13	11	77	223	1	20	383	65
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	272	229	194	265	114	97	740	1361	1154	919	1361	1154
Arrive On Green	0.12	0.12	0.12	0.12	0.12	0.12	0.73	0.73	0.73	0.73	0.73	0.73
Sat Flow, veh/h	1387	1870	1585	1241	936	792	942	1870	1585	1157	1870	1585
Grp Volume(v), veh/h	61	11	136	3	0	24	77	223	1	20	383	65
Grp Sat Flow(s),veh/h/ln	1387	1870	1585	1241	0	1728	942	1870	1585	1157	1870	1585
Q Serve(g_s), s	2.5	0.3	4.9	0.1	0.0	0.7	1.8	2.2	0.0	0.3	4.2	0.7
Cycle Q Clear(g_c), s	3.2	0.3	4.9	0.4	0.0	0.7	6.0	2.2	0.0	2.5	4.2	0.7
Prop In Lane	1.00		1.00	1.00		0.46	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	272	229	194	265	0	211	740	1361	1154	919	1361	1154
V/C Ratio(X)	0.22	0.05	0.70	0.01	0.00	0.11	0.10	0.16	0.00	0.02	0.28	0.06
Avail Cap(c_a), veh/h	600	670	568	558	0	619	740	1361	1154	919	1361	1154
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.9	23.3	25.3	23.4	0.0	23.4	3.8	2.5	2.2	2.9	2.8	2.3
Incr Delay (d2), s/veh	0.4	0.1	4.6	0.0	0.0	0.2	0.3	0.3	0.0	0.0	0.5	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.4	0.2	3.6	0.1	0.0	0.5	0.5	0.9	0.0	0.1	1.8	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.3	23.3	29.9	23.5	0.0	23.7	4.1	2.8	2.2	3.0	3.3	2.4
LnGrp LOS	C	C	C	C	A	C	A	A	A	A	A	A
Approach Vol, veh/h		208			27			301			468	
Approach Delay, s/veh		28.2			23.7			3.1			3.2	
Approach LOS		C			C			A			A	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		48.2		11.8		48.2		11.8				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		29.5		21.5		29.5		21.5				
Max Q Clear Time (g_c+I1), s		8.0		6.9		6.2		2.7				
Green Ext Time (p_c), s		1.6		0.5		2.7		0.1				

Intersection Summary

HCM 6th Ctrl Delay	8.9
HCM 6th LOS	A



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↘		↗	↘	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	100		0	100		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.921			0.940			0.996			0.993	
Flt Protected		0.986			0.978		0.950		0.950		0.950	
Satd. Flow (prot)	0	1692	0	0	1712	0	1770	1855	0	1770	1850	0
Flt Permitted		0.986			0.978		0.950		0.950		0.950	
Satd. Flow (perm)	0	1692	0	0	1712	0	1770	1855	0	1770	1850	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		458			470			732			699	
Travel Time (s)		10.4			10.7			16.6			15.9	

Intersection Summary

Area Type: Other

Intersection												
Int Delay, s/veh	1.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	15	6	29	16	4	16	12	366	10	4	490	24
Future Vol, veh/h	15	6	29	16	4	16	12	366	10	4	490	24
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	16	7	32	17	4	17	13	398	11	4	533	26

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	994	989	546	1004	997	404	559	0	0	409	0	0
Stage 1	554	554	-	430	430	-	-	-	-	-	-	-
Stage 2	440	435	-	574	567	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	224	247	538	220	244	647	1012	-	-	1150	-	-
Stage 1	517	514	-	603	583	-	-	-	-	-	-	-
Stage 2	596	580	-	504	507	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	212	243	538	200	240	647	1012	-	-	1150	-	-
Mov Cap-2 Maneuver	212	243	-	200	240	-	-	-	-	-	-	-
Stage 1	510	512	-	595	575	-	-	-	-	-	-	-
Stage 2	568	572	-	467	505	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	17.8		19		0.3		0.1	
HCM LOS	C		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1012	-	-	335	297	1150	-	-
HCM Lane V/C Ratio	0.013	-	-	0.162	0.132	0.004	-	-
HCM Control Delay (s)	8.6	-	-	17.8	19	8.1	-	-
HCM Lane LOS	A	-	-	C	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.6	0.4	0	-	-



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↘		↗	↘	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	100		0	100		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.916			0.921			0.996			0.999	
Flt Protected		0.986			0.983		0.950		0.950			
Satd. Flow (prot)	0	1682	0	0	1686	0	1770	1855	0	1770	1861	0
Flt Permitted		0.986			0.983		0.950		0.950			
Satd. Flow (perm)	0	1682	0	0	1686	0	1770	1855	0	1770	1861	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		319			430			608			732	
Travel Time (s)		7.3			9.8			13.8			16.6	

Intersection Summary

Area Type: Other

Intersection												
Int Delay, s/veh	1.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	11	4	24	9	2	16	8	363	10	13	520	4
Future Vol, veh/h	11	4	24	9	2	16	8	363	10	13	520	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	12	4	26	10	2	17	9	395	11	14	565	4

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1023	1019	567	1029	1016	401	569	0	0	406	0	0
Stage 1	595	595	-	419	419	-	-	-	-	-	-	-
Stage 2	428	424	-	610	597	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	214	237	523	212	238	649	1003	-	-	1153	-	-
Stage 1	491	492	-	612	590	-	-	-	-	-	-	-
Stage 2	605	587	-	482	491	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	204	232	523	195	233	649	1003	-	-	1153	-	-
Mov Cap-2 Maneuver	204	232	-	195	233	-	-	-	-	-	-	-
Stage 1	487	486	-	606	585	-	-	-	-	-	-	-
Stage 2	581	582	-	448	485	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	17.4		16.6		0.2		0.2	
HCM LOS	C		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1003	-	-	333	340	1153	-	-
HCM Lane V/C Ratio	0.009	-	-	0.127	0.086	0.012	-	-
HCM Control Delay (s)	8.6	-	-	17.4	16.6	8.2	-	-
HCM Lane LOS	A	-	-	C	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.4	0.3	0	-	-

Lanes and Geometrics
 4: Tennyson St. & W 64th Ave.

6501 Lowell Blvd
 06/07/2021



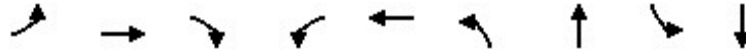
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		100	150		0	0		0	0		0
Storage Lanes	1		1	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850		0.995			0.919				0.949
Flt Protected	0.950			0.950				0.984				0.993
Satd. Flow (prot)	1770	1863	1583	1770	1853	0	0	1684	0	0	1755	0
Flt Permitted	0.220			0.349				0.899				0.966
Satd. Flow (perm)	410	1863	1583	650	1853	0	0	1539	0	0	1708	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			74		3			93				21
Link Speed (mph)		30			30			30				30
Link Distance (ft)		700			838			502				485
Travel Time (s)		15.9			19.0			11.4				11.0

Intersection Summary

Area Type: Other

Timings
4: Tennyson St. & W 64th Ave.

6501 Lowell Blvd
06/07/2021

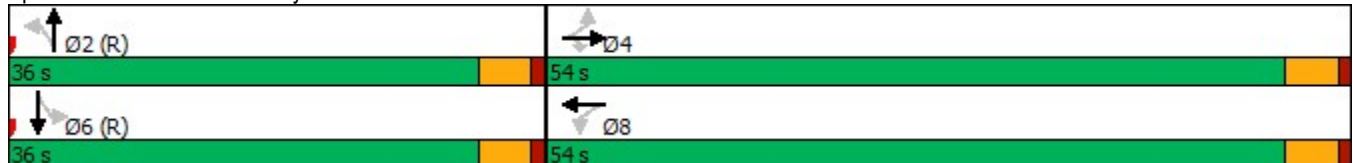


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↖	↑	↗	↖	↗		↕		↕
Traffic Volume (vph)	13	359	68	180	450	63	16	7	25
Future Volume (vph)	13	359	68	180	450	63	16	7	25
Turn Type	Perm	NA	Perm	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4			8		2		6
Permitted Phases	4		4	8		2		6	
Detector Phase	4	4	4	8	8	2	2	6	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	54.0	54.0	54.0	54.0	54.0	36.0	36.0	36.0	36.0
Total Split (%)	60.0%	60.0%	60.0%	60.0%	60.0%	40.0%	40.0%	40.0%	40.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5		4.5		4.5
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	32.9	32.9	32.9	32.9	32.9		48.1		48.1
Actuated g/C Ratio	0.37	0.37	0.37	0.37	0.37		0.53		0.53
v/c Ratio	0.09	0.57	0.12	0.83	0.74		0.25		0.06
Control Delay	16.6	25.3	4.0	63.2	42.2		8.7		9.7
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	16.6	25.3	4.0	63.2	42.2		8.7		9.7
LOS	B	C	A	E	D		A		A
Approach Delay		21.7			48.1		8.7		9.7
Approach LOS		C			D		A		A

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 50
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.83
 Intersection Signal Delay: 32.1
 Intersection Capacity Utilization 58.4%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service B

Splits and Phases: 4: Tennyson St. & W 64th Ave.





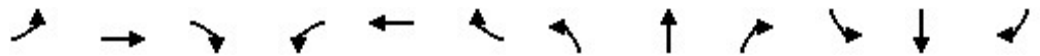
Lane Group	EBL	EBT	EBR	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	14	390	74	196	505	214	56
v/c Ratio	0.09	0.57	0.12	0.83	0.74	0.25	0.06
Control Delay	16.6	25.3	4.0	63.2	42.2	8.7	9.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.6	25.3	4.0	63.2	42.2	8.7	9.7
Queue Length 50th (ft)	5	174	0	113	283	33	9
Queue Length 95th (ft)	15	212	22	176	357	92	34
Internal Link Dist (ft)		620			758	422	405
Turn Bay Length (ft)	150		100	150			
Base Capacity (vph)	225	1024	903	357	1020	866	922
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.38	0.08	0.55	0.50	0.25	0.06
Intersection Summary							

HCM 6th Signalized Intersection Summary
4: Tennyson St. & W 64th Ave.

6501 Lowell Blvd
06/07/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	13	359	68	180	450	15	63	16	119	7	25	19
Future Volume (veh/h)	13	359	68	180	450	15	63	16	119	7	25	19
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	14	390	74	196	489	16	68	17	129	8	27	21
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	259	780	661	325	751	25	263	85	448	129	421	302
Arrive On Green	0.42	0.42	0.42	0.42	0.42	0.42	0.48	0.48	0.48	0.48	0.48	0.48
Sat Flow, veh/h	894	1870	1585	928	1801	59	436	175	928	172	872	626
Grp Volume(v), veh/h	14	390	74	196	0	505	214	0	0	56	0	0
Grp Sat Flow(s),veh/h/ln	894	1870	1585	928	0	1860	1539	0	0	1671	0	0
Q Serve(g_s), s	1.1	13.8	2.6	17.7	0.0	19.6	2.8	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	20.7	13.8	2.6	31.6	0.0	19.6	7.1	0.0	0.0	1.5	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.03	0.32		0.60	0.14		0.37
Lane Grp Cap(c), veh/h	259	780	661	325	0	776	795	0	0	852	0	0
V/C Ratio(X)	0.05	0.50	0.11	0.60	0.00	0.65	0.27	0.00	0.00	0.07	0.00	0.00
Avail Cap(c_a), veh/h	377	1029	872	448	0	1023	795	0	0	852	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	29.3	19.3	16.0	30.9	0.0	21.0	13.8	0.0	0.0	12.4	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.5	0.1	1.8	0.0	0.9	0.8	0.0	0.0	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.4	9.8	1.7	7.2	0.0	13.0	4.8	0.0	0.0	1.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	29.3	19.8	16.1	32.7	0.0	21.9	14.6	0.0	0.0	12.6	0.0	0.0
LnGrp LOS	C	B	B	C	A	C	B	A	A	B	A	A
Approach Vol, veh/h		478			701			214				56
Approach Delay, s/veh		19.5			24.9			14.6				12.6
Approach LOS		B			C			B				B
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		47.9		42.1		47.9		42.1				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		31.5		49.5		31.5		49.5				
Max Q Clear Time (g_c+I1), s		9.1		22.7		3.5		33.6				
Green Ext Time (p_c), s		1.3		2.9		0.2		4.0				
Intersection Summary												
HCM 6th Ctrl Delay				21.1								
HCM 6th LOS				C								



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	200		150	150		75	200		150	200		100
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.253			0.539			0.556			0.565		
Satd. Flow (perm)	471	1863	1583	1004	1863	1583	1036	1863	1583	1052	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			115			127			127			153
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		596			1268			763			608	
Travel Time (s)		13.5			28.8			17.3			13.8	

Intersection Summary

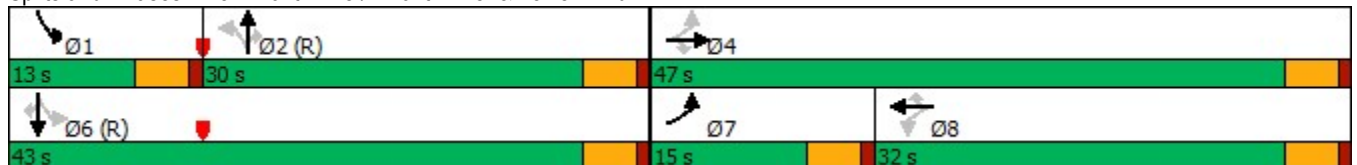
Area Type: Other

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	132	345	106	81	271	49	52	150	63	104	314	141
Future Volume (vph)	132	345	106	81	271	49	52	150	63	104	314	141
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4			8			2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	7	4	4	8	8	8	2	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	15.0	47.0	47.0	32.0	32.0	32.0	30.0	30.0	30.0	13.0	43.0	43.0
Total Split (%)	16.7%	52.2%	52.2%	35.6%	35.6%	35.6%	33.3%	33.3%	33.3%	14.4%	47.8%	47.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead			Lag	Lag	Lag	Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes			Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	34.2	34.2	34.2	19.9	19.9	19.9	36.4	36.4	36.4	46.8	46.8	46.8
Actuated g/C Ratio	0.38	0.38	0.38	0.22	0.22	0.22	0.40	0.40	0.40	0.52	0.52	0.52
v/c Ratio	0.45	0.53	0.17	0.40	0.72	0.12	0.14	0.22	0.10	0.18	0.35	0.17
Control Delay	34.8	38.0	14.6	31.5	37.6	3.6	23.1	22.1	0.8	13.8	15.5	3.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.8	38.0	14.6	31.5	37.6	3.6	23.1	22.1	0.8	13.8	15.5	3.1
LOS	C	D	B	C	D	A	C	C	A	B	B	A
Approach Delay		33.0			32.3			17.3			12.1	
Approach LOS		C			C			B			B	

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 65
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.72
 Intersection Signal Delay: 24.1
 Intersection Capacity Utilization 58.3%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service B

Splits and Phases: 5: W 64th Ave./W. 64th Ave. & Lowell Blvd.





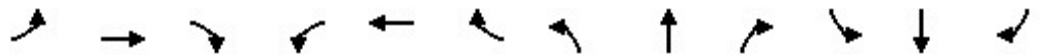
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	143	375	115	88	295	53	57	163	68	113	341	153
v/c Ratio	0.45	0.53	0.17	0.40	0.72	0.12	0.14	0.22	0.10	0.18	0.35	0.17
Control Delay	34.8	38.0	14.6	31.5	37.6	3.6	23.1	22.1	0.8	13.8	15.5	3.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.8	38.0	14.6	31.5	37.6	3.6	23.1	22.1	0.8	13.8	15.5	3.1
Queue Length 50th (ft)	77	210	19	43	158	2	21	63	0	31	109	0
Queue Length 95th (ft)	111	261	48	m57	m182	m3	56	126	5	72	204	34
Internal Link Dist (ft)		516			1188			683			528	
Turn Bay Length (ft)	200		150	150		75	200		150	200		100
Base Capacity (vph)	330	879	808	306	569	571	418	753	715	617	969	896
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.43	0.14	0.29	0.52	0.09	0.14	0.22	0.10	0.18	0.35	0.17

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM 6th Signalized Intersection Summary
 5: W 64th Ave./W. 64th Ave. & Lowell Blvd.

6501 Lowell Blvd
 06/07/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↘	↖	↗	↘	↖	↗	↘	↖	↗	↘
Traffic Volume (veh/h)	132	345	106	81	271	49	52	150	63	104	314	141
Future Volume (veh/h)	132	345	106	81	271	49	52	150	63	104	314	141
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	143	375	115	88	295	53	57	163	68	113	341	153
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	270	618	523	206	371	314	502	874	741	652	1066	903
Arrive On Green	0.03	0.11	0.11	0.07	0.07	0.07	0.47	0.47	0.47	0.05	0.57	0.57
Sat Flow, veh/h	1781	1870	1585	906	1870	1585	903	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	143	375	115	88	295	53	57	163	68	113	341	153
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	906	1870	1585	903	1870	1585	1781	1870	1585
Q Serve(g_s), s	5.5	17.2	6.0	8.6	14.0	2.8	3.2	4.6	2.1	2.8	8.6	4.1
Cycle Q Clear(g_c), s	5.5	17.2	6.0	14.0	14.0	2.8	3.2	4.6	2.1	2.8	8.6	4.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	270	618	523	206	371	314	502	874	741	652	1066	903
V/C Ratio(X)	0.53	0.61	0.22	0.43	0.80	0.17	0.11	0.19	0.09	0.17	0.32	0.17
Avail Cap(c_a), veh/h	332	883	748	303	571	484	502	874	741	727	1066	903
HCM Platoon Ratio	0.33	0.33	0.33	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.70	0.70	0.70	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.0	34.5	29.5	42.9	40.3	35.0	13.6	14.0	13.3	10.3	10.2	9.2
Incr Delay (d2), s/veh	1.6	1.0	0.2	1.0	3.1	0.2	0.5	0.5	0.2	0.1	0.8	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	4.5	13.6	4.3	3.8	11.0	2.0	1.3	3.6	1.4	1.9	6.3	2.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.6	35.5	29.7	43.9	43.3	35.2	14.1	14.4	13.6	10.5	11.0	9.6
LnGrp LOS	C	D	C	D	D	D	B	B	B	B	B	A
Approach Vol, veh/h		633			436			288			607	
Approach Delay, s/veh		32.9			42.5			14.2			10.5	
Approach LOS		C			D			B			B	
Timer - Assigned Phs	1	2		4		6	7	8				
Phs Duration (G+Y+Rc), s	9.2	46.6		34.2		55.8	11.9	22.4				
Change Period (Y+Rc), s	4.5	4.5		4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s	8.5	25.5		42.5		38.5	10.5	27.5				
Max Q Clear Time (g_c+I1), s	4.8	6.6		19.2		10.6	7.5	16.0				
Green Ext Time (p_c), s	0.1	1.3		2.7		2.7	0.1	1.9				

Intersection Summary

HCM 6th Ctrl Delay	25.4
HCM 6th LOS	C



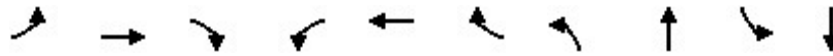
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	100		150	150		100	600		0	250		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor			0.850			0.850		0.987			0.990	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	5019	0	1770	5034	0
Flt Permitted	0.380			0.414			0.085			0.194		
Satd. Flow (perm)	708	1863	1583	771	1863	1583	158	5019	0	361	5034	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			127			127		23			18	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1268			424			903			562	
Travel Time (s)		28.8			9.6			20.5			12.8	

Intersection Summary

Area Type: Other

Timings
6: Federal Blvd. & W. 64th Ave.

6501 Lowell Blvd
06/07/2021

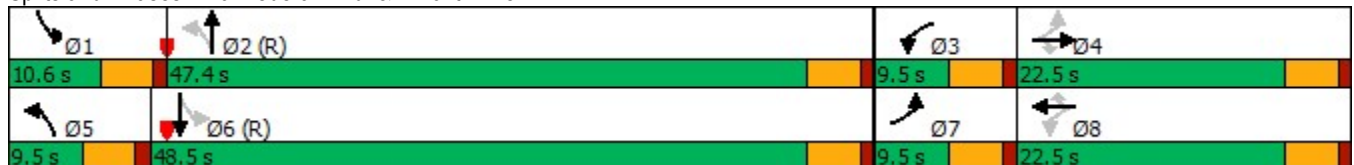


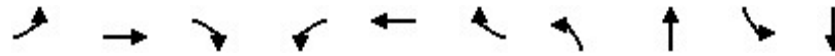
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	130	189	195	157	201	48	108	974	76	2553
Future Volume (vph)	130	189	195	157	201	48	108	974	76	2553
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA
Protected Phases	7	4		3	8		5	2	1	6
Permitted Phases	4		4	8		8	2		6	
Detector Phase	7	4	4	3	8	8	5	2	1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	9.5	22.5
Total Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	47.4	10.6	48.5
Total Split (%)	10.6%	25.0%	25.0%	10.6%	25.0%	25.0%	10.6%	52.7%	11.8%	53.9%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)	20.0	15.0	15.0	20.0	15.0	15.0	52.6	47.7	52.1	45.8
Actuated g/C Ratio	0.22	0.17	0.17	0.22	0.17	0.17	0.58	0.53	0.58	0.51
v/c Ratio	0.65	0.66	0.57	0.75	0.70	0.14	0.58	0.43	0.27	1.16
Control Delay	34.1	35.4	13.7	49.8	47.4	0.8	25.4	14.3	9.7	99.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.1	35.4	13.7	49.8	47.4	0.8	25.4	14.3	9.7	99.6
LOS	C	D	B	D	D	A	C	B	A	F
Approach Delay		26.8			42.8			15.3		97.2
Approach LOS		C			D			B		F

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 120
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.16
 Intersection Signal Delay: 65.7
 Intersection LOS: E
 Intersection Capacity Utilization 93.1%
 ICU Level of Service F
 Analysis Period (min) 15

Splits and Phases: 6: Federal Blvd. & W. 64th Ave.





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	141	205	212	171	218	52	117	1158	83	2976
v/c Ratio	0.65	0.66	0.57	0.75	0.70	0.14	0.58	0.43	0.27	1.16
Control Delay	34.1	35.4	13.7	49.8	47.4	0.8	25.4	14.3	9.7	99.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.1	35.4	13.7	49.8	47.4	0.8	25.4	14.3	9.7	99.6
Queue Length 50th (ft)	38	60	0	77	117	0	25	148	17	~765
Queue Length 95th (ft)	79	119	19	#144	187	0	#98	191	37	#860
Internal Link Dist (ft)		1188			344			823		482
Turn Bay Length (ft)	100		150	150		100	600		250	
Base Capacity (vph)	216	372	418	227	372	418	202	2672	308	2570
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.65	0.55	0.51	0.75	0.59	0.12	0.58	0.43	0.27	1.16

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

HCM 6th Signalized Intersection Summary
6: Federal Blvd. & W. 64th Ave.

6501 Lowell Blvd
06/07/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	130	189	195	157	201	48	108	974	91	76	2553	185
Future Volume (veh/h)	130	189	195	157	201	48	108	974	91	76	2553	185
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	141	205	212	171	218	52	117	1059	99	83	2775	201
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	237	305	258	233	305	258	174	2532	236	360	2575	182
Arrive On Green	0.02	0.05	0.05	0.06	0.16	0.16	0.05	0.53	0.53	0.05	0.53	0.53
Sat Flow, veh/h	1781	1870	1585	1781	1870	1585	1781	4751	444	1781	4868	344
Grp Volume(v), veh/h	141	205	212	171	218	52	117	758	400	83	1921	1055
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	1585	1781	1702	1791	1781	1702	1808
Q Serve(g_s), s	5.0	9.7	11.9	5.0	9.9	2.6	2.6	12.0	12.1	1.9	47.6	47.6
Cycle Q Clear(g_c), s	5.0	9.7	11.9	5.0	9.9	2.6	2.6	12.0	12.1	1.9	47.6	47.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.25	1.00		0.19
Lane Grp Cap(c), veh/h	237	305	258	233	305	258	174	1814	954	360	1801	957
V/C Ratio(X)	0.59	0.67	0.82	0.74	0.72	0.20	0.67	0.42	0.42	0.23	1.07	1.10
Avail Cap(c_a), veh/h	237	374	317	233	374	317	179	1814	954	394	1801	957
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.92	0.92	0.92	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.2	40.2	41.3	34.3	35.7	32.6	21.0	12.6	12.6	9.3	21.2	21.2
Incr Delay (d2), s/veh	3.7	3.2	12.3	11.5	4.9	0.4	9.2	0.7	1.4	0.3	41.6	61.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.3	8.6	9.7	3.7	8.5	1.8	3.0	7.9	8.5	1.3	37.8	47.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	36.8	43.4	53.5	45.7	40.6	33.0	30.2	13.3	14.0	9.7	62.8	82.8
LnGrp LOS	D	D	D	D	D	C	C	B	B	A	F	F
Approach Vol, veh/h		558			441			1275			3059	
Approach Delay, s/veh		45.6			41.7			15.1			68.2	
Approach LOS		D			D			B			E	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.9	52.5	9.5	19.2	9.2	52.1	9.5	19.2				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	6.1	42.9	5.0	18.0	5.0	44.0	5.0	18.0				
Max Q Clear Time (g_c+I1), s	3.9	14.1	7.0	13.9	4.6	49.6	7.0	11.9				
Green Ext Time (p_c), s	0.0	9.3	0.0	0.7	0.0	0.0	0.0	0.7				
Intersection Summary												
HCM 6th Ctrl Delay			51.0									
HCM 6th LOS			D									



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)		0%	0%		0%	
Storage Length (ft)	100			0	0	0
Storage Lanes	1			0	1	0
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.998		0.942	
Flt Protected	0.950				0.972	
Satd. Flow (prot)	1770	1863	1859	0	1706	0
Flt Permitted	0.950				0.972	
Satd. Flow (perm)	1770	1863	1859	0	1706	0
Link Speed (mph)		30	30		30	
Link Distance (ft)		838	596		267	
Travel Time (s)		19.0	13.5		6.1	

Intersection Summary
























Area Type: Other

Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	5	565	458	6	18	14
Future Vol, veh/h	5	565	458	6	18	14
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	614	498	7	20	15

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	505	0	-	0	1126 502
Stage 1	-	-	-	-	502 -
Stage 2	-	-	-	-	624 -
Critical Hdwy	4.12	-	-	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.218	-	-	-	3.518 3.318
Pot Cap-1 Maneuver	1060	-	-	-	227 569
Stage 1	-	-	-	-	608 -
Stage 2	-	-	-	-	534 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1060	-	-	-	226 569
Mov Cap-2 Maneuver	-	-	-	-	226 -
Stage 1	-	-	-	-	605 -
Stage 2	-	-	-	-	534 -

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	18.2
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1060	-	-	-	307
HCM Lane V/C Ratio	0.005	-	-	-	0.113
HCM Control Delay (s)	8.4	-	-	-	18.2
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	0.4

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		150	150		0	225		250	150		150
Storage Lanes	1		1	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850		0.904				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1684	0	1770	1863	1583	1770	1863	1583
Flt Permitted	0.719			0.747			0.488			0.277		
Satd. Flow (perm)	1339	1863	1583	1391	1684	0	909	1863	1583	516	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			85		37				27			98
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		549			716			667			367	
Travel Time (s)		12.5			16.3			15.2			8.3	

Intersection Summary

Area Type: Other

Timings
1: Lowell Blvd. & W. 68th Ave.

6501 Lowell Blvd
06/07/2021

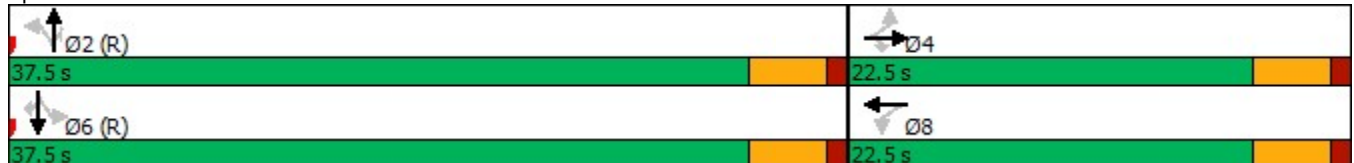


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	59	15	78	13	19	135	765	22	15	420	90
Future Volume (vph)	59	15	78	13	19	135	765	22	15	420	90
Turn Type	Perm	NA	Perm	Perm	NA	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8		2			6	
Permitted Phases	4		4	8		2		2	6		6
Detector Phase	4	4	4	8	8	2	2	2	6	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	22.5	22.5	22.5	22.5	22.5	37.5	37.5	37.5	37.5	37.5	37.5
Total Split (%)	37.5%	37.5%	37.5%	37.5%	37.5%	62.5%	62.5%	62.5%	62.5%	62.5%	62.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag											
Lead-Lag Optimize?											
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	8.3	8.3	8.3	8.3	8.3	45.6	45.6	45.6	45.6	45.6	45.6
Actuated g/C Ratio	0.14	0.14	0.14	0.14	0.14	0.76	0.76	0.76	0.76	0.76	0.76
v/c Ratio	0.35	0.06	0.29	0.07	0.22	0.21	0.59	0.02	0.04	0.32	0.08
Control Delay	27.7	21.3	8.8	21.8	13.6	4.4	7.0	1.5	3.7	4.3	1.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.7	21.3	8.8	21.8	13.6	4.4	7.0	1.5	3.7	4.3	1.1
LOS	C	C	A	C	B	A	A	A	A	A	A
Approach Delay		17.3			15.2		6.5			3.7	
Approach LOS		B			B		A			A	

Intersection Summary

Cycle Length: 60
 Actuated Cycle Length: 60
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.59
 Intersection Signal Delay: 6.9
 Intersection Capacity Utilization 65.6%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service C

Splits and Phases: 1: Lowell Blvd. & W. 68th Ave.



Queues

6501 Lowell Blvd

1: Lowell Blvd. & W. 68th Ave.

06/07/2021



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	64	16	85	14	58	147	832	24	16	457	98
v/c Ratio	0.35	0.06	0.29	0.07	0.22	0.21	0.59	0.02	0.04	0.32	0.08
Control Delay	27.7	21.3	8.8	21.8	13.6	4.4	7.0	1.5	3.7	4.3	1.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.7	21.3	8.8	21.8	13.6	4.4	7.0	1.5	3.7	4.3	1.1
Queue Length 50th (ft)	21	5	0	5	7	14	117	0	1	47	0
Queue Length 95th (ft)	49	18	30	17	32	39	261	5	7	103	11
Internal Link Dist (ft)		469			636		587			287	
Turn Bay Length (ft)	150		150	150		225		250	150		150
Base Capacity (vph)	401	558	534	417	531	690	1414	1208	392	1414	1225
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.03	0.16	0.03	0.11	0.21	0.59	0.02	0.04	0.32	0.08

Intersection Summary

HCM 6th Signalized Intersection Summary
 1: Lowell Blvd. & W. 68th Ave.

6501 Lowell Blvd
 06/07/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	59	15	78	13	19	34	135	765	22	15	420	90
Future Volume (veh/h)	59	15	78	13	19	34	135	765	22	15	420	90
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	64	16	85	14	21	37	147	832	24	16	457	98
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	232	214	182	258	70	123	675	1375	1166	458	1375	1166
Arrive On Green	0.11	0.11	0.11	0.11	0.11	0.11	0.74	0.74	0.74	0.74	0.74	0.74
Sat Flow, veh/h	1345	1870	1585	1294	607	1070	854	1870	1585	645	1870	1585
Grp Volume(v), veh/h	64	16	85	14	0	58	147	832	24	16	457	98
Grp Sat Flow(s),veh/h/ln	1345	1870	1585	1294	0	1678	854	1870	1585	645	1870	1585
Q Serve(g_s), s	2.7	0.5	3.0	0.6	0.0	1.9	4.4	12.7	0.2	0.7	5.1	1.0
Cycle Q Clear(g_c), s	4.7	0.5	3.0	1.0	0.0	1.9	9.5	12.7	0.2	13.4	5.1	1.0
Prop In Lane	1.00		1.00	1.00		0.64	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	232	214	182	258	0	192	675	1375	1166	458	1375	1166
V/C Ratio(X)	0.28	0.07	0.47	0.05	0.00	0.30	0.22	0.60	0.02	0.03	0.33	0.08
Avail Cap(c_a), veh/h	481	561	476	498	0	503	675	1375	1166	458	1375	1166
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.5	23.7	24.8	24.2	0.0	24.4	4.4	3.8	2.1	7.0	2.8	2.2
Incr Delay (d2), s/veh	0.6	0.1	1.9	0.1	0.0	0.9	0.7	2.0	0.0	0.1	0.6	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.6	0.4	2.1	0.3	0.0	1.4	1.2	5.5	0.1	0.2	2.1	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.1	23.9	26.7	24.3	0.0	25.2	5.2	5.8	2.2	7.1	3.4	2.4
LnGrp LOS	C	C	C	C	A	C	A	A	A	A	A	A
Approach Vol, veh/h		165			72			1003			571	
Approach Delay, s/veh		26.6			25.0			5.6			3.4	
Approach LOS		C			C			A			A	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		48.6		11.4		48.6		11.4				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		33.0		18.0		33.0		18.0				
Max Q Clear Time (g_c+l1), s		14.7		6.7		15.4		3.9				
Green Ext Time (p_c), s		7.1		0.4		3.2		0.2				

Intersection Summary

HCM 6th Ctrl Delay	7.6
HCM 6th LOS	A



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	100		0	100		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.961			0.941			0.996			0.992	
Flt Protected		0.971			0.986		0.950		0.950			
Satd. Flow (prot)	0	1738	0	0	1728	0	1770	1855	0	1770	1848	0
Flt Permitted		0.971			0.986		0.950		0.950			
Satd. Flow (perm)	0	1738	0	0	1728	0	1770	1855	0	1770	1848	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		458			470			732			667	
Travel Time (s)		10.4			10.7			16.6			15.2	

Intersection Summary

Area Type: Other

Intersection												
Int Delay, s/veh	5.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	38	7	18	10	10	16	32	855	26	19	460	25
Future Vol, veh/h	38	7	18	10	10	16	32	855	26	19	460	25
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	41	8	20	11	11	17	35	929	28	21	500	27

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1583	1583	514	1583	1582	943	527	0	0	957	0	0
Stage 1	556	556	-	1013	1013	-	-	-	-	-	-	-
Stage 2	1027	1027	-	570	569	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	88	109	560	88	109	318	1040	-	-	719	-	-
Stage 1	515	513	-	288	316	-	-	-	-	-	-	-
Stage 2	283	312	-	506	506	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	73	102	560	76	102	318	1040	-	-	719	-	-
Mov Cap-2 Maneuver	73	102	-	76	102	-	-	-	-	-	-	-
Stage 1	497	498	-	278	305	-	-	-	-	-	-	-
Stage 2	249	301	-	467	491	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	95.2		44.6		0.3		0.4	
HCM LOS	F		E					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1040	-	-	101	129	719	-	-
HCM Lane V/C Ratio	0.033	-	-	0.678	0.303	0.029	-	-
HCM Control Delay (s)	8.6	-	-	95.2	44.6	10.2	-	-
HCM Lane LOS	A	-	-	F	E	B	-	-
HCM 95th %tile Q(veh)	0.1	-	-	3.4	1.2	0.1	-	-



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	100		0	100		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.915			0.940			0.998			0.996	
Flt Protected		0.985			0.978		0.950		0.950			
Satd. Flow (prot)	0	1679	0	0	1712	0	1770	1859	0	1770	1855	0
Flt Permitted		0.985			0.978		0.950		0.950			
Satd. Flow (perm)	0	1679	0	0	1712	0	1770	1859	0	1770	1855	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		319			430			608			732	
Travel Time (s)		7.3			9.8			13.8			16.6	

Intersection Summary

Area Type: Other

Intersection												
Int Delay, s/veh	1.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↔	↔		↔	↔	
Traffic Vol, veh/h	7	2	16	15	4	15	28	859	13	19	488	12
Future Vol, veh/h	7	2	16	15	4	15	28	859	13	19	488	12
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	8	2	17	16	4	16	30	934	14	21	530	13

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1590	1587	537	1589	1586	941	543	0	0	948	0	0
Stage 1	579	579	-	1001	1001	-	-	-	-	-	-	-
Stage 2	1011	1008	-	588	585	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	87	108	544	87	108	319	1026	-	-	724	-	-
Stage 1	501	501	-	293	321	-	-	-	-	-	-	-
Stage 2	289	318	-	495	498	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	76	102	544	79	102	319	1026	-	-	724	-	-
Mov Cap-2 Maneuver	76	102	-	79	102	-	-	-	-	-	-	-
Stage 1	486	486	-	285	312	-	-	-	-	-	-	-
Stage 2	263	309	-	463	484	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	29	46.4	0.3	0.4
HCM LOS	D	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1026	-	-	177	123	724	-
HCM Lane V/C Ratio	0.03	-	-	0.154	0.3	0.029	-
HCM Control Delay (s)	8.6	-	-	29	46.4	10.1	-
HCM Lane LOS	A	-	-	D	E	B	-
HCM 95th %tile Q(veh)	0.1	-	-	0.5	1.2	0.1	-

Lanes and Geometrics
 4: Tennyson St. & W 64th Ave.

6501 Lowell Blvd
 06/07/2021



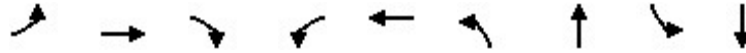
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%				0%
Storage Length (ft)	150		100	150		0	0		0	0		0
Storage Lanes	1		1	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850		0.994			0.919				0.952
Flt Protected	0.950			0.950				0.985				0.983
Satd. Flow (prot)	1770	1863	1583	1770	1852	0	0	1686	0	0	1743	0
Flt Permitted	0.229			0.106				0.878				0.838
Satd. Flow (perm)	427	1863	1583	197	1852	0	0	1503	0	0	1486	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			60		4			94				17
Link Speed (mph)		30			30			30				30
Link Distance (ft)		501			853			646				482
Travel Time (s)		11.4			19.4			14.7				11.0

Intersection Summary

Area Type: Other

Timings
4: Tennyson St. & W 64th Ave.

6501 Lowell Blvd
06/07/2021

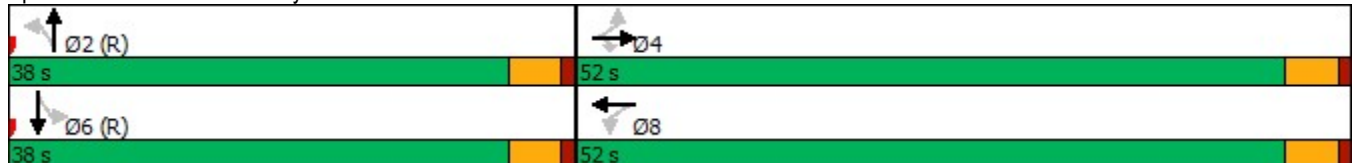


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↖	↑	↗	↖	↗		↕		↕
Traffic Volume (vph)	25	777	110	97	594	137	40	16	13
Future Volume (vph)	25	777	110	97	594	137	40	16	13
Turn Type	Perm	NA	Perm	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4			8		2		6
Permitted Phases	4		4	8		2		6	
Detector Phase	4	4	4	8	8	2	2	6	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	52.0	52.0	52.0	52.0	52.0	38.0	38.0	38.0	38.0
Total Split (%)	57.8%	57.8%	57.8%	57.8%	57.8%	42.2%	42.2%	42.2%	42.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0		0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5		4.5		4.5
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	47.5	47.5	47.5	47.5	47.5		33.5		33.5
Actuated g/C Ratio	0.53	0.53	0.53	0.53	0.53		0.37		0.37
v/c Ratio	0.12	0.86	0.14	1.02	0.69		0.77		0.09
Control Delay	12.5	29.4	6.3	118.7	29.9		29.7		13.8
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	12.5	29.4	6.3	118.7	29.9		29.7		13.8
LOS	B	C	A	F	C		C		B
Approach Delay		26.1			41.8		29.7		13.8
Approach LOS		C			D		C		B

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.02
 Intersection Signal Delay: 31.9
 Intersection Capacity Utilization 89.7%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service E

Splits and Phases: 4: Tennyson St. & W 64th Ave.





Lane Group	EBL	EBT	EBR	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	27	845	120	105	674	476	48
v/c Ratio	0.12	0.86	0.14	1.02	0.69	0.77	0.09
Control Delay	12.5	29.4	6.3	118.7	29.9	29.7	13.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.5	29.4	6.3	118.7	29.9	29.7	13.8
Queue Length 50th (ft)	7	392	16	~58	332	190	11
Queue Length 95th (ft)	22	#646	42	m#111	m410	#350	34
Internal Link Dist (ft)		421			773	566	402
Turn Bay Length (ft)	150		100	150			
Base Capacity (vph)	225	983	863	103	979	618	563
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.12	0.86	0.14	1.02	0.69	0.77	0.09

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

HCM 6th Signalized Intersection Summary
 4: Tennyson St. & W 64th Ave.

6501 Lowell Blvd
 06/07/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	25	777	110	97	594	26	137	40	261	16	13	16
Future Volume (veh/h)	25	777	110	97	594	26	137	40	261	16	13	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	27	845	120	105	646	28	149	43	284	17	14	17
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	483	987	837	161	939	41	217	68	343	196	163	167
Arrive On Green	0.53	0.53	0.53	1.00	1.00	1.00	0.37	0.37	0.37	0.37	0.37	0.37
Sat Flow, veh/h	764	1870	1585	582	1779	77	442	182	923	381	437	448
Grp Volume(v), veh/h	27	845	120	105	0	674	476	0	0	48	0	0
Grp Sat Flow(s),veh/h/ln	764	1870	1585	582	0	1856	1547	0	0	1266	0	0
Q Serve(g_s), s	1.6	35.0	3.5	12.5	0.0	0.0	22.3	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	1.6	35.0	3.5	47.5	0.0	0.0	25.0	0.0	0.0	1.6	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.04	0.31		0.60	0.35		0.35
Lane Grp Cap(c), veh/h	483	987	837	161	0	980	628	0	0	525	0	0
V/C Ratio(X)	0.06	0.86	0.14	0.65	0.00	0.69	0.76	0.00	0.00	0.09	0.00	0.00
Avail Cap(c_a), veh/h	483	987	837	161	0	980	628	0	0	525	0	0
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	10.4	18.3	10.9	19.0	0.0	0.0	25.5	0.0	0.0	18.2	0.0	0.0
Incr Delay (d2), s/veh	0.0	7.5	0.1	9.1	0.0	2.0	8.3	0.0	0.0	0.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.5	22.3	2.1	4.4	0.0	1.0	15.5	0.0	0.0	1.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	10.4	25.8	10.9	28.1	0.0	2.0	33.8	0.0	0.0	18.6	0.0	0.0
LnGrp LOS	B	C	B	C	A	A	C	A	A	B	A	A
Approach Vol, veh/h		992			779			476				48
Approach Delay, s/veh		23.6			5.5			33.8				18.6
Approach LOS		C			A			C				B
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		38.0		52.0		38.0		52.0				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		33.5		47.5		33.5		47.5				
Max Q Clear Time (g_c+I1), s		27.0		37.0		3.6		49.5				
Green Ext Time (p_c), s		1.7		4.9		0.2		0.0				

Intersection Summary

HCM 6th Ctrl Delay	19.5
HCM 6th LOS	B



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)	0%		0%		0%		0%		0%		0%	
Storage Length (ft)	200		150	150		75	200		150	200		100
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.850			0.850			0.850			0.850		
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.132			0.465			0.583			0.116		
Satd. Flow (perm)	246	1863	1583	866	1863	1583	1086	1863	1583	216	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			97			127			127			199
Link Speed (mph)		30			30			30				30
Link Distance (ft)		476			1480			763				608
Travel Time (s)		10.8			33.6			17.3				13.8

Intersection Summary

Area Type: Other

Timings
5: W 64th Ave./W. 64th Ave. & Lowell Blvd.

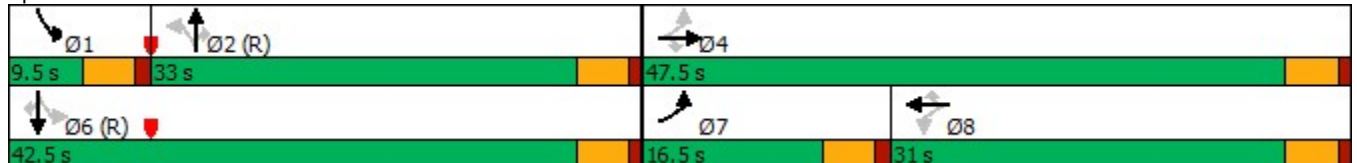
6501 Lowell Blvd
06/07/2021

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	274	491	89	59	463	88	157	528	125	59	266	183
Future Volume (vph)	274	491	89	59	463	88	157	528	125	59	266	183
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4			8			2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	7	4	4	8	8	8	2	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	16.5	47.5	47.5	31.0	31.0	31.0	33.0	33.0	33.0	9.5	42.5	42.5
Total Split (%)	18.3%	52.8%	52.8%	34.4%	34.4%	34.4%	36.7%	36.7%	36.7%	10.6%	47.2%	47.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead			Lag	Lag	Lag	Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes			Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	42.4	42.4	42.4	25.9	25.9	25.9	31.0	31.0	31.0	38.6	38.6	38.6
Actuated g/C Ratio	0.47	0.47	0.47	0.29	0.29	0.29	0.34	0.34	0.34	0.43	0.43	0.43
v/c Ratio	0.94	0.61	0.12	0.26	0.94	0.18	0.46	0.90	0.22	0.36	0.36	0.25
Control Delay	55.3	27.9	8.0	27.7	59.1	3.1	29.3	48.5	6.1	21.3	19.3	3.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.3	27.9	8.0	27.7	59.1	3.1	29.3	48.5	6.1	21.3	19.3	3.4
LOS	E	C	A	C	E	A	C	D	A	C	B	A
Approach Delay		34.6			47.9			38.2			13.8	
Approach LOS		C			D			D			B	

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.94
 Intersection Signal Delay: 34.8
 Intersection LOS: C
 Intersection Capacity Utilization 86.5%
 ICU Level of Service E
 Analysis Period (min) 15

Splits and Phases: 5: W 64th Ave./W. 64th Ave. & Lowell Blvd.





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	298	534	97	64	503	96	171	574	136	64	289	199
v/c Ratio	0.94	0.61	0.12	0.26	0.94	0.18	0.46	0.90	0.22	0.36	0.36	0.25
Control Delay	55.3	27.9	8.0	27.7	59.1	3.1	29.3	48.5	6.1	21.3	19.3	3.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.3	27.9	8.0	27.7	59.1	3.1	29.3	48.5	6.1	21.3	19.3	3.4
Queue Length 50th (ft)	144	259	10	28	275	0	78	320	3	21	109	0
Queue Length 95th (ft)	m#190	m317	m18	62	#463	21	143	#533	43	46	173	39
Internal Link Dist (ft)		396			1400			683			528	
Turn Bay Length (ft)	200		150	150		75	200		150	200		100
Base Capacity (vph)	318	890	806	254	548	555	373	641	628	180	798	792
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.94	0.60	0.12	0.25	0.92	0.17	0.46	0.90	0.22	0.36	0.36	0.25

Intersection Summary

- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

HCM 6th Signalized Intersection Summary
 5: W 64th Ave./W. 64th Ave. & Lowell Blvd.

6501 Lowell Blvd
 06/07/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↘	↖	↗	↘	↖	↗	↘	↖	↗	↘
Traffic Volume (veh/h)	274	491	89	59	463	88	157	528	125	59	266	183
Future Volume (veh/h)	274	491	89	59	463	88	157	528	125	59	266	183
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	298	534	97	64	503	96	171	574	136	64	289	199
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	339	882	748	287	540	457	374	624	529	188	801	679
Arrive On Green	0.13	0.47	0.47	0.29	0.29	0.29	0.33	0.33	0.33	0.04	0.43	0.43
Sat Flow, veh/h	1781	1870	1585	796	1870	1585	908	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	298	534	97	64	503	96	171	574	136	64	289	199
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	796	1870	1585	908	1870	1585	1781	1870	1585
Q Serve(g_s), s	10.1	19.0	3.1	5.8	23.6	4.1	14.1	26.5	5.6	2.0	9.4	7.4
Cycle Q Clear(g_c), s	10.1	19.0	3.1	8.3	23.6	4.1	15.0	26.5	5.6	2.0	9.4	7.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	339	882	748	287	540	457	374	624	529	188	801	679
V/C Ratio(X)	0.88	0.61	0.13	0.22	0.93	0.21	0.46	0.92	0.26	0.34	0.36	0.29
Avail Cap(c_a), veh/h	339	894	757	292	551	467	374	624	529	208	801	679
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	0.09	0.09	0.09	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.0	17.6	13.4	26.7	31.2	24.3	25.4	28.8	21.8	21.7	17.4	16.8
Incr Delay (d2), s/veh	22.0	1.1	0.1	0.0	3.2	0.0	4.0	20.8	1.2	1.1	1.3	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	10.0	12.6	1.9	1.6	12.4	2.1	6.1	21.4	4.0	1.5	7.5	5.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	43.0	18.7	13.5	26.8	34.4	24.3	29.3	49.7	23.0	22.8	18.7	17.9
LnGrp LOS	D	B	B	C	C	C	C	D	C	C	B	B
Approach Vol, veh/h		929			663			881			552	
Approach Delay, s/veh		26.0			32.2			41.6			18.9	
Approach LOS		C			C			D			B	
Timer - Assigned Phs	1	2		4		6	7	8				
Phs Duration (G+Y+Rc), s	8.5	34.5		47.0		43.0	16.5	30.5				
Change Period (Y+Rc), s	4.5	4.5		4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s	5.0	28.5		43.0		38.0	12.0	26.5				
Max Q Clear Time (g_c+I1), s	4.0	28.5		21.0		11.4	12.1	25.6				
Green Ext Time (p_c), s	0.0	0.0		3.9		2.5	0.0	0.4				

Intersection Summary

HCM 6th Ctrl Delay	30.6
HCM 6th LOS	C



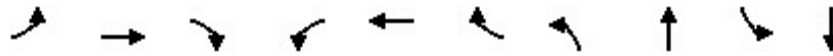
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	100		150	150		100	600		0	250		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor			0.850			0.850		0.993			0.988	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	5050	0	1770	5024	0
Flt Permitted	0.180			0.539			0.075			0.081		
Satd. Flow (perm)	335	1863	1583	1004	1863	1583	140	5050	0	151	5024	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			209			177		9			15	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1480			550			1046			611	
Travel Time (s)		33.6			12.5			23.8			13.9	

Intersection Summary

Area Type: Other

Timings
6: Federal Blvd. & W. 64th Ave.

6501 Lowell Blvd
06/07/2021



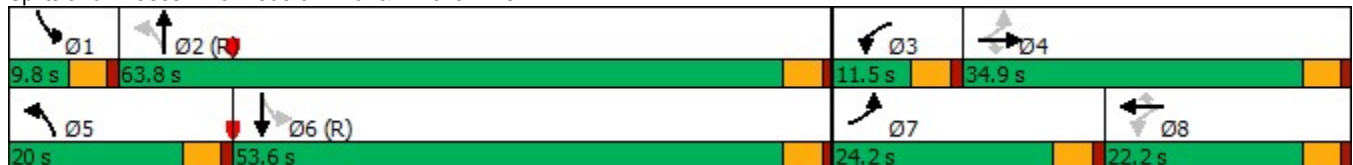
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations	↖	↑	↗	↖	↑	↗	↖	↑↑↑	↖	↑↑↑
Traffic Volume (vph)	346	293	213	135	259	116	272	2230	101	1826
Future Volume (vph)	346	293	213	135	259	116	272	2230	101	1826
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA
Protected Phases	7	4		3	8		5	2	1	6
Permitted Phases	4		4	8		8	2		6	
Detector Phase	7	4	4	3	8	8	5	2	1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	20.6	20.6	9.5	22.5	9.5	22.5
Total Split (s)	24.2	34.9	34.9	11.5	22.2	22.2	20.0	63.8	9.8	53.6
Total Split (%)	20.2%	29.1%	29.1%	9.6%	18.5%	18.5%	16.7%	53.2%	8.2%	44.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)	41.9	30.4	30.4	24.7	17.7	17.7	69.1	59.3	54.4	49.1
Actuated g/C Ratio	0.35	0.25	0.25	0.21	0.15	0.15	0.58	0.49	0.45	0.41
v/c Ratio	1.07	0.65	0.42	0.59	1.01	0.33	1.02	0.99	0.79	1.03
Control Delay	100.8	47.4	9.1	42.1	107.4	4.2	91.3	47.1	57.7	61.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	100.8	47.4	9.1	42.1	107.4	4.2	91.3	47.1	57.7	61.8
LOS	F	D	A	D	F	A	F	D	E	E
Approach Delay		59.7			66.3			51.8		61.6
Approach LOS		E			E			D		E

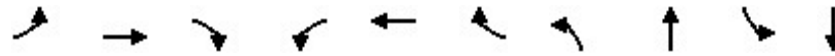
Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 120
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.07
 Intersection Signal Delay: 57.5
 Intersection Capacity Utilization 101.9%
 Analysis Period (min) 15

Intersection LOS: E
 ICU Level of Service G

Splits and Phases: 6: Federal Blvd. & W. 64th Ave.





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	376	305	232	147	276	126	296	2487	110	2118
v/c Ratio	1.07	0.65	0.42	0.59	1.01	0.33	1.02	0.99	0.79	1.03
Control Delay	100.8	47.4	9.1	42.1	107.4	4.2	91.3	47.1	57.7	61.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	100.8	47.4	9.1	42.1	107.4	4.2	91.3	47.1	57.7	61.8
Queue Length 50th (ft)	~271	212	14	80	~218	0	~186	679	37	~638
Queue Length 95th (ft)	#468	311	79	132	#396	18	#371	#821	#134	#736
Internal Link Dist (ft)		1400			470			966		531
Turn Bay Length (ft)	100		150	150		100	600		250	
Base Capacity (vph)	352	471	557	251	274	384	291	2500	139	2064
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.07	0.65	0.42	0.59	1.01	0.33	1.02	0.99	0.79	1.03

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

HCM 6th Signalized Intersection Summary
6: Federal Blvd. & W. 64th Ave.

6501 Lowell Blvd
06/07/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↶	↷	↷	↶	↷	↷	↶	↷↷↷		↶	↷↷↷	
Traffic Volume (veh/h)	346	293	213	135	259	116	272	2230	110	101	1826	168
Future Volume (veh/h)	346	293	213	135	259	116	272	2230	110	101	1826	168
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	376	305	232	147	276	126	296	2372	115	110	1943	175
Peak Hour Factor	0.92	0.96	0.92	0.92	0.94	0.92	0.92	0.94	0.96	0.92	0.94	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	352	474	402	258	276	234	290	2466	119	143	1952	175
Arrive On Green	0.16	0.25	0.25	0.06	0.15	0.15	0.13	0.49	0.49	0.04	0.41	0.41
Sat Flow, veh/h	1781	1870	1585	1781	1870	1585	1781	4991	240	1781	4770	427
Grp Volume(v), veh/h	376	305	232	147	276	126	296	1612	875	110	1383	735
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	1585	1781	1702	1827	1781	1702	1793
Q Serve(g_s), s	19.7	17.5	15.4	7.0	17.7	8.8	15.5	54.6	55.8	4.3	48.5	49.1
Cycle Q Clear(g_c), s	19.7	17.5	15.4	7.0	17.7	8.8	15.5	54.6	55.8	4.3	48.5	49.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.13	1.00		0.24
Lane Grp Cap(c), veh/h	352	474	402	258	276	234	290	1682	903	143	1393	734
V/C Ratio(X)	1.07	0.64	0.58	0.57	1.00	0.54	1.02	0.96	0.97	0.77	0.99	1.00
Avail Cap(c_a), veh/h	352	474	402	258	276	234	290	1682	903	143	1393	734
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.85	0.85	0.85	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.5	40.0	39.2	42.3	51.2	47.4	39.6	29.2	29.5	29.1	35.3	35.5
Incr Delay (d2), s/veh	63.1	2.5	1.7	3.0	54.3	2.5	58.2	14.0	23.4	22.5	22.5	33.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	21.2	12.7	9.9	1.4	18.2	6.6	19.5	32.8	38.2	4.8	32.0	36.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	98.6	42.5	40.9	45.3	105.4	49.8	97.8	43.2	52.8	51.6	57.8	69.0
LnGrp LOS	F	D	D	D	F	D	F	D	D	D	E	F
Approach Vol, veh/h		913			549			2783			2228	
Approach Delay, s/veh		65.2			76.6			52.0			61.2	
Approach LOS		E			E			D			E	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.8	63.8	11.5	34.9	20.0	53.6	24.2	22.2				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	5.3	59.3	7.0	30.4	15.5	49.1	19.7	17.7				
Max Q Clear Time (g_c+I1), s	6.3	57.8	9.0	19.5	17.5	51.1	21.7	19.7				
Green Ext Time (p_c), s	0.0	1.4	0.0	2.0	0.0	0.0	0.0	0.0				

Intersection Summary

HCM 6th Ctrl Delay	59.1
HCM 6th LOS	E

Notes

User approved pedestrian interval to be less than phase max green.



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)		0%	0%		0%	
Storage Length (ft)	100			0	0	0
Storage Lanes	1			0	1	0
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.996		0.936	
Flt Protected	0.950				0.974	
Satd. Flow (prot)	1770	1863	1855	0	1698	0
Flt Permitted	0.950				0.974	
Satd. Flow (perm)	1770	1863	1855	0	1698	0
Link Speed (mph)		30	30		30	
Link Distance (ft)		853	476		311	
Travel Time (s)		19.4	10.8		7.1	

Intersection Summary

Area Type: Other

Intersection						
Int Delay, s/veh	0.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↙	↑	↗		↙	
Traffic Vol, veh/h	16	823	752	20	10	9
Future Vol, veh/h	16	823	752	20	10	9
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	17	895	817	22	11	10

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	839	0	-	0	1757 828
Stage 1	-	-	-	-	828 -
Stage 2	-	-	-	-	929 -
Critical Hdwy	4.12	-	-	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.218	-	-	-	3.518 3.318
Pot Cap-1 Maneuver	796	-	-	-	93 371
Stage 1	-	-	-	-	429 -
Stage 2	-	-	-	-	385 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	796	-	-	-	91 371
Mov Cap-2 Maneuver	-	-	-	-	91 -
Stage 1	-	-	-	-	420 -
Stage 2	-	-	-	-	385 -

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	34.6
HCM LOS			D

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	796	-	-	-	142
HCM Lane V/C Ratio	0.022	-	-	-	0.145
HCM Control Delay (s)	9.6	-	-	-	34.6
HCM Lane LOS	A	-	-	-	D
HCM 95th %tile Q(veh)	0.1	-	-	-	0.5

TTLIC DENVER - LOWELL

IN THE COUNTY OF ADAMS, COLORADO

SITE PLAN



TTLIC DENVER - LOWELL SITE PLAN
 6501 LOWELL BOULEVARD
 DENVER, COLORADO

OWNER:
 THE TRUE LIFE COMPANIES, INC
 1350 17TH STREET
 SUITE 350
 DENVER, CO 80202

LAND USE SUMMARY				
LAND USE	ACREAGE	% TOTAL	UNITS	DENSITY
BUILDING AREAS				
RESIDENTIAL LOTS	3.4	50%	124	
OPEN AREAS				
PRIVATE ACCESS DRIVES	1.6	24%		
LANDSCAPE BUFFER AREAS	1.7 (0.5 ACTIVE)	26%		
OPEN AREAS SUBTOTAL	3.4	50%		
TOTAL	6.8	100%	124	18.2 DU/AC

* NOTE: AT LEAST THIRTY PERCENT (30%) OF THE SITE SHALL BE OPEN AREA (2.2AC). TWENTY FIVE PERCENT (25%) OF THE OPEN AREA MUST BE ACTIVE OPEN SPACE (0.5AC).

- NOTES:**
1. Site plan is shown is conceptual and may change at time of Final Development Plan.
 2. Active land uses, landscape areas, and amenities are conceptual and subject to change with the Final Development Plan.
 3. Signage locations are conceptual and subject to change at time of Final Development Plan.

NOT FOR CONSTRUCTION

DATE:
 03/19/2021
 06/11/2021

SHEET TITLE:
 SITE PLAN

SHEET NUMBER:
 1 OF 1

CHECKED BY:
 FILENAME:
 TTLIC DENVER - LOWELL

TRAFFIC IMPACT REPORT

6501 LOWELL BLVD
ADAMS COUNTY, COLORADO

June 9, 2021

Prepared for:
The True Life Companies
1350 17th St., Suite 350
Denver, CO 80202

Prepared by:



1120 Lincoln Street
Denver, CO 80203
Ph: 303-623-6300

Harris Kocher Smith Project No. 200917

TABLE OF CONTENTS

I.	INTRODUCTION.....	3
A.	Project Overview.....	3
B.	Purpose of Study.....	3
C.	Study Area.....	3
II.	EXISTING CONDITIONS.....	3
A.	Existing Traffic Volumes.....	3
B.	Existing Roadway System.....	4
III.	BACKGROUND TRAFFIC.....	7
A.	Background Traffic Volumes.....	7
B.	Background Traffic Operational Analysis.....	7
IV.	PROJECT DEVELOPMENT.....	8
A.	Trip Generation.....	8
B.	Trip Distribution.....	9
C.	Trip Assignment.....	9
V.	TOTAL TRAFFIC.....	9
VI.	PROJECT ANALYSIS.....	9
A.	Operational Analysis.....	9
B.	Queue Lengths and Storage Required.....	13
VII.	SUMMARY.....	15

LIST OF TABLES

Table 1: Trip Generation.....	8
Table 2: Summary of Results – Intersection Capacity Analysis.....	12
Table 3: Summary of Results – Queue Analysis.....	14
Table 4: Summary of Recommendations.....	15

FIGURES

- 1 Site Location Map
- 2 Conceptual Site Plan
- 3 2021 Existing (COVID Adjusted) Traffic Volumes
- 4 2028 Background Traffic Volumes
- 5 2040 Background Traffic Volumes
- 6 2021 Existing Traffic Operational Conditions
- 7 2028 Background Traffic Operational Conditions
- 8 2040 Background Traffic Operational Conditions
- 9 Site-Generated Trip Distribution
- 10 Site-Generated Trip Assignment
- 11 2028 Total Traffic Volumes (Background + Site Generated)
- 12 2040 Total Traffic Volumes (Background + Site Generated)
- 13 2028 Total Traffic Operational Conditions
- 14 2040 Total Traffic Operational Conditions

APPENDIX “A” 2021 EXISTING TRAFFIC VOLUME COUNTS

APPENDIX “B” INTERSECTION CAPACITY ANALYSIS WORKSHEETS

I. INTRODUCTION

A. Project Overview

The True Life Companies is proposing to develop a parcel of land containing approximately 7.15 acres located within the jurisdictional boundaries of Adams County, Colorado. The undeveloped property is bound on the south by W. 64th Ave., on the east by Lowell Blvd., on the north by residential properties fronting Meade Ct., and on the west by residential properties fronting Newton St. Upon buildout, the proposed development will contain 126 3-story duplex housing units. The proposed development will be known as 6501 Lowell Blvd. Figure 1 provides a site location map of the proposed project and surrounding transportation system.

The proposed development will have two access points. One access point will be the existing west leg of the Lowell Blvd./W. 65th Ave. intersection. The existing west leg will be extended to provide access into the proposed site. The second access point will be a proposed “T” intersection with W. 64th Ave. located west of Lowell Blvd. Figure 2 illustrates the conceptual site plan for the development.

B. Purpose of Study

The purpose of this study is to evaluate the impacts of the vehicular trips projected to be generated by the proposed 6501 Lowell Blvd development on the study area intersections and roadway system. The study includes 2021 (existing), 2028 (short-term), and 2040 (long-range) analysis horizons. The 2028 (short-term) analysis horizon is five years after the proposed occupancy year (2023) for this project. The 2040 (long-range) analysis horizon evaluates implications of the proposed project on the long-range traffic condition.

C. Study Area

The study area encompasses the existing roadway system in the vicinity of the project site. Specifically, the following existing intersections are included in the study:

- W. 68th Ave./Lowell Blvd.
- W. 66th Ave./Lowell Blvd.
- W. 65th Ave./Lowell Blvd.
- W. 64th Ave./Tennyson St.
- W. 64th Ave./Lowell Blvd.
- W. 64th Ave./Federal Blvd. (SH 287)

II. EXISTING CONDITIONS

A. Existing Traffic Volumes

Existing peak hour intersection turning movement traffic volume counts were collected for this study at the following intersections on Thursday, March 4, 2021:

- W. 66th Ave./Lowell Blvd.
- W. 65th Ave./Lowell Blvd.
- W. 64th Ave./Lowell Blvd.

24-hour directional traffic volume counts were collected for this study at the following locations on March 4, 2021:

- Lowell Blvd. north of W. 64th Ave.
- W. 64th Ave. west of Lowell Blvd.

Existing peak hour intersection turning movement traffic volume counts were collected for this study at the additional following intersections on Wednesday, June 2, 2021:

- W. 68th Ave./Lowell Blvd.
- W. 64th Ave./Tennyson St.
- W. 64th Ave./Federal Blvd. (SH 287)

In order to account for the ongoing COVID-19 pandemic and its impact on current traffic volumes, the 2021 (existing) traffic volume counts collected for this study were adjusted based on the following methodology. Utilizing the Denver Regional Council of Governments (DRCOG) travel models for 2015 and 2040 daily traffic volume forecasts it was determined that the average annual traffic volume growth rate (AGR) for Lowell Blvd. and W. 64th Ave. within the study limits is 1.0%. This AGR was applied to a DRCOG Regional Count Map daily traffic count collected on W. 64th Ave. just west of Lowell Blvd. in 2010 (12,100vpd) to project the expected non-COVID 2021 (existing) traffic volume (13,500vpd). The projected non-COVID 2021 (existing) average daily traffic for W. 64th Ave. was found to be 21.6% higher than the daily traffic volume counted in March 2021. Based on this methodology, the 2021 (existing) traffic volume counts were increased by 21.6% to project the equivalent non-COVID 2021 (existing) traffic volumes.

A summary of the 2021 (existing) COVID adjusted peak hour intersection turning movement traffic volume counts and 24-hour directional traffic volume counts collected for this study are illustrated in Figure 3. Detailed traffic volume count data collected for this study is provided in Appendix “A”.

B. Existing Roadway System

The existing transportation network in the vicinity of the subject property is graphically illustrated in Figure 1. The following narrative provides a description of the study area roadways and associated intersections as they currently exist in 2021:

Study Area Roadways:

- **Federal Blvd. (SH 287)** – Federal Blvd. (SH 287) is classified as a Non-Rural Regional Arterial (NR-A) roadway under the jurisdiction of the Colorado Department of Transportation (CDOT) within the study area. The roadway section consists of three travel lanes in each direction with a raised center median. There is curb and gutter along both sides of the roadway. There are intermittent sections of attached sidewalk along both sides of the roadway. The posted speed limit is 45 mph within the study area. Per the *Adams County Transportation Plan*, Federal Blvd. (SH 287) within the study area is not anticipated to undergo any modifications through the 2040 (long-range) analysis horizon.
- **Lowell Blvd.** – Lowell Blvd. is classified as a Minor Arterial roadway under the jurisdiction of Adams County within the study area. The roadway section consists of one travel lane in each direction with a striped center two-way continuous left turn lane.

There is curb and gutter along both sides of the roadway. There is attached sidewalk along the east side of the roadway, and a detached sidewalk along the west side of the roadway. The posted speed limit is 30 mph within the study area. Lowell Blvd. within the study area is not anticipated to undergo any modifications through the 2040 (long-range) analysis horizon.

- **Tennyson St.** – Tennyson St. is classified as a Local roadway under the jurisdiction of Adams County within the study area. The roadway section consists of one travel lane in each direction. South of W. 64th Ave., there is curb and gutter on both sides of the roadway. There is attached sidewalk along the east side of the roadway and detached sidewalk along the west side of the roadway. North of W. 64th Ave., there is curb and gutter and attached sidewalk only along the east side of the roadway. The posted speed limit is 25 mph within the study area.
- **W. 64th Ave.** – W. 64th Ave. is classified as a Minor Arterial roadway under the jurisdiction of Adams County within the study area. The roadway section consists of one travel lane in each direction with a striped center two-way continuous left turn lane. There is curb and gutter and attached sidewalk along both sides of the roadway. The posted speed limit is 30 mph within the study area. W. 64th Ave. within the study area is not anticipated to undergo any modifications through the 2040 (long-range) analysis horizon.
- **W. 65th Ave.** – W. 65th Ave. is classified as a Local roadway under the jurisdiction of Adams County within the study area. The roadway section consists of one travel lane in each direction with no striping. There is curb and gutter and attached sidewalk along both sides of the roadway. The posted speed limit is 25 mph within the study area.
- **W. 66th Ave.** – W. 66th Ave. is classified as a Local roadway under the jurisdiction of Adams County within the study area. The roadway section consists of one travel lane in each direction with no striping. There is curb and gutter and attached sidewalk along both sides of the roadway. The posted speed limit is 25 mph within the study area.
- **W. 68th Ave.** – W. 68th Ave. is classified as a Local roadway under the jurisdiction of Adams County within the study area. The roadway section consists of one travel lane in each direction with a striped center two-way continuous left turn lane west of Lowell Blvd., and one travel lane in each direction with no median east of Lowell Blvd. There is curb and gutter along both sides of the roadway. West of Lowell Blvd., there is attached sidewalk along the north side of the roadway and detached sidewalk along the south side of the roadway. East of Lowell Blvd., there is attached sidewalk along both sides of the roadway. The posted speed limit is 25 mph within the study area.

Study Area Intersections:

- **W. 68th Ave./Lowell Blvd.** - The W. 68th Ave./Lowell Blvd. intersection is a four-legged signalized intersection operating under actuated/coordinated control with permissive only left turn phasing on all approaches. The east leg of the intersection has one left turn lane with approximately 150 feet of storage and one shared through/right turn lane on the westbound approach, and one eastbound departure lane. The west leg of the intersection has one left turn lane with approximately 150 feet of storage, one through lane, and one right turn lane with approximately 150 feet of storage on the eastbound approach, and one westbound departure lane. The north leg of the intersection has one left turn lane with approximately 150 feet of storage, one through lane, and one right turn

lane with approximately 150 feet of storage on the southbound approach, and one northbound departure lane. The south leg of the intersection has one left turn lane with approximately 225 feet of storage, one through lane, and one right turn lane with approximately 250 feet of storage on the northbound approach, and one southbound departure lane.

- **W. 66th Ave./Lowell Blvd.** - The W. 66th Ave./Lowell Blvd. intersection is a four-legged intersection operating under stop sign control on the eastbound and westbound approaches. The east leg of the intersection has one shared left/through/right turn lane on the westbound approach, and one eastbound departure lane. The west leg of the intersection has one shared left/through/right turn lane on the eastbound approach, and one westbound departure lane. The north leg of the intersection has one left turn lane with approximately 575 feet of storage and one shared through/right turn lane on the southbound approach, and one northbound departure lane. The south leg of the intersection has one left turn lane with approximately 200 feet of storage and one shared through/right turn lane on the northbound approach, and one southbound departure lane.
- **W. 65th Ave./Lowell Blvd.** – The W. 65th Ave./Lowell Blvd. intersection is a four-legged intersection operating under stop sign control on the eastbound and westbound approaches. The east leg of the intersection has one shared left/through/right turn lane on the westbound approach, and one eastbound departure lane. The west leg of the intersection has one shared left/through/right turn lane on the eastbound approach, and one westbound departure lane. The west leg currently does not carry any traffic as it dead-ends to undeveloped land, but is proposed to be extended as an access road as part of the 6501 Lowell Blvd development. The north leg of the intersection has one left turn lane with approximately 300 feet of storage and one shared through/right turn lane on the southbound approach, and one northbound departure lane. The south leg of the intersection has one left turn lane with approximately 150 feet of storage and one shared through/right turn lane on the northbound approach, and one southbound departure lane.
- **W. 64th Ave./Tennyson St.** – The W. 64th Ave./Tennyson St. intersection is a four-legged signalized intersection operating under actuated/coordinated control with permissive only left turn phasing on the eastbound and westbound approaches. The east leg of the intersection has one left turn lane with approximately 225 feet of storage, and one shared through/right turn lane on the westbound approach, and one eastbound departure lane. The west leg of the intersection has one left turn lane with approximately 150 feet of storage, one through lane, and one right turn lane with approximately 100 feet of storage on the eastbound approach, and one westbound departure lane. The north leg of the intersection has one shared left/through/right turn lane on the southbound approach, and one northbound departure lane. The south leg of the intersection has one shared left/through/right turn lane on the northbound approach, and one southbound departure lane.
- **W. 64th Ave./Lowell Blvd.** – The W. 64th Ave./Lowell Blvd. intersection is a four-legged signalized intersection operating under actuated/coordinated control with protected/permissive left turn phasing on the eastbound and southbound approaches, and permissive only left turn phasing on the westbound and northbound approaches. The east leg of the intersection has one left turn lane with approximately 270 feet of storage, one through lane, and one right turn lane with approximately 75 feet of storage on the westbound approach, and one eastbound departure lane. The west leg of the

intersection has one left turn lane with approximately 500 feet of storage, one through lane, and one right turn lane with approximately 200 feet of storage on the eastbound approach, and one westbound departure lane. The north leg of the intersection has one left turn lane with approximately 220 feet of storage, one through lane, and one right turn lane with approximately 150 feet of storage on the southbound approach, and one northbound departure lane. The south leg of the intersection has one left turn lane with approximately 200 feet of storage, one through lane, and one right turn lane with approximately 150 feet of storage on the northbound approach, and one southbound departure lane.

- **W. 64th Ave./Federal Blvd. (SH 287)** – The W. 64th Ave./Federal Blvd. (SH 287) intersection is a four-legged signalized intersection operating under actuated/coordinated control with protected/permissive left turn phasing on all four approaches. The east leg of the intersection has one left turn lane with approximately 150 feet of storage, one through lane, and one right turn lane with approximately 100 feet of storage on the westbound approach, and two eastbound departure lanes. The west leg of the intersection has one left turn lane with approximately 100 feet of storage, one through lane, and one right turn lane with approximately 150 feet of storage on the eastbound approach, and two westbound departure lanes. The north leg of the intersection has one left turn lane with approximately 250 feet of storage, two through lanes, and one shared through/right turn lane on the southbound approach, and three northbound departure lanes. The south leg of the intersection has one left turn lane with approximately 600 feet of storage, two through lanes, and one shared through/right turn lane on the northbound approach, and three southbound departure lanes.

III. BACKGROUND TRAFFIC

A. Background Traffic Volumes

Background traffic volume forecasts for the 2028 (short-term) and 2040 (long-range) analysis horizons were developed for this study utilizing the following strategy:

- For the purposes of this study it is assumed that peak-hour distribution of background intersection approach traffic (left turn, through, right turn) will remain constant through the 2028 and 2040 analysis horizons.
- Utilizing the Denver Regional Council of Governments (DRCOG) travel models for 2015 and 2040 daily traffic volume forecasts it was determined that the average annual traffic volume growth rate (AGR) for both Lowell Blvd. and W. 64th Ave. within the study limits is 1.0%. This traffic volume growth rate was applied to all peak hour 2021 (existing) COVID adjusted traffic volumes to determine the 2028 (short-term) and 2040 (long-range) background traffic volumes. A 1.0% growth rate equates to a 7-year (2021 to 2028) growth factor of 1.072 and a 19-year (2021 to 2040) growth factor of 1.21.

Figures 4 and 5 graphically illustrate the projected background traffic volumes for the 2028 (short-term) and 2040 (long-range) analysis horizons, respectively.

B. Background Traffic Operational Analysis

In order to establish a base condition in which to evaluate the impact of the traffic generated by the proposed development on the study area intersections, peak hour capacity analyses were performed for the 2021 (existing), 2028 (short-term) and 2040 (long-range) background traffic

conditions. These analyses utilized the methodologies contained in the *Highway Capacity Manual 6th Edition* (HCM 6) employing *Synchro 10* software and resulted in a qualitative measure of the operational characteristics of the intersection described by a letter designation ranging from “A” to “F” known as “Level of Service” (LOS). LOS “A” represents ideal free flow operating conditions, whereas LOS “F” represents excessive congestion and delay. Un-signalized intersection capacity analysis reports a LOS designation for each impeded intersection movement. Signalized intersection capacity analysis reports the overall LOS designation for the intersection as well as for each lane group and approach. LOS “D” is considered the minimum acceptable standard of operation.

The following study area intersections were analyzed for the 2021 (existing) traffic conditions, as well as for the 2028 (short-term) and 2040 (long-range) background traffic analysis horizons:

- W. 68th Ave./Lowell Blvd.
- W. 66th Ave./Lowell Blvd.
- W. 65th Ave./Lowell Blvd.
- W. 64th Ave./Tennyson St.
- W. 64th Ave./Lowell Blvd.
- W. 64th Ave./Federal Blvd. (SH 287)

The results of these background traffic operational analyses are summarized graphically for the 2021 (existing) COVID adjusted traffic conditions, as well as for the 2028 (short-term) and 2040 (long-range) background traffic analysis horizons in Figures 6, 7, and 8, respectively. A summary of the results of the intersection capacity analyses is provided in Table 2 and detailed *Synchro 10* software intersection capacity analysis reports in Appendix “B”.

IV. PROJECT DEVELOPMENT

A. Trip Generation

Site generated vehicular trip projections for the proposed 6501 Lowell Blvd development were forecast using the publication *Trip Generation, 10th Edition*, by the Institute of Transportation Engineers (ITE). Estimates of total daily traffic volumes and a.m. and p.m. peak hour traffic volumes were calculated. Trip generation reductions due to transportation demand management, internal trip capture, or transit use were not considered.

For the purposes of this study it was assumed that the subject parcel will be fully developed by 2023 and consist of 126 3-story duplex housing units. Based on these parameters, at build-out, the proposed 6501 Lowell Blvd development is projected to generate 1,286 daily vehicle trips of which 94 are projected to be generated during the a.m. peak hour and 127 during the p.m. peak hour. Trip generation projections for the proposed 6501 Lowell Blvd development are provided in Table 1.

**TABLE 1
TRIP GENERATION**

Land Use	Intensity	ITE Code	Daily (vpd)	AM Peak Hour (vph)				PM Peak Hour (vph)					
				Total	% In	% Out	In	Out	Total	% In	% Out	In	Out
Single-Family Detached Housing	126 DU	210	1286	94	25%	75%	24	70	127	63%	37%	80	47
		Total	1,286	94			24	70	127			80	47

B. Trip Distribution

The distribution of the projected site generated vehicle trips by the proposed 6501 Lowell Blvd development was established based on current and projected future traffic patterns on the surrounding transportation system, efficiency of access to the principal transportation corridors serving the proposed development, and the potential trip origins/destinations for the proposed land uses within the development. Figure 9 graphically illustrates the projected trip distribution patterns for the proposed development.

C. Trip Assignment

The site generated vehicular trips projected to be generated by the proposed 6501 Lowell Blvd development were assigned to the study area roadways and intersections utilizing the trip distribution analysis described above. Figure 10 graphically illustrates the site generated trip assignment for the proposed development.

V. TOTAL TRAFFIC

Total traffic forecasts for the 2028 (short-term) and 2040 (long-range) analysis horizons were computed by combining the associated 2028 (short-term) and 2040 (long-range) background traffic volumes with the projected site generated traffic volumes. Figures 11 and 12 graphically illustrate the total traffic projections for the study area intersections for the 2028 (short-term) and 2040 (long-range) analysis horizons, respectively.

VI. PROJECT ANALYSIS

A. Operational Analysis

In order to evaluate the impact of the proposed 6501 Lowell Blvd development on the study area roadway system, peak hour intersection capacity analyses for total traffic conditions (projected site generated trips + background traffic) were performed for the 2028 (short-term) and 2040 (long-range) analysis horizons at each of the study area intersections listed below.

- W. 68th Ave./Lowell Blvd.
- W. 66th Ave./Lowell Blvd.
- W. 65th Ave./Lowell Blvd.
- W. 64th Ave./Tennyson St.
- W. 64th Ave./Lowell Blvd.
- W. 64th Ave./Federal Blvd. (SH 287)
- W. 64th Ave./South Site Access

A narrative of the summary of the analysis and comparison to background traffic conditions for the 2028 (short-term) and 2040 (long-range) analysis horizons is provided below. The results of the total traffic operational analyses are summarized graphically for the 2028 (short-term) and 2040 (long-range) analysis horizons in Figures 13 and 14, respectively. A summary of the results of the intersection capacity analysis is provided in Table 2 and detailed *Synchro 10* software intersection capacity analysis reports in Appendix "B".

Study-Area Intersections – Summary of Results:

- **W. 68th Ave./Lowell Blvd.** – The W. 68th Ave./Lowell Blvd. intersection is not anticipated to undergo any significant geometric or operational modifications through the 2040 (long-range) analysis horizon. Therefore, the intersection is anticipated to remain under actuated/coordinated signalized control with permissive only left turn phasing on all four approaches. Based on these parameters, it is projected that the intersection, as well as all lane groups will operate at an acceptable level of service (LOS “D” or better) through the 2040 (long-range) analysis horizon. No operational modifications are recommended as a result of the proposed 6501 Lowell Blvd development.
- **W. 66th Ave./Lowell Blvd.** – The W. 66th Ave./Lowell Blvd. intersection is not anticipated to undergo any significant geometric or operational modifications through the 2040 (long-range) analysis horizon. Therefore, the intersection is anticipated to remain under stop sign control on the eastbound and westbound approaches. Based on these parameters, it is projected that the intersection, as well as all lane groups will operate at an acceptable level of service (LOS “D” or better) through the 2028 (short-term) analysis horizon, with the exception of the eastbound shared left/through/right turn lane which is experiencing a failing level of service in the p.m. peak hour under current conditions. This failing level of service is projected to continue in the p.m. peak hour through 2028. The failing level of service on the eastbound approach is due to high north/south through volumes on Lowell Blvd., causing substantial delay for vehicles on the eastbound and westbound approaches attempting to turn left or go straight through the intersection. By the 2040 (long-range) background analysis horizon, it is projected that the westbound shared left/through/right turn lane will have a failing level of service in the p.m. peak hour as well due to the background through traffic volumes on Lowell Blvd. These failing levels of service for 66th Ave are typical for stop controlled minor street approaches along Lowell Blvd. due to the high background traffic through volumes on Lowell Blvd causing substantial delay. No operational modifications are recommended as a result of the proposed 6501 Lowell Blvd development.
- **W. 65th Ave./Lowell Blvd.** – The W. 65th Ave./Lowell Blvd. intersection is not anticipated to undergo any significant geometric or operational modifications through the 2028 (short-term) background analysis horizon. Therefore, the intersection is anticipated to remain under stop sign control on the eastbound and westbound approaches. Based on these parameters, it is projected that the intersection, as well as all lane groups will operate at an acceptable level of service (LOS “D” or better) through the 2028 (short-term) background analysis horizon.

Concurrent with construction of the proposed 6501 Lowell Blvd development, the west leg of this intersection will be extended and serve as an access for the proposed development. With the addition of site traffic on the west leg, the intersection is projected to continue operating with an acceptable level of service for all impeded movements. By the 2040 (long-range) analysis horizon, it is projected that in the background traffic scenario, the westbound shared left/through/right turn lane will experience a failing level of service in the p.m. peak hour. The failing level of service on the westbound approach is typical for stop controlled minor street approaches along Lowell Blvd. due to the high background traffic through volumes on Lowell Blvd. causing substantial delay for vehicles on the minor approaches attempting to turn left or go straight through the intersection.

- **W. 64th Ave./Tennyson St.** – The W. 64th Ave./Tennyson St. intersection is not anticipated to undergo any significant geometric or operational modifications through the

2040 (long-range) analysis horizon. Therefore, the intersection is anticipated to remain under actuated/coordinated signalized control with permissive only left turn phasing on the eastbound and westbound approach. Based on these parameters, it is projected that the intersection, as well as all lane groups will operate at an acceptable level of service (LOS "D" or better) through the 2040 (long-range) analysis horizon. No operational modifications are recommended as a result of the proposed 6501 Lowell Blvd development.

- **W. 64th Ave./Lowell Blvd.** – The W. 64th Ave./Lowell Blvd. Dr. intersection is not anticipated to undergo any significant geometric or operational modifications through the 2040 (long-range) analysis horizon. Therefore, the intersection is anticipated to remain under actuated/coordinated signalized control with protected/permissive left turn phasing on the eastbound and southbound approaches, and permissive only left turn phasing on the northbound and westbound approaches. Based on these parameters, it is projected that the intersection, as well as all lane groups will operate at acceptable levels of service (LOS "D" or better) through the 2040 (long-range) analysis horizon. No operational modifications are recommended as a result of the proposed 6501 Lowell Blvd development.
- **W. 64th Ave./Federal Blvd. (SH 287)** – The W. 64th Ave./Federal Blvd. (SH 287) intersection is not anticipated to undergo any significant geometric or operational modifications through the 2040 (long-range) analysis horizon. Therefore, the intersection is anticipated to remain under actuated/coordinated signalized control with protected/permissive left turn phasing on all four approaches. Based on these parameters, it is projected that by the 2040 (long-range) analysis horizon, the intersection overall will have a failing level of service (LOS "E" or worse) in the p.m. peak hour, and multiple lane groups will also have a failing level of service in the a.m. and p.m. peak hour. This is due to high background traffic through volumes on Federal Blvd. (SH 287). No operational modifications are recommended as a result of the proposed 6501 Lowell Blvd development.
- **W. 64th Ave./South Site Access** – The W. 64th Ave./ South Site Access intersection will be constructed concurrently with the proposed 6501 Lowell Blvd. development. The intersection will be a "T" intersection under stop sign control on the southbound approach. The east leg of the intersection will have one shared through/right turn lane on the westbound approach, and one eastbound departure lane. The west leg of the intersection will have one left turn lane with approximately 250 feet of storage and one through lane on the eastbound approach, and one westbound departure lane. The north leg of the intersection will be constructed to have one shared left/right turn lane on the southbound approach, and one northbound departure lane. Based on these parameters, it is projected that all impeded lane groups will operate with acceptable levels of service (LOS "D" or better) through the 2040 (long-range) analysis horizon total traffic scenario.

**TABLE 2
SUMMARY OF RESULTS - INTERSECTION CAPACITY ANALYSIS**

INTERSECTION	INTERSECTION CONTROL	2021 EXISTING TRAFFIC		2028 BACKGROUND TRAFFIC		2028 TOTAL TRAFFIC		2040 BACKGROUND TRAFFIC		2040 TOTAL TRAFFIC	
		AM PEAK	PM PEAK	AM PEAK	PM PEAK	AM PEAK	PM PEAK	AM PEAK	PM PEAK	AM PEAK	PM PEAK
		LOS	LOS	LOS	LOS	LOS	LOS	LOS	LOS	LOS	LOS
1. W. 68th Ave./Lowell Blvd. a. EB L (Perm) b. EB T c. EB R d. WB L (Perm) e. WB TR f. NB L (Perm) g. NB T h. NB R i. SBL (Perm) j. SBT k. SBR l. INTERSECTION	Signal	C	C	C	C	C	C	C	C	C	C
		C	C	C	C	C	C	C	C	C	C
		C	C	C	C	C	C	C	C	C	C
		C	C	C	C	C	C	C	C	C	C
		C	C	C	C	C	C	C	C	C	C
		A	A	A	A	A	A	A	A	A	A
		A	A	A	A	A	A	A	A	A	A
		A	A	A	A	A	A	A	A	A	A
		A	A	A	A	A	A	A	A	A	A
		A	A	A	A	A	A	A	A	A	A
		A	A	A	A	A	A	A	A	A	A
		A	A	A	A	A	A	A	A	A	A
		A	A	A	A	A	A	A	A	A	A
2. W. 66th Ave./Lowell Blvd. a. EB LTR b. WB LTR c. NB L d. SBL e. INTERSECTION	TWSC										
	Stop	B	E	C	E	C	F	C	F	C	F
	Stop	C	D	C	D	C	D	C	E	C	E
		A	A	A	A	A	A	A	A	A	A
		A	A	A	A	A	A	A	B	A	B
		A	A	A	A	A	A	A	A	A	A
3. W. 65th Ave./Lowell Blvd. a. EB LTR b. WB LTR c. NB L d. SBL e. INTERSECTION	TWSC										
	Stop	A	A	A	A	C	C	A	A	C	D
	Stop	B	C	B	D	B	D	C	E	C	E
		A	A	A	A	A	A	A	A	A	A
		A	A	A	A	A	A	A	B	A	B
		A	A	A	A	A	A	A	A	A	A
4. W. 64th Ave./Tennyson St. a. EB L (Perm) b. EB T c. EB R d. WB L (Perm) e. WB TR f. NB LTR g. SB LTR h. INTERSECTION	Signal	C	B	C	B	C	B	C	B	C	B
		C	C	C	C	C	C	C	C	C	C
		C	B	C	B	C	B	C	B	C	B
		D	B	D	B	D	B	D	C	D	C
		C	A	C	A	C	A	C	A	C	A
		B	C	B	C	B	C	B	C	B	C
		A	B	B	B	B	B	B	B	B	B
		C	B	C	B	C	B	C	B	C	B
		C	B	C	B	C	B	C	B	C	B
5. W. 64th Ave./Lowell Blvd. a. EB L (Prot+Perm) b. EB T c. EB R d. WB L (Perm) e. WB T f. WB R g. NB L (Perm) h. NB T i. NB R j. SBL (Prot+Perm) k. SBT l. SBR m. INTERSECTION	Signal	C	C	C	C	C	D	C	D	C	D
		C	B	D	B	D	B	D	B	D	B
		C	B	C	B	C	B	C	B	C	B
		D	C	D	C	D	C	D	C	D	C
		D	D	D	D	D	D	D	D	D	D
		D	C	D	C	D	C	D	C	D	C
		B	C	B	C	B	C	B	C	B	C
		B	C	B	C	B	C	B	D	B	D
		B	B	B	B	B	C	B	C	B	C
		A	B	A	B	A	B	B	C	B	C
		A	B	A	B	A	B	B	B	B	B
		A	B	A	B	A	B	A	B	A	B
		C	C	C	C	C	C	C	C	C	C
		C	C	C	C	C	C	C	C	C	C
		C	C	C	C	C	C	C	C	C	C
6. W. 64th Ave./Federal Blvd. (SH 287) a. EB L (Prot+Perm) b. EB T c. EB R d. WB L (Prot+Perm) e. WB T f. WB R g. NB L (Prot+Perm) h. NB TR i. SBL (Prot+Perm) j. SB TR k. INTERSECTION	Signal	C	D	C	D	C	D	D	F	D	F
		D	D	D	D	D	D	D	D	D	D
		D	D	D	D	D	D	D	D	D	D
		D	C	D	C	D	C	D	D	D	D
		D	D	D	D	D	D	D	F	D	F
		C	D	C	D	C	C	C	D	C	D
		C	D	C	D	C	D	C	F	C	F
		B	C	B	D	B	D	B	D	B	D
		A	C	A	C	A	C	A	D	A	D
		C	C	D	D	D	D	F	E	F	F
		C	C	C	D	C	D	D	E	D	E
		C	C	C	C	C	C	C	C	C	C
		C	C	C	C	C	C	C	C	C	C
7. W. 64th Ave./South Site Access a. EB L b. SB LR c. INTERSECTION	TWSC										
	Stop	-	-	-	-	A	A	-	-	A	A
		-	-	-	-	C	D	-	-	C	D
		-	-	-	-	A	A	-	-	A	A

B. Queue Lengths and Storage Required

Queue lengths and associated storage requirements for auxiliary lanes (turn bays) at the study area intersections were calculated for the 2021 (existing) and 2028 (short-term) and 2040 (long-range) analysis horizon background and total traffic scenarios using the results of the *Synchro* 10 95th percentile reported queue lengths. Queue lengths are based on a 25-foot vehicle length. All queue lengths are reported in total feet. Results of the queue length/turn bay storage length requirement calculations are provided in Table 3. A narrative of the summary of the queue length/storage analysis and comparison to existing turn bay storage is provided below.

- **W. 68th Ave./Lowell Blvd.** - Based on the results of the queuing analysis, it is projected that all turn bays will have adequate capacity to serve the intersection through the 2040 (long-range) analysis horizon total traffic scenario.
- **W. 66th Ave./Lowell Blvd.** – Based on the results of the queuing analysis, it is projected that there will not be any queuing impacts associated with this intersection through the 2040 (long-range) analysis horizon total traffic scenario.
- **W. 65th Ave./Lowell Blvd.** – Based on the results of the queuing analysis, it is projected that there will not be any queuing impacts associated with this intersection through the 2040 (long-range) analysis horizon total traffic scenario. Right-turning traffic volumes at this intersection do not warrant the construction of any right turn auxiliary lanes per the *Adams County Development Standards*.
- **W. 64th Ave./Tennyson St.** - Based on the results of the queuing analysis, it is projected that all turn bays will have adequate capacity to serve the intersection through the 2040 (long-range) analysis horizon total traffic scenario.
- **W. 64th Ave./Lowell Blvd.** - Based on the results of the queuing analysis, it is projected that all turn bays will have adequate capacity to serve the intersection through the 2040 (long-range) analysis horizon total traffic scenario, with the exception of the westbound right turn lane queue, which is projected to spill back into the westbound through lane in the 2040 (long-range) p.m. peak hour. Also, by the 2040 (long-range) background analysis horizon, it is projected the westbound through lane queue will spill back through the W. 64th Ave./Knox Ct. intersection during the p.m. peak hour.
- **W. 64th Ave./Federal Blvd. (SH 287)** - Based on the results of the queuing analysis, it is projected under existing conditions, the eastbound left turn bay exceeds its capacity in the p.m. peak hour, blocking access to driveways along W. 64th Ave. This will continue through the 2040 (long-range) analysis horizon. All other turn bays will have adequate capacity to serve the intersection through the 2040 (long-range) analysis horizon total traffic scenario. However, by the 2040 (long-range) background analysis horizon, it is projected the southbound through lane queue will spill back through the W. Hawthorne Pl./Federal Blvd. (SH 287) intersection during the a.m. peak hour.
- **W. 64th Ave./South Site Access** - Based on the results of the queuing analysis, it is projected that there will not be any queuing impacts associated with this intersection through the 2040 (long-range) analysis horizon total traffic scenario. Right-turning traffic volumes at this intersection do not warrant the construction of any right turn auxiliary lanes per the *Adams County Development Standards*.

**TABLE 3
SUMMARY OF RESULTS - QUEUE ANALYSIS**

INTERSECTION (# OF LANES IN LANE GROUP)	EXISTING STORAGE (CUMULATIVE) (FT)	2021 EXISTING TRAFFIC		2028 BACKGROUND TRAFFIC		2028 TOTAL TRAFFIC		2040 BACKGROUND TRAFFIC		2040 TOTAL TRAFFIC	
		QUEUE LENGTH (FT) 95TH%		QUEUE LENGTH (FT) 95TH%		QUEUE LENGTH (FT) 95TH%		QUEUE LENGTH (FT) 95TH%		QUEUE LENGTH (FT) 95TH%	
		AM PEAK	PM PEAK	AM PEAK	PM PEAK	AM PEAK	PM PEAK	AM PEAK	PM PEAK	AM PEAK	PM PEAK
1. W. 68th Ave./Lowell Blvd.											
a. EB L (1)	150	42	44	44	46	44	46	48	49	48	49
b. EB T (1)	500	14	16	14	17	14	17	15	18	15	18
c. EB R (1)	150	36	28	37	29	37	29	39	30	39	30
d. WB L (1)	150	6	16	7	16	7	16	7	17	7	17
e. WB TR (1)	275	19	29	19	30	19	30	20	32	20	32
f. NB L (1)	225	16	30	18	32	18	33	20	39	20	39
g. NB T (1)	320	35	172	38	198	40	202	44	256	46	261
h. NB R (1)	250	25	4	25	5	25	5	25	5	25	5
i. SB L (1)	150	6	6	6	6	6	6	7	7	7	7
j. SB T (1)	150	61	75	68	83	69	87	80	99	82	103
k. SB R (1)	150	8	10	8	10	8	10	9	11	9	11
2. W. 66th Ave./Lowell Blvd.											
a. EB LTR (1)	180	10	38	10	48	10	50	15	83	15	85
b. WB LTR (1)	285	8	15	8	18	8	20	10	28	10	30
c. NB L (1)	200	0	3	0	3	0	3	0	3	0	3
d. SB L (1)	575	0	3	0	3	0	3	0	3	0	3
3. W. 65th Ave./Lowell Blvd.											
a. EB LTR (1)	-	0	0	0	0	10	10	0	0	10	13
b. WB LTR (1)	115	3	10	5	13	5	18	5	20	8	30
c. NB L (1)	150	0	0	0	0	0	3	0	0	0	3
d. SB L (1)	300	0	3	0	3	0	3	0	3	0	3
4. W. 64th Ave./Tennyson St.											
a. EB L (1)	150	15	19	16	20	16	20	16	23	16	22
b. EB T (1)	250	196	406	202	455	200	473	213	623	212	646
c. EB R (1)	100	23	34	23	37	22	37	22	42	22	42
d. WB L (1)	225	156	74	164	85	167	89	177	116	176	111
e. WB TR (1)	310	314	383	333	394	342	390	358	413	357	410
f. NB LTR (1)	300	61	235	71	260	73	264	90	324	92	350
g. SB LTR (1)	700	26	30	29	32	30	32	34	34	34	34
5. W. 64th Ave./Lowell Blvd.											
a. EB L (1)	500	111	177	115	193	110	195	114	213	111	290
b. EB T (1)	500	242	294	249	314	248	318	256	323	261	317
c. EB R (1)	200	59	25	59	23	53	23	49	50	48	50
d. WB L (1)	270	58	35	60	37	59	36	58	63	57	62
e. WB T (1)	385	167	312	173	320	173	336	178	451	182	463
f. WB R (1)	75	30	50	33	50	33	75	45	85	50	90
g. NB L (1)	200	46	109	50	118	51	121	55	133	56	143
h. NB T (1)	1250	101	346	110	410	115	422	125	494	126	533
i. NB R (1)	150	25	28	28	33	28	33	35	41	35	43
j. SB L (1)	220	49	34	54	35	63	40	63	38	72	46
k. SB T (1)	600	149	134	164	143	172	147	198	161	204	173
l. SB R (1)	150	28	34	30	35	31	35	33	37	34	39
6. W. 64th Ave./Federal Blvd. (SH 287)											
a. EB L (1)	100	48	247	55	276	64	292	70	468	79	468
b. EB T (1)	1220	73	217	83	236	92	242	106	321	119	311
c. EB R (1)	150	25	76	27	84	28	84	75	85	19	79
d. WB L (1)	150	108	86	114	88	114	88	140	136	144	132
e. WB T (1)	1250	154	212	165	236	167	243	185	391	187	396
f. WB R (1)	100	38	25	40	50	40	50	45	90	45	18
g. NB L (1)	600	53	214	68	227	77	246	91	355	98	371
h. NB TR (3)	2275	152	546	164	631	164	632	191	840	191	821
i. SB L (1)	250	32	48	35	54	35	54	37	133	37	134
j. SB TR (3)	750	638	458	717	544	718	531	858	736	860	736
7. W. 64th Ave./South Site Access											
a. EB L (1)	-	-	-	-	-	0	3	-	-	0	3
b. SB LR (1)	-	-	-	-	-	8	10	-	-	10	13

VII. SUMMARY

The True Life Companies is proposing to develop a parcel of land containing approximately 7.15 acres located within the jurisdictional boundaries of Adams County, Colorado. The undeveloped property is bound on the south by W. 64th Ave., on the east by Lowell Blvd., on the north by residential properties fronting Meade Ct., and on the west by residential properties fronting Newton St. Upon buildout, the proposed development will contain 126 3-story duplex housing units. The proposed development will be known as 6501 Lowell Blvd.

The proposed development will have two access points. One access point will be the existing west leg of the Lowell Blvd./W. 65th Ave. intersection. The existing west leg will be extended to provide access into the proposed site. The second access point will be a proposed “T” intersection with W. 64th Ave. located west of Lowell Blvd.

Upon buildout, the proposed 6501 Lowell Blvd development is projected to generate 1,286 daily vehicle trips of which 94 are projected to be generated during the a.m. peak hour and 127 during the p.m. peak hour.

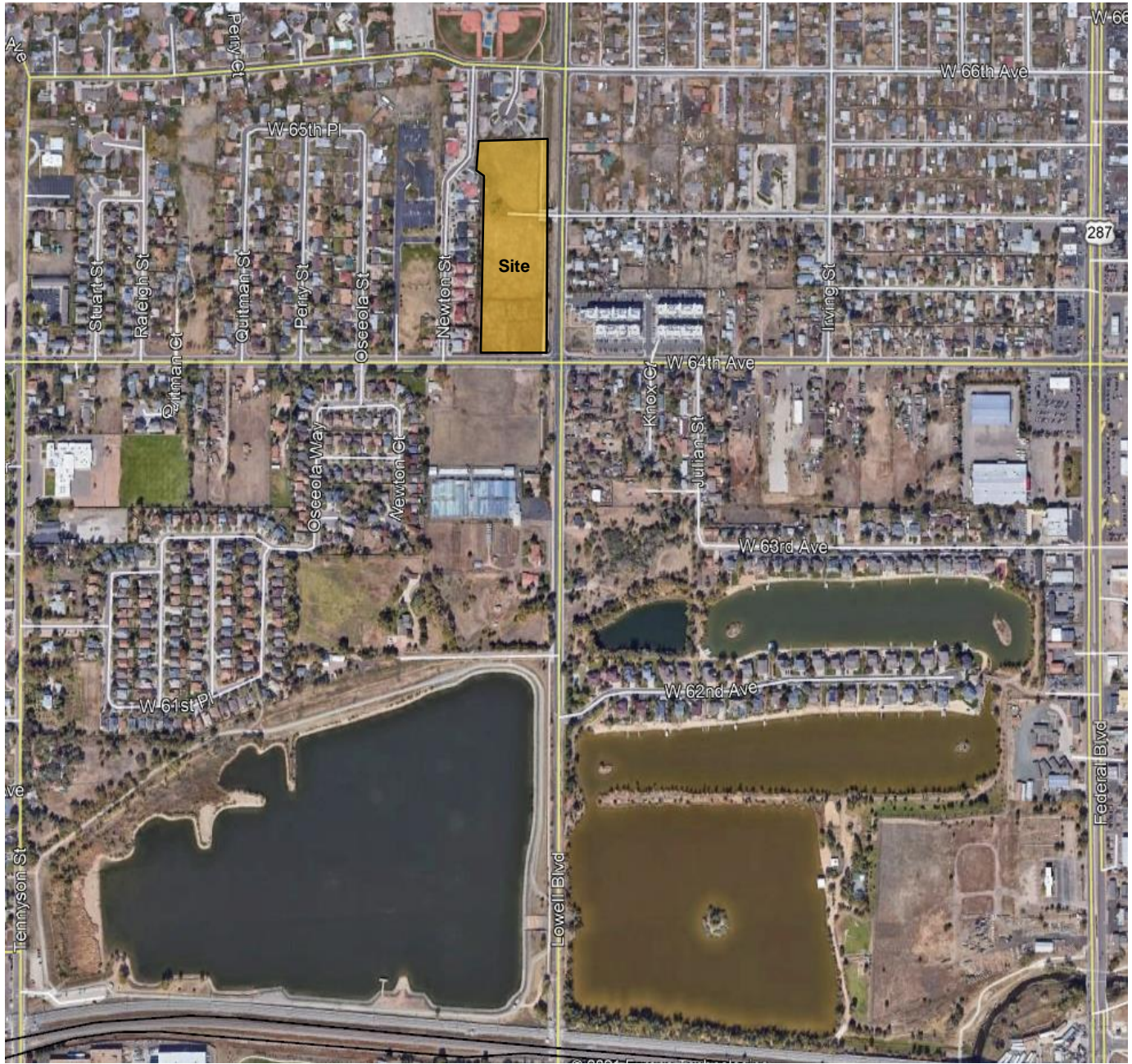
Based on the analyses contained herein, Table 4 presents the summary of recommendations for the study area intersections required to accommodate the proposed 6501 Lowell Blvd development project.

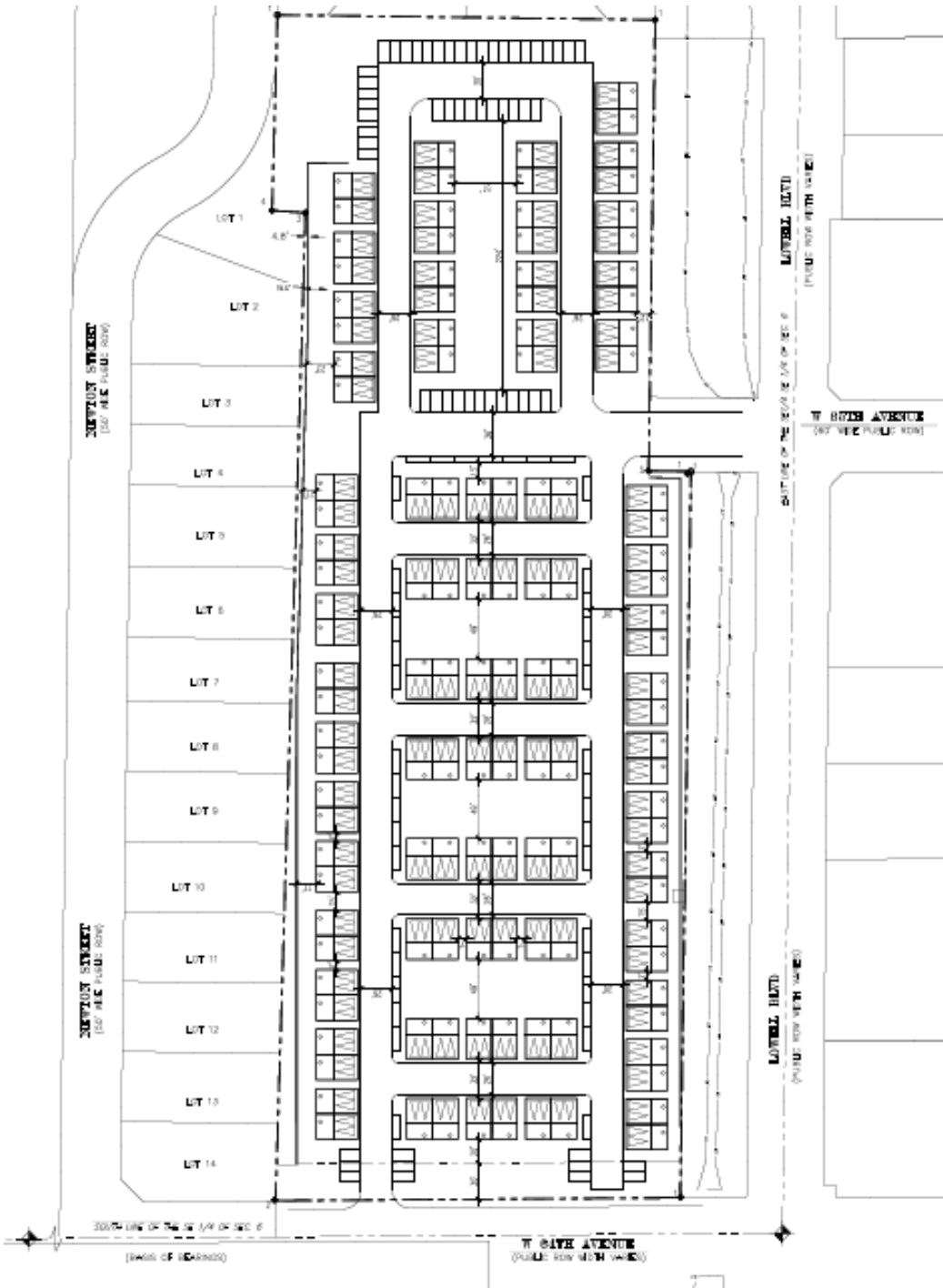
**TABLE 4
SUMMARY OF RECOMMENDATIONS**

Intersection	Recommendations	Responsible	Timing
W. 68 th Ave./Lowell Blvd.	No geometric or operational modifications are recommended as a result of the development of the proposed project.	N/A	N/A
W. 66 th Ave./Lowell Blvd.	No geometric or operational modifications are recommended as a result of the development of the proposed project.	N/A	N/A
W. 65 th Ave./Lowell Blvd.	Extend the west leg of the intersection to serve as an access for the proposed development.	Developer	Concurrently with Project
W. 64 th Ave./Tennyson St.	No geometric or operational modifications are recommended as a result of the development of the proposed project.	N/A	N/A
W. 64 th Ave./Lowell Blvd.	No geometric or operational modifications are recommended as a result of the development of the proposed project.	N/A	N/A

**TABLE 4 (CONTINUED)
SUMMARY OF RECOMMENDATIONS**

Intersection	Recommendations	Responsible	Timing
W. 64 th Ave./Federal Blvd. (SH 287)	No geometric or operational modifications are recommended as a result of the development of the proposed project.	N/A	N/A
W. 64 th Ave./South Site Access	Construct concurrently with the proposed 6501 Lowell Blvd development. The intersection will be under stop sign control on the southbound approach. The east leg of the intersection will have one shared through/right turn lane on the westbound approach, and one eastbound departure lane. The west leg of the intersection will have one left turn lane with approximately 250 feet of storage and one through lane on the eastbound approach, and one westbound departure lane. The north leg of the intersection will be constructed to have one shared left/right turn lane on the southbound approach, and one northbound departure lane.	Developer	Concurrently with Project

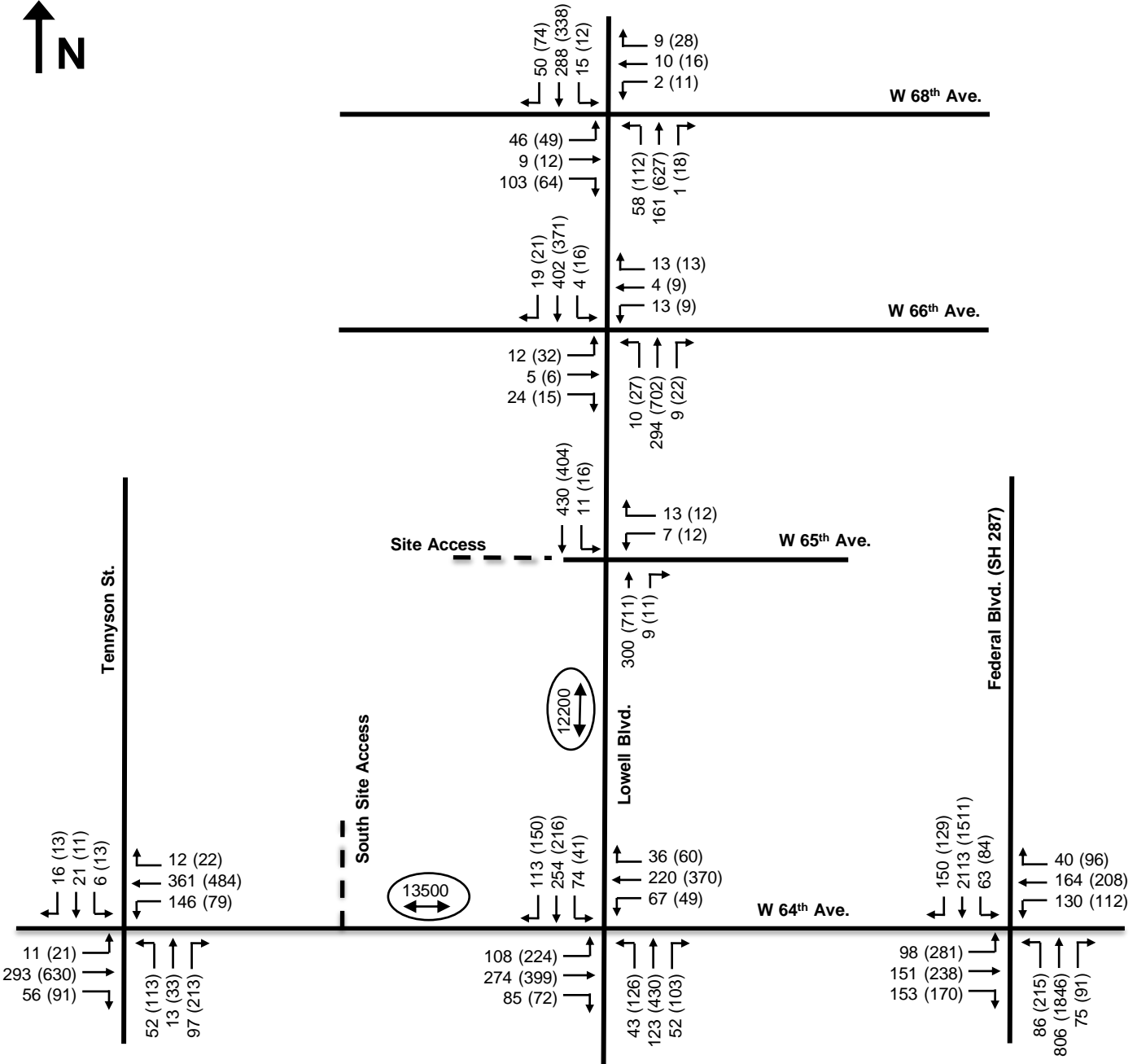




Conceptual Site Plan

6501 Lowell Blvd
The True Life Companies
HKS #200917

Figure 2



Legend: Drawing Not To Scale

- ↖ 5 (8) Weekday AM (PM)
- ← 64 (50) Peak Hour
- ↙ 8 (7) Traffic Volumes, vph
- ↔ (3200) Daily Traffic Volumes, vpd

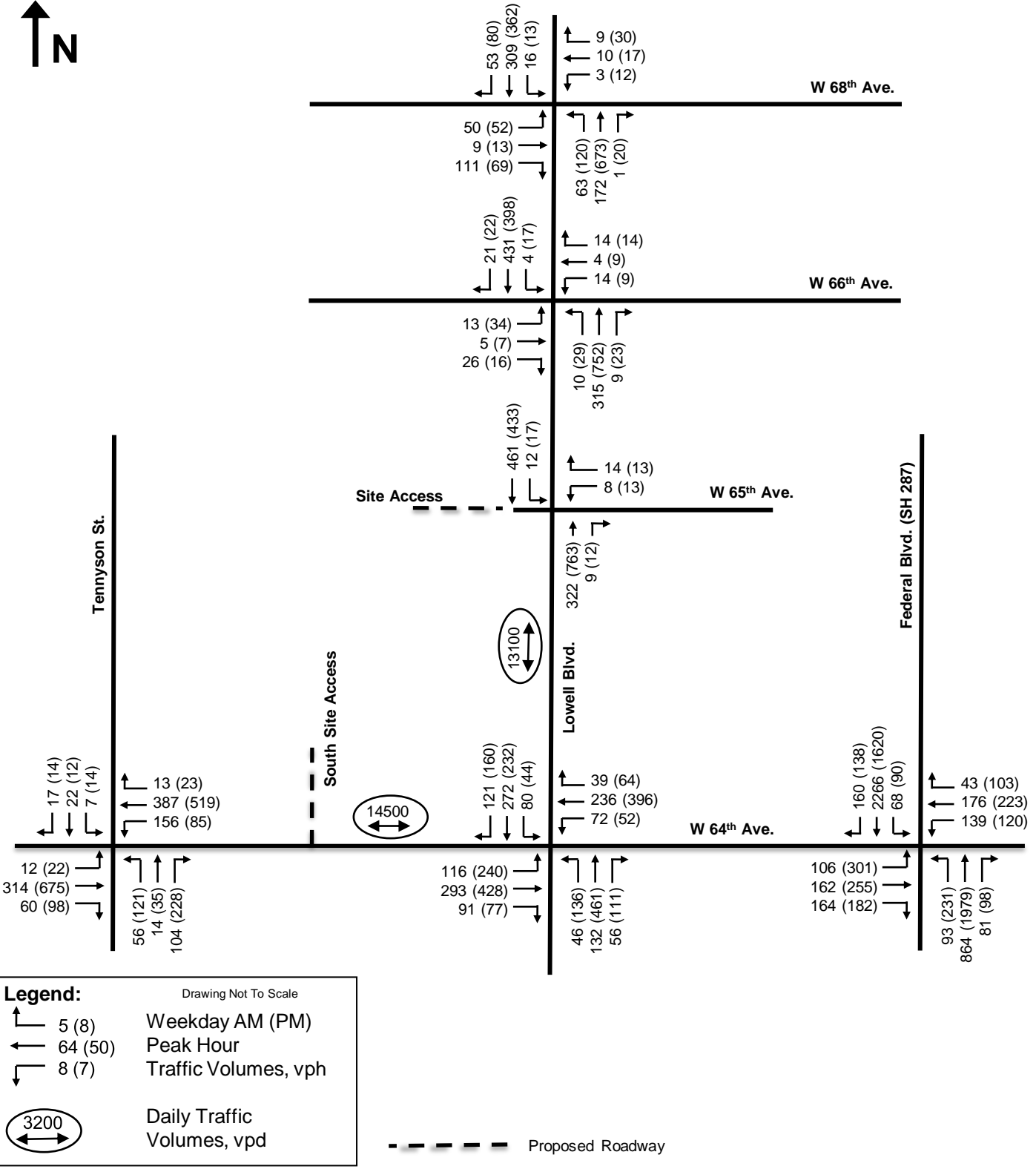
Proposed Roadway: - - - - -

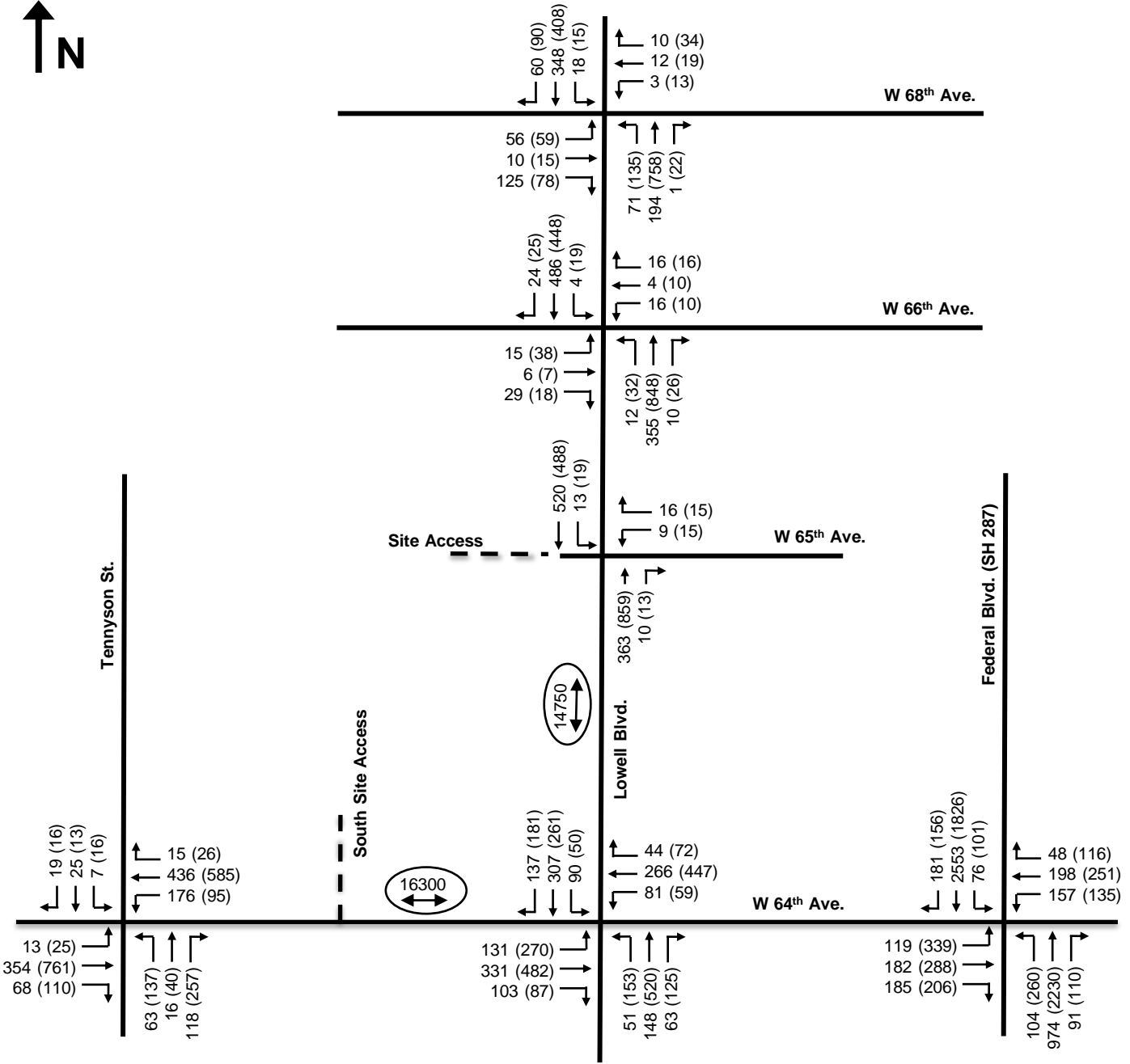


2021 Existing (COVID Adjusted) Traffic Volumes

6501 Lowell Blvd
 The True Life Companies
 HKS #200917

Figure 3

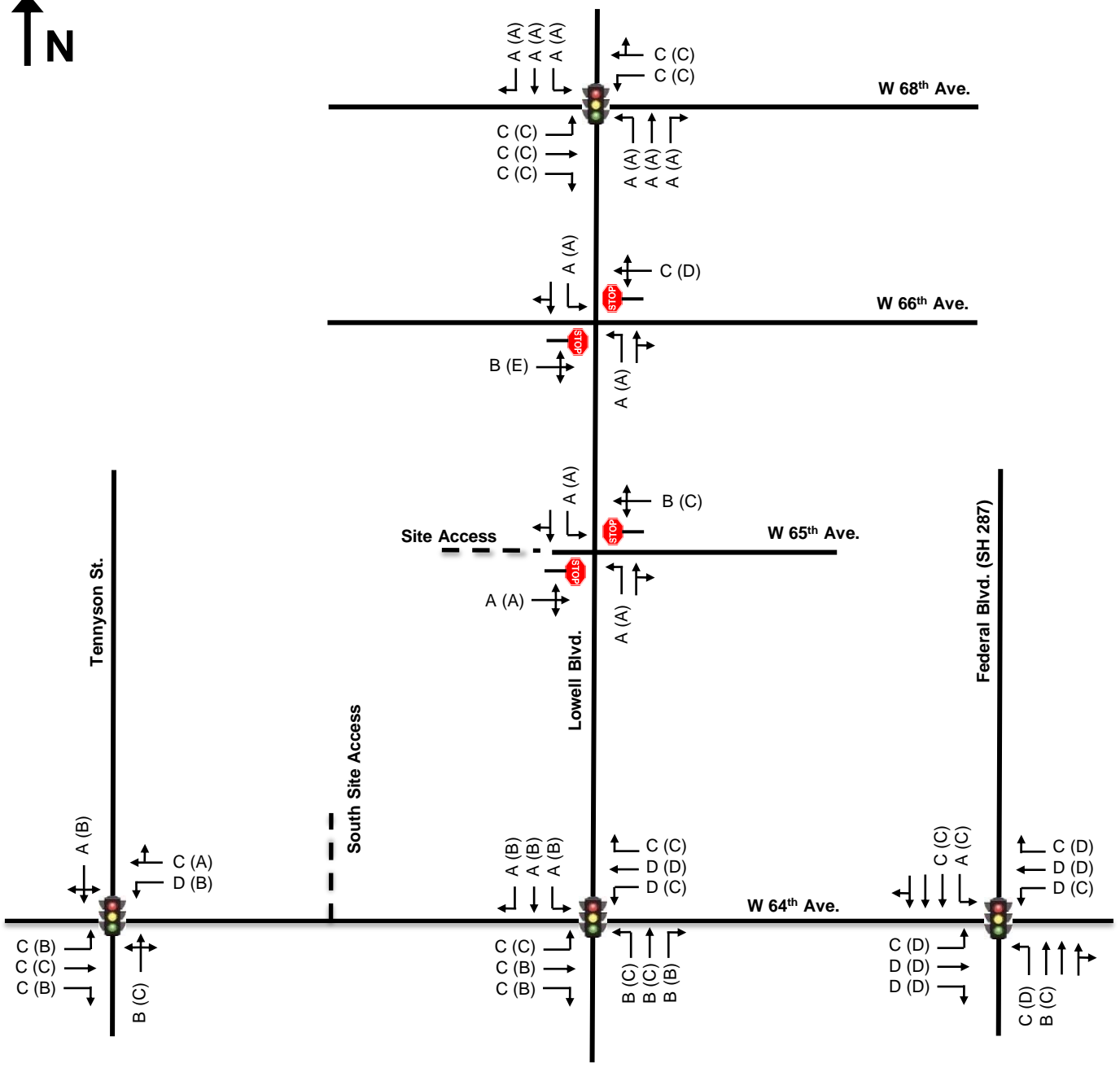




2040 Background Traffic Volumes

6501 Lowell Blvd
 The True Life Companies
 HKS #200917

Figure 5



Legend: Drawing Not To Scale

	A (B)	Weekday AM (PM)
	B (C)	Peak Hour
	D (D)	Level of Service

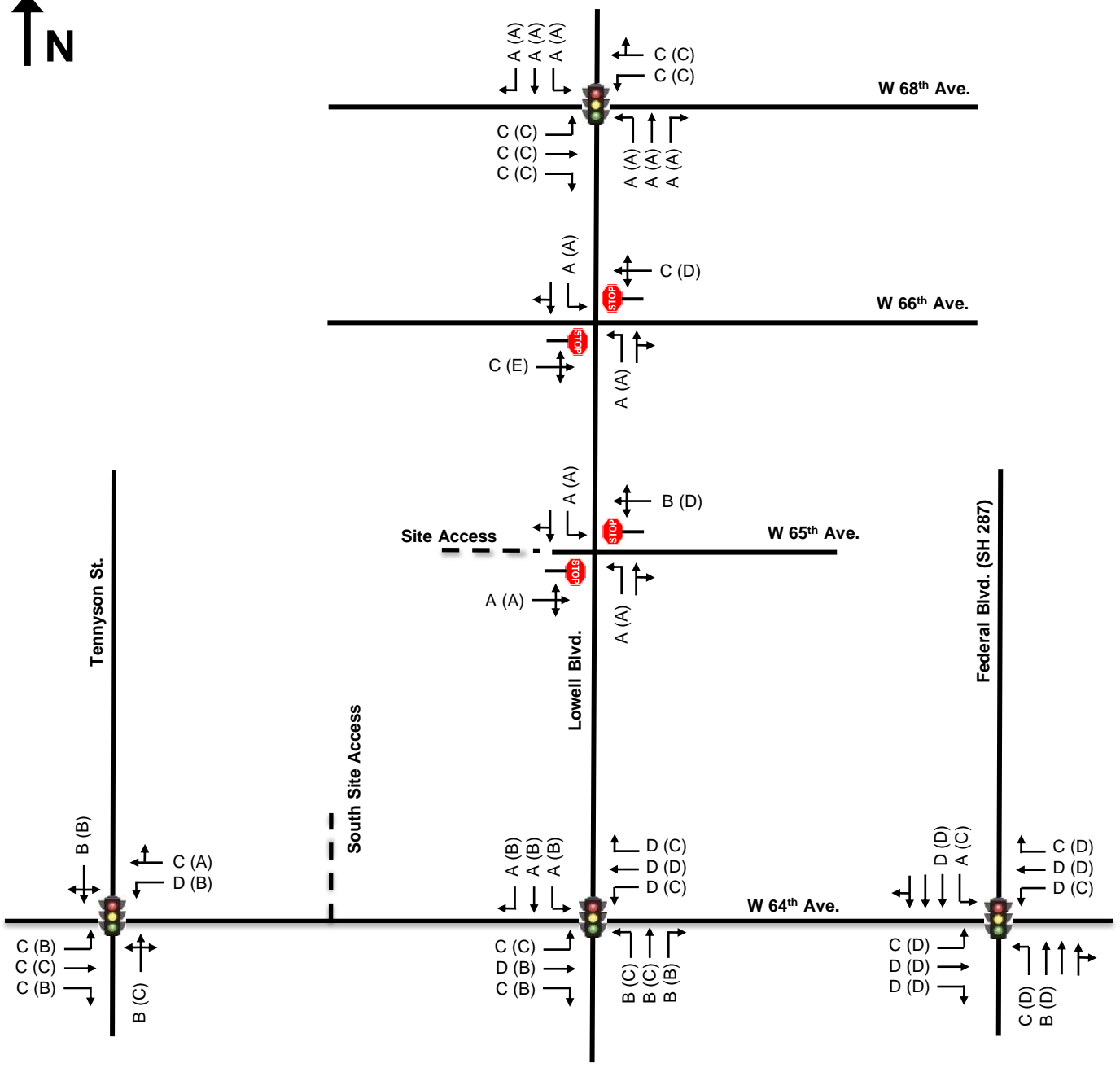
- - - - - Proposed Roadway



6501 Lowell Blvd
 The True Life Companies
 HKS #200917

2021 Existing Traffic Operational Conditions

Figure 6



Legend: Drawing Not To Scale

	A (B)	Weekday AM (PM)
	B (C)	Peak Hour
	D (D)	Level of Service

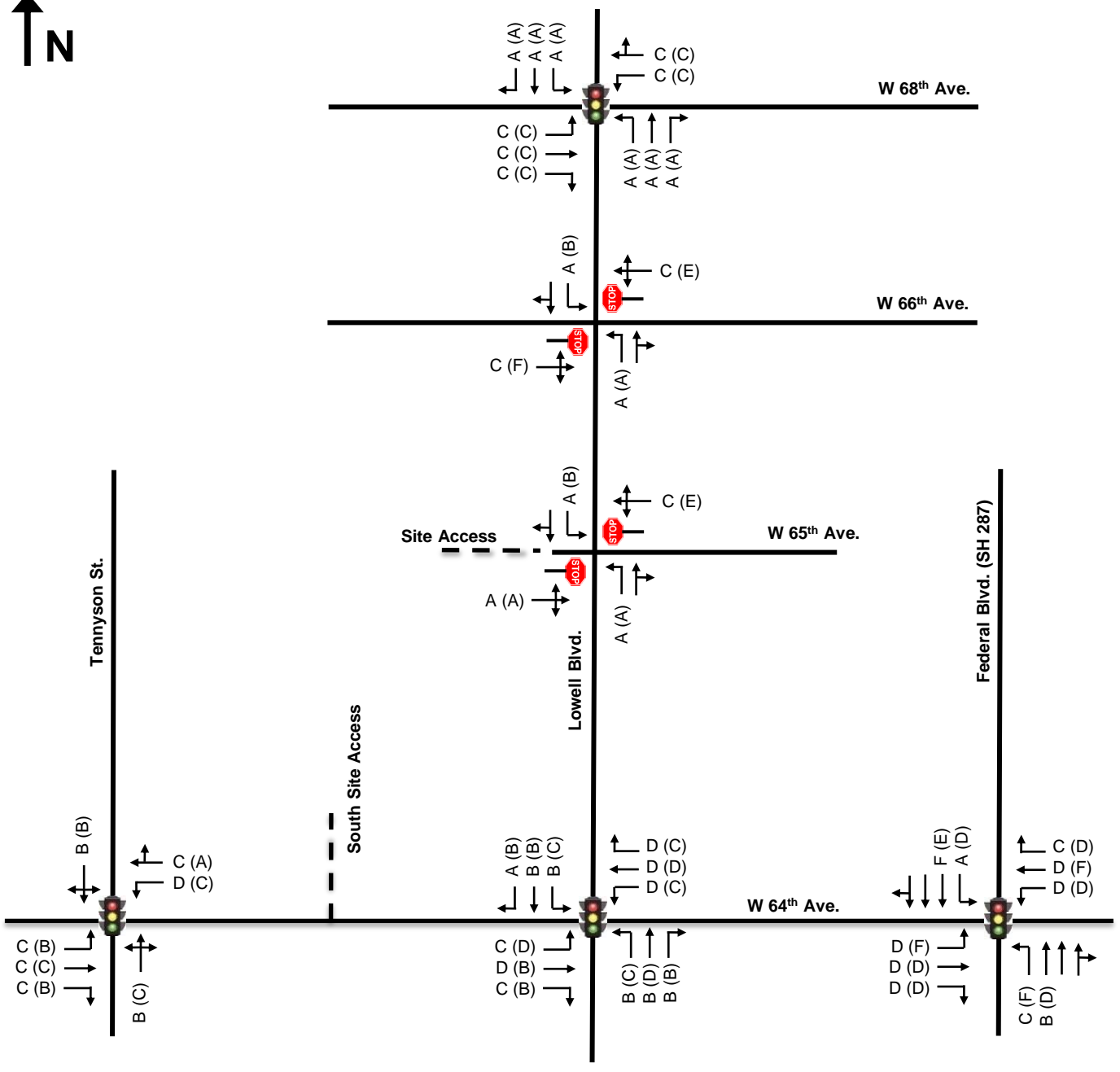
- - - - - Proposed Roadway



2028 Background Traffic Operational Conditions

6501 Lowell Blvd
 The True Life Companies
 HKS #200917

Figure 7



Legend: Drawing Not To Scale

	A (B)	Weekday AM (PM)
	B (C)	Peak Hour
	D (D)	Level of Service

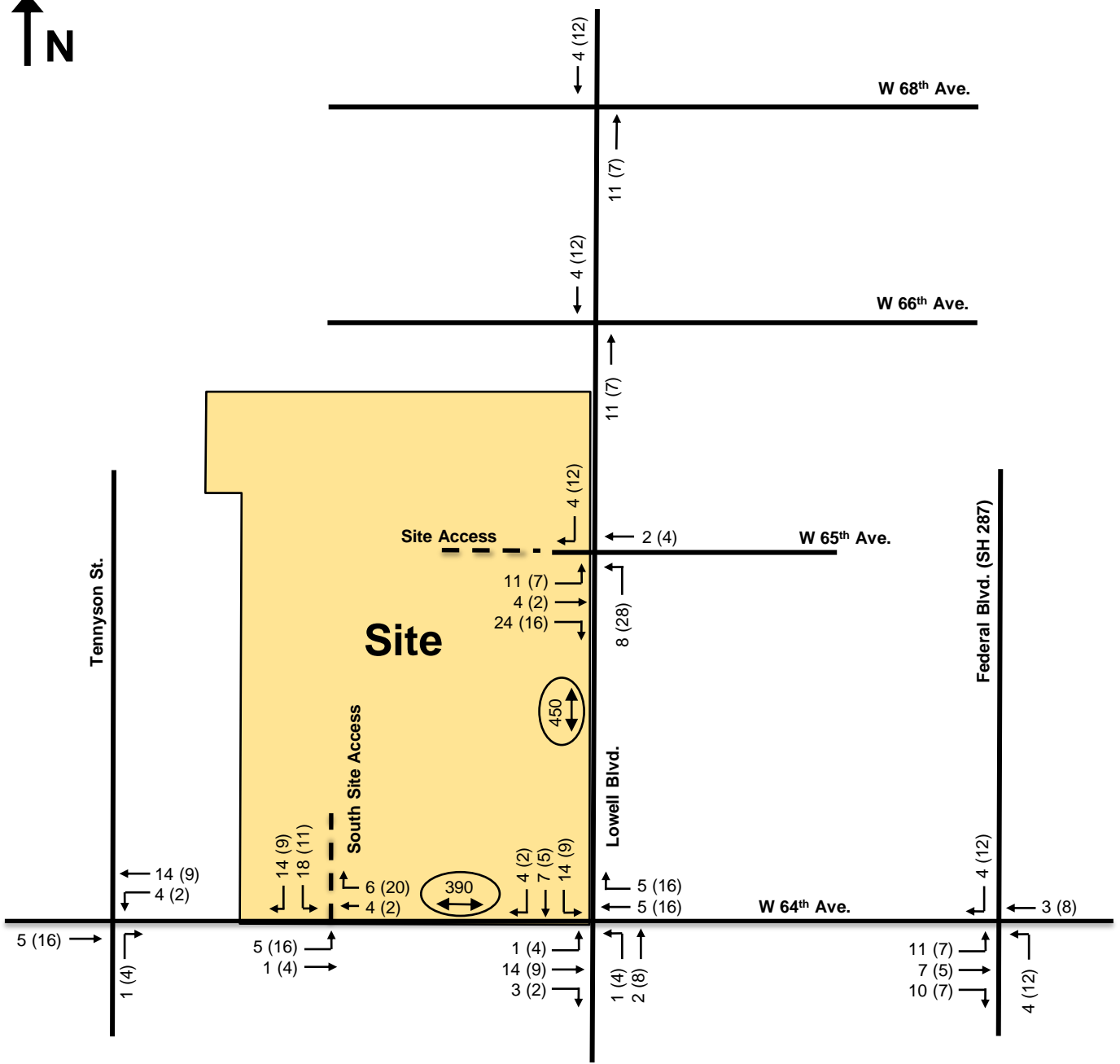
----- Proposed Roadway



2040 Background Traffic Operational Conditions

6501 Lowell Blvd
 The True Life Companies
 HKS #200917

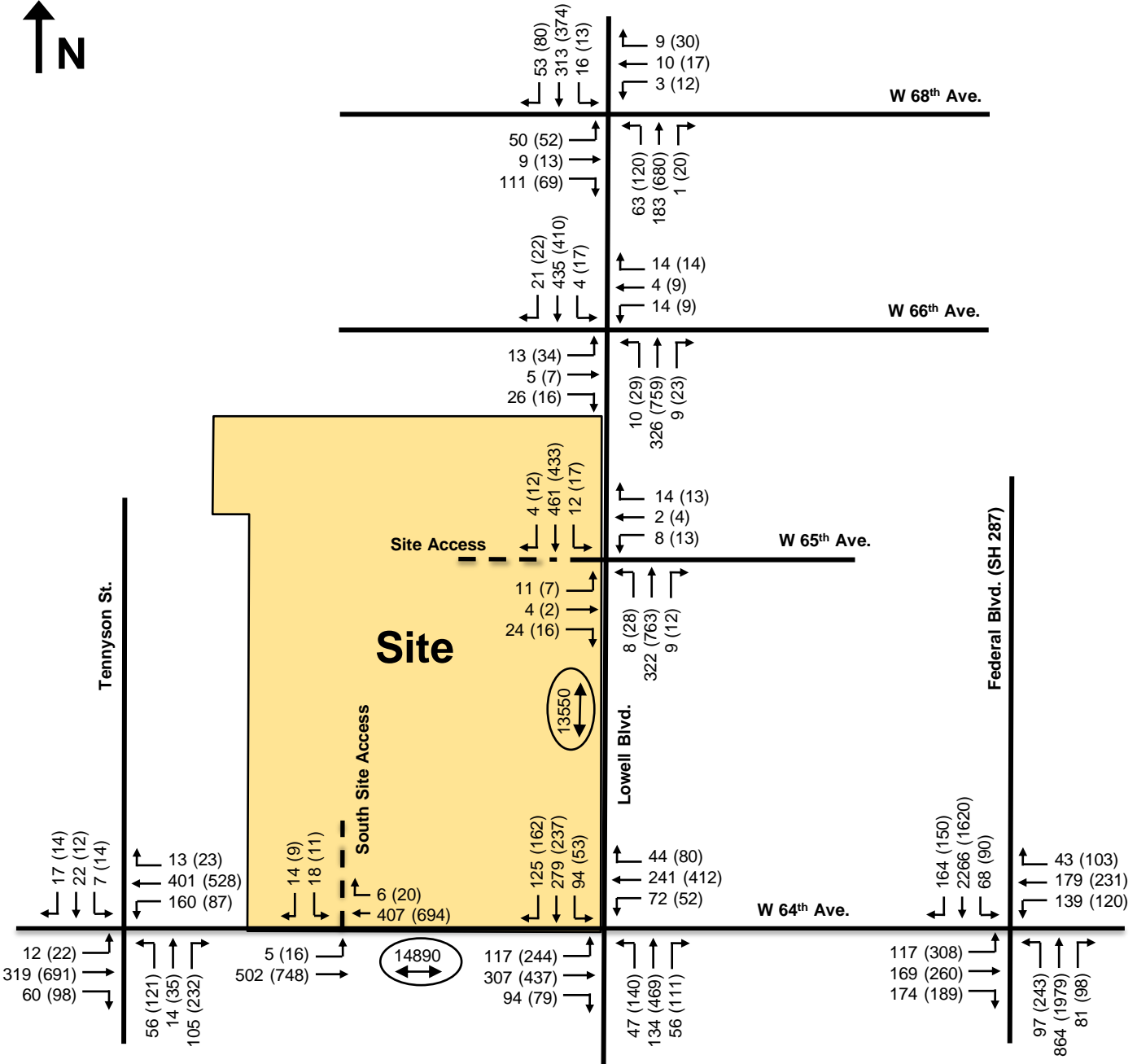
Figure 8



Legend: Drawing Not To Scale

- 5 (8) Weekday AM (PM)
- 64 (50) Peak Hour
- 8 (7) Traffic Volumes, vph
- Daily Traffic Volumes, vpd

--- Proposed Roadway



2028 Total Traffic Volumes (Background + Site Generated)

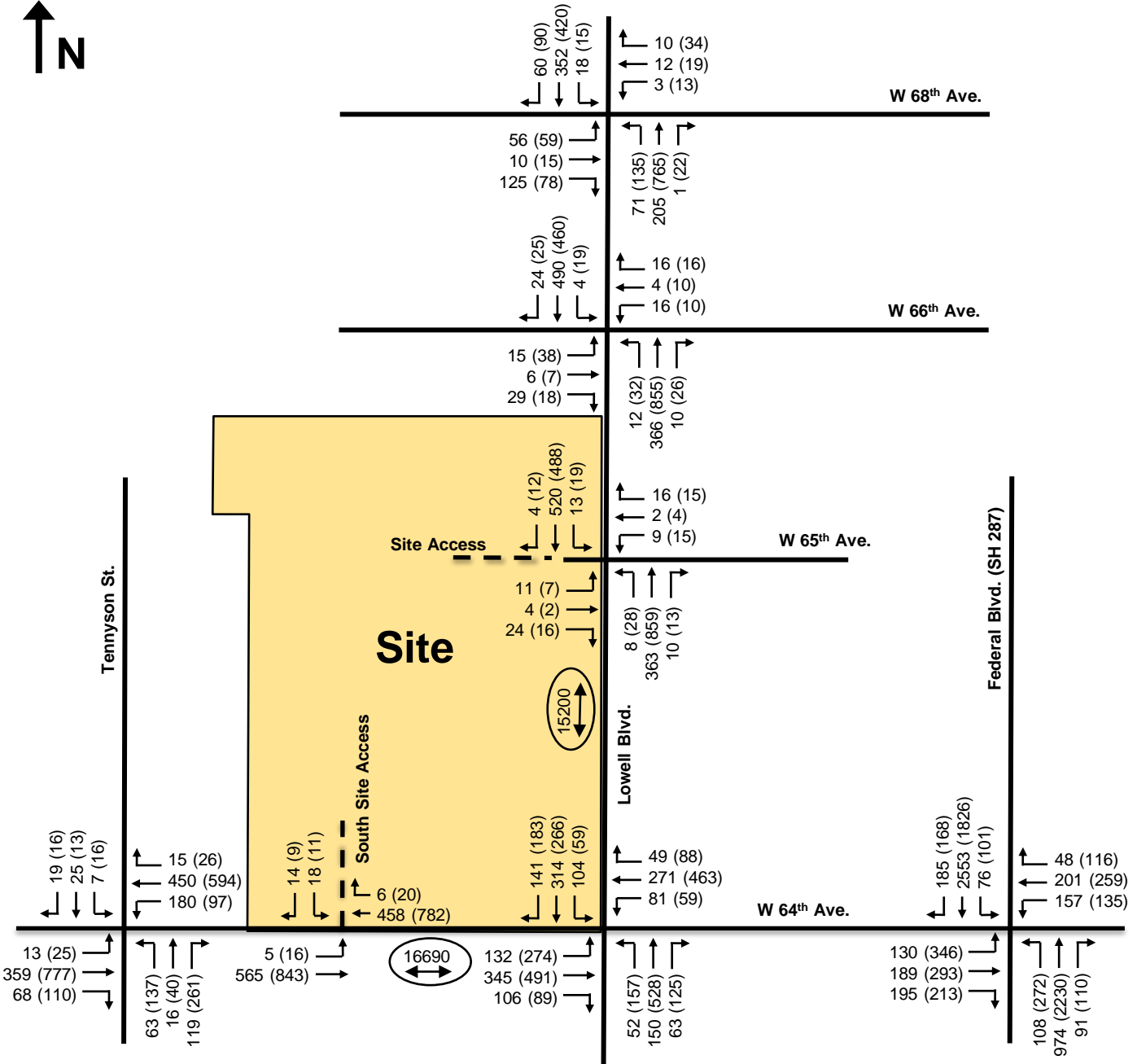
HKS HARRIS KOCHER SMITH
DENVER • DALLAS/FORT WORTH

6501 Lowell Blvd

The True Life Companies

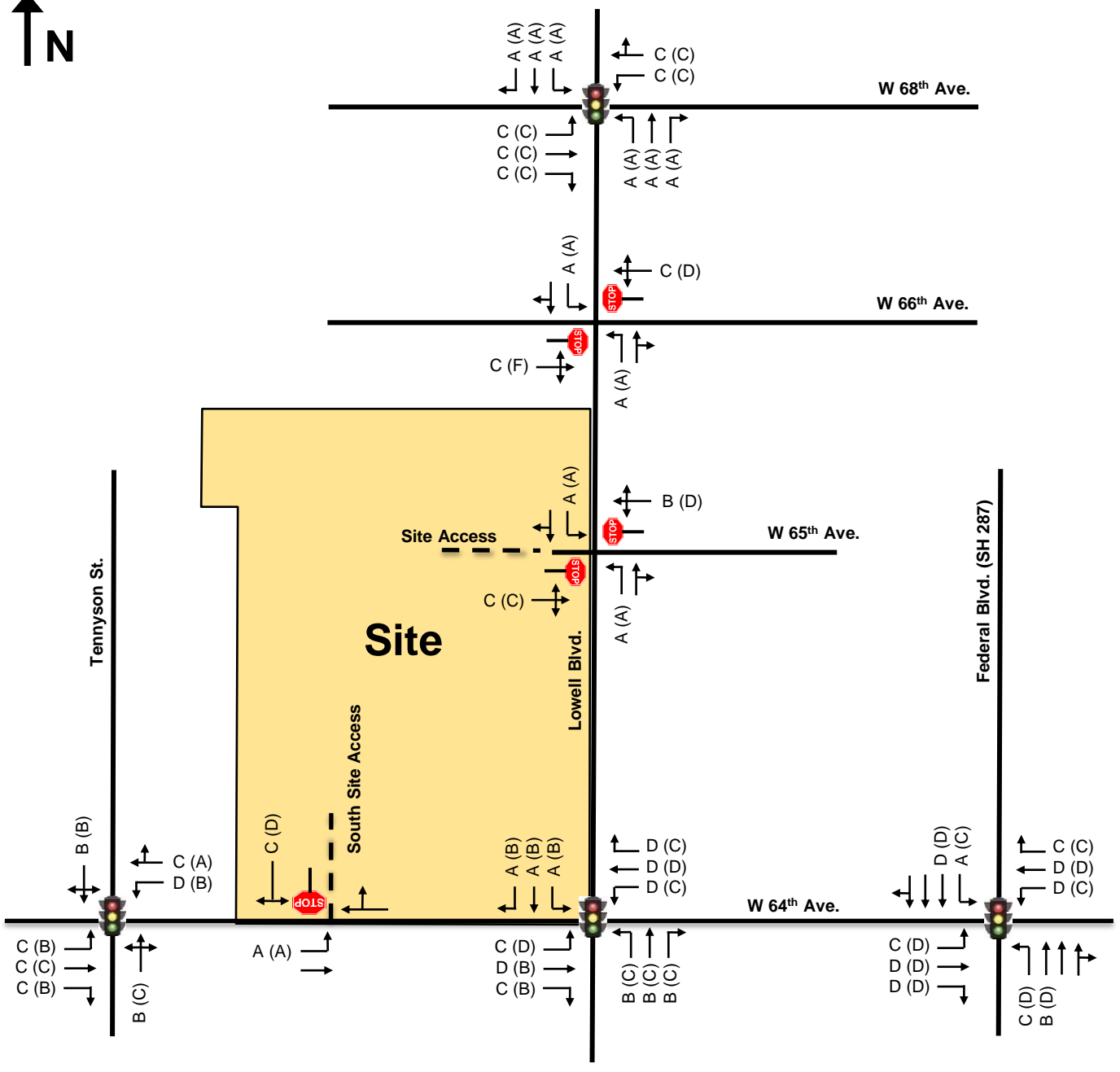
HKS #200917

Figure 11



**2040 Total Traffic Volumes
(Background + Site Generated)**

Figure 12



Legend: Drawing Not To Scale

	A (B)	Weekday AM (PM)
	B (C)	Peak Hour
	D (D)	Level of Service

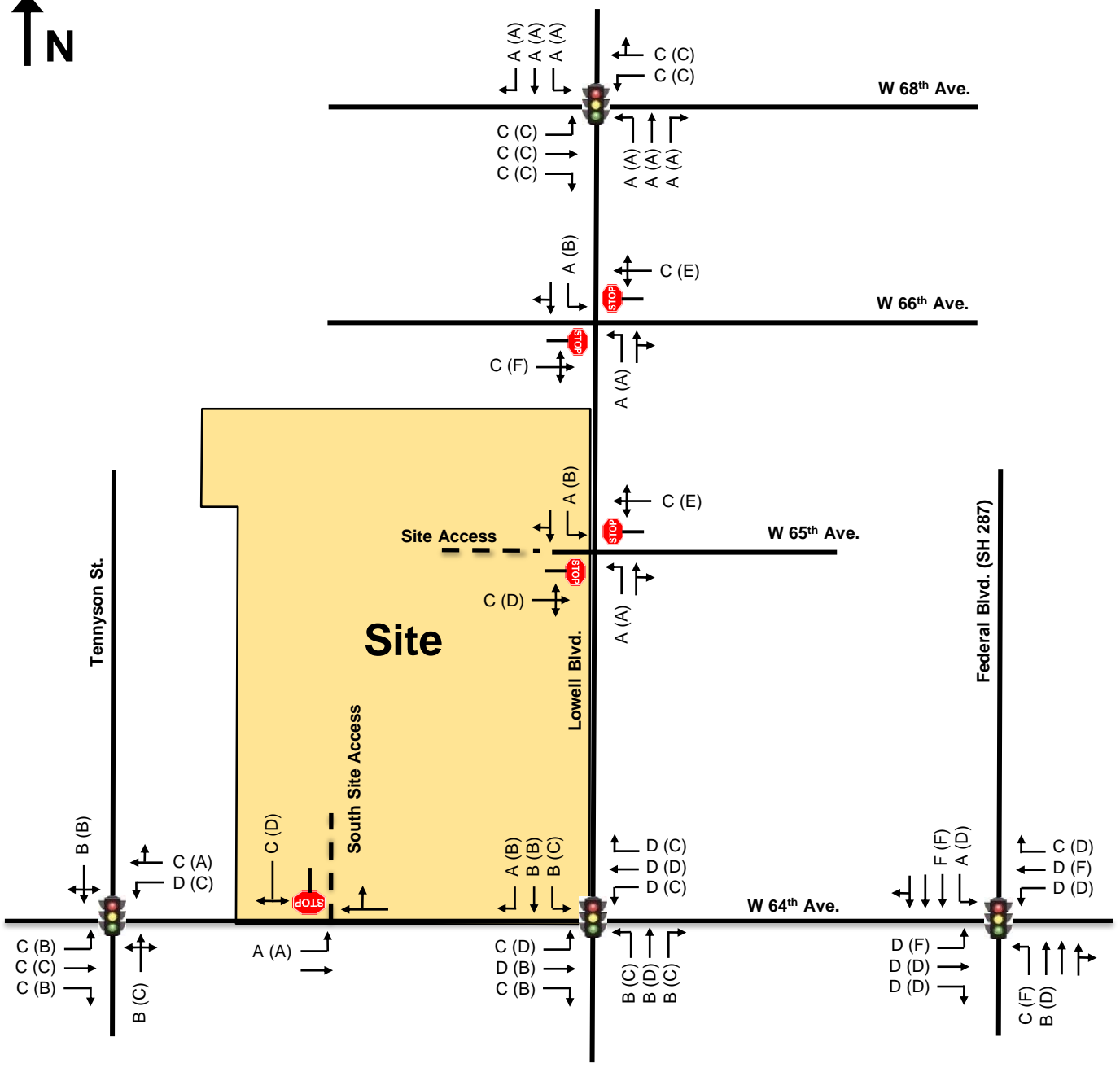
- - - - - Proposed Roadway



6501 Lowell Blvd
 The True Life Companies
 HKS #200917

2028 Total Traffic Operational Conditions

Figure 13



Legend: Drawing Not To Scale

	A (B)	Weekday AM (PM)
	B (C)	Peak Hour
	D (D)	Level of Service

- - - - - Proposed Roadway

APPENDIX “A”

**2021 EXISTING
TRAFFIC VOLUME COUNTS**

All Traffic Data Services
www.alltrafficdata.net

Date Start: 04-Mar-21
Site Code: 4
Station ID: 4
LOWELL BLVD N.O. 64TH AVE

Start Time	04-Mar-21 Thu	NB	SB	Total						
12:00 AM		63	33	96						
01:00		26	25	51						
02:00		24	16	40						
03:00		8	10	18						
04:00		13	17	30						
05:00		23	28	51						
06:00		63	108	171						
07:00		118	277	395						
08:00		266	428	694						
09:00		295	377	672						
10:00		244	245	489						
11:00		212	239	451						
12:00 PM		243	270	513						
01:00		301	279	580						
02:00		346	258	604						
03:00		434	292	726						
04:00		516	327	843						
05:00		590	335	925						
06:00		726	328	1054						
07:00		386	255	641						
08:00		224	171	395						
09:00		159	87	246						
10:00		111	73	184						
11:00		76	59	135						
Total		5467	4537	10004						
Percent		54.6%	45.4%							
AM Peak	-	09:00	08:00	-	-	-	-	-	-	08:00
Vol.	-	295	428	-	-	-	-	-	-	694
PM Peak	-	18:00	17:00	-	-	-	-	-	-	18:00
Vol.	-	726	335	-	-	-	-	-	-	1054
Grand Total		5467	4537							10004
Percent		54.6%	45.4%							
ADT		ADT 10,004	AADT 10,004							

All Traffic Data Services
www.alltrafficdata.net

Date Start: 04-Mar-21
Site Code: 5
Station ID: 5
64TH AVE W.O. LOWELL BLVD

Start Time	04-Mar-21 Thu	EB	WB							Total
12:00 AM		20	24							44
01:00		13	20							33
02:00		13	8							21
03:00		19	18							37
04:00		37	22							59
05:00		79	94							173
06:00		228	134							362
07:00		347	266							613
08:00		354	286							640
09:00		269	216							485
10:00		266	268							534
11:00		328	324							652
12:00 PM		371	370							741
01:00		380	342							722
02:00		448	416							864
03:00		519	468							987
04:00		538	466							1004
05:00		534	516							1050
06:00		366	353							719
07:00		239	233							472
08:00		181	163							344
09:00		128	121							249
10:00		93	90							183
11:00		55	40							95
Total		5825	5258							11083
Percent		52.6%	47.4%							
AM Peak	-	08:00	11:00	-	-	-	-	-	-	11:00
Vol.	-	354	324	-	-	-	-	-	-	652
PM Peak	-	16:00	17:00	-	-	-	-	-	-	17:00
Vol.	-	538	516	-	-	-	-	-	-	1050
Grand Total		5825	5258							11083
Percent		52.6%	47.4%							
ADT		ADT 11,083	AADT 11,083							



(303) 216-2439
www.alltrafficdata.net

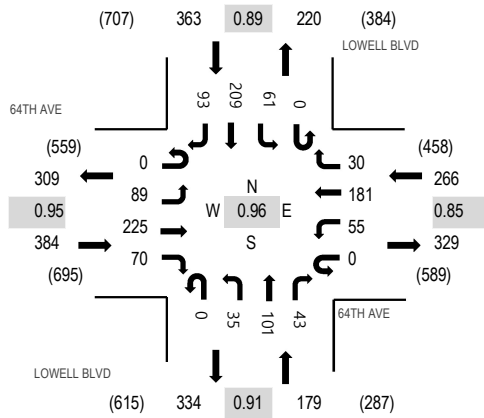
Location: 1 LOWELL BLVD & 64TH AVE AM

Date: Thursday, March 4, 2021

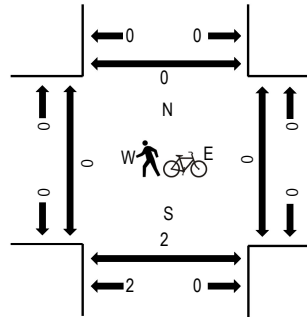
Peak Hour: 07:30 AM - 08:30 AM

Peak 15-Minutes: 07:45 AM - 08:00 AM

Peak Hour - All Vehicles



Peak Hour - Pedestrians/Bicycles on Crosswalk



Note: Total study counts contained in parentheses.

Traffic Counts

Interval Start Time	64TH AVE Eastbound				64TH AVE Westbound				LOWELL BLVD Northbound				LOWELL BLVD Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
7:00 AM	0	19	38	14	0	12	21	4	0	4	14	4	0	25	39	17	211	1,073	0	0	0	0
7:15 AM	0	11	46	16	0	8	34	4	0	7	17	5	0	17	55	35	255	1,166	0	0	1	0
7:30 AM	0	16	63	21	0	14	35	6	0	6	22	12	0	19	69	14	297	1,192	0	0	2	0
7:45 AM	0	23	57	18	0	21	47	11	0	13	26	10	0	16	42	26	310	1,171	0	0	0	0
8:00 AM	0	22	58	21	0	8	57	6	0	4	27	11	0	16	52	22	304	1,074	0	0	0	0
8:15 AM	0	28	47	10	0	12	42	7	0	12	26	10	0	10	46	31	281		0	0	0	0
8:30 AM	0	32	47	15	0	8	40	9	0	6	21	2	0	15	48	33	276		0	0	0	0
8:45 AM	0	13	38	22	0	14	33	5	0	5	15	8	0	15	30	15	213		0	0	0	0
Count Total	0	164	394	137	0	97	309	52	0	57	168	62	0	133	381	193	2,147		0	0	3	0
Peak Hour	0	89	225	70	0	55	181	30	0	35	101	43	0	61	209	93	1,192		0	0	2	0



(303) 216-2439
www.alltrafficdata.net

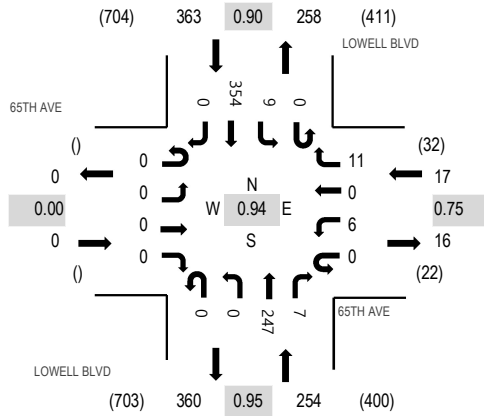
Location: 2 LOWELL BLVD & 65TH AVE AM

Date: Thursday, March 4, 2021

Peak Hour: 07:45 AM - 08:45 AM

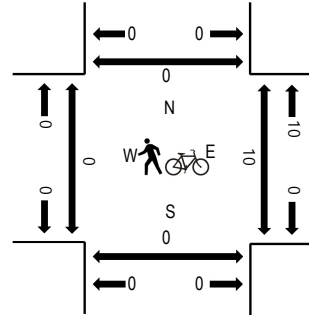
Peak 15-Minutes: 08:30 AM - 08:45 AM

Peak Hour - All Vehicles



Note: Total study counts contained in parentheses.

Peak Hour - Pedestrians/Bicycles on Crosswalk



Traffic Counts

Interval Start Time	65TH AVE Eastbound				65TH AVE Westbound				LOWELL BLVD Northbound				LOWELL BLVD Southbound				Total	Rolling Hour	Pedestrian Crossings				
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North	
7:00 AM	0	0	0	0	0	0	1	0	2	0	0	37	0	0	1	82	0	123	567	0	0	0	0
7:15 AM	0	0	0	0	0	3	0	4	0	0	0	31	0	0	2	99	0	139	593	0	1	0	0
7:30 AM	0	0	0	0	0	1	0	1	0	0	0	44	2	0	1	102	0	151	617	0	0	0	0
7:45 AM	0	0	0	0	0	2	0	3	0	0	0	66	1	0	1	81	0	154	634	0	0	0	0
8:00 AM	0	0	0	0	0	2	0	5	0	0	0	58	0	0	4	80	0	149	569	0	5	0	0
8:15 AM	0	0	0	0	0	1	0	2	0	0	0	61	2	0	2	95	0	163		0	5	0	0
8:30 AM	0	0	0	0	0	1	0	1	0	0	0	62	4	0	2	98	0	168		0	0	0	0
8:45 AM	0	0	0	0	0	2	0	1	0	0	0	32	0	1	0	53	0	89		0	0	0	0
Count Total	0	0	0	0	0	13	0	19	0	0	0	391	9	1	13	690	0	1,136		0	11	0	0
Peak Hour	0	0	0	0	0	6	0	11	0	0	0	247	7	0	9	354	0	634		0	10	0	0



(303) 216-2439
www.alltrafficdata.net

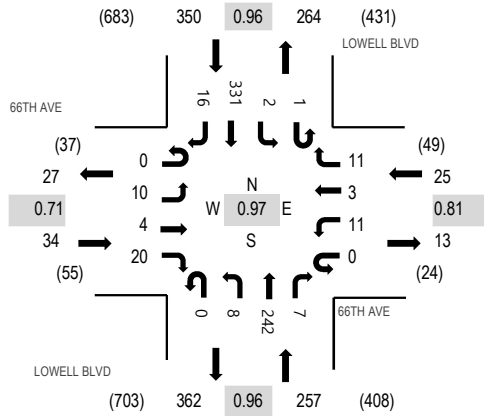
Location: 3 LOWELL BLVD & 66TH AVE AM

Date: Thursday, March 4, 2021

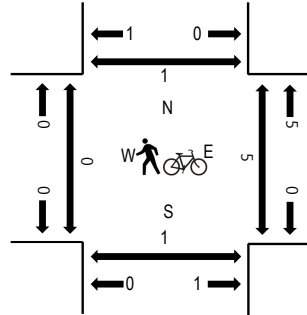
Peak Hour: 07:45 AM - 08:45 AM

Peak 15-Minutes: 08:15 AM - 08:30 AM

Peak Hour - All Vehicles



Peak Hour - Pedestrians/Bicycles on Crosswalk



Note: Total study counts contained in parentheses.

Traffic Counts

Interval Start Time	66TH AVE Eastbound				66TH AVE Westbound				LOWELL BLVD Northbound				LOWELL BLVD Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
7:00 AM	0	1	0	2	0	1	1	4	0	0	36	0	0	4	83	3	135	592	0	0	3	0
7:15 AM	0	0	2	4	0	2	1	2	0	0	34	1	0	0	93	1	140	620	0	1	0	0
7:30 AM	0	3	1	3	0	2	0	6	0	0	43	2	0	0	95	0	155	652	0	0	0	2
7:45 AM	0	2	0	5	0	1	1	3	0	3	60	1	0	0	80	6	162	666	0	0	0	1
8:00 AM	0	2	2	9	0	1	2	3	0	2	63	2	1	1	73	2	163	603	0	0	0	0
8:15 AM	0	5	1	4	0	5	0	2	0	1	59	3	0	0	86	6	172		0	5	1	0
8:30 AM	0	1	1	2	0	4	0	3	0	2	60	1	0	1	92	2	169		0	0	0	0
8:45 AM	0	2	0	3	0	2	0	3	0	2	33	0	0	1	51	2	99		0	0	0	0
Count Total	0	16	7	32	0	18	5	26	0	10	388	10	1	7	653	22	1,195		0	6	4	3
Peak Hour	0	10	4	20	0	11	3	11	0	8	242	7	1	2	331	16	666		0	5	1	1

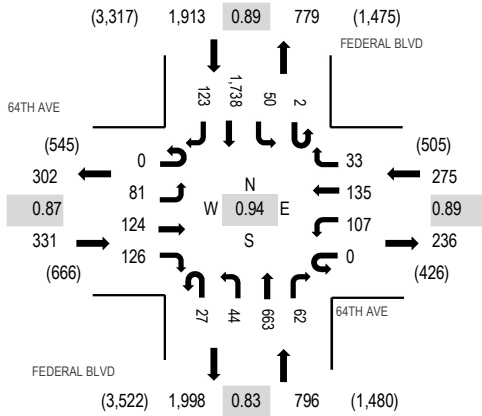
Location: 1 FEDERAL BLVD & 64TH AVE AM

Date: Wednesday, June 2, 2021

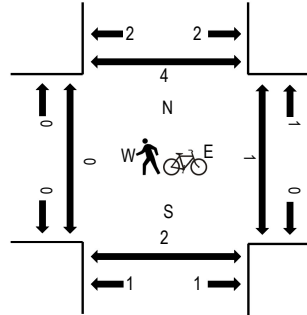
Peak Hour: 07:15 AM - 08:15 AM

Peak 15-Minutes: 07:30 AM - 07:45 AM

Peak Hour - All Vehicles



Peak Hour - Pedestrians/Bicycles on Crosswalk

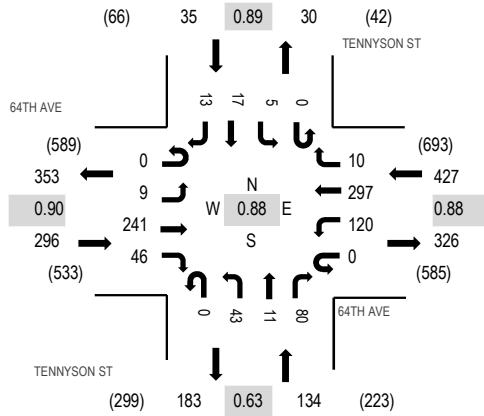


Note: Total study counts contained in parentheses.

Traffic Counts

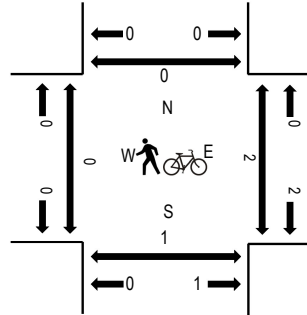
Interval Start Time	64TH AVE Eastbound				64TH AVE Westbound				FEDERAL BLVD Northbound				FEDERAL BLVD Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
7:00 AM	0	20	38	33	0	25	14	9	2	11	102	11	0	9	376	13	663	3,253	0	0	0	0
7:15 AM	0	15	18	25	0	22	24	8	7	14	168	18	1	11	500	14	845	3,315	0	0	0	1
7:30 AM	0	25	32	40	0	29	34	10	9	8	149	6	0	13	487	38	880	3,150	0	0	0	2
7:45 AM	0	21	42	27	0	29	40	8	4	10	201	25	1	13	399	45	865	2,961	0	0	0	0
8:00 AM	0	20	32	34	0	27	37	7	7	12	145	13	0	13	352	26	725	2,715	0	0	1	0
8:15 AM	0	14	19	33	0	18	25	9	4	17	169	7	1	8	332	24	680		1	1	0	1
8:30 AM	1	20	26	40	0	20	40	13	9	15	152	6	2	17	310	20	691		1	0	0	1
8:45 AM	0	27	31	33	0	22	32	3	8	10	151	10	4	8	259	21	619		0	1	2	2
Count Total	1	162	238	265	0	192	246	67	50	97	1,237	96	9	92	3,015	201	5,968		2	2	3	7
Peak Hour	0	81	124	126	0	107	135	33	27	44	663	62	2	50	1,738	123	3,315		0	0	1	3

Peak Hour - All Vehicles



Note: Total study counts contained in parentheses.

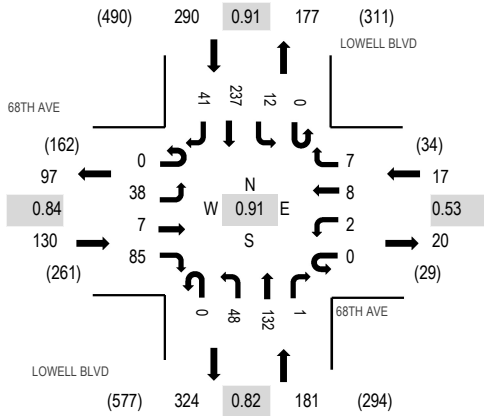
Peak Hour - Pedestrians/Bicycles on Crosswalk



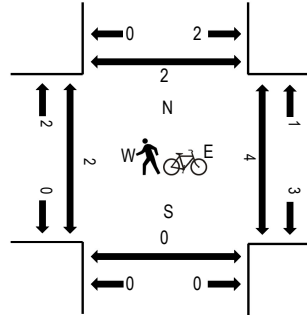
Traffic Counts

Interval Start Time	64TH AVE Eastbound				64TH AVE Westbound				TENNYSON ST Northbound				TENNYSON ST Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
7:00 AM	0	0	47	4	0	21	35	1	0	5	2	15	0	2	0	3	135	698	1	0	0	0
7:15 AM	0	0	48	12	0	11	45	1	0	3	0	9	0	2	3	5	139	771	0	0	0	0
7:30 AM	0	3	51	9	0	28	52	2	0	14	0	18	0	3	3	2	185	824	0	0	0	0
7:45 AM	0	2	62	15	0	39	80	2	0	5	2	22	0	0	6	4	239	892	0	0	1	0
8:00 AM	0	1	62	9	0	27	71	4	0	5	2	16	0	2	6	3	208	817	0	0	0	0
8:15 AM	0	3	49	11	0	24	69	1	0	12	2	15	0	2	0	4	192		0	1	0	0
8:30 AM	0	3	68	11	0	30	77	3	0	21	5	27	0	1	5	2	253		0	0	0	0
8:45 AM	0	1	50	12	0	10	59	1	0	10	1	12	0	2	3	3	164		0	1	0	0
Count Total	0	13	437	83	0	190	488	15	0	75	14	134	0	14	26	26	1,515		1	2	1	0
Peak Hour	0	9	241	46	0	120	297	10	0	43	11	80	0	5	17	13	892		0	1	1	0

Peak Hour - All Vehicles



Peak Hour - Pedestrians/Bicycles on Crosswalk



Note: Total study counts contained in parentheses.

Traffic Counts

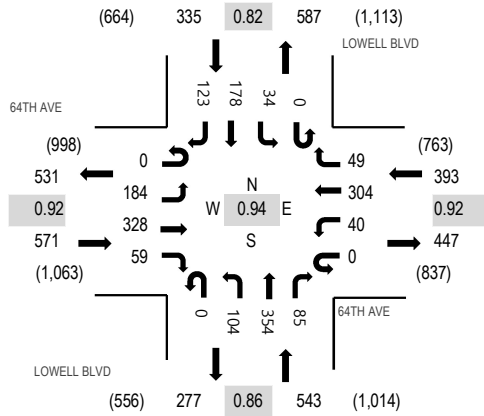
Interval Start Time	68TH AVE Eastbound				68TH AVE Westbound				LOWELL BLVD Northbound				LOWELL BLVD Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
7:00 AM	0	15	0	18	0	0	0	0	0	4	14	0	0	0	30	7	88	461	0	3	0	2
7:15 AM	0	12	3	24	0	0	2	0	0	5	21	0	0	2	36	3	108	506	0	0	0	0
7:30 AM	0	12	1	23	0	2	0	3	0	6	22	0	0	2	48	9	128	550	0	1	0	1
7:45 AM	0	6	0	17	0	2	5	3	0	14	26	1	0	0	53	10	137	586	0	0	0	0
8:00 AM	0	5	0	22	0	1	0	3	0	11	30	0	0	4	45	12	133	618	0	0	0	0
8:15 AM	0	16	2	17	0	0	0	2	0	15	25	1	0	3	57	14	152		1	1	0	1
8:30 AM	0	7	3	31	0	0	2	2	0	12	32	0	0	2	68	5	164		1	0	0	1
8:45 AM	0	10	2	15	0	1	6	0	0	10	45	0	0	3	67	10	169		0	0	0	0
Count Total	0	83	11	167	0	6	15	13	0	77	215	2	0	16	404	70	1,079		2	5	0	5
Peak Hour	0	38	7	85	0	2	8	7	0	48	132	1	0	12	237	41	618		2	1	0	2



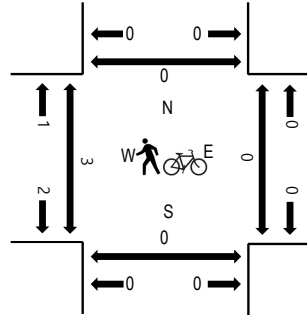
(303) 216-2439
www.alltrafficdata.net

Location: 1 LOWELL BLVD & 64TH AVE PM
Date: Thursday, March 4, 2021
Peak Hour: 04:30 PM - 05:30 PM
Peak 15-Minutes: 05:00 PM - 05:15 PM

Peak Hour - All Vehicles



Peak Hour - Pedestrians/Bicycles on Crosswalk



Note: Total study counts contained in parentheses.

Traffic Counts

Interval Start Time	64TH AVE Eastbound				64TH AVE Westbound				LOWELL BLVD Northbound				LOWELL BLVD Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
4:00 PM	0	40	85	15	0	8	71	13	0	24	57	19	0	15	58	33	438	1,704	0	0	0	0
4:15 PM	0	29	71	9	0	8	62	13	0	20	79	17	0	9	47	31	395	1,755	0	0	0	0
4:30 PM	0	54	91	8	0	8	73	13	0	20	78	22	0	8	38	23	436	1,842	0	0	0	0
4:45 PM	0	40	68	25	0	11	75	9	0	24	76	21	0	7	46	33	435	1,807	0	0	0	0
5:00 PM	0	41	75	13	0	12	81	15	0	30	110	22	0	10	50	30	489	1,800	1	0	0	0
5:15 PM	0	49	94	13	0	9	75	12	0	30	90	20	0	9	44	37	482		1	0	0	0
5:30 PM	0	46	58	14	0	14	59	13	0	23	93	16	0	10	33	22	401		0	0	0	0
5:45 PM	0	45	64	16	0	22	72	15	0	23	83	17	0	9	35	27	428		0	0	0	1
Count Total	0	344	606	113	0	92	568	103	0	194	666	154	0	77	351	236	3,504		2	0	0	1
Peak Hour	0	184	328	59	0	40	304	49	0	104	354	85	0	34	178	123	1,842		2	0	0	0



(303) 216-2439
www.alltrafficdata.net

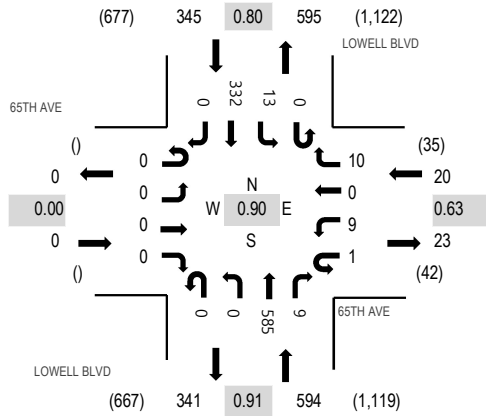
Location: 2 LOWELL BLVD & 65TH AVE PM

Date: Thursday, March 4, 2021

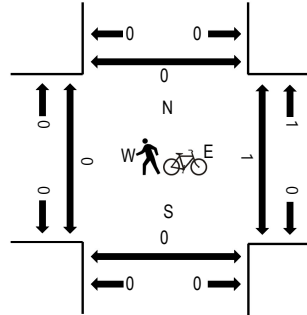
Peak Hour: 04:30 PM - 05:30 PM

Peak 15-Minutes: 05:00 PM - 05:15 PM

Peak Hour - All Vehicles



Peak Hour - Pedestrians/Bicycles on Crosswalk



Note: Total study counts contained in parentheses.

Traffic Counts

Interval Start Time	65TH AVE Eastbound				65TH AVE Westbound				LOWELL BLVD Northbound				LOWELL BLVD Southbound				Total	Rolling Hour	Pedestrian Crossings				
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North	
4:00 PM	0	0	0	0	0	0	0	0	4	0	0	110	3	0	3	108	0	228	873	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	1	0	0	117	2	0	1	86	0	207	911	0	0	0	0
4:30 PM	0	0	0	0	0	1	0	3	0	0	0	149	0	0	3	80	0	236	959	0	0	0	0
4:45 PM	0	0	0	0	0	5	0	2	0	0	0	121	2	0	1	71	0	202	948	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	1	0	0	0	165	4	0	3	93	0	266	958	0	0	0	0
5:15 PM	0	0	0	0	1	3	0	4	0	0	0	150	3	0	6	88	0	255		0	1	0	0
5:30 PM	0	0	0	0	0	1	0	3	1	0	0	148	1	0	6	65	0	225		0	0	0	0
5:45 PM	0	0	0	0	0	3	0	3	0	0	0	141	2	0	1	62	0	212		0	0	0	0
Count Total	0	0	0	0	1	13	0	21	1	0	0	1,101	17	0	24	653	0	1,831		0	1	0	0
Peak Hour	0	0	0	0	1	9	0	10	0	0	0	585	9	0	13	332	0	959		0	1	0	0



(303) 216-2439
www.alltrafficdata.net

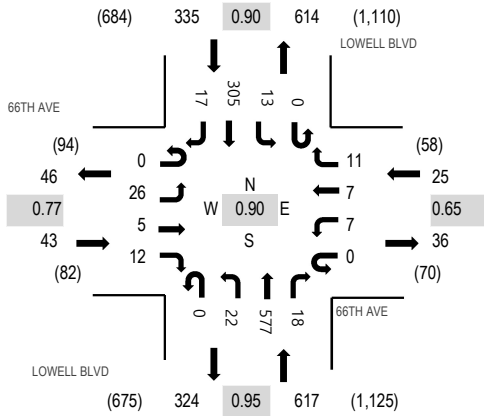
Location: 3 LOWELL BLVD & 66TH AVE PM

Date: Thursday, March 4, 2021

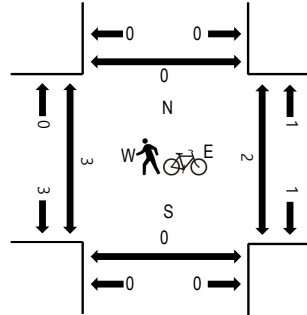
Peak Hour: 05:00 PM - 06:00 PM

Peak 15-Minutes: 05:00 PM - 05:15 PM

Peak Hour - All Vehicles



Peak Hour - Pedestrians/Bicycles on Crosswalk



Note: Total study counts contained in parentheses.

Traffic Counts

Interval Start Time	66TH AVE Eastbound			66TH AVE Westbound			LOWELL BLVD Northbound			LOWELL BLVD Southbound			Total	Rolling Hour	Pedestrian Crossings							
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North				
4:00 PM	0	2	0	9	0	3	2	1	0	5	101	9	0	2	98	6	238	929	0	0	0	0
4:15 PM	0	5	1	7	0	5	3	5	0	4	109	4	0	0	76	9	228	974	0	1	1	2
4:30 PM	0	6	1	2	0	3	0	4	0	6	140	5	0	5	76	4	252	1,019	0	0	0	0
4:45 PM	0	3	1	2	0	4	1	2	0	3	118	4	0	2	66	5	211	998	0	1	0	0
5:00 PM	0	9	2	3	0	1	2	4	0	9	150	4	0	3	92	4	283	1,020	1	0	0	0
5:15 PM	0	5	1	5	0	3	3	0	0	6	152	0	0	6	88	4	273		2	1	0	0
5:30 PM	0	4	2	3	0	0	1	4	0	3	135	6	0	4	66	3	231		0	0	0	0
5:45 PM	0	8	0	1	0	3	1	3	0	4	140	8	0	0	59	6	233		0	1	0	0
Count Total	0	42	8	32	0	22	13	23	0	40	1,045	40	0	22	621	41	1,949		3	4	1	2
Peak Hour	0	26	5	12	0	7	7	11	0	22	577	18	0	13	305	17	1,020		3	2	0	0

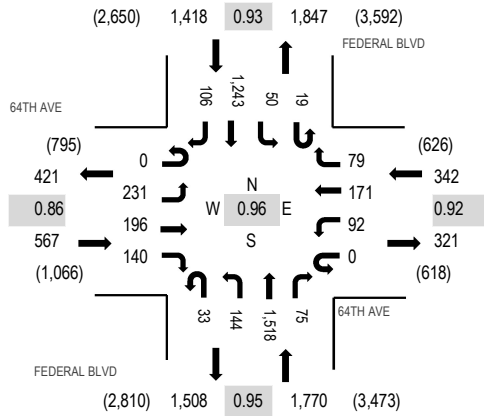
Location: 1 FEDERAL BLVD & 64TH AVE PM

Date: Wednesday, June 2, 2021

Peak Hour: 04:30 PM - 05:30 PM

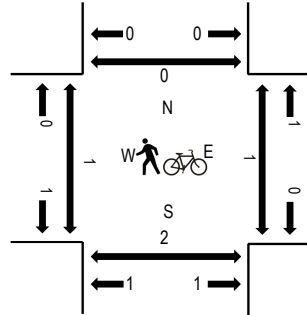
Peak 15-Minutes: 05:00 PM - 05:15 PM

Peak Hour - All Vehicles



Note: Total study counts contained in parentheses.

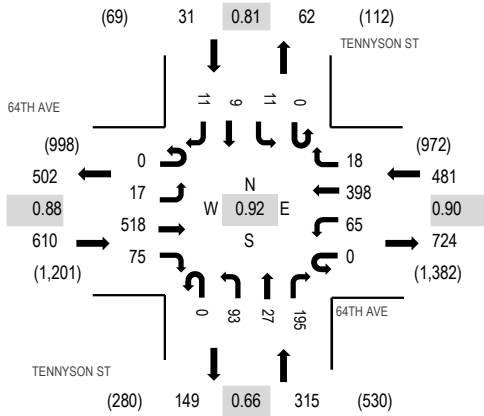
Peak Hour - Pedestrians/Bicycles on Crosswalk



Traffic Counts

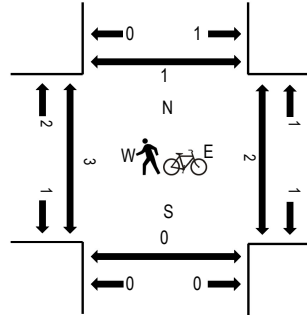
Interval Start Time	64TH AVE Eastbound				64TH AVE Westbound				FEDERAL BLVD Northbound				FEDERAL BLVD Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
4:00 PM	0	44	46	39	0	20	34	17	3	24	359	26	3	15	288	30	948	3,939	3	0	0	0
4:15 PM	0	51	42	38	0	25	43	20	7	33	350	19	5	12	256	41	942	4,062	0	0	0	0
4:30 PM	0	62	43	37	0	22	35	21	1	34	365	25	2	10	331	24	1,012	4,097	0	0	0	0
4:45 PM	0	66	65	35	0	26	46	21	12	33	381	17	6	12	298	19	1,037	4,031	0	0	2	0
5:00 PM	0	51	46	33	0	21	43	18	12	37	408	22	6	11	326	37	1,071	3,876	0	0	0	0
5:15 PM	0	52	42	35	0	23	47	19	8	40	364	11	5	17	288	26	977		0	0	0	0
5:30 PM	0	36	33	31	0	24	29	9	5	30	433	15	4	14	257	26	946		0	0	0	0
5:45 PM	0	53	48	38	0	15	38	10	5	28	349	17	2	10	251	18	882		0	2	0	0
Count Total	0	415	365	286	0	176	315	135	53	259	3,009	152	33	101	2,295	221	7,815		3	2	2	0
Peak Hour	0	231	196	140	0	92	171	79	33	144	1,518	75	19	50	1,243	106	4,097		0	0	2	0

Peak Hour - All Vehicles



Note: Total study counts contained in parentheses.

Peak Hour - Pedestrians/Bicycles on Crosswalk



Traffic Counts

Interval Start Time	64TH AVE Eastbound				64TH AVE Westbound				TENNYSON ST Northbound				TENNYSON ST Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
4:00 PM	0	3	129	25	0	17	96	2	0	20	7	42	0	4	1	4	350	1,437	2	0	0	0
4:15 PM	0	7	108	20	0	19	115	6	0	19	2	44	0	1	5	2	348	1,427	1	1	0	1
4:30 PM	0	3	126	16	0	14	104	3	0	35	7	78	0	2	2	2	392	1,436	0	0	0	0
4:45 PM	0	4	155	14	0	15	83	7	0	19	11	31	0	4	1	3	347	1,356	0	0	0	0
5:00 PM	0	5	111	14	0	16	118	2	0	16	6	43	0	2	3	4	340	1,335	0	0	0	1
5:15 PM	0	2	135	18	0	12	121	3	0	15	2	39	0	5	1	4	357		0	0	0	0
5:30 PM	0	7	117	16	0	11	93	4	0	12	5	35	0	0	7	5	312		0	1	1	0
5:45 PM	0	7	146	13	0	16	90	5	0	17	2	23	0	2	4	1	326		0	0	0	0
Count Total	0	38	1,027	136	0	120	820	32	0	153	42	335	0	20	24	25	2,772		3	2	1	2
Peak Hour	0	17	518	75	0	65	398	18	0	93	27	195	0	11	9	11	1,437		3	1	0	1

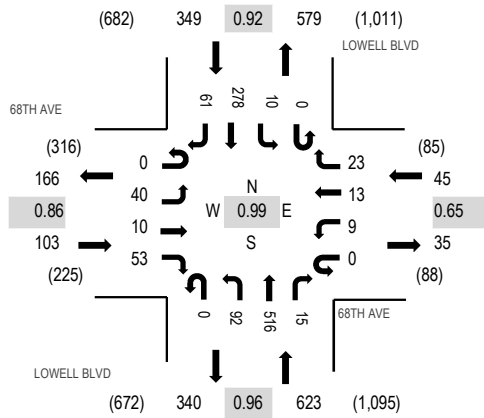
Location: 3 LOWELL BLVD & 68TH AVE PM

Date: Wednesday, June 2, 2021

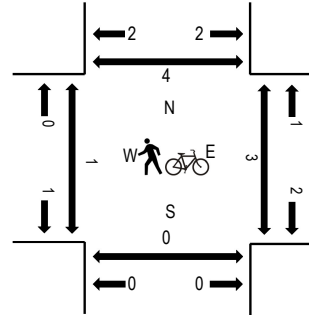
Peak Hour: 05:00 PM - 06:00 PM

Peak 15-Minutes: 05:45 PM - 06:00 PM

Peak Hour - All Vehicles



Peak Hour - Pedestrians/Bicycles on Crosswalk


























Note: Total study counts contained in parentheses.

Traffic Counts

Interval Start Time	68TH AVE Eastbound				68TH AVE Westbound				LOWELL BLVD Northbound				LOWELL BLVD Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
4:00 PM	0	8	3	13	0	1	2	5	0	12	78	6	0	5	66	16	215	967	1	0	0	0
4:15 PM	0	6	0	21	0	1	2	1	0	17	102	5	0	8	61	16	240	1,022	2	2	0	1
4:30 PM	0	7	4	24	0	1	1	1	0	18	97	5	0	7	69	12	246	1,065	0	0	0	3
4:45 PM	0	17	2	17	0	4	7	14	0	36	96	0	0	8	54	11	266	1,102	3	2	1	17
5:00 PM	0	8	1	12	0	1	3	8	0	17	127	7	0	4	70	12	270	1,120	0	0	0	0
5:15 PM	0	14	4	14	0	4	6	6	0	18	131	4	0	3	61	18	283		1	2	0	1
5:30 PM	0	9	0	13	0	4	3	5	0	32	128	3	0	0	70	16	283		0	0	0	0
5:45 PM	0	9	5	14	0	0	1	4	0	25	130	1	0	3	77	15	284		0	1	0	0
Count Total	0	78	19	128	0	16	25	44	0	175	889	31	0	38	528	116	2,087		7	7	1	22
Peak Hour	0	40	10	53	0	9	13	23	0	92	516	15	0	10	278	61	1,120		1	3	0	1

APPENDIX “B”

**INTERSECTION
CAPACITY ANALYSIS
WORKSHEETS**

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		150	150		0	225		250	150		150
Storage Lanes	1		1	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850		0.929				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1730	0	1770	1863	1583	1770	1863	1583
Flt Permitted	0.744			0.751			0.570			0.647		
Satd. Flow (perm)	1386	1863	1583	1399	1730	0	1062	1863	1583	1205	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			112		10				27			54
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		594			990			699			502	
Travel Time (s)		13.5			22.5			15.9			11.4	

Intersection Summary

Area Type: Other

Timings
1: Lowell Blvd. & W. 68th Ave.

6501 Lowell Blvd
06/07/2021



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↘	↖	↗	↖	↗	↘	↖	↗	↘
Traffic Volume (vph)	46	9	103	2	10	58	161	1	15	288	50
Future Volume (vph)	46	9	103	2	10	58	161	1	15	288	50
Turn Type	Perm	NA	Perm	Perm	NA	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8		2			6	
Permitted Phases	4		4	8		2		2	6		6
Detector Phase	4	4	4	8	8	2	2	2	6	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	26.0	26.0	26.0	26.0	26.0	34.0	34.0	34.0	34.0	34.0	34.0
Total Split (%)	43.3%	43.3%	43.3%	43.3%	43.3%	56.7%	56.7%	56.7%	56.7%	56.7%	56.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag											
Lead-Lag Optimize?											
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	7.7	7.7	7.7	7.7	7.7	46.2	46.2	46.2	46.2	46.2	46.2
Actuated g/C Ratio	0.13	0.13	0.13	0.13	0.13	0.77	0.77	0.77	0.77	0.77	0.77
v/c Ratio	0.28	0.04	0.37	0.01	0.09	0.08	0.12	0.00	0.02	0.22	0.04
Control Delay	26.9	21.9	9.4	21.5	17.1	3.2	3.1	0.0	3.0	3.4	1.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.9	21.9	9.4	21.5	17.1	3.2	3.1	0.0	3.0	3.4	1.2
LOS	C	C	A	C	B	A	A	A	A	A	A
Approach Delay		15.2			17.5		3.1			3.1	
Approach LOS		B			B		A			A	

Intersection Summary

Cycle Length: 60
 Actuated Cycle Length: 60
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 45
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.37
 Intersection Signal Delay: 6.0
 Intersection Capacity Utilization 39.8%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service A

Splits and Phases: 1: Lowell Blvd. & W. 68th Ave.



Queues

6501 Lowell Blvd

1: Lowell Blvd. & W. 68th Ave.

06/07/2021


























Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	50	10	112	2	21	63	175	1	16	313	54
v/c Ratio	0.28	0.04	0.37	0.01	0.09	0.08	0.12	0.00	0.02	0.22	0.04
Control Delay	26.9	21.9	9.4	21.5	17.1	3.2	3.1	0.0	3.0	3.4	1.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.9	21.9	9.4	21.5	17.1	3.2	3.1	0.0	3.0	3.4	1.2
Queue Length 50th (ft)	17	3	0	1	4	5	14	0	1	28	0
Queue Length 95th (ft)	42	14	36	6	19	16	35	0	6	61	8
Internal Link Dist (ft)		514			910		619			422	
Turn Bay Length (ft)	150		150	150		225		250	150		150
Base Capacity (vph)	496	667	639	501	626	817	1433	1224	927	1433	1231
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.01	0.18	0.00	0.03	0.08	0.12	0.00	0.02	0.22	0.04

Intersection Summary

HCM 6th Signalized Intersection Summary
 1: Lowell Blvd. & W. 68th Ave.

6501 Lowell Blvd
 06/07/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	46	9	103	2	10	9	58	161	1	15	288	50
Future Volume (veh/h)	46	9	103	2	10	9	58	161	1	15	288	50
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	50	10	112	2	11	10	63	175	1	16	313	54
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	250	195	166	247	94	86	825	1394	1182	989	1394	1182
Arrive On Green	0.10	0.10	0.10	0.10	0.10	0.10	0.75	0.75	0.75	0.75	0.75	0.75
Sat Flow, veh/h	1391	1870	1585	1269	902	820	1015	1870	1585	1209	1870	1585
Grp Volume(v), veh/h	50	10	112	2	0	21	63	175	1	16	313	54
Grp Sat Flow(s),veh/h/ln	1391	1870	1585	1269	0	1723	1015	1870	1585	1209	1870	1585
Q Serve(g_s), s	2.0	0.3	4.1	0.1	0.0	0.7	1.2	1.6	0.0	0.2	3.1	0.5
Cycle Q Clear(g_c), s	2.7	0.3	4.1	0.4	0.0	0.7	4.3	1.6	0.0	1.8	3.1	0.5
Prop In Lane	1.00		1.00	1.00		0.48	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	250	195	166	247	0	180	825	1394	1182	989	1394	1182
V/C Ratio(X)	0.20	0.05	0.68	0.01	0.00	0.12	0.08	0.13	0.00	0.02	0.22	0.05
Avail Cap(c_a), veh/h	603	670	568	569	0	617	825	1394	1182	989	1394	1182
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.6	24.2	25.9	24.4	0.0	24.4	3.0	2.1	1.9	2.4	2.3	2.0
Incr Delay (d2), s/veh	0.4	0.1	4.8	0.0	0.0	0.3	0.2	0.2	0.0	0.0	0.4	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.2	0.2	3.0	0.0	0.0	0.5	0.3	0.6	0.0	0.1	1.2	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.0	24.3	30.6	24.4	0.0	24.6	3.2	2.3	1.9	2.4	2.7	2.1
LnGrp LOS	C	C	C	C	A	C	A	A	A	A	A	A
Approach Vol, veh/h		172			23			239			383	
Approach Delay, s/veh		28.9			24.6			2.5			2.6	
Approach LOS		C			C			A			A	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		49.2		10.8		49.2		10.8				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		29.5		21.5		29.5		21.5				
Max Q Clear Time (g_c+I1), s		6.3		6.1		5.1		2.7				
Green Ext Time (p_c), s		1.2		0.4		2.1		0.0				
Intersection Summary												
HCM 6th Ctrl Delay			8.7									
HCM 6th LOS			A									



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↖		↗	↖	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	100		0	100		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.920			0.941			0.995				0.993
Flt Protected		0.985			0.979		0.950			0.950		
Satd. Flow (prot)	0	1688	0	0	1716	0	1770	1853	0	1770	1850	0
Flt Permitted		0.985			0.979		0.950			0.950		
Satd. Flow (perm)	0	1688	0	0	1716	0	1770	1853	0	1770	1850	0
Link Speed (mph)		30			30			30				30
Link Distance (ft)		458			470			732				699
Travel Time (s)		10.4			10.7			16.6				15.9

Intersection Summary

Area Type: Other

Intersection												
Int Delay, s/veh	1.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	12	5	24	13	4	13	10	294	9	4	402	19
Future Vol, veh/h	12	5	24	13	4	13	10	294	9	4	402	19
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	13	5	26	14	4	14	11	320	10	4	437	21

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	812	808	448	818	813	325	458	0	0	330	0	0
Stage 1	456	456	-	347	347	-	-	-	-	-	-	-
Stage 2	356	352	-	471	466	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	298	315	611	295	313	716	1103	-	-	1229	-	-
Stage 1	584	568	-	669	635	-	-	-	-	-	-	-
Stage 2	661	632	-	573	562	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	286	311	611	276	309	716	1103	-	-	1229	-	-
Mov Cap-2 Maneuver	286	311	-	276	309	-	-	-	-	-	-	-
Stage 1	578	566	-	662	629	-	-	-	-	-	-	-
Stage 2	637	626	-	542	560	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	14.6		15.2		0.3		0.1	
HCM LOS	B		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1103	-	-	421	384	1229	-
HCM Lane V/C Ratio	0.01	-	-	0.106	0.085	0.004	-
HCM Control Delay (s)	8.3	-	-	14.6	15.2	7.9	-
HCM Lane LOS	A	-	-	B	C	A	-
HCM 95th %tile Q(veh)	0	-	-	0.4	0.3	0	-



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↘		↗	↘	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	100		0	100		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt					0.914			0.996				
Flt Protected					0.982					0.950		
Satd. Flow (prot)	0	1863	0	0	1672	0	1863	1855	0	1770	1863	0
Flt Permitted					0.982					0.950		
Satd. Flow (perm)	0	1863	0	0	1672	0	1863	1855	0	1770	1863	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		319			430			608			732	
Travel Time (s)		7.3			9.8			13.8			16.6	

Intersection Summary

Area Type: Other

Intersection												
Int Delay, s/veh	0.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↖	↗		↖	↗	
Traffic Vol, veh/h	0	0	0	7	0	13	0	300	9	11	430	0
Future Vol, veh/h	0	0	0	7	0	13	0	300	9	11	430	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	8	0	14	0	326	10	12	467	0

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	829	827	467	822	822	331	467	0	0	336	0	0
Stage 1	491	491	-	331	331	-	-	-	-	-	-	-
Stage 2	338	336	-	491	491	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	290	307	596	293	309	711	1094	-	-	1223	-	-
Stage 1	559	548	-	682	645	-	-	-	-	-	-	-
Stage 2	676	642	-	559	548	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	282	304	596	291	306	711	1094	-	-	1223	-	-
Mov Cap-2 Maneuver	282	304	-	291	306	-	-	-	-	-	-	-
Stage 1	559	543	-	682	645	-	-	-	-	-	-	-
Stage 2	663	642	-	554	543	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	0		13		0		0.2	
HCM LOS	A		B					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1094	-	-	-	472	1223	-
HCM Lane V/C Ratio	-	-	-	-	0.046	0.01	-
HCM Control Delay (s)	0	-	-	0	13	8	-
HCM Lane LOS	A	-	-	A	B	A	-
HCM 95th %tile Q(veh)	0	-	-	-	0.1	0	-

Lanes and Geometrics
4: Tennyson St. & W 64th Ave.

6501 Lowell Blvd
06/07/2021



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%				0%
Storage Length (ft)	150		100	150		0	0		0	0		0
Storage Lanes	1		1	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850		0.995			0.919				0.951
Flt Protected	0.950			0.950				0.984				0.993
Satd. Flow (prot)	1770	1863	1583	1770	1853	0	0	1684	0	0	1759	0
Flt Permitted	0.258			0.379				0.906				0.970
Satd. Flow (perm)	481	1863	1583	706	1853	0	0	1551	0	0	1718	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			61		3			91				17
Link Speed (mph)		30			30			30				30
Link Distance (ft)		700			1434			502				485
Travel Time (s)		15.9			32.6			11.4				11.0

Intersection Summary

Area Type: Other



Lane Group	EBL	EBT	EBR	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	12	318	61	159	405	176	47
v/c Ratio	0.08	0.57	0.12	0.75	0.72	0.18	0.05
Control Delay	19.9	29.4	5.4	59.4	45.5	5.9	7.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.9	29.4	5.4	59.4	45.5	5.9	7.6
Queue Length 50th (ft)	5	152	0	91	228	19	6
Queue Length 95th (ft)	15	196	23	156	314	61	26
Internal Link Dist (ft)		620			1354	422	405
Turn Bay Length (ft)	150		100	150			
Base Capacity (vph)	264	1024	898	388	1020	965	1035
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.31	0.07	0.41	0.40	0.18	0.05
Intersection Summary							

HCM 6th Signalized Intersection Summary
 4: Tennyson St. & W 64th Ave.

6501 Lowell Blvd
 06/07/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	11	293	56	146	361	12	52	13	97	6	21	16
Future Volume (veh/h)	11	293	56	146	361	12	52	13	97	6	21	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	12	318	61	159	392	13	57	14	105	7	23	17
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	227	646	548	292	622	21	304	93	509	151	486	335
Arrive On Green	0.35	0.35	0.35	0.23	0.23	0.23	0.55	0.55	0.55	0.55	0.55	0.55
Sat Flow, veh/h	980	1870	1585	1004	1800	60	453	168	918	190	877	605
Grp Volume(v), veh/h	12	318	61	159	0	405	176	0	0	47	0	0
Grp Sat Flow(s),veh/h/ln	980	1870	1585	1004	0	1860	1539	0	0	1672	0	0
Q Serve(g_s), s	0.9	12.1	2.4	13.7	0.0	17.6	0.5	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	18.6	12.1	2.4	25.8	0.0	17.6	4.7	0.0	0.0	1.1	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.03	0.32		0.60	0.15		0.36
Lane Grp Cap(c), veh/h	227	646	548	292	0	642	906	0	0	973	0	0
V/C Ratio(X)	0.05	0.49	0.11	0.54	0.00	0.63	0.19	0.00	0.00	0.05	0.00	0.00
Avail Cap(c_a), veh/h	427	1029	872	498	0	1023	906	0	0	973	0	0
HCM Platoon Ratio	1.00	1.00	1.00	0.67	0.67	0.67	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	0.90	0.00	0.90	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	33.0	23.2	20.1	38.3	0.0	29.4	10.0	0.0	0.0	9.2	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.6	0.1	1.4	0.0	0.9	0.5	0.0	0.0	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.4	9.0	1.6	6.5	0.0	12.9	3.1	0.0	0.0	0.8	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.1	23.8	20.1	39.7	0.0	30.3	10.4	0.0	0.0	9.3	0.0	0.0
LnGrp LOS	C	C	C	D	A	C	B	A	A	A	A	A
Approach Vol, veh/h		391			564			176				47
Approach Delay, s/veh		23.5			33.0			10.4				9.3
Approach LOS		C			C			B				A
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		54.4		35.6		54.4		35.6				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		31.5		49.5		31.5		49.5				
Max Q Clear Time (g_c+I1), s		6.7		20.6		3.1		27.8				
Green Ext Time (p_c), s		1.0		2.3		0.2		3.3				
Intersection Summary												
HCM 6th Ctrl Delay				25.5								
HCM 6th LOS				C								



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	200		150	150		75	200		150	200		100
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.300			0.578			0.590			0.604		
Satd. Flow (perm)	559	1863	1583	1077	1863	1583	1099	1863	1583	1125	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			92			127			127			123
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1434			1268			763			608	
Travel Time (s)		32.6			28.8			17.3			13.8	

Intersection Summary

Area Type: Other

Timings
5: W 64th Ave./W. 64th Ave. & Lowell Blvd.

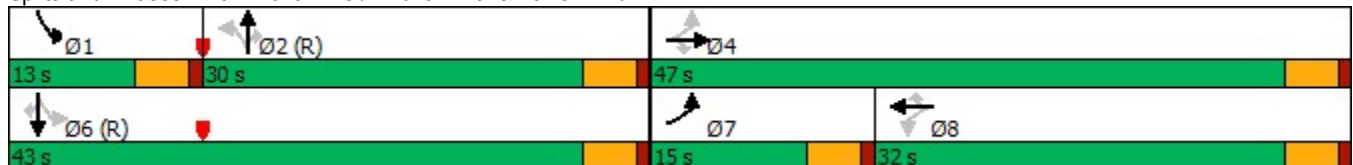
6501 Lowell Blvd
06/07/2021

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	108	274	85	67	220	36	43	123	52	74	254	113
Future Volume (vph)	108	274	85	67	220	36	43	123	52	74	254	113
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4			8			2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	7	4	4	8	8	8	2	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	15.0	47.0	47.0	32.0	32.0	32.0	30.0	30.0	30.0	13.0	43.0	43.0
Total Split (%)	16.7%	52.2%	52.2%	35.6%	35.6%	35.6%	33.3%	33.3%	33.3%	14.4%	47.8%	47.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead			Lag	Lag	Lag	Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes			Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	29.1	29.1	29.1	17.4	17.4	17.4	41.8	41.8	41.8	51.9	51.9	51.9
Actuated g/C Ratio	0.32	0.32	0.32	0.19	0.19	0.19	0.46	0.46	0.46	0.58	0.58	0.58
v/c Ratio	0.38	0.49	0.16	0.35	0.66	0.10	0.09	0.15	0.07	0.11	0.26	0.13
Control Delay	38.0	41.6	19.0	33.5	39.8	2.2	20.0	19.0	0.2	11.6	12.3	2.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.0	41.6	19.0	33.5	39.8	2.2	20.0	19.0	0.2	11.6	12.3	2.9
LOS	D	D	B	C	D	A	C	B	A	B	B	A
Approach Delay		36.7			34.3			14.7			9.7	
Approach LOS		D			C			B			A	

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 65
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.66
 Intersection Signal Delay: 24.6
 Intersection Capacity Utilization 51.1%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service A

Splits and Phases: 5: W 64th Ave./W. 64th Ave. & Lowell Blvd.





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	117	298	92	73	239	39	47	134	57	80	276	123
v/c Ratio	0.38	0.49	0.16	0.35	0.66	0.10	0.09	0.15	0.07	0.11	0.26	0.13
Control Delay	38.0	41.6	19.0	33.5	39.8	2.2	20.0	19.0	0.2	11.6	12.3	2.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.0	41.6	19.0	33.5	39.8	2.2	20.0	19.0	0.2	11.6	12.3	2.9
Queue Length 50th (ft)	64	167	16	37	128	1	16	47	0	20	79	0
Queue Length 95th (ft)	111	242	59	m58	m167	m3	46	101	0	49	149	28
Internal Link Dist (ft)		1354			1188			683			528	
Turn Bay Length (ft)	200		150	150		75	200		150	200		100
Base Capacity (vph)	322	879	796	329	569	571	511	866	803	711	1073	964
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.36	0.34	0.12	0.22	0.42	0.07	0.09	0.15	0.07	0.11	0.26	0.13

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM 6th Signalized Intersection Summary
 5: W 64th Ave./W. 64th Ave. & Lowell Blvd.

6501 Lowell Blvd
 06/07/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↘	↖	↗	↘	↖	↗	↘	↖	↗	↘
Traffic Volume (veh/h)	108	274	85	67	220	36	43	123	52	74	254	113
Future Volume (veh/h)	108	274	85	67	220	36	43	123	52	74	254	113
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	117	298	92	73	239	39	47	134	57	80	276	123
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	251	537	455	214	310	263	588	963	816	735	1146	972
Arrive On Green	0.02	0.09	0.09	0.05	0.05	0.05	0.51	0.51	0.51	0.05	0.61	0.61
Sat Flow, veh/h	1781	1870	1585	994	1870	1585	986	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	117	298	92	73	239	39	47	134	57	80	276	123
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	994	1870	1585	986	1870	1585	1781	1870	1585
Q Serve(g_s), s	4.7	13.7	4.8	6.5	11.4	2.1	2.2	3.4	1.6	1.8	6.0	2.9
Cycle Q Clear(g_c), s	4.7	13.7	4.8	9.2	11.4	2.1	2.2	3.4	1.6	1.8	6.0	2.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	251	537	455	214	310	263	588	963	816	735	1146	972
V/C Ratio(X)	0.47	0.56	0.20	0.34	0.77	0.15	0.08	0.14	0.07	0.11	0.24	0.13
Avail Cap(c_a), veh/h	331	883	748	353	571	484	588	963	816	817	1146	972
HCM Platoon Ratio	0.33	0.33	0.33	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.80	0.80	0.80	0.85	0.85	0.85	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.0	35.2	31.2	41.2	40.9	36.5	11.1	11.4	11.0	8.3	7.9	7.3
Incr Delay (d2), s/veh	1.1	0.7	0.2	0.8	3.5	0.2	0.3	0.3	0.2	0.1	0.5	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	3.8	10.8	3.4	3.1	9.6	1.5	0.9	2.5	1.1	1.1	4.2	1.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	30.0	36.0	31.4	42.0	44.3	36.7	11.4	11.7	11.1	8.3	8.4	7.6
LnGrp LOS	C	D	C	D	D	D	B	B	B	A	A	A
Approach Vol, veh/h		507			351			238			479	
Approach Delay, s/veh		33.8			43.0			11.5			8.2	
Approach LOS		C			D			B			A	
Timer - Assigned Phs	1	2		4		6	7	8				
Phs Duration (G+Y+Rc), s	8.8	50.8		30.3		59.7	10.9	19.4				
Change Period (Y+Rc), s	4.5	4.5		4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s	8.5	25.5		42.5		38.5	10.5	27.5				
Max Q Clear Time (g_c+I1), s	3.8	5.4		15.7		8.0	6.7	13.4				
Green Ext Time (p_c), s	0.1	1.1		2.1		2.1	0.1	1.6				

Intersection Summary

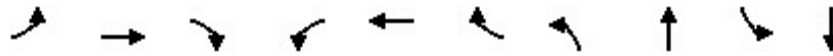
HCM 6th Ctrl Delay	24.7
HCM 6th LOS	C



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	100		150	150		100	600		0	250		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor			0.850			0.850		0.987			0.990	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	5019	0	1770	5034	0
Flt Permitted	0.535			0.474			0.085			0.251		
Satd. Flow (perm)	997	1863	1583	883	1863	1583	158	5019	0	468	5034	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			139			127		23			17	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1268			424			903			562	
Travel Time (s)		28.8			9.6			20.5			12.8	

Intersection Summary

Area Type: Other

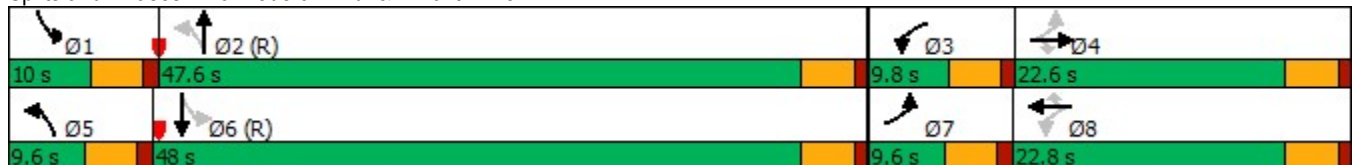


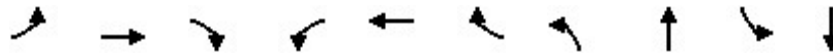
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations	↖	↑	↗	↖	↑	↗	↖	↑↑↑	↖	↑↑↑
Traffic Volume (vph)	98	151	153	130	164	40	86	806	63	2113
Future Volume (vph)	98	151	153	130	164	40	86	806	63	2113
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA
Protected Phases	7	4		3	8		5	2	1	6
Permitted Phases	4		4	8		8	2		6	
Detector Phase	7	4	4	3	8	8	5	2	1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	9.5	22.5
Total Split (s)	9.6	22.6	22.6	9.8	22.8	22.8	9.6	47.6	10.0	48.0
Total Split (%)	10.7%	25.1%	25.1%	10.9%	25.3%	25.3%	10.7%	52.9%	11.1%	53.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)	18.6	13.5	13.5	19.8	15.6	15.6	54.2	49.0	54.0	48.9
Actuated g/C Ratio	0.21	0.15	0.15	0.22	0.17	0.17	0.60	0.54	0.60	0.54
v/c Ratio	0.43	0.59	0.47	0.57	0.55	0.11	0.44	0.35	0.18	0.90
Control Delay	20.9	28.7	6.5	36.9	41.2	0.6	16.5	12.7	8.3	25.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.9	28.7	6.5	36.9	41.2	0.6	16.5	12.7	8.3	25.8
LOS	C	C	A	D	D	A	B	B	A	C
Approach Delay		18.4			34.7			13.1		25.3
Approach LOS		B			C			B		C

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.90
 Intersection Signal Delay: 22.5
 Intersection LOS: C
 Intersection Capacity Utilization 79.1%
 ICU Level of Service D
 Analysis Period (min) 15

Splits and Phases: 6: Federal Blvd. & W. 64th Ave.





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	107	164	166	141	178	43	93	958	68	2460
v/c Ratio	0.43	0.59	0.47	0.57	0.55	0.11	0.44	0.35	0.18	0.90
Control Delay	20.9	28.7	6.5	36.9	41.2	0.6	16.5	12.7	8.3	25.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.9	28.7	6.5	36.9	41.2	0.6	16.5	12.7	8.3	25.8
Queue Length 50th (ft)	24	41	0	65	96	0	18	110	13	462
Queue Length 95th (ft)	48	73	0	108	154	0	53	152	32	#638
Internal Link Dist (ft)		1188			344			823		482
Turn Bay Length (ft)	100		150	150		100	600		250	
Base Capacity (vph)	249	374	429	246	378	423	209	2741	371	2741
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.44	0.39	0.57	0.47	0.10	0.44	0.35	0.18	0.90

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM 6th Signalized Intersection Summary
6: Federal Blvd. & W. 64th Ave.

6501 Lowell Blvd
06/07/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	98	151	153	130	164	40	86	806	75	63	2113	150
Future Volume (veh/h)	98	151	153	130	164	40	86	806	75	63	2113	150
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	107	164	166	141	178	43	93	876	82	68	2297	163
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	235	252	214	236	256	217	190	2665	249	431	2709	190
Arrive On Green	0.02	0.04	0.04	0.06	0.14	0.14	0.05	0.56	0.56	0.05	0.56	0.56
Sat Flow, veh/h	1781	1870	1585	1781	1870	1585	1781	4751	443	1781	4871	342
Grp Volume(v), veh/h	107	164	166	141	178	43	93	627	331	68	1598	862
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	1585	1781	1702	1791	1781	1702	1809
Q Serve(g_s), s	4.6	7.8	9.3	5.3	8.2	2.2	2.0	8.9	9.0	1.4	35.3	36.4
Cycle Q Clear(g_c), s	4.6	7.8	9.3	5.3	8.2	2.2	2.0	8.9	9.0	1.4	35.3	36.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.25	1.00		0.19
Lane Grp Cap(c), veh/h	235	252	214	236	256	217	190	1909	1004	431	1893	1006
V/C Ratio(X)	0.46	0.65	0.78	0.60	0.69	0.20	0.49	0.33	0.33	0.16	0.84	0.86
Avail Cap(c_a), veh/h	235	376	319	236	380	322	202	1909	1004	459	1893	1006
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.94	0.94	0.94	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.0	40.9	41.7	33.3	37.0	34.4	19.8	10.6	10.7	7.9	16.7	16.9
Incr Delay (d2), s/veh	1.3	2.6	6.4	4.1	3.4	0.4	1.9	0.5	0.9	0.2	4.8	9.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	3.8	7.1	7.5	1.2	7.0	1.5	2.0	5.8	6.4	0.9	19.7	22.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.2	43.6	48.1	37.4	40.4	34.9	21.7	11.1	11.5	8.1	21.5	26.3
LnGrp LOS	C	D	D	D	D	C	C	B	B	A	C	C
Approach Vol, veh/h		437			362			1051			2528	
Approach Delay, s/veh		43.0			38.6			12.2			22.8	
Approach LOS		D			D			B			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.6	55.0	9.8	16.6	9.0	54.5	9.6	16.8				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	5.5	43.1	5.3	18.1	5.1	43.5	5.1	18.3				
Max Q Clear Time (g_c+I1), s	3.4	11.0	7.3	11.3	4.0	38.4	6.6	10.2				
Green Ext Time (p_c), s	0.0	7.5	0.0	0.8	0.0	4.8	0.0	0.6				
Intersection Summary												
HCM 6th Ctrl Delay			23.6									
HCM 6th LOS			C									



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		150	150		0	225		250	150		150
Storage Lanes	1		1	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850		0.904				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1684	0	1770	1863	1583	1770	1863	1583
Flt Permitted	0.726			0.749			0.543			0.359		
Satd. Flow (perm)	1352	1863	1583	1395	1684	0	1011	1863	1583	669	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			70		30				27			80
Link Speed (mph)		30			30			30				30
Link Distance (ft)		549			716			667				367
Travel Time (s)		12.5			16.3			15.2				8.3

Intersection Summary

Area Type: Other

Timings
1: Lowell Blvd. & W. 68th Ave.

6501 Lowell Blvd
06/07/2021

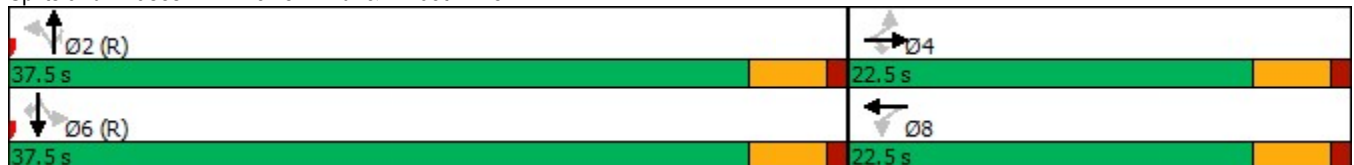


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑	↗	↖	↗	↖	↑	↗	↖	↑	↗
Traffic Volume (vph)	49	12	64	11	16	112	627	18	12	338	74
Future Volume (vph)	49	12	64	11	16	112	627	18	12	338	74
Turn Type	Perm	NA	Perm	Perm	NA	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8		2			6	
Permitted Phases	4		4	8		2		2	6		6
Detector Phase	4	4	4	8	8	2	2	2	6	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	22.5	22.5	22.5	22.5	22.5	37.5	37.5	37.5	37.5	37.5	37.5
Total Split (%)	37.5%	37.5%	37.5%	37.5%	37.5%	62.5%	62.5%	62.5%	62.5%	62.5%	62.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag											
Lead-Lag Optimize?											
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	7.9	7.9	7.9	7.9	7.9	46.0	46.0	46.0	46.0	46.0	46.0
Actuated g/C Ratio	0.13	0.13	0.13	0.13	0.13	0.77	0.77	0.77	0.77	0.77	0.77
v/c Ratio	0.30	0.05	0.26	0.07	0.19	0.16	0.48	0.02	0.03	0.26	0.06
Control Delay	27.2	21.8	9.3	22.2	14.2	3.7	5.3	1.3	3.2	3.7	1.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.2	21.8	9.3	22.2	14.2	3.7	5.3	1.3	3.2	3.7	1.1
LOS	C	C	A	C	B	A	A	A	A	A	A
Approach Delay		17.5			15.8		4.9			3.2	
Approach LOS		B			B		A			A	

Intersection Summary

Cycle Length: 60
 Actuated Cycle Length: 60
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.48
 Intersection Signal Delay: 6.0
 Intersection Capacity Utilization 57.8%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service B

Splits and Phases: 1: Lowell Blvd. & W. 68th Ave.



Queues

6501 Lowell Blvd

1: Lowell Blvd. & W. 68th Ave.

06/07/2021



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	53	13	70	12	47	122	682	20	13	367	80
v/c Ratio	0.30	0.05	0.26	0.07	0.19	0.16	0.48	0.02	0.03	0.26	0.06
Control Delay	27.2	21.8	9.3	22.2	14.2	3.7	5.3	1.3	3.2	3.7	1.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.2	21.8	9.3	22.2	14.2	3.7	5.3	1.3	3.2	3.7	1.1
Queue Length 50th (ft)	18	4	0	4	6	10	80	0	1	34	0
Queue Length 95th (ft)	44	16	28	16	29	30	172	4	6	75	10
Internal Link Dist (ft)		469			636		587			287	
Turn Bay Length (ft)	150		150	150		225		250	150		150
Base Capacity (vph)	405	558	523	418	526	775	1429	1220	513	1429	1233
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.02	0.13	0.03	0.09	0.16	0.48	0.02	0.03	0.26	0.06

Intersection Summary

HCM 6th Signalized Intersection Summary
 1: Lowell Blvd. & W. 68th Ave.

6501 Lowell Blvd
 06/07/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	49	12	64	11	16	28	112	627	18	12	338	74
Future Volume (veh/h)	49	12	64	11	16	28	112	627	18	12	338	74
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	53	13	70	12	17	30	122	682	20	13	367	80
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	218	183	155	240	59	105	772	1407	1192	574	1407	1192
Arrive On Green	0.10	0.10	0.10	0.10	0.10	0.10	0.75	0.75	0.75	0.75	0.75	0.75
Sat Flow, veh/h	1359	1870	1585	1315	607	1071	943	1870	1585	745	1870	1585
Grp Volume(v), veh/h	53	13	70	12	0	47	122	682	20	13	367	80
Grp Sat Flow(s),veh/h/ln	1359	1870	1585	1315	0	1678	943	1870	1585	745	1870	1585
Q Serve(g_s), s	2.3	0.4	2.5	0.5	0.0	1.6	2.7	8.5	0.2	0.4	3.6	0.8
Cycle Q Clear(g_c), s	3.8	0.4	2.5	0.9	0.0	1.6	6.4	8.5	0.2	9.0	3.6	0.8
Prop In Lane	1.00		1.00	1.00		0.64	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	218	183	155	240	0	164	772	1407	1192	574	1407	1192
V/C Ratio(X)	0.24	0.07	0.45	0.05	0.00	0.29	0.16	0.48	0.02	0.02	0.26	0.07
Avail Cap(c_a), veh/h	492	561	476	506	0	503	772	1407	1192	574	1407	1192
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.9	24.6	25.5	25.0	0.0	25.1	3.3	2.9	1.9	4.6	2.3	1.9
Incr Delay (d2), s/veh	0.6	0.2	2.0	0.1	0.0	0.9	0.4	1.2	0.0	0.1	0.5	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.3	0.3	1.8	0.3	0.0	1.1	0.7	3.2	0.1	0.1	1.3	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.5	24.7	27.6	25.1	0.0	26.1	3.7	4.1	1.9	4.7	2.7	2.0
LnGrp LOS	C	C	C	C	A	C	A	A	A	A	A	A
Approach Vol, veh/h		136			59			824			460	
Approach Delay, s/veh		27.3			25.9			4.0			2.7	
Approach LOS		C			C			A			A	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		49.6		10.4		49.6		10.4				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		33.0		18.0		33.0		18.0				
Max Q Clear Time (g_c+I1), s		10.5		5.8		11.0		3.6				
Green Ext Time (p_c), s		5.8		0.3		2.6		0.2				
Intersection Summary												
HCM 6th Ctrl Delay			6.6									
HCM 6th LOS			A									



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↘		↗	↘	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	100		0	100		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.963			0.944			0.995			0.992	
Flt Protected		0.971			0.986		0.950			0.950		
Satd. Flow (prot)	0	1742	0	0	1734	0	1770	1853	0	1770	1848	0
Flt Permitted		0.971			0.986		0.950			0.950		
Satd. Flow (perm)	0	1742	0	0	1734	0	1770	1853	0	1770	1848	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		458			470			732			667	
Travel Time (s)		10.4			10.7			16.6			15.2	

Intersection Summary

Area Type: Other

Intersection												
Int Delay, s/veh	2.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↖	↗		↖	↗	
Traffic Vol, veh/h	32	6	15	9	9	13	27	702	22	16	371	21
Future Vol, veh/h	32	6	15	9	9	13	27	702	22	16	371	21
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	35	7	16	10	10	14	29	763	24	17	403	23

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1294	1294	415	1293	1293	775	426	0	0	787	0	0
Stage 1	449	449	-	833	833	-	-	-	-	-	-	-
Stage 2	845	845	-	460	460	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	139	163	637	140	163	398	1133	-	-	832	-	-
Stage 1	589	572	-	363	384	-	-	-	-	-	-	-
Stage 2	357	379	-	581	566	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	123	156	637	128	156	398	1133	-	-	832	-	-
Mov Cap-2 Maneuver	123	156	-	128	156	-	-	-	-	-	-	-
Stage 1	574	561	-	354	374	-	-	-	-	-	-	-
Stage 2	327	369	-	548	555	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	38.1		27.6		0.3		0.4	
HCM LOS	E		D					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1133	-	-	165	193	832	-
HCM Lane V/C Ratio	0.026	-	-	0.349	0.175	0.021	-
HCM Control Delay (s)	8.3	-	-	38.1	27.6	9.4	-
HCM Lane LOS	A	-	-	E	D	A	-
HCM 95th %tile Q(veh)	0.1	-	-	1.5	0.6	0.1	-



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↘		↗	↘	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	100		0	100		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt					0.932			0.998				
Flt Protected					0.976					0.950		
Satd. Flow (prot)	0	1863	0	0	1694	0	1863	1859	0	1770	1863	0
Flt Permitted					0.976					0.950		
Satd. Flow (perm)	0	1863	0	0	1694	0	1863	1859	0	1770	1863	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		319			430			608			732	
Travel Time (s)		7.3			9.8			13.8			16.6	

Intersection Summary

Area Type: Other

Intersection												
Int Delay, s/veh	0.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	0	0	0	12	0	12	0	711	11	16	404	0
Future Vol, veh/h	0	0	0	12	0	12	0	711	11	16	404	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	13	0	13	0	773	12	17	439	0

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1259	1258	439	1252	1252	779	439	0	0	785	0	0
Stage 1	473	473	-	779	779	-	-	-	-	-	-	-
Stage 2	786	785	-	473	473	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	147	171	618	149	172	396	1121	-	-	834	-	-
Stage 1	572	558	-	389	406	-	-	-	-	-	-	-
Stage 2	385	404	-	572	558	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	140	168	618	147	169	396	1121	-	-	834	-	-
Mov Cap-2 Maneuver	140	168	-	147	169	-	-	-	-	-	-	-
Stage 1	572	547	-	389	406	-	-	-	-	-	-	-
Stage 2	372	404	-	560	547	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	24.1	0	0.4
HCM LOS	A	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1121	-	-	-	214	834	-
HCM Lane V/C Ratio	-	-	-	-	0.122	0.021	-
HCM Control Delay (s)	0	-	-	0	24.1	9.4	-
HCM Lane LOS	A	-	-	A	C	A	-
HCM 95th %tile Q(veh)	0	-	-	-	0.4	0.1	-



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%				0%
Storage Length (ft)	150		100	150		0	0		0	0		0
Storage Lanes	1		1	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850		0.993			0.920				0.953
Flt Protected	0.950			0.950				0.985				0.983
Satd. Flow (prot)	1770	1863	1583	1770	1850	0	0	1688	0	0	1745	0
Flt Permitted	0.265			0.148				0.887				0.872
Satd. Flow (perm)	494	1863	1583	276	1850	0	0	1520	0	0	1548	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			61		4			93				14
Link Speed (mph)		30			30			30				30
Link Distance (ft)		501			1329			646				482
Travel Time (s)		11.4			30.2			14.7				11.0

Intersection Summary

Area Type: Other



Lane Group	EBL	EBT	EBR	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	23	685	99	86	550	391	40
v/c Ratio	0.10	0.81	0.13	0.69	0.66	0.53	0.06
Control Delay	13.0	29.3	5.8	59.8	37.0	18.2	12.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.0	29.3	5.8	59.8	37.0	18.2	12.9
Queue Length 50th (ft)	7	315	11	51	320	121	8
Queue Length 95th (ft)	19	406	34	m74	m383	235	30
Internal Link Dist (ft)		421			1249	566	402
Turn Bay Length (ft)	150		100	150			
Base Capacity (vph)	260	983	864	145	978	732	701
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.70	0.11	0.59	0.56	0.53	0.06

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM 6th Signalized Intersection Summary
 4: Tennyson St. & W 64th Ave.

6501 Lowell Blvd
 06/07/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	21	630	91	79	484	22	113	33	213	13	11	13
Future Volume (veh/h)	21	630	91	79	484	22	113	33	213	13	11	13
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	23	685	99	86	526	24	123	36	232	14	12	14
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	445	879	745	193	834	38	237	87	397	241	207	212
Arrive On Green	0.47	0.47	0.47	0.94	0.94	0.94	0.43	0.43	0.43	0.43	0.43	0.43
Sat Flow, veh/h	858	1870	1585	690	1775	81	429	203	922	434	481	493
Grp Volume(v), veh/h	23	685	99	86	0	550	391	0	0	40	0	0
Grp Sat Flow(s),veh/h/ln	858	1870	1585	690	0	1856	1554	0	0	1407	0	0
Q Serve(g_s), s	1.4	27.6	3.2	10.1	0.0	4.0	12.6	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	5.4	27.6	3.2	37.6	0.0	4.0	16.9	0.0	0.0	1.2	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.04	0.31		0.59	0.35		0.35
Lane Grp Cap(c), veh/h	445	879	745	193	0	872	721	0	0	660	0	0
V/C Ratio(X)	0.05	0.78	0.13	0.45	0.00	0.63	0.54	0.00	0.00	0.06	0.00	0.00
Avail Cap(c_a), veh/h	495	987	837	233	0	979	721	0	0	660	0	0
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.78	0.00	0.78	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	15.3	20.0	13.5	15.0	0.0	1.6	19.3	0.0	0.0	14.9	0.0	0.0
Incr Delay (d2), s/veh	0.0	3.6	0.1	1.3	0.0	0.9	2.9	0.0	0.0	0.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.5	17.8	2.0	2.4	0.0	1.6	10.6	0.0	0.0	0.9	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	15.3	23.6	13.6	16.2	0.0	2.4	22.2	0.0	0.0	15.1	0.0	0.0
LnGrp LOS	B	C	B	B	A	A	C	A	A	B	A	A
Approach Vol, veh/h		807			636			391				40
Approach Delay, s/veh		22.1			4.3			22.2				15.1
Approach LOS		C			A			C				B
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		43.2		46.8		43.2		46.8				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		33.5		47.5		33.5		47.5				
Max Q Clear Time (g_c+I1), s		18.9		29.6		3.2		39.6				
Green Ext Time (p_c), s		2.2		5.1		0.2		2.6				
Intersection Summary												
HCM 6th Ctrl Delay				15.9								
HCM 6th LOS				B								



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	200		150	150		75	200		150	200		100
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.154			0.510			0.612			0.251		
Satd. Flow (perm)	287	1863	1583	950	1863	1583	1140	1863	1583	468	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			78			127			127			163
Link Speed (mph)		30			30			30				30
Link Distance (ft)		1329			1480			763				608
Travel Time (s)		30.2			33.6			17.3				13.8

Intersection Summary

Area Type: Other

Timings
5: W 64th Ave./W. 64th Ave. & Lowell Blvd.

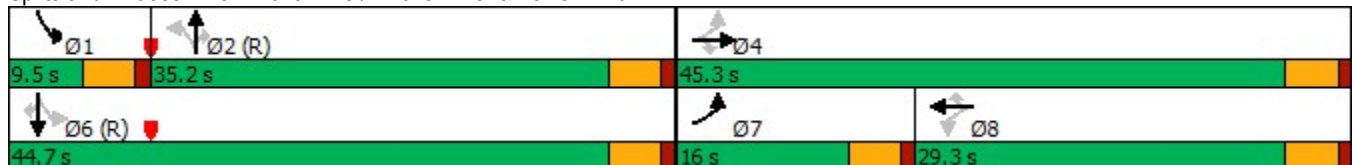
6501 Lowell Blvd
06/07/2021

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	224	399	72	49	370	60	126	430	103	41	216	150
Future Volume (vph)	224	399	72	49	370	60	126	430	103	41	216	150
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4			8			2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	7	4	4	8	8	8	2	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	16.0	45.3	45.3	29.3	29.3	29.3	35.2	35.2	35.2	9.5	44.7	44.7
Total Split (%)	17.8%	50.3%	50.3%	32.6%	32.6%	32.6%	39.1%	39.1%	39.1%	10.6%	49.7%	49.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead			Lag	Lag	Lag	Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes			Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	38.7	38.7	38.7	22.7	22.7	22.7	36.6	36.6	36.6	42.3	42.3	42.3
Actuated g/C Ratio	0.43	0.43	0.43	0.25	0.25	0.25	0.41	0.41	0.41	0.47	0.47	0.47
v/c Ratio	0.78	0.54	0.11	0.22	0.86	0.13	0.30	0.62	0.16	0.15	0.27	0.20
Control Delay	46.1	32.3	10.4	30.8	47.6	6.8	22.8	27.6	3.8	15.3	16.2	3.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.1	32.3	10.4	30.8	47.6	6.8	22.8	27.6	3.8	15.3	16.2	3.2
LOS	D	C	B	C	D	A	C	C	A	B	B	A
Approach Delay		34.5			40.8			23.0			11.3	
Approach LOS		C			D			C			B	

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 70
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.86
 Intersection Signal Delay: 28.2
 Intersection Capacity Utilization 73.7%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service D

Splits and Phases: 5: W 64th Ave./W. 64th Ave. & Lowell Blvd.





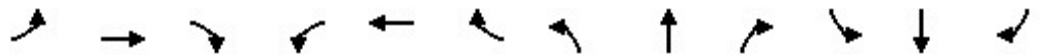
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	243	434	78	53	402	65	137	467	112	45	235	163
v/c Ratio	0.78	0.54	0.11	0.22	0.86	0.13	0.30	0.62	0.16	0.15	0.27	0.20
Control Delay	46.1	32.3	10.4	30.8	47.6	6.8	22.8	27.6	3.8	15.3	16.2	3.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.1	32.3	10.4	30.8	47.6	6.8	22.8	27.6	3.8	15.3	16.2	3.2
Queue Length 50th (ft)	125	207	9	27	247	2	58	231	0	14	82	0
Queue Length 95th (ft)	m#177	294	m25	m35	m312	m4	109	346	28	34	134	34
Internal Link Dist (ft)		1249			1400			683			528	
Turn Bay Length (ft)	200		150	150		75	200		150	200		100
Base Capacity (vph)	312	844	760	261	513	528	463	758	719	297	876	831
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.78	0.51	0.10	0.20	0.78	0.12	0.30	0.62	0.16	0.15	0.27	0.20

Intersection Summary

- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

HCM 6th Signalized Intersection Summary
 5: W 64th Ave./W. 64th Ave. & Lowell Blvd.

6501 Lowell Blvd
 06/07/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↘	↖	↗	↘	↖	↗	↘	↖	↗	↘
Traffic Volume (veh/h)	224	399	72	49	370	60	126	430	103	41	216	150
Future Volume (veh/h)	224	399	72	49	370	60	126	430	103	41	216	150
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	243	434	78	53	402	65	137	467	112	45	235	163
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	325	779	660	299	461	391	471	741	628	310	905	767
Arrive On Green	0.16	0.55	0.55	0.08	0.08	0.08	0.40	0.40	0.40	0.04	0.48	0.48
Sat Flow, veh/h	1781	1870	1585	888	1870	1585	987	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	243	434	78	53	402	65	137	467	112	45	235	163
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	888	1870	1585	987	1870	1585	1781	1870	1585
Q Serve(g_s), s	8.8	13.5	2.1	5.0	19.1	3.4	8.8	18.1	4.1	1.3	6.7	5.3
Cycle Q Clear(g_c), s	8.8	13.5	2.1	5.0	19.1	3.4	8.8	18.1	4.1	1.3	6.7	5.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	325	779	660	299	461	391	471	741	628	310	905	767
V/C Ratio(X)	0.75	0.56	0.12	0.18	0.87	0.17	0.29	0.63	0.18	0.15	0.26	0.21
Avail Cap(c_a), veh/h	339	848	719	325	515	437	471	741	628	342	905	767
HCM Platoon Ratio	1.33	1.33	1.33	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.48	0.48	0.48	0.51	0.51	0.51	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.5	14.7	12.2	33.5	39.9	32.7	19.1	21.9	17.7	16.0	13.7	13.4
Incr Delay (d2), s/veh	4.2	0.3	0.0	0.1	7.8	0.1	1.6	4.0	0.6	0.2	0.7	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	5.9	7.3	1.3	2.0	14.3	2.4	3.9	13.2	2.8	0.9	5.2	3.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.8	15.1	12.2	33.6	47.8	32.8	20.6	25.9	18.3	16.3	14.4	14.0
LnGrp LOS	C	B	B	C	D	C	C	C	B	B	B	B
Approach Vol, veh/h		755			520			716				443
Approach Delay, s/veh		18.2			44.5			23.7				14.5
Approach LOS		B			D			C				B
Timer - Assigned Phs	1	2		4		6	7	8				
Phs Duration (G+Y+Rc), s	7.9	40.2		42.0		48.0	15.3	26.7				
Change Period (Y+Rc), s	4.5	4.5		4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s	5.0	30.7		40.8		40.2	11.5	24.8				
Max Q Clear Time (g_c+I1), s	3.3	20.1		15.5		8.7	10.8	21.1				
Green Ext Time (p_c), s	0.0	3.0		3.1		2.0	0.1	1.1				

Intersection Summary

HCM 6th Ctrl Delay	24.8
HCM 6th LOS	C



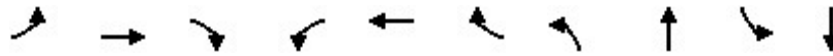
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	100		150	150		100	600		0	250		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor			0.850			0.850		0.993			0.988	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	5050	0	1770	5024	0
Flt Permitted	0.265			0.531			0.102			0.115		
Satd. Flow (perm)	494	1863	1583	989	1863	1583	190	5050	0	214	5024	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			185			182		10			17	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1480			550			1046			611	
Travel Time (s)		33.6			12.5			23.8			13.9	

Intersection Summary

Area Type: Other

Timings
6: Federal Blvd. & W. 64th Ave.

6501 Lowell Blvd
06/07/2021



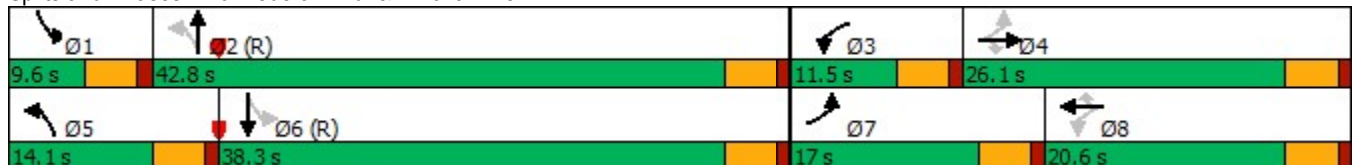
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations	↖	↑	↗	↖	↑	↗	↖	↑↑↑	↖	↑↑↑
Traffic Volume (vph)	281	238	170	112	208	96	215	1846	84	1511
Future Volume (vph)	281	238	170	112	208	96	215	1846	84	1511
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA
Protected Phases	7	4		3	8		5	2	1	6
Permitted Phases	4		4	8		8	2		6	
Detector Phase	7	4	4	3	8	8	5	2	1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	20.6	20.6	9.5	22.5	9.5	22.5
Total Split (s)	17.0	26.1	26.1	11.5	20.6	20.6	14.1	42.8	9.6	38.3
Total Split (%)	18.9%	29.0%	29.0%	12.8%	22.9%	22.9%	15.7%	47.6%	10.7%	42.6%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)	31.5	20.1	20.1	21.5	14.5	14.5	49.5	41.4	40.5	34.9
Actuated g/C Ratio	0.35	0.22	0.22	0.24	0.16	0.16	0.55	0.46	0.45	0.39
v/c Ratio	0.87	0.62	0.37	0.41	0.75	0.25	0.84	0.90	0.47	0.91
Control Delay	64.1	52.6	18.0	25.3	52.1	1.8	44.8	30.6	19.9	34.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	64.1	52.6	18.0	25.3	52.1	1.8	44.8	30.6	19.9	34.6
LOS	E	D	B	C	D	A	D	C	B	C
Approach Delay		48.7			33.3			32.0		33.9
Approach LOS		D			C			C		C

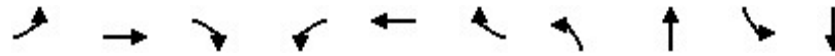
Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.91
 Intersection Signal Delay: 35.1
 Intersection Capacity Utilization 85.5%
 Analysis Period (min) 15

Intersection LOS: D
 ICU Level of Service E

Splits and Phases: 6: Federal Blvd. & W. 64th Ave.





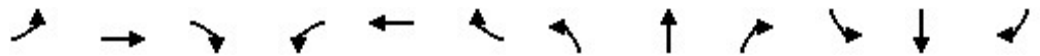
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	305	259	185	122	226	104	234	2106	91	1782
v/c Ratio	0.87	0.62	0.37	0.41	0.75	0.25	0.84	0.90	0.47	0.91
Control Delay	64.1	52.6	18.0	25.3	52.1	1.8	44.8	30.6	19.9	34.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	64.1	52.6	18.0	25.3	52.1	1.8	44.8	30.6	19.9	34.6
Queue Length 50th (ft)	161	139	24	46	121	0	81	418	24	348
Queue Length 95th (ft)	#247	217	76	86	#212	3	#214	#546	48	#458
Internal Link Dist (ft)		1400			470			966		531
Turn Bay Length (ft)	100		150	150		100	600		250	
Base Capacity (vph)	350	447	520	297	333	432	280	2330	192	1958
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.87	0.58	0.36	0.41	0.68	0.24	0.84	0.90	0.47	0.91

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM 6th Signalized Intersection Summary
6: Federal Blvd. & W. 64th Ave.

6501 Lowell Blvd
06/07/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	281	238	170	112	208	96	215	1846	91	84	1511	129
Future Volume (veh/h)	281	238	170	112	208	96	215	1846	91	84	1511	129
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	305	259	185	122	226	104	234	2007	99	91	1642	140
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	357	391	331	285	272	231	279	2321	114	189	2021	172
Arrive On Green	0.05	0.07	0.07	0.08	0.15	0.15	0.09	0.47	0.47	0.05	0.42	0.42
Sat Flow, veh/h	1781	1870	1585	1781	1870	1585	1781	4985	245	1781	4793	408
Grp Volume(v), veh/h	305	259	185	122	226	104	234	1368	738	91	1166	616
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	1585	1781	1702	1826	1781	1702	1797
Q Serve(g_s), s	12.5	12.2	10.2	5.2	10.6	5.4	6.4	32.3	32.6	2.6	27.1	27.2
Cycle Q Clear(g_c), s	12.5	12.2	10.2	5.2	10.6	5.4	6.4	32.3	32.6	2.6	27.1	27.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.13	1.00		0.23
Lane Grp Cap(c), veh/h	357	391	331	285	272	231	279	1585	850	189	1436	758
V/C Ratio(X)	0.85	0.66	0.56	0.43	0.83	0.45	0.84	0.86	0.87	0.48	0.81	0.81
Avail Cap(c_a), veh/h	357	449	380	288	335	284	302	1585	850	201	1436	758
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	0.90	0.90	0.90	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.1	38.8	37.9	29.6	37.4	35.2	19.3	21.5	21.6	20.2	22.9	22.9
Incr Delay (d2), s/veh	16.4	2.7	1.3	1.0	13.5	1.4	17.5	6.5	11.6	1.9	5.1	9.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	11.8	10.3	7.6	4.0	9.7	3.9	6.7	19.4	22.2	2.0	16.8	18.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	46.5	41.5	39.2	30.6	50.8	36.5	36.8	28.0	33.1	22.1	28.0	32.2
LnGrp LOS	D	D	D	C	D	D	D	C	C	C	C	C
Approach Vol, veh/h		749			452			2340			1873	
Approach Delay, s/veh		43.0			42.1			30.5			29.1	
Approach LOS		D			D			C			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.0	46.4	11.3	23.3	12.9	42.5	17.0	17.6				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	5.1	38.3	7.0	21.6	9.6	33.8	12.5	16.1				
Max Q Clear Time (g_c+I1), s	4.6	34.6	7.2	14.2	8.4	29.2	14.5	12.6				
Green Ext Time (p_c), s	0.0	3.4	0.0	1.3	0.1	3.8	0.0	0.5				

Intersection Summary

HCM 6th Ctrl Delay	32.7
HCM 6th LOS	C

Notes

User approved pedestrian interval to be less than phase max green.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		150	150		0	225		250	150		150
Storage Lanes	1		1	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850		0.929				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1730	0	1770	1863	1583	1770	1863	1583
Flt Permitted	0.744			0.751			0.558			0.640		
Satd. Flow (perm)	1386	1863	1583	1399	1730	0	1039	1863	1583	1192	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			121		10				27			58
Link Speed (mph)		30			30			30				30
Link Distance (ft)		594			990			699				502
Travel Time (s)		13.5			22.5			15.9				11.4

Intersection Summary

Area Type: Other

Timings
1: Lowell Blvd. & W. 68th Ave.

6501 Lowell Blvd
06/07/2021



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑	↗	↖	↗	↖	↑	↗	↖	↑	↗
Traffic Volume (vph)	50	9	111	3	10	63	172	1	16	309	53
Future Volume (vph)	50	9	111	3	10	63	172	1	16	309	53
Turn Type	Perm	NA	Perm	Perm	NA	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8		2			6	
Permitted Phases	4		4	8		2		2	6		6
Detector Phase	4	4	4	8	8	2	2	2	6	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	26.0	26.0	26.0	26.0	26.0	34.0	34.0	34.0	34.0	34.0	34.0
Total Split (%)	43.3%	43.3%	43.3%	43.3%	43.3%	56.7%	56.7%	56.7%	56.7%	56.7%	56.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag											
Lead-Lag Optimize?											
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	7.9	7.9	7.9	7.9	7.9	46.0	46.0	46.0	46.0	46.0	46.0
Actuated g/C Ratio	0.13	0.13	0.13	0.13	0.13	0.77	0.77	0.77	0.77	0.77	0.77
v/c Ratio	0.30	0.04	0.39	0.02	0.09	0.09	0.13	0.00	0.02	0.24	0.05
Control Delay	27.0	21.7	9.2	21.3	16.9	3.3	3.2	0.0	3.1	3.5	1.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.0	21.7	9.2	21.3	16.9	3.3	3.2	0.0	3.1	3.5	1.2
LOS	C	C	A	C	B	A	A	A	A	A	A
Approach Delay		15.1			17.4		3.2			3.2	
Approach LOS		B			B		A			A	

Intersection Summary

Cycle Length: 60
 Actuated Cycle Length: 60
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 45
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.39
 Intersection Signal Delay: 6.1
 Intersection Capacity Utilization 41.1%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service A

Splits and Phases: 1: Lowell Blvd. & W. 68th Ave.



Queues

6501 Lowell Blvd

1: Lowell Blvd. & W. 68th Ave.

06/07/2021



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	54	10	121	3	21	68	187	1	17	336	58
v/c Ratio	0.30	0.04	0.39	0.02	0.09	0.09	0.13	0.00	0.02	0.24	0.05
Control Delay	27.0	21.7	9.2	21.3	16.9	3.3	3.2	0.0	3.1	3.5	1.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.0	21.7	9.2	21.3	16.9	3.3	3.2	0.0	3.1	3.5	1.2
Queue Length 50th (ft)	18	3	0	1	4	5	16	0	1	30	0
Queue Length 95th (ft)	44	14	37	7	19	18	38	0	6	68	8
Internal Link Dist (ft)		514			910		619			422	
Turn Bay Length (ft)	150		150	150		225		250	150		150
Base Capacity (vph)	496	667	644	501	626	797	1429	1220	914	1429	1227
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.01	0.19	0.01	0.03	0.09	0.13	0.00	0.02	0.24	0.05

Intersection Summary

HCM 6th Signalized Intersection Summary
 1: Lowell Blvd. & W. 68th Ave.

6501 Lowell Blvd
 06/07/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	9	111	3	10	9	63	172	1	16	309	53
Future Volume (veh/h)	50	9	111	3	10	9	63	172	1	16	309	53
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	54	10	121	3	11	10	68	187	1	17	336	58
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	259	208	176	254	100	91	795	1382	1171	969	1382	1171
Arrive On Green	0.11	0.11	0.11	0.11	0.11	0.11	0.74	0.74	0.74	0.74	0.74	0.74
Sat Flow, veh/h	1391	1870	1585	1259	902	820	990	1870	1585	1195	1870	1585
Grp Volume(v), veh/h	54	10	121	3	0	21	68	187	1	17	336	58
Grp Sat Flow(s),veh/h/ln	1391	1870	1585	1259	0	1723	990	1870	1585	1195	1870	1585
Q Serve(g_s), s	2.2	0.3	4.4	0.1	0.0	0.7	1.4	1.7	0.0	0.3	3.4	0.6
Cycle Q Clear(g_c), s	2.8	0.3	4.4	0.4	0.0	0.7	4.8	1.7	0.0	2.0	3.4	0.6
Prop In Lane	1.00		1.00	1.00		0.48	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	259	208	176	254	0	191	795	1382	1171	969	1382	1171
V/C Ratio(X)	0.21	0.05	0.69	0.01	0.00	0.11	0.09	0.14	0.00	0.02	0.24	0.05
Avail Cap(c_a), veh/h	603	670	568	565	0	617	795	1382	1171	969	1382	1171
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.3	23.8	25.7	24.0	0.0	24.0	3.3	2.3	2.0	2.6	2.5	2.1
Incr Delay (d2), s/veh	0.4	0.1	4.7	0.0	0.0	0.3	0.2	0.2	0.0	0.0	0.4	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.3	0.2	3.2	0.1	0.0	0.5	0.4	0.7	0.0	0.1	1.4	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.7	23.9	30.3	24.0	0.0	24.2	3.5	2.5	2.0	2.6	2.9	2.2
LnGrp LOS	C	C	C	C	A	C	A	A	A	A	A	A
Approach Vol, veh/h		185			24			256			411	
Approach Delay, s/veh		28.6			24.2			2.7			2.8	
Approach LOS		C			C			A			A	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		48.8		11.2		48.8		11.2				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		29.5		21.5		29.5		21.5				
Max Q Clear Time (g_c+I1), s		6.8		6.4		5.4		2.7				
Green Ext Time (p_c), s		1.3		0.5		2.3		0.1				

Intersection Summary

HCM 6th Ctrl Delay	8.8
HCM 6th LOS	A



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↘		↗	↘	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	100		0	100		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.920			0.940			0.996			0.993	
Flt Protected		0.985			0.978		0.950		0.950		0.950	
Satd. Flow (prot)	0	1688	0	0	1712	0	1770	1855	0	1770	1850	0
Flt Permitted		0.985			0.978		0.950		0.950		0.950	
Satd. Flow (perm)	0	1688	0	0	1712	0	1770	1855	0	1770	1850	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		458			470			732			699	
Travel Time (s)		10.4			10.7			16.6			15.9	

Intersection Summary

Area Type: Other

Intersection												
Int Delay, s/veh	1.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	13	5	26	14	4	14	10	315	9	4	431	21
Future Vol, veh/h	13	5	26	14	4	14	10	315	9	4	431	21
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	14	5	28	15	4	15	11	342	10	4	468	23

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	867	862	480	873	868	347	491	0	0	352	0	0
Stage 1	488	488	-	369	369	-	-	-	-	-	-	-
Stage 2	379	374	-	504	499	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	273	293	586	271	290	696	1072	-	-	1207	-	-
Stage 1	561	550	-	651	621	-	-	-	-	-	-	-
Stage 2	643	618	-	550	544	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	261	289	586	251	286	696	1072	-	-	1207	-	-
Mov Cap-2 Maneuver	261	289	-	251	286	-	-	-	-	-	-	-
Stage 1	555	548	-	644	615	-	-	-	-	-	-	-
Stage 2	618	612	-	517	542	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	15.4		16.2		0.3		0.1	
HCM LOS	C		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1072	-	-	395	356	1207	-
HCM Lane V/C Ratio	0.01	-	-	0.121	0.098	0.004	-
HCM Control Delay (s)	8.4	-	-	15.4	16.2	8	-
HCM Lane LOS	A	-	-	C	C	A	-
HCM 95th %tile Q(veh)	0	-	-	0.4	0.3	0	-



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↘		↗	↘	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	100		0	100		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt					0.916			0.996				
Flt Protected					0.982					0.950		
Satd. Flow (prot)	0	1863	0	0	1676	0	1863	1855	0	1770	1863	0
Flt Permitted					0.982					0.950		
Satd. Flow (perm)	0	1863	0	0	1676	0	1863	1855	0	1770	1863	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		319			430			608			732	
Travel Time (s)		7.3			9.8			13.8			16.6	

Intersection Summary

Area Type: Other

Intersection												
Int Delay, s/veh	0.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	0	0	0	8	0	14	0	322	9	12	461	0
Future Vol, veh/h	0	0	0	8	0	14	0	322	9	12	461	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	9	0	15	0	350	10	13	501	0

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	890	887	501	882	882	355	501	0	0	360	0	0
Stage 1	527	527	-	355	355	-	-	-	-	-	-	-
Stage 2	363	360	-	527	527	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	264	283	570	267	285	689	1063	-	-	1199	-	-
Stage 1	535	528	-	662	630	-	-	-	-	-	-	-
Stage 2	656	626	-	535	528	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	256	280	570	265	282	689	1063	-	-	1199	-	-
Mov Cap-2 Maneuver	256	280	-	265	282	-	-	-	-	-	-	-
Stage 1	535	522	-	662	630	-	-	-	-	-	-	-
Stage 2	642	626	-	529	522	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	13.7	0	0.2
HCM LOS	A	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1063	-	-	-	436	1199	-
HCM Lane V/C Ratio	-	-	-	-	0.055	0.011	-
HCM Control Delay (s)	0	-	-	0	13.7	8	-
HCM Lane LOS	A	-	-	A	B	A	-
HCM 95th %tile Q(veh)	0	-	-	-	0.2	0	-

Lanes and Geometrics
 4: Tennyson St. & W 64th Ave.

6501 Lowell Blvd
 06/07/2021



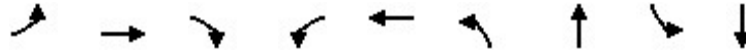
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		100	150		0	0		0	0		0
Storage Lanes	1		1	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850		0.995			0.919				0.951
Flt Protected	0.950			0.950				0.984				0.992
Satd. Flow (prot)	1770	1863	1583	1770	1853	0	0	1684	0	0	1757	0
Flt Permitted	0.246			0.368				0.903				0.965
Satd. Flow (perm)	458	1863	1583	685	1853	0	0	1546	0	0	1709	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			65		3			91				18
Link Speed (mph)		30			30			30				30
Link Distance (ft)		700			1434			502				485
Travel Time (s)		15.9			32.6			11.4				11.0

Intersection Summary

Area Type: Other

Timings
4: Tennyson St. & W 64th Ave.

6501 Lowell Blvd
06/07/2021

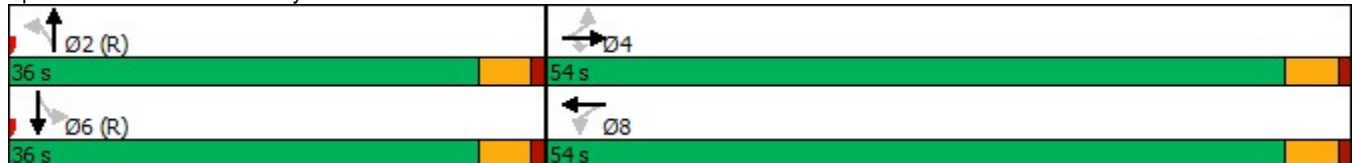


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↖	↑	↗	↖	↗		↕		↕
Traffic Volume (vph)	12	314	60	156	387	56	14	7	22
Future Volume (vph)	12	314	60	156	387	56	14	7	22
Turn Type	Perm	NA	Perm	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4			8		2		6
Permitted Phases	4		4	8		2		6	
Detector Phase	4	4	4	8	8	2	2	6	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	54.0	54.0	54.0	54.0	54.0	36.0	36.0	36.0	36.0
Total Split (%)	60.0%	60.0%	60.0%	60.0%	60.0%	40.0%	40.0%	40.0%	40.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5		4.5		4.5
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	28.9	28.9	28.9	28.9	28.9		52.1		52.1
Actuated g/C Ratio	0.32	0.32	0.32	0.32	0.32		0.58		0.58
v/c Ratio	0.09	0.57	0.12	0.78	0.73		0.20		0.05
Control Delay	19.1	28.2	5.0	60.8	44.3		6.7		8.2
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	19.1	28.2	5.0	60.8	44.3		6.7		8.2
LOS	B	C	A	E	D		A		A
Approach Delay		24.3			49.0		6.7		8.2
Approach LOS		C			D		A		A

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 45
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.78
 Intersection Signal Delay: 32.8
 Intersection Capacity Utilization 53.5%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service A

Splits and Phases: 4: Tennyson St. & W 64th Ave.





Lane Group	EBL	EBT	EBR	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	13	341	65	170	435	189	50
v/c Ratio	0.09	0.57	0.12	0.78	0.73	0.20	0.05
Control Delay	19.1	28.2	5.0	60.8	44.3	6.7	8.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.1	28.2	5.0	60.8	44.3	6.7	8.2
Queue Length 50th (ft)	5	160	0	98	246	23	7
Queue Length 95th (ft)	16	202	23	164	333	71	29
Internal Link Dist (ft)		620			1354	422	405
Turn Bay Length (ft)	150		100	150			
Base Capacity (vph)	251	1024	899	376	1020	933	997
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.33	0.07	0.45	0.43	0.20	0.05

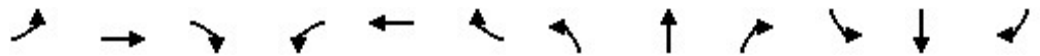
Intersection Summary

HCM 6th Signalized Intersection Summary
 4: Tennyson St. & W 64th Ave.

6501 Lowell Blvd
 06/07/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	314	60	156	387	13	56	14	104	7	22	17
Future Volume (veh/h)	12	314	60	156	387	13	56	14	104	7	22	17
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	13	341	65	170	421	14	61	15	113	8	24	18
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	233	690	585	304	664	22	291	90	488	155	456	318
Arrive On Green	0.37	0.37	0.37	0.25	0.25	0.25	0.53	0.53	0.53	0.53	0.53	0.53
Sat Flow, veh/h	954	1870	1585	979	1800	60	449	170	920	205	859	599
Grp Volume(v), veh/h	13	341	65	170	0	435	189	0	0	50	0	0
Grp Sat Flow(s),veh/h/ln	954	1870	1585	979	0	1860	1539	0	0	1664	0	0
Q Serve(g_s), s	1.0	12.7	2.4	15.0	0.0	18.8	1.3	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	19.8	12.7	2.4	27.6	0.0	18.8	5.5	0.0	0.0	1.2	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.03	0.32		0.60	0.16		0.36
Lane Grp Cap(c), veh/h	233	690	585	304	0	686	870	0	0	930	0	0
V/C Ratio(X)	0.06	0.49	0.11	0.56	0.00	0.63	0.22	0.00	0.00	0.05	0.00	0.00
Avail Cap(c_a), veh/h	405	1029	872	481	0	1023	870	0	0	930	0	0
HCM Platoon Ratio	1.00	1.00	1.00	0.67	0.67	0.67	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.89	0.00	0.89	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	32.2	21.9	18.7	37.9	0.0	28.5	11.2	0.0	0.0	10.2	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.5	0.1	1.4	0.0	0.9	0.6	0.0	0.0	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.4	9.3	1.6	6.8	0.0	13.5	3.6	0.0	0.0	0.9	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	32.3	22.5	18.8	39.3	0.0	29.3	11.7	0.0	0.0	10.3	0.0	0.0
LnGrp LOS	C	C	B	D	A	C	B	A	A	B	A	A
Approach Vol, veh/h		419			605			189			50	
Approach Delay, s/veh		22.2			32.1			11.7			10.3	
Approach LOS		C			C			B			B	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		52.3		37.7		52.3		37.7				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		31.5		49.5		31.5		49.5				
Max Q Clear Time (g_c+I1), s		7.5		21.8		3.2		29.6				
Green Ext Time (p_c), s		1.1		2.4		0.2		3.6				
Intersection Summary												
HCM 6th Ctrl Delay				24.9								
HCM 6th LOS				C								



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	200		150	150		75	200		150	200		100
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.280			0.568			0.579			0.595		
Satd. Flow (perm)	522	1863	1583	1058	1863	1583	1079	1863	1583	1108	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			99			127			127			132
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1434			1268			763			608	
Travel Time (s)		32.6			28.8			17.3			13.8	

Intersection Summary

Area Type: Other

Timings
5: W 64th Ave./W. 64th Ave. & Lowell Blvd.

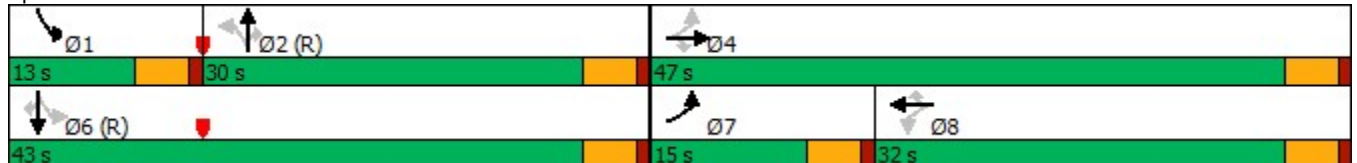
6501 Lowell Blvd
06/07/2021

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	116	293	91	72	236	39	46	132	56	80	272	121
Future Volume (vph)	116	293	91	72	236	39	46	132	56	80	272	121
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4			8			2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	7	4	4	8	8	8	2	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	15.0	47.0	47.0	32.0	32.0	32.0	30.0	30.0	30.0	13.0	43.0	43.0
Total Split (%)	16.7%	52.2%	52.2%	35.6%	35.6%	35.6%	33.3%	33.3%	33.3%	14.4%	47.8%	47.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead			Lag	Lag	Lag	Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes			Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	32.1	32.1	32.1	18.0	18.0	18.0	38.7	38.7	38.7	48.9	48.9	48.9
Actuated g/C Ratio	0.36	0.36	0.36	0.20	0.20	0.20	0.43	0.43	0.43	0.54	0.54	0.54
v/c Ratio	0.40	0.48	0.16	0.37	0.69	0.10	0.11	0.18	0.08	0.13	0.29	0.14
Control Delay	37.0	40.0	17.6	33.2	40.4	2.5	21.2	20.3	0.2	12.3	13.5	3.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.0	40.0	17.6	33.2	40.4	2.5	21.2	20.3	0.2	12.3	13.5	3.0
LOS	D	D	B	C	D	A	C	C	A	B	B	A
Approach Delay		35.2			34.7			15.7			10.6	
Approach LOS		D			C			B			B	

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 65
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.69
 Intersection Signal Delay: 24.6
 Intersection Capacity Utilization 53.1%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service A

Splits and Phases: 5: W 64th Ave./W. 64th Ave. & Lowell Blvd.





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	126	318	99	78	257	42	50	143	61	87	296	132
v/c Ratio	0.40	0.48	0.16	0.37	0.69	0.10	0.11	0.18	0.08	0.13	0.29	0.14
Control Delay	37.0	40.0	17.6	33.2	40.4	2.5	21.2	20.3	0.2	12.3	13.5	3.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.0	40.0	17.6	33.2	40.4	2.5	21.2	20.3	0.2	12.3	13.5	3.0
Queue Length 50th (ft)	68	179	17	39	139	1	17	51	0	23	87	0
Queue Length 95th (ft)	115	249	59	m60	m173	m3	50	110	0	54	164	30
Internal Link Dist (ft)		1354			1188			683			528	
Turn Bay Length (ft)	200		150	150		75	200		150	200		100
Base Capacity (vph)	331	879	799	323	569	571	463	800	752	668	1013	921
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.38	0.36	0.12	0.24	0.45	0.07	0.11	0.18	0.08	0.13	0.29	0.14

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM 6th Signalized Intersection Summary
 5: W 64th Ave./W. 64th Ave. & Lowell Blvd.

6501 Lowell Blvd
 06/07/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↶	↷	↷	↶	↷	↷	↶	↷	↷	↶	↷	↷
Traffic Volume (veh/h)	116	293	91	72	236	39	46	132	56	80	272	121
Future Volume (veh/h)	116	293	91	72	236	39	46	132	56	80	272	121
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	126	318	99	78	257	42	50	143	61	87	296	132
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	258	564	478	215	330	279	559	934	791	707	1119	949
Arrive On Green	0.02	0.10	0.10	0.06	0.06	0.06	0.50	0.50	0.50	0.05	0.60	0.60
Sat Flow, veh/h	1781	1870	1585	969	1870	1585	960	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	126	318	99	78	257	42	50	143	61	87	296	132
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	969	1870	1585	960	1870	1585	1781	1870	1585
Q Serve(g_s), s	5.0	14.6	5.2	7.1	12.2	2.3	2.5	3.7	1.8	2.0	6.8	3.3
Cycle Q Clear(g_c), s	5.0	14.6	5.2	10.4	12.2	2.3	2.5	3.7	1.8	2.0	6.8	3.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	258	564	478	215	330	279	559	934	791	707	1119	949
V/C Ratio(X)	0.49	0.56	0.21	0.36	0.78	0.15	0.09	0.15	0.08	0.12	0.26	0.14
Avail Cap(c_a), veh/h	332	883	748	340	571	484	559	934	791	788	1119	949
HCM Platoon Ratio	0.33	0.33	0.33	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.80	0.80	0.80	0.82	0.82	0.82	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.3	34.9	30.6	41.4	40.7	36.0	11.9	12.2	11.7	8.9	8.6	7.9
Incr Delay (d2), s/veh	1.1	0.7	0.2	0.8	3.3	0.2	0.3	0.3	0.2	0.1	0.6	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	4.1	11.4	3.7	3.4	10.1	1.6	1.0	2.8	1.2	1.3	4.9	2.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	29.4	35.6	30.8	42.3	44.0	36.2	12.2	12.6	11.9	9.0	9.2	8.2
LnGrp LOS	C	D	C	D	D	D	B	B	B	A	A	A
Approach Vol, veh/h		543			377			254			515	
Approach Delay, s/veh		33.3			42.8			12.3			8.9	
Approach LOS		C			D			B			A	
Timer - Assigned Phs	1	2		4		6	7	8				
Phs Duration (G+Y+Rc), s	8.9	49.4		31.6		58.4	11.3	20.4				
Change Period (Y+Rc), s	4.5	4.5		4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s	8.5	25.5		42.5		38.5	10.5	27.5				
Max Q Clear Time (g_c+I1), s	4.0	5.7		16.6		8.8	7.0	14.2				
Green Ext Time (p_c), s	0.1	1.1		2.3		2.3	0.1	1.7				

Intersection Summary

HCM 6th Ctrl Delay	24.8
HCM 6th LOS	C



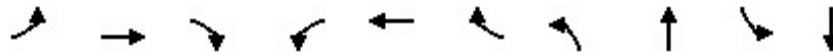
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	100		150	150		100	600		0	250		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor			0.850			0.850		0.987			0.990	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	5019	0	1770	5034	0
Flt Permitted	0.505			0.450			0.086			0.227		
Satd. Flow (perm)	941	1863	1583	838	1863	1583	160	5019	0	423	5034	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			134			127			23			17
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1268			424			903			562	
Travel Time (s)		28.8			9.6			20.5			12.8	

Intersection Summary

Area Type: Other

Timings
6: Federal Blvd. & W. 64th Ave.

6501 Lowell Blvd
06/07/2021

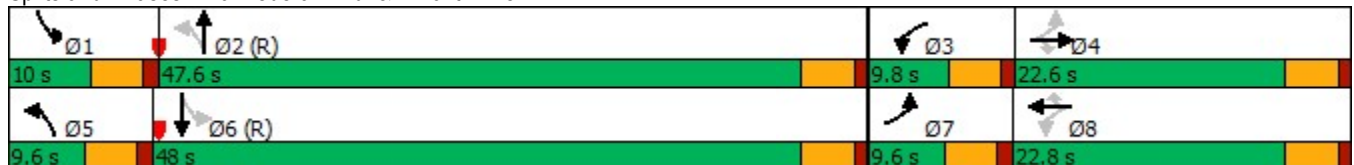


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations	↖	↑	↗	↖	↑	↗	↖	↑↑↑	↖	↑↑↑
Traffic Volume (vph)	106	162	164	139	176	43	93	864	68	2266
Future Volume (vph)	106	162	164	139	176	43	93	864	68	2266
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA
Protected Phases	7	4		3	8		5	2	1	6
Permitted Phases	4		4	8		8	2		6	
Detector Phase	7	4	4	3	8	8	5	2	1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	9.5	22.5
Total Split (s)	9.6	22.6	22.6	9.8	22.8	22.8	9.6	47.6	10.0	48.0
Total Split (%)	10.7%	25.1%	25.1%	10.9%	25.3%	25.3%	10.7%	52.9%	11.1%	53.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)	19.0	13.9	13.9	20.2	16.0	16.0	53.7	48.5	53.7	48.5
Actuated g/C Ratio	0.21	0.15	0.15	0.22	0.18	0.18	0.60	0.54	0.60	0.54
v/c Ratio	0.47	0.61	0.50	0.62	0.58	0.12	0.48	0.38	0.21	0.97
Control Delay	22.8	30.5	8.1	39.2	41.5	0.7	18.5	13.3	8.8	34.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.8	30.5	8.1	39.2	41.5	0.7	18.5	13.3	8.8	34.0
LOS	C	C	A	D	D	A	B	B	A	C
Approach Delay		20.1			35.7			13.7		33.3
Approach LOS		C			D			B		C

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.97
 Intersection Signal Delay: 27.5
 Intersection LOS: C
 Intersection Capacity Utilization 83.7%
 ICU Level of Service E
 Analysis Period (min) 15

Splits and Phases: 6: Federal Blvd. & W. 64th Ave.





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	115	176	178	151	191	47	101	1027	74	2637
v/c Ratio	0.47	0.61	0.50	0.62	0.58	0.12	0.48	0.38	0.21	0.97
Control Delay	22.8	30.5	8.1	39.2	41.5	0.7	18.5	13.3	8.8	34.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.8	30.5	8.1	39.2	41.5	0.7	18.5	13.3	8.8	34.0
Queue Length 50th (ft)	27	45	0	69	103	0	20	123	14	~599
Queue Length 95th (ft)	55	83	0	114	165	0	#68	164	35	#717
Internal Link Dist (ft)		1188			344			823		482
Turn Bay Length (ft)	100		150	150		100	600		250	
Base Capacity (vph)	245	374	425	243	378	423	209	2717	346	2721
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.47	0.47	0.42	0.62	0.51	0.11	0.48	0.38	0.21	0.97

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

HCM 6th Signalized Intersection Summary
6: Federal Blvd. & W. 64th Ave.

6501 Lowell Blvd
06/07/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	106	162	164	139	176	43	93	864	81	68	2266	160
Future Volume (veh/h)	106	162	164	139	176	43	93	864	81	68	2266	160
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	115	176	178	151	191	47	101	939	88	74	2463	174
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	235	267	226	236	271	229	179	2621	245	406	2668	186
Arrive On Green	0.02	0.05	0.05	0.06	0.14	0.14	0.05	0.55	0.55	0.05	0.55	0.55
Sat Flow, veh/h	1781	1870	1585	1781	1870	1585	1781	4750	444	1781	4874	339
Grp Volume(v), veh/h	115	176	178	151	191	47	101	672	355	74	1709	928
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	1585	1781	1702	1790	1781	1702	1809
Q Serve(g_s), s	4.9	8.3	10.0	5.3	8.8	2.4	2.2	9.9	10.0	1.6	41.1	42.9
Cycle Q Clear(g_c), s	4.9	8.3	10.0	5.3	8.8	2.4	2.2	9.9	10.0	1.6	41.1	42.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.25	1.00		0.19
Lane Grp Cap(c), veh/h	235	267	226	236	271	229	179	1878	988	406	1864	991
V/C Ratio(X)	0.49	0.66	0.79	0.64	0.71	0.20	0.56	0.36	0.36	0.18	0.92	0.94
Avail Cap(c_a), veh/h	235	376	319	236	380	322	189	1878	988	431	1864	991
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.94	0.94	0.94	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.6	40.7	41.5	33.5	36.7	33.9	20.9	11.3	11.3	8.3	18.5	18.9
Incr Delay (d2), s/veh	1.5	2.6	7.9	5.7	3.4	0.4	3.4	0.5	1.0	0.2	8.7	16.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	4.1	7.5	8.1	1.8	7.5	1.7	2.3	6.5	7.1	1.0	23.4	28.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.0	43.4	49.4	39.2	40.1	34.4	24.4	11.8	12.3	8.5	27.2	35.8
LnGrp LOS	C	D	D	D	D	C	C	B	B	A	C	D
Approach Vol, veh/h		469			389			1128			2711	
Approach Delay, s/veh		43.4			39.0			13.1			29.6	
Approach LOS		D			D			B			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.7	54.2	9.8	17.3	9.1	53.8	9.6	17.5				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	5.5	43.1	5.3	18.1	5.1	43.5	5.1	18.3				
Max Q Clear Time (g_c+I1), s	3.6	12.0	7.3	12.0	4.2	44.9	6.9	10.8				
Green Ext Time (p_c), s	0.0	8.2	0.0	0.8	0.0	0.0	0.0	0.7				
Intersection Summary												
HCM 6th Ctrl Delay				27.8								
HCM 6th LOS				C								



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		150	150		0	225		250	150		150
Storage Lanes	1		1	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850		0.903				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1682	0	1770	1863	1583	1770	1863	1583
Flt Permitted	0.724			0.748			0.530			0.330		
Satd. Flow (perm)	1349	1863	1583	1393	1682	0	987	1863	1583	615	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			75		33				27			87
Link Speed (mph)		30			30			30				30
Link Distance (ft)		549			716			667				367
Travel Time (s)		12.5			16.3			15.2				8.3

Intersection Summary

Area Type: Other

Timings
1: Lowell Blvd. & W. 68th Ave.

6501 Lowell Blvd
06/07/2021

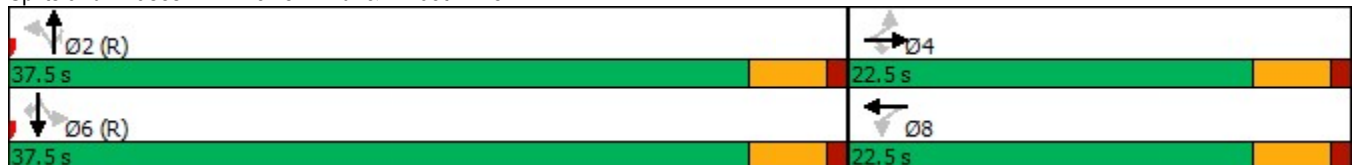


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑	↗	↖	↗	↖	↑	↗	↖	↑	↗
Traffic Volume (vph)	52	13	69	12	17	120	673	20	13	362	80
Future Volume (vph)	52	13	69	12	17	120	673	20	13	362	80
Turn Type	Perm	NA	Perm	Perm	NA	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8		2			6	
Permitted Phases	4		4	8		2		2	6		6
Detector Phase	4	4	4	8	8	2	2	2	6	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	22.5	22.5	22.5	22.5	22.5	37.5	37.5	37.5	37.5	37.5	37.5
Total Split (%)	37.5%	37.5%	37.5%	37.5%	37.5%	62.5%	62.5%	62.5%	62.5%	62.5%	62.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag											
Lead-Lag Optimize?											
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	8.1	8.1	8.1	8.1	8.1	45.8	45.8	45.8	45.8	45.8	45.8
Actuated g/C Ratio	0.14	0.14	0.14	0.14	0.14	0.76	0.76	0.76	0.76	0.76	0.76
v/c Ratio	0.31	0.06	0.27	0.07	0.20	0.17	0.51	0.02	0.03	0.28	0.07
Control Delay	27.3	21.6	9.1	22.1	13.9	3.9	5.8	1.4	3.4	3.8	1.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.3	21.6	9.1	22.1	13.9	3.9	5.8	1.4	3.4	3.8	1.1
LOS	C	C	A	C	B	A	A	A	A	A	A
Approach Delay		17.4			15.5		5.4			3.3	
Approach LOS		B			B		A			A	

Intersection Summary

Cycle Length: 60
 Actuated Cycle Length: 60
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.51
 Intersection Signal Delay: 6.3
 Intersection Capacity Utilization 60.4%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service B

Splits and Phases: 1: Lowell Blvd. & W. 68th Ave.





Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	57	14	75	13	51	130	732	22	14	393	87
v/c Ratio	0.31	0.06	0.27	0.07	0.20	0.17	0.51	0.02	0.03	0.28	0.07
Control Delay	27.3	21.6	9.1	22.1	13.9	3.9	5.8	1.4	3.4	3.8	1.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.3	21.6	9.1	22.1	13.9	3.9	5.8	1.4	3.4	3.8	1.1
Queue Length 50th (ft)	19	5	0	4	6	11	91	0	1	38	0
Queue Length 95th (ft)	46	17	29	16	30	32	198	5	6	83	10
Internal Link Dist (ft)		469			636		587			287	
Turn Bay Length (ft)	150		150	150		225		250	150		150
Base Capacity (vph)	404	558	527	417	527	754	1423	1215	469	1423	1230
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.03	0.14	0.03	0.10	0.17	0.51	0.02	0.03	0.28	0.07

Intersection Summary

HCM 6th Signalized Intersection Summary
 1: Lowell Blvd. & W. 68th Ave.

6501 Lowell Blvd
 06/07/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	52	13	69	12	17	30	120	673	20	13	362	80
Future Volume (veh/h)	52	13	69	12	17	30	120	673	20	13	362	80
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	57	14	75	13	18	33	130	732	22	14	393	87
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	223	195	165	247	62	113	741	1395	1182	533	1395	1182
Arrive On Green	0.10	0.10	0.10	0.10	0.10	0.10	0.75	0.75	0.75	0.75	0.75	0.75
Sat Flow, veh/h	1354	1870	1585	1308	591	1084	915	1870	1585	710	1870	1585
Grp Volume(v), veh/h	57	14	75	13	0	51	130	732	22	14	393	87
Grp Sat Flow(s),veh/h/ln	1354	1870	1585	1308	0	1675	915	1870	1585	710	1870	1585
Q Serve(g_s), s	2.4	0.4	2.7	0.5	0.0	1.7	3.2	9.8	0.2	0.5	4.1	0.9
Cycle Q Clear(g_c), s	4.1	0.4	2.7	0.9	0.0	1.7	7.3	9.8	0.2	10.3	4.1	0.9
Prop In Lane	1.00		1.00	1.00		0.65	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	223	195	165	247	0	174	741	1395	1182	533	1395	1182
V/C Ratio(X)	0.26	0.07	0.45	0.05	0.00	0.29	0.18	0.52	0.02	0.03	0.28	0.07
Avail Cap(c_a), veh/h	488	561	476	504	0	503	741	1395	1182	533	1395	1182
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.7	24.3	25.3	24.7	0.0	24.8	3.6	3.2	2.0	5.3	2.5	2.0
Incr Delay (d2), s/veh	0.6	0.2	2.0	0.1	0.0	0.9	0.5	1.4	0.0	0.1	0.5	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.4	0.3	1.9	0.3	0.0	1.2	0.9	3.9	0.1	0.1	1.6	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.3	24.4	27.2	24.8	0.0	25.8	4.1	4.6	2.0	5.4	3.0	2.2
LnGrp LOS	C	C	C	C	A	C	A	A	A	A	A	A
Approach Vol, veh/h		146			64			884			494	
Approach Delay, s/veh		27.0			25.6			4.5			2.9	
Approach LOS		C			C			A			A	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		49.3		10.7		49.3		10.7				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		33.0		18.0		33.0		18.0				
Max Q Clear Time (g_c+I1), s		11.8		6.1		12.3		3.7				
Green Ext Time (p_c), s		6.3		0.3		2.8		0.2				

Intersection Summary		
HCM 6th Ctrl Delay		6.9
HCM 6th LOS		A



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↘		↗	↘	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	100		0	100		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.963			0.942			0.996			0.992	
Flt Protected		0.971			0.986		0.950		0.950		0.950	
Satd. Flow (prot)	0	1742	0	0	1730	0	1770	1855	0	1770	1848	0
Flt Permitted		0.971			0.986		0.950		0.950		0.950	
Satd. Flow (perm)	0	1742	0	0	1730	0	1770	1855	0	1770	1848	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		458			470			732			667	
Travel Time (s)		10.4			10.7			16.6			15.2	

Intersection Summary

Area Type: Other

Intersection												
Int Delay, s/veh	3.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	34	7	16	9	9	14	29	752	23	17	398	22
Future Vol, veh/h	34	7	16	9	9	14	29	752	23	17	398	22
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	37	8	17	10	10	15	32	817	25	18	433	24

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1387	1387	445	1388	1387	830	457	0	0	842	0	0
Stage 1	481	481	-	894	894	-	-	-	-	-	-	-
Stage 2	906	906	-	494	493	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	120	143	613	120	143	370	1104	-	-	794	-	-
Stage 1	566	554	-	336	360	-	-	-	-	-	-	-
Stage 2	331	355	-	557	547	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	105	136	613	107	136	370	1104	-	-	794	-	-
Mov Cap-2 Maneuver	105	136	-	107	136	-	-	-	-	-	-	-
Stage 1	550	541	-	326	350	-	-	-	-	-	-	-
Stage 2	300	345	-	521	534	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	48.7		31.5		0.3		0.4	
HCM LOS	E		D					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1104	-	-	142	170	794	-	-
HCM Lane V/C Ratio	0.029	-	-	0.436	0.205	0.023	-	-
HCM Control Delay (s)	8.4	-	-	48.7	31.5	9.6	-	-
HCM Lane LOS	A	-	-	E	D	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	1.9	0.7	0.1	-	-



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	100		0	100		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt					0.932			0.998				
Flt Protected					0.976					0.950		
Satd. Flow (prot)	0	1863	0	0	1694	0	1863	1859	0	1770	1863	0
Flt Permitted					0.976					0.950		
Satd. Flow (perm)	0	1863	0	0	1694	0	1863	1859	0	1770	1863	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		319			430			608			732	
Travel Time (s)		7.3			9.8			13.8			16.6	

Intersection Summary

Area Type: Other

Intersection												
Int Delay, s/veh	0.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	0	0	0	13	0	13	0	763	12	17	433	0
Future Vol, veh/h	0	0	0	13	0	13	0	763	12	17	433	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	14	0	14	0	829	13	18	471	0

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	1350	1349	471	1343	1343	836	471	0	0	842	0	0
Stage 1	507	507	-	836	836	-	-	-	-	-	-	-
Stage 2	843	842	-	507	507	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	128	151	593	129	152	367	1091	-	-	794	-	-
Stage 1	548	539	-	362	382	-	-	-	-	-	-	-
Stage 2	358	380	-	548	539	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	121	148	593	127	149	367	1091	-	-	794	-	-
Mov Cap-2 Maneuver	121	148	-	127	149	-	-	-	-	-	-	-
Stage 1	548	527	-	362	382	-	-	-	-	-	-	-
Stage 2	344	380	-	536	527	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	0		27.4		0		0.4	
HCM LOS	A		D					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1091	-	-	-	-	189	794	-
HCM Lane V/C Ratio	-	-	-	-	0.15	0.023	-	-
HCM Control Delay (s)	0	-	-	0	27.4	9.6	-	-
HCM Lane LOS	A	-	-	A	D	A	-	-
HCM 95th %tile Q(veh)	0	-	-	-	0.5	0.1	-	-

Lanes and Geometrics
 4: Tennyson St. & W 64th Ave.

6501 Lowell Blvd
 06/07/2021



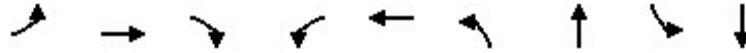
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		100	150		0	0		0	0		0
Storage Lanes	1		1	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850		0.994			0.920				0.953
Flt Protected	0.950			0.950				0.984				0.983
Satd. Flow (prot)	1770	1863	1583	1770	1852	0	0	1686	0	0	1745	0
Flt Permitted	0.247			0.128				0.884				0.863
Satd. Flow (perm)	460	1863	1583	238	1852	0	0	1515	0	0	1532	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			62		4			93				15
Link Speed (mph)		30			30			30				30
Link Distance (ft)		501			1329			646				482
Travel Time (s)		11.4			30.2			14.7				11.0

Intersection Summary

Area Type: Other

Timings
4: Tennyson St. & W 64th Ave.

6501 Lowell Blvd
06/07/2021

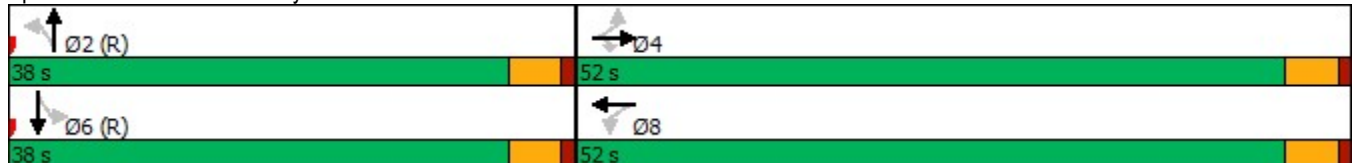


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↖	↑	↗	↖	↗		↕		↕
Traffic Volume (vph)	22	675	98	85	519	121	35	14	12
Future Volume (vph)	22	675	98	85	519	121	35	14	12
Turn Type	Perm	NA	Perm	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4			8		2		6
Permitted Phases	4		4	8		2		6	
Detector Phase	4	4	4	8	8	2	2	6	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	52.0	52.0	52.0	52.0	52.0	38.0	38.0	38.0	38.0
Total Split (%)	57.8%	57.8%	57.8%	57.8%	57.8%	42.2%	42.2%	42.2%	42.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0		0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5		4.5		4.5
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	42.3	42.3	42.3	42.3	42.3		38.7		38.7
Actuated g/C Ratio	0.47	0.47	0.47	0.47	0.47		0.43		0.43
v/c Ratio	0.11	0.84	0.14	0.83	0.68		0.59		0.06
Control Delay	12.8	30.1	5.9	79.7	36.4		20.5		13.3
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	12.8	30.1	5.9	79.7	36.4		20.5		13.3
LOS	B	C	A	E	D		C		B
Approach Delay		26.6			42.2		20.5		13.3
Approach LOS		C			D		C		B

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 55
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.84
 Intersection Signal Delay: 30.4
 Intersection Capacity Utilization 80.0%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service D

Splits and Phases: 4: Tennyson St. & W 64th Ave.





Lane Group	EBL	EBT	EBR	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	24	734	107	92	589	418	43
v/c Ratio	0.11	0.84	0.14	0.83	0.68	0.59	0.06
Control Delay	12.8	30.1	5.9	79.7	36.4	20.5	13.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.8	30.1	5.9	79.7	36.4	20.5	13.3
Queue Length 50th (ft)	7	336	13	54	335	142	9
Queue Length 95th (ft)	20	455	37	m#85	m394	260	32
Internal Link Dist (ft)		421			1249	566	402
Turn Bay Length (ft)	150		100	150			
Base Capacity (vph)	242	983	864	125	979	705	667
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.75	0.12	0.74	0.60	0.59	0.06

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

HCM 6th Signalized Intersection Summary
 4: Tennyson St. & W 64th Ave.

6501 Lowell Blvd
 06/07/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	22	675	98	85	519	23	121	35	228	14	12	14
Future Volume (veh/h)	22	675	98	85	519	23	121	35	228	14	12	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	24	734	107	92	564	25	132	38	248	15	13	15
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	487	930	788	193	883	39	227	80	371	220	192	192
Arrive On Green	0.50	0.50	0.50	0.99	0.99	0.99	0.40	0.40	0.40	0.40	0.40	0.40
Sat Flow, veh/h	827	1870	1585	654	1777	79	433	198	921	413	476	476
Grp Volume(v), veh/h	24	734	107	92	0	589	418	0	0	43	0	0
Grp Sat Flow(s),veh/h/ln	827	1870	1585	654	0	1856	1552	0	0	1366	0	0
Q Serve(g_s), s	1.4	29.2	3.3	11.5	0.0	0.5	15.7	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	1.8	29.2	3.3	40.8	0.0	0.5	19.6	0.0	0.0	1.3	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.04	0.32		0.59	0.35		0.35
Lane Grp Cap(c), veh/h	487	930	788	193	0	923	678	0	0	604	0	0
V/C Ratio(X)	0.05	0.79	0.14	0.48	0.00	0.64	0.62	0.00	0.00	0.07	0.00	0.00
Avail Cap(c_a), veh/h	512	987	837	213	0	980	678	0	0	604	0	0
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.75	0.00	0.75	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	12.0	18.7	12.2	13.6	0.0	0.1	21.8	0.0	0.0	16.4	0.0	0.0
Incr Delay (d2), s/veh	0.0	4.2	0.1	1.4	0.0	1.0	4.2	0.0	0.0	0.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.4	18.6	2.0	2.6	0.0	0.6	12.2	0.0	0.0	1.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	12.0	22.9	12.3	15.0	0.0	1.1	25.9	0.0	0.0	16.7	0.0	0.0
LnGrp LOS	B	C	B	B	A	A	C	A	A	B	A	A
Approach Vol, veh/h		865			681			418				43
Approach Delay, s/veh		21.3			3.0			25.9				16.7
Approach LOS		C			A			C				B
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		40.8		49.2		40.8		49.2				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		33.5		47.5		33.5		47.5				
Max Q Clear Time (g_c+I1), s		21.6		31.2		3.3		42.8				
Green Ext Time (p_c), s		2.2		5.3		0.2		1.9				

Intersection Summary

HCM 6th Ctrl Delay	15.9
HCM 6th LOS	B



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	200		150	150		75	200		150	200		100
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.143			0.496			0.603			0.212		
Satd. Flow (perm)	266	1863	1583	924	1863	1583	1123	1863	1583	395	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			84			127			127			174
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1329			1480			763			608	
Travel Time (s)		30.2			33.6			17.3			13.8	

Intersection Summary

Area Type: Other



























Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	261	465	84	57	430	70	148	501	121	48	252	174
v/c Ratio	0.85	0.57	0.11	0.24	0.89	0.14	0.33	0.67	0.17	0.18	0.29	0.21
Control Delay	50.5	31.4	9.7	31.6	49.9	7.6	23.6	29.9	4.4	15.8	16.7	3.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.5	31.4	9.7	31.6	49.9	7.6	23.6	29.9	4.4	15.8	16.7	3.1
Queue Length 50th (ft)	134	227	9	30	270	3	63	254	0	15	89	0
Queue Length 95th (ft)	m#193	314	m23	m37	m320	m4	118	#410	33	35	143	35
Internal Link Dist (ft)		1249			1400			683			528	
Turn Bay Length (ft)	200		150	150		75	200		150	200		100
Base Capacity (vph)	308	844	763	254	513	528	448	743	708	263	861	825
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.85	0.55	0.11	0.22	0.84	0.13	0.33	0.67	0.17	0.18	0.29	0.21

Intersection Summary

- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

HCM 6th Signalized Intersection Summary
 5: W 64th Ave./W. 64th Ave. & Lowell Blvd.

6501 Lowell Blvd
 06/07/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	240	428	77	52	396	64	136	461	111	44	232	160
Future Volume (veh/h)	240	428	77	52	396	64	136	461	111	44	232	160
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	261	465	84	57	430	70	148	501	121	48	252	174
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	329	810	686	290	483	409	444	708	600	270	874	740
Arrive On Green	0.12	0.43	0.43	0.09	0.09	0.09	0.38	0.38	0.38	0.04	0.47	0.47
Sat Flow, veh/h	1781	1870	1585	858	1870	1585	961	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	261	465	84	57	430	70	148	501	121	48	252	174
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	858	1870	1585	961	1870	1585	1781	1870	1585
Q Serve(g_s), s	9.2	16.9	2.9	5.6	20.5	3.7	10.2	20.5	4.6	1.4	7.5	5.9
Cycle Q Clear(g_c), s	9.2	16.9	2.9	6.8	20.5	3.7	10.2	20.5	4.6	1.4	7.5	5.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	329	810	686	290	483	409	444	708	600	270	874	740
V/C Ratio(X)	0.79	0.57	0.12	0.20	0.89	0.17	0.33	0.71	0.20	0.18	0.29	0.23
Avail Cap(c_a), veh/h	335	848	719	305	515	437	444	708	600	300	874	740
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.43	0.43	0.43	0.46	0.46	0.46	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.1	19.3	15.3	34.2	39.9	32.2	20.6	23.8	18.8	17.5	14.8	14.4
Incr Delay (d2), s/veh	5.5	0.4	0.0	0.2	8.7	0.1	2.0	5.9	0.8	0.3	0.8	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	6.3	9.9	1.8	2.2	15.1	2.6	4.4	15.0	3.2	1.0	5.8	3.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.6	19.6	15.3	34.3	48.6	32.3	22.6	29.7	19.6	17.8	15.6	15.1
LnGrp LOS	C	B	B	C	D	C	C	C	B	B	B	B
Approach Vol, veh/h		810			557			770				474
Approach Delay, s/veh		21.8			45.1			26.7				15.6
Approach LOS		C			D			C				B
Timer - Assigned Phs	1	2		4		6	7	8				
Phs Duration (G+Y+Rc), s	8.0	38.6		43.5		46.5	15.7	27.8				
Change Period (Y+Rc), s	4.5	4.5		4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s	5.0	30.7		40.8		40.2	11.5	24.8				
Max Q Clear Time (g_c+I1), s	3.4	22.5		18.9		9.5	11.2	22.5				
Green Ext Time (p_c), s	0.0	2.8		3.3		2.2	0.0	0.8				
Intersection Summary												
HCM 6th Ctrl Delay				27.1								
HCM 6th LOS				C								



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	100		150	150		100	600		0	250		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor			0.850			0.850		0.993			0.988	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	5050	0	1770	5024	0
Flt Permitted	0.243			0.498			0.108			0.123		
Satd. Flow (perm)	453	1863	1583	928	1863	1583	201	5050	0	229	5024	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			198			236			10			17
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1480			550			1046			611	
Travel Time (s)		33.6			12.5			23.8			13.9	

Intersection Summary

Area Type: Other

Timings
6: Federal Blvd. & W. 64th Ave.

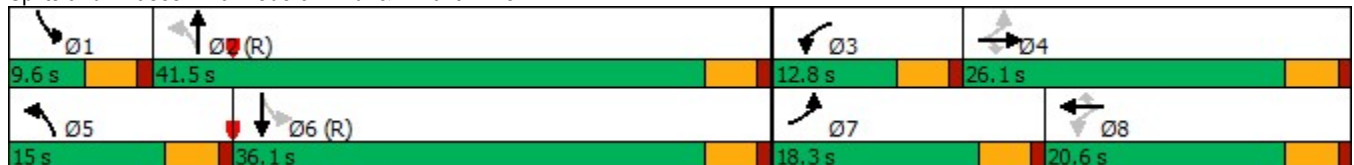
6501 Lowell Blvd
06/07/2021

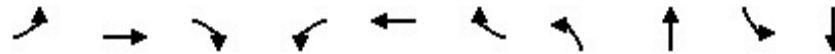
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	
Lane Configurations											
Traffic Volume (vph)	301	255	182	120	223	103	231	1979	90	1620	
Future Volume (vph)	301	255	182	120	223	103	231	1979	90	1620	
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA	
Protected Phases	7	4		3	8		5	2	1	6	
Permitted Phases	4		4	8		8	2		6		
Detector Phase	7	4	4	3	8	8	5	2	1	6	
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	9.5	22.5	22.5	9.5	20.6	20.6	9.5	22.5	9.5	22.5	
Total Split (s)	18.3	26.1	26.1	12.8	20.6	20.6	15.0	41.5	9.6	36.1	
Total Split (%)	20.3%	29.0%	29.0%	14.2%	22.9%	22.9%	16.7%	46.1%	10.7%	40.1%	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None	None	None	None	None	None	C-Max	None	C-Max	
Act Effct Green (s)	33.2	20.7	20.7	22.9	14.9	14.9	47.8	39.9	38.1	32.6	
Actuated g/C Ratio	0.37	0.23	0.23	0.25	0.17	0.17	0.53	0.44	0.42	0.36	
v/c Ratio	0.89	0.65	0.38	0.42	0.79	0.24	0.86	1.01	0.51	1.04	
Control Delay	63.9	53.7	18.4	24.0	54.8	1.3	47.1	47.8	22.4	62.9	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	63.9	53.7	18.4	24.0	54.8	1.3	47.1	47.8	22.4	62.9	
LOS	E	D	B	C	D	A	D	D	C	E	
Approach Delay		49.1			34.1			47.8		60.9	
Approach LOS		D			C			D		E	

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.04
 Intersection Signal Delay: 51.4
 Intersection Capacity Utilization 90.6%
 Analysis Period (min) 15
 Intersection LOS: D
 ICU Level of Service E

Splits and Phases: 6: Federal Blvd. & W. 64th Ave.





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	327	277	198	130	242	112	251	2258	98	1911
v/c Ratio	0.89	0.65	0.38	0.42	0.79	0.24	0.86	1.01	0.51	1.04
Control Delay	63.9	53.7	18.4	24.0	54.8	1.3	47.1	47.8	22.4	62.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.9	53.7	18.4	24.0	54.8	1.3	47.1	47.8	22.4	62.9
Queue Length 50th (ft)	176	154	30	48	131	0	91	~533	27	~446
Queue Length 95th (ft)	#276	236	84	88	#236	0	#227	#631	#54	#544
Internal Link Dist (ft)		1400			470			966		531
Turn Bay Length (ft)	100		150	150		100	600		250	
Base Capacity (vph)	369	447	530	316	333	476	294	2243	191	1832
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.89	0.62	0.37	0.41	0.73	0.24	0.85	1.01	0.51	1.04

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

HCM 6th Signalized Intersection Summary
6: Federal Blvd. & W. 64th Ave.

6501 Lowell Blvd
06/07/2021


























Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	301	255	182	120	223	103	231	1979	98	90	1620	138
Future Volume (veh/h)	301	255	182	120	223	103	231	1979	98	90	1620	138
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	327	277	198	130	242	112	251	2151	107	98	1761	150
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	381	425	360	298	287	243	285	2205	109	173	1825	155
Arrive On Green	0.05	0.07	0.07	0.08	0.15	0.15	0.11	0.44	0.44	0.05	0.38	0.38
Sat Flow, veh/h	1781	1870	1585	1781	1870	1585	1781	4983	247	1781	4794	407
Grp Volume(v), veh/h	327	277	198	130	242	112	251	1466	792	98	1249	662
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	1585	1781	1702	1826	1781	1702	1797
Q Serve(g_s), s	13.2	13.0	10.8	5.4	11.3	5.8	8.1	38.0	38.4	3.0	32.3	32.5
Cycle Q Clear(g_c), s	13.2	13.0	10.8	5.4	11.3	5.8	8.1	38.0	38.4	3.0	32.3	32.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.14	1.00		0.23
Lane Grp Cap(c), veh/h	381	425	360	298	287	243	285	1506	808	173	1296	684
V/C Ratio(X)	0.86	0.65	0.55	0.44	0.84	0.46	0.88	0.97	0.98	0.57	0.96	0.97
Avail Cap(c_a), veh/h	381	449	380	321	335	284	292	1506	808	184	1296	684
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.88	0.88	0.88	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.2	38.2	37.2	28.8	37.0	34.7	23.0	24.6	24.7	21.9	27.3	27.3
Incr Delay (d2), s/veh	15.6	2.7	1.3	1.0	15.7	1.4	24.7	17.6	27.2	3.6	17.7	27.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	12.2	10.8	8.1	4.3	10.4	4.1	8.9	24.9	29.2	2.4	22.1	25.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	44.7	40.9	38.5	29.8	52.7	36.1	47.7	42.2	51.9	25.5	45.0	54.7
LnGrp LOS	D	D	D	C	D	D	D	D	D	C	D	D
Approach Vol, veh/h		802			484			2509			2009	
Approach Delay, s/veh		41.9			42.7			45.8			47.2	
Approach LOS		D			D			D			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.1	44.3	11.7	24.9	14.6	38.8	18.3	18.3				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	5.1	37.0	8.3	21.6	10.5	31.6	13.8	16.1				
Max Q Clear Time (g_c+I1), s	5.0	40.4	7.4	15.0	10.1	34.5	15.2	13.3				
Green Ext Time (p_c), s	0.0	0.0	0.0	1.3	0.0	0.0	0.0	0.5				

Intersection Summary

HCM 6th Ctrl Delay	45.5
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		150	150		0	225		250	150		150
Storage Lanes	1		1	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850		0.929				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1730	0	1770	1863	1583	1770	1863	1583
Flt Permitted	0.744			0.751			0.556			0.633		
Satd. Flow (perm)	1386	1863	1583	1399	1730	0	1036	1863	1583	1179	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			121		10				27			58
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		594			990			699			502	
Travel Time (s)		13.5			22.5			15.9			11.4	

Intersection Summary

Area Type: Other

Timings
1: Lowell Blvd. & W. 68th Ave.

6501 Lowell Blvd
06/07/2021



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑	↗	↖	↗	↖	↑	↗	↖	↑	↗
Traffic Volume (vph)	50	9	111	3	10	63	183	1	16	313	53
Future Volume (vph)	50	9	111	3	10	63	183	1	16	313	53
Turn Type	Perm	NA	Perm	Perm	NA	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8		2			6	
Permitted Phases	4		4	8		2		2	6		6
Detector Phase	4	4	4	8	8	2	2	2	6	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	26.0	26.0	26.0	26.0	26.0	34.0	34.0	34.0	34.0	34.0	34.0
Total Split (%)	43.3%	43.3%	43.3%	43.3%	43.3%	56.7%	56.7%	56.7%	56.7%	56.7%	56.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag											
Lead-Lag Optimize?											
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	7.9	7.9	7.9	7.9	7.9	46.0	46.0	46.0	46.0	46.0	46.0
Actuated g/C Ratio	0.13	0.13	0.13	0.13	0.13	0.77	0.77	0.77	0.77	0.77	0.77
v/c Ratio	0.30	0.04	0.39	0.02	0.09	0.09	0.14	0.00	0.02	0.24	0.05
Control Delay	27.0	21.7	9.2	21.3	16.9	3.3	3.2	0.0	3.1	3.6	1.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.0	21.7	9.2	21.3	16.9	3.3	3.2	0.0	3.1	3.6	1.2
LOS	C	C	A	C	B	A	A	A	A	A	A
Approach Delay		15.1			17.4		3.2			3.2	
Approach LOS		B			B		A			A	

Intersection Summary

Cycle Length: 60
 Actuated Cycle Length: 60
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 45
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.39
 Intersection Signal Delay: 6.1
 Intersection Capacity Utilization 41.3%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service A

Splits and Phases: 1: Lowell Blvd. & W. 68th Ave.



Queues

6501 Lowell Blvd

1: Lowell Blvd. & W. 68th Ave.

06/07/2021

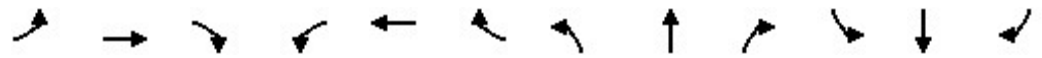


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	54	10	121	3	21	68	199	1	17	340	58
v/c Ratio	0.30	0.04	0.39	0.02	0.09	0.09	0.14	0.00	0.02	0.24	0.05
Control Delay	27.0	21.7	9.2	21.3	16.9	3.3	3.2	0.0	3.1	3.6	1.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.0	21.7	9.2	21.3	16.9	3.3	3.2	0.0	3.1	3.6	1.2
Queue Length 50th (ft)	18	3	0	1	4	5	17	0	1	31	0
Queue Length 95th (ft)	44	14	37	7	19	18	40	0	6	69	8
Internal Link Dist (ft)		514			910		619			422	
Turn Bay Length (ft)	150		150	150		225		250	150		150
Base Capacity (vph)	496	667	644	501	626	794	1429	1220	904	1429	1227
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.01	0.19	0.01	0.03	0.09	0.14	0.00	0.02	0.24	0.05

Intersection Summary

HCM 6th Signalized Intersection Summary
 1: Lowell Blvd. & W. 68th Ave.

6501 Lowell Blvd
 06/07/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	9	111	3	10	9	63	183	1	16	313	53
Future Volume (veh/h)	50	9	111	3	10	9	63	183	1	16	313	53
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	54	10	121	3	11	10	68	199	1	17	340	58
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	259	208	176	254	100	91	792	1382	1171	957	1382	1171
Arrive On Green	0.11	0.11	0.11	0.11	0.11	0.11	0.74	0.74	0.74	0.74	0.74	0.74
Sat Flow, veh/h	1391	1870	1585	1259	902	820	987	1870	1585	1182	1870	1585
Grp Volume(v), veh/h	54	10	121	3	0	21	68	199	1	17	340	58
Grp Sat Flow(s),veh/h/ln	1391	1870	1585	1259	0	1723	987	1870	1585	1182	1870	1585
Q Serve(g_s), s	2.2	0.3	4.4	0.1	0.0	0.7	1.4	1.9	0.0	0.3	3.5	0.6
Cycle Q Clear(g_c), s	2.8	0.3	4.4	0.4	0.0	0.7	4.9	1.9	0.0	2.1	3.5	0.6
Prop In Lane	1.00		1.00	1.00		0.48	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	259	208	176	254	0	191	792	1382	1171	957	1382	1171
V/C Ratio(X)	0.21	0.05	0.69	0.01	0.00	0.11	0.09	0.14	0.00	0.02	0.25	0.05
Avail Cap(c_a), veh/h	603	670	568	565	0	617	792	1382	1171	957	1382	1171
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.3	23.8	25.7	24.0	0.0	24.0	3.3	2.3	2.0	2.6	2.5	2.1
Incr Delay (d2), s/veh	0.4	0.1	4.7	0.0	0.0	0.3	0.2	0.2	0.0	0.0	0.4	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.3	0.2	3.2	0.1	0.0	0.5	0.4	0.7	0.0	0.1	1.4	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.7	23.9	30.3	24.0	0.0	24.2	3.5	2.5	2.0	2.6	2.9	2.2
LnGrp LOS	C	C	C	C	A	C	A	A	A	A	A	A
Approach Vol, veh/h		185			24			268			415	
Approach Delay, s/veh		28.6			24.2			2.8			2.8	
Approach LOS		C			C			A			A	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		48.8		11.2		48.8		11.2				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		29.5		21.5		29.5		21.5				
Max Q Clear Time (g_c+I1), s		6.9		6.4		5.5		2.7				
Green Ext Time (p_c), s		1.4		0.5		2.3		0.1				

Intersection Summary		
HCM 6th Ctrl Delay		8.7
HCM 6th LOS		A



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↘		↗	↘	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	100		0	100		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.920			0.940			0.996			0.993	
Flt Protected		0.985			0.978		0.950		0.950		0.950	
Satd. Flow (prot)	0	1688	0	0	1712	0	1770	1855	0	1770	1850	0
Flt Permitted		0.985			0.978		0.950		0.950		0.950	
Satd. Flow (perm)	0	1688	0	0	1712	0	1770	1855	0	1770	1850	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		458			470			732			699	
Travel Time (s)		10.4			10.7			16.6			15.9	

Intersection Summary

Area Type: Other

Intersection												
Int Delay, s/veh	1.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	13	5	26	14	4	14	10	326	9	4	435	21
Future Vol, veh/h	13	5	26	14	4	14	10	326	9	4	435	21
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	14	5	28	15	4	15	11	354	10	4	473	23

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	884	879	485	890	885	359	496	0	0	364	0	0
Stage 1	493	493	-	381	381	-	-	-	-	-	-	-
Stage 2	391	386	-	509	504	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	266	286	582	264	284	685	1068	-	-	1195	-	-
Stage 1	558	547	-	641	613	-	-	-	-	-	-	-
Stage 2	633	610	-	547	541	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	254	282	582	245	280	685	1068	-	-	1195	-	-
Mov Cap-2 Maneuver	254	282	-	245	280	-	-	-	-	-	-	-
Stage 1	552	545	-	635	607	-	-	-	-	-	-	-
Stage 2	608	604	-	514	539	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	15.6		16.5		0.2		0.1	
HCM LOS	C		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1068	-	-	387	348	1195	-
HCM Lane V/C Ratio	0.01	-	-	0.124	0.1	0.004	-
HCM Control Delay (s)	8.4	-	-	15.6	16.5	8	-
HCM Lane LOS	A	-	-	C	C	A	-
HCM 95th %tile Q(veh)	0	-	-	0.4	0.3	0	-



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↘		↗	↘	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	100		0	100		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.916			0.922			0.996				0.999
Flt Protected		0.986			0.983		0.950			0.950		
Satd. Flow (prot)	0	1682	0	0	1688	0	1770	1855	0	1770	1861	0
Flt Permitted		0.986			0.983		0.950			0.950		
Satd. Flow (perm)	0	1682	0	0	1688	0	1770	1855	0	1770	1861	0
Link Speed (mph)		30			30			30				30
Link Distance (ft)		319			430			608				732
Travel Time (s)		7.3			9.8			13.8				16.6

Intersection Summary

Area Type: Other

Intersection												
Int Delay, s/veh	1.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	11	4	24	8	2	14	8	322	9	12	461	4
Future Vol, veh/h	11	4	24	8	2	14	8	322	9	12	461	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	12	4	26	9	2	15	9	350	10	13	501	4

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	911	907	503	917	904	355	505	0	0	360	0	0
Stage 1	529	529	-	373	373	-	-	-	-	-	-	-
Stage 2	382	378	-	544	531	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	255	276	569	253	277	689	1060	-	-	1199	-	-
Stage 1	533	527	-	648	618	-	-	-	-	-	-	-
Stage 2	640	615	-	523	526	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	244	271	569	235	272	689	1060	-	-	1199	-	-
Mov Cap-2 Maneuver	244	271	-	235	272	-	-	-	-	-	-	-
Stage 1	529	521	-	643	613	-	-	-	-	-	-	-
Stage 2	618	610	-	489	520	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	15.6		14.9		0.2		0.2	
HCM LOS	C		B					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1060	-	-	382	389	1199	-	-
HCM Lane V/C Ratio	0.008	-	-	0.111	0.067	0.011	-	-
HCM Control Delay (s)	8.4	-	-	15.6	14.9	8	-	-
HCM Lane LOS	A	-	-	C	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.4	0.2	0	-	-

Lanes and Geometrics
 4: Tennyson St. & W 64th Ave.

6501 Lowell Blvd
 06/07/2021



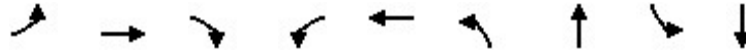
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%				0%
Storage Length (ft)	150		100	150		0	0		0	0		0
Storage Lanes	1		1	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850		0.995			0.919				0.951
Flt Protected	0.950			0.950				0.984				0.992
Satd. Flow (prot)	1770	1863	1583	1770	1853	0	0	1684	0	0	1757	0
Flt Permitted	0.239			0.368				0.904				0.965
Satd. Flow (perm)	445	1863	1583	685	1853	0	0	1548	0	0	1709	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			65		3			92				18
Link Speed (mph)		30			30			30				30
Link Distance (ft)		700			838			502				485
Travel Time (s)		15.9			19.0			11.4				11.0

Intersection Summary

Area Type: Other

Timings
4: Tennyson St. & W 64th Ave.

6501 Lowell Blvd
06/07/2021

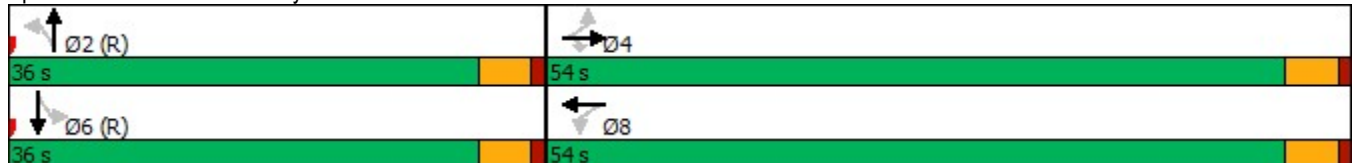


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↖	↑	↗	↖	↗		↕		↕
Traffic Volume (vph)	12	319	60	160	401	56	14	7	22
Future Volume (vph)	12	319	60	160	401	56	14	7	22
Turn Type	Perm	NA	Perm	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4			8		2		6
Permitted Phases	4		4	8		2		6	
Detector Phase	4	4	4	8	8	2	2	6	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	54.0	54.0	54.0	54.0	54.0	36.0	36.0	36.0	36.0
Total Split (%)	60.0%	60.0%	60.0%	60.0%	60.0%	40.0%	40.0%	40.0%	40.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0		0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5		4.5		4.5
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	29.7	29.7	29.7	29.7	29.7		51.3		51.3
Actuated g/C Ratio	0.33	0.33	0.33	0.33	0.33		0.57		0.57
v/c Ratio	0.09	0.56	0.11	0.77	0.73		0.21		0.05
Control Delay	18.3	27.3	4.8	59.3	43.8		7.0		8.6
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	18.3	27.3	4.8	59.3	43.8		7.0		8.6
LOS	B	C	A	E	D		A		A
Approach Delay		23.6			48.2		7.0		8.6
Approach LOS		C			D		A		A

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 45
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.77
 Intersection Signal Delay: 32.5
 Intersection Capacity Utilization 54.3%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service A

Splits and Phases: 4: Tennyson St. & W 64th Ave.





Lane Group	EBL	EBT	EBR	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	13	347	65	174	450	190	50
v/c Ratio	0.09	0.56	0.11	0.77	0.73	0.21	0.05
Control Delay	18.3	27.3	4.8	59.3	43.8	7.0	8.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.3	27.3	4.8	59.3	43.8	7.0	8.6
Queue Length 50th (ft)	5	161	0	99	254	24	7
Queue Length 95th (ft)	16	200	22	167	342	73	30
Internal Link Dist (ft)		620			758	422	405
Turn Bay Length (ft)	150		100	150			
Base Capacity (vph)	244	1024	899	376	1020	921	981
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.34	0.07	0.46	0.44	0.21	0.05

Intersection Summary

HCM 6th Signalized Intersection Summary
 4: Tennyson St. & W 64th Ave.

6501 Lowell Blvd
 06/07/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	319	60	160	401	13	56	14	105	7	22	17
Future Volume (veh/h)	12	319	60	160	401	13	56	14	105	7	22	17
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	13	347	65	174	436	14	61	15	114	8	24	18
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	231	704	596	308	678	22	286	89	484	154	450	314
Arrive On Green	0.38	0.38	0.38	0.25	0.25	0.25	0.52	0.52	0.52	0.52	0.52	0.52
Sat Flow, veh/h	940	1870	1585	974	1802	58	446	170	923	205	860	599
Grp Volume(v), veh/h	13	347	65	174	0	450	190	0	0	50	0	0
Grp Sat Flow(s),veh/h/ln	940	1870	1585	974	0	1860	1539	0	0	1664	0	0
Q Serve(g_s), s	1.1	12.8	2.4	15.4	0.0	19.4	1.4	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	20.5	12.8	2.4	28.2	0.0	19.4	5.6	0.0	0.0	1.3	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.03	0.32		0.60	0.16		0.36
Lane Grp Cap(c), veh/h	231	704	596	308	0	700	859	0	0	918	0	0
V/C Ratio(X)	0.06	0.49	0.11	0.56	0.00	0.64	0.22	0.00	0.00	0.05	0.00	0.00
Avail Cap(c_a), veh/h	394	1029	872	477	0	1023	859	0	0	918	0	0
HCM Platoon Ratio	1.00	1.00	1.00	0.67	0.67	0.67	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	32.2	21.5	18.3	37.7	0.0	28.3	11.5	0.0	0.0	10.5	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.5	0.1	1.6	0.0	1.0	0.6	0.0	0.0	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.4	9.4	1.6	7.1	0.0	14.2	3.7	0.0	0.0	0.9	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	32.3	22.0	18.3	39.3	0.0	29.3	12.1	0.0	0.0	10.6	0.0	0.0
LnGrp LOS	C	C	B	D	A	C	B	A	A	B	A	A
Approach Vol, veh/h		425			624			190				50
Approach Delay, s/veh		21.8			32.0			12.1				10.6
Approach LOS		C			C			B				B
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		51.6		38.4		51.6		38.4				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		31.5		49.5		31.5		49.5				
Max Q Clear Time (g_c+I1), s		7.6		22.5		3.3		30.2				
Green Ext Time (p_c), s		1.1		2.5		0.2		3.7				
Intersection Summary												
HCM 6th Ctrl Delay				24.9								
HCM 6th LOS				C								



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	200		150	150		75	200		150	200		100
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.279			0.559			0.575			0.589		
Satd. Flow (perm)	520	1863	1583	1041	1863	1583	1071	1863	1583	1097	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			102			127			127			136
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		596			1268			763			608	
Travel Time (s)		13.5			28.8			17.3			13.8	

Intersection Summary

Area Type: Other

Timings
5: W 64th Ave./W. 64th Ave. & Lowell Blvd.

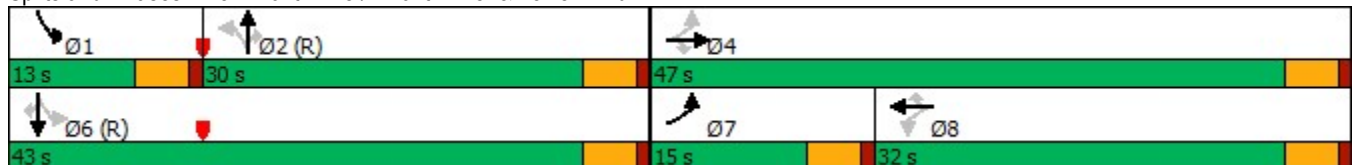
6501 Lowell Blvd
06/07/2021

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	117	307	94	72	241	44	47	134	56	94	279	125
Future Volume (vph)	117	307	94	72	241	44	47	134	56	94	279	125
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4			8			2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	7	4	4	8	8	8	2	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	15.0	47.0	47.0	32.0	32.0	32.0	30.0	30.0	30.0	13.0	43.0	43.0
Total Split (%)	16.7%	52.2%	52.2%	35.6%	35.6%	35.6%	33.3%	33.3%	33.3%	14.4%	47.8%	47.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead			Lag	Lag	Lag	Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes			Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	32.5	32.5	32.5	18.4	18.4	18.4	38.0	38.0	38.0	48.5	48.5	48.5
Actuated g/C Ratio	0.36	0.36	0.36	0.20	0.20	0.20	0.42	0.42	0.42	0.54	0.54	0.54
v/c Ratio	0.40	0.50	0.16	0.37	0.69	0.11	0.11	0.19	0.08	0.16	0.30	0.15
Control Delay	35.6	39.1	16.4	32.6	39.4	3.2	22.0	21.0	0.2	12.7	13.9	3.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.6	39.1	16.4	32.6	39.4	3.2	22.0	21.0	0.2	12.7	13.9	3.0
LOS	D	D	B	C	D	A	C	C	A	B	B	A
Approach Delay		34.2			33.5			16.3			10.9	
Approach LOS		C			C			B			B	

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 65
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.69
 Intersection Signal Delay: 24.2
 Intersection Capacity Utilization 54.2%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service A

Splits and Phases: 5: W 64th Ave./W. 64th Ave. & Lowell Blvd.





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	127	334	102	78	262	48	51	146	61	102	303	136
v/c Ratio	0.40	0.50	0.16	0.37	0.69	0.11	0.11	0.19	0.08	0.16	0.30	0.15
Control Delay	35.6	39.1	16.4	32.6	39.4	3.2	22.0	21.0	0.2	12.7	13.9	3.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.6	39.1	16.4	32.6	39.4	3.2	22.0	21.0	0.2	12.7	13.9	3.0
Queue Length 50th (ft)	68	187	17	39	141	1	18	53	0	27	91	0
Queue Length 95th (ft)	110	248	53	m59	m173	m4	51	115	0	63	172	31
Internal Link Dist (ft)		516			1188			683			528	
Turn Bay Length (ft)	200		150	150		75	200		150	200		100
Base Capacity (vph)	333	879	801	318	569	571	452	786	741	659	1004	916
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.38	0.38	0.13	0.25	0.46	0.08	0.11	0.19	0.08	0.15	0.30	0.15

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM 6th Signalized Intersection Summary
 5: W 64th Ave./W. 64th Ave. & Lowell Blvd.

6501 Lowell Blvd
 06/07/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↘	↖	↗	↘	↖	↗	↘	↖	↗	↘
Traffic Volume (veh/h)	117	307	94	72	241	44	47	134	56	94	279	125
Future Volume (veh/h)	117	307	94	72	241	44	47	134	56	94	279	125
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	127	334	102	78	262	48	51	146	61	102	303	136
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	259	570	483	208	335	284	549	924	783	701	1113	943
Arrive On Green	0.02	0.10	0.10	0.06	0.06	0.06	0.49	0.49	0.49	0.05	0.60	0.60
Sat Flow, veh/h	1781	1870	1585	953	1870	1585	950	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	127	334	102	78	262	48	51	146	61	102	303	136
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	953	1870	1585	950	1870	1585	1781	1870	1585
Q Serve(g_s), s	5.0	15.4	5.3	7.2	12.4	2.6	2.6	3.9	1.8	2.4	7.0	3.4
Cycle Q Clear(g_c), s	5.0	15.4	5.3	11.3	12.4	2.6	2.6	3.9	1.8	2.4	7.0	3.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	259	570	483	208	335	284	549	924	783	701	1113	943
V/C Ratio(X)	0.49	0.59	0.21	0.38	0.78	0.17	0.09	0.16	0.08	0.15	0.27	0.14
Avail Cap(c_a), veh/h	332	883	748	328	571	484	549	924	783	778	1113	943
HCM Platoon Ratio	0.33	0.33	0.33	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.76	0.76	0.76	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.1	35.0	30.5	42.1	40.6	36.0	12.2	12.5	12.0	9.1	8.8	8.1
Incr Delay (d2), s/veh	1.4	1.0	0.2	0.9	3.1	0.2	0.3	0.4	0.2	0.1	0.6	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	4.1	12.4	3.8	3.4	10.1	1.8	1.0	3.0	1.2	1.6	5.0	2.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	29.6	36.0	30.7	42.9	43.7	36.2	12.5	12.9	12.2	9.2	9.4	8.4
LnGrp LOS	C	D	C	D	D	D	B	B	B	A	A	A
Approach Vol, veh/h		563			388			258			541	
Approach Delay, s/veh		33.6			42.6			12.6			9.1	
Approach LOS		C			D			B			A	
Timer - Assigned Phs	1	2		4		6	7	8				
Phs Duration (G+Y+Rc), s	9.1	49.0		31.9		58.1	11.3	20.6				
Change Period (Y+Rc), s	4.5	4.5		4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s	8.5	25.5		42.5		38.5	10.5	27.5				
Max Q Clear Time (g_c+I1), s	4.4	5.9		17.4		9.0	7.0	14.4				
Green Ext Time (p_c), s	0.1	1.2		2.4		2.4	0.1	1.7				

Intersection Summary

HCM 6th Ctrl Delay	24.9
HCM 6th LOS	C



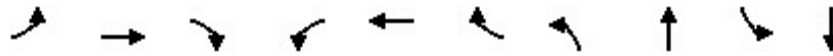
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	100		150	150		100	600		0	250		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor			0.850			0.850		0.987			0.990	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	5019	0	1770	5034	0
Flt Permitted	0.433			0.447			0.084			0.229		
Satd. Flow (perm)	807	1863	1583	833	1863	1583	156	5019	0	427	5034	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			134			127			23			17
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1268			424			903			562	
Travel Time (s)		28.8			9.6			20.5			12.8	

Intersection Summary

Area Type: Other

Timings
6: Federal Blvd. & W. 64th Ave.

6501 Lowell Blvd
06/07/2021

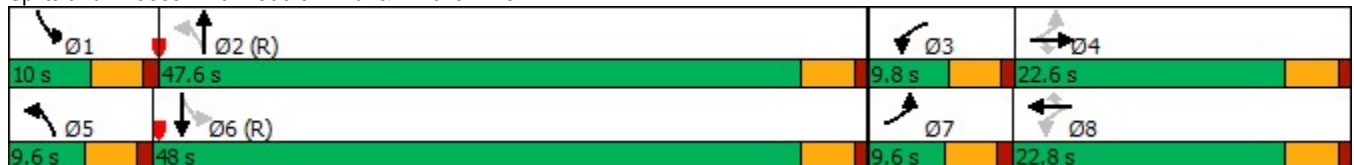


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations	↖	↑	↗	↖	↑	↗	↖	↑↑↑	↖	↑↑↑
Traffic Volume (vph)	117	169	174	139	179	43	97	864	68	2266
Future Volume (vph)	117	169	174	139	179	43	97	864	68	2266
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA
Protected Phases	7	4		3	8		5	2	1	6
Permitted Phases	4		4	8		8	2		6	
Detector Phase	7	4	4	3	8	8	5	2	1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	9.5	22.5
Total Split (s)	9.6	22.6	22.6	9.8	22.8	22.8	9.6	47.6	10.0	48.0
Total Split (%)	10.7%	25.1%	25.1%	10.9%	25.3%	25.3%	10.7%	52.9%	11.1%	53.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)	19.2	14.1	14.1	19.6	14.3	14.3	53.6	48.4	53.4	48.3
Actuated g/C Ratio	0.21	0.16	0.16	0.22	0.16	0.16	0.60	0.54	0.59	0.54
v/c Ratio	0.56	0.63	0.53	0.64	0.66	0.13	0.50	0.38	0.21	0.98
Control Delay	27.3	32.6	9.7	40.3	46.1	0.8	20.1	13.3	8.8	35.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.3	32.6	9.7	40.3	46.1	0.8	20.1	13.3	8.8	35.2
LOS	C	C	A	D	D	A	C	B	A	D
Approach Delay		22.6			38.5			14.0		34.5
Approach LOS		C			D			B		C

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.98
 Intersection Signal Delay: 28.7
 Intersection LOS: C
 Intersection Capacity Utilization 84.4%
 ICU Level of Service E
 Analysis Period (min) 15

Splits and Phases: 6: Federal Blvd. & W. 64th Ave.





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	127	184	189	151	195	47	105	1027	74	2641
v/c Ratio	0.56	0.63	0.53	0.64	0.66	0.13	0.50	0.38	0.21	0.98
Control Delay	27.3	32.6	9.7	40.3	46.1	0.8	20.1	13.3	8.8	35.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.3	32.6	9.7	40.3	46.1	0.8	20.1	13.3	8.8	35.2
Queue Length 50th (ft)	32	50	0	69	105	0	21	123	15	~606
Queue Length 95th (ft)	64	92	0	114	167	0	#77	164	35	#718
Internal Link Dist (ft)		1188			344			823		482
Turn Bay Length (ft)	100		150	150		100	600		250	
Base Capacity (vph)	226	374	425	236	378	423	208	2707	346	2708
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.49	0.44	0.64	0.52	0.11	0.50	0.38	0.21	0.98

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

HCM 6th Signalized Intersection Summary
6: Federal Blvd. & W. 64th Ave.

6501 Lowell Blvd
06/07/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	117	169	174	139	179	43	97	864	81	68	2266	164
Future Volume (veh/h)	117	169	174	139	179	43	97	864	81	68	2266	164
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	127	184	189	151	195	47	105	939	88	74	2463	178
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	241	279	237	238	283	240	178	2589	242	401	2629	187
Arrive On Green	0.02	0.05	0.05	0.06	0.15	0.15	0.05	0.55	0.55	0.05	0.54	0.54
Sat Flow, veh/h	1781	1870	1585	1781	1870	1585	1781	4750	444	1781	4866	346
Grp Volume(v), veh/h	127	184	189	151	195	47	105	672	355	74	1712	929
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	1585	1781	1702	1790	1781	1702	1808
Q Serve(g_s), s	5.1	8.7	10.6	5.3	8.9	2.3	2.3	10.1	10.1	1.6	41.8	43.8
Cycle Q Clear(g_c), s	5.1	8.7	10.6	5.3	8.9	2.3	2.3	10.1	10.1	1.6	41.8	43.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.25	1.00		0.19
Lane Grp Cap(c), veh/h	241	279	237	238	283	240	178	1855	976	401	1839	977
V/C Ratio(X)	0.53	0.66	0.80	0.63	0.69	0.20	0.59	0.36	0.36	0.18	0.93	0.95
Avail Cap(c_a), veh/h	241	376	319	238	380	322	187	1855	976	426	1839	977
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	0.93	0.93	0.93	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.7	40.5	41.4	33.0	36.2	33.4	21.0	11.6	11.6	8.6	19.1	19.6
Incr Delay (d2), s/veh	2.0	2.5	9.2	5.4	3.2	0.4	4.4	0.6	1.1	0.2	10.0	19.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	4.6	7.8	8.6	1.7	7.6	1.6	2.4	6.7	7.3	1.1	24.2	29.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.7	43.0	50.7	38.4	39.4	33.8	25.4	12.2	12.7	8.8	29.1	38.8
LnGrp LOS	C	D	D	D	D	C	C	B	B	A	C	D
Approach Vol, veh/h		500			393			1132			2715	
Approach Delay, s/veh		43.8			38.4			13.5			31.8	
Approach LOS		D			D			B			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.7	53.6	9.8	17.9	9.1	53.1	9.6	18.1				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	5.5	43.1	5.3	18.1	5.1	43.5	5.1	18.3				
Max Q Clear Time (g_c+I1), s	3.6	12.1	7.3	12.6	4.3	45.8	7.1	10.9				
Green Ext Time (p_c), s	0.0	8.2	0.0	0.8	0.0	0.0	0.0	0.7				
Intersection Summary												
HCM 6th Ctrl Delay				29.3								
HCM 6th LOS				C								



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)		0%	0%		0%	
Storage Length (ft)	100			0	0	0
Storage Lanes	1			0	1	0
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.998		0.942	
Flt Protected	0.950				0.972	
Satd. Flow (prot)	1770	1863	1859	0	1706	0
Flt Permitted	0.950				0.972	
Satd. Flow (perm)	1770	1863	1859	0	1706	0
Link Speed (mph)		30	30		30	
Link Distance (ft)		838	596		267	
Travel Time (s)		19.0	13.5		6.1	

Intersection Summary

Area Type: Other

Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	5	502	407	6	18	14
Future Vol, veh/h	5	502	407	6	18	14
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	546	442	7	20	15

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	449	0	-	0	1002 446
Stage 1	-	-	-	-	446 -
Stage 2	-	-	-	-	556 -
Critical Hdwy	4.12	-	-	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.218	-	-	-	3.518 3.318
Pot Cap-1 Maneuver	1111	-	-	-	269 612
Stage 1	-	-	-	-	645 -
Stage 2	-	-	-	-	574 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1111	-	-	-	268 612
Mov Cap-2 Maneuver	-	-	-	-	268 -
Stage 1	-	-	-	-	642 -
Stage 2	-	-	-	-	574 -

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	16.2
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1111	-	-	-	355
HCM Lane V/C Ratio	0.005	-	-	-	0.098
HCM Control Delay (s)	8.3	-	-	-	16.2
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	0.3



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		150	150		0	225		250	150		150
Storage Lanes	1		1	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850		0.903				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1682	0	1770	1863	1583	1770	1863	1583
Flt Permitted	0.724			0.748			0.521			0.327		
Satd. Flow (perm)	1349	1863	1583	1393	1682	0	970	1863	1583	609	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			75		33				27			87
Link Speed (mph)		30			30			30				30
Link Distance (ft)		549			716			667				367
Travel Time (s)		12.5			16.3			15.2				8.3

Intersection Summary

Area Type: Other

Timings
1: Lowell Blvd. & W. 68th Ave.

6501 Lowell Blvd
06/07/2021

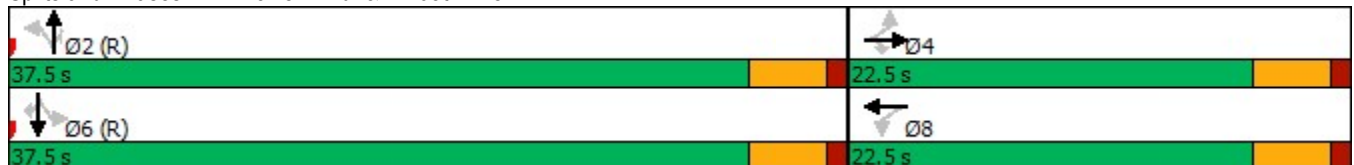


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑	↗	↖	↗	↖	↑	↗	↖	↑	↗
Traffic Volume (vph)	52	13	69	12	17	120	680	20	13	374	80
Future Volume (vph)	52	13	69	12	17	120	680	20	13	374	80
Turn Type	Perm	NA	Perm	Perm	NA	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8		2			6	
Permitted Phases	4		4	8		2		2	6		6
Detector Phase	4	4	4	8	8	2	2	2	6	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	22.5	22.5	22.5	22.5	22.5	37.5	37.5	37.5	37.5	37.5	37.5
Total Split (%)	37.5%	37.5%	37.5%	37.5%	37.5%	62.5%	62.5%	62.5%	62.5%	62.5%	62.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag											
Lead-Lag Optimize?											
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	8.1	8.1	8.1	8.1	8.1	45.8	45.8	45.8	45.8	45.8	45.8
Actuated g/C Ratio	0.14	0.14	0.14	0.14	0.14	0.76	0.76	0.76	0.76	0.76	0.76
v/c Ratio	0.31	0.06	0.27	0.07	0.20	0.18	0.52	0.02	0.03	0.29	0.07
Control Delay	27.3	21.6	9.1	22.1	13.9	3.9	5.8	1.4	3.4	3.9	1.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.3	21.6	9.1	22.1	13.9	3.9	5.8	1.4	3.4	3.9	1.1
LOS	C	C	A	C	B	A	A	A	A	A	A
Approach Delay		17.4			15.5		5.4			3.4	
Approach LOS		B			B		A			A	

Intersection Summary

Cycle Length: 60
 Actuated Cycle Length: 60
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.52
 Intersection Signal Delay: 6.3
 Intersection Capacity Utilization 60.8%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service B

Splits and Phases: 1: Lowell Blvd. & W. 68th Ave.



Queues

6501 Lowell Blvd

1: Lowell Blvd. & W. 68th Ave.

06/07/2021


























Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	57	14	75	13	51	130	739	22	14	407	87
v/c Ratio	0.31	0.06	0.27	0.07	0.20	0.18	0.52	0.02	0.03	0.29	0.07
Control Delay	27.3	21.6	9.1	22.1	13.9	3.9	5.8	1.4	3.4	3.9	1.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.3	21.6	9.1	22.1	13.9	3.9	5.8	1.4	3.4	3.9	1.1
Queue Length 50th (ft)	19	5	0	4	6	11	93	0	1	39	0
Queue Length 95th (ft)	46	17	29	16	30	33	202	5	6	87	10
Internal Link Dist (ft)		469			636		587			287	
Turn Bay Length (ft)	150		150	150		225		250	150		150
Base Capacity (vph)	404	558	527	417	527	741	1423	1215	465	1423	1230
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.03	0.14	0.03	0.10	0.18	0.52	0.02	0.03	0.29	0.07

Intersection Summary

HCM 6th Signalized Intersection Summary
 1: Lowell Blvd. & W. 68th Ave.

6501 Lowell Blvd
 06/07/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	52	13	69	12	17	30	120	680	20	13	374	80
Future Volume (veh/h)	52	13	69	12	17	30	120	680	20	13	374	80
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	57	14	75	13	18	33	130	739	22	14	407	87
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	223	195	165	247	62	113	730	1395	1182	529	1395	1182
Arrive On Green	0.10	0.10	0.10	0.10	0.10	0.10	0.75	0.75	0.75	0.75	0.75	0.75
Sat Flow, veh/h	1354	1870	1585	1308	591	1084	903	1870	1585	705	1870	1585
Grp Volume(v), veh/h	57	14	75	13	0	51	130	739	22	14	407	87
Grp Sat Flow(s),veh/h/ln	1354	1870	1585	1308	0	1675	903	1870	1585	705	1870	1585
Q Serve(g_s), s	2.4	0.4	2.7	0.5	0.0	1.7	3.3	10.0	0.2	0.5	4.2	0.9
Cycle Q Clear(g_c), s	4.1	0.4	2.7	0.9	0.0	1.7	7.5	10.0	0.2	10.5	4.2	0.9
Prop In Lane	1.00		1.00	1.00		0.65	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	223	195	165	247	0	174	730	1395	1182	529	1395	1182
V/C Ratio(X)	0.26	0.07	0.45	0.05	0.00	0.29	0.18	0.53	0.02	0.03	0.29	0.07
Avail Cap(c_a), veh/h	488	561	476	504	0	503	730	1395	1182	529	1395	1182
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.7	24.3	25.3	24.7	0.0	24.8	3.7	3.2	2.0	5.4	2.5	2.0
Incr Delay (d2), s/veh	0.6	0.2	2.0	0.1	0.0	0.9	0.5	1.4	0.0	0.1	0.5	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.4	0.3	1.9	0.3	0.0	1.2	0.9	4.0	0.1	0.1	1.6	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.3	24.4	27.2	24.8	0.0	25.8	4.2	4.6	2.0	5.5	3.0	2.2
LnGrp LOS	C	C	C	C	A	C	A	A	A	A	A	A
Approach Vol, veh/h		146			64			891			508	
Approach Delay, s/veh		27.0			25.6			4.5			2.9	
Approach LOS		C			C			A			A	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		49.3		10.7		49.3		10.7				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		33.0		18.0		33.0		18.0				
Max Q Clear Time (g_c+I1), s		12.0		6.1		12.5		3.7				
Green Ext Time (p_c), s		6.3		0.3		2.9		0.2				
Intersection Summary												
HCM 6th Ctrl Delay				6.9								
HCM 6th LOS				A								



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↘		↗	↘	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	100		0	100		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.963			0.942			0.996			0.992	
Flt Protected		0.971			0.986		0.950		0.950		0.950	
Satd. Flow (prot)	0	1742	0	0	1730	0	1770	1855	0	1770	1848	0
Flt Permitted		0.971			0.986		0.950		0.950		0.950	
Satd. Flow (perm)	0	1742	0	0	1730	0	1770	1855	0	1770	1848	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		458			470			732			667	
Travel Time (s)		10.4			10.7			16.6			15.2	

Intersection Summary

Area Type: Other

Intersection												
Int Delay, s/veh	3.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	34	7	16	9	9	14	29	759	23	17	410	22
Future Vol, veh/h	34	7	16	9	9	14	29	759	23	17	410	22
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	37	8	17	10	10	15	32	825	25	18	446	24

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1408	1408	458	1409	1408	838	470	0	0	850	0	0
Stage 1	494	494	-	902	902	-	-	-	-	-	-	-
Stage 2	914	914	-	507	506	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	116	139	603	116	139	366	1092	-	-	788	-	-
Stage 1	557	546	-	332	356	-	-	-	-	-	-	-
Stage 2	327	352	-	548	540	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	101	132	603	103	132	366	1092	-	-	788	-	-
Mov Cap-2 Maneuver	101	132	-	103	132	-	-	-	-	-	-	-
Stage 1	541	533	-	322	346	-	-	-	-	-	-	-
Stage 2	296	342	-	513	528	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	51.3		32.6		0.3		0.4	
HCM LOS	F		D					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1092	-	-	137	165	788	-	-
HCM Lane V/C Ratio	0.029	-	-	0.452	0.211	0.023	-	-
HCM Control Delay (s)	8.4	-	-	51.3	32.6	9.7	-	-
HCM Lane LOS	A	-	-	F	D	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	2	0.8	0.1	-	-



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↘		↗	↘	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	100		0	100		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.915			0.941			0.998			0.996	
Flt Protected		0.985			0.979		0.950		0.950			
Satd. Flow (prot)	0	1679	0	0	1716	0	1770	1859	0	1770	1855	0
Flt Permitted		0.985			0.979		0.950		0.950			
Satd. Flow (perm)	0	1679	0	0	1716	0	1770	1859	0	1770	1855	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		319			430			608			732	
Travel Time (s)		7.3			9.8			13.8			16.6	

Intersection Summary

Area Type: Other

Intersection												
Int Delay, s/veh	1.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	7	2	16	13	4	13	28	763	12	17	433	12
Future Vol, veh/h	7	2	16	13	4	13	28	763	12	17	433	12
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	8	2	17	14	4	14	30	829	13	18	471	13

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1419	1416	478	1419	1416	836	484	0	0	842	0	0
Stage 1	514	514	-	896	896	-	-	-	-	-	-	-
Stage 2	905	902	-	523	520	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	114	137	587	114	137	367	1079	-	-	794	-	-
Stage 1	543	535	-	335	359	-	-	-	-	-	-	-
Stage 2	331	356	-	537	532	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	103	130	587	105	130	367	1079	-	-	794	-	-
Mov Cap-2 Maneuver	103	130	-	105	130	-	-	-	-	-	-	-
Stage 1	528	523	-	326	349	-	-	-	-	-	-	-
Stage 2	306	346	-	507	520	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	23.1		33.6		0.3		0.4	
HCM LOS	C		D					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1079	-	-	226	158	794	-
HCM Lane V/C Ratio	0.028	-	-	0.12	0.206	0.023	-
HCM Control Delay (s)	8.4	-	-	23.1	33.6	9.6	-
HCM Lane LOS	A	-	-	C	D	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.4	0.7	0.1	-



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%				0%
Storage Length (ft)	150		100	150		0	0		0	0		0
Storage Lanes	1		1	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850		0.994			0.919				0.953
Flt Protected	0.950			0.950				0.985				0.983
Satd. Flow (prot)	1770	1863	1583	1770	1852	0	0	1686	0	0	1745	0
Flt Permitted	0.243			0.120				0.884				0.862
Satd. Flow (perm)	453	1863	1583	224	1852	0	0	1513	0	0	1530	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			60		4			94				15
Link Speed (mph)		30			30			30				30
Link Distance (ft)		501			853			646				482
Travel Time (s)		11.4			19.4			14.7				11.0

Intersection Summary

Area Type: Other



Lane Group	EBL	EBT	EBR	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	24	751	107	95	599	422	43
v/c Ratio	0.11	0.85	0.14	0.90	0.68	0.61	0.07
Control Delay	12.7	30.5	6.0	92.7	35.7	21.0	13.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.7	30.5	6.0	92.7	35.7	21.0	13.4
Queue Length 50th (ft)	7	343	13	55	334	145	9
Queue Length 95th (ft)	20	473	37	m#89	m390	264	32
Internal Link Dist (ft)		421			773	566	402
Turn Bay Length (ft)	150		100	150			
Base Capacity (vph)	239	983	863	118	979	696	658
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.76	0.12	0.81	0.61	0.61	0.07

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

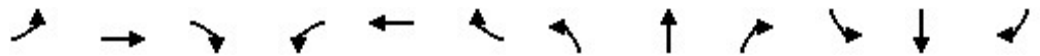
m Volume for 95th percentile queue is metered by upstream signal.

HCM 6th Signalized Intersection Summary
 4: Tennyson St. & W 64th Ave.

6501 Lowell Blvd
 06/07/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	22	691	98	87	528	23	121	35	232	14	12	14
Future Volume (veh/h)	22	691	98	87	528	23	121	35	232	14	12	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	24	751	107	95	574	25	132	38	252	15	13	15
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	495	947	803	193	901	39	222	77	365	214	186	186
Arrive On Green	0.51	0.51	0.51	1.00	1.00	1.00	0.39	0.39	0.39	0.39	0.39	0.39
Sat Flow, veh/h	820	1870	1585	644	1779	77	430	195	927	407	474	472
Grp Volume(v), veh/h	24	751	107	95	0	599	422	0	0	43	0	0
Grp Sat Flow(s),veh/h/ln	820	1870	1585	644	0	1856	1552	0	0	1353	0	0
Q Serve(g_s), s	1.3	29.8	3.2	12.3	0.0	0.0	16.4	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	1.3	29.8	3.2	42.1	0.0	0.0	20.2	0.0	0.0	1.4	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.04	0.31		0.60	0.35		0.35
Lane Grp Cap(c), veh/h	495	947	803	193	0	940	663	0	0	586	0	0
V/C Ratio(X)	0.05	0.79	0.13	0.49	0.00	0.64	0.64	0.00	0.00	0.07	0.00	0.00
Avail Cap(c_a), veh/h	513	987	837	207	0	980	663	0	0	586	0	0
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	11.3	18.3	11.8	13.7	0.0	0.0	22.5	0.0	0.0	17.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	4.3	0.1	1.9	0.0	1.3	4.6	0.0	0.0	0.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.4	18.9	2.0	2.7	0.0	0.6	12.5	0.0	0.0	1.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	11.3	22.7	11.8	15.7	0.0	1.3	27.2	0.0	0.0	17.2	0.0	0.0
LnGrp LOS	B	C	B	B	A	A	C	A	A	B	A	A
Approach Vol, veh/h		882			694			422				43
Approach Delay, s/veh		21.0			3.3			27.2				17.2
Approach LOS		C			A			C				B
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		39.9		50.1		39.9		50.1				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		33.5		47.5		33.5		47.5				
Max Q Clear Time (g_c+I1), s		22.2		31.8		3.4		44.1				
Green Ext Time (p_c), s		2.1		5.4		0.2		1.5				
Intersection Summary												
HCM 6th Ctrl Delay				16.2								
HCM 6th LOS				B								



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)	0%		0%		0%		0%		0%		0%	
Storage Length (ft)	200		150	150		75	200		150	200		100
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.850			0.850			0.850			0.850		
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.141			0.491			0.600			0.185		
Satd. Flow (perm)	263	1863	1583	915	1863	1583	1118	1863	1583	345	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			86			127			127			176
Link Speed (mph)		30			30			30				30
Link Distance (ft)		476			1480			763				608
Travel Time (s)		10.8			33.6			17.3				13.8

Intersection Summary

Area Type: Other

Timings
5: W 64th Ave./W. 64th Ave. & Lowell Blvd.

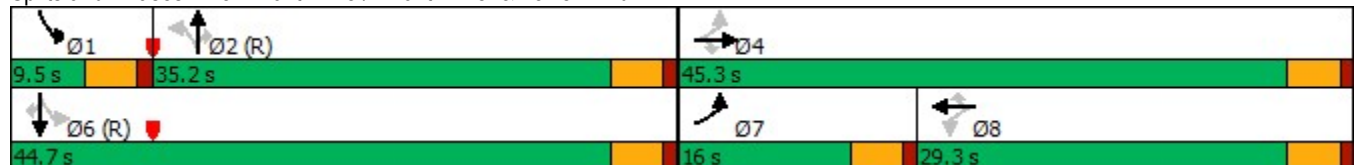
6501 Lowell Blvd
06/07/2021

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	244	437	79	52	412	80	140	469	111	53	237	162
Future Volume (vph)	244	437	79	52	412	80	140	469	111	53	237	162
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4			8			2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	7	4	4	8	8	8	2	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	16.0	45.3	45.3	29.3	29.3	29.3	35.2	35.2	35.2	9.5	44.7	44.7
Total Split (%)	17.8%	50.3%	50.3%	32.6%	32.6%	32.6%	39.1%	39.1%	39.1%	10.6%	49.7%	49.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead			Lag	Lag	Lag	Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes			Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	39.9	39.9	39.9	23.9	23.9	23.9	33.5	33.5	33.5	41.1	41.1	41.1
Actuated g/C Ratio	0.44	0.44	0.44	0.27	0.27	0.27	0.37	0.37	0.37	0.46	0.46	0.46
v/c Ratio	0.86	0.58	0.11	0.23	0.91	0.17	0.37	0.74	0.18	0.24	0.30	0.22
Control Delay	50.9	30.6	9.4	31.7	51.3	9.7	25.3	33.6	4.5	16.9	17.0	3.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.9	30.6	9.4	31.7	51.3	9.7	25.3	33.6	4.5	16.9	17.0	3.1
LOS	D	C	A	C	D	A	C	C	A	B	B	A
Approach Delay		34.9			43.3			27.5			12.0	
Approach LOS		C			D			C			B	

Intersection Summary

Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.91	
Intersection Signal Delay: 30.4	Intersection LOS: C
Intersection Capacity Utilization 79.1%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 5: W 64th Ave./W. 64th Ave. & Lowell Blvd.





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	265	475	86	57	448	87	152	510	121	58	258	176
v/c Ratio	0.86	0.58	0.11	0.23	0.91	0.17	0.37	0.74	0.18	0.24	0.30	0.22
Control Delay	50.9	30.6	9.4	31.7	51.3	9.7	25.3	33.6	4.5	16.9	17.0	3.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.9	30.6	9.4	31.7	51.3	9.7	25.3	33.6	4.5	16.9	17.0	3.1
Queue Length 50th (ft)	135	233	9	30	280	5	65	260	0	18	91	0
Queue Length 95th (ft)	m#195	m318	m23	m36	m#336	m7	121	#422	33	40	147	35
Internal Link Dist (ft)		396			1400			683			528	
Turn Bay Length (ft)	200		150	150		75	200		150	200		100
Base Capacity (vph)	308	844	764	252	513	528	416	693	668	238	851	818
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.86	0.56	0.11	0.23	0.87	0.16	0.37	0.74	0.18	0.24	0.30	0.22

Intersection Summary

- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

HCM 6th Signalized Intersection Summary
 5: W 64th Ave./W. 64th Ave. & Lowell Blvd.

6501 Lowell Blvd
 06/07/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↘	↖	↗	↘	↖	↗	↘	↖	↗	↘
Traffic Volume (veh/h)	244	437	79	52	412	80	140	469	111	53	237	162
Future Volume (veh/h)	244	437	79	52	412	80	140	469	111	53	237	162
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	265	475	86	57	448	87	152	510	121	58	258	176
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	327	824	698	292	496	421	430	687	582	259	860	728
Arrive On Green	0.12	0.44	0.44	0.09	0.09	0.09	0.37	0.37	0.37	0.04	0.46	0.46
Sat Flow, veh/h	1781	1870	1585	849	1870	1585	954	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	265	475	86	57	448	87	152	510	121	58	258	176
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	849	1870	1585	954	1870	1585	1781	1870	1585
Q Serve(g_s), s	9.2	17.1	2.9	5.7	21.4	4.6	10.8	21.4	4.7	1.7	7.8	6.1
Cycle Q Clear(g_c), s	9.2	17.1	2.9	7.1	21.4	4.6	10.8	21.4	4.7	1.7	7.8	6.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	327	824	698	292	496	421	430	687	582	259	860	728
V/C Ratio(X)	0.81	0.58	0.12	0.20	0.90	0.21	0.35	0.74	0.21	0.22	0.30	0.24
Avail Cap(c_a), veh/h	332	848	719	301	515	437	430	687	582	282	860	728
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.43	0.43	0.43	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.8	18.9	14.9	34.0	39.9	32.3	21.4	24.8	19.5	18.3	15.2	14.8
Incr Delay (d2), s/veh	13.8	0.9	0.1	0.1	9.4	0.1	2.3	7.1	0.8	0.4	0.9	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	8.6	11.7	1.8	2.2	15.7	3.2	4.7	15.7	3.3	1.3	6.1	4.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	35.7	19.8	15.0	34.2	49.3	32.4	23.7	31.9	20.3	18.7	16.1	15.6
LnGrp LOS	D	B	B	C	D	C	C	C	C	B	B	B
Approach Vol, veh/h		826			592			783			492	
Approach Delay, s/veh		24.4			45.4			28.5			16.2	
Approach LOS		C			D			C			B	
Timer - Assigned Phs	1	2		4		6	7	8				
Phs Duration (G+Y+Rc), s	8.3	37.5		44.1		45.9	15.7	28.4				
Change Period (Y+Rc), s	4.5	4.5		4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s	5.0	30.7		40.8		40.2	11.5	24.8				
Max Q Clear Time (g_c+I1), s	3.7	23.4		19.1		9.8	11.2	23.4				
Green Ext Time (p_c), s	0.0	2.7		3.3		2.2	0.0	0.5				

Intersection Summary

HCM 6th Ctrl Delay	28.7
HCM 6th LOS	C



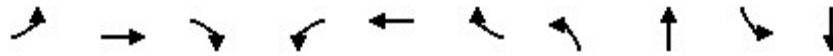
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	100		150	150		100	600		0	250		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor			0.850			0.850		0.993			0.988	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	5050	0	1770	5024	0
Flt Permitted	0.235			0.470			0.109			0.124		
Satd. Flow (perm)	438	1863	1583	875	1863	1583	203	5050	0	231	5024	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			205			236		10			18	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1480			550			1046			611	
Travel Time (s)		33.6			12.5			23.8			13.9	

Intersection Summary

Area Type: Other

Timings
6: Federal Blvd. & W. 64th Ave.

6501 Lowell Blvd
06/07/2021

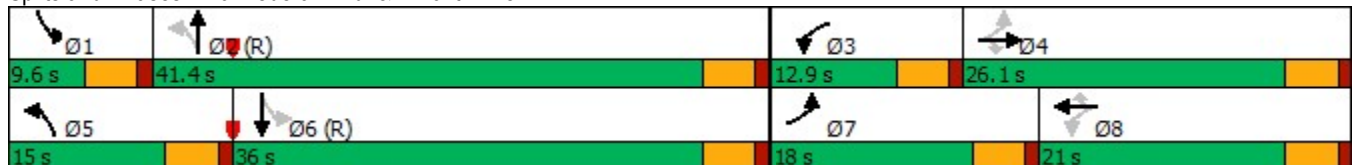


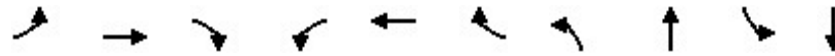
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations	↖	↑	↗	↖	↑	↗	↖	↑↑↑	↖	↑↑↑
Traffic Volume (vph)	308	260	189	120	231	103	243	1979	90	1620
Future Volume (vph)	308	260	189	120	231	103	243	1979	90	1620
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA
Protected Phases	7	4		3	8		5	2	1	6
Permitted Phases	4		4	8		8	2		6	
Detector Phase	7	4	4	3	8	8	5	2	1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	20.6	20.6	9.5	22.5	9.5	22.5
Total Split (s)	18.0	26.1	26.1	12.9	21.0	21.0	15.0	41.4	9.6	36.0
Total Split (%)	20.0%	29.0%	29.0%	14.3%	23.3%	23.3%	16.7%	46.0%	10.7%	40.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)	33.3	20.7	20.7	23.4	15.3	15.3	47.7	39.8	37.7	32.2
Actuated g/C Ratio	0.37	0.23	0.23	0.26	0.17	0.17	0.53	0.44	0.42	0.36
v/c Ratio	0.93	0.66	0.39	0.42	0.79	0.24	0.89	1.01	0.51	1.04
Control Delay	70.3	53.9	18.1	24.0	54.9	1.2	51.6	48.6	22.4	61.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	70.3	53.9	18.1	24.0	54.9	1.2	51.6	48.6	22.4	61.2
LOS	E	D	B	C	D	A	D	D	C	E
Approach Delay		51.7			34.5			48.9		59.3
Approach LOS		D			C			D		E

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.04
 Intersection Signal Delay: 51.6
 Intersection Capacity Utilization 92.3%
 Analysis Period (min) 15
 Intersection LOS: D
 ICU Level of Service F

Splits and Phases: 6: Federal Blvd. & W. 64th Ave.





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	335	283	205	130	251	112	264	2258	98	1879
v/c Ratio	0.93	0.66	0.39	0.42	0.79	0.24	0.89	1.01	0.51	1.04
Control Delay	70.3	53.9	18.1	24.0	54.9	1.2	51.6	48.6	22.4	61.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	70.3	53.9	18.1	24.0	54.9	1.2	51.6	48.6	22.4	61.2
Queue Length 50th (ft)	181	158	31	48	136	0	99	~534	27	~433
Queue Length 95th (ft)	#292	242	84	88	#243	0	#246	#632	54	#531
Internal Link Dist (ft)		1400			470			966		531
Turn Bay Length (ft)	100		150	150		100	600		250	
Base Capacity (vph)	361	447	535	313	341	482	298	2237	191	1811
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.93	0.63	0.38	0.42	0.74	0.23	0.89	1.01	0.51	1.04

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

HCM 6th Signalized Intersection Summary
6: Federal Blvd. & W. 64th Ave.

6501 Lowell Blvd
06/07/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	308	260	189	120	231	103	243	1979	98	90	1620	150
Future Volume (veh/h)	308	260	189	120	231	103	243	1979	98	90	1620	150
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	335	283	205	130	251	112	264	2151	107	98	1723	156
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.94	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	375	428	363	295	296	251	293	2197	109	173	1788	161
Arrive On Green	0.05	0.08	0.08	0.08	0.16	0.16	0.12	0.44	0.44	0.05	0.38	0.38
Sat Flow, veh/h	1781	1870	1585	1781	1870	1585	1781	4983	247	1781	4766	430
Grp Volume(v), veh/h	335	283	205	130	251	112	264	1466	792	98	1229	650
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	1585	1781	1702	1826	1781	1702	1793
Q Serve(g_s), s	13.5	13.3	11.2	5.4	11.7	5.8	8.8	38.1	38.5	3.0	31.8	32.0
Cycle Q Clear(g_c), s	13.5	13.3	11.2	5.4	11.7	5.8	8.8	38.1	38.5	3.0	31.8	32.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.14	1.00		0.24
Lane Grp Cap(c), veh/h	375	428	363	295	296	251	293	1501	805	173	1277	673
V/C Ratio(X)	0.89	0.66	0.57	0.44	0.85	0.45	0.90	0.98	0.98	0.57	0.96	0.97
Avail Cap(c_a), veh/h	375	449	380	320	343	291	293	1501	805	183	1277	673
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	0.88	0.88	0.88	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.2	38.2	37.3	28.5	36.8	34.3	23.5	24.7	24.8	22.0	27.5	27.6
Incr Delay (d2), s/veh	20.4	3.0	1.6	1.0	16.0	1.2	28.9	18.3	28.0	3.6	17.7	27.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	12.9	11.0	8.3	4.2	10.8	4.1	9.7	25.1	29.5	2.4	21.8	25.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	49.6	41.2	38.8	29.6	52.8	35.6	52.5	43.0	52.8	25.7	45.2	54.9
LnGrp LOS	D	D	D	C	D	D	D	D	D	C	D	D
Approach Vol, veh/h		823			493			2522			1977	
Approach Delay, s/veh		44.0			42.8			47.1			47.4	
Approach LOS		D			D			D			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.1	44.2	11.6	25.1	15.0	38.3	18.0	18.7				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	5.1	36.9	8.4	21.6	10.5	31.5	13.5	16.5				
Max Q Clear Time (g_c+I1), s	5.0	40.5	7.4	15.3	10.8	34.0	15.5	13.7				
Green Ext Time (p_c), s	0.0	0.0	0.0	1.3	0.0	0.0	0.0	0.5				

Intersection Summary

HCM 6th Ctrl Delay	46.4
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)		0%	0%		0%	
Storage Length (ft)	100			0	0	0
Storage Lanes	1			0	1	0
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.996		0.939	
Flt Protected	0.950				0.973	
Satd. Flow (prot)	1770	1863	1855	0	1702	0
Flt Permitted	0.950				0.973	
Satd. Flow (perm)	1770	1863	1855	0	1702	0
Link Speed (mph)		30	30		30	
Link Distance (ft)		853	476		311	
Travel Time (s)		19.4	10.8		7.1	

Intersection Summary

Area Type: Other

Intersection						
Int Delay, s/veh	0.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	16	748	694	20	11	9
Future Vol, veh/h	16	748	694	20	11	9
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	17	813	754	22	12	10

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	776	0	-	0	1612 765
Stage 1	-	-	-	-	765 -
Stage 2	-	-	-	-	847 -
Critical Hdwy	4.12	-	-	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.218	-	-	-	3.518 3.318
Pot Cap-1 Maneuver	840	-	-	-	115 403
Stage 1	-	-	-	-	459 -
Stage 2	-	-	-	-	420 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	840	-	-	-	113 403
Mov Cap-2 Maneuver	-	-	-	-	113 -
Stage 1	-	-	-	-	450 -
Stage 2	-	-	-	-	420 -

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	29.8
HCM LOS			D

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	840	-	-	-	167
HCM Lane V/C Ratio	0.021	-	-	-	0.13
HCM Control Delay (s)	9.4	-	-	-	29.8
HCM Lane LOS	A	-	-	-	D
HCM 95th %tile Q(veh)	0.1	-	-	-	0.4



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		150	150		0	225		250	150		150
Storage Lanes	1		1	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850		0.931				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1734	0	1770	1863	1583	1770	1863	1583
Flt Permitted	0.742			0.750			0.537			0.626		
Satd. Flow (perm)	1382	1863	1583	1397	1734	0	1000	1863	1583	1166	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			136		11				27			65
Link Speed (mph)		30			30			30				30
Link Distance (ft)		594			990			699				502
Travel Time (s)		13.5			22.5			15.9				11.4

Intersection Summary

Area Type: Other

Timings
1: Lowell Blvd. & W. 68th Ave.

6501 Lowell Blvd
06/07/2021

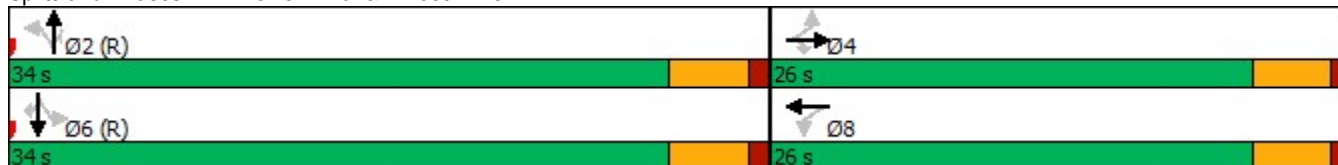


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑	↗	↖	↗	↖	↑	↗	↖	↑	↗
Traffic Volume (vph)	56	10	125	3	12	71	194	1	18	348	60
Future Volume (vph)	56	10	125	3	12	71	194	1	18	348	60
Turn Type	Perm	NA	Perm	Perm	NA	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8		2			6	
Permitted Phases	4		4	8		2		2	6		6
Detector Phase	4	4	4	8	8	2	2	2	6	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	26.0	26.0	26.0	26.0	26.0	34.0	34.0	34.0	34.0	34.0	34.0
Total Split (%)	43.3%	43.3%	43.3%	43.3%	43.3%	56.7%	56.7%	56.7%	56.7%	56.7%	56.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag											
Lead-Lag Optimize?											
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	8.2	8.2	8.2	8.2	8.2	45.7	45.7	45.7	45.7	45.7	45.7
Actuated g/C Ratio	0.14	0.14	0.14	0.14	0.14	0.76	0.76	0.76	0.76	0.76	0.76
v/c Ratio	0.32	0.04	0.41	0.02	0.10	0.10	0.15	0.00	0.02	0.27	0.05
Control Delay	27.2	21.3	8.9	21.0	16.5	3.6	3.4	0.0	3.2	3.8	1.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.2	21.3	8.9	21.0	16.5	3.6	3.4	0.0	3.2	3.8	1.2
LOS	C	C	A	C	B	A	A	A	A	A	A
Approach Delay		14.9			17.0		3.4			3.4	
Approach LOS		B			B		A			A	

Intersection Summary

Cycle Length: 60
 Actuated Cycle Length: 60
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 45
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.41
 Intersection Signal Delay: 6.2
 Intersection Capacity Utilization 43.5%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service A

Splits and Phases: 1: Lowell Blvd. & W. 68th Ave.



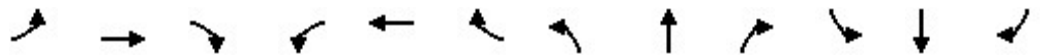


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	61	11	136	3	24	77	211	1	20	378	65
v/c Ratio	0.32	0.04	0.41	0.02	0.10	0.10	0.15	0.00	0.02	0.27	0.05
Control Delay	27.2	21.3	8.9	21.0	16.5	3.6	3.4	0.0	3.2	3.8	1.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.2	21.3	8.9	21.0	16.5	3.6	3.4	0.0	3.2	3.8	1.2
Queue Length 50th (ft)	20	4	0	1	4	6	18	0	2	36	0
Queue Length 95th (ft)	48	15	39	7	20	20	44	0	7	80	9
Internal Link Dist (ft)		514			910		619			422	
Turn Bay Length (ft)	150		150	150		225		250	150		150
Base Capacity (vph)	495	667	654	500	628	762	1419	1212	888	1419	1221
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.12	0.02	0.21	0.01	0.04	0.10	0.15	0.00	0.02	0.27	0.05

Intersection Summary

HCM 6th Signalized Intersection Summary
 1: Lowell Blvd. & W. 68th Ave.

6501 Lowell Blvd
 06/07/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	56	10	125	3	12	10	71	194	1	18	348	60
Future Volume (veh/h)	56	10	125	3	12	10	71	194	1	18	348	60
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	61	11	136	3	13	11	77	211	1	20	378	65
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	272	229	194	265	114	97	744	1361	1154	931	1361	1154
Arrive On Green	0.12	0.12	0.12	0.12	0.12	0.12	0.73	0.73	0.73	0.73	0.73	0.73
Sat Flow, veh/h	1387	1870	1585	1241	936	792	947	1870	1585	1170	1870	1585
Grp Volume(v), veh/h	61	11	136	3	0	24	77	211	1	20	378	65
Grp Sat Flow(s),veh/h/ln	1387	1870	1585	1241	0	1728	947	1870	1585	1170	1870	1585
Q Serve(g_s), s	2.5	0.3	4.9	0.1	0.0	0.7	1.8	2.1	0.0	0.3	4.1	0.7
Cycle Q Clear(g_c), s	3.2	0.3	4.9	0.4	0.0	0.7	5.9	2.1	0.0	2.4	4.1	0.7
Prop In Lane	1.00		1.00	1.00		0.46	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	272	229	194	265	0	211	744	1361	1154	931	1361	1154
V/C Ratio(X)	0.22	0.05	0.70	0.01	0.00	0.11	0.10	0.16	0.00	0.02	0.28	0.06
Avail Cap(c_a), veh/h	600	670	568	558	0	619	744	1361	1154	931	1361	1154
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.9	23.3	25.3	23.4	0.0	23.4	3.8	2.5	2.2	2.9	2.8	2.3
Incr Delay (d2), s/veh	0.4	0.1	4.6	0.0	0.0	0.2	0.3	0.2	0.0	0.0	0.5	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.4	0.2	3.6	0.1	0.0	0.5	0.5	0.9	0.0	0.1	1.8	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.3	23.3	29.9	23.5	0.0	23.7	4.1	2.7	2.2	2.9	3.3	2.4
LnGrp LOS	C	C	C	C	A	C	A	A	A	A	A	A
Approach Vol, veh/h		208			27			289			463	
Approach Delay, s/veh		28.2			23.7			3.1			3.2	
Approach LOS		C			C			A			A	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		48.2		11.8		48.2		11.8				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		29.5		21.5		29.5		21.5				
Max Q Clear Time (g_c+I1), s		7.9		6.9		6.1		2.7				
Green Ext Time (p_c), s		1.6		0.5		2.6		0.1				
Intersection Summary												
HCM 6th Ctrl Delay			9.0									
HCM 6th LOS			A									



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕		↗	↖		↗	↖	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	100		0	100		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.921			0.940			0.996			0.993	
Flt Protected		0.986			0.978		0.950		0.950			
Satd. Flow (prot)	0	1692	0	0	1712	0	1770	1855	0	1770	1850	0
Flt Permitted		0.986			0.978		0.950		0.950			
Satd. Flow (perm)	0	1692	0	0	1712	0	1770	1855	0	1770	1850	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		458			470			732			699	
Travel Time (s)		10.4			10.7			16.6			15.9	

Intersection Summary

Area Type: Other

Intersection												
Int Delay, s/veh	1.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↗	↘		↗	↘	
Traffic Vol, veh/h	15	6	29	16	4	16	12	355	10	4	486	24
Future Vol, veh/h	15	6	29	16	4	16	12	355	10	4	486	24
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	16	7	32	17	4	17	13	386	11	4	528	26

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	977	972	541	987	980	392	554	0	0	397	0	0
Stage 1	549	549	-	418	418	-	-	-	-	-	-	-
Stage 2	428	423	-	569	562	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	230	252	541	226	250	657	1016	-	-	1162	-	-
Stage 1	520	516	-	612	591	-	-	-	-	-	-	-
Stage 2	605	588	-	507	510	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	218	248	541	206	246	657	1016	-	-	1162	-	-
Mov Cap-2 Maneuver	218	248	-	206	246	-	-	-	-	-	-	-
Stage 1	513	514	-	604	583	-	-	-	-	-	-	-
Stage 2	577	580	-	470	508	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	17.5		18.6		0.3		0.1	
HCM LOS	C		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1016	-	-	341	304	1162	-
HCM Lane V/C Ratio	0.013	-	-	0.159	0.129	0.004	-
HCM Control Delay (s)	8.6	-	-	17.5	18.6	8.1	-
HCM Lane LOS	A	-	-	C	C	A	-
HCM 95th %tile Q(veh)	0	-	-	0.6	0.4	0	-



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↘		↗	↘	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	100		0	100		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt					0.915			0.996				
Flt Protected					0.982					0.950		
Satd. Flow (prot)	0	1863	0	0	1674	0	1863	1855	0	1770	1863	0
Flt Permitted					0.982					0.950		
Satd. Flow (perm)	0	1863	0	0	1674	0	1863	1855	0	1770	1863	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		319			430			608			732	
Travel Time (s)		7.3			9.8			13.8			16.6	

Intersection Summary

Area Type: Other

Intersection												
Int Delay, s/veh	0.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	0	0	0	9	0	16	0	363	10	13	520	0
Future Vol, veh/h	0	0	0	9	0	16	0	363	10	13	520	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	10	0	17	0	395	11	14	565	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1002	999	565	994	994	401	565	0	0	406	0	0
Stage 1	593	593	-	401	401	-	-	-	-	-	-	-
Stage 2	409	406	-	593	593	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	221	243	524	224	245	649	1007	-	-	1153	-	-
Stage 1	492	493	-	626	601	-	-	-	-	-	-	-
Stage 2	619	598	-	492	493	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	213	240	524	222	242	649	1007	-	-	1153	-	-
Mov Cap-2 Maneuver	213	240	-	222	242	-	-	-	-	-	-	-
Stage 1	492	487	-	626	601	-	-	-	-	-	-	-
Stage 2	602	598	-	486	487	-	-	-	-	-	-	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			15.1			0			0.2		
HCM LOS	A			C								

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1007	-	-	-	383	1153	-	-
HCM Lane V/C Ratio	-	-	-	-	0.071	0.012	-	-
HCM Control Delay (s)	0	-	-	0	15.1	8.2	-	-
HCM Lane LOS	A	-	-	A	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	-	0.2	0	-	-



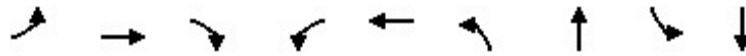
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		100	150		0	0		0	0		0
Storage Lanes	1		1	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850		0.995			0.919				0.949
Flt Protected	0.950			0.950				0.984				0.993
Satd. Flow (prot)	1770	1863	1583	1770	1853	0	0	1684	0	0	1755	0
Flt Permitted	0.226			0.347				0.899				0.966
Satd. Flow (perm)	421	1863	1583	646	1853	0	0	1539	0	0	1708	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			74		3			93				21
Link Speed (mph)		30			30			30				30
Link Distance (ft)		700			1434			502				485
Travel Time (s)		15.9			32.6			11.4				11.0

Intersection Summary

Area Type: Other

Timings
4: Tennyson St. & W 64th Ave.

6501 Lowell Blvd
06/07/2021

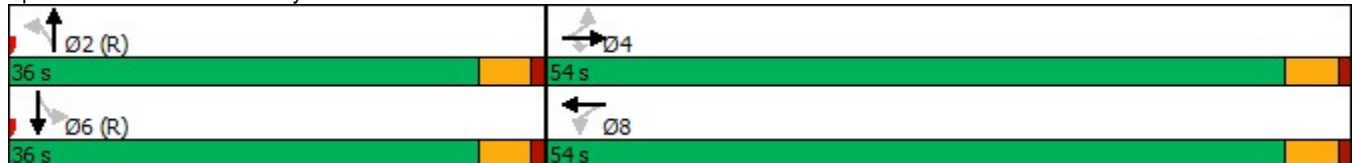


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	13	354	68	176	436	63	16	7	25
Future Volume (vph)	13	354	68	176	436	63	16	7	25
Turn Type	Perm	NA	Perm	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4			8		2		6
Permitted Phases	4		4	8		2		6	
Detector Phase	4	4	4	8	8	2	2	6	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	54.0	54.0	54.0	54.0	54.0	36.0	36.0	36.0	36.0
Total Split (%)	60.0%	60.0%	60.0%	60.0%	60.0%	40.0%	40.0%	40.0%	40.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0		0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5		4.5		4.5
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	32.1	32.1	32.1	32.1	32.1		48.9		48.9
Actuated g/C Ratio	0.36	0.36	0.36	0.36	0.36		0.54		0.54
v/c Ratio	0.09	0.58	0.12	0.83	0.74		0.24		0.06
Control Delay	17.0	26.0	4.1	65.2	42.8		8.4		9.4
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	17.0	26.0	4.1	65.2	42.8		8.4		9.4
LOS	B	C	A	E	D		A		A
Approach Delay		22.3			49.1		8.4		9.4
Approach LOS		C			D		A		A

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 50
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.83
 Intersection Signal Delay: 32.5
 Intersection Capacity Utilization 57.9%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service B

Splits and Phases: 4: Tennyson St. & W 64th Ave.





Lane Group	EBL	EBT	EBR	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	14	385	74	191	490	213	56
v/c Ratio	0.09	0.58	0.12	0.83	0.74	0.24	0.06
Control Delay	17.0	26.0	4.1	65.2	42.8	8.4	9.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.0	26.0	4.1	65.2	42.8	8.4	9.4
Queue Length 50th (ft)	5	174	0	111	275	32	9
Queue Length 95th (ft)	16	213	22	177	358	90	34
Internal Link Dist (ft)		620			1354	422	405
Turn Bay Length (ft)	150		100	150			
Base Capacity (vph)	231	1024	903	355	1020	878	937
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.38	0.08	0.54	0.48	0.24	0.06
Intersection Summary							

HCM 6th Signalized Intersection Summary
 4: Tennyson St. & W 64th Ave.

6501 Lowell Blvd
 06/07/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	13	354	68	176	436	15	63	16	118	7	25	19
Future Volume (veh/h)	13	354	68	176	436	15	63	16	118	7	25	19
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	14	385	74	191	474	16	68	17	128	8	27	21
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	260	767	650	320	737	25	268	86	453	130	427	307
Arrive On Green	0.41	0.41	0.41	0.41	0.41	0.41	0.49	0.49	0.49	0.49	0.49	0.49
Sat Flow, veh/h	906	1870	1585	933	1799	61	439	175	924	173	871	626
Grp Volume(v), veh/h	14	385	74	191	0	490	213	0	0	56	0	0
Grp Sat Flow(s),veh/h/ln	906	1870	1585	933	0	1859	1538	0	0	1670	0	0
Q Serve(g_s), s	1.1	13.8	2.6	17.2	0.0	19.0	2.7	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	20.1	13.8	2.6	31.0	0.0	19.0	6.9	0.0	0.0	1.5	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.03	0.32		0.60	0.14		0.37
Lane Grp Cap(c), veh/h	260	767	650	320	0	762	806	0	0	864	0	0
V/C Ratio(X)	0.05	0.50	0.11	0.60	0.00	0.64	0.26	0.00	0.00	0.06	0.00	0.00
Avail Cap(c_a), veh/h	387	1029	872	450	0	1023	806	0	0	864	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.87	0.00	0.87	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	29.3	19.7	16.4	31.2	0.0	21.3	13.4	0.0	0.0	12.1	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.5	0.1	1.6	0.0	0.8	0.8	0.0	0.0	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.4	9.8	1.7	6.9	0.0	12.4	4.7	0.0	0.0	1.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	29.4	20.2	16.5	32.8	0.0	22.1	14.2	0.0	0.0	12.2	0.0	0.0
LnGrp LOS	C	C	B	C	A	C	B	A	A	B	A	A
Approach Vol, veh/h		473			681			213				56
Approach Delay, s/veh		19.9			25.1			14.2				12.2
Approach LOS		B			C			B				B
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		48.6		41.4		48.6		41.4				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		31.5		49.5		31.5		49.5				
Max Q Clear Time (g_c+I1), s		8.9		22.1		3.5		33.0				
Green Ext Time (p_c), s		1.3		2.8		0.2		3.9				
Intersection Summary												
HCM 6th Ctrl Delay				21.2								
HCM 6th LOS				C								



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	200		150	150		75	200		150	200		100
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.257			0.546			0.559			0.569		
Satd. Flow (perm)	479	1863	1583	1017	1863	1583	1041	1863	1583	1060	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			112			127			127			149
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1434			1268			763			608	
Travel Time (s)		32.6			28.8			17.3			13.8	

Intersection Summary

Area Type: Other



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	142	360	112	88	289	48	55	161	68	98	334	149
v/c Ratio	0.44	0.51	0.17	0.40	0.71	0.11	0.13	0.21	0.09	0.16	0.34	0.17
Control Delay	35.5	38.3	15.3	31.8	37.9	3.0	22.8	21.7	0.8	13.5	15.2	3.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.5	38.3	15.3	31.8	37.9	3.0	22.8	21.7	0.8	13.5	15.2	3.1
Queue Length 50th (ft)	77	203	19	44	155	1	20	61	0	27	105	0
Queue Length 95th (ft)	114	256	49	m58	m178	m2	55	125	5	63	198	33
Internal Link Dist (ft)		1354			1188			683			528	
Turn Bay Length (ft)	200		150	150		75	200		150	200		100
Base Capacity (vph)	331	879	806	310	569	571	426	763	723	623	975	899
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.41	0.14	0.28	0.51	0.08	0.13	0.21	0.09	0.16	0.34	0.17

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM 6th Signalized Intersection Summary
 5: W 64th Ave./W. 64th Ave. & Lowell Blvd.

6501 Lowell Blvd
 06/07/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↘	↖	↗	↘	↖	↗	↘	↖	↗	↘
Traffic Volume (veh/h)	131	331	103	81	266	44	51	148	63	90	307	137
Future Volume (veh/h)	131	331	103	81	266	44	51	148	63	90	307	137
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	142	360	112	88	289	48	55	161	68	98	334	149
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	270	611	518	212	364	309	511	884	749	658	1073	909
Arrive On Green	0.03	0.11	0.11	0.06	0.06	0.06	0.47	0.47	0.47	0.05	0.57	0.57
Sat Flow, veh/h	1781	1870	1585	922	1870	1585	912	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	142	360	112	88	289	48	55	161	68	98	334	149
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	922	1870	1585	912	1870	1585	1781	1870	1585
Q Serve(g_s), s	5.5	16.5	5.8	8.5	13.7	2.6	3.0	4.5	2.1	2.4	8.3	4.0
Cycle Q Clear(g_c), s	5.5	16.5	5.8	13.1	13.7	2.6	3.0	4.5	2.1	2.4	8.3	4.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	270	611	518	212	364	309	511	884	749	658	1073	909
V/C Ratio(X)	0.53	0.59	0.22	0.42	0.79	0.16	0.11	0.18	0.09	0.15	0.31	0.16
Avail Cap(c_a), veh/h	332	883	748	314	571	484	511	884	749	735	1073	909
HCM Platoon Ratio	0.33	0.33	0.33	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.79	0.79	0.79	0.71	0.71	0.71	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.2	34.4	29.6	42.3	40.3	35.1	13.3	13.7	13.1	10.1	10.0	9.0
Incr Delay (d2), s/veh	1.3	0.7	0.2	0.9	2.9	0.2	0.4	0.5	0.2	0.1	0.8	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	4.5	12.5	4.2	3.8	10.8	1.8	1.2	3.5	1.4	1.6	6.1	2.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.4	35.1	29.8	43.2	43.2	35.3	13.7	14.1	13.3	10.2	10.7	9.4
LnGrp LOS	C	D	C	D	D	D	B	B	B	B	B	A
Approach Vol, veh/h		614			425			284			581	
Approach Delay, s/veh		32.6			42.3			13.9			10.3	
Approach LOS		C			D			B			B	
Timer - Assigned Phs	1	2		4		6	7	8				
Phs Duration (G+Y+Rc), s	9.1	47.0		33.9		56.1	11.9	22.0				
Change Period (Y+Rc), s	4.5	4.5		4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s	8.5	25.5		42.5		38.5	10.5	27.5				
Max Q Clear Time (g_c+I1), s	4.4	6.5		18.5		10.3	7.5	15.7				
Green Ext Time (p_c), s	0.1	1.3		2.6		2.6	0.1	1.8				

Intersection Summary

HCM 6th Ctrl Delay	25.2
HCM 6th LOS	C



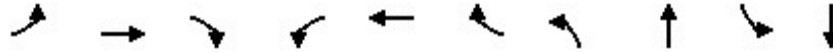
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	100		150	150		100	600		0	250		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor			0.850			0.850		0.987			0.990	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	5019	0	1770	5034	0
Flt Permitted	0.386			0.430			0.085			0.193		
Satd. Flow (perm)	719	1863	1583	801	1863	1583	158	5019	0	360	5034	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			127			127		23			17	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1268			424			903			562	
Travel Time (s)		28.8			9.6			20.5			12.8	

Intersection Summary

Area Type: Other

Timings
6: Federal Blvd. & W. 64th Ave.

6501 Lowell Blvd
06/07/2021

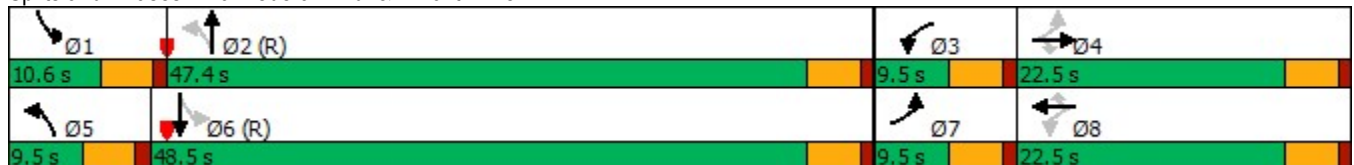


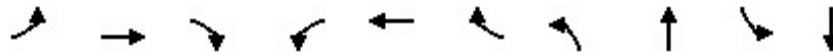
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	119	182	185	157	198	48	104	974	76	2553
Future Volume (vph)	119	182	185	157	198	48	104	974	76	2553
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA
Protected Phases	7	4		3	8		5	2	1	6
Permitted Phases	4		4	8		8	2		6	
Detector Phase	7	4	4	3	8	8	5	2	1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	9.5	22.5
Total Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	47.4	10.6	48.5
Total Split (%)	10.6%	25.0%	25.0%	10.6%	25.0%	25.0%	10.6%	52.7%	11.8%	53.9%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)	19.9	14.9	14.9	19.9	14.9	14.9	52.8	47.8	52.2	45.9
Actuated g/C Ratio	0.22	0.17	0.17	0.22	0.17	0.17	0.59	0.53	0.58	0.51
v/c Ratio	0.59	0.64	0.55	0.74	0.70	0.14	0.56	0.43	0.27	1.15
Control Delay	30.0	33.5	11.9	48.3	47.4	0.8	23.7	14.2	9.7	98.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.0	33.5	11.9	48.3	47.4	0.8	23.7	14.2	9.7	98.2
LOS	C	C	B	D	D	A	C	B	A	F
Approach Delay		24.4			42.2			15.1		95.8
Approach LOS		C			D			B		F

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 120
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.15
 Intersection Signal Delay: 64.8
 Intersection LOS: E
 Intersection Capacity Utilization 92.4%
 ICU Level of Service F
 Analysis Period (min) 15

Splits and Phases: 6: Federal Blvd. & W. 64th Ave.





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	129	198	201	171	215	52	113	1158	83	2972
v/c Ratio	0.59	0.64	0.55	0.74	0.70	0.14	0.56	0.43	0.27	1.15
Control Delay	30.0	33.5	11.9	48.3	47.4	0.8	23.7	14.2	9.7	98.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.0	33.5	11.9	48.3	47.4	0.8	23.7	14.2	9.7	98.2
Queue Length 50th (ft)	33	55	0	78	116	0	24	148	17	~763
Queue Length 95th (ft)	70	106	0	#140	185	0	#91	191	37	#858
Internal Link Dist (ft)		1188			344			823		482
Turn Bay Length (ft)	100		150	150		100	600		250	
Base Capacity (vph)	217	372	418	231	372	418	203	2676	309	2574
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.59	0.53	0.48	0.74	0.58	0.12	0.56	0.43	0.27	1.15

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

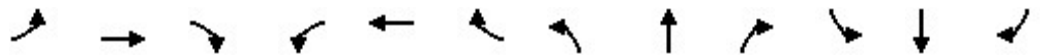
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

HCM 6th Signalized Intersection Summary
6: Federal Blvd. & W. 64th Ave.

6501 Lowell Blvd
06/07/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	119	182	185	157	198	48	104	974	91	76	2553	181
Future Volume (veh/h)	119	182	185	157	198	48	104	974	91	76	2553	181
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	129	198	201	171	215	52	113	1059	99	83	2775	197
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	231	293	248	231	293	248	173	2562	239	364	2612	181
Arrive On Green	0.02	0.05	0.05	0.06	0.16	0.16	0.05	0.54	0.54	0.05	0.54	0.54
Sat Flow, veh/h	1781	1870	1585	1781	1870	1585	1781	4751	444	1781	4875	338
Grp Volume(v), veh/h	129	198	201	171	215	52	113	758	400	83	1918	1054
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	1585	1781	1702	1791	1781	1702	1809
Q Serve(g_s), s	5.0	9.4	11.3	5.0	9.9	2.6	2.5	11.9	11.9	1.8	48.2	48.2
Cycle Q Clear(g_c), s	5.0	9.4	11.3	5.0	9.9	2.6	2.5	11.9	11.9	1.8	48.2	48.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.25	1.00		0.19
Lane Grp Cap(c), veh/h	231	293	248	231	293	248	173	1836	966	364	1823	969
V/C Ratio(X)	0.56	0.68	0.81	0.74	0.73	0.21	0.65	0.41	0.41	0.23	1.05	1.09
Avail Cap(c_a), veh/h	231	374	317	231	374	317	179	1836	966	398	1823	969
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	0.93	0.93	0.93	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.7	40.4	41.4	34.7	36.2	33.1	21.1	12.3	12.3	9.1	20.9	20.9
Incr Delay (d2), s/veh	2.8	3.1	10.9	12.0	5.4	0.4	7.9	0.7	1.3	0.3	36.3	55.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	4.7	8.3	9.2	3.7	8.5	1.8	2.8	7.8	8.4	1.2	36.1	45.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	35.5	43.5	52.2	46.7	41.6	33.5	28.9	13.0	13.6	9.4	57.2	76.5
LnGrp LOS	D	D	D	D	D	C	C	B	B	A	F	F
Approach Vol, veh/h		528			438			1271			3055	
Approach Delay, s/veh		44.9			42.6			14.6			62.5	
Approach LOS		D			D			B			E	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.9	53.0	9.5	18.6	9.2	52.7	9.5	18.6				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	6.1	42.9	5.0	18.0	5.0	44.0	5.0	18.0				
Max Q Clear Time (g_c+I1), s	3.8	13.9	7.0	13.3	4.5	50.2	7.0	11.9				
Green Ext Time (p_c), s	0.0	9.4	0.0	0.8	0.0	0.0	0.0	0.7				

Intersection Summary

HCM 6th Ctrl Delay	47.6
HCM 6th LOS	D



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		150	150		0	225		250	150		150
Storage Lanes	1		1	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850		0.904				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1684	0	1770	1863	1583	1770	1863	1583
Flt Permitted	0.719			0.747			0.497			0.281		
Satd. Flow (perm)	1339	1863	1583	1391	1684	0	926	1863	1583	523	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			85		37				27			98
Link Speed (mph)		30			30			30				30
Link Distance (ft)		549			716			667				367
Travel Time (s)		12.5			16.3			15.2				8.3

Intersection Summary

Area Type: Other

Timings
1: Lowell Blvd. & W. 68th Ave.

6501 Lowell Blvd
06/07/2021

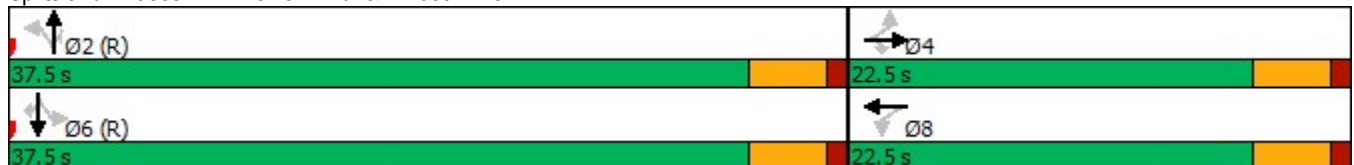


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑	↗	↖	↗	↖	↑	↗	↖	↑	↗
Traffic Volume (vph)	59	15	78	13	19	135	758	22	15	408	90
Future Volume (vph)	59	15	78	13	19	135	758	22	15	408	90
Turn Type	Perm	NA	Perm	Perm	NA	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8		2			6	
Permitted Phases	4		4	8		2		2	6		6
Detector Phase	4	4	4	8	8	2	2	2	6	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	22.5	22.5	22.5	22.5	22.5	37.5	37.5	37.5	37.5	37.5	37.5
Total Split (%)	37.5%	37.5%	37.5%	37.5%	37.5%	62.5%	62.5%	62.5%	62.5%	62.5%	62.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag											
Lead-Lag Optimize?											
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	8.3	8.3	8.3	8.3	8.3	45.6	45.6	45.6	45.6	45.6	45.6
Actuated g/C Ratio	0.14	0.14	0.14	0.14	0.14	0.76	0.76	0.76	0.76	0.76	0.76
v/c Ratio	0.35	0.06	0.29	0.07	0.22	0.21	0.58	0.02	0.04	0.31	0.08
Control Delay	27.7	21.3	8.8	21.8	13.6	4.3	6.9	1.5	3.7	4.2	1.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.7	21.3	8.8	21.8	13.6	4.3	6.9	1.5	3.7	4.2	1.1
LOS	C	C	A	C	B	A	A	A	A	A	A
Approach Delay		17.3			15.2		6.4			3.6	
Approach LOS		B			B		A			A	

Intersection Summary

Cycle Length: 60
 Actuated Cycle Length: 60
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.58
 Intersection Signal Delay: 6.9
 Intersection Capacity Utilization 65.2%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service C

Splits and Phases: 1: Lowell Blvd. & W. 68th Ave.



Queues

6501 Lowell Blvd

1: Lowell Blvd. & W. 68th Ave.

06/07/2021



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	64	16	85	14	58	147	824	24	16	443	98
v/c Ratio	0.35	0.06	0.29	0.07	0.22	0.21	0.58	0.02	0.04	0.31	0.08
Control Delay	27.7	21.3	8.8	21.8	13.6	4.3	6.9	1.5	3.7	4.2	1.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.7	21.3	8.8	21.8	13.6	4.3	6.9	1.5	3.7	4.2	1.1
Queue Length 50th (ft)	21	5	0	5	7	14	115	0	1	45	0
Queue Length 95th (ft)	49	18	30	17	32	39	256	5	7	99	11
Internal Link Dist (ft)		469			636		587			287	
Turn Bay Length (ft)	150		150	150		225		250	150		150
Base Capacity (vph)	401	558	534	417	531	703	1414	1208	397	1414	1225
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.03	0.16	0.03	0.11	0.21	0.58	0.02	0.04	0.31	0.08

Intersection Summary

HCM 6th Signalized Intersection Summary
 1: Lowell Blvd. & W. 68th Ave.

6501 Lowell Blvd
 06/07/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	59	15	78	13	19	34	135	758	22	15	408	90
Future Volume (veh/h)	59	15	78	13	19	34	135	758	22	15	408	90
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	64	16	85	14	21	37	147	824	24	16	443	98
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	232	214	182	258	70	123	685	1375	1166	462	1375	1166
Arrive On Green	0.11	0.11	0.11	0.11	0.11	0.11	0.74	0.74	0.74	0.74	0.74	0.74
Sat Flow, veh/h	1345	1870	1585	1294	607	1070	865	1870	1585	650	1870	1585
Grp Volume(v), veh/h	64	16	85	14	0	58	147	824	24	16	443	98
Grp Sat Flow(s),veh/h/ln	1345	1870	1585	1294	0	1678	865	1870	1585	650	1870	1585
Q Serve(g_s), s	2.7	0.5	3.0	0.6	0.0	1.9	4.3	12.5	0.2	0.7	4.9	1.0
Cycle Q Clear(g_c), s	4.7	0.5	3.0	1.0	0.0	1.9	9.2	12.5	0.2	13.2	4.9	1.0
Prop In Lane	1.00		1.00	1.00		0.64	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	232	214	182	258	0	192	685	1375	1166	462	1375	1166
V/C Ratio(X)	0.28	0.07	0.47	0.05	0.00	0.30	0.21	0.60	0.02	0.03	0.32	0.08
Avail Cap(c_a), veh/h	481	561	476	498	0	503	685	1375	1166	462	1375	1166
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.5	23.7	24.8	24.2	0.0	24.4	4.3	3.8	2.1	6.9	2.8	2.2
Incr Delay (d2), s/veh	0.6	0.1	1.9	0.1	0.0	0.9	0.7	1.9	0.0	0.1	0.6	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.6	0.4	2.1	0.3	0.0	1.4	1.2	5.4	0.1	0.2	2.0	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.1	23.9	26.7	24.3	0.0	25.2	5.1	5.7	2.2	7.0	3.4	2.4
LnGrp LOS	C	C	C	C	A	C	A	A	A	A	A	A
Approach Vol, veh/h		165			72			995				557
Approach Delay, s/veh		26.6			25.0			5.5				3.3
Approach LOS		C			C			A				A
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		48.6		11.4		48.6		11.4				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		33.0		18.0		33.0		18.0				
Max Q Clear Time (g_c+I1), s		14.5		6.7		15.2		3.9				
Green Ext Time (p_c), s		7.0		0.4		3.1		0.2				

Intersection Summary

HCM 6th Ctrl Delay	7.6
HCM 6th LOS	A



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕		↗	↖		↗	↖	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	100		0	100		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.961			0.941			0.996			0.992	
Flt Protected		0.971			0.986		0.950			0.950		
Satd. Flow (prot)	0	1738	0	0	1728	0	1770	1855	0	1770	1848	0
Flt Permitted		0.971			0.986		0.950			0.950		
Satd. Flow (perm)	0	1738	0	0	1728	0	1770	1855	0	1770	1848	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		458			470			732			667	
Travel Time (s)		10.4			10.7			16.6			15.2	

Intersection Summary

Area Type: Other

Intersection												
Int Delay, s/veh	5.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↔	↔		↔	↔	
Traffic Vol, veh/h	38	7	18	10	10	16	32	848	26	19	448	25
Future Vol, veh/h	38	7	18	10	10	16	32	848	26	19	448	25
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	41	8	20	11	11	17	35	922	28	21	487	27

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1563	1563	501	1563	1562	936	514	0	0	950	0	0
Stage 1	543	543	-	1006	1006	-	-	-	-	-	-	-
Stage 2	1020	1020	-	557	556	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	91	112	570	91	112	321	1052	-	-	723	-	-
Stage 1	524	520	-	291	319	-	-	-	-	-	-	-
Stage 2	285	314	-	515	513	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	76	105	570	79	105	321	1052	-	-	723	-	-
Mov Cap-2 Maneuver	76	105	-	79	105	-	-	-	-	-	-	-
Stage 1	507	505	-	281	308	-	-	-	-	-	-	-
Stage 2	251	304	-	476	498	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	88.3		43		0.3		0.4	
HCM LOS	F		E					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1052	-	-	105	133	723	-	-
HCM Lane V/C Ratio	0.033	-	-	0.652	0.294	0.029	-	-
HCM Control Delay (s)	8.5	-	-	88.3	43	10.1	-	-
HCM Lane LOS	A	-	-	F	E	B	-	-
HCM 95th %tile Q(veh)	0.1	-	-	3.3	1.1	0.1	-	-



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↘		↗	↘	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	100		0	100		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt					0.932			0.998				
Flt Protected					0.976					0.950		
Satd. Flow (prot)	0	1863	0	0	1694	0	1863	1859	0	1770	1863	0
Flt Permitted					0.976					0.950		
Satd. Flow (perm)	0	1863	0	0	1694	0	1863	1859	0	1770	1863	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		319			430			608			732	
Travel Time (s)		7.3			9.8			13.8			16.6	

Intersection Summary

Area Type: Other

Intersection												
Int Delay, s/veh	0.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	0	0	0	15	0	15	0	859	13	19	488	0
Future Vol, veh/h	0	0	0	15	0	15	0	859	13	19	488	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	16	0	16	0	934	14	21	530	0

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	1521	1520	530	1513	1513	941	530	0	0	948	0	0
Stage 1	572	572	-	941	941	-	-	-	-	-	-	-
Stage 2	949	948	-	572	572	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	97	119	549	98	120	319	1037	-	-	724	-	-
Stage 1	505	504	-	316	342	-	-	-	-	-	-	-
Stage 2	313	339	-	505	504	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	90	116	549	96	117	319	1037	-	-	724	-	-
Mov Cap-2 Maneuver	90	116	-	96	117	-	-	-	-	-	-	-
Stage 1	505	489	-	316	342	-	-	-	-	-	-	-
Stage 2	297	339	-	490	489	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	36.1	0	0.4
HCM LOS	A	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1037	-	-	-	148	724	-
HCM Lane V/C Ratio	-	-	-	-	0.22	0.029	-
HCM Control Delay (s)	0	-	-	0	36.1	10.1	-
HCM Lane LOS	A	-	-	A	E	B	-
HCM 95th %tile Q(veh)	0	-	-	-	0.8	0.1	-

Lanes and Geometrics
 4: Tennyson St. & W 64th Ave.

6501 Lowell Blvd
 06/07/2021



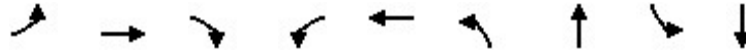
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		100	150		0	0		0	0		0
Storage Lanes	1		1	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850		0.994			0.920				0.952
Flt Protected	0.950			0.950				0.984				0.983
Satd. Flow (prot)	1770	1863	1583	1770	1852	0	0	1686	0	0	1743	0
Flt Permitted	0.217			0.095				0.878				0.841
Satd. Flow (perm)	404	1863	1583	177	1852	0	0	1505	0	0	1491	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			61		4			93				17
Link Speed (mph)		30			30			30				30
Link Distance (ft)		501			1329			646				482
Travel Time (s)		11.4			30.2			14.7				11.0

Intersection Summary

Area Type: Other

Timings
4: Tennyson St. & W 64th Ave.

6501 Lowell Blvd
06/07/2021

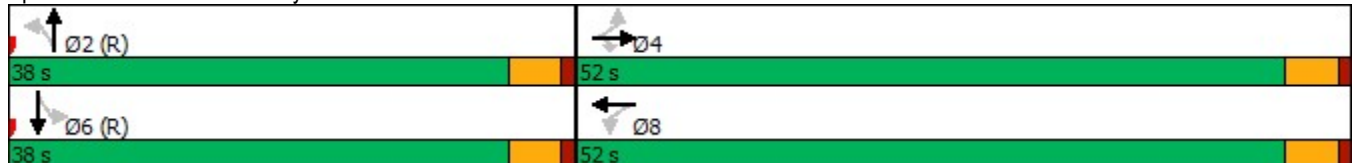


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↖	↑	↗	↖	↗		↕		↕
Traffic Volume (vph)	25	761	110	95	585	137	40	16	13
Future Volume (vph)	25	761	110	95	585	137	40	16	13
Turn Type	Perm	NA	Perm	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4			8		2		6
Permitted Phases	4		4	8		2		6	
Detector Phase	4	4	4	8	8	2	2	6	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	52.0	52.0	52.0	52.0	52.0	38.0	38.0	38.0	38.0
Total Split (%)	57.8%	57.8%	57.8%	57.8%	57.8%	42.2%	42.2%	42.2%	42.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	45.5	45.5	45.5	45.5	45.5		35.5		35.5
Actuated g/C Ratio	0.51	0.51	0.51	0.51	0.51		0.39		0.39
v/c Ratio	0.13	0.88	0.14	1.16	0.71		0.73		0.08
Control Delay	12.8	31.7	6.2	166.4	32.9		27.0		13.7
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	12.8	31.7	6.2	166.4	32.9		27.0		13.7
LOS	B	C	A	F	C		C		B
Approach Delay		28.1			50.8		27.0		13.7
Approach LOS		C			D		C		B

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 65
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.16
 Intersection Signal Delay: 35.3
 Intersection Capacity Utilization 88.5%
 Analysis Period (min) 15
 Intersection LOS: D
 ICU Level of Service E

Splits and Phases: 4: Tennyson St. & W 64th Ave.





Lane Group	EBL	EBT	EBR	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	27	827	120	103	664	471	48
v/c Ratio	0.13	0.88	0.14	1.16	0.71	0.73	0.08
Control Delay	12.8	31.7	6.2	166.4	32.9	27.0	13.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.8	31.7	6.2	166.4	32.9	27.0	13.7
Queue Length 50th (ft)	7	378	16	-64	330	187	11
Queue Length 95th (ft)	23	#623	42	m#116	m413	#324	34
Internal Link Dist (ft)		421			1249	566	402
Turn Bay Length (ft)	150		100	150			
Base Capacity (vph)	213	983	864	93	979	649	597
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.84	0.14	1.11	0.68	0.73	0.08

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

HCM 6th Signalized Intersection Summary
 4: Tennyson St. & W 64th Ave.

6501 Lowell Blvd
 06/07/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	25	761	110	95	585	26	137	40	257	16	13	16
Future Volume (veh/h)	25	761	110	95	585	26	137	40	257	16	13	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	27	827	120	103	636	28	149	43	279	17	14	17
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	487	987	837	171	938	41	219	69	341	197	164	168
Arrive On Green	0.53	0.53	0.53	1.00	1.00	1.00	0.37	0.37	0.37	0.37	0.37	0.37
Sat Flow, veh/h	772	1870	1585	592	1778	78	446	184	916	384	440	451
Grp Volume(v), veh/h	27	827	120	103	0	664	471	0	0	48	0	0
Grp Sat Flow(s),veh/h/ln	772	1870	1585	592	0	1856	1546	0	0	1275	0	0
Q Serve(g_s), s	1.5	33.7	3.5	13.8	0.0	0.0	22.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	1.5	33.7	3.5	47.5	0.0	0.0	24.6	0.0	0.0	1.6	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.04	0.32		0.59	0.35		0.35
Lane Grp Cap(c), veh/h	487	987	837	171	0	980	628	0	0	529	0	0
V/C Ratio(X)	0.06	0.84	0.14	0.60	0.00	0.68	0.75	0.00	0.00	0.09	0.00	0.00
Avail Cap(c_a), veh/h	487	987	837	171	0	980	628	0	0	529	0	0
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	0.69	0.00	0.69	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	10.4	18.0	10.9	17.7	0.0	0.0	25.4	0.0	0.0	18.2	0.0	0.0
Incr Delay (d2), s/veh	0.0	6.5	0.1	4.1	0.0	1.3	8.0	0.0	0.0	0.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.5	21.3	2.1	3.7	0.0	0.6	15.2	0.0	0.0	1.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	10.4	24.4	10.9	21.7	0.0	1.3	33.4	0.0	0.0	18.6	0.0	0.0
LnGrp LOS	B	C	B	C	A	A	C	A	A	B	A	A
Approach Vol, veh/h		974			767			471				48
Approach Delay, s/veh		22.4			4.0			33.4				18.6
Approach LOS		C			A			C				B
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		38.0		52.0		38.0		52.0				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		33.5		47.5		33.5		47.5				
Max Q Clear Time (g_c+I1), s		26.6		35.7		3.6		49.5				
Green Ext Time (p_c), s		1.8		5.2		0.2		0.0				
Intersection Summary												
HCM 6th Ctrl Delay				18.4								
HCM 6th LOS				B								



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	200		150	150		75	200		150	200		100
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.135			0.451			0.586			0.129		
Satd. Flow (perm)	251	1863	1583	840	1863	1583	1092	1863	1583	240	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			93			127			127			197
Link Speed (mph)		30			30			30				30
Link Distance (ft)		1329			1480			763				608
Travel Time (s)		30.2			33.6			17.3				13.8

Intersection Summary

Area Type: Other

Timings
5: W 64th Ave./W. 64th Ave. & Lowell Blvd.

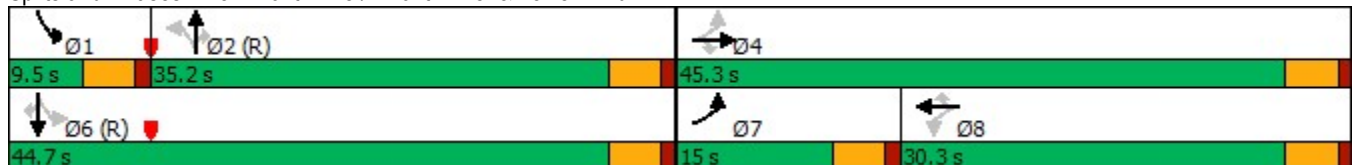
6501 Lowell Blvd
06/07/2021

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	270	482	87	59	447	72	153	520	125	50	261	181
Future Volume (vph)	270	482	87	59	447	72	153	520	125	50	261	181
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4			8			2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	7	4	4	8	8	8	2	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	15.0	45.3	45.3	30.3	30.3	30.3	35.2	35.2	35.2	9.5	44.7	44.7
Total Split (%)	16.7%	50.3%	50.3%	33.7%	33.7%	33.7%	39.1%	39.1%	39.1%	10.6%	49.7%	49.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead			Lag	Lag	Lag	Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes			Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	40.1	40.1	40.1	25.1	25.1	25.1	33.3	33.3	33.3	40.9	40.9	40.9
Actuated g/C Ratio	0.45	0.45	0.45	0.28	0.28	0.28	0.37	0.37	0.37	0.45	0.45	0.45
v/c Ratio	1.01	0.63	0.13	0.27	0.93	0.15	0.41	0.82	0.20	0.28	0.34	0.24
Control Delay	76.4	30.6	9.0	28.7	59.1	1.9	26.4	38.9	5.6	17.9	17.5	3.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	76.4	30.6	9.0	28.7	59.1	1.9	26.4	38.9	5.6	17.9	17.5	3.1
LOS	E	C	A	C	E	A	C	D	A	B	B	A
Approach Delay		43.0			48.9			31.3			12.2	
Approach LOS		D			D			C			B	

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.01
 Intersection Signal Delay: 35.2
 Intersection LOS: D
 Intersection Capacity Utilization 85.0%
 ICU Level of Service E
 Analysis Period (min) 15

Splits and Phases: 5: W 64th Ave./W. 64th Ave. & Lowell Blvd.





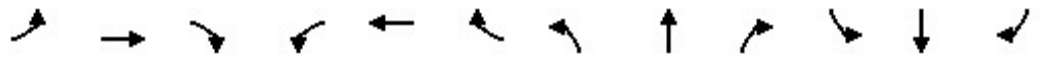
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	293	524	95	64	486	78	166	565	136	54	284	197
v/c Ratio	1.01	0.63	0.13	0.27	0.93	0.15	0.41	0.82	0.20	0.28	0.34	0.24
Control Delay	76.4	30.6	9.0	28.7	59.1	1.9	26.4	38.9	5.6	17.9	17.5	3.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	76.4	30.6	9.0	28.7	59.1	1.9	26.4	38.9	5.6	17.9	17.5	3.1
Queue Length 50th (ft)	~148	262	10	28	266	0	72	300	3	17	102	0
Queue Length 95th (ft)	m#213	m323	m19	63	#451	11	133	#494	41	38	161	37
Internal Link Dist (ft)		1249			1400			683			528	
Turn Bay Length (ft)	200		150	150		75	200		150	200		100
Base Capacity (vph)	289	844	768	240	534	544	403	688	664	195	846	826
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.01	0.62	0.12	0.27	0.91	0.14	0.41	0.82	0.20	0.28	0.34	0.24

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

HCM 6th Signalized Intersection Summary
 5: W 64th Ave./W. 64th Ave. & Lowell Blvd.

6501 Lowell Blvd
 06/07/2021



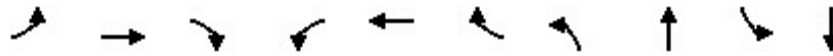
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	270	482	87	59	447	72	153	520	125	50	261	181
Future Volume (veh/h)	270	482	87	59	447	72	153	520	125	50	261	181
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	293	524	95	64	486	78	166	565	136	54	284	197
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	311	835	708	266	523	443	405	678	574	218	848	719
Arrive On Green	0.12	0.45	0.45	0.28	0.28	0.28	0.36	0.36	0.36	0.04	0.45	0.45
Sat Flow, veh/h	1781	1870	1585	804	1870	1585	914	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	293	524	95	64	486	78	166	565	136	54	284	197
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	804	1870	1585	914	1870	1585	1781	1870	1585
Q Serve(g_s), s	10.3	19.4	3.2	6.0	22.8	3.4	12.9	24.8	5.4	1.6	8.8	7.0
Cycle Q Clear(g_c), s	10.3	19.4	3.2	10.4	22.8	3.4	13.5	24.8	5.4	1.6	8.8	7.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	311	835	708	266	523	443	405	678	574	218	848	719
V/C Ratio(X)	0.94	0.63	0.13	0.24	0.93	0.18	0.41	0.83	0.24	0.25	0.33	0.27
Avail Cap(c_a), veh/h	311	848	719	271	536	454	405	678	574	243	848	719
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.36	0.36	0.36	0.09	0.09	0.09	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.2	19.2	14.7	28.9	31.5	24.6	22.8	26.2	20.0	19.6	15.8	15.3
Incr Delay (d2), s/veh	18.4	0.5	0.0	0.0	3.1	0.0	3.0	11.5	1.0	0.6	1.1	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	8.0	10.9	2.0	1.7	12.0	1.8	5.4	18.6	3.8	1.2	6.9	4.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	40.6	19.7	14.7	29.0	34.7	24.6	25.9	37.7	21.0	20.2	16.9	16.3
LnGrp LOS	D	B	B	C	C	C	C	D	C	C	B	B
Approach Vol, veh/h		912			628			867			535	
Approach Delay, s/veh		25.9			32.8			32.8			17.0	
Approach LOS		C			C			C			B	
Timer - Assigned Phs	1	2		4		6	7	8				
Phs Duration (G+Y+Rc), s	8.2	37.1		44.7		45.3	15.0	29.7				
Change Period (Y+Rc), s	4.5	4.5		4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s	5.0	30.7		40.8		40.2	10.5	25.8				
Max Q Clear Time (g_c+I1), s	3.6	26.8		21.4		10.8	12.3	24.8				
Green Ext Time (p_c), s	0.0	1.8		3.6		2.5	0.0	0.4				
Intersection Summary												
HCM 6th Ctrl Delay				27.8								
HCM 6th LOS				C								



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	100		150	150		100	600		0	250		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor			0.850			0.850		0.993			0.988	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	5050	0	1770	5024	0
Flt Permitted	0.180			0.505			0.072			0.079		
Satd. Flow (perm)	335	1863	1583	941	1863	1583	134	5050	0	147	5024	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			193			177		9			14	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1480			550			1046			611	
Travel Time (s)		33.6			12.5			23.8			13.9	

Intersection Summary

Area Type: Other

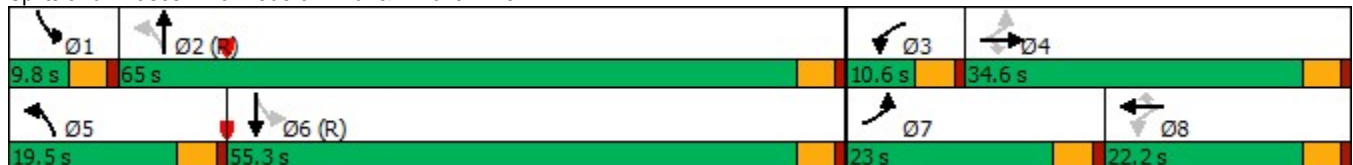


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations	↖	↑	↗	↖	↑	↗	↖	↑↑↑	↖	↑↑↑
Traffic Volume (vph)	339	288	206	135	251	116	260	2230	101	1826
Future Volume (vph)	339	288	206	135	251	116	260	2230	101	1826
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA
Protected Phases	7	4		3	8		5	2	1	6
Permitted Phases	4		4	8		8	2		6	
Detector Phase	7	4	4	3	8	8	5	2	1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	20.6	20.6	9.5	22.5	9.5	22.5
Total Split (s)	23.0	34.6	34.6	10.6	22.2	22.2	19.5	65.0	9.8	55.3
Total Split (%)	19.2%	28.8%	28.8%	8.8%	18.5%	18.5%	16.3%	54.2%	8.2%	46.1%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)	40.7	30.1	30.1	23.8	17.7	17.7	70.3	60.5	56.1	50.8
Actuated g/C Ratio	0.34	0.25	0.25	0.20	0.15	0.15	0.59	0.50	0.47	0.42
v/c Ratio	1.10	0.67	0.41	0.64	1.00	0.33	1.00	1.00	0.79	1.01
Control Delay	112.4	48.6	10.2	48.0	105.0	4.2	87.9	47.1	56.5	56.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	112.4	48.6	10.2	48.0	105.0	4.2	87.9	47.1	56.5	56.4
LOS	F	D	B	D	F	A	F	D	E	E
Approach Delay		65.1			66.4			51.2		56.4
Approach LOS		E			E			D		E

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 120
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.10
 Intersection Signal Delay: 56.2
 Intersection LOS: E
 Intersection Capacity Utilization 100.1%
 ICU Level of Service G
 Analysis Period (min) 15

Splits and Phases: 6: Federal Blvd. & W. 64th Ave.





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	368	313	224	147	273	126	283	2544	110	2155
v/c Ratio	1.10	0.67	0.41	0.64	1.00	0.33	1.00	1.00	0.79	1.01
Control Delay	112.4	48.6	10.2	48.0	105.0	4.2	87.9	47.1	56.5	56.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	112.4	48.6	10.2	48.0	105.0	4.2	87.9	47.1	56.5	56.4
Queue Length 50th (ft)	~273	219	18	82	214	0	170	694	36	~613
Queue Length 95th (ft)	#468	321	85	#136	#391	18	#355	#840	#133	#736
Internal Link Dist (ft)		1400			470			966		531
Turn Bay Length (ft)	100		150	150		100	600		250	
Base Capacity (vph)	334	467	541	228	274	384	283	2550	140	2134
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.10	0.67	0.41	0.64	1.00	0.33	1.00	1.00	0.79	1.01

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

HCM 6th Signalized Intersection Summary
6: Federal Blvd. & W. 64th Ave.

6501 Lowell Blvd
06/07/2021


























Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	339	288	206	135	251	116	260	2230	110	101	1826	156
Future Volume (veh/h)	339	288	206	135	251	116	260	2230	110	101	1826	156
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	368	313	224	147	273	126	283	2424	120	110	1985	170
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	336	469	398	238	276	234	285	2514	123	142	2029	173
Arrive On Green	0.15	0.25	0.25	0.05	0.15	0.15	0.13	0.50	0.50	0.04	0.42	0.42
Sat Flow, veh/h	1781	1870	1585	1781	1870	1585	1781	4986	245	1781	4793	408
Grp Volume(v), veh/h	368	313	224	147	273	126	283	1648	896	110	1406	749
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	1585	1781	1702	1826	1781	1702	1797
Q Serve(g_s), s	18.5	18.1	14.8	6.1	17.5	8.8	14.9	55.8	57.3	4.2	48.7	49.5
Cycle Q Clear(g_c), s	18.5	18.1	14.8	6.1	17.5	8.8	14.9	55.8	57.3	4.2	48.7	49.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.13	1.00		0.23
Lane Grp Cap(c), veh/h	336	469	398	238	276	234	285	1716	921	142	1441	761
V/C Ratio(X)	1.09	0.67	0.56	0.62	0.99	0.54	0.99	0.96	0.97	0.77	0.98	0.98
Avail Cap(c_a), veh/h	336	469	398	238	276	234	285	1716	921	142	1441	761
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	0.84	0.84	0.84	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.4	40.4	39.2	44.2	51.1	47.4	39.4	28.6	29.0	28.8	34.0	34.2
Incr Delay (d2), s/veh	72.7	3.0	1.5	4.8	51.2	2.5	51.6	14.2	23.8	22.9	18.6	29.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	21.7	13.1	9.6	2.7	17.8	6.6	18.3	33.4	39.0	4.8	31.2	35.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	109.1	43.5	40.8	49.0	102.2	49.8	90.9	42.8	52.8	51.8	52.6	63.3
LnGrp LOS	F	D	D	D	F	D	F	D	D	D	D	E
Approach Vol, veh/h		905			546			2827			2265	
Approach Delay, s/veh		69.5			75.8			50.7			56.1	
Approach LOS		E			E			D			E	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.8	65.0	10.6	34.6	19.5	55.3	23.0	22.2				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	5.3	60.5	6.1	30.1	15.0	50.8	18.5	17.7				
Max Q Clear Time (g_c+I1), s	6.2	59.3	8.1	20.1	16.9	51.5	20.5	19.5				
Green Ext Time (p_c), s	0.0	1.2	0.0	1.9	0.0	0.0	0.0	0.0				

Intersection Summary

HCM 6th Ctrl Delay	57.3
HCM 6th LOS	E

Notes

User approved pedestrian interval to be less than phase max green.

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		150	150		0	225		250	150		150
Storage Lanes	1		1	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850		0.931				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1734	0	1770	1863	1583	1770	1863	1583
Flt Permitted	0.742			0.750			0.535			0.619		
Satd. Flow (perm)	1382	1863	1583	1397	1734	0	997	1863	1583	1153	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			136		11				27			65
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		594			990			699			502	
Travel Time (s)		13.5			22.5			15.9			11.4	

Intersection Summary

Area Type: Other

Timings
1: Lowell Blvd. & W. 68th Ave.

6501 Lowell Blvd
06/07/2021



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑	↗	↖	↗	↖	↑	↗	↖	↑	↗
Traffic Volume (vph)	56	10	125	3	12	71	205	1	18	352	60
Future Volume (vph)	56	10	125	3	12	71	205	1	18	352	60
Turn Type	Perm	NA	Perm	Perm	NA	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8		2			6	
Permitted Phases	4		4	8		2		2	6		6
Detector Phase	4	4	4	8	8	2	2	2	6	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	26.0	26.0	26.0	26.0	26.0	34.0	34.0	34.0	34.0	34.0	34.0
Total Split (%)	43.3%	43.3%	43.3%	43.3%	43.3%	56.7%	56.7%	56.7%	56.7%	56.7%	56.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag											
Lead-Lag Optimize?											
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	8.2	8.2	8.2	8.2	8.2	45.7	45.7	45.7	45.7	45.7	45.7
Actuated g/C Ratio	0.14	0.14	0.14	0.14	0.14	0.76	0.76	0.76	0.76	0.76	0.76
v/c Ratio	0.32	0.04	0.41	0.02	0.10	0.10	0.16	0.00	0.02	0.27	0.05
Control Delay	27.2	21.3	8.9	21.0	16.5	3.6	3.4	0.0	3.2	3.9	1.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.2	21.3	8.9	21.0	16.5	3.6	3.4	0.0	3.2	3.9	1.2
LOS	C	C	A	C	B	A	A	A	A	A	A
Approach Delay		14.9			17.0		3.4			3.5	
Approach LOS		B			B		A			A	

Intersection Summary

Cycle Length: 60
 Actuated Cycle Length: 60
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 45
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.41
 Intersection Signal Delay: 6.2
 Intersection Capacity Utilization 43.7%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service A

Splits and Phases: 1: Lowell Blvd. & W. 68th Ave.



Queues

6501 Lowell Blvd

1: Lowell Blvd. & W. 68th Ave.

06/07/2021



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	61	11	136	3	24	77	223	1	20	383	65
v/c Ratio	0.32	0.04	0.41	0.02	0.10	0.10	0.16	0.00	0.02	0.27	0.05
Control Delay	27.2	21.3	8.9	21.0	16.5	3.6	3.4	0.0	3.2	3.9	1.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.2	21.3	8.9	21.0	16.5	3.6	3.4	0.0	3.2	3.9	1.2
Queue Length 50th (ft)	20	4	0	1	4	6	19	0	2	37	0
Queue Length 95th (ft)	48	15	39	7	20	20	46	0	7	82	9
Internal Link Dist (ft)		514			910		619			422	
Turn Bay Length (ft)	150		150	150		225		250	150		150
Base Capacity (vph)	495	667	654	500	628	759	1419	1212	878	1419	1221
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.12	0.02	0.21	0.01	0.04	0.10	0.16	0.00	0.02	0.27	0.05

Intersection Summary

HCM 6th Signalized Intersection Summary
 1: Lowell Blvd. & W. 68th Ave.

6501 Lowell Blvd
 06/07/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	56	10	125	3	12	10	71	205	1	18	352	60
Future Volume (veh/h)	56	10	125	3	12	10	71	205	1	18	352	60
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	61	11	136	3	13	11	77	223	1	20	383	65
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	272	229	194	265	114	97	740	1361	1154	919	1361	1154
Arrive On Green	0.12	0.12	0.12	0.12	0.12	0.12	0.73	0.73	0.73	0.73	0.73	0.73
Sat Flow, veh/h	1387	1870	1585	1241	936	792	942	1870	1585	1157	1870	1585
Grp Volume(v), veh/h	61	11	136	3	0	24	77	223	1	20	383	65
Grp Sat Flow(s),veh/h/ln	1387	1870	1585	1241	0	1728	942	1870	1585	1157	1870	1585
Q Serve(g_s), s	2.5	0.3	4.9	0.1	0.0	0.7	1.8	2.2	0.0	0.3	4.2	0.7
Cycle Q Clear(g_c), s	3.2	0.3	4.9	0.4	0.0	0.7	6.0	2.2	0.0	2.5	4.2	0.7
Prop In Lane	1.00		1.00	1.00		0.46	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	272	229	194	265	0	211	740	1361	1154	919	1361	1154
V/C Ratio(X)	0.22	0.05	0.70	0.01	0.00	0.11	0.10	0.16	0.00	0.02	0.28	0.06
Avail Cap(c_a), veh/h	600	670	568	558	0	619	740	1361	1154	919	1361	1154
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.9	23.3	25.3	23.4	0.0	23.4	3.8	2.5	2.2	2.9	2.8	2.3
Incr Delay (d2), s/veh	0.4	0.1	4.6	0.0	0.0	0.2	0.3	0.3	0.0	0.0	0.5	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.4	0.2	3.6	0.1	0.0	0.5	0.5	0.9	0.0	0.1	1.8	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.3	23.3	29.9	23.5	0.0	23.7	4.1	2.8	2.2	3.0	3.3	2.4
LnGrp LOS	C	C	C	C	A	C	A	A	A	A	A	A
Approach Vol, veh/h		208			27			301			468	
Approach Delay, s/veh		28.2			23.7			3.1			3.2	
Approach LOS		C			C			A			A	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		48.2		11.8		48.2		11.8				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		29.5		21.5		29.5		21.5				
Max Q Clear Time (g_c+I1), s		8.0		6.9		6.2		2.7				
Green Ext Time (p_c), s		1.6		0.5		2.7		0.1				

Intersection Summary

HCM 6th Ctrl Delay	8.9
HCM 6th LOS	A



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↘		↗	↘	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	100		0	100		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.921			0.940			0.996			0.993	
Flt Protected		0.986			0.978		0.950		0.950			
Satd. Flow (prot)	0	1692	0	0	1712	0	1770	1855	0	1770	1850	0
Flt Permitted		0.986			0.978		0.950		0.950			
Satd. Flow (perm)	0	1692	0	0	1712	0	1770	1855	0	1770	1850	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		458			470			732			699	
Travel Time (s)		10.4			10.7			16.6			15.9	

Intersection Summary

Area Type: Other

Intersection												
Int Delay, s/veh	1.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	15	6	29	16	4	16	12	366	10	4	490	24
Future Vol, veh/h	15	6	29	16	4	16	12	366	10	4	490	24
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	16	7	32	17	4	17	13	398	11	4	533	26

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	994	989	546	1004	997	404	559	0	0	409	0	0
Stage 1	554	554	-	430	430	-	-	-	-	-	-	-
Stage 2	440	435	-	574	567	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	224	247	538	220	244	647	1012	-	-	1150	-	-
Stage 1	517	514	-	603	583	-	-	-	-	-	-	-
Stage 2	596	580	-	504	507	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	212	243	538	200	240	647	1012	-	-	1150	-	-
Mov Cap-2 Maneuver	212	243	-	200	240	-	-	-	-	-	-	-
Stage 1	510	512	-	595	575	-	-	-	-	-	-	-
Stage 2	568	572	-	467	505	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	17.8	19	0.3	0.1
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1012	-	-	335	297	1150	-
HCM Lane V/C Ratio	0.013	-	-	0.162	0.132	0.004	-
HCM Control Delay (s)	8.6	-	-	17.8	19	8.1	-
HCM Lane LOS	A	-	-	C	C	A	-
HCM 95th %tile Q(veh)	0	-	-	0.6	0.4	0	-



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↘		↗	↘	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	100		0	100		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.916			0.921			0.996			0.999	
Flt Protected		0.986			0.983		0.950		0.950			
Satd. Flow (prot)	0	1682	0	0	1686	0	1770	1855	0	1770	1861	0
Flt Permitted		0.986			0.983		0.950		0.950			
Satd. Flow (perm)	0	1682	0	0	1686	0	1770	1855	0	1770	1861	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		319			430			608			732	
Travel Time (s)		7.3			9.8			13.8			16.6	

Intersection Summary

Area Type: Other

Intersection												
Int Delay, s/veh	1.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	11	4	24	9	2	16	8	363	10	13	520	4
Future Vol, veh/h	11	4	24	9	2	16	8	363	10	13	520	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	12	4	26	10	2	17	9	395	11	14	565	4

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1023	1019	567	1029	1016	401	569	0	0	406	0	0
Stage 1	595	595	-	419	419	-	-	-	-	-	-	-
Stage 2	428	424	-	610	597	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	214	237	523	212	238	649	1003	-	-	1153	-	-
Stage 1	491	492	-	612	590	-	-	-	-	-	-	-
Stage 2	605	587	-	482	491	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	204	232	523	195	233	649	1003	-	-	1153	-	-
Mov Cap-2 Maneuver	204	232	-	195	233	-	-	-	-	-	-	-
Stage 1	487	486	-	606	585	-	-	-	-	-	-	-
Stage 2	581	582	-	448	485	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	17.4		16.6		0.2		0.2	
HCM LOS	C		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1003	-	-	333	340	1153	-	-
HCM Lane V/C Ratio	0.009	-	-	0.127	0.086	0.012	-	-
HCM Control Delay (s)	8.6	-	-	17.4	16.6	8.2	-	-
HCM Lane LOS	A	-	-	C	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.4	0.3	0	-	-

Lanes and Geometrics
 4: Tennyson St. & W 64th Ave.

6501 Lowell Blvd
 06/07/2021



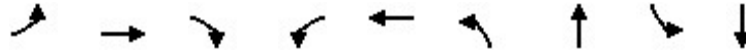
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%				0%
Storage Length (ft)	150		100	150		0	0		0	0		0
Storage Lanes	1		1	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850		0.995			0.919				0.949
Flt Protected	0.950			0.950				0.984				0.993
Satd. Flow (prot)	1770	1863	1583	1770	1853	0	0	1684	0	0	1755	0
Flt Permitted	0.220			0.349				0.899				0.966
Satd. Flow (perm)	410	1863	1583	650	1853	0	0	1539	0	0	1708	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			74		3			93				21
Link Speed (mph)		30			30			30				30
Link Distance (ft)		700			838			502				485
Travel Time (s)		15.9			19.0			11.4				11.0

Intersection Summary

Area Type: Other

Timings
4: Tennyson St. & W 64th Ave.

6501 Lowell Blvd
06/07/2021

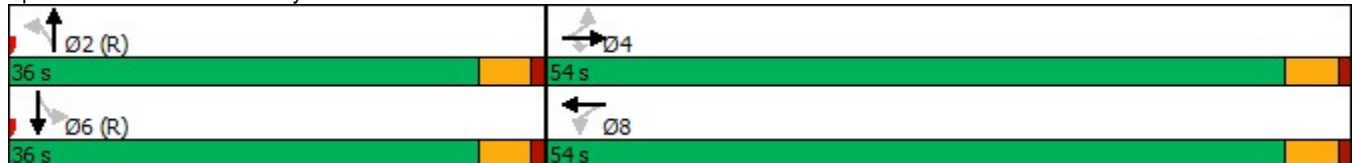


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↖	↑	↗	↖	↗		↕		↕
Traffic Volume (vph)	13	359	68	180	450	63	16	7	25
Future Volume (vph)	13	359	68	180	450	63	16	7	25
Turn Type	Perm	NA	Perm	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4			8		2		6
Permitted Phases	4		4	8		2		6	
Detector Phase	4	4	4	8	8	2	2	6	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	54.0	54.0	54.0	54.0	54.0	36.0	36.0	36.0	36.0
Total Split (%)	60.0%	60.0%	60.0%	60.0%	60.0%	40.0%	40.0%	40.0%	40.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5		4.5		4.5
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	32.9	32.9	32.9	32.9	32.9		48.1		48.1
Actuated g/C Ratio	0.37	0.37	0.37	0.37	0.37		0.53		0.53
v/c Ratio	0.09	0.57	0.12	0.83	0.74		0.25		0.06
Control Delay	16.6	25.3	4.0	63.2	42.2		8.7		9.7
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	16.6	25.3	4.0	63.2	42.2		8.7		9.7
LOS	B	C	A	E	D		A		A
Approach Delay		21.7			48.1		8.7		9.7
Approach LOS		C			D		A		A

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 50
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.83
 Intersection Signal Delay: 32.1
 Intersection Capacity Utilization 58.4%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service B

Splits and Phases: 4: Tennyson St. & W 64th Ave.





Lane Group	EBL	EBT	EBR	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	14	390	74	196	505	214	56
v/c Ratio	0.09	0.57	0.12	0.83	0.74	0.25	0.06
Control Delay	16.6	25.3	4.0	63.2	42.2	8.7	9.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.6	25.3	4.0	63.2	42.2	8.7	9.7
Queue Length 50th (ft)	5	174	0	113	283	33	9
Queue Length 95th (ft)	15	212	22	176	357	92	34
Internal Link Dist (ft)		620			758	422	405
Turn Bay Length (ft)	150		100	150			
Base Capacity (vph)	225	1024	903	357	1020	866	922
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.38	0.08	0.55	0.50	0.25	0.06
Intersection Summary							

HCM 6th Signalized Intersection Summary
4: Tennyson St. & W 64th Ave.

6501 Lowell Blvd
06/07/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	13	359	68	180	450	15	63	16	119	7	25	19
Future Volume (veh/h)	13	359	68	180	450	15	63	16	119	7	25	19
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	14	390	74	196	489	16	68	17	129	8	27	21
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	259	780	661	325	751	25	263	85	448	129	421	302
Arrive On Green	0.42	0.42	0.42	0.42	0.42	0.42	0.48	0.48	0.48	0.48	0.48	0.48
Sat Flow, veh/h	894	1870	1585	928	1801	59	436	175	928	172	872	626
Grp Volume(v), veh/h	14	390	74	196	0	505	214	0	0	56	0	0
Grp Sat Flow(s),veh/h/ln	894	1870	1585	928	0	1860	1539	0	0	1671	0	0
Q Serve(g_s), s	1.1	13.8	2.6	17.7	0.0	19.6	2.8	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	20.7	13.8	2.6	31.6	0.0	19.6	7.1	0.0	0.0	1.5	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.03	0.32		0.60	0.14		0.37
Lane Grp Cap(c), veh/h	259	780	661	325	0	776	795	0	0	852	0	0
V/C Ratio(X)	0.05	0.50	0.11	0.60	0.00	0.65	0.27	0.00	0.00	0.07	0.00	0.00
Avail Cap(c_a), veh/h	377	1029	872	448	0	1023	795	0	0	852	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	29.3	19.3	16.0	30.9	0.0	21.0	13.8	0.0	0.0	12.4	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.5	0.1	1.8	0.0	0.9	0.8	0.0	0.0	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.4	9.8	1.7	7.2	0.0	13.0	4.8	0.0	0.0	1.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	29.3	19.8	16.1	32.7	0.0	21.9	14.6	0.0	0.0	12.6	0.0	0.0
LnGrp LOS	C	B	B	C	A	C	B	A	A	B	A	A
Approach Vol, veh/h		478			701			214			56	
Approach Delay, s/veh		19.5			24.9			14.6			12.6	
Approach LOS		B			C			B			B	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		47.9		42.1		47.9		42.1				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		31.5		49.5		31.5		49.5				
Max Q Clear Time (g_c+I1), s		9.1		22.7		3.5		33.6				
Green Ext Time (p_c), s		1.3		2.9		0.2		4.0				
Intersection Summary												
HCM 6th Ctrl Delay				21.1								
HCM 6th LOS				C								



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	200		150	150		75	200		150	200		100
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.253			0.539			0.556			0.565		
Satd. Flow (perm)	471	1863	1583	1004	1863	1583	1036	1863	1583	1052	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			115			127			127			153
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		596			1268			763			608	
Travel Time (s)		13.5			28.8			17.3			13.8	

Intersection Summary

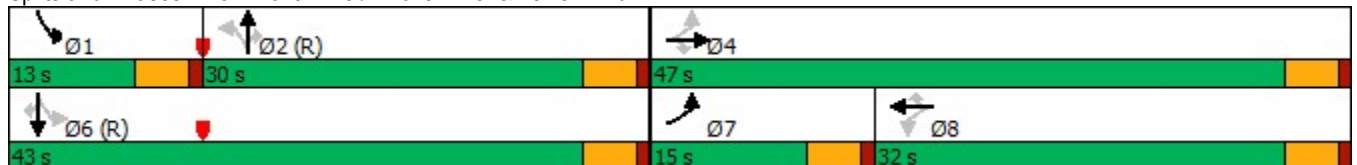
Area Type: Other

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	132	345	106	81	271	49	52	150	63	104	314	141
Future Volume (vph)	132	345	106	81	271	49	52	150	63	104	314	141
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4			8			2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	7	4	4	8	8	8	2	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	15.0	47.0	47.0	32.0	32.0	32.0	30.0	30.0	30.0	13.0	43.0	43.0
Total Split (%)	16.7%	52.2%	52.2%	35.6%	35.6%	35.6%	33.3%	33.3%	33.3%	14.4%	47.8%	47.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead			Lag	Lag	Lag	Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes			Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	34.2	34.2	34.2	19.9	19.9	19.9	36.4	36.4	36.4	46.8	46.8	46.8
Actuated g/C Ratio	0.38	0.38	0.38	0.22	0.22	0.22	0.40	0.40	0.40	0.52	0.52	0.52
v/c Ratio	0.45	0.53	0.17	0.40	0.72	0.12	0.14	0.22	0.10	0.18	0.35	0.17
Control Delay	34.8	38.0	14.6	31.5	37.6	3.6	23.1	22.1	0.8	13.8	15.5	3.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.8	38.0	14.6	31.5	37.6	3.6	23.1	22.1	0.8	13.8	15.5	3.1
LOS	C	D	B	C	D	A	C	C	A	B	B	A
Approach Delay		33.0			32.3			17.3			12.1	
Approach LOS		C			C			B			B	

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 65
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.72
 Intersection Signal Delay: 24.1
 Intersection Capacity Utilization 58.3%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service B

Splits and Phases: 5: W 64th Ave./W. 64th Ave. & Lowell Blvd.





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	143	375	115	88	295	53	57	163	68	113	341	153
v/c Ratio	0.45	0.53	0.17	0.40	0.72	0.12	0.14	0.22	0.10	0.18	0.35	0.17
Control Delay	34.8	38.0	14.6	31.5	37.6	3.6	23.1	22.1	0.8	13.8	15.5	3.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.8	38.0	14.6	31.5	37.6	3.6	23.1	22.1	0.8	13.8	15.5	3.1
Queue Length 50th (ft)	77	210	19	43	158	2	21	63	0	31	109	0
Queue Length 95th (ft)	111	261	48	m57	m182	m3	56	126	5	72	204	34
Internal Link Dist (ft)		516			1188			683			528	
Turn Bay Length (ft)	200		150	150		75	200		150	200		100
Base Capacity (vph)	330	879	808	306	569	571	418	753	715	617	969	896
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.43	0.14	0.29	0.52	0.09	0.14	0.22	0.10	0.18	0.35	0.17

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM 6th Signalized Intersection Summary
 5: W 64th Ave./W. 64th Ave. & Lowell Blvd.

6501 Lowell Blvd
 06/07/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↘	↖	↗	↘	↖	↗	↘	↖	↗	↘
Traffic Volume (veh/h)	132	345	106	81	271	49	52	150	63	104	314	141
Future Volume (veh/h)	132	345	106	81	271	49	52	150	63	104	314	141
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	143	375	115	88	295	53	57	163	68	113	341	153
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	270	618	523	206	371	314	502	874	741	652	1066	903
Arrive On Green	0.03	0.11	0.11	0.07	0.07	0.07	0.47	0.47	0.47	0.05	0.57	0.57
Sat Flow, veh/h	1781	1870	1585	906	1870	1585	903	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	143	375	115	88	295	53	57	163	68	113	341	153
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	906	1870	1585	903	1870	1585	1781	1870	1585
Q Serve(g_s), s	5.5	17.2	6.0	8.6	14.0	2.8	3.2	4.6	2.1	2.8	8.6	4.1
Cycle Q Clear(g_c), s	5.5	17.2	6.0	14.0	14.0	2.8	3.2	4.6	2.1	2.8	8.6	4.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	270	618	523	206	371	314	502	874	741	652	1066	903
V/C Ratio(X)	0.53	0.61	0.22	0.43	0.80	0.17	0.11	0.19	0.09	0.17	0.32	0.17
Avail Cap(c_a), veh/h	332	883	748	303	571	484	502	874	741	727	1066	903
HCM Platoon Ratio	0.33	0.33	0.33	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.70	0.70	0.70	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.0	34.5	29.5	42.9	40.3	35.0	13.6	14.0	13.3	10.3	10.2	9.2
Incr Delay (d2), s/veh	1.6	1.0	0.2	1.0	3.1	0.2	0.5	0.5	0.2	0.1	0.8	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	4.5	13.6	4.3	3.8	11.0	2.0	1.3	3.6	1.4	1.9	6.3	2.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.6	35.5	29.7	43.9	43.3	35.2	14.1	14.4	13.6	10.5	11.0	9.6
LnGrp LOS	C	D	C	D	D	D	B	B	B	B	B	A
Approach Vol, veh/h		633			436			288			607	
Approach Delay, s/veh		32.9			42.5			14.2			10.5	
Approach LOS		C			D			B			B	
Timer - Assigned Phs	1	2		4		6	7	8				
Phs Duration (G+Y+Rc), s	9.2	46.6		34.2		55.8	11.9	22.4				
Change Period (Y+Rc), s	4.5	4.5		4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s	8.5	25.5		42.5		38.5	10.5	27.5				
Max Q Clear Time (g_c+I1), s	4.8	6.6		19.2		10.6	7.5	16.0				
Green Ext Time (p_c), s	0.1	1.3		2.7		2.7	0.1	1.9				

Intersection Summary

HCM 6th Ctrl Delay	25.4
HCM 6th LOS	C



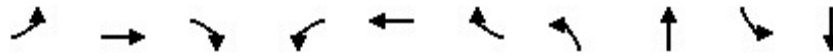
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	100		150	150		100	600		0	250		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor			0.850			0.850		0.987			0.990	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	5019	0	1770	5034	0
Flt Permitted	0.380			0.414			0.085			0.194		
Satd. Flow (perm)	708	1863	1583	771	1863	1583	158	5019	0	361	5034	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			127			127		23			18	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1268			424			903			562	
Travel Time (s)		28.8			9.6			20.5			12.8	

Intersection Summary

Area Type: Other

Timings
6: Federal Blvd. & W. 64th Ave.

6501 Lowell Blvd
06/07/2021

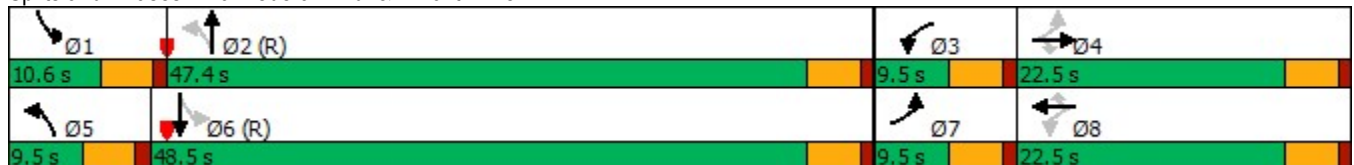


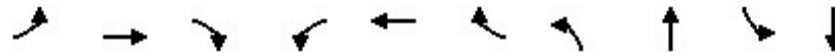
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	130	189	195	157	201	48	108	974	76	2553
Future Volume (vph)	130	189	195	157	201	48	108	974	76	2553
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA
Protected Phases	7	4		3	8		5	2	1	6
Permitted Phases	4		4	8		8	2		6	
Detector Phase	7	4	4	3	8	8	5	2	1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	9.5	22.5
Total Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	47.4	10.6	48.5
Total Split (%)	10.6%	25.0%	25.0%	10.6%	25.0%	25.0%	10.6%	52.7%	11.8%	53.9%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)	20.0	15.0	15.0	20.0	15.0	15.0	52.6	47.7	52.1	45.8
Actuated g/C Ratio	0.22	0.17	0.17	0.22	0.17	0.17	0.58	0.53	0.58	0.51
v/c Ratio	0.65	0.66	0.57	0.75	0.70	0.14	0.58	0.43	0.27	1.16
Control Delay	34.1	35.4	13.7	49.8	47.4	0.8	25.4	14.3	9.7	99.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.1	35.4	13.7	49.8	47.4	0.8	25.4	14.3	9.7	99.6
LOS	C	D	B	D	D	A	C	B	A	F
Approach Delay		26.8			42.8			15.3		97.2
Approach LOS		C			D			B		F

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 120
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.16
 Intersection Signal Delay: 65.7
 Intersection Capacity Utilization 93.1%
 Analysis Period (min) 15
 Intersection LOS: E
 ICU Level of Service F

Splits and Phases: 6: Federal Blvd. & W. 64th Ave.





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	141	205	212	171	218	52	117	1158	83	2976
v/c Ratio	0.65	0.66	0.57	0.75	0.70	0.14	0.58	0.43	0.27	1.16
Control Delay	34.1	35.4	13.7	49.8	47.4	0.8	25.4	14.3	9.7	99.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.1	35.4	13.7	49.8	47.4	0.8	25.4	14.3	9.7	99.6
Queue Length 50th (ft)	38	60	0	77	117	0	25	148	17	~765
Queue Length 95th (ft)	79	119	19	#144	187	0	#98	191	37	#860
Internal Link Dist (ft)		1188			344			823		482
Turn Bay Length (ft)	100		150	150		100	600		250	
Base Capacity (vph)	216	372	418	227	372	418	202	2672	308	2570
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.65	0.55	0.51	0.75	0.59	0.12	0.58	0.43	0.27	1.16

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

HCM 6th Signalized Intersection Summary
6: Federal Blvd. & W. 64th Ave.

6501 Lowell Blvd
06/07/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	130	189	195	157	201	48	108	974	91	76	2553	185
Future Volume (veh/h)	130	189	195	157	201	48	108	974	91	76	2553	185
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	141	205	212	171	218	52	117	1059	99	83	2775	201
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	237	305	258	233	305	258	174	2532	236	360	2575	182
Arrive On Green	0.02	0.05	0.05	0.06	0.16	0.16	0.05	0.53	0.53	0.05	0.53	0.53
Sat Flow, veh/h	1781	1870	1585	1781	1870	1585	1781	4751	444	1781	4868	344
Grp Volume(v), veh/h	141	205	212	171	218	52	117	758	400	83	1921	1055
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	1585	1781	1702	1791	1781	1702	1808
Q Serve(g_s), s	5.0	9.7	11.9	5.0	9.9	2.6	2.6	12.0	12.1	1.9	47.6	47.6
Cycle Q Clear(g_c), s	5.0	9.7	11.9	5.0	9.9	2.6	2.6	12.0	12.1	1.9	47.6	47.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.25	1.00		0.19
Lane Grp Cap(c), veh/h	237	305	258	233	305	258	174	1814	954	360	1801	957
V/C Ratio(X)	0.59	0.67	0.82	0.74	0.72	0.20	0.67	0.42	0.42	0.23	1.07	1.10
Avail Cap(c_a), veh/h	237	374	317	233	374	317	179	1814	954	394	1801	957
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	0.92	0.92	0.92	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.2	40.2	41.3	34.3	35.7	32.6	21.0	12.6	12.6	9.3	21.2	21.2
Incr Delay (d2), s/veh	3.7	3.2	12.3	11.5	4.9	0.4	9.2	0.7	1.4	0.3	41.6	61.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.3	8.6	9.7	3.7	8.5	1.8	3.0	7.9	8.5	1.3	37.8	47.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	36.8	43.4	53.5	45.7	40.6	33.0	30.2	13.3	14.0	9.7	62.8	82.8
LnGrp LOS	D	D	D	D	D	C	C	B	B	A	F	F
Approach Vol, veh/h		558			441			1275			3059	
Approach Delay, s/veh		45.6			41.7			15.1			68.2	
Approach LOS		D			D			B			E	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.9	52.5	9.5	19.2	9.2	52.1	9.5	19.2				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	6.1	42.9	5.0	18.0	5.0	44.0	5.0	18.0				
Max Q Clear Time (g_c+I1), s	3.9	14.1	7.0	13.9	4.6	49.6	7.0	11.9				
Green Ext Time (p_c), s	0.0	9.3	0.0	0.7	0.0	0.0	0.0	0.7				
Intersection Summary												
HCM 6th Ctrl Delay			51.0									
HCM 6th LOS			D									



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)		0%	0%		0%	
Storage Length (ft)	100			0	0	0
Storage Lanes	1			0	1	0
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.998		0.942	
Flt Protected	0.950				0.972	
Satd. Flow (prot)	1770	1863	1859	0	1706	0
Flt Permitted	0.950				0.972	
Satd. Flow (perm)	1770	1863	1859	0	1706	0
Link Speed (mph)		30	30		30	
Link Distance (ft)		838	596		267	
Travel Time (s)		19.0	13.5		6.1	

Intersection Summary
























Area Type: Other

Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	5	565	458	6	18	14
Future Vol, veh/h	5	565	458	6	18	14
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	614	498	7	20	15

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	505	0	-	0	1126 502
Stage 1	-	-	-	-	502 -
Stage 2	-	-	-	-	624 -
Critical Hdwy	4.12	-	-	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.218	-	-	-	3.518 3.318
Pot Cap-1 Maneuver	1060	-	-	-	227 569
Stage 1	-	-	-	-	608 -
Stage 2	-	-	-	-	534 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1060	-	-	-	226 569
Mov Cap-2 Maneuver	-	-	-	-	226 -
Stage 1	-	-	-	-	605 -
Stage 2	-	-	-	-	534 -

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	18.2
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1060	-	-	-	307
HCM Lane V/C Ratio	0.005	-	-	-	0.113
HCM Control Delay (s)	8.4	-	-	-	18.2
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	0.4

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		150	150		0	225		250	150		150
Storage Lanes	1		1	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850		0.904				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1684	0	1770	1863	1583	1770	1863	1583
Flt Permitted	0.719			0.747			0.488			0.277		
Satd. Flow (perm)	1339	1863	1583	1391	1684	0	909	1863	1583	516	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			85		37				27			98
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		549			716			667			367	
Travel Time (s)		12.5			16.3			15.2			8.3	

Intersection Summary

Area Type: Other

Timings
1: Lowell Blvd. & W. 68th Ave.

6501 Lowell Blvd
06/07/2021

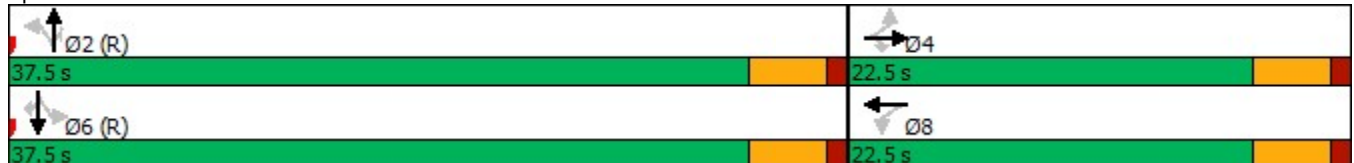


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	59	15	78	13	19	135	765	22	15	420	90
Future Volume (vph)	59	15	78	13	19	135	765	22	15	420	90
Turn Type	Perm	NA	Perm	Perm	NA	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8		2			6	
Permitted Phases	4		4	8		2		2	6		6
Detector Phase	4	4	4	8	8	2	2	2	6	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	22.5	22.5	22.5	22.5	22.5	37.5	37.5	37.5	37.5	37.5	37.5
Total Split (%)	37.5%	37.5%	37.5%	37.5%	37.5%	62.5%	62.5%	62.5%	62.5%	62.5%	62.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag											
Lead-Lag Optimize?											
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	8.3	8.3	8.3	8.3	8.3	45.6	45.6	45.6	45.6	45.6	45.6
Actuated g/C Ratio	0.14	0.14	0.14	0.14	0.14	0.76	0.76	0.76	0.76	0.76	0.76
v/c Ratio	0.35	0.06	0.29	0.07	0.22	0.21	0.59	0.02	0.04	0.32	0.08
Control Delay	27.7	21.3	8.8	21.8	13.6	4.4	7.0	1.5	3.7	4.3	1.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.7	21.3	8.8	21.8	13.6	4.4	7.0	1.5	3.7	4.3	1.1
LOS	C	C	A	C	B	A	A	A	A	A	A
Approach Delay		17.3			15.2		6.5			3.7	
Approach LOS		B			B		A			A	

Intersection Summary

Cycle Length: 60
 Actuated Cycle Length: 60
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.59
 Intersection Signal Delay: 6.9
 Intersection Capacity Utilization 65.6%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service C

Splits and Phases: 1: Lowell Blvd. & W. 68th Ave.



Queues

6501 Lowell Blvd

1: Lowell Blvd. & W. 68th Ave.

06/07/2021



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	64	16	85	14	58	147	832	24	16	457	98
v/c Ratio	0.35	0.06	0.29	0.07	0.22	0.21	0.59	0.02	0.04	0.32	0.08
Control Delay	27.7	21.3	8.8	21.8	13.6	4.4	7.0	1.5	3.7	4.3	1.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.7	21.3	8.8	21.8	13.6	4.4	7.0	1.5	3.7	4.3	1.1
Queue Length 50th (ft)	21	5	0	5	7	14	117	0	1	47	0
Queue Length 95th (ft)	49	18	30	17	32	39	261	5	7	103	11
Internal Link Dist (ft)		469			636		587			287	
Turn Bay Length (ft)	150		150	150		225		250	150		150
Base Capacity (vph)	401	558	534	417	531	690	1414	1208	392	1414	1225
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.03	0.16	0.03	0.11	0.21	0.59	0.02	0.04	0.32	0.08

Intersection Summary

HCM 6th Signalized Intersection Summary
 1: Lowell Blvd. & W. 68th Ave.

6501 Lowell Blvd
 06/07/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	59	15	78	13	19	34	135	765	22	15	420	90
Future Volume (veh/h)	59	15	78	13	19	34	135	765	22	15	420	90
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	64	16	85	14	21	37	147	832	24	16	457	98
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	232	214	182	258	70	123	675	1375	1166	458	1375	1166
Arrive On Green	0.11	0.11	0.11	0.11	0.11	0.11	0.74	0.74	0.74	0.74	0.74	0.74
Sat Flow, veh/h	1345	1870	1585	1294	607	1070	854	1870	1585	645	1870	1585
Grp Volume(v), veh/h	64	16	85	14	0	58	147	832	24	16	457	98
Grp Sat Flow(s),veh/h/ln	1345	1870	1585	1294	0	1678	854	1870	1585	645	1870	1585
Q Serve(g_s), s	2.7	0.5	3.0	0.6	0.0	1.9	4.4	12.7	0.2	0.7	5.1	1.0
Cycle Q Clear(g_c), s	4.7	0.5	3.0	1.0	0.0	1.9	9.5	12.7	0.2	13.4	5.1	1.0
Prop In Lane	1.00		1.00	1.00		0.64	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	232	214	182	258	0	192	675	1375	1166	458	1375	1166
V/C Ratio(X)	0.28	0.07	0.47	0.05	0.00	0.30	0.22	0.60	0.02	0.03	0.33	0.08
Avail Cap(c_a), veh/h	481	561	476	498	0	503	675	1375	1166	458	1375	1166
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.5	23.7	24.8	24.2	0.0	24.4	4.4	3.8	2.1	7.0	2.8	2.2
Incr Delay (d2), s/veh	0.6	0.1	1.9	0.1	0.0	0.9	0.7	2.0	0.0	0.1	0.6	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.6	0.4	2.1	0.3	0.0	1.4	1.2	5.5	0.1	0.2	2.1	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.1	23.9	26.7	24.3	0.0	25.2	5.2	5.8	2.2	7.1	3.4	2.4
LnGrp LOS	C	C	C	C	A	C	A	A	A	A	A	A
Approach Vol, veh/h		165			72			1003			571	
Approach Delay, s/veh		26.6			25.0			5.6			3.4	
Approach LOS		C			C			A			A	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		48.6		11.4		48.6		11.4				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		33.0		18.0		33.0		18.0				
Max Q Clear Time (g_c+I1), s		14.7		6.7		15.4		3.9				
Green Ext Time (p_c), s		7.1		0.4		3.2		0.2				

Intersection Summary

HCM 6th Ctrl Delay	7.6
HCM 6th LOS	A



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↘		↗	↘	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	100		0	100		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.961			0.941			0.996			0.992	
Flt Protected		0.971			0.986		0.950			0.950		
Satd. Flow (prot)	0	1738	0	0	1728	0	1770	1855	0	1770	1848	0
Flt Permitted		0.971			0.986		0.950			0.950		
Satd. Flow (perm)	0	1738	0	0	1728	0	1770	1855	0	1770	1848	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		458			470			732			667	
Travel Time (s)		10.4			10.7			16.6			15.2	

Intersection Summary

Area Type: Other

Intersection												
Int Delay, s/veh	5.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	38	7	18	10	10	16	32	855	26	19	460	25
Future Vol, veh/h	38	7	18	10	10	16	32	855	26	19	460	25
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	41	8	20	11	11	17	35	929	28	21	500	27

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1583	1583	514	1583	1582	943	527	0	0	957	0	0
Stage 1	556	556	-	1013	1013	-	-	-	-	-	-	-
Stage 2	1027	1027	-	570	569	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	88	109	560	88	109	318	1040	-	-	719	-	-
Stage 1	515	513	-	288	316	-	-	-	-	-	-	-
Stage 2	283	312	-	506	506	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	73	102	560	76	102	318	1040	-	-	719	-	-
Mov Cap-2 Maneuver	73	102	-	76	102	-	-	-	-	-	-	-
Stage 1	497	498	-	278	305	-	-	-	-	-	-	-
Stage 2	249	301	-	467	491	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	95.2		44.6		0.3		0.4	
HCM LOS	F		E					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1040	-	-	101	129	719	-	-
HCM Lane V/C Ratio	0.033	-	-	0.678	0.303	0.029	-	-
HCM Control Delay (s)	8.6	-	-	95.2	44.6	10.2	-	-
HCM Lane LOS	A	-	-	F	E	B	-	-
HCM 95th %tile Q(veh)	0.1	-	-	3.4	1.2	0.1	-	-



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	100		0	100		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.915			0.940			0.998			0.996	
Flt Protected		0.985			0.978		0.950		0.950			
Satd. Flow (prot)	0	1679	0	0	1712	0	1770	1859	0	1770	1855	0
Flt Permitted		0.985			0.978		0.950		0.950			
Satd. Flow (perm)	0	1679	0	0	1712	0	1770	1859	0	1770	1855	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		319			430			608			732	
Travel Time (s)		7.3			9.8			13.8			16.6	

Intersection Summary

Area Type: Other

Intersection												
Int Delay, s/veh	1.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↔	↔		↔	↔	
Traffic Vol, veh/h	7	2	16	15	4	15	28	859	13	19	488	12
Future Vol, veh/h	7	2	16	15	4	15	28	859	13	19	488	12
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	8	2	17	16	4	16	30	934	14	21	530	13

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1590	1587	537	1589	1586	941	543	0	0	948	0	0
Stage 1	579	579	-	1001	1001	-	-	-	-	-	-	-
Stage 2	1011	1008	-	588	585	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	87	108	544	87	108	319	1026	-	-	724	-	-
Stage 1	501	501	-	293	321	-	-	-	-	-	-	-
Stage 2	289	318	-	495	498	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	76	102	544	79	102	319	1026	-	-	724	-	-
Mov Cap-2 Maneuver	76	102	-	79	102	-	-	-	-	-	-	-
Stage 1	486	486	-	285	312	-	-	-	-	-	-	-
Stage 2	263	309	-	463	484	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	29	46.4	0.3	0.4
HCM LOS	D	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1026	-	-	177	123	724	-
HCM Lane V/C Ratio	0.03	-	-	0.154	0.3	0.029	-
HCM Control Delay (s)	8.6	-	-	29	46.4	10.1	-
HCM Lane LOS	A	-	-	D	E	B	-
HCM 95th %tile Q(veh)	0.1	-	-	0.5	1.2	0.1	-

Lanes and Geometrics
 4: Tennyson St. & W 64th Ave.

6501 Lowell Blvd
 06/07/2021



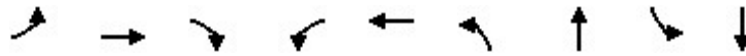
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		100	150		0	0		0	0		0
Storage Lanes	1		1	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850		0.994			0.919				0.952
Flt Protected	0.950			0.950				0.985				0.983
Satd. Flow (prot)	1770	1863	1583	1770	1852	0	0	1686	0	0	1743	0
Flt Permitted	0.229			0.106				0.878				0.838
Satd. Flow (perm)	427	1863	1583	197	1852	0	0	1503	0	0	1486	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			60		4			94				17
Link Speed (mph)		30			30			30				30
Link Distance (ft)		501			853			646				482
Travel Time (s)		11.4			19.4			14.7				11.0

Intersection Summary

Area Type: Other

Timings
4: Tennyson St. & W 64th Ave.

6501 Lowell Blvd
06/07/2021

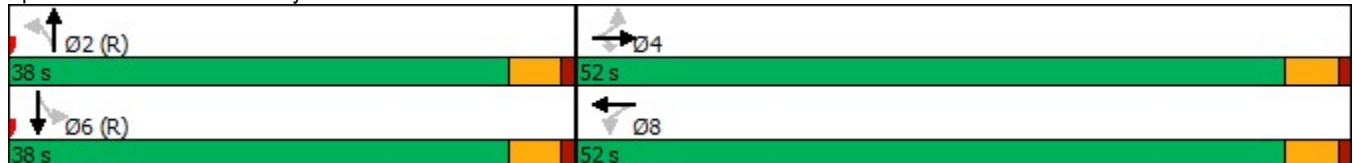


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↖	↑	↗	↖	↗		↕		↕
Traffic Volume (vph)	25	777	110	97	594	137	40	16	13
Future Volume (vph)	25	777	110	97	594	137	40	16	13
Turn Type	Perm	NA	Perm	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4			8		2		6
Permitted Phases	4		4	8		2		6	
Detector Phase	4	4	4	8	8	2	2	6	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	52.0	52.0	52.0	52.0	52.0	38.0	38.0	38.0	38.0
Total Split (%)	57.8%	57.8%	57.8%	57.8%	57.8%	42.2%	42.2%	42.2%	42.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0		0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5		4.5		4.5
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	47.5	47.5	47.5	47.5	47.5		33.5		33.5
Actuated g/C Ratio	0.53	0.53	0.53	0.53	0.53		0.37		0.37
v/c Ratio	0.12	0.86	0.14	1.02	0.69		0.77		0.09
Control Delay	12.5	29.4	6.3	118.7	29.9		29.7		13.8
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	12.5	29.4	6.3	118.7	29.9		29.7		13.8
LOS	B	C	A	F	C		C		B
Approach Delay		26.1			41.8		29.7		13.8
Approach LOS		C			D		C		B

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.02
 Intersection Signal Delay: 31.9
 Intersection Capacity Utilization 89.7%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service E

Splits and Phases: 4: Tennyson St. & W 64th Ave.





Lane Group	EBL	EBT	EBR	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	27	845	120	105	674	476	48
v/c Ratio	0.12	0.86	0.14	1.02	0.69	0.77	0.09
Control Delay	12.5	29.4	6.3	118.7	29.9	29.7	13.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.5	29.4	6.3	118.7	29.9	29.7	13.8
Queue Length 50th (ft)	7	392	16	~58	332	190	11
Queue Length 95th (ft)	22	#646	42	m#111	m410	#350	34
Internal Link Dist (ft)		421			773	566	402
Turn Bay Length (ft)	150		100	150			
Base Capacity (vph)	225	983	863	103	979	618	563
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.12	0.86	0.14	1.02	0.69	0.77	0.09

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

HCM 6th Signalized Intersection Summary
 4: Tennyson St. & W 64th Ave.

6501 Lowell Blvd
 06/07/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	25	777	110	97	594	26	137	40	261	16	13	16
Future Volume (veh/h)	25	777	110	97	594	26	137	40	261	16	13	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	27	845	120	105	646	28	149	43	284	17	14	17
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	483	987	837	161	939	41	217	68	343	196	163	167
Arrive On Green	0.53	0.53	0.53	1.00	1.00	1.00	0.37	0.37	0.37	0.37	0.37	0.37
Sat Flow, veh/h	764	1870	1585	582	1779	77	442	182	923	381	437	448
Grp Volume(v), veh/h	27	845	120	105	0	674	476	0	0	48	0	0
Grp Sat Flow(s),veh/h/ln	764	1870	1585	582	0	1856	1547	0	0	1266	0	0
Q Serve(g_s), s	1.6	35.0	3.5	12.5	0.0	0.0	22.3	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	1.6	35.0	3.5	47.5	0.0	0.0	25.0	0.0	0.0	1.6	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.04	0.31		0.60	0.35		0.35
Lane Grp Cap(c), veh/h	483	987	837	161	0	980	628	0	0	525	0	0
V/C Ratio(X)	0.06	0.86	0.14	0.65	0.00	0.69	0.76	0.00	0.00	0.09	0.00	0.00
Avail Cap(c_a), veh/h	483	987	837	161	0	980	628	0	0	525	0	0
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	10.4	18.3	10.9	19.0	0.0	0.0	25.5	0.0	0.0	18.2	0.0	0.0
Incr Delay (d2), s/veh	0.0	7.5	0.1	9.1	0.0	2.0	8.3	0.0	0.0	0.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.5	22.3	2.1	4.4	0.0	1.0	15.5	0.0	0.0	1.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	10.4	25.8	10.9	28.1	0.0	2.0	33.8	0.0	0.0	18.6	0.0	0.0
LnGrp LOS	B	C	B	C	A	A	C	A	A	B	A	A
Approach Vol, veh/h		992			779			476				48
Approach Delay, s/veh		23.6			5.5			33.8				18.6
Approach LOS		C			A			C				B
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		38.0		52.0		38.0		52.0				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		33.5		47.5		33.5		47.5				
Max Q Clear Time (g_c+I1), s		27.0		37.0		3.6		49.5				
Green Ext Time (p_c), s		1.7		4.9		0.2		0.0				

Intersection Summary

HCM 6th Ctrl Delay	19.5
HCM 6th LOS	B



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)	0%		0%		0%		0%		0%		0%	
Storage Length (ft)	200		150	150		75	200		150	200		100
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.850			0.850			0.850			0.850		
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.132			0.465			0.583			0.116		
Satd. Flow (perm)	246	1863	1583	866	1863	1583	1086	1863	1583	216	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			97			127			127			199
Link Speed (mph)		30			30			30				30
Link Distance (ft)		476			1480			763				608
Travel Time (s)		10.8			33.6			17.3				13.8

Intersection Summary

Area Type: Other

Timings
5: W 64th Ave./W. 64th Ave. & Lowell Blvd.

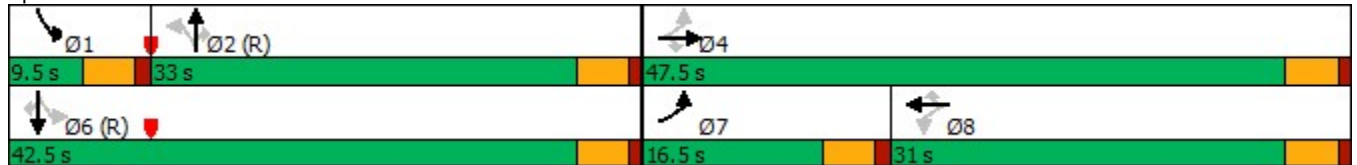
6501 Lowell Blvd
06/07/2021

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	274	491	89	59	463	88	157	528	125	59	266	183
Future Volume (vph)	274	491	89	59	463	88	157	528	125	59	266	183
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4			8			2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	7	4	4	8	8	8	2	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	16.5	47.5	47.5	31.0	31.0	31.0	33.0	33.0	33.0	9.5	42.5	42.5
Total Split (%)	18.3%	52.8%	52.8%	34.4%	34.4%	34.4%	36.7%	36.7%	36.7%	10.6%	47.2%	47.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead			Lag	Lag	Lag	Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes			Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	42.4	42.4	42.4	25.9	25.9	25.9	31.0	31.0	31.0	38.6	38.6	38.6
Actuated g/C Ratio	0.47	0.47	0.47	0.29	0.29	0.29	0.34	0.34	0.34	0.43	0.43	0.43
v/c Ratio	0.94	0.61	0.12	0.26	0.94	0.18	0.46	0.90	0.22	0.36	0.36	0.25
Control Delay	55.3	27.9	8.0	27.7	59.1	3.1	29.3	48.5	6.1	21.3	19.3	3.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.3	27.9	8.0	27.7	59.1	3.1	29.3	48.5	6.1	21.3	19.3	3.4
LOS	E	C	A	C	E	A	C	D	A	C	B	A
Approach Delay		34.6			47.9			38.2			13.8	
Approach LOS		C			D			D			B	

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.94
 Intersection Signal Delay: 34.8
 Intersection LOS: C
 Intersection Capacity Utilization 86.5%
 ICU Level of Service E
 Analysis Period (min) 15

Splits and Phases: 5: W 64th Ave./W. 64th Ave. & Lowell Blvd.





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	298	534	97	64	503	96	171	574	136	64	289	199
v/c Ratio	0.94	0.61	0.12	0.26	0.94	0.18	0.46	0.90	0.22	0.36	0.36	0.25
Control Delay	55.3	27.9	8.0	27.7	59.1	3.1	29.3	48.5	6.1	21.3	19.3	3.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.3	27.9	8.0	27.7	59.1	3.1	29.3	48.5	6.1	21.3	19.3	3.4
Queue Length 50th (ft)	144	259	10	28	275	0	78	320	3	21	109	0
Queue Length 95th (ft)	m#190	m317	m18	62	#463	21	143	#533	43	46	173	39
Internal Link Dist (ft)		396			1400			683			528	
Turn Bay Length (ft)	200		150	150		75	200		150	200		100
Base Capacity (vph)	318	890	806	254	548	555	373	641	628	180	798	792
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.94	0.60	0.12	0.25	0.92	0.17	0.46	0.90	0.22	0.36	0.36	0.25

Intersection Summary

- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

HCM 6th Signalized Intersection Summary
 5: W 64th Ave./W. 64th Ave. & Lowell Blvd.

6501 Lowell Blvd
 06/07/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↘	↖	↗	↘	↖	↗	↘	↖	↗	↘
Traffic Volume (veh/h)	274	491	89	59	463	88	157	528	125	59	266	183
Future Volume (veh/h)	274	491	89	59	463	88	157	528	125	59	266	183
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	298	534	97	64	503	96	171	574	136	64	289	199
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	339	882	748	287	540	457	374	624	529	188	801	679
Arrive On Green	0.13	0.47	0.47	0.29	0.29	0.29	0.33	0.33	0.33	0.04	0.43	0.43
Sat Flow, veh/h	1781	1870	1585	796	1870	1585	908	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	298	534	97	64	503	96	171	574	136	64	289	199
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	796	1870	1585	908	1870	1585	1781	1870	1585
Q Serve(g_s), s	10.1	19.0	3.1	5.8	23.6	4.1	14.1	26.5	5.6	2.0	9.4	7.4
Cycle Q Clear(g_c), s	10.1	19.0	3.1	8.3	23.6	4.1	15.0	26.5	5.6	2.0	9.4	7.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	339	882	748	287	540	457	374	624	529	188	801	679
V/C Ratio(X)	0.88	0.61	0.13	0.22	0.93	0.21	0.46	0.92	0.26	0.34	0.36	0.29
Avail Cap(c_a), veh/h	339	894	757	292	551	467	374	624	529	208	801	679
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	0.09	0.09	0.09	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.0	17.6	13.4	26.7	31.2	24.3	25.4	28.8	21.8	21.7	17.4	16.8
Incr Delay (d2), s/veh	22.0	1.1	0.1	0.0	3.2	0.0	4.0	20.8	1.2	1.1	1.3	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	10.0	12.6	1.9	1.6	12.4	2.1	6.1	21.4	4.0	1.5	7.5	5.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	43.0	18.7	13.5	26.8	34.4	24.3	29.3	49.7	23.0	22.8	18.7	17.9
LnGrp LOS	D	B	B	C	C	C	C	D	C	C	B	B
Approach Vol, veh/h		929			663			881			552	
Approach Delay, s/veh		26.0			32.2			41.6			18.9	
Approach LOS		C			C			D			B	
Timer - Assigned Phs	1	2		4		6	7	8				
Phs Duration (G+Y+Rc), s	8.5	34.5		47.0		43.0	16.5	30.5				
Change Period (Y+Rc), s	4.5	4.5		4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s	5.0	28.5		43.0		38.0	12.0	26.5				
Max Q Clear Time (g_c+I1), s	4.0	28.5		21.0		11.4	12.1	25.6				
Green Ext Time (p_c), s	0.0	0.0		3.9		2.5	0.0	0.4				

Intersection Summary

HCM 6th Ctrl Delay	30.6
HCM 6th LOS	C



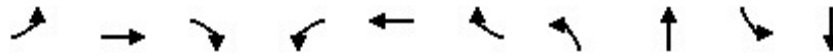
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	100		150	150		100	600		0	250		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor			0.850			0.850		0.993			0.988	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	5050	0	1770	5024	0
Flt Permitted	0.180			0.539			0.075			0.081		
Satd. Flow (perm)	335	1863	1583	1004	1863	1583	140	5050	0	151	5024	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			209			177		9			15	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1480			550			1046			611	
Travel Time (s)		33.6			12.5			23.8			13.9	

Intersection Summary

Area Type: Other

Timings
6: Federal Blvd. & W. 64th Ave.

6501 Lowell Blvd
06/07/2021

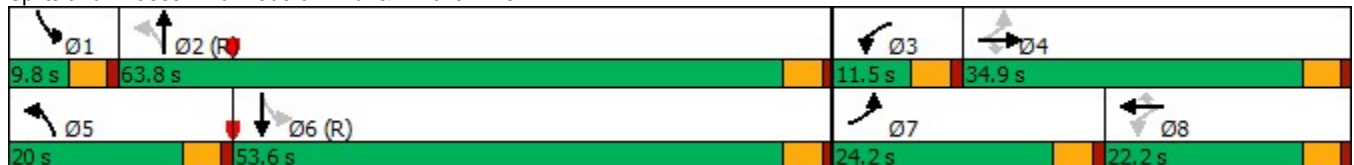


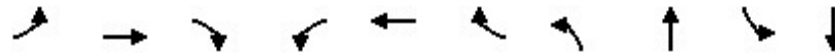
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations	↖	↑	↗	↖	↑	↗	↖	↑↑↑	↖	↑↑↑
Traffic Volume (vph)	346	293	213	135	259	116	272	2230	101	1826
Future Volume (vph)	346	293	213	135	259	116	272	2230	101	1826
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA
Protected Phases	7	4		3	8		5	2	1	6
Permitted Phases	4		4	8		8	2		6	
Detector Phase	7	4	4	3	8	8	5	2	1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	20.6	20.6	9.5	22.5	9.5	22.5
Total Split (s)	24.2	34.9	34.9	11.5	22.2	22.2	20.0	63.8	9.8	53.6
Total Split (%)	20.2%	29.1%	29.1%	9.6%	18.5%	18.5%	16.7%	53.2%	8.2%	44.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)	41.9	30.4	30.4	24.7	17.7	17.7	69.1	59.3	54.4	49.1
Actuated g/C Ratio	0.35	0.25	0.25	0.21	0.15	0.15	0.58	0.49	0.45	0.41
v/c Ratio	1.07	0.65	0.42	0.59	1.01	0.33	1.02	0.99	0.79	1.03
Control Delay	100.8	47.4	9.1	42.1	107.4	4.2	91.3	47.1	57.7	61.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	100.8	47.4	9.1	42.1	107.4	4.2	91.3	47.1	57.7	61.8
LOS	F	D	A	D	F	A	F	D	E	E
Approach Delay		59.7			66.3			51.8		61.6
Approach LOS		E			E			D		E

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 120
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.07
 Intersection Signal Delay: 57.5
 Intersection LOS: E
 Intersection Capacity Utilization 101.9%
 ICU Level of Service G
 Analysis Period (min) 15

Splits and Phases: 6: Federal Blvd. & W. 64th Ave.





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	376	305	232	147	276	126	296	2487	110	2118
v/c Ratio	1.07	0.65	0.42	0.59	1.01	0.33	1.02	0.99	0.79	1.03
Control Delay	100.8	47.4	9.1	42.1	107.4	4.2	91.3	47.1	57.7	61.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	100.8	47.4	9.1	42.1	107.4	4.2	91.3	47.1	57.7	61.8
Queue Length 50th (ft)	~271	212	14	80	~218	0	~186	679	37	~638
Queue Length 95th (ft)	#468	311	79	132	#396	18	#371	#821	#134	#736
Internal Link Dist (ft)		1400			470			966		531
Turn Bay Length (ft)	100		150	150		100	600		250	
Base Capacity (vph)	352	471	557	251	274	384	291	2500	139	2064
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.07	0.65	0.42	0.59	1.01	0.33	1.02	0.99	0.79	1.03

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

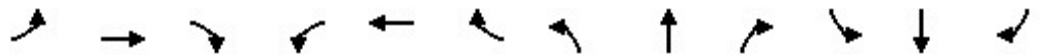
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

HCM 6th Signalized Intersection Summary
6: Federal Blvd. & W. 64th Ave.

6501 Lowell Blvd
06/07/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	346	293	213	135	259	116	272	2230	110	101	1826	168
Future Volume (veh/h)	346	293	213	135	259	116	272	2230	110	101	1826	168
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	376	305	232	147	276	126	296	2372	115	110	1943	175
Peak Hour Factor	0.92	0.96	0.92	0.92	0.94	0.92	0.92	0.94	0.96	0.92	0.94	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	352	474	402	258	276	234	290	2466	119	143	1952	175
Arrive On Green	0.16	0.25	0.25	0.06	0.15	0.15	0.13	0.49	0.49	0.04	0.41	0.41
Sat Flow, veh/h	1781	1870	1585	1781	1870	1585	1781	4991	240	1781	4770	427
Grp Volume(v), veh/h	376	305	232	147	276	126	296	1612	875	110	1383	735
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	1585	1781	1702	1827	1781	1702	1793
Q Serve(g_s), s	19.7	17.5	15.4	7.0	17.7	8.8	15.5	54.6	55.8	4.3	48.5	49.1
Cycle Q Clear(g_c), s	19.7	17.5	15.4	7.0	17.7	8.8	15.5	54.6	55.8	4.3	48.5	49.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.13	1.00		0.24
Lane Grp Cap(c), veh/h	352	474	402	258	276	234	290	1682	903	143	1393	734
V/C Ratio(X)	1.07	0.64	0.58	0.57	1.00	0.54	1.02	0.96	0.97	0.77	0.99	1.00
Avail Cap(c_a), veh/h	352	474	402	258	276	234	290	1682	903	143	1393	734
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	0.85	0.85	0.85	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.5	40.0	39.2	42.3	51.2	47.4	39.6	29.2	29.5	29.1	35.3	35.5
Incr Delay (d2), s/veh	63.1	2.5	1.7	3.0	54.3	2.5	58.2	14.0	23.4	22.5	22.5	33.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	21.2	12.7	9.9	1.4	18.2	6.6	19.5	32.8	38.2	4.8	32.0	36.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	98.6	42.5	40.9	45.3	105.4	49.8	97.8	43.2	52.8	51.6	57.8	69.0
LnGrp LOS	F	D	D	D	F	D	F	D	D	D	E	F
Approach Vol, veh/h		913			549			2783			2228	
Approach Delay, s/veh		65.2			76.6			52.0			61.2	
Approach LOS		E			E			D			E	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.8	63.8	11.5	34.9	20.0	53.6	24.2	22.2				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	5.3	59.3	7.0	30.4	15.5	49.1	19.7	17.7				
Max Q Clear Time (g_c+I1), s	6.3	57.8	9.0	19.5	17.5	51.1	21.7	19.7				
Green Ext Time (p_c), s	0.0	1.4	0.0	2.0	0.0	0.0	0.0	0.0				

Intersection Summary

HCM 6th Ctrl Delay	59.1
HCM 6th LOS	E

Notes

User approved pedestrian interval to be less than phase max green.



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)		0%	0%		0%	
Storage Length (ft)	100			0	0	0
Storage Lanes	1			0	1	0
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.996		0.936	
Flt Protected	0.950				0.974	
Satd. Flow (prot)	1770	1863	1855	0	1698	0
Flt Permitted	0.950				0.974	
Satd. Flow (perm)	1770	1863	1855	0	1698	0
Link Speed (mph)		30	30		30	
Link Distance (ft)		853	476		311	
Travel Time (s)		19.4	10.8		7.1	

Intersection Summary

Area Type: Other

Intersection						
Int Delay, s/veh	0.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	16	823	752	20	10	9
Future Vol, veh/h	16	823	752	20	10	9
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	17	895	817	22	11	10

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	839	0	-	0	1757 828
Stage 1	-	-	-	-	828 -
Stage 2	-	-	-	-	929 -
Critical Hdwy	4.12	-	-	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.218	-	-	-	3.518 3.318
Pot Cap-1 Maneuver	796	-	-	-	93 371
Stage 1	-	-	-	-	429 -
Stage 2	-	-	-	-	385 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	796	-	-	-	91 371
Mov Cap-2 Maneuver	-	-	-	-	91 -
Stage 1	-	-	-	-	420 -
Stage 2	-	-	-	-	385 -

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	34.6
HCM LOS			D

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	796	-	-	-	142
HCM Lane V/C Ratio	0.022	-	-	-	0.145
HCM Control Delay (s)	9.6	-	-	-	34.6
HCM Lane LOS	A	-	-	-	D
HCM 95th %tile Q(veh)	0.1	-	-	-	0.5



WAIVER FROM SUBDIVISION DESIGN STANDARDS

Application submittals must include all documents on this checklist as well as this page. Please use the reference guide (pg. 2) included in this packet for more information on each submittal item.

All submittals shall include one (1) hard copy of all documents and one (1) electronic copy with all documents combined in a single PDF. For hard copies, each document shall be labeled or tabbed with the corresponding checklist number.

1. Development Application Form (pg. 7)
2. Application Fees of \$500
3. Written Explanation of the Project
4. Site Plan Showing Proposed Development
5. Copy of Plat Prepared by Registered Land Surveyor (see guide pg. 4)
6. Proof of Ownership (title policy dated within 30 days of submittal)
7. Proof of Water and Sewer Services
8. Proof of Utilities (e.g. electric, gas)
9. Neighborhood Meeting Summary
10. Legal Description
11. Certificate of Taxes Paid
12. Certificate of Notice to Mineral Estate Owners/and Lessees (pg. 9)
13. Certificate of Surface Development (pg. 10)

Waiver from Subdivision Design Standards Guide to Development Application Submittal

All development application submittals shall consist of one (1) hard copy of each document and one (1) electronic copy (USB or CD) with all documents combined in a single PDF. **Application submittals that do not conform to these guidelines shall not be accepted.**

3. Written Explanation of the Project:

- A clear and concise, yet thorough, description of the proposal. Please include, if applicable, timeframe, purpose of project, and improvements that will be made to the site

4. Site Plan Showing Proposed Development:

- A detailed drawing of existing and proposed improvements
- Including:
 - Streets, roads, and intersections
 - Driveways, access points, and parking areas
 - Existing and proposed structures, wells, and septic systems,
 - Easements, utility lines, and no build or hazardous areas
 - Scale, north arrow, and date of preparation
- An Improvement Location Certificate or Survey may be required during the official review

5. Copy of Plat Prepared by Registered Land Surveyor

- A map or maps together with supporting documentation of certain described land providing permanent and accurate record of the legal description, dedications, exact size, shape, and location of lots, blocks, streets, easements, and parcels

6. Proof of Ownership:

- A deed may be found in the Office of the Clerk and Recorder
- A title commitment is prepared by a professional title company

7. Proof of Water:

- Public utilities-A written statement from the appropriate water district indicating that they will provide service to the property **OR** a copy of a current bill from the service provider
- Private utilities- Well permit(s) information can be obtained from the Colorado State Division of Water Resources at (303) 866-3587

Proof of Sewer:

- Public utilities-A written statement from the appropriate sanitation district indicating that they will provide service to the property **OR** a copy of a current bill from the service provider
- Private utilities-A written statement from Tri-County Health indicating the viability of obtaining Onsite Wastewater Treatment Systems

8. Proof of Utilities (Gas, Electric, etc):

- A written statement from the appropriate utility provider indicating that they will provide service to the property
- Copy of a current bill from the service provider

9. Neighborhood Meeting Summary:

- Please refer to Section 2-01-02 of the Adams County Development Standards and Regulations for the specific requirements regarding time, location, and notice
- A written summary shall be prepared including the materials submittal presented at the meeting, any issues identified at the meeting, and how those issues have been addressed

10. Legal Description:

- Geographical description used to locate and identify a property
- Visit <http://gisapp.adcogov.org/quicksearch/> to find the legal description for your property

11. Certificate of Taxes Paid:

- All taxes on the subject property must be paid in full. Please contact the Adams County Treasurer's Office
- Or <http://adcogov.org/index.aspx?NID=812>

12. and 13. Certificate of Notice to Mineral Estate Owners/ Certificate of Surface Development:

- The State of Colorado requires notification to mineral rights owners of applications for surface development (i.e. zoning, plats, etc.)
- Mineral or Surface right owners may be found in the title commitment for the subject property
- You may also search the Office of the Clerk and Recorder for any recorded deeds, easements, or other documents.

Required Engineering Documents

1. Level 1-Storm Drainage Plan:

- A level 1 Storm Drainage Plan is a preliminary design plan showing existing and proposed site drainage features or improvements and, is intended to show how the storm drainage will be mitigated.
- See Appendix B for a plan preparation checklist

Level 2-Storm Drainage Study (SDS):

- A level 2 SDS is a preliminary design report that describes the existing and proposed drainage features and, includes a hydrologic analysis of the proposed site. A Level 2 SDS also includes a drainage plan.
- See Appendix B for a plan preparation checklist

Level 3-Storm Drainage Study (SDS):

- A level 3 SDS is a preliminary design report that describes the existing and proposed drainage features, includes a hydrologic analysis of the proposed site and hydraulic analysis of all proposed drainage mitigation measures. A Level 3 SDS also includes a drainage plan and construction plans for all drainage mitigation features.
- See Appendix B for a plan preparation checklist

2. Traffic Impact Study:

- Intended to forecast and mitigate the transportation and traffic impacts of a proposed land use development or redevelopment project

See Chapter 8 of the Adams County Development Standards for requirements

3. Erosion and Sediment Control Plans:

- Erosion and Sediment Control (ESC) plans are construction plans showing the proposed Best Management Practices, or BMP's, that will be used to mitigate erosion and the transport of sediment from a site under construction.
- ESC plans are often done in three (3) phases: Initial, Interim and, Final.
- These plans must also include installation details for each of the BMP's.

4. Construction / Engineering Design Plans:

- A set of maps and/or drawings showing how a proposed development is to be constructed.
- The plans must include:
 - site maps of the existing conditions and proposed improvements,
 - installation/construction details for all proposed improvements,
 - survey control (horizontal and vertical) for locating the improvements and,
 - all necessary specification for the products to be used.
- Construction plans are often broken out for specific improvements; for example: site plan, grading plan, waterline improvement plans, roadways improvements plans, etc.

Plat Correction, Replat and Vacation of Recorded Plat or Easement-Plat Document Requirements

1. **Subdivision Name, Subtitle:** Name of subdivision at the top of the sheet, followed by a subtitle identifying the section, township and range information along with County and State.
2. **Property Description:** An accurate and clear property (legal) description of the overall boundary of the subdivision with the acreage of the subdivision. All courses in the property (legal) description shall be shown and labeled on the plat drawing, with all bearings having the same direction as called out in the legal description. The only exception being where more than one description is required, going a different direction over the same course. The direction shall then hold for the description having more weight (i.e., the overall boundary) for purposes of the plat. If both record and "as-measured" dimensions are being used, show both and clearly label on the plat drawing. Point of commencement and/or point of beginning shall be clearly labeled on the plat drawing.
3. **Ownership Certificate:**
 - a. Know all men by these presents that (owner name(s)), being the sole owner of the following described tract of land:
 - b. Legal Description
 - c. Have (Has) by these presents laid out, platted and subdivided the same into lots as shown on this plat under the name and style of (subdivision name).
4. **Surveyor's Statement:** Statement by a registered land surveyor, professionally licensed by the State of Colorado, to the effect that the layout represents a survey made by him and that the monuments thereon actually exist as located and that all dimensional and other details are correct.
5. **Access Provisions:**
 - a. Statement Restricting Access: A statement restricting access rights across the right-of-way lines of major highways, parkways, streets or freeways, where required as a provision of approval.
6. **Storm Drainage Facilities Statement:**
 - a. The policy of the County requires that maintenance access shall be provided to all storm drainage facilities to assure continuous operational capability of the system. The property owners shall be responsible for the maintenance of all drainage facilities including inlets, pipes, culverts, channels, ditches, hydraulic structures, and detention basins located on their land unless modified by the subdivision development agreement. Should the owner fail to maintain said facilities, the County shall have the right to enter said land for the sole purpose of operations and maintenance. All such maintenance cost will be assessed to the property owners.
7. **Layout:** The exact layout including:
 - a. **Boundary Lines:** The subdivision boundary will be clearly distinguishable from other map lines by use of a distinct line type and/or thickness. All lines will be labeled with a complete bearing and distance, and all curves will be labeled with a central angle (delta), radius and arc length. Radial bearings and/or chord bearings will be provided for all nontangent curves. All dimensions to be determined by accurate field survey which must balance and close within limit of one in

five thousand (5,000). Show adjacent and/or intersecting plat/deed lines and label appropriately to include recording information (book and page and/or reception number).

- b. **Streets:** All street rights of way defined by the plat will be clearly distinguishable from other map lines by use of a distinct line type and/or thickness. All lines will be labeled with a complete bearing and distance, and all curves will be labeled with a central angle (delta), radius and arc length. Radial bearings and/or chord bearings will be provided for all nontangent curves. Widths shall be labeled from each right-of-way line normal to the corresponding street center line. All street center lines defined by the plat will be clearly distinguishable from other map lines by use of distinct line type and/or thickness. All lines will be labeled with a complete bearing and distance and all curves will be labeled with a central angle (delta), radius and arc length. Radial bearings and/or chord bearings will be provided for all nontangent curves. The plat shall show the right-of-way lines, widths, locations and street names of all existing and proposed public or private streets:
 - i. Within the proposed subdivision, and
 - ii. Immediately abutting the proposed subdivision, and
 - iii. Any private street shall include the designation "(Private)" immediately following street name; any other private right of way that is not named shall include the designation "(Private)" in a manner that clearly conveys such a status.
- c. **Easements:** All easements as required by Adams County and other public and quasi-public agencies. Said easements shall be clearly labeled to include width, use and identification as public or private, if necessary. Tie to property lines and annotate with bearings and distances as necessary. Clearly show and label all existing easements, to include width and recording information, that cross, abut or are located within the subdivision boundary.
- d. **Lots And Blocks:** All lines of lots, blocks and other parcels of land defined by the plat will be clearly distinguishable from other map lines by use of a distinct line type and/or thickness. All lines will be labeled with a complete bearing and distance and all curves will be labeled with a radius and arc length. Lots must close to one in five thousand (5,000).
- e. **Readability:** All line annotation and all other text will be easily and clearly readable. No text shall overwrite other text or be overwritten by map lines.
- f. **Leader Lines:** Use leader lines whenever a dimension is not clearly and unmistakably associated with a given line, line segment or arc.
- g. **Multiple Sheets:** Whenever a plat drawing spans multiple sheets, clear and well labeled match lines and a key map shall be included on each sheet. Labels will be of the nature "See Sheet of ". Duplicate street names, widths, lot numbers, tract names, easement labeling or any such labeling when any feature is shown on multiple sheets.
- h. **Identification System:** All lots and blocks in the subdivision shall be numbered, beginning with the numeral "1" and continuing consecutively throughout the tract, with no omissions or duplications. All tracts shall be likewise labeled beginning with the letter "A". Lots and tracts shall be labeled with the area of the lot or tract.
- i. **Legend:** Provide a legend which designates all lines and symbols except where called out on plat drawing.

j. **Inundation Mark:** The plat shall clearly show the 100-year floodplain line. Reference the appropriate FEMA panel by which the location of this line has been determined.

8. **Easements:** Book and page and/or reception number for all existing easements.

9. **Adjacent Subdivision:** Names of adjacent platted areas along with the reception and/or plat book and page number shall be shown. If unplatted, so indicate. Existing street rights of way that intersect the subdivision boundary or are adjacent to said boundary lines shall be clearly labeled with the street name, right of way width and appropriate deed or plat recording information wherein the right of way is defined. Show and label all existing lots and blocks that are immediately adjacent to the subdivision boundary.

10. **Basis Of Bearing:** A clearly defined basis of bearings shall be provided, both verbally and graphically. All monumentation defining said line shall be shown and labeled on the plat drawing. When said line is not common with the subdivision boundary, it shall be accurately tied to the boundary with bearings and distances.

11. **Monuments:** All monuments used to determine and/or describe a boundary (including basis of bearings, point of beginning and point of commencement) shall be shown and clearly labeled on the plat drawing. Monuments for corners defined by the plat, or otherwise found to be missing in the field, shall be placed and set in accord with the requirements of the State of Colorado.

12. **Not A Part Of Subdivision:** All areas enclosed within the subdivision boundary which do not constitute a part of the subdivision shall be labeled "Not a part of this subdivision". All lines pertaining to such areas shall be dashed.

13. **Square Footage:** The area in square feet of all lot and tracts sought to be platted.

14. **Operation and Maintenance Manual reference:**

REFER TO THE OPERATION AND MAINTENANCE MANUEL RECORDED
_____ AT RECEPTION NO. _____ FOR
ADDITIONAL DRAINAGE GUIDELINES.

15. **Other Information:** All other information required by State law.



Application Type:

<input type="checkbox"/> Conceptual Review	<input type="checkbox"/> Preliminary PUD	<input type="checkbox"/> Temporary Use
<input type="checkbox"/> Subdivision, Preliminary	<input type="checkbox"/> Final PUD	<input type="checkbox"/> Variance
<input type="checkbox"/> Subdivision, Final	<input type="checkbox"/> Rezone	<input type="checkbox"/> Conditional Use
<input type="checkbox"/> Plat Correction/ Vacation	<input type="checkbox"/> Special Use	<input type="checkbox"/> Other: _____

PROJECT NAME:

APPLICANT

Name(s): Phone #:

Address:

City, State, Zip:

2nd Phone #: Email:

OWNER

Name(s): Phone #:

Address:

City, State, Zip:

2nd Phone #: Email:

TECHNICAL REPRESENTATIVE (Consultant, Engineer, Surveyor, Architect, etc.)

Name: Phone #:

Address:

City, State, Zip:

2nd Phone #: Email:

DESCRIPTION OF SITE

Address:

City, State, Zip:

Area (acres or square feet):

Tax Assessor Parcel Number

Existing Zoning:

Existing Land Use:

Proposed Land Use:

Have you attended a Conceptual Review? YES NO

If Yes, please list PRE#:

I hereby certify that I am making this application as owner of the above described property or acting under the authority of the owner (attached authorization, if not owner). I am familiar with all pertinent requirements, procedures, and fees of the County. I understand that the Application Review Fee is non-refundable. All statements made on this form and additional application materials are true to the best of my knowledge and belief.

Name:

Date:

Owner's Printed Name

Name:

Linette Brozovich
Linette Brozovich (Mar 19, 2021 12:18 MST)

Owner's Signature

CERTIFICATION OF NOTICE TO MINERAL ESTATE OWNERS

I/We, _____
(the "Applicant") by signing below, hereby declare and certify as follows:

With respect to the property located at:

Physical Address: _____

Legal Description: _____

Parcel #(s): _____

(PLEASE CHECK ONE):

_____ On the _____ day of _____, 20____, which is not less than thirty days before the initial public hearing, notice of application for surface development was provided to mineral estate owners pursuant to section 24-65.5-103 of the Colorado Revised Statutes;

or

_____ I/We have searched the records of the Adams County Tax Assessor and the Adams County Clerk and Recorder for the above identified parcel and have found that no mineral estate owner is identified therein.

Date: _____ Applicant: _____

By: _____

Print Name: _____

Address: _____

STATE OF COLORADO)

)

COUNTY OF ADAMS)

Subscribed and sworn to before me this _____ day of _____, 20____, by
_____.

Witness my hand and official seal.

My Commission expires: _____

Notary Public

After Recording Return To:

Name and Address of Person Preparing Legal Description:

A recorded copy of this Certification shall be submitted to the Adams County Community and Economic Development Department with all applicable land use applications.

APPLICANT'S CERTIFICATION CONCERNING QUALIFYING SURFACE DEVELOPMENT,
PURSUANT TO C.R.S. §24-65.5-103.3 (1)(b)

I/We, _____
_____, (the "Applicant") by signing below, hereby declare and certify as follows:

Concerning the property located at:

Physical Address: _____

Legal Description: _____

Parcel #(s): _____

With respect to qualifying surface developments, that (PLEASE CHECK ONE):

_____ No mineral estate owner has entered an appearance or filed an objection to the proposed application for development within thirty days after the initial public hearing on the application; or

_____ The Applicant and any mineral estate owners who have filed an objection to the proposed application for development or have otherwise filed an entry of appearance in the initial public hearing regarding such application no later than thirty days following the initial public hearing on the application have executed a surface use agreement related to the property included in the application for development, the provisions of which have been incorporated into the application for development or are evidenced by a memorandum or otherwise recorded in the records of the clerk and recorder of the county in which the property is located so as to provide notice to transferees of the Applicant, who shall be bound by such surface use agreements; or

_____ The application for development provides:

- (i) Access to mineral operations, surface facilities, flowlines, and pipelines in support of such operations existing when the final public hearing on the application for development is held by means of public roads sufficient to withstand trucks and drilling equipment or thirty-foot-wide access easements;
- (ii) An oil and gas operations area and existing well site locations in accordance with section 24-65.5-103.5 of the Colorado Revised Statutes; and
- (iii) That the deposit for incremental drilling costs described in section 24-65.5-103.7 of the Colorado Revised Statutes has been made.

Date: _____ Applicant: _____

After Recording Return To:

By: _____
Print Name: _____
Address: _____



CRESTVIEW WATER & SANITATION DISTRICT

Kevin Blumhardt
Harris, Kocher & Smith
1120 Lincoln Street Ste. 1000
Denver, CO 80203

October 5, 2020

RE: Water and Sanitary Sewer Service, 6501 Lowell Boulevard
Will Serve Letter

To Whom it May Concern:

Please be advised that Crestview Water and Sanitation District is willing to provide treated water and sanitary sewer service to a possible development on the parcel no. 0182506400046 with the address of 6501 Lowell Boulevard in Adams County, Colorado that is wholly within the Crestview Water and Sanitation District boundaries.

Prior to creating a layout and filing a plat for the development, the developer should have a pre-design meeting with Crestview, as the developer MUST allow for the installation of adequate water mains in strict accordance with Denver Water Engineering Standards and Crestview Rules and Regulations and engineering requirements. Sanitary sewer mains must also be designed in accordance with Crestview Rules and Regulations and engineering requirements. The landowner/developer is responsible for all costs related to the installation of required water and sewer mains. The landowner/developer is responsible for all utility modeling, engineering studies and plan development/review costs. All water and sewer mains and appurtenances shall be installed at the land owner/developer's expense and deeded free and clear to the District prior to the issuance of any water or sewer taps.

Crestview Water & Sanitation District provides its drinking water to the residents of the District by means of a wholesale water purchasing contract with Denver Water. As part of the Contract, Denver Water requires Crestview to adhere to the Denver Water engineering standards including modeling of Crestview's water distribution system. Denver Water has determined that there is NOT adequate water supply into Crestview for fire flows for additional growth within Crestview. Denver Water is requiring the installation of a master meter and a twelve (12) inch water supply beginning at approximately 5800 Lowell Blvd. going north and attaching to the existing eight (8) inch water main at 62nd avenue & Lowell boulevard. No plans for future developments will be approved without the inclusion of the aforementioned master meter and 12 inch water main.

After a quick and informal review of your site plan in your request for a will-serve letter, we have concerns about the width of some of the units at 18 feet. Crestview requires that the water and

Name
Date
Page 2

sanitary services must be a minimum of five (5) feet from both property lines and a minimum of ten (10) feet of separation between the services.

Current connection fees can be provided by contacting our office. Any water and/or sewer services must be approved by Crestview and connected to the appropriate main lines and installed into its permanent structure's foundation prior to completion of the construction of said structure.

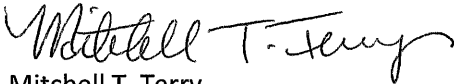
Crestview requires a signature of acceptance of this Will Serve letter by the owner/developer prior to scheduling a pre-design meeting with Crestview. Please provide a copy of this signed Will Serve letter when scheduling a pre-design meeting.

Signature of owner/developer representative

Date

If you have any questions or require additional information, please contact our office.

Sincerely,



Mitchell T. Terry
District Manager
Crestview Water & Sanitation District



1600 West 12th Ave
Denver, CO 80204-3412
303.628.6000
denverwater.org

October 7, 2020

Kevin Blumhardt
c/o HKS
1120 Lincoln St, Suite 1000
Denver, CO 80203

RE: 6501 N LOWELL BLVD

Dear Kevin:

Denver Water has been asked to determine whether the property described on the attached layout is located within a Distributor's service area and eligible to receive water service. This letter verifies that the property is located within Crestview W&S District Distributor service area. This property is eligible to receive water. Any project located on the property will be subject to compliance with Denver Water's Operating Rules, Regulations, Engineering Standards and applicable charges. Prior to proceeding with the project, verify with to determine Crestview W&S District Distributor's ability to serve, rules and regulations affecting service and additional applicable charges. Please check the fire requirements for the proposed development with the Fire Prevention Bureau and the availability of fire flow from existing mains with the Distributor's Hydraulics Department or with Denver Water's Hydraulics Department.

If you have questions, or you would like to schedule a meeting to discuss the proposed project, please contact Denver Water Sales Administration at 303-628-6100 (Option 2).

Sincerely,

Wendy Sutherland

Wendy Sutherland
Sales Administration

Enclosure

ALTA/NSPS LAND TITLE SURVEY

TWO PARCELS LOCATED IN THE SOUTHEAST QUARTER OF THE SOUTHEAST QUARTER OF SECTION 6,
TOWNSHIP 3 SOUTH, RANGE 68 WEST OF THE SIXTH PRINCIPAL MERIDIAN,
COUNTY OF ADAMS, STATE OF COLORADO

LEGAL DESCRIPTION

PER FIRST AMERICAN TITLE INSURANCE COMPANY COMMITMENT NO. NCS-989426-CO, WITH A COMMITMENT DATE OF NOVEMBER 14, 2019 AT 5:00 P.M.:

PARCEL A:

THAT PART OF THE SOUTHEAST ONE-QUARTER OF THE SOUTHEAST ONE-QUARTER OF SECTION 6, TOWNSHIP 3 SOUTH, RANGE 68 WEST OF THE SIXTH PRINCIPAL MERIDIAN, COUNTY OF ADAMS, STATE OF COLORADO, DESCRIBED AS: **BEGINNING** AT THE NORTHEAST CORNER OF THE SOUTHEAST ONE-QUARTER OF THE SOUTHEAST ONE-QUARTER OF SAID SECTION 6; THENCE SOUTH 00°52'48" WEST ALONG THE EAST LINE OF THE SOUTHEAST ONE-QUARTER A DISTANCE OF 330.00 FEET TO A POINT ON THE EASTERLY EXTENSION OF THE SOUTH LINE OF A PARCEL DESCRIBED IN BOOK 2838 AT PAGE 601, ADAMS COUNTY RECORDS; THENCE SOUTH 89°34'06" WEST ALONG SAID EASTERLY EXTENSION A DISTANCE OF 120.02 FEET TO THE SOUTHEAST CORNER OF SAID PARCEL, SAID CORNER ALSO BEING THE **TRUE POINT OF BEGINNING**; THENCE CONTINUING SOUTH 89°34'06" WEST ALONG THE SOUTH LINE OF SAID PARCEL DESCRIBED IN BOOK 2838 AT PAGE 601, DISTANCE OF 312.42 FEET TO A POINT ON AN OLD EXISTING FENCE LINE AS SHOWN IN BOOK 176 AT PAGE 93, ADAMS COUNTY RECORDS; THENCE NORTH 00°31'17" WEST ALONG SAID OLD EXISTING FENCE LINE A DISTANCE OF 22.50 FEET TO AN OLD EXISTING (EAST-WEST) FENCE LINE; THENCE SOUTH 89°12'14" EAST ALONG SAID OLD EXISTING (EAST-WEST) FENCE LINE A DISTANCE OF 312.89 FEET TO A POINT ON THE EAST LINE OF A PARCEL DESCRIBED IN BOOK 2838 AT PAGE 601; THENCE SOUTH 00°52'48" WEST ALONG SAID EAST LINE A DISTANCE OF 15.80 FEET TO THE **TRUE POINT OF BEGINNING**, COUNTY OF ADAMS, STATE OF COLORADO.

PARCEL B:

THAT PART OF THE SE1/4 SE 1/4 OF SECTION 6, TOWNSHIP 3 SOUTH, RANGE 68 WEST OF THE 6TH P.M., DESCRIBED AS FOLLOWS:

BEGINNING AT THE SOUTHEAST CORNER OF SAID SECTION 6; THENCE WEST, A DISTANCE OF 420.58 FEET, MORE OR LESS, TO THE SOUTHEAST CORNER OF TRACT OF LAND DESCRIBED IN DECREE RECORDED IN BOOK 367 AT PAGE 43; THENCE NORTHEASTERLY, ALONG THE EAST LINE OF SAID TRACT DESCRIBED IN BOOK 367 AT PAGE 43, A DISTANCE OF 849 FEET TO THE TERMINAL POINT OF COURSE NO. 5 OF SAID TRACT DESCRIBED IN BOOK 367 AT PAGE 43; THENCE NORTH 89°50' WEST, ALONG SAID COURSE NO. 5, A DISTANCE OF 28.5 FEET TO THE TERMINAL POINT OF COURSE NO. 4 OF SAID TRACT DESCRIBED IN BOOK 367 AT PAGE 43; THENCE NORTH 0°40' EAST, ALONG SAID COURSE NO. 4, TO A POINT 330 FEET SOUTH OF THE NORTH LINE OF THE SE 1/4 SE 1/4 OF SAID SECTION 6; THENCE EAST, ALONG A LINE 330 FEET SOUTH OF AND PARALLEL TO THE NORTH LINE OF THE SE 1/4 SE 1/4 OF SAID SECTION 6, TO A POINT ON THE EAST LINE OF SAID SECTION 6; THENCE SOUTH, ALONG THE EAST LINE OF SAID SECTION 6, TO THE **POINT OF BEGINNING**, COUNTY OF ADAMS, STATE OF COLORADO.

EXCLUDING THEREFROM THAT PORTION AS DESCRIBED IN RULE, ORDER, JUDGEMENT AND DECREE RECORDED AUGUST 16, 1985 AT RECEPTION NO. 593561.

TITLE COMMITMENT NOTES

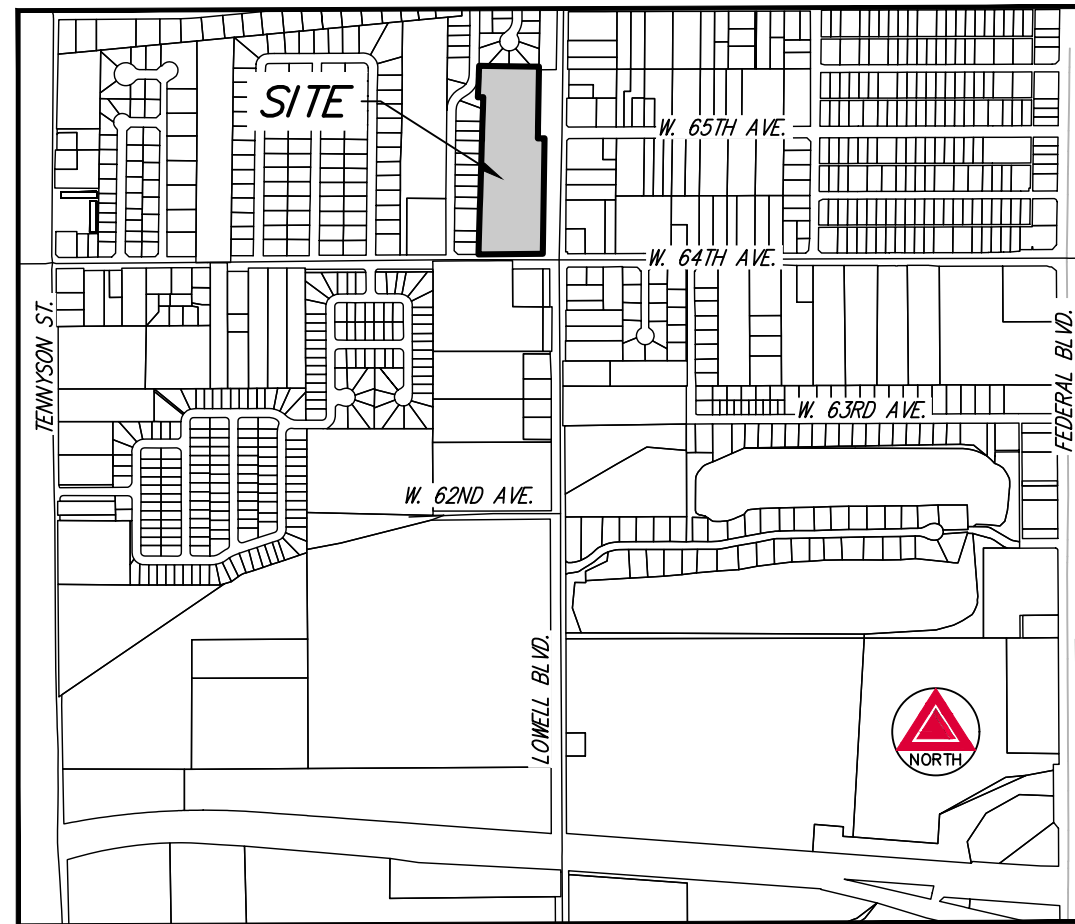
FIRST AMERICAN TITLE INSURANCE COMPANY COMMITMENT NO. NCS-989426-CO, WITH A COMMITMENT DATE OF NOVEMBER 14, 2019 AT 5:00 P.M. WAS RELIED UPON FOR RECORD INFORMATION REGARDING RIGHTS-OF-WAY, EASEMENTS AND ENCUMBRANCES. THIS SURVEY DOES NOT REPRESENT A TITLE SEARCH BY AZTEC CONSULTANTS, INC. TO DETERMINE OWNERSHIP, RIGHTS-OF-WAY, EASEMENTS OR OTHER MATTERS OF PUBLIC RECORD.

NOTE: THE WORD "AFFECTS" AS USED BELOW, IS HEREBY DEFINED AS: "A DETERMINATION THAT THE PROPERTY OR INTERESTS DESCRIBED, WITHIN THE ITEMS LISTED AMONG THE SCHEDULE B - PART II PROVIDED, FALLS WITHIN OR TOUCHES THE SUBJECT PROPERTY".

ITEM NUMBERS BELOW REFER TO THOSE ITEMS AS LISTED IN SCHEDULE B - PART II OF SAID TITLE COMMITMENT.

ITEM NUMBERS 1-8 ARE STANDARD EXCEPTIONS NOT TO BE ADDRESSED AS A PART OF THIS SURVEY.

9. TERMS, CONDITIONS, PROVISIONS, OBLIGATIONS AND AGREEMENTS AS SET FORTH IN THE RESOLUTION RECORDED JULY 16, 1986 AT RECEPTION NO. 663298.
AFFECTS THE SUBJECT PROPERTY, BUT IS NOT A PLOTTABLE ITEM.
10. TERMS, CONDITIONS, PROVISIONS, OBLIGATIONS AND AGREEMENTS AS SET FORTH IN THE ZONING HEARING DECISION - CASE #5-97-Z RECORDED AUGUST 25, 1997 AT RECEPTION NO. C0311110.
AFFECTS THE SUBJECT PROPERTY, BUT IS NOT A PLOTTABLE ITEM.
11. TERMS, CONDITIONS, PROVISIONS, OBLIGATIONS, EASEMENTS AND AGREEMENTS AS SET FORTH IN THE PERMANENT DRAINAGE EASEMENT RECORDED JANUARY 7, 2009 AT RECEPTION NO. 200900001130.
AFFECTS THE SUBJECT PROPERTY AND IS SHOWN HEREON.
12. TERMS, CONDITIONS, PROVISIONS, OBLIGATIONS AND AGREEMENTS AS SET FORTH IN THE RESOLUTION RECORDED FEBRUARY 17, 2016 AT RECEPTION NO. 2016000012301.
AFFECTS THE SUBJECT PROPERTY, BUT IS NOT A PLOTTABLE ITEM.



VICINITY MAP

SCALE: 1" = 1000'

BASIS OF BEARINGS

BEARINGS SHOWN HEREON ARE GRID BEARINGS DERIVED FROM GPS OBSERVATION BASED UPON THE COLORADO COORDINATE SYSTEM OF 1983 NORTH ZONE (NAD 83, 2011) REFERENCED TO THE SOUTH LINE OF THE SOUTHEAST QUARTER OF SECTION 6, TOWNSHIP 3 SOUTH, RANGE 68 WEST, SIXTH PRINCIPAL MERIDIAN BEING MONUMENTED AS SHOWN HEREON, TAKEN TO BEAR SOUTH 89°35'29" WEST, A DISTANCE OF 2,640.29 FEET.

FLOOD ZONE

THE SUBJECT PROPERTY SHOWN HEREIN LIES WITHIN OTHER AREAS - ZONE X, AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN, AS SHOWN ON FEDERAL EMERGENCY MANAGEMENT AGENCY FLOOD INSURANCE RATE MAP INDEX NO. 08001C0583H, MAP REVISED MARCH 5, 2007.

BENCHMARK

AZTEC CONTROL POINT 55 BEING A 1.5 INCH ALUMINUM CAP 18 FEET EAST OF THE BACK OF WALK ON THE EAST SIDE OF LOWELL BOULEVARD AND 33 FEET SOUTHEAST OF A POWER POLE.

NAVD88 ELEV=5233.13'

GENERAL NOTES

1. THE FIELD WORK FOR THIS SURVEY WAS PERFORMED BY AN AZTEC CONSULTANTS, INC. SURVEY CREW AND COMPLETED ON DECEMBER 13, 2019.
2. PER C.R.S. 38-51-106, "ALL LINEAL UNITS DEPICTED ON THIS LAND SURVEY PLAT ARE U.S. SURVEY FEET. ONE METER EQUALS 39.37/12 U.S. SURVEY FEET, EXACTLY ACCORDING TO THE NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY."
3. AS TO TABLE A ITEM NO. 2: PER THE ADAMS COUNTY ASSESSOR'S OFFICE, THE SUBJECT PROPERTY'S ADDRESS IS 6501 LOWELL BLVD., DENVER, CO.
5. AS TO TABLE A ITEM NO. 4: THE SURVEYED PARCEL CONTAINS A TOTAL OF 7.154 ACRES OR 311,618 SQUARE FEET, MORE OR LESS.
6. AS TO TABLE A ITEM NO. 11: THIS SURVEY DOES NOT CERTIFY TO SUBSURFACE FEATURES, IMPROVEMENTS, UTILITIES OR BURIED LINES OF ANY TYPE, LOCATION DEPICTED HEREON ARE DERIVED FROM FIELD SURVEY OF UTILITY FLAGGING / PAINT MARKING, PERFORMED BY AZTEC SURVEY AND LOCATING ON DECEMBER 10, 2019.
7. AS TO TABLE A ITEM NO. 16: THERE WAS NO OBSERVED EVIDENCE OF CURRENT EARTH MOVING WORK, BUILDING CONSTRUCTION OR BUILDING ADDITIONS AT THE TIME OF THIS SURVEY.
8. THE PROPERTY HAS DIRECT PHYSICAL ACCESS TO WEST 65TH AVENUE, A DEDICATED PUBLIC STREET.
9. THE PROPERTY DESCRIBED HEREON IS THE SAME AS THE PROPERTY DESCRIBED IN FIRST AMERICAN TITLE INSURANCE COMPANY COMMITMENT NO. NCS-989426-CO, WITH A COMMITMENT DATE OF NOVEMBER 14, 2019 AT 5:00 P.M., AND THAT ALL EASEMENTS, COVENANTS AND RESTRICTIONS REFERENCED IN SAID TITLE COMMITMENT OR APPARENT FROM A PHYSICAL INSPECTION OF THE SITE OR OTHERWISE KNOWN TO ME HAVE BEEN PLOTTED HEREON OR OTHERWISE NOTED AS TO THEIR EFFECT ON THE SUBJECT PROPERTY
10. THE ACCOMPANYING SURVEY WAS MADE ON THE GROUND AND CORRECTLY SHOWS THE LOCATION OF ALL BUILDINGS, STRUCTURES AND OTHER IMPROVEMENTS SITUATED ON THE ABOVE PREMISES; THERE ARE NO VISIBLE ENCROACHMENTS ON THE SUBJECT PROPERTY OR UPON ADJACENT LAND ABUTTING SAID PROPERTY EXCEPT AS SHOWN HEREON AND WAS MADE IN ACCORDANCE WITH LAWS AND/OR MINIMUM STANDARDS OF THE STATE OF COLORADO.
11. ANY PERSON WHO KNOWINGLY REMOVES, ALTERS OR DEFACES ANY PUBLIC LAND SURVEY MONUMENT OR ACCESSORY COMMITS A CLASS TWO (2) MISDEMEANOR PURSUANT TO STATE STATUTE 18-4-508, C.R.S.

SURVEYOR'S STATEMENT

TO: LINETTE M. BROZOVICH
FIRST AMERICAN TITLE INSURANCE COMPANY

THIS IS TO CERTIFY THAT THIS MAP OR PLAT AND THE SURVEY ON WHICH IT IS BASED WERE MADE IN ACCORDANCE WITH THE 2016 MINIMUM STANDARD DETAIL REQUIREMENTS FOR ALTA/NSPS LAND TITLE SURVEYS, JOINTLY ESTABLISHED AND ADOPTED BY ALTA AND NSPS, AND INCLUDES ITEMS 1-5, 7(a), 8, 11, 13, 16 AND 20 OF TABLE A THEREOF. THE FIELD WORK WAS COMPLETED ON DECEMBER 13, 2019.

DATE OF PLAT OR MAP: 12/20/2019

MICHAEL J. NOFFSINGER, PLS NO. 38367
COLORADO LICENSED PROFESSIONAL LAND SURVEYOR
FOR AND ON BEHALF OF AZTEC CONSULTANTS, INC.

NOTICE: ACCORDING TO COLORADO LAW, YOU MUST COMMENCE ANY LEGAL ACTION BASED UPON ANY DEFECT IN THIS SURVEY WITHIN THREE YEARS AFTER YOU FIRST DISCOVER SUCH DEFECT. IN NO EVENT, MAY ANY ACTION BASED UPON ANY DEFECT IN THIS SURVEY BE COMMENCED MORE THAN TEN YEARS FROM THE DATE OF THE CERTIFICATION SHOWN HEREON.

NOTICE: PER THE STATE OF COLORADO BOARD OF LICENSURE FOR ARCHITECTS, PROFESSIONAL ENGINEERS, AND PROFESSIONAL LAND SURVEYORS RULE 1.6.B.2 THE WORD "CERTIFY" AS USED HEREON MEANS AN EXPRESSION OF PROFESSIONAL OPINION AND DOES NOT CONSTITUTE A WARRANTY OR GUARANTEE, EXPRESSED OR IMPLIED. THE SURVEY REPRESENTED HEREON HAS BEEN PERFORMED BY ME OR UNDER MY DIRECT SUPERVISION IN ACCORDANCE WITH APPLICABLE STANDARDS OF PRACTICE AND IS BASED UPON MY KNOWLEDGE, INFORMATION AND BELIEF.

ADAMS COUNTY CLERK AND RECORDER'S CERTIFICATE

THIS ALTA WAS FILED FOR RECORD IN THE OFFICE OF THE COUNTY CLERK AND RECORDER OF ADAMS COUNTY AT ____ M. ON THE ____ DAY OF _____, 20__.

RECEPTION NO. _____

ADAMS COUNTY CLERK AND RECORDER

BY: _____
DEPUTY

SCALE	N.T.S.
DATE	12/20/2019

BY	DATE	COMMENT

AZTEC
 CONSULTANTS, INC.
 300 East Mineral Ave., Suite 1
 Littleton, Colorado 80122
 Phone: (303) 713-1898
 Fax: (303) 713-1897
 www.aztecconsultants.com

ALTA/NSPS LAND TITLE SURVEY
 SE1/4 SE1/4 SEC 6, T3S, R68W, 6TH P.M.
 ADAMS COUNTY, COLORADO
 PREPARED FOR
 REDLAND
 1500 WEST CANAL COURT, LITTLETON, CO 80120

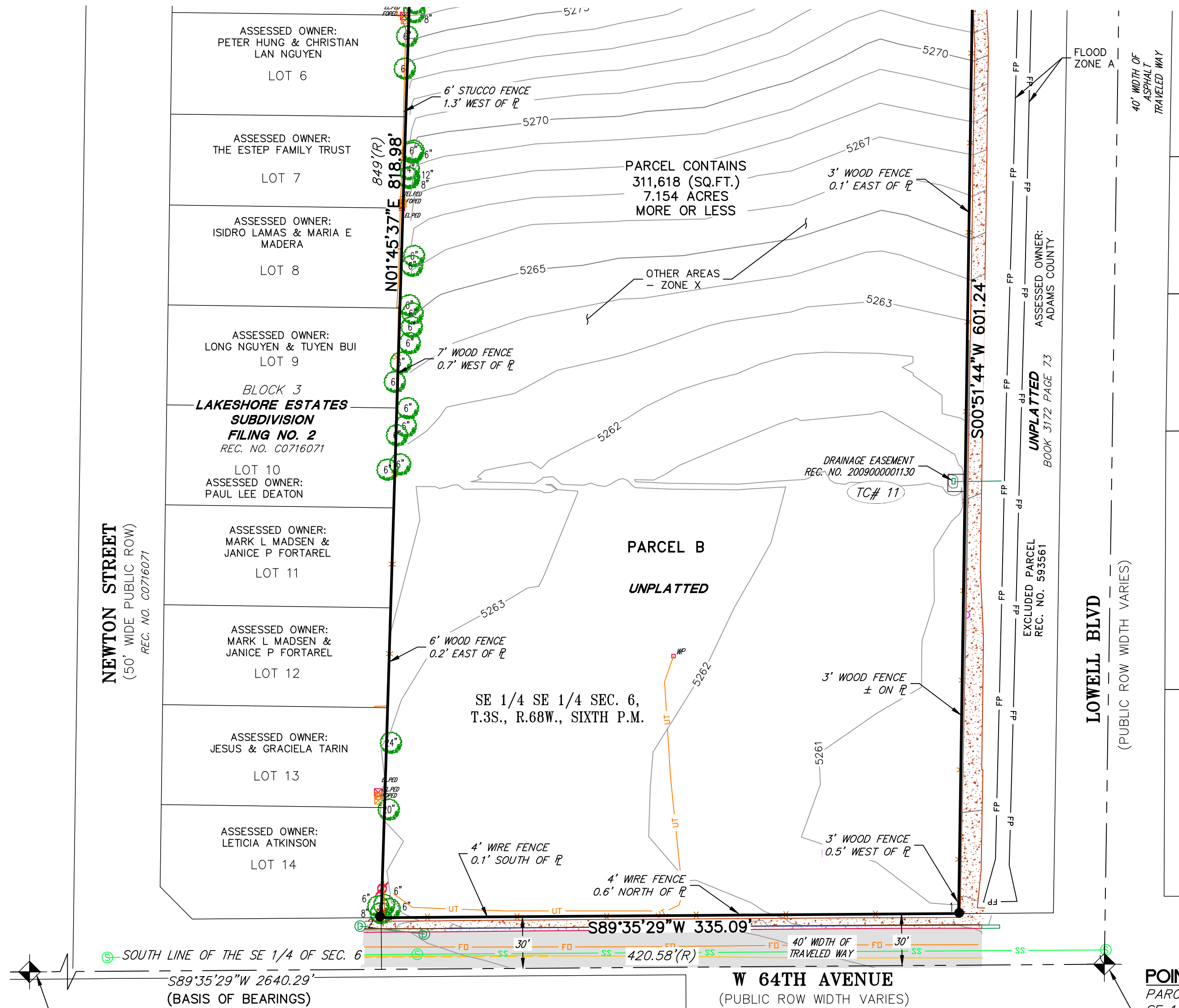
SHEET	ONE
OF	3 SHEETS
JOB NO.	54819-54

FOR REVIEW

ALTA/NSPS LAND TITLE SURVEY

TWO PARCELS LOCATED IN THE SOUTHEAST QUARTER OF THE SOUTHEAST QUARTER OF SECTION 6,
TOWNSHIP 3 SOUTH, RANGE 68 WEST OF THE SIXTH PRINCIPAL MERIDIAN,
COUNTY OF ADAMS, STATE OF COLORADO

SEE SHEET 3



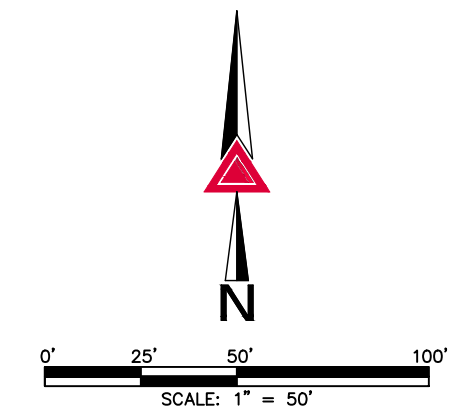
MONUMENT SYMBOL LEGEND

- ◆ SECTION CORNER MONUMENT AS DESCRIBED
- 1 ○ SET NO. 5 REBAR WITH 1-1/4" YELLOW PLASTIC CAP STAMPED "AZTEC PLS 38367"
- 2 ○ SET 1" BRASS DISK STAMPED "AZTEC LS 38367"
- 1 ● FOUND NO. 4 REBAR - NO CAP
- 2 ● FOUND 3/4" STEEL ROD
- 3 ● FOUND NO. 5 REBAR WITH 1-1/2" RED PLASTIC CAP STAMPED "BM SURVEY LSXX717"
- 4 ● FOUND NO. 4 REBAR WITH 1" RED PLASTIC CAP - STAMPING ILLEGIBLE
- 5 ● FOUND NO. 4 REBAR WITH 1" ORANGE PLASTIC CAP STAMPED "PE LS 9489"
- ROW RIGHT-OF-WAY
- ℙ PROPERTY LINE
- (R) RECORD DIMENSIONS PER TITLE COMMITMENT
- (TC# XX) TITLE COMMITMENT - SCHEDULE B, PART II EXCEPTIONS
- FP FLOOD PLAIN LIMITS

FOR TOPOGRAPHIC
LEGEND SEE SHEET 3

SOUTH LINE OF THE SE 1/4 OF SEC. 6
S89°35'29"W 2640.29'
(BASIS OF BEARINGS)

S 1/4 SECTION 6,
T3S, R68W, 6TH P.M.
FOUND NO. 6 REBAR
WITH 2" ALUMINUM CAP
STAMPING ILLEGIBLE



POINT OF BEGINNING
PARCEL B
SE 1/4 SECTION 6,
T3S, R68W, 6TH P.M.
FOUND 1" AXLE - NO CAP
IN RANGE BOX

SCALE	1" = 50'
DATE	12/20/2019
BY	JRW
MDW	

DATE	BY	COMMENT

300 East Mineral Ave., Suite 1
Littleton, Colorado 80122
Phone: (303) 713-1898
Fax: (303) 713-1897
www.aztecconsultants.com

AZTEC

CONSULTANTS, INC.

ALTA/NSPS LAND TITLE SURVEY
SE1/4 SEC 6, T3S, R68W, 6TH P.M.
ADAMS COUNTY, COLORADO
PREPARED FOR
REDLAND
1500 WEST CANAL COURT, LITTLETON, CO 80120

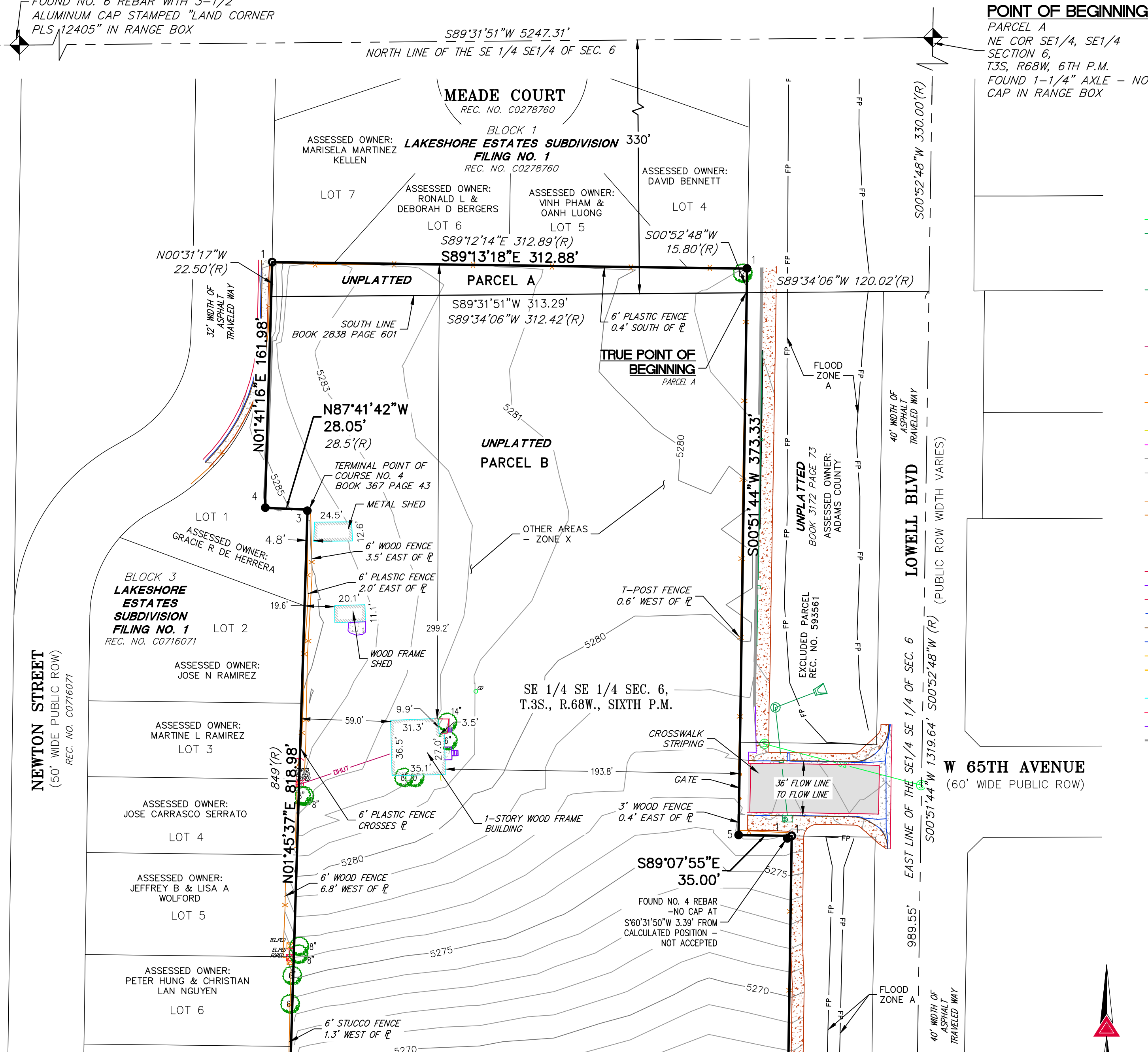
FOR REVIEW

FOR AND ON BEHALF OF
AZTEC CONSULTANTS, INC

ALTA/NSPS LAND TITLE SURVEY

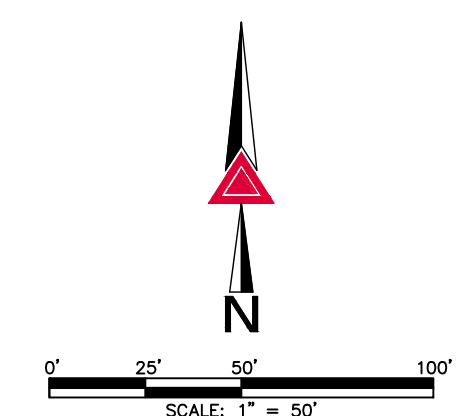
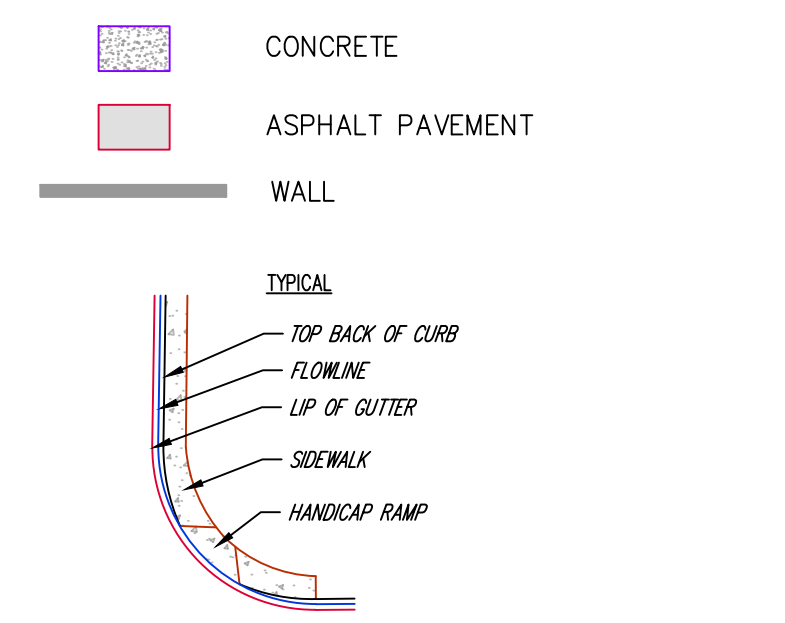
TWO PARCELS LOCATED IN THE SOUTHEAST QUARTER OF THE SOUTHEAST QUARTER OF SECTION 6,
TOWNSHIP 3 SOUTH, RANGE 68 WEST OF THE SIXTH PRINCIPAL MERIDIAN,
COUNTY OF ADAMS, STATE OF COLORADO

S 1/16 SECTION 6, T3S, R68W, SECTION 1,
T3S, R69W, 6TH P.M.
FOUND NO. 6 REBAR WITH 3-1/2"
ALUMINUM CAP STAMPED "LAND CORNER
PLS 12405" IN RANGE BOX



TOPOGRAPHIC LEGEND

	SANITARY CLEANOUT
	SANITARY MANHOLE
	SANITARY UNDERGROUND
	STORM CORRUGATED PLASTIC PIPE
	STORM INLET
	STORM FES
	STORM MANHOLE
	STORM REINFORCED CONCRETE PIPE
	ELECTRIC PEDESTAL
	ELECTRIC POLE
	ELECTRIC TRANSFORMER
	OVERHEAD UTILITY
	GUY WIRE
	TELEPHONE LINE UNDERGROUND
	TELEPHONE PEDESTAL
	FIBER OPTIC UNDERGROUND
	FIBER OPTICS PEDESTAL
	GAS LINE UNDERGROUND
	MISC
	EX CONT-MJR
	EX CONT-MNR
	TREE DECIDUOUS
	FENCE
	GATE
	FENCE POST
	WOOD POST
	SIDEWALK
	EDGE ASPHALT
	EDGE CONCRETE
	CURB LIP OF GUTTER
	FLOWLINE
	CURB TOP FACE
	CHASE
	LINEMARKING YELLOW STRIPE DASHED
	LINEMARKING YELLOW STRIPE SOLID
	SIGN
	BUILDING
	DECK
	STEPS
	WALL



SEE SHEET 2
FOR MONUMENT SYMBOL
LEGEND SEE SHEET 2

FOR REVIEW

SCALE 1" = 50'	DATE 12/20/2019
BY	COMMENT
DATE	
<p>300 East Mineral Ave., Suite 1 Littleton, Colorado 80122 Phone: (303) 713-1898 Fax: (303) 713-1897 www.aztecconsultants.com</p> <h2>AZTEC</h2> <p>CONSULTANTS, INC.</p>	
<p>ALTA/NSPS LAND TITLE SURVEY SE1/4 SE1/4 SEC 6, T3S, R68W, 6TH P.M. ADAMS COUNTY, COLORADO</p> <p>PREPARED FOR REDLAND 1500 WEST CANAL COURT, LITTLETON, CO 80120</p>	
<p>SHEET THREE</p> <p>OF 3 SHEETS</p> <p>JOB NO. 54819-54</p>	

6501 LOWELL BLVD.

AUGUST 24, 2020

124 TOTAL ATTACHED DWELLING UNITS

28 TOWNHOUSE D.U.
96 DUPLEX D.U.

SITE PLAN
SHEET 2 OF 5



64TH AVENUE

ENTRY

65TH AVE.

NORTH LOWELL BLVD.

DESIGN BY FRANKLIN SALAZAR / 303-870-5943

SITE PLAN

FRANKLIN SALAZAR ARCHITECTURE, P.C.
 12200 W. 10TH AVENUE, SUITE 100
 DENVER, CO 80231
 TEL: 303-751-1111
 WWW.FRANKLINARCHITECTURE.COM

The Land referred to herein below is situated in the County of Adams, State of Colorado, and is described as follows:

PARCEL A:

That part of the Southeast one-quarter of the Southeast one-quarter of Section 6, Township 3 South, Range 68 West of the Sixth Principal Meridian, County of Adams, State of Colorado, described as:

Beginning at the Northeast corner of the Southeast one-quarter of the Southeast one-quarter of said Section 6; thence South 00°52'48" West along the East line of the Southeast one-quarter a distance of 330.00 feet to a point on the Easterly extension of the South line of a parcel described in [Book 2838 at Page 601](#), Adams County records; thence South 89°34'06" West along said Easterly extension a distance of 120.02 feet to the Southeast corner of said parcel, said corner also being the True Point of Beginning; thence continuing South 89°34'06" West along the South line of said parcel described in [Book 2838 at Page 601](#), distance of 312.42 feet to a point on an old existing fence line as shown in [Book 176 at Page 93](#), Adams County records; thence North 00°31'17" West along said old existing fence line a distance of 22.50 feet to an old existing (East-West) fence line; thence South 89°12'14" East along said old existing (East-West) fence line a distance of 312.89 feet to a point on the East line of a parcel described in [Book 2838 at Page 601](#); thence South 00°52'48" West along said East line a distance of 15.80 feet to the True Point of Beginning,
County of Adams,
State of Colorado.

PARCEL B:

That part of the SE1/4 SE 1/4 of Section 6, Township 3 South, Range 68 West of the 6th P.M., described as follows: Beginning at the Southeast corner of said Section 6; thence West, a distance of 420.58 feet, more or less, to the Southeast corner of Tract of land described in Decree recorded in Book 367 at Page 43; thence Northeasterly, along the East line of said tract described in Book 367 at Page 43, a distance of 849 feet to the terminal point of Course No. 5 of said tract described in Book 367 at Page 43; thence North 89°50' West, along said Course No. 5, a distance of 28.5 feet to the terminal point of Course No. 4 of said tract described in Book 367 at Page 43; thence North 0°40' East, along said Course No. 4, to a point 330 feet South of the North line of the SE 1/4 SE 1/4 of said Section 6; thence East, along a line 330 feet South of and parallel to the North line of the SE 1/4 SE 1/4 of said Section 6, to a point on the East line of said Section 6; thence South, along the East line of said Section 6, to the Point of Beginning,
County of Adams,
State of Colorado.

Excluding therefrom that portion as described in Rule, Order, Judgement and Decree recorded August 16, 1985 at Reception No. [593561](#).

NOTE: The above legal description will be amended upon satisfaction of the requirements herein set forth.

Legal Description

PARCEL A:

That part of the Southeast one-quarter of the Southeast one-quarter of Section 6, Township 3 South, Range 68 West of the Sixth Principal Meridian, County of Adams, State of Colorado, described as follows:

Beginning at the Northeast corner of the Southeast one-quarter of the Southeast one-quarter of said Section 6; thence South 00°52'48" West along the East line of the Southeast one-quarter a distance of 330.00 feet to a point on the Easterly extension of the South line of a parcel described in Book 2838 at Page 601, Adams County records; thence South 89°34'06" West along said Easterly extension a distance of 120.02 feet to the Southeast corner of said parcel, said corner also being the True Point of Beginning; thence continuing South 89°34'06" West along the South line of said parcel described in Book 2838 at Page 601, distance of 312.42 feet to a point on an old existing fence line as shown in Book 176 at Page 93, Adams County records; thence North 00°31'17" West along said old existing fence line a distance of 22.50 feet to an old existing (East-West) fence line; thence South 89°12'14" East along said old existing (East-West) fence line a distance of 312.89 feet to a point on the East line of a parcel described in Book 2838 at Page 601; thence South 00°52'48" West along said East line a distance of 15.80 feet to the True Point of Beginning, County of Adams, State of Colorado.

PARCEL B:

That part of the SE1/4 SE 1/4 of Section 6, Township 3 South, Range 68 West of the 6th P.M., described as follows:

Beginning at the Southeast corner of said Section 6; thence West, a distance of 420.58 feet, more or less, to the Southeast corner of Tract of land described in Decree recorded in Book 367 at Page 43; thence Northeasterly, along the East line of said tract described in Book 367 at Page 43, a distance of 849 feet to the terminal point of Course No. 5 of said tract described in Book 367 at Page 43; thence North 89°50' West, along said Course No. 5, a distance of 28.5 feet to the terminal point of Course No. 4 of said tract described in Book 367 at Page 43; thence North 0°40' East, along said Course No. 4, to a point 330 feet South of the North line of the SE 1/4 SE 1/4 of said Section 6; thence East, along a line 330 feet South of and parallel to the North line of the SE 1/4 SE 1/4 of said Section 6, to a point on the East line of said Section 6; thence South, along the East line of said Section 6, to the Point of Beginning, County of Adams, State of Colorado.

TTLC Denver-Lowell Neighborhood Meeting Summary

April 20, 2021 6-7pm

Attendees:

Klaus Holzapfel

925-785-3254

David Clock – The True Life Companies

- The True Life Companies have been in business 13+ years, we are headquartered in Denver, CO. Our mission is to address the need for for-sale housing, market-rate housing.
- Project is located at 64th and Lowell Boulevard, approximately 7 acres.
- We are proposing 124 three-story duplex lots with 4 building elevation options and three floor plan layouts. Average duplex size will be 1,700 sq ft, resulting in approximately 18 du/ac.
- We are working closely with the seller to maintain safety on the property.
- We have submitted a Rezone, PUD-PDP and Preliminary Plat Applications, refinements will be made to all applications once we receive comments back from Adams County. Comments due back early/mid-May.

Eva Mather – Norris Design

- Site is located between Hidden Lake and Jim Baker Reservoir.
- 675' Mailing Buffer Notice
- Situated between 3 light-rail spots
- Site is adjacent to Baker School Apartments
- Adams County Future Land Use Map designates this site as "Urban Residential", which application is in compliance with.
- Served by Highland Hills Rec District, Adams County Fire, Westminster Schools.
- Existing zoning is R-1-A and C-4, we are proposing a Planned Unit Development, similar to the site adjacent to the East, the Baker School Apartments.
- Site Plan shows individual duplex lots. Primary access will be on 65th & Lowell, with a secondary access off 64th Ave. All streets will be private drives with access to private garages. Guest parking will be available, 1 parking space per 4 units.
- Amenity space will be provided as well as open space and a detention pond. Amenities will be made more clear in the future.
- 4 Architecture elevations will be made available.

Questions:

Klaus Holzapfel:

1. How big are the proposed units? Will they be rentals or sold to individual owners? Crime in the area has been rising. Will you participate in a mitigation plan? (I would).

David Clock – We will provide for-sale, market rate duplex housing, a total of 124 units. We will have 4 different elevations that have three different unit plans. All will be three-story units. Average unit size will be about 1,700 sq ft. Approximately 18 units per acre. These units will also be individually parcel lots, so the owner will purchase the land as well as the duplex. We are very intimately involved with the seller and very aware what has been going on with this property. We have already stepped in to mitigate some issues that

have been going on with the property currently. We are aware a fire was started, we have fenced off the area and are in the process of abolishing the structures on site. This project will have a HOA that will govern and protect the property. This development will be a valuable group to have a presence in this area and help to prevent crime and undesirable events.

2. Have you looked into electrification for these units and skipping gas? That's what I'm doing across the street.

David Clock – We have not at this time. We have processed a preliminary application with the County to receive feedback on what has been proposed as far as product type and density. Next, we will refine our application once we receive the new input. Exactly which utilities used will be addressed as we submit more applications with the County. We will be happy to share those details once we have progressed.

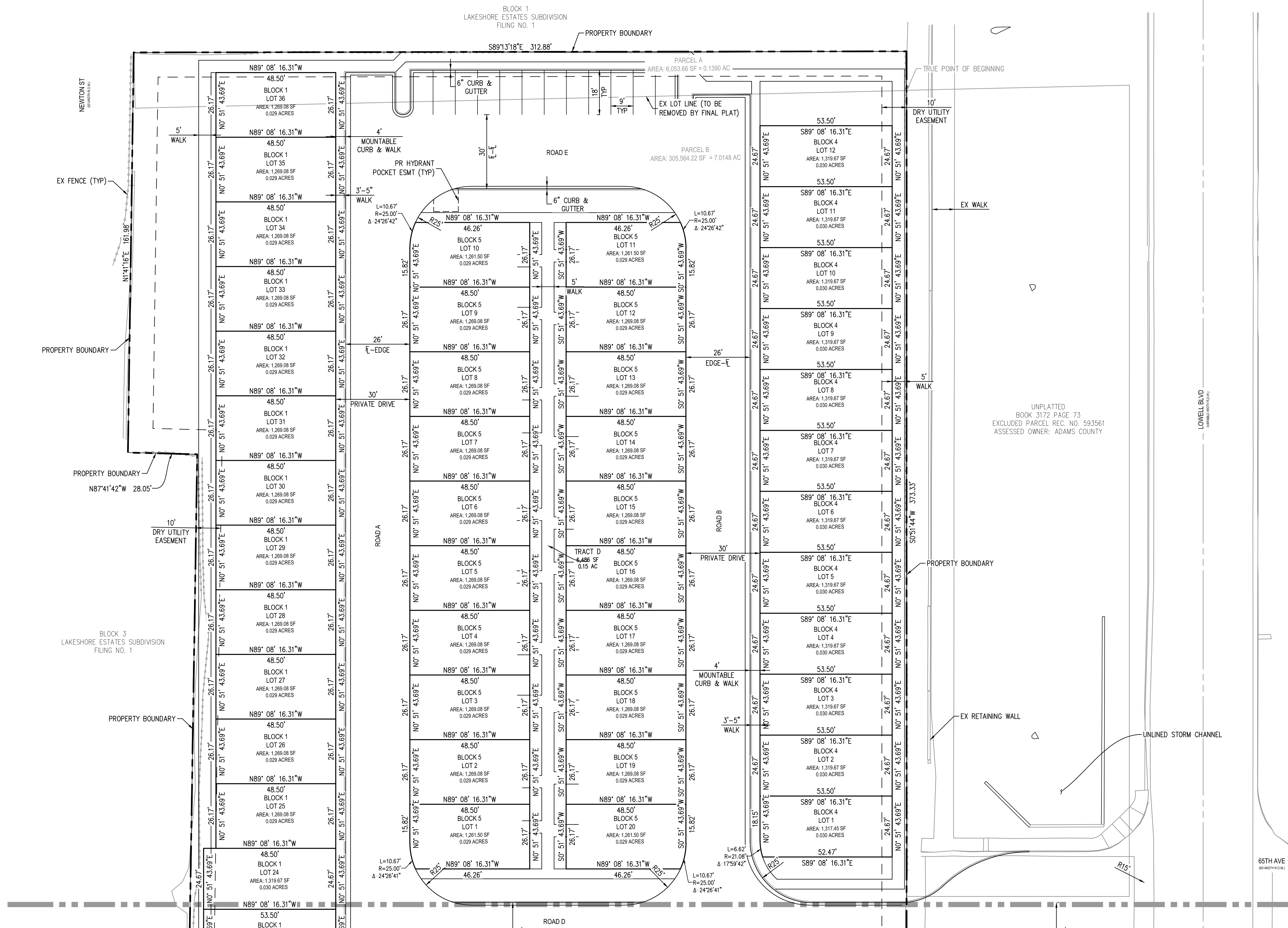
TTLIC DENVER - LOWELL

TWO PARCELS LOCATED IN THE SOUTHEAST 1/4 OF THE SOUTHEAST 1/4 OF SECTION 6, TOWNSHIP 3 SOUTH, RANGE 68 WEST OF THE SIXTH P.M. COUNTY OF ADAMS, STATE OF COLORADO

MAJOR SUBDIVISION PRELIMINARY PLAT

NO CHANGES ARE TO BE MADE TO THIS DRAWING WITHOUT WRITTEN PERMISSION OF HARRIS KOCHER SMITH.

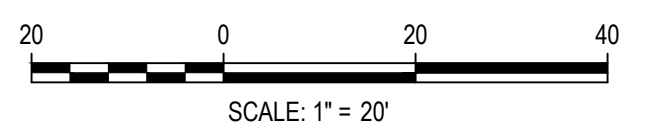
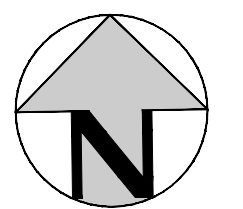
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LEGEND

PROPERTY BOUNDARY	---
LOT LINE	---
SETBACK LINE	---
DRY UTILITY EASEMENT	---

UNPLATTED
BOOK 3172 PAGE 73
EXCLUDED PARCEL REC. NO. 593561
ASSESSED OWNER: ADAMS COUNTY



MATCH LINE - SEE SHEET 3

REVISION DATE:

ISSUE DATE: 06-11-2021

SITE PLAN
SHEET 2 OF 10

TTLIC DENVER - LOWELL

PROJECT #: 20217

TTLIC DENVER - LOWELL

TWO PARCELS LOCATED IN THE SOUTHEAST 1/4 OF THE SOUTHEAST 1/4 OF SECTION 6, TOWNSHIP 3 SOUTH, RANGE 68 WEST OF THE SIXTH P.M. COUNTY OF ADAMS, STATE OF COLORADO

MAJOR SUBDIVISION PRELIMINARY PLAT

MATCH LINE - SEE SHEET 2

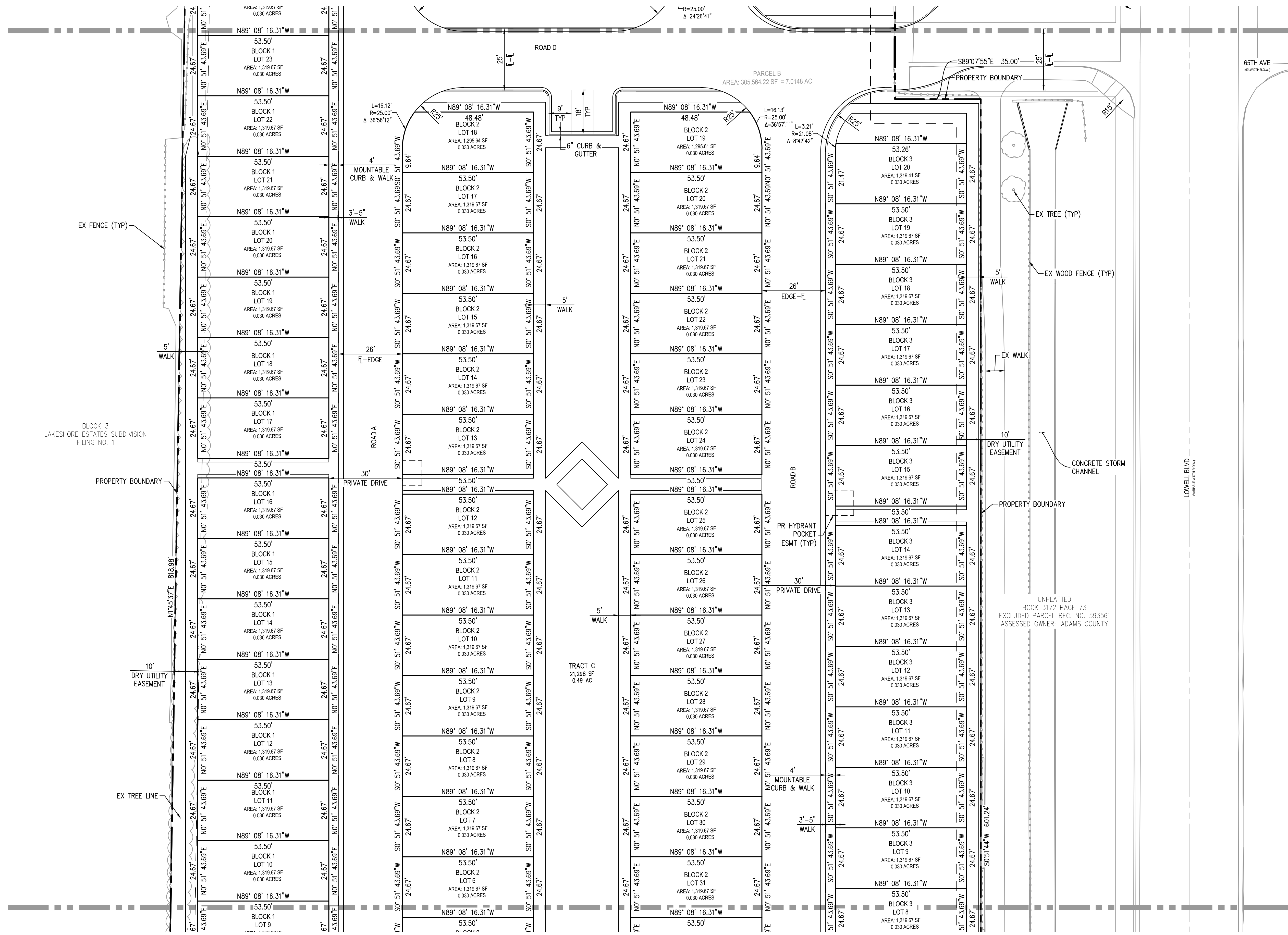
R=25.00'
Δ 24°26'41"

PARCEL B
AREA: 305,564.22 SF = 7.0148 AC

65TH AVE
(R-2000 ZONING)

- LEGEND**
- PROPERTY BOUNDARY
 - LOT LINE
 - SETBACK LINE
 - DRY UTILITY EASEMENT

NO CHANGES ARE TO BE MADE TO THIS DRAWING WITHOUT WRITTEN PERMISSION OF HARRIS KOCHER SMITH.



MATCH LINE - SEE SHEET 4

REVISION DATE:

ISSUE DATE: 06-11-2021

SHEET 3 OF 10

SITE PLAN

TTLIC DENVER - LOWELL

Project: 16-2009-PE-ENGINEERING-PRELIMINARY PLAT-PP - SITE PLANNING Layout LAYOUT
Client: 16-2009-PE-ENGINEERING-PRELIMINARY PLAT-PP - SITE PLANNING Layout LAYOUT
Date: 06/11/2021 10:05:34 AM By: Kevin Bunch
P:\Projects\16-2009-PE-ENGINEERING-PRELIMINARY PLAT-PP - SITE PLANNING Layout LAYOUT

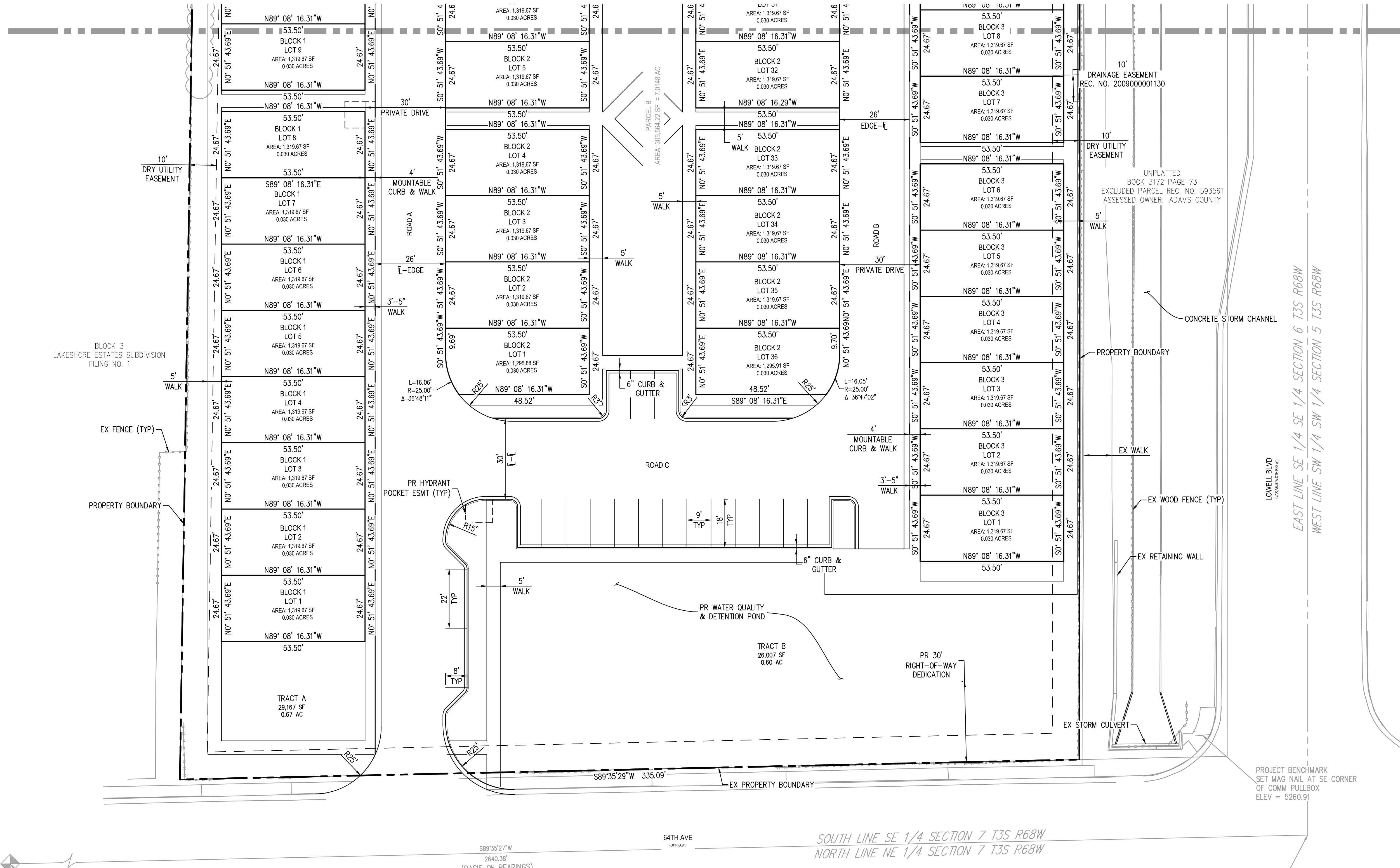
PROJECT #: 200817

TTLIC DENVER - LOWELL

TWO PARCELS LOCATED IN THE SOUTHEAST 1/4 OF THE SOUTHEAST 1/4 OF SECTION 6, TOWNSHIP 3 SOUTH, RANGE 68 WEST OF THE SIXTH P.M. COUNTY OF ADAMS, STATE OF COLORADO

MAJOR SUBDIVISION PRELIMINARY PLAT

MATCH LINE - SEE SHEET 3



LEGEND

PROPERTY BOUNDARY	---
LOT LINE	---
SETBACK LINE	---
DRY UTILITY EASEMENT	---

LOWELL BLVD (UNPLANNED)
EAST LINE SE 1/4 SE 1/4 SECTION 6 T3S R68W
WEST LINE SW 1/4 SW 1/4 SECTION 5 T3S R68W

PROJECT BENCHMARK
SET MAG NAIL AT SE CORNER
OF COMM PULLBOX
ELEV = 5260.91

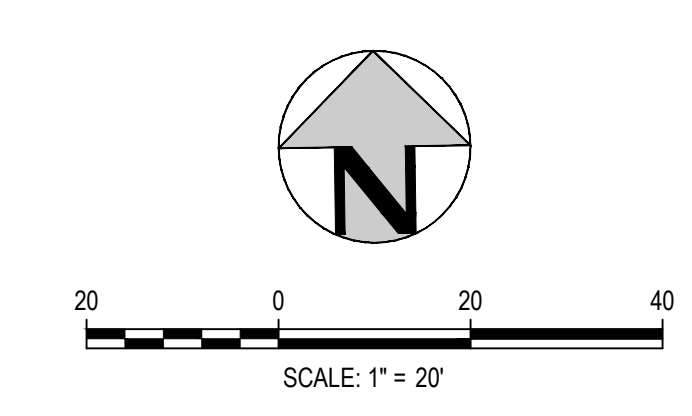
SOUTH LINE SE 1/4 SECTION 7 T3S R68W
NORTH LINE NE 1/4 SECTION 7 T3S R68W

NO CHANGES ARE TO BE MADE TO THIS DRAWING WITHOUT WRITTEN PERMISSION OF HARRIS KOEHLER SMITH.

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Plotted: FRI 08/11/21 10:05:38A By: Kevin Boudreau

1/4 CORNER SECTION 6/SECTION 7
FOUND 1.5" AXLE W/
2" ALUMINUM CAP IN RANGE BOX
DOWN 1.5' BELOW ROAD SURFACE
ILLEGIBLE

POINT OF BEGINNING
SW CORNER SECTION 6
FOUND 1" AXLE IN RANGE BOX
DOWN 1.3' BELOW ROAD SURFACE



PROJECT #: 200917

TTLIC DENVER - LOWELL

TWO PARCELS LOCATED IN THE SOUTHEAST 1/4 OF THE SOUTHEAST 1/4 OF SECTION 6, TOWNSHIP 3 SOUTH, RANGE 68 WEST OF THE SIXTH P.M. COUNTY OF ADAMS, STATE OF COLORADO
MAJOR SUBDIVISION PRELIMINARY PLAT

BLOCK 1
LAKESHORE ESTATES SUBDIVISION
FILING NO. 1

S89°13'18"E 312.88'

PROPERTY BOUNDARY

10'
DRY UTILITY EASEMENT

EX STORM
FLARED END SECTION

NEWTON ST
(UNIMPROVED)

N1°41'16"E 161.98'

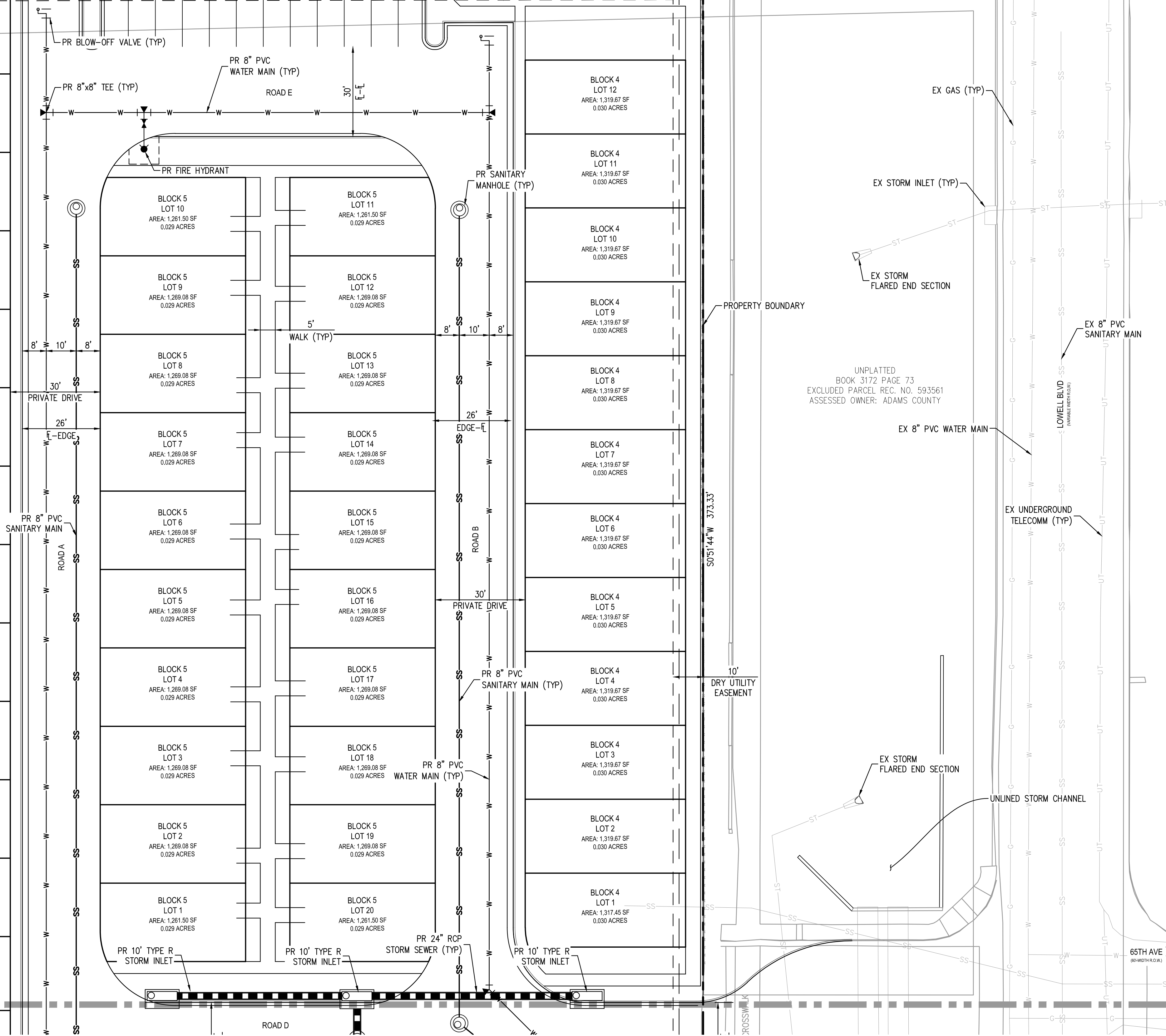
8'
SETBACK

PROPERTY BOUNDARY

N87°41'42"W 28.05'

10'
DRY UTILITY EASEMENT

BLOCK 3
LAKESHORE ESTATES SUBDIVISION
FILING NO. 1



UNPLATTED
BOOK 3172 PAGE 73
EXCLUDED PARCEL REC. NO. 593561
ASSESSED OWNER: ADAMS COUNTY

EX 8" PVC WATER MAIN

EX 8" PVC SANITARY MAIN

EX UNDERGROUND
TELECOMM (TYP)

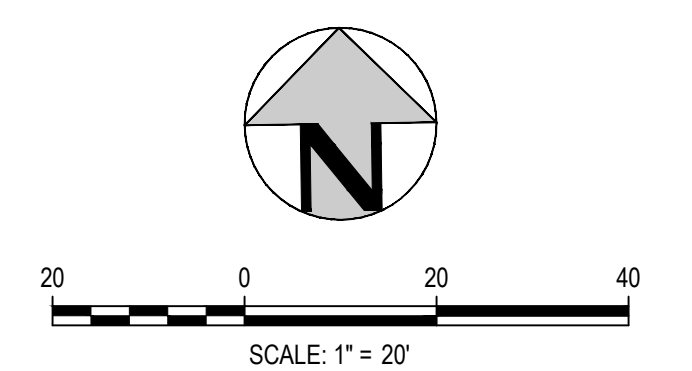
EX STORM
FLARED END SECTION

UNLINED STORM CHANNEL

65TH AVE
(IMPROVED)

LEGEND

- PROPERTY BOUNDARY
- PROPOSED WATER
- PROPOSED HYDRANT
- PROPOSED SANITARY SEWER W/ MANHOLE
- PROPOSED STORM SEWER
- PROPOSED STORM SEWER INLET
- EXISTING WATER
- EXISTING SANITARY SEWER
- EXISTING STORM SEWER
- EXISTING UNDERGROUND TELECOMM
- EXISTING GAS
- EXISTING UNDERGROUND ELECTRIC



MATCH LINE - SEE SHEET 6

REVISION DATE:

ISSUE DATE: 06-11-2021

OVERALL UTILITY PLAN

SHEET 5 OF 10

TTLIC DENVER - LOWELL

NO CHANGES ARE TO BE MADE TO THIS DRAWING WITHOUT WRITTEN PERMISSION OF HARRIS KOCHER SMITH, INC.

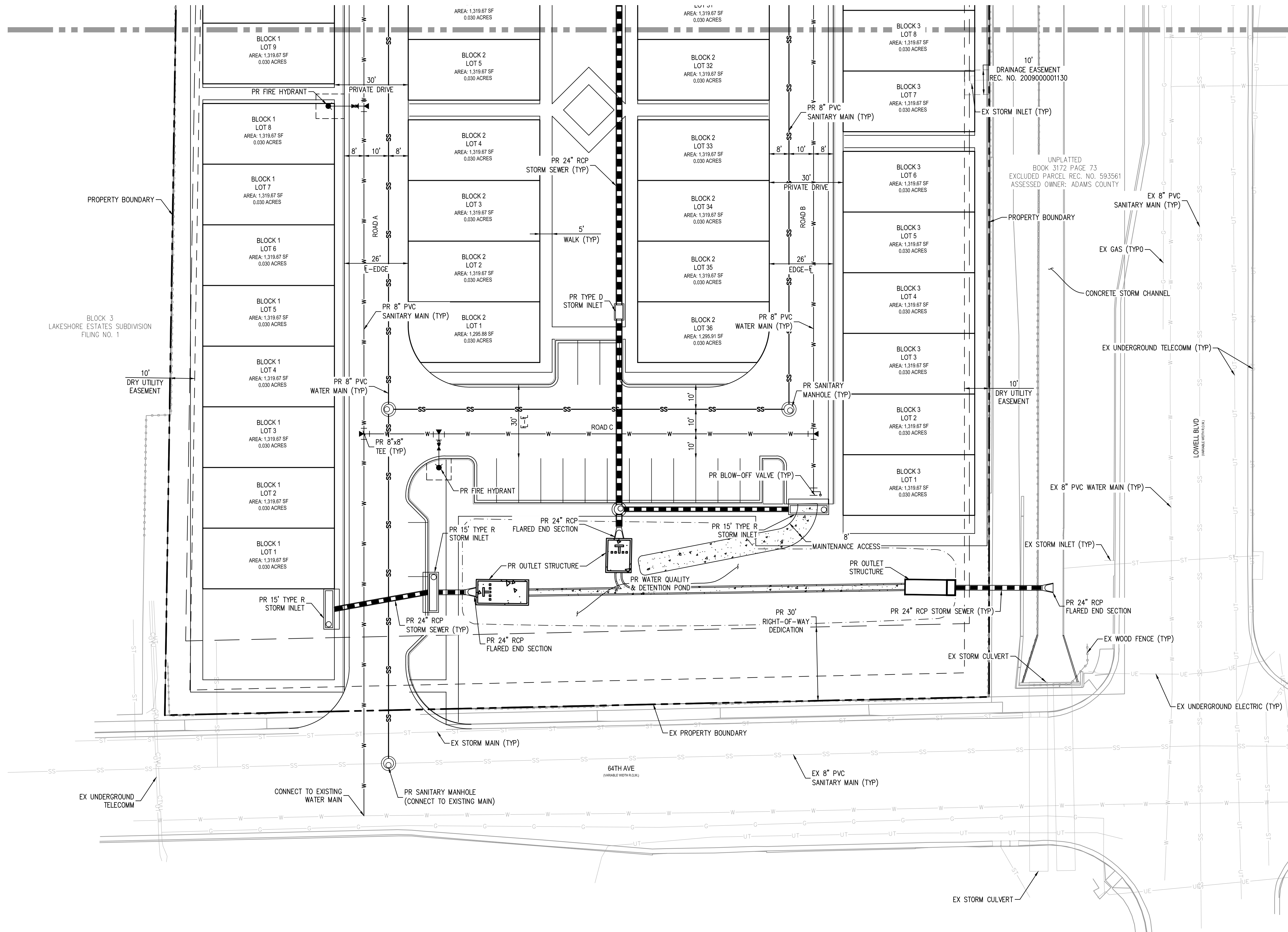
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PROJECT #: 200817

TTLIC DENVER - LOWELL

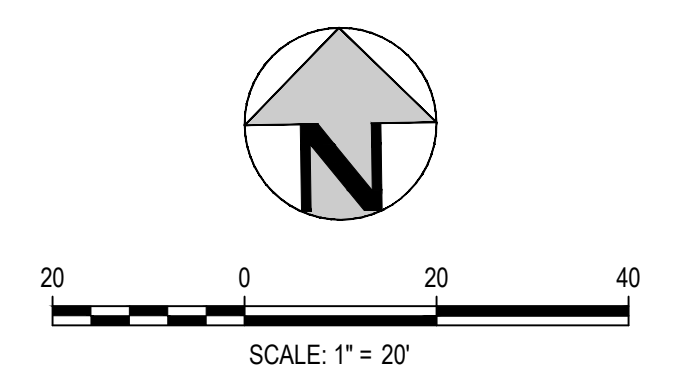
TWO PARCELS LOCATED IN THE SOUTHEAST 1/4 OF THE SOUTHEAST 1/4 OF SECTION 6, TOWNSHIP 3 SOUTH, RANGE 68 WEST OF THE SIXTH P.M.
COUNTY OF ADAMS, STATE OF COLORADO
MAJOR SUBDIVISION PRELIMINARY PLAT

MATCH LINE - SEE SHEET 6



LEGEND

PROPERTY BOUNDARY	---
PROPOSED WATER	W
PROPOSED HYDRANT	▲
PROPOSED SANITARY SEWER W/ MANHOLE	SS
PROPOSED STORM SEWER	ST
PROPOSED STORM SEWER INLET	SI
EXISTING WATER	W
EXISTING SANITARY SEWER	SS
EXISTING STORM SEWER	ST
EXISTING UNDERGROUND TELECOMM	UT
EXISTING GAS	G
EXISTING UNDERGROUND ELECTRIC	UE



REVISION DATE:

ISSUE DATE: 06-11-2021

SHEET 7 OF 10

OVERALL UTILITY PLAN

TTLIC DENVER - LOWELL

NO CHANGES ARE TO BE MADE TO THIS DRAWING WITHOUT WRITTEN PERMISSION OF HARRIS KOCHER SMITH.
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Plotted: FRI 06/11/21 10:05:54A By: Kevin Blumhagen

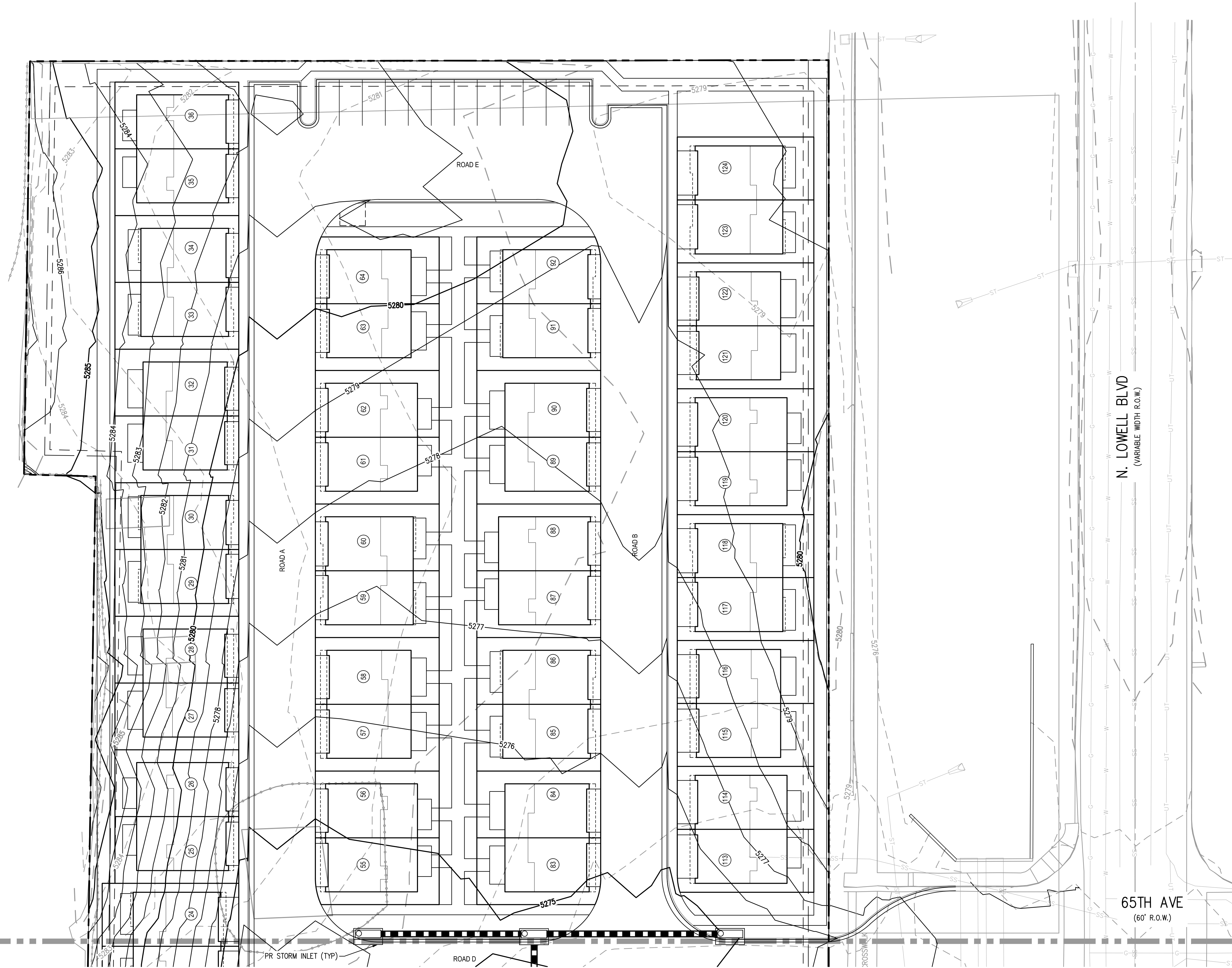
PROJECT #: 200817

TTLIC DENVER - LOWELL

TWO PARCELS LOCATED IN THE SOUTHEAST 1/4 OF THE SOUTHEAST 1/4 OF SECTION 6, TOWNSHIP 3 SOUTH, RANGE 68 WEST OF THE SIXTH P.M. COUNTY OF ADAMS, STATE OF COLORADO
MAJOR SUBDIVISION PRELIMINARY PLAT

NO CHANGES ARE TO BE MADE TO THIS DRAWING WITHOUT WRITTEN PERMISSION OF HARRIS KOCHER SMITH.

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Plotted: FRI 08/11/21 10:08:07A By: Kevin Blumhardt



LEGEND

- PROPERTY BOUNDARY
- PROPOSED CONTOUR
- EXISTING CONTOUR
- PROPOSED STORM SEWER
- PROPOSED STORM SEWER INLET
- EXISTING STORM SEWER

SCALE: 1" = 20'

MATCH LINE - SEE SHEET 9

REVISION DATE: ISSUE DATE: 06-11-2021 SHEET 8 OF 10

OVERALL GRADING PLAN
TTLIC DENVER - LOWELL

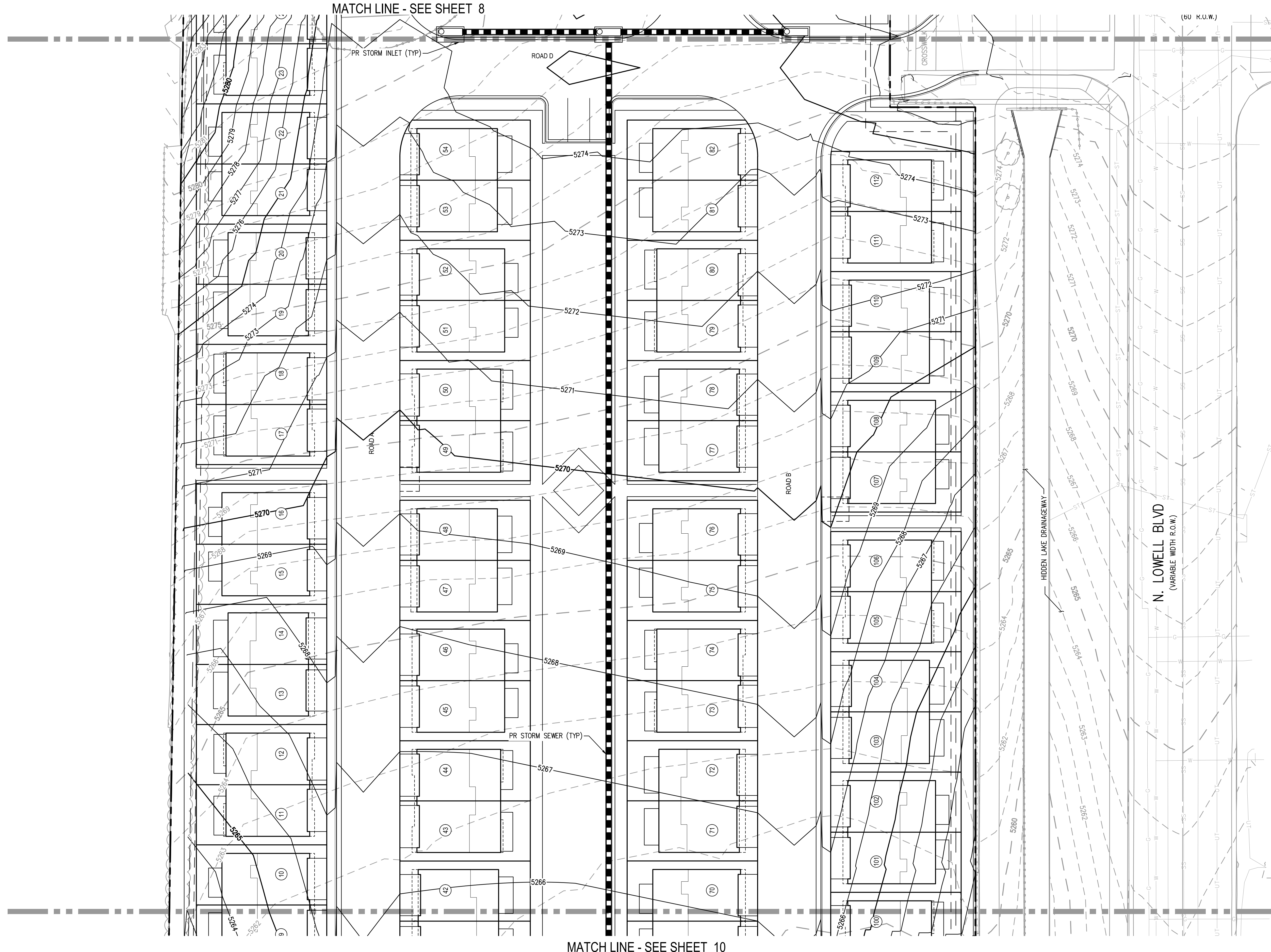
PROJECT #: 200817

TTLIC DENVER - LOWELL

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MAJOR SUBDIVISION PRELIMINARY PLAT

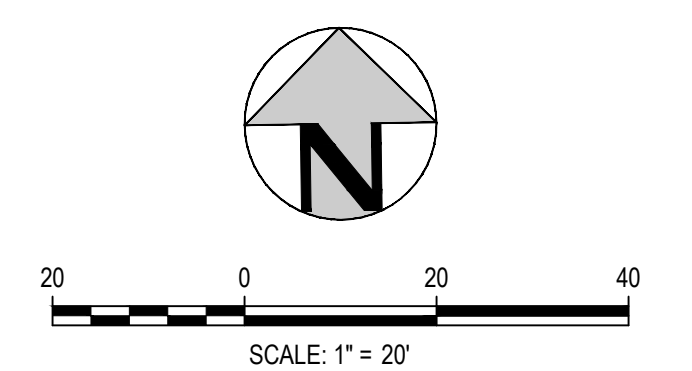
NO CHANGES ARE TO BE MADE TO THIS DRAWING WITHOUT WRITTEN PERMISSION OF HARRIS KOCHER SMITH.

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Plotted: FRI 08/11/21 10:05:02A By: Kevin Blumhagen



LEGEND

- PROPERTY BOUNDARY
- PROPOSED CONTOUR
- EXISTING CONTOUR
- PROPOSED STORM SEWER
- PROPOSED STORM SEWER INLET
- EXISTING STORM SEWER



MATCH LINE - SEE SHEET 10

REVISION DATE:

ISSUE DATE: 06-11-2021

SHEET 9 OF 10

OVERALL GRADING PLAN

TTLIC DENVER - LOWELL

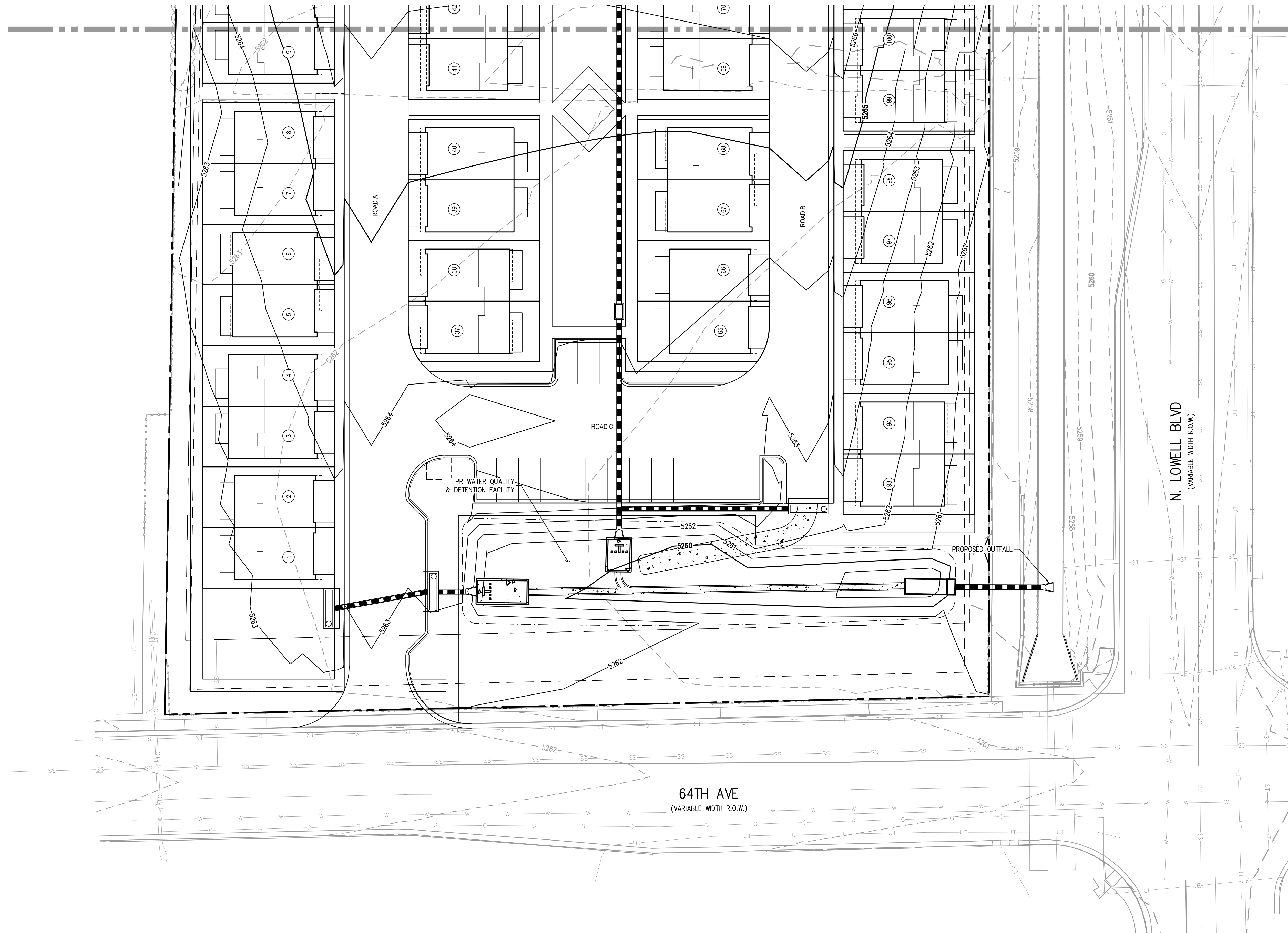
PROJECT #: 200817

TTLIC DENVER - LOWELL

TWO PARCELS LOCATED IN THE SOUTHEAST 1/4 OF THE SOUTHEAST 1/4 OF SECTION 6, TOWNSHIP 3 SOUTH, RANGE 68 WEST OF THE SIXTH P.M. COUNTY OF ADAMS, STATE OF COLORADO

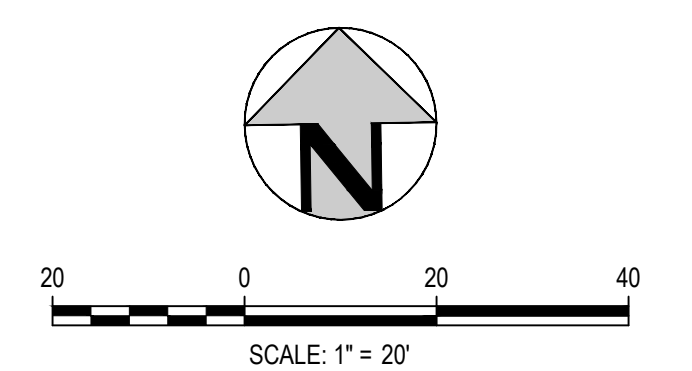
MAJOR SUBDIVISION PRELIMINARY PLAT

MATCH LINE - SEE SHEET 9



LEGEND

PROPERTY BOUNDARY	
PROPOSED CONTOUR	
EXISTING CONTOUR	
PROPOSED STORM SEWER	
PROPOSED STORM SEWER INLET	
EXISTING STORM SEWER	



NO CHANGES ARE TO BE MADE TO THIS DRAWING WITHOUT WRITTEN PERMISSION OF HARRIS KOEHLER SMITH.
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Plotted: FRI 08/11/21 10:05:58A By: Kevin Blumhardt

PROJECT #: 200817

Recording Requested by:)
 TTL Management, Inc.)
)
 After Recordation, Mail to:)
)
 TTL Management, Inc.)
 c/o The True Life Companies, LLC)
 Attn.: David Clock)
 1350 17th Street Suite 350)
 Denver, CO 80202)

Space above this line for recorder's use

MEMORANDUM OF PURCHASE AGREEMENT

²⁰²¹This Memorandum of Purchase Agreement ("Memorandum") is executed as of ~~October~~ ^{January} ~~9, 2020~~ in connection with that certain Real Estate Purchase and Sale Agreement, dated July 14, 2020 ("Agreement") between the undersigned Seller and TTL Management, Inc., an Arizona corporation ("Buyer") relating to the Property described in Exhibit One attached hereto and incorporated herein by reference. Unless defined herein, all capitalized terms in this Memorandum shall have the meaning given in the Agreement.

Seller hereby grants to Buyer the right to purchase the Property at a price, and under the terms and conditions, set forth in the Agreement.

SELLER:

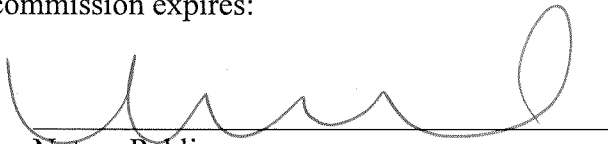

 Linette Brozovich

First American Title Insurance
 National Commercial Services
 NCS- 989426 CO

STATE OF COLORADO)
) ss.
County of *Adams*)

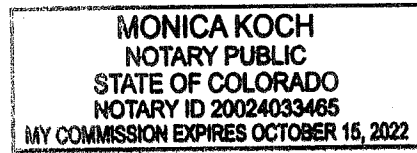
The foregoing instrument was acknowledged before me this 9 day of ~~October~~, ^{January} 2021;
by Linette Brozovich. *w*

Witness my hand and official seal.
My commission expires:



Notary Public

(SEAL)



[EXHIBIT ONE: LEGAL DESCRIPTION OF THE PROPERTY]

The Land referred to herein below is situated in the County of Adams, State of Colorado, and is described as follows:

PARCEL A:

That part of the Southeast one-quarter of the Southeast one-quarter of Section 6, Township 3 South, Range 68 West of the Sixth Principal Meridian, County of Adams, State of Colorado, described as: Beginning at the Northeast corner of the Southeast one-quarter of the Southeast one-quarter of said Section 6; thence South $00^{\circ}52'48''$ West along the East line of the Southeast one-quarter a distance of 330.00 feet to a point on the Easterly extension of the South line of a parcel described in Book 2838 at Page 601, Adams County records; thence South $89^{\circ}34'06''$ West along said Easterly extension a distance of 120.02 feet to the Southeast corner of said parcel, said corner also being the True Point of Beginning; thence continuing South $89^{\circ}34'06''$ West along the South line of said parcel described in Book 2838 at Page 601, distance of 312.42 feet to a point on an old existing fence line as shown in Book 176 at Page 93, Adams County records; thence North $00^{\circ}31'17''$ West along said old existing fence line a distance of 22.50 feet to an old existing (East-West) fence line; thence South $89^{\circ}12'14''$ East along said old existing (East-West) fence line a distance of 312.89 feet to a point on the East line of a parcel described in Book 2838 at Page 601; thence South $00^{\circ}52'48''$ West along said East line a distance of 15.80 feet to the True Point of Beginning, County of Adams, State of Colorado.

PARCEL B:

That part of the SE1/4 SE 1/4 of Section 6, Township 3 South, Range 68 West of the 6th P.M., described as follows:

Beginning at the Southeast corner of said Section 6; thence West, a distance of 420.58 feet, more or less, to the Southeast corner of Tract of land described in Decree recorded in Book 367 at Page 43; thence Northeasterly, along the East line of said tract described in Book 367 at Page 43, a distance of 849 feet to the terminal point of Course No. 5 of said tract described in Book 367 at Page 43; thence North $89^{\circ}50'$ West, along said Course No. 5, a distance of 28.5 feet to the terminal point of Course No. 4 of said tract described in Book 367 at Page 43; thence North $0^{\circ}40'$ East, along said Course No. 4, to a point 330 feet South of the North line of the SE 1/4 SE 1/4 of said Section 6; thence East, along a line 330 feet South of and parallel to the North line of the SE 1/4 SE 1/4 of said Section 6, to a point on the East line of said Section 6; thence South, along the East line of said Section 6, to the Point of Beginning, County of Adams, State of Colorado. Excluding therefrom that portion as described in Rule, Order, Judgement and Decree recorded August 16, 1985 at Reception No. 593561.

APN: 0182506400046

TTLC Management, Inc.



June 11, 2021

Adams County
Attn: Layla Bajelan
4430 S. Adams County Parkway
Brighton, CO 80601

Re: TTLC Denver – Lowell Wavier Request

Dear Ms. Bajelan:

The project is requesting a waiver from the County's subdivision design standards to allow for access to residential homes via private roads instead of the required public access alleyways from ROW. All homes in this development take access from internal private access roads. No homes will take access from a public right-of-way. These private roads will have two access points, one from Lowell Boulevard to the east and the other from 64th Avenue to the south. Private roadways will be constructed by the property owner and maintained by the HOA. This project is located in the Urban Residential District which promotes high density developments. In following high density guidelines for this district, the lot sizes on this parcel will not allow for the required 50' ROW width. Allowing private roadways within this project will also alleviate additional burdens to the County's infrastructure.

These private roads will be designed to allow for access of emergency vehicles as noted in the statement below from our team engineer.

"Private roadways shall consist of 26-foot minimum width of paved roadway and 25-foot minimum curve radii. Private roadways shall be in tracts dedicated for emergency access. Private roadways shall be maintained by the H.O.A."

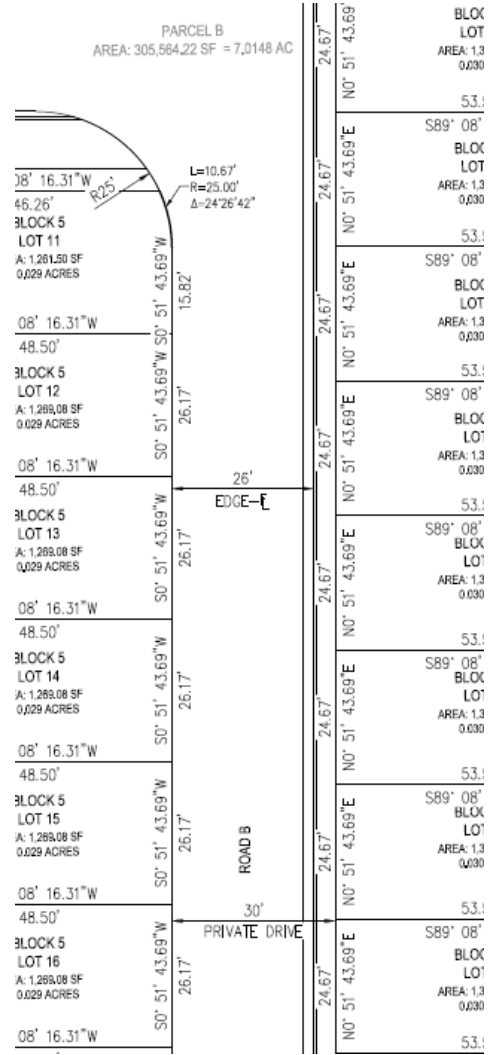
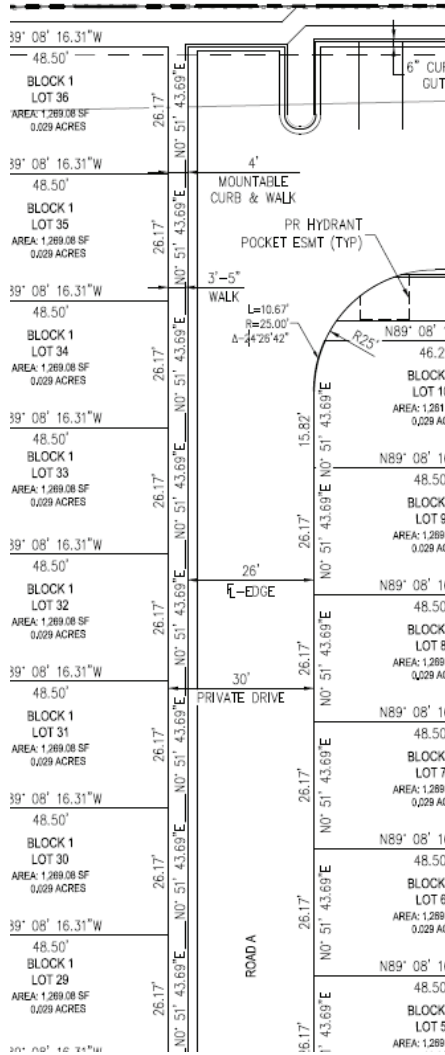
Please see the following page for private roadway sections.

We look forward to continued work with the County to make this project a success.

Sincerely,

David Clock
Regional Director

TTL Management, Inc.



1350 17th Street, Suite 350, Denver, CO 80202
 (720) 210-9970
www.thetruelifecompanies.com

TTLIC DENVER - LOWELL

IN THE COUNTY OF ADAMS, COLORADO

SITE PLAN



TTLIC DENVER - LOWELL SITE PLAN
 6501 LOWELL BOULEVARD
 DENVER, COLORADO

OWNER:
 THE TRUE LIFE COMPANIES, INC
 1350 17TH STREET
 SUITE 350
 DENVER, CO 80202

LAND USE SUMMARY				
LAND USE	ACREAGE	% TOTAL	UNITS	DENSITY
BUILDING AREAS				
RESIDENTIAL LOTS	3.4	50%	124	
OPEN AREAS				
PRIVATE ACCESS DRIVES	1.6	24%		
LANDSCAPE BUFFER AREAS	1.7 (0.5 ACTIVE)	26%		
OPEN AREAS SUBTOTAL	3.4	50%		
TOTAL	6.8	100%	124	18.2 DU/AC

* NOTE: AT LEAST THIRTY PERCENT (30%) OF THE SITE SHALL BE OPEN AREA (2.2AC). TWENTY FIVE PERCENT (25%) OF THE OPEN AREA MUST BE ACTIVE OPEN SPACE (0.5AC).

- NOTES:**
1. Site plan is shown is conceptual and may change at time of Final Development Plan.
 2. Active land uses, landscape areas, and amenities are conceptual and subject to change with the Final Development Plan.
 3. Signage locations are conceptual and subject to change at time of Final Development Plan.

NOT FOR CONSTRUCTION

DATE:
 03/19/2021
 06/11/2021

SHEET TITLE:
 SITE PLAN

SHEET NUMBER:
 1 OF 1

CHECKED BY:
 FILENAME:
 TTLIC DENVER - LOWELL



Statement Of Taxes Due

Account Number R0102011

Parcel 0182506400046

Assessed To

BROZOVICH LINETTE M
12633 IRVING CIR
BROOMFIELD, CO 80020

Legal Description

Situs Address

SECT,TWN,RNG:6-3-68 DESC: BEG AT SE COR SEC 6 TH W 420/58 FT M/L TH N 849 FT TH W 28/5 FT TH N TO A PT 330 FT S OF N LN SE4 SE4 SD SEC TH E TO A PT ON E LN SD SEC TH S TO POB EXC RDS AND EXC PARC 6/83A 6501 LOWELL BLVD

Year	Tax	Interest	Fees	Payments	Balance
Tax Charge					
2020	\$409.10	\$0.00	\$0.00	(\$409.10)	\$0.00
Total Tax Charge					\$0.00
Grand Total Due as of 03/16/2021					\$0.00

Tax Billed at 2020 Rates for Tax Area 495 - 495

Authority	Mill Levy	Amount	Values	Actual	Assessed
RANGEVIEW LIBRARY DISTRICT	3.6700000	\$12.22	1276	\$44,184	\$3,160
CRESTVIEW WATER & SANITATIO	3.3060000	\$11.01	AG DRY FARMING	\$595	\$170
ADAMS COUNTY FIRE PROTECTIO	16.6830000	\$55.55	LAND		
GENERAL	22.7730000	\$75.83	Total	\$44,779	\$3,330
HYLAND HILLS PARK & RECREAT	5.1160000	\$17.04			
RETIREMENT	0.3140000	\$1.05			
ROAD/BRIDGE	1.3000000	\$4.33			
DEVELOPMENTALLY DISABLED	0.2570000	\$0.86			
SD 50 BOND (Westminster)	10.1770000	\$33.89			
SD 50 GENERAL (Westminster)	56.0030000	\$186.49			
URBAN DRAINAGE SOUTH PLATTE	0.1000000	\$0.33			
URBAN DRAINAGE & FLOOD CONT	0.9000000	\$3.00			
SOCIAL SERVICES	2.2530000	\$7.50			
Taxes Billed 2020	122.8520000	\$409.10			

Tax amounts are subject to change due to endorsement, advertising, or fees.
Please call the office to confirm amount due after August 1st.

All Tax Lien Redemption payments must be made with cash or cashier's check.

Adams County Treasurer & Public Trustee
4430 S Adams County Parkway Suite C2436
Brighton, CO 80601
720-523-6160

TTL Management, Inc.



March 22, 2021

Adams County
Attn: Layla Bajelan
4430 South Adams County Parkway
Brighton, CO 80601

Re: Letter of Explanation
Project: TTLC Denver – Lowell
Address: 6501 Lowell Blvd, Denver, CO 80221
Applications: Rezone
Planned Unit Development / Preliminary Development Plan
Preliminary Plat

Dear Ms. Bajelan:

Please find enclosed development applications for a Rezoning, Planned Unit Development (PUD), Preliminary Development Plan, and Preliminary Plat for the site located at the northwest corner of 64th Avenue and Lowell Boulevard (Property) in unincorporated Adams County. The Property address is 6501 Lowell Blvd, Denver, CO 80221. This application has been prepared by and for the following parties to the benefit of the residents of Adams County and the surrounding areas.

Applicant

TTL Management, Inc
Contact: David Clock, Regional Director
1350 17th Street Suite 350
Denver, CO 80202
720-330-9211
dclock@thetruelifecompanies.com

Architect

KTGY
Contact: Doug Heaton
820 16th Street, Suite 500
Denver, CO 80202
303.825.6400
dheaton@ktgy.com

Entitlements/ Landscape Architect

Norris Design
Contact: Eva Mather/John Norris
1101 Bannock St.
Denver, Colorado 80204
303-892-1166
emather@norris-design.com
jnorris@norris-design.com

Civil Engineer

Harris Kocher Smith
Contact: John Stafford
1120 Lincoln St, Suite 1000
Denver, Colorado 80203
(303) 623-6300
jstafford@hkseng.com

Applications

Three applications associated with this written explanation include Rezone to Planned Use Development (PUD), Preliminary Development Plan (PDP), Preliminary Plat and Major Subdivision. In the Conceptual Plan Review processed with the County it notes that a PDP may require a Preliminary Plat. Therefore, we are also including the application for Preliminary Plat and supporting documents. Due to intricate coordination required for site designs and engineering, it is the desire of the Applicant to provide complete planning designs for review of this first submittal and defer some of the more detailed engineering designs to the second submittal after receiving first round comments from the County in order to minimize re-work of the designs based on those comments. In communications with County engineering and planning Staff, there exists flexibility with regard to the percent completeness of engineering designs with the first submittal and Applicant would like to take advantage of that flexibility. Given that this is the initial review of the Preliminary Plat, the Applicant understands that these designs could change based on these first round comments from the County. The information provided as a part of the Preliminary Plat application is intended to give sufficient design and intent for the County to review and respond. Engineering designs, including the Preliminary Plat, will then be advanced based on first round comments.

Please find the following the Applicant proposes as deferred items to the 2nd Submittal:

Planned Unit Development /Preliminary Development Plan Checklist

- *Item 7 – All Applicable Engineering Documents – see below*

Subdivision-Major/Preliminary Checklist

- *Item 7 – Fire Protection Report – deferred submittal with 2nd submittal, based on 1st round of comments*
- *Required Engineering Documents*
 - *Item 1 – Preliminary Drainage Report – submitting Preliminary Drainage Analysis Letter, full drainage report to be included with 2nd submittal to take into account first round comments from Adams County*
 - *Item 3 – Preliminary Erosion and Sediment Control Plans – deferred submittal to be include with 2nd submittal to take into account first round comments from Adams County*
 - *Item 4 – Preliminary Construction/Engineering Design Plans – deferred submittal to be include with 2nd submittal to take into account first round comments from Adams County*

TTLC Management, Inc.



Project Description

TTLC Denver – Lowell is a new residential subdivision to provide new, for-sale homes to the burgeoning area within Adams County. The property is approximately 6.8 acres. These applications propose 124 residential duplex lots that will provide new homes to address and relieve the current substantial lack of housing within the County. This new community is designed to attract a broad spectrum of residents with access to the existing Jim Baker Trail and Hidden Lake Park. The neighborhood will have convenient access to major transportation corridors as well as direct access to several RTD FastTrack Stations.

The abutting neighborhoods to the west and north are zoned R-1-C with other neighbors zoned PUD, R-4, R-2 and R-3. This development provides a residential transition from the single-family detached homes to the north and west, to the multi-family development on the northeast corner of 64th and Lowell Boulevard which is directly across the street. In the Conceptual Plan Review comments and during follow up correspondences with county Staff it was confirmed that our proposed project and building type is compatible with the surrounding existing uses and building types.

The applications for TTLC Denver - Lowell rezone the site from R-1-A and C-4 to PUD to create standards to allow this product at this location. The proposal draws from several other neighboring zones to provide compatibility. The applicant's PUD is requesting a density of 18.2 du/ac, which is consistent with R-4 zoning and a height restriction of 35' which is consistent with R-3 zoning.

The property is located near several key transit areas creating a great opportunity for transition to higher density residential. The site is within 1.4 miles of the Clear Creek-Federal RTD Station, 1.5 miles of the 60th & Sheridan /Arvada Gold Strike RTD Station on the Gold Line and 0.8 miles from the Westminster RTD Station on the B Line.

Applicability to Comprehensive Plan

This property is identified as Urban Residential in the 2012 Future Land Use Map. As discussed in the Comprehensive Plan, Urban Residential development is encouraged in infill areas and within County and municipality growth areas where it can be readily served by a full range of urban services. Being located on two major existing streets, and with commitments for water, sewer, power and gas, the infrastructure exists to accommodate these new residential homes.

The 2012 Adams County Comprehensive Plan outlines key goals to create a more sustainable and resilient Adams County. The key goals which strongly support the proposed TTLC Denver - Lowell PDP and how it will meet these goals are as follows:

TTLC Management, Inc.



Promote Coordinated and Connected Growth:

Revitalization and reinvestment in established areas to meet the needs of a variety of residents.

Reduce the Fiscal Impact of Growth:

Infill development to take advantage of existing infrastructure to aid in reducing fiscal impacts with new development.

Promote Economic Vitality:

Locate Urban Residential uses within close proximity to the surrounding transportation corridors and within municipal and county growth areas, especially in the Southwest Area of the County.

Preserve the County's Natural Resources:

Support and implement the preservation of active and passive open space, wildlife habitat and environmental quality.

Open Space

The proposed density achieves the Urban Residential land use designation. The proposed neighborhood provides open space areas consistent with this type of urban infill development and meets Adams County open space requirement of thirty (30) percent with 25% as active open space.

Access

The primary entrance to the site will be from Lowell Boulevard with a second access point from W 64th Avenue. A system of internal private streets and walkways will provide access throughout the neighborhood. The private streets shall be constructed by the Developer and maintained by a new to be formed Homeowner's Association (HOA).

The site plan accommodates a minimum of two (2) resident parking spaces per single-family attached unit in garages plus 0.25 guest parking spaces for a total of 280 parking spaces.

Phasing and Build Timing

TTLC Denver - Lowell would move forward in one (1) total phase. Depending on the final entitlement approvals, development work will begin in approximately one and one half (1.5) to two (2) years with full completion in approximately four (4) to five (5) years.

We look forward to working with County Staff on the review and approval of this new neighborhood in Adams County. Feel free to contact our team directly should you have any comments, questions, and/or requests for additional information.

TTLIC Management, Inc.



Best Regards,
TTLIC Management, Inc.

DClock

David Clock
Regional Director - Colorado

Attach.

CC: Scott Menard, TTLIC Management, Inc.
Leah Beniston, TTLIC Management, Inc.
Mark Foster, TTLIC Management, Inc.