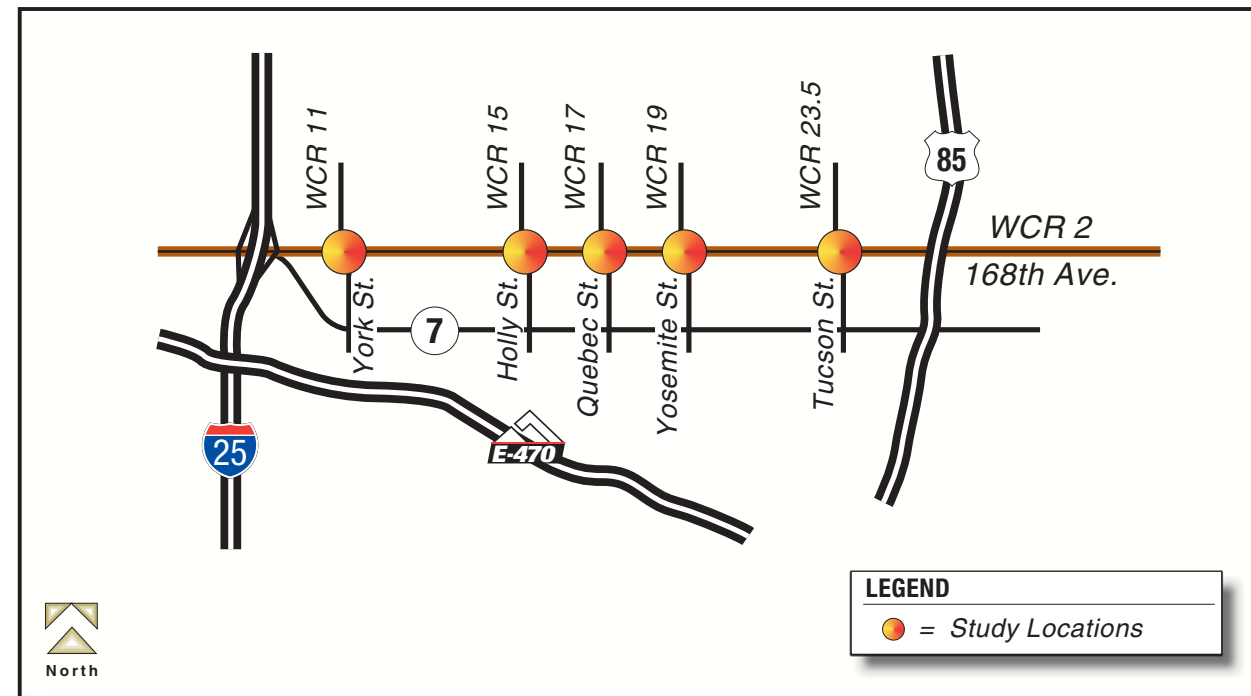
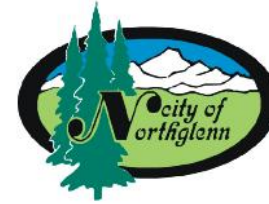


Weld/Adams County Line Crossroads Alignment Study



October 2008





Weld/Adams County Line Crossroads Alignment Study

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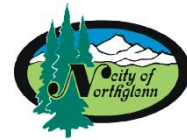
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Weld/Adams County Line Crossroads Alignment Study

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Weld/Adams County Line Crossroads Alignment Study

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APPENDIX (SEPARATE DOCUMENT)

Evaluation Matrices
Local Agencies Comments
Public Comments

I. INTRODUCTION

Project Background

The border between Weld County and Adams County is known as Weld County Road 2 (WCR 2), or East 168th Avenue. Due to survey correction lines, many of the north-south roadways that intersect East 168th Avenue are offset, making it difficult for traffic to smoothly travel across the joint county boundary, as well as complicating how multiple jurisdictions can properly plan for future transportation needs.

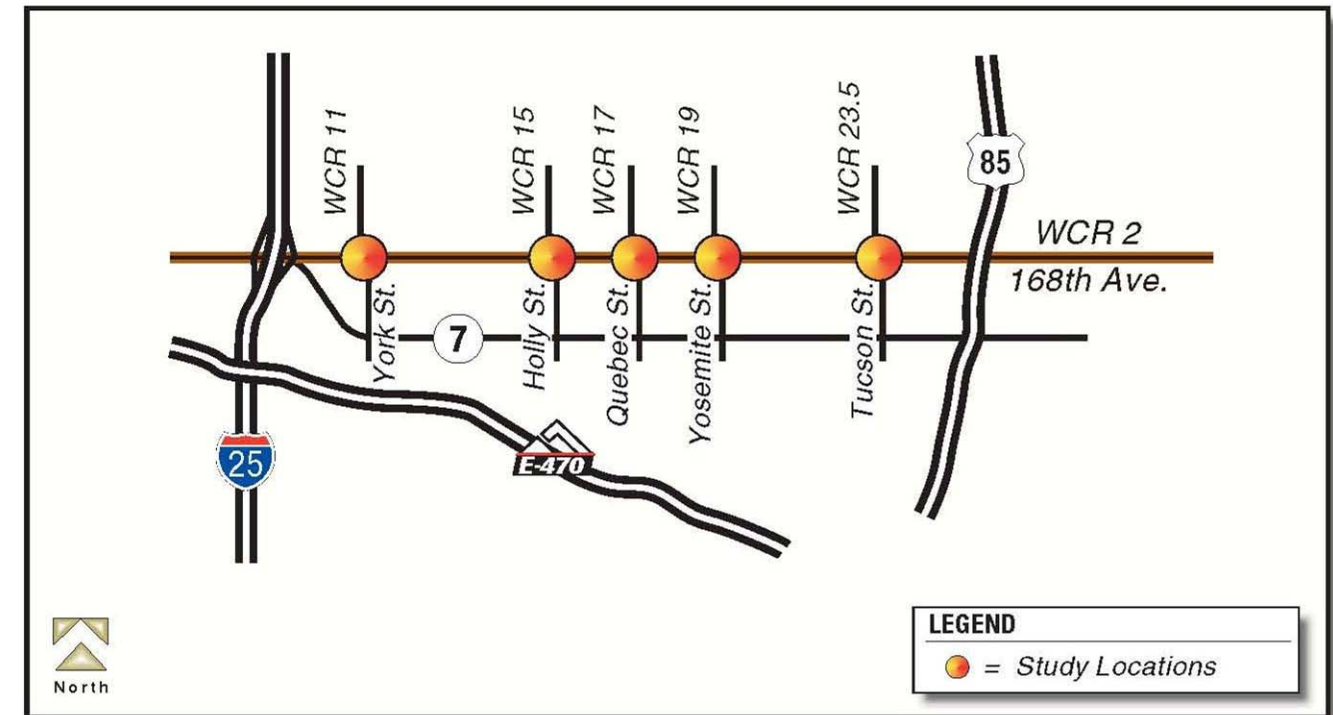
Study Purpose

The purpose of this study is to establish preferred north-south alignments that will provide a smooth transition across East 168th Avenue for the following five disjointed intersections:

- ▶ Weld County Road (WCR) 11/York Street
- ▶ Weld County Road (WCR) 15/Holly Street
- ▶ Weld County Road (WCR) 17/Quebec Street
- ▶ Weld County Road (WCR) 19/Yosemite Street
- ▶ Weld County Road (WCR) 23.5/Tucson Street

The preferred alignments will improve the connectivity between the jurisdictions so that future traffic demands can be accommodated with planned improvements. By identifying preferred alignments at this time, this study will serve as a guide for Weld County, Adams County, the City and County of Broomfield, the City of Northglenn and the City of Thornton to preserve rights-of-way for the alignments so they may be constructed as needed. Planning now will allow the improvements to be implemented in an orderly fashion and will allow for minimized disruption in the future. The study locations are shown graphically in **Figure 1**.

Figure 1. Corridor Study Area



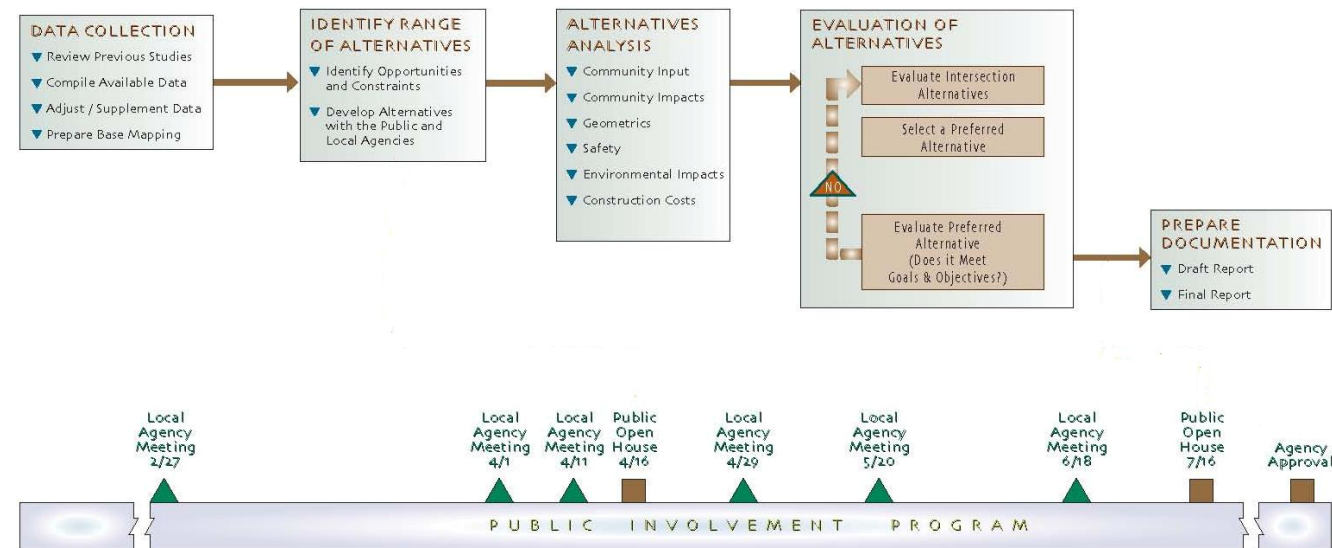
Study Process

The study was initiated with an extensive data collection effort to better understand the opportunities and the constraints around each study location. Comprehensive plans and transportation plans from the communities located within the study locations were compiled and reviewed; parcel ownership information was collected; known development plans were collected; environmental data compiled by the Counties was mapped; and other relevant information was collected. With the collected data and with input from the public (including representatives of the local entities), a number of alternatives were identified for each intersection within the study area. These alternatives were then evaluated based on a number of factors including:

- ▶ Community Input
- ▶ Community Impacts
- ▶ Geometrics
- ▶ Safety
- ▶ Environmental Impacts
- ▶ Construction Costs

The results of this evaluation process were then discussed with the local entity representatives, and preliminary preferred alternatives for each intersection were identified. The preliminary preferred alternatives were presented to the public for comment, and additional refinements of the alternatives were made. The results of the study were then assembled into this Report. The study process is shown graphically in **Figure 2**.

Figure 2. Work Plan

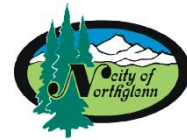


In order to ensure maximum public involvement for both open house meetings, notification was sent to all of the property owners within the study area (over 900 total notices were mailed) and a notice was posted on Weld County's web site.

Public Input

Weld County, Adams County, the City and County of Broomfield, the City of Northglenn and the City of Thornton have been actively involved throughout this planning process. A Local Agency Advisory Group, comprised of representatives of the local governments, met six times throughout the study to provide input on data needs, the identification of alternatives and the evaluation of those alternatives. Input from the Local Agency Advisory Group has been instrumental in selecting the preferred alternative for each intersection.

The public has also been an integral part of this process. An initial open house for the project was held in April 2008 to solicit input from the public on concerns, issues, and opportunities for the alternatives at each study location. The public was asked to participate by "voting" for their preferred alternative at each study location. Over 37 residents attended the initial open house for the project. A second and final open house for the project was held in July 2008 to receive input from the public on the preliminary preferred alternatives; over 19 residents attended.



Weld/Adams County Line Crossroads Alignment Study

II. EXISTING AND FUTURE CONDITIONS

The information that was collected during the data collection process served as the basis for creating and evaluating alternative alignments. The sources of the data collection were Weld County, Adams County and local municipalities. Existing land use plans, transportation plans and specific development plans were compiled as well as aerial photography, right-of-way and parcel ownership information, environmental considerations and USGS topographic information. All of this information, along with numerous site visits, was assembled to determine the physical characteristics of each study location.

As part of the data collection effort, several comprehensive and transportation plans from the communities within the study area were collected. The plans include the following:

- ▶ Adams County Comprehensive Plan (Completed January 2004)
- ▶ Adams County Transportation Plan (Adopted April 1996)
- ▶ City and County of Broomfield 2005 Comprehensive Plan (Adopted October 25, 2005)
- ▶ City and County of Broomfield 2005 Transportation Plan (Completed November 2005)
- ▶ City of Thornton Comprehensive Plan (Completed September 2007)
- ▶ Thornton Thoroughfare Plan (Completed August 2000)
- ▶ City of Northglenn Municipal Code
- ▶ Weld County Roadway Classification Plan (June 2002)

This chapter summarizes the information extracted from these plans and the information received from Weld County's and Adams County's Geographical Information System (GIS) departments.

Collected Data Information

GIS information obtained from the Counties includes the following:

- ▶ Parcel Boundaries
- ▶ Planned Land Uses
- ▶ Existing Floodplain Limits
- ▶ Jurisdictional Boundaries
- ▶ Aerial Photography (Flown in April – June 2006)

This information was subsidized with site observations to collect other pertinent data required for this study such as:

- ▶ Existing Utility Information
- ▶ Residence and Other Structure Locations
- ▶ Drainageways and Drainage Facilities (Ditches, Pipes, etc.)
- ▶ Gas and Oil Features

The above information is shown graphically in **Figures 3** through **7**.



Weld/Adams County Line Crossroads Alignment Study

Weld County Road 11/York Street & Weld County Road 2/East 168th Avenue Intersection

Existing Features

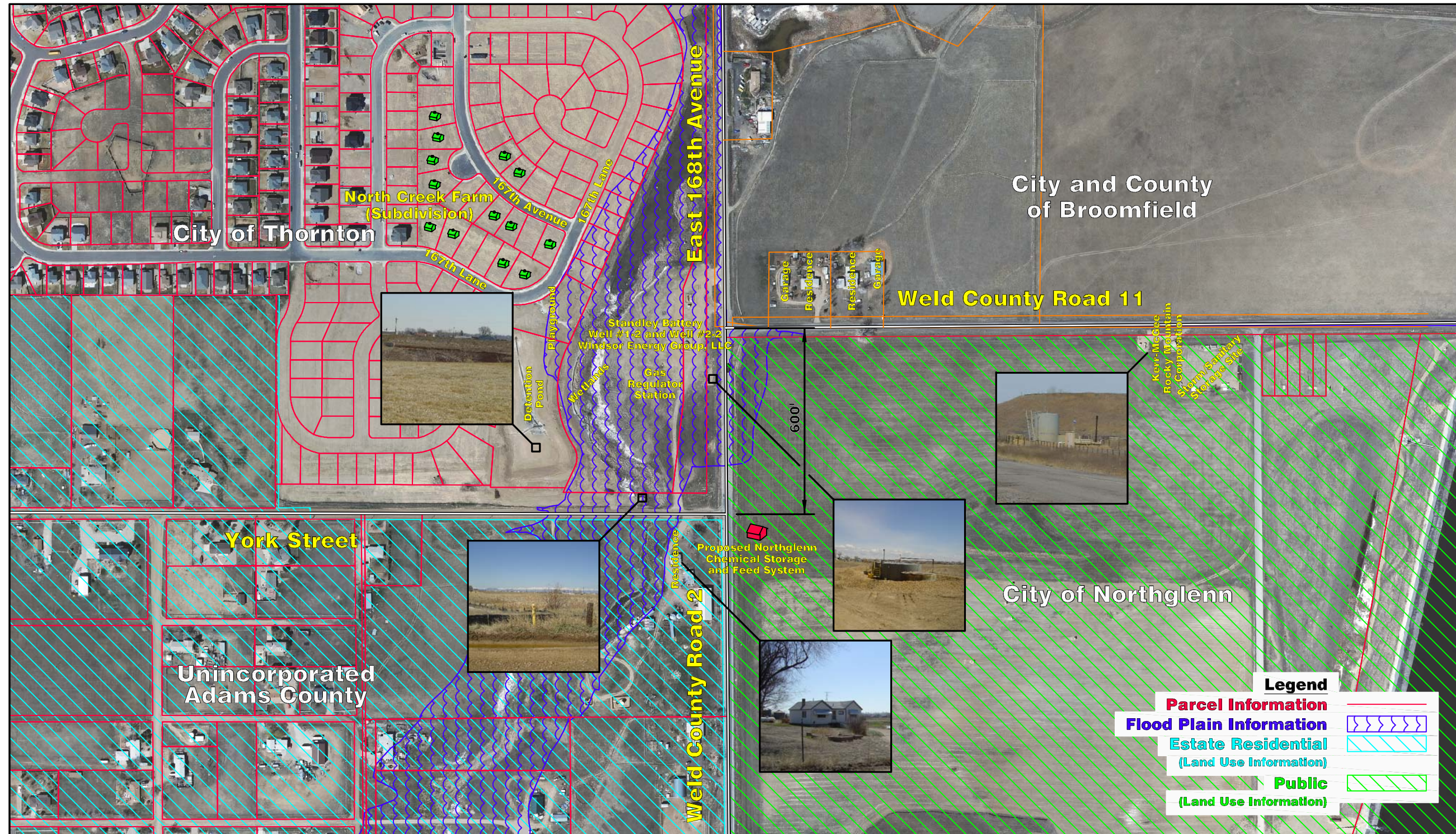


Figure 3



Weld/Adams County Line Crossroads Alignment Study

Weld County Road 15/Holly Street & Weld County Road 2/East 168th Avenue Intersection

Existing Features

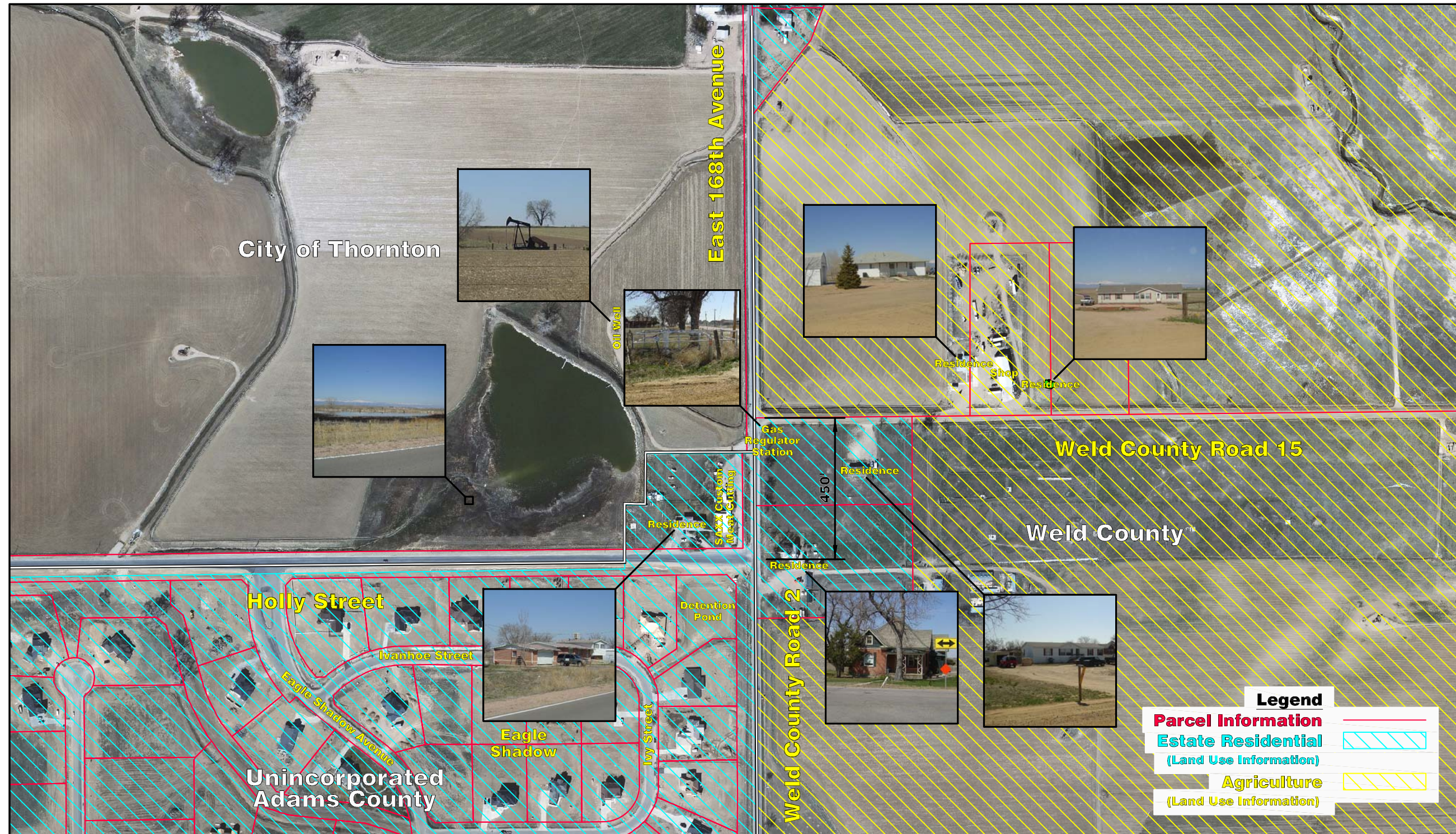


Figure 4



Weld/Adams County Line Crossroads Alignment Study

Weld County Road 17/Quebec Street & Weld County Road 2/East 168th Avenue Intersection

Existing Features

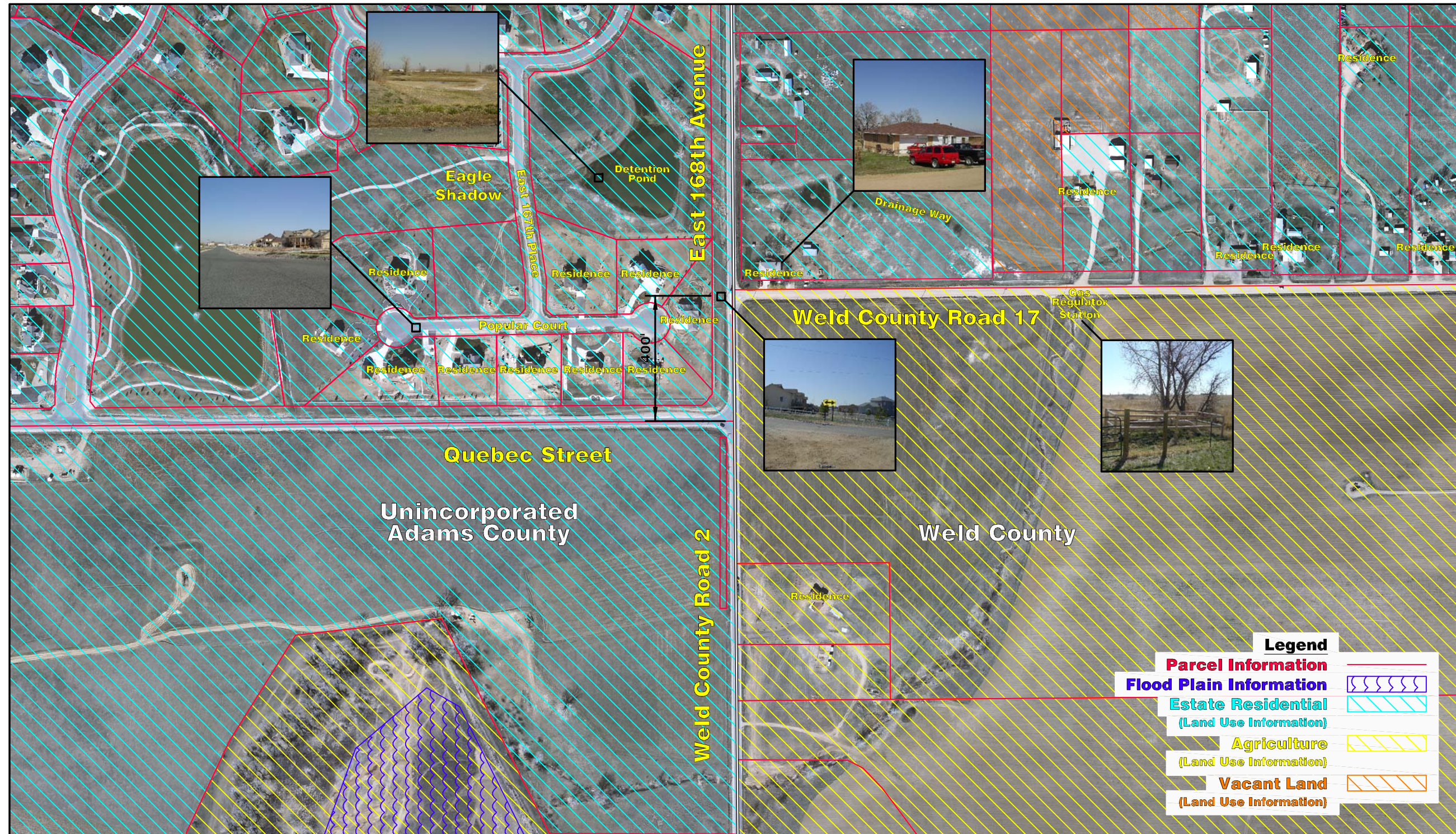


Figure 5



Weld/Adams County Line Crossroads Alignment Study

Weld County Road 19/Yosemite Street & Weld County Road 2/East 168th Avenue Intersection

Existing Features



Figure 6



Weld/Adams County Line Crossroads Alignment Study

Weld County Road 23.5/Tucson Street & Weld County Road 2/East 168th Avenue Intersection

Existing Features



Figure 7



Weld/Adams County Line Crossroads Alignment Study

III. IDENTIFICATION OF ALTERNATIVES

Design Parameters

Before any alternatives for the study intersections could be developed, basic design parameters had to be established that could be independent and different for each intersection. Once the design parameter information was gathered from the respective agencies, this information was presented to the local agencies and preferred design parameters were established for each intersection. It was noted that these design parameters might have to be flexible for certain areas within the study area as the nature of the surrounding area changes. The final design parameters for the intersection improvements should adhere to current approved design criteria from the applicable agencies or to criteria as established by the current version of American Association of State Highway and Transportation Officials (AASHTO) guidelines.

Weld County Road 11 / York Street Design Parameters

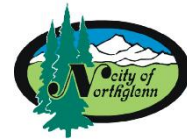
Design Element		Units
Roadway Classification	Major Arterial	
Posted Speed Limit	45	MPH
Maximum Design Speed	55	MPH
Minimum Lane Width	12	Feet
Minimum Driving Lanes	4	
Curb and Gutter Type	Type 2 (Section IIB)	
Minimum Right-of-Way Width	150	Feet
Horizontal Alignment		
Minimum Curve Radius	1190	Feet
Minimum Stopping Sight Distance	325	Feet
Minimum Length of Tangents Between All Curves	200	Feet
Minimum Clear Zone From the Face of Curb	14-16	Feet
Superelevation (e max)(M-203-12 Superelevation Streets)	4%	
Typical Minimum Median Width (BOC to BOC)	18	Feet
Typical Minimum Median Width with Left Turn Lane (BOC to BOC)	5	Feet
Intersection Design		
Minimum Curb Return Radii (Varies Depending on Intersection)	35	Feet
Permissible Intersection Angles	75	Degrees
Sidewalk	8' Width Detached	

Weld County Road 15 / Holly Street Design Parameters

Design Element		Units
Roadway Classification	Minor Arterial	
Posted Speed Limit	45	MPH
Maximum Design Speed	55	MPH
Minimum Lane Width	12	Feet
Minimum Driving Lanes	4	
Curb and Gutter Type	Type 2 (Section IIB)	
Minimum Right-of-Way Width	120	Feet
Horizontal Alignment		
Minimum Curve Radius	1190	Feet
Minimum Stopping Sight Distance	400	Feet
Minimum Length of Tangents Between All Curves	200	Feet
Minimum Clear Zone From the Face of Curb	14-16	Feet
Superelevation (e max)(M-203-12 Superelevation Streets)	4%	
Typical Minimum Median Width (BOC to BOC)	11	Feet
Typical Minimum Median Width with Left Turn Lane (BOC to BOC)	-	Feet
Intersection Design		
Minimum Curb Return Radii (Varies Depending on Intersection)	35	Feet
Permissible Intersection Angles	75	Degrees
Sidewalk	10' Width	

Weld County Road 17 / Quebec Street Design Parameters

Design Element		Units
Roadway Classification	Major Arterial	
Posted Speed Limit	45	MPH
Maximum Design Speed	55	MPH
Minimum Lane Width	12	Feet
Minimum Driving Lanes	4	
Curb and Gutter Type	Type 2 (Section IIB)	
Minimum Right-of-Way Width	150	Feet
Horizontal Alignment		
Minimum Curve Radius	1190	Feet
Minimum Stopping Sight Distance	400	Feet
Minimum Length of Tangents Between All Curves	200	Feet
Minimum Clear Zone From the Face of Curb	14-16	Feet
Superelevation (e max)(M-203-12 Superelevation Streets)	4%	
Typical Minimum Median Width (BOC to BOC)	14	Feet
Typical Minimum Median Width with Left Turn Lane (BOC to BOC)	5	Feet
Intersection Design		
Minimum Curb Return Radii (Varies Depending on Intersection)	30	Feet
Permissible Intersection Angles	-	Degrees
Sidewalk	10' Width	



Weld/Adams County Line Crossroads Alignment Study

Weld County Road 19 / Yosemite Street Design Parameters

Design Element		Units
Roadway Classification	Minor Arterial	
Posted Speed Limit	45	MPH
Maximum Design Speed	55	MPH
Minimum Lane Width	12	Feet
Minimum Driving Lanes	4	
Curb and Gutter Type	Type 2 (Section IIB)	
Minimum Right-of-Way Width	120	Feet
Horizontal Alignment		
Minimum Curve Radius	1190	Feet
Minimum Stopping Sight Distance	400	Feet
Minimum Length of Tangents Between All Curves	200	Feet
Minimum Clear Zone From the Face of Curb	14-16	Feet
Superelevation (e max)(M-203-12 Superelevation Streets)	4%	
Typical Minimum Median Width (BOC to BOC)	14	Feet
Typical Minimum Median Width with Left Turn Lane (BOC to BOC)	-	Feet
Intersection Design		
Minimum Curb Return Radii (Varies Depending on Intersection)	30	Feet
Permissible Intersection Angles	-	Degrees
Sidewalk	10' Width	

Weld County Road 23.5 / Tucson Street Design Parameters

Design Element		Units
Roadway Classification	Local Road	
Posted Speed Limit	45	MPH
Maximum Design Speed	55	MPH
Minimum Lane Width	12	Feet
Minimum Driving Lanes	2	
Curb and Gutter Type	Type 2 (Section IIB)	
Minimum Right-of-Way Width	60	Feet
Horizontal Alignment		
Minimum Curve Radius	1190	Feet
Minimum Stopping Sight Distance	200	Feet
Minimum Length of Tangents Between All Curves	130	Feet
Minimum Clear Zone From the Face of Curb	14-16	Feet
Superelevation (e max)(M-203-12 Superelevation Streets)	4%	
Typical Minimum Median Width (BOC to BOC)	-	Feet
Typical Minimum Median Width with Left Turn Lane (BOC to BOC)	-	Feet
Intersection Design		
Minimum Curb Return Radii (Varies Depending on Intersection)	30	Feet
Permissible Intersection Angles	90°	Degrees
Sidewalk	5.5' Width Attached	

Construction and Right-of-way Schedule

At the time of writing this Report, no specific schedule has been identified for purchasing rights-of-way and constructing any of the intersection improvements for the intersections identified in the corridor study area. The construction schedule for any of the designated intersection improvements will be highly dependent on the growth patterns in the corridor study area. The jurisdictional local agencies within the project corridor will use this study as a basis to obtain rights-of-way for the intersection improvements as development occurs. Rights-of-way not obtained through the development process will be purchased as needed. Furthermore, as development occurs, it is anticipated that developments adjacent to the applicable intersections will be responsible for the construction of the intersection improvements as a means to mitigate their traffic impacts. The Counties and local agencies within the project corridor will ultimately be responsible for those portions not funded by adjacent developments.

Generation of Alternatives

After the data collection process, several alternatives for each intersection were generated for the corridor study area. The alternatives were generated based on input received from the public and the local agencies. The alternatives that were initially generated were sent to the local agencies for comments, and were refined after comments were received. New alternatives and refinements of existing alternatives has been an ongoing effort with additional input from the public and the local agencies. The different alternatives for each intersection that were evaluated for this study are shown on **Figures 8 through 12**.



Weld/Adams County Line Crossroads Alignment Study

Weld County Road 11/York Street & Weld County Road 2/East 168th Avenue Intersection

Intersection Alternatives

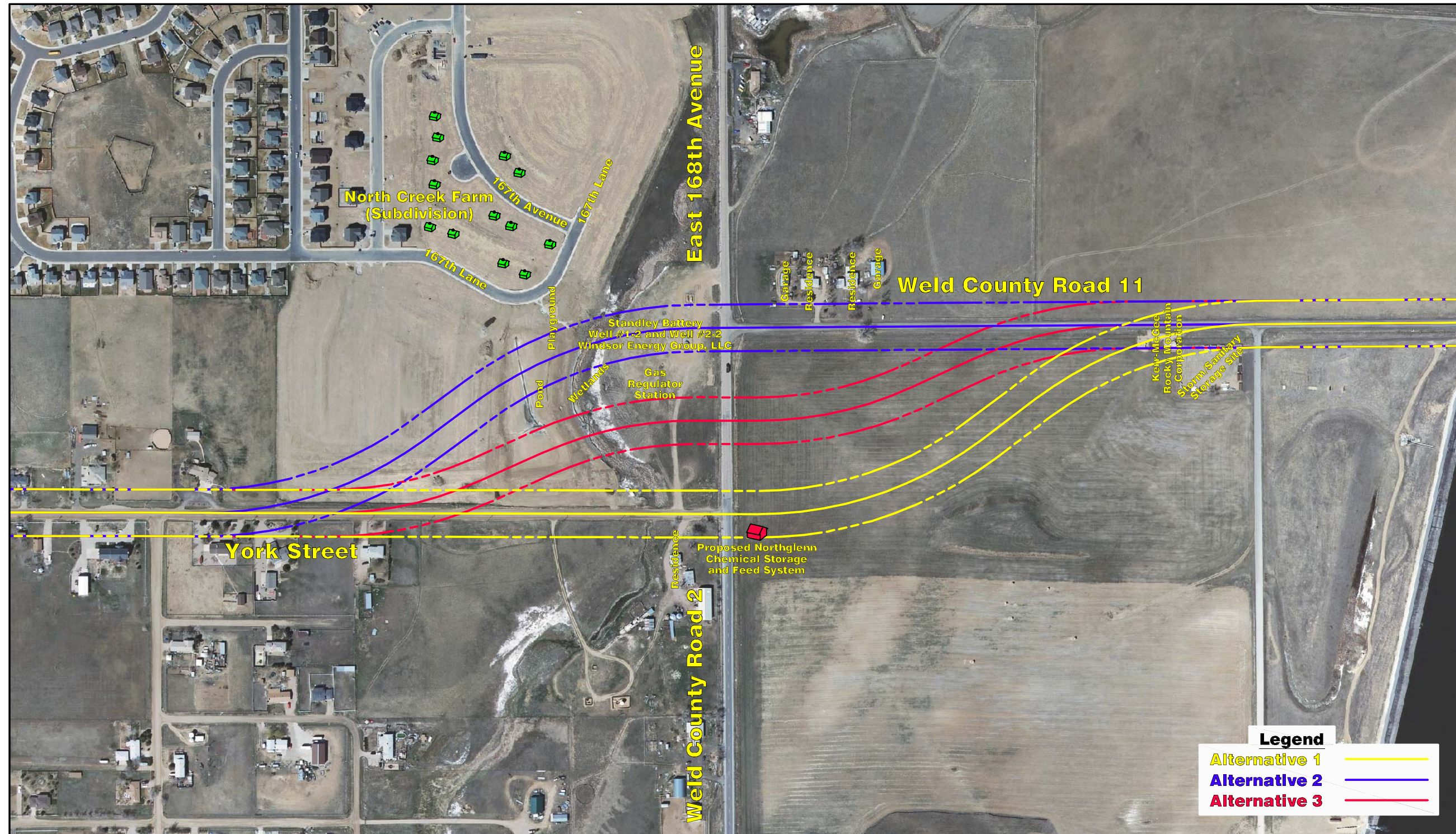


Figure 8



Weld/Adams County Line Crossroads Alignment Study

Weld County Road 15/Holly Street & Weld County Road 2/East 168th Avenue Intersection

Intersection Alternatives

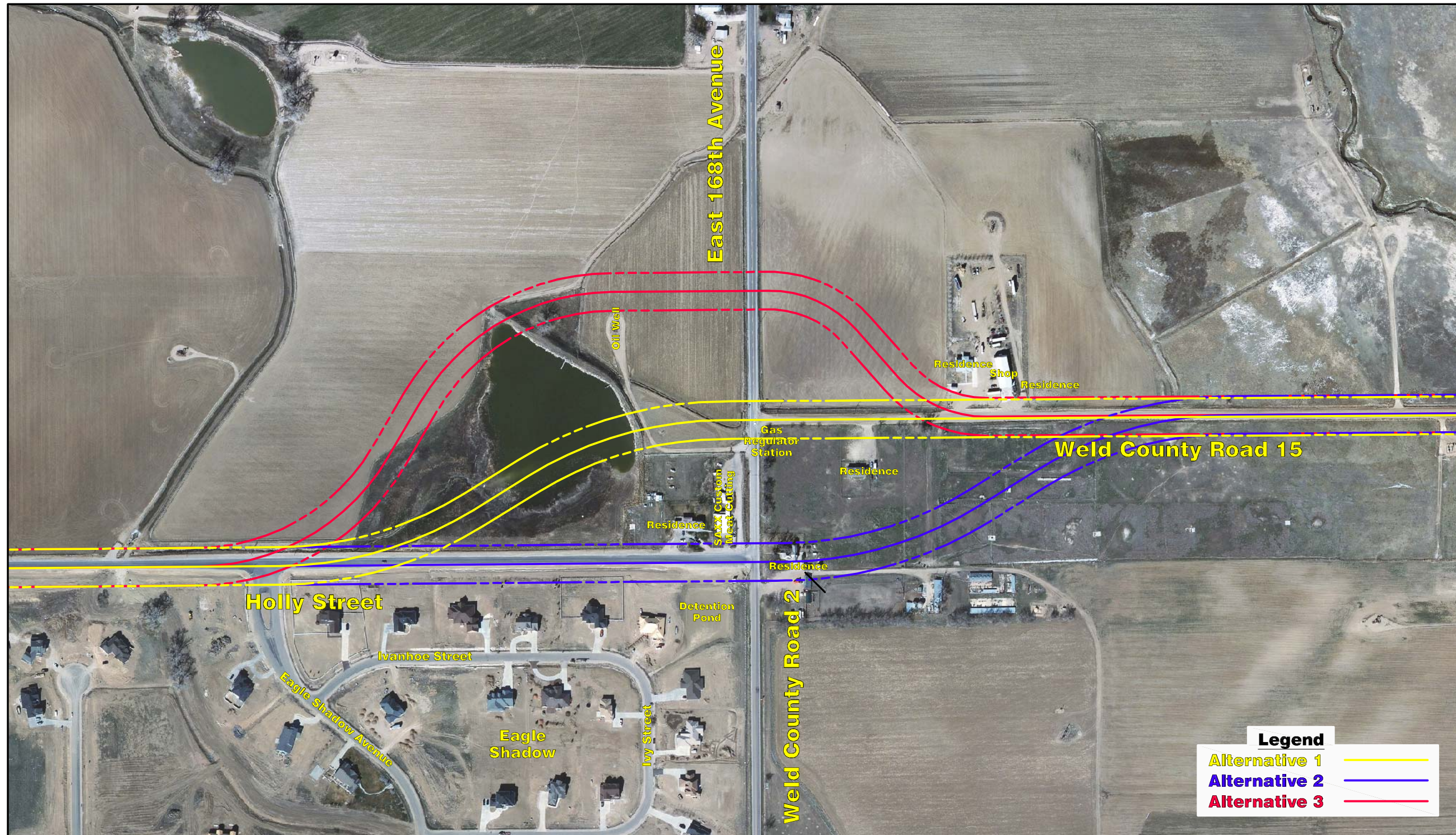


Figure 9

Weld County Road 17/Quebec Street & Weld County Road 2/East 168th Avenue Intersection

Intersection Alternatives

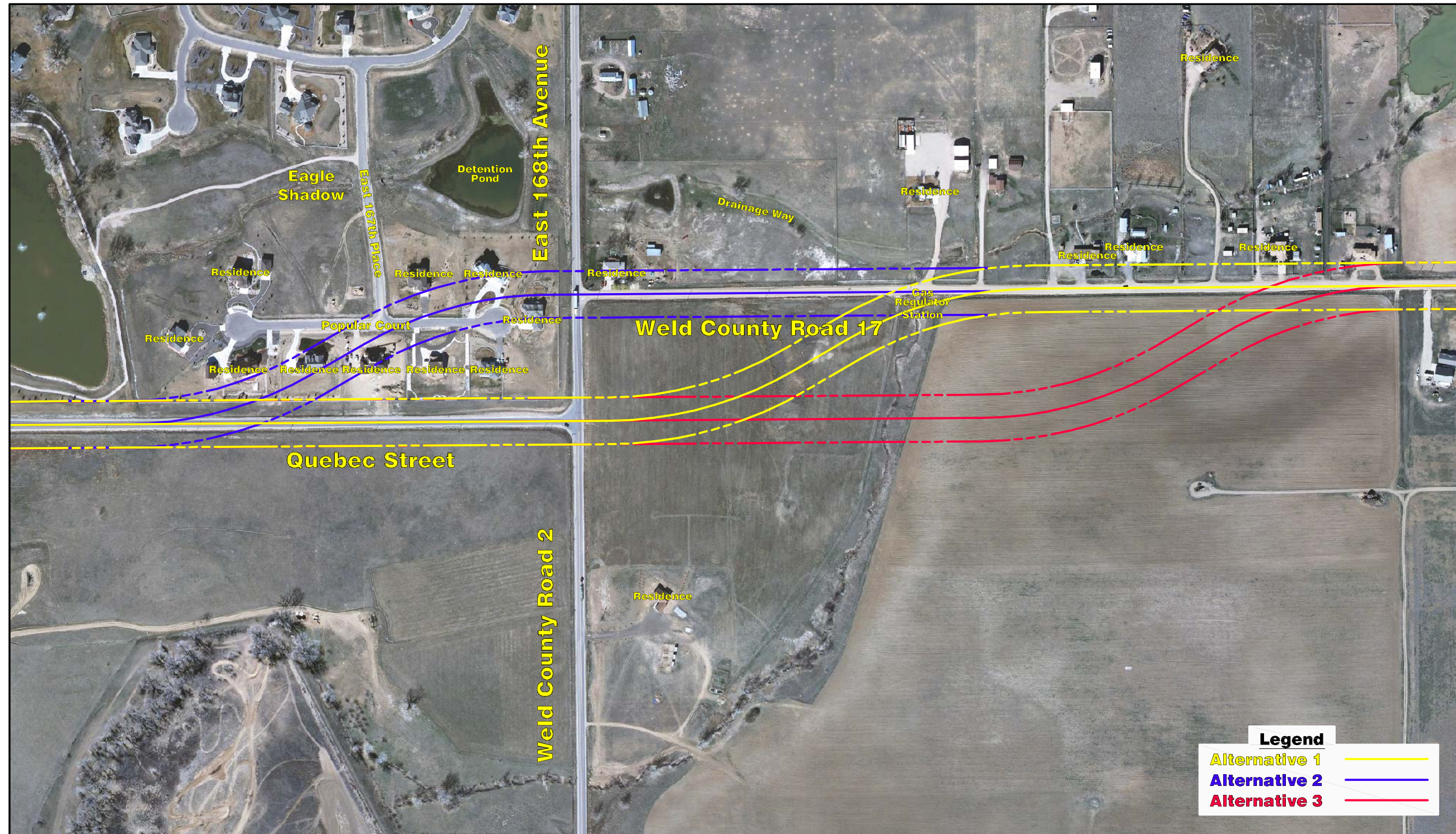


Figure 10



Weld/Adams County Line Crossroads Alignment Study

Weld County Road 19/Yosemite Street & Weld County Road 2/East 168th Avenue Intersection

Intersection Alternatives



Figure 11



Weld/Adams County Line Crossroads Alignment Study

Weld County Road 23.5/Tucson Street & Weld County Road 2/East 168th Avenue Intersection

Intersection Alternatives



Figure 12

IV. EVALUATION & RECOMMENDATION OF ALTERNATIVES

The alternatives for each intersection identified within the corridor study area were evaluated independent of the other intersections. The criterion that was utilized for the evaluation process is listed below:

Community Input (Weight Factor ~ 2.0)

- ▶ Refers to the general public opinion for the alternative alignments simply measured as favorable or not.

Community Impacts (Weight Factor ~ 2.0)

- ▶ Access is a measure of the level of convenience and clarity of access to existing and future developments and adjacent property owners.
- ▶ *Right-of-way Impacts* is a measure of the amount and number of severed parcels, proximity impacts, and/or displaced residences that would be required of existing and future developments in order to construct the alternative.
- ▶ *Current and Future Development Impacts* is a measure of consistency with current and future residential and commercial development plans.

Geometrics (Weight Factor ~ 1.0)

- ▶ *Geometrics* are a measure on how well the alternative achieves the preferred design criteria established by the local agencies.

Safety (Weight Factor ~ 2.0)

- ▶ *Safety* is a measure of expected conflict points for the traveling public and improvement of existing problems or high accident locations.

Environmental Impacts (Weight Factor ~ 1.0)

- ▶ Refers to unfavorable impacts to known environmental conditions. This would include a measure of each alternative's impact on the existing flood plain and/or existing drainage facilities. This would also include any impacts to known existing historical buildings or sites or mining hazards.

Construction Costs (Weight Factor ~ 2.0)

- ▶ *Construction Cost* is a relative comparison of costs to construct the alternative.

These criteria were incorporated into an evaluation matrix as shown in **Figure 13**. Each alternative for the different intersections was then evaluated and compared to the other alternatives for that intersection in order to determine the preferred alternative that scored the best for each intersection. The evaluation panel consisted of representatives from the local agencies (Weld County, Adams County, City and County of Broomfield, City of Northglenn and City of Thornton) and a representative from Felsburg Holt & Ullevig. After the preferred alternative for each intersection was determined, the preferred alternatives were then presented to the public at the project's final open house.

Figure 13. Example Evaluation Matrix

Weld/Adams County Line Crossroads Alignment Study

Evaluation Matrix - WCR 11/York Street/WCR 2/168th Avenue Intersection

Submitted by:
<Insert Name Here>

Evaluation Criteria	Weight Factors	Alternative 1		Alternative 2		Alternative 3	
		Scoring (1 - 5, 1 best)	Weighted Scoring	Scoring (1 - 5, 1 best)	Weighted Scoring	Scoring (1 - 5, 1 best)	Weighted Scoring
Community Input							
General Public Opinion of Alternative	2.0		0.00		0.00		0.00
Votes Received at Public Open House		13		0		3	
Community Impacts							
Access Impacts							
Right-of-way Impacts							
Current and Future Development Impacts							
Average for Community Impacts	2.0	0.00	0.00	0.00	0.00	0.00	0.00
Geometrics							
Design Criteria Achieved	1.0		0.00		0.00		0.00
Safety							
Traffic Safety	2.0		0.00		0.00		0.00
Environmental Impacts							
Flood Plain/Drainage Facilities/Historical Buildings or Sites	1.0		0.00		0.00		0.00
Construction Cost							
Construction Cost	2.0		0.00		0.00		0.00
		\$4,430,000		\$5,280,000		\$5,170,000	
Total (lowest score is preferred)			0.00		0.00		0.00

The criteria are scored from 1 to 5 with 1 being the best.

This chapter describes the advantages and disadvantages of each alternative for each intersection in detail.

Weld County Road 11/York Street & Weld County Road 2/East 168th Avenue Intersection

Alternative 1



This offset intersection is surrounded by four different jurisdictions - the City and County of Broomfield west of Weld County Road 11, the City of Northglenn east of Weld County Road 11, the City of Thornton west of York Street and Adams County east of York Street.

Other characteristics of this intersection include:

- ▶ Subdivision within the City of Thornton named North Creek Farms
- ▶ Existing Utilities such as the Standley Battery Wells and Kerr McGee Storage Tanks
- ▶ Proposed Utilities such as the proposed Chemical Storage and Feed System the City of Northglenn is designing over their Existing Force Main
- ▶ An Existing Detention Pond, Drainageway and Wetlands along with the Existing Floodplain
- ▶ A 600-foot Separation occurs between the Existing Intersections

The following three alternatives were developed for this intersection.

Alternative 1

Alternative 1 shifts Weld County Road 11 to the east to realign with the existing East 168th Avenue and York Street intersection. This alignment shift occurs on the City of Northglenn parcel. Access for the residences on the current Weld County Road 11 can obtain access through a cul-de-sac that accesses East 168th Avenue or this access may be relocated to the realigned Weld County Road 11. Details such as access locations should be finalized during the final design process of the intersection improvements.

Alternative 1 Advantages:

- ▶ Does not impact North Creek Farm Subdivision
- ▶ Achieves Intersection Design Criteria
- ▶ Right-of-way can be obtained from City of Northglenn Parcel (north of East 168th Avenue)
- ▶ Minimal Impacts to Existing Wetlands and Drainageways
- ▶ Utilizes Existing Road and Right-of-way South of East 168th Avenue
- ▶ Public's Favorite (13 votes)
- ▶ Lower Anticipated Construction Costs (\$4.43 million)

Alternative 1 Disadvantages:

- ▶ Does not compliment City and County of Broomfield's Transportation Plan
- ▶ Bisects City of Northglenn Parcel
- ▶ Impacts Kerr-McGee Oil Storage Tanks
- ▶ Requires an Intergovernmental Agreement (IGA) or Memorandum of Understanding (MOU) between Agencies

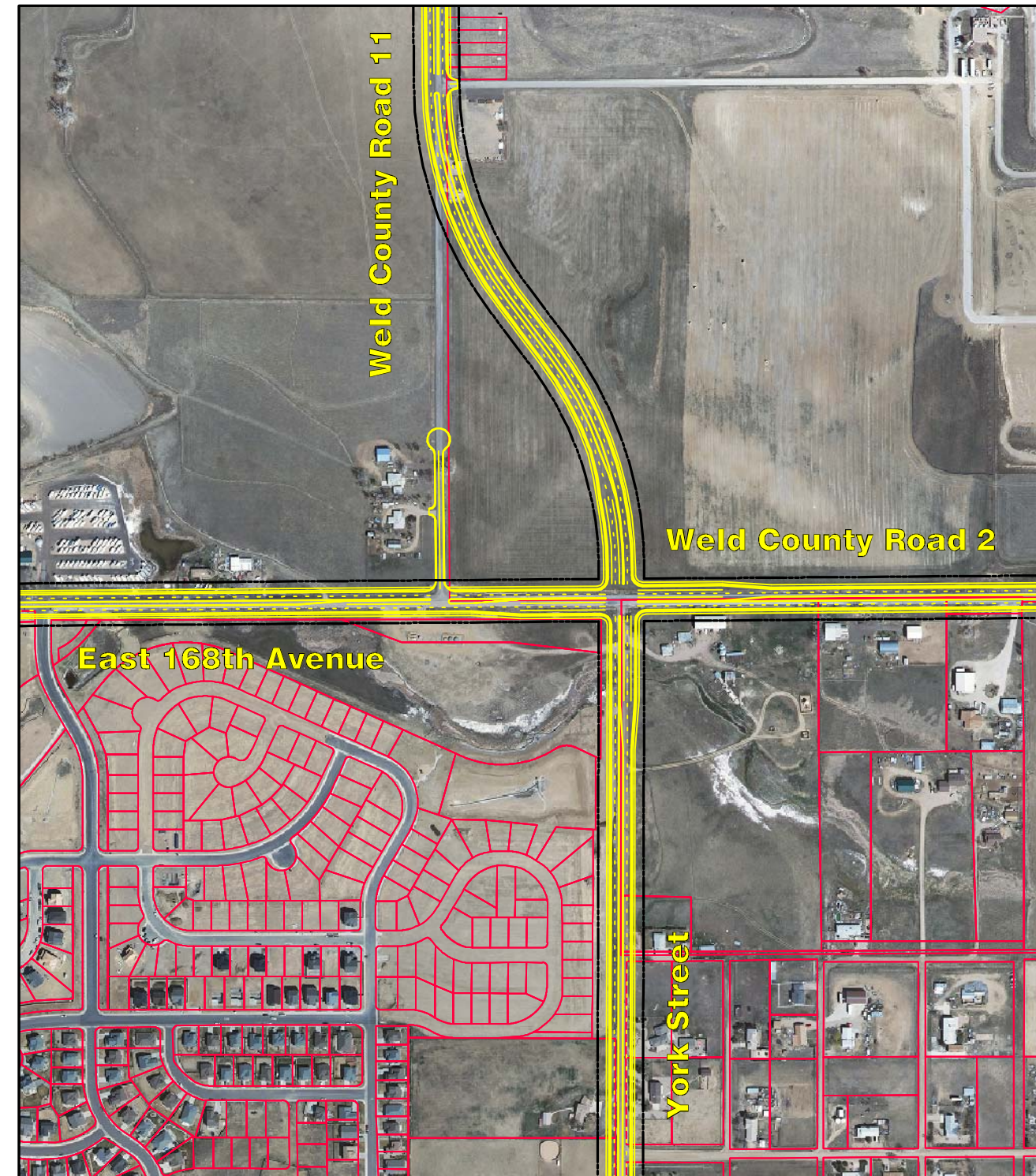


Figure 14



Weld/Adams County Line Crossroads Alignment Study

Weld County Road 11/York Street & Weld County Road 2/East 168th Avenue Intersection

Alternative 2



Alternative 2

Alternative 2 leaves Weld County Road 11 in its present location and shifts York Street to the west to realign with the existing East 168th Avenue and Weld County Road 11 intersection. This alignment shift occurs within the platted North Creek Farm subdivision that is located within the City of Thornton jurisdiction. Access for the residences west of Weld County Road 11 would have to be directly on Weld County Road 11 unless a secondary street and access locations were developed on the west side of the residences. Details such as access locations should be finalized during the final design process of the intersection improvements.

Alternative 2 Advantages:

- ▶ Does not bisect City of Northglenn Parcel
- ▶ Compliments City and County of Broomfield's Transportation Plan
- ▶ Utilizes Existing Road and Right-of-way North of East 168th Avenue

Alternative 2 Disadvantages:

- ▶ Major Impacts to North Creek Farm subdivision (17 platted lots)
- ▶ Major Impacts to the Existing Detention Pond approved by Urban Drainage and Flood Control District
- ▶ Impacts Standley Battery Well (south of East 168th Avenue)
- ▶ Impacts Existing Wetlands
- ▶ Not Favored by Public (0 Votes)
- ▶ Higher Anticipated Construction Costs (\$5.28 million)

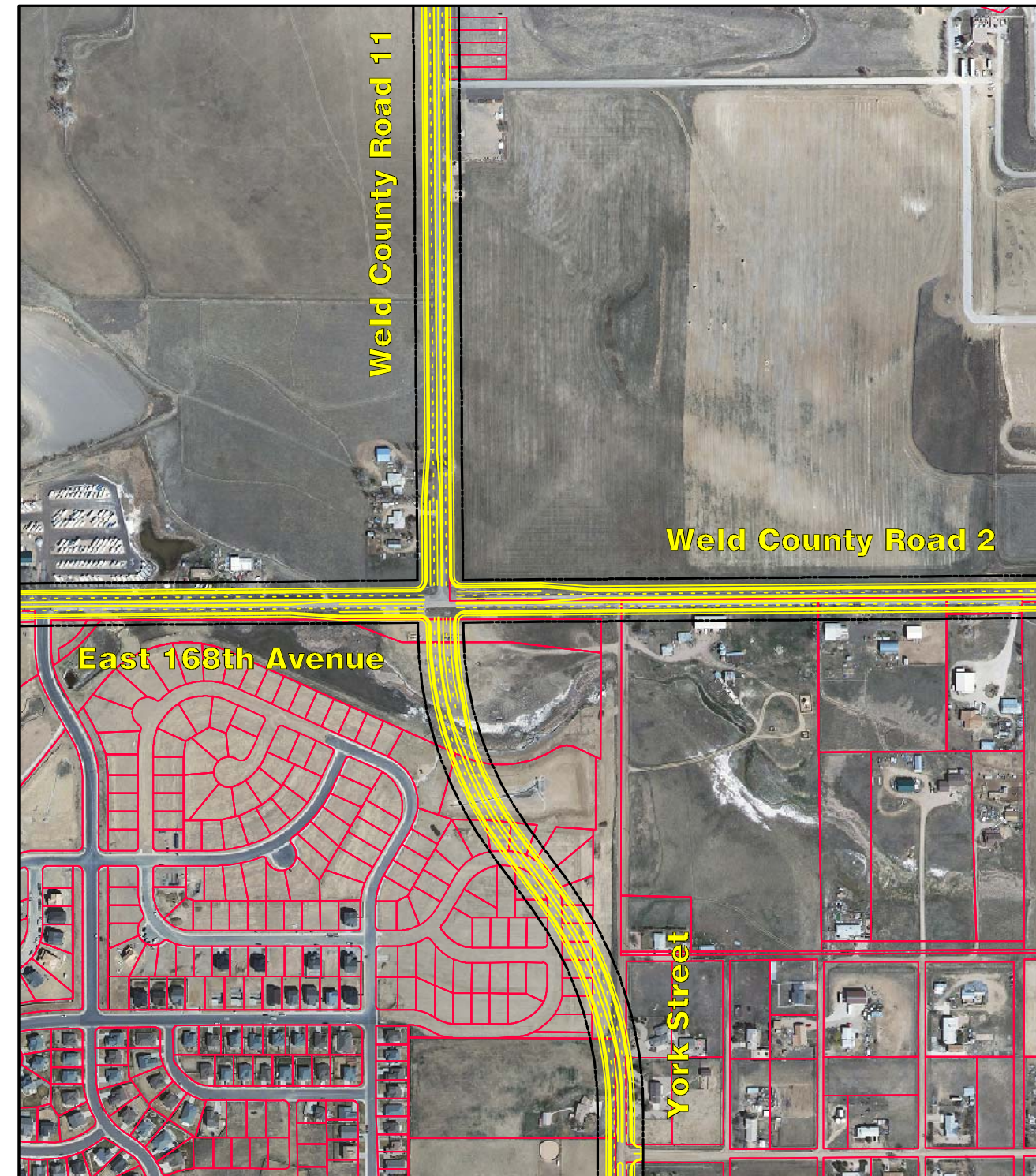


Figure 15



Weld/Adams County Line Crossroads Alignment Study

Weld County Road 11/York Street & Weld County Road 2/East 168th Avenue Intersection

Alternative 3



Alternative 3

Alternative 3 splits the difference between the two existing intersections at Weld County Road 11 and York Street on East 168th Avenue. This alignment shift occurs within a portion of the platted North Creek Farm subdivision that is located within the City of Thornton jurisdiction and on a portion of the City of Northglenn parcel. Access for the residences west of Weld County Road 11 could be provided directly onto Weld County Road 11 or a cul-de-sac and combined access road via to East 168th Avenue or Weld County Road 11. Details such as access locations should be finalized during the final design process of the intersection improvements.

Alternative 3 Advantages:

- ▶ Does not Impact Existing Residences
- ▶ Minimal Impacts to Existing Utilities

Alternative 3 Disadvantages:

- ▶ Impacts North Creek Farm subdivision (4 platted lots)
- ▶ Impacts Existing Detention Pond approved by Urban Drainage and Flood Control District
- ▶ Impacts Existing Wetlands
- ▶ Does not Utilize Any Existing Rights-of-way
- ▶ Leaves a Remnant Parcel for the City of Northglenn
- ▶ Not Favored by Public (3 Votes)
- ▶ Higher Anticipated Construction Costs (\$5.17 million)

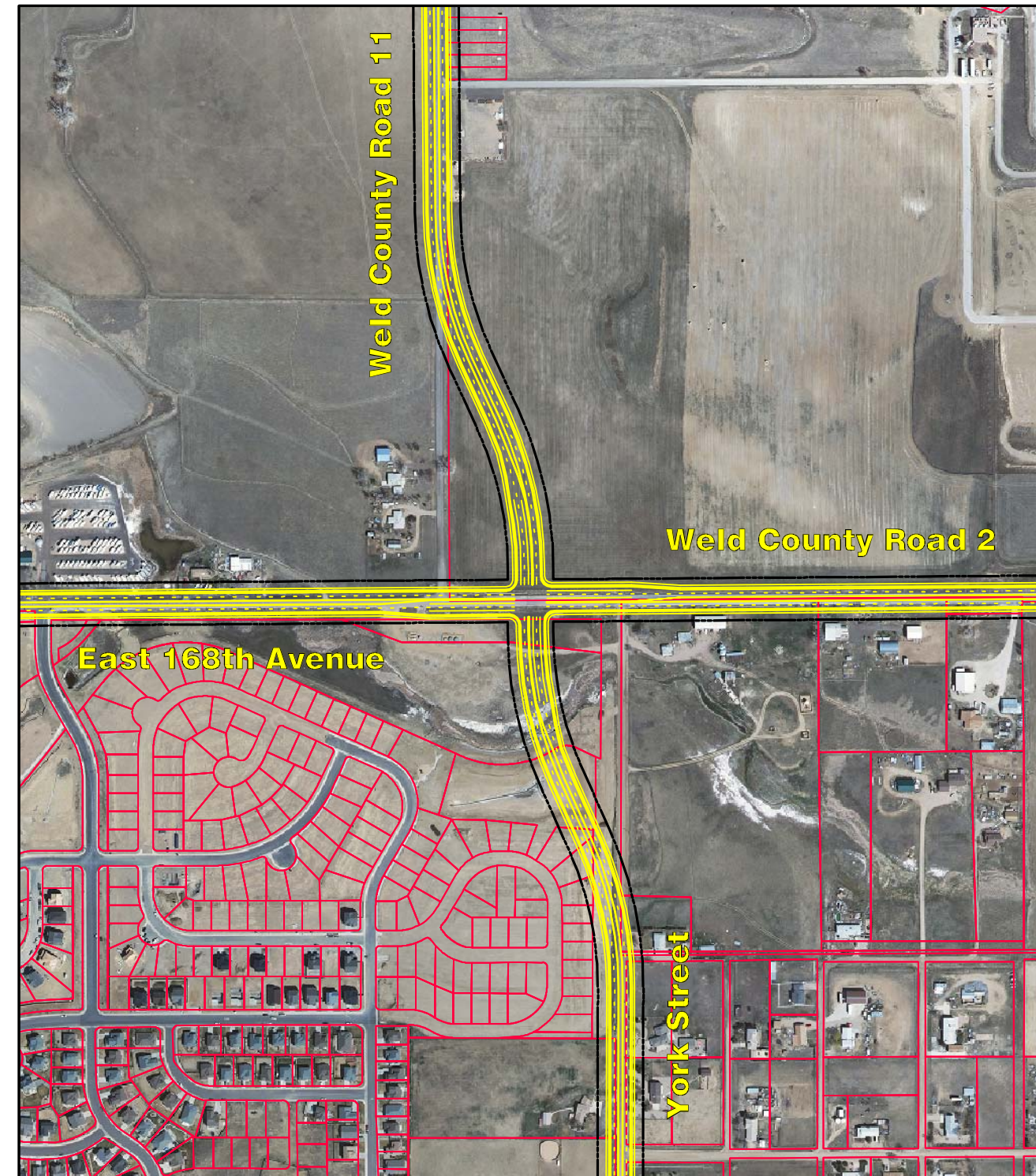


Figure 16



Weld/Adams County Line Crossroads Alignment Study

Preferred Alternative

Due to several factors including community input, fewer development impacts, fewer wetland and drainage impacts and lower anticipated construction costs, Alternative 1 is the preferred alternative for this intersection.

The City and County of Broomfield is currently working with a planned development north of East 168th Avenue on the west side of Weld County Road 11. Broomfield City Council has approved the “257 Land Plan” PUD Plan and preliminary plat for this development. It is understood between the agencies that no improvements will be completed to Weld County Road 11 or York Street, until development occurs in the surrounding area to assist in planning and funding the required improvements. The City and County of Broomfield has an adopted vision and development approvals that have determined their preferred intersection configuration for East 168th Avenue and Weld County Road 11 that does not coincide with this study’s preferred intersection configuration. However, the City and County of Broomfield is interested in working with the City of Northglenn, the City of Thornton, Adams County and Weld County to determine the final design and funding scenarios for the study’s preferred alternative when the intersection improvements are warranted. With this in mind, it may be in all the agencies best interests to enter into an Intergovernmental Agreement (IGA) or Memorandum of Understanding (MOU) between the agencies that better defines responsibilities, funding sources and timelines.

The recommend alternative for this intersection is shown on Figure 17. The anticipated typical sections for the interim and ultimate roadways for this intersection are shown on Figure 18.



Weld/Adams County Line Crossroads Alignment Study

Weld County Road 11/York Street & Weld County Road 2/East 168th Avenue Intersection

Recommended Alternative

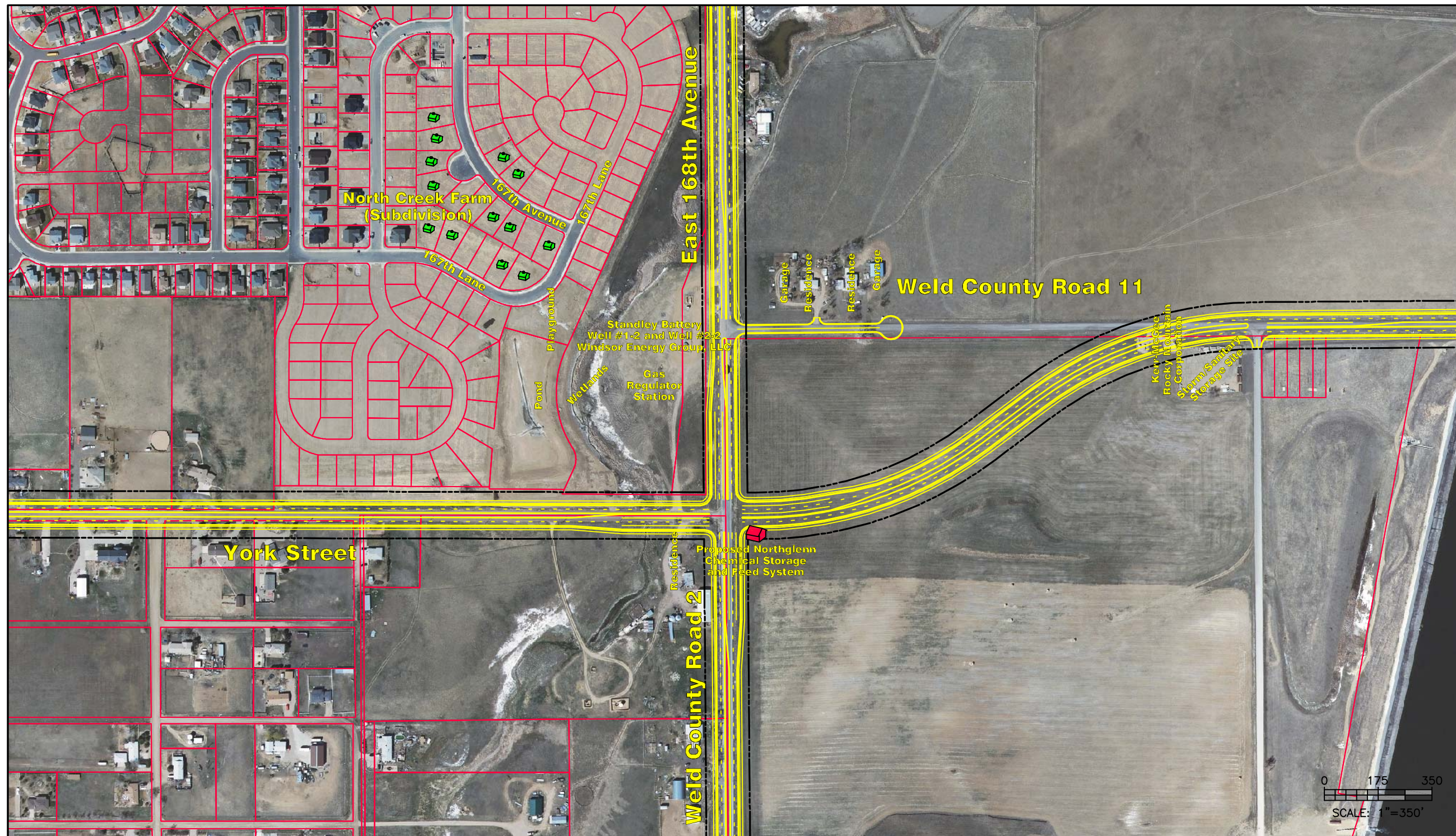


Figure 17

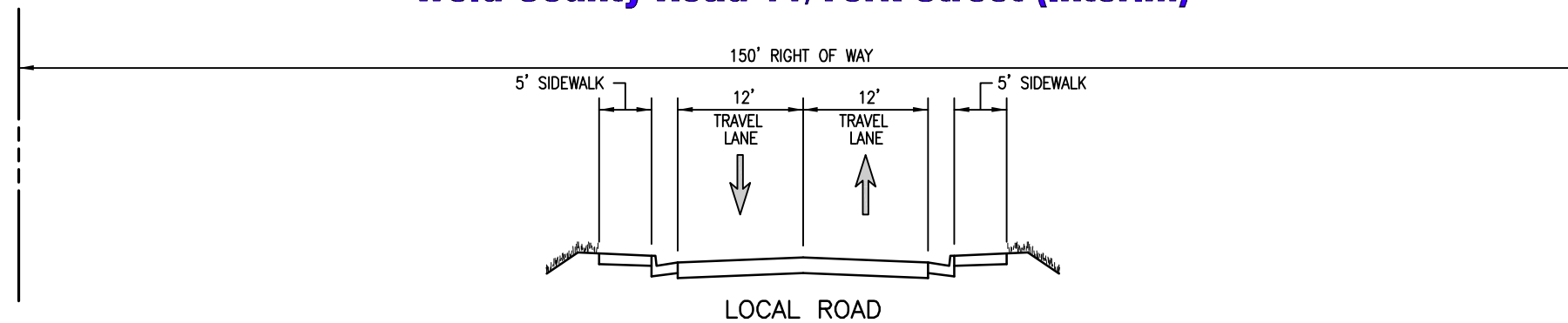


Weld/Adams County Line Crossroads Alignment Study

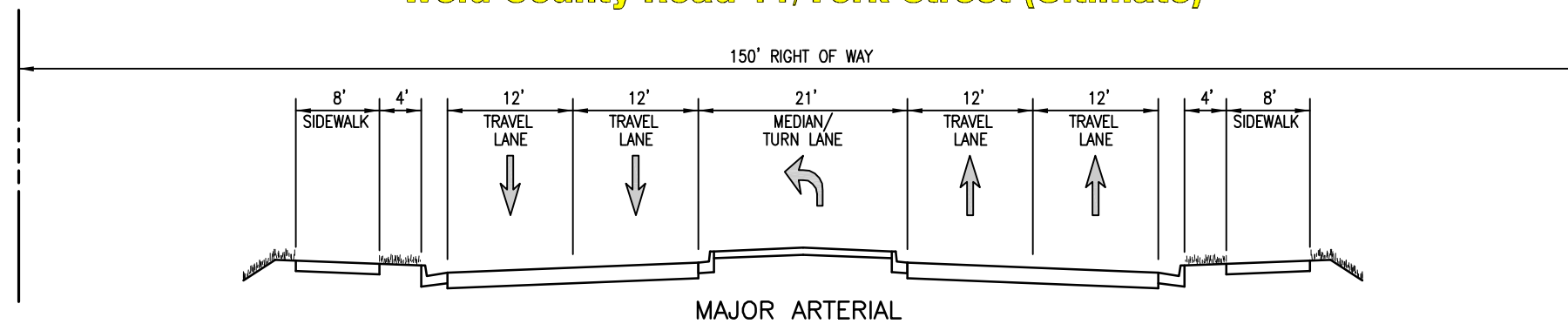
Weld County Road 11/York Street & Weld County Road 2/East 168th Avenue Intersection

Typical Sections

Weld County Road 11/York Street (Interim)



Weld County Road 11/York Street (Ultimate)



Weld County Road 2/East 168th Avenue (Ultimate)

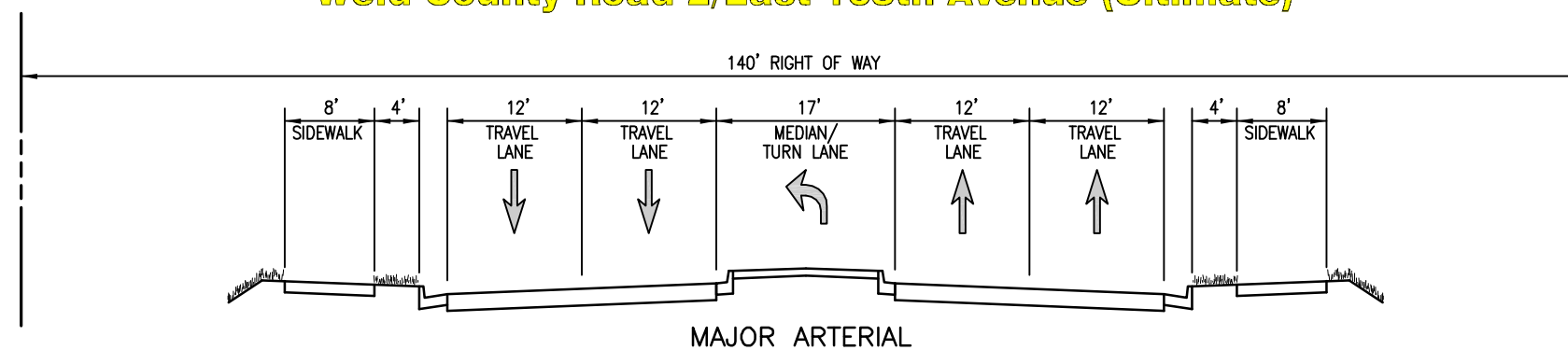


Figure 18



Weld/Adams County Line Crossroads Alignment Study

Weld County Road 15/Holly Street & Weld County Road 2/East 168th Avenue Intersection

Alternative 1



This offset intersection falls within the City of Thornton and Adams County jurisdiction south of East 168th Avenue and Weld County north of East 168th Avenue. Holly Street south of East 168th Avenue has been improved and is currently paved. Weld County Road 15 north of East 168th Avenue is an existing gravel road.

Other characteristics of this intersection include:

- ▶ Subdivision within Adams County named Eagle Shadow
- ▶ Known Existing Utilities such as oil wells and gas regulator stations
- ▶ Existing Irrigation Pond resides on the Albert Sack's Parcel
- ▶ A 450-foot Separation occurs between the Existing Intersections
- ▶ Residence at end of Holly Street (Paul Jacobucci)

The following three alternatives were developed for this intersection.

Alternative 1

Alternative 1 shifts Holly Street to the west to realign with the existing East 168th Avenue and Weld County Road 15 intersection. This alignment shift occurs on the Albert Sack's parcel within the City of Thornton jurisdiction. Access for the residence south of the existing East 168th Avenue and Holly Street intersection can obtain access through a cul-de-sac that accesses East 168th Avenue or this access may be relocated to the realigned Holly Street. Details such as access locations should be finalized during the final design process of the intersection improvements.

Alternative 1 Advantages:

- ▶ Minimal Impacts to Existing Residences
- ▶ Moves Holly Street away from the Eagle Shadow subdivision
- ▶ Achieves Intersection Design Criteria
- ▶ Utilizes Existing Road and Right-of-way North of East 168th Avenue
- ▶ Highest Public Approval (7 Votes)
- ▶ Lowest Anticipated Construction Costs (\$4.58 million)

Alternative 1 Disadvantages:

- ▶ Impacts Existing Irrigation Pond (Sack's Parcel)
- ▶ Bisects Sack's Parcel South of East 168th Avenue



Figure 19



Weld/Adams County Line Crossroads Alignment Study

Weld County Road 15/Holly Street & Weld County Road 2/East 168th Avenue Intersection

Alternative 2



Alternative 2

Alternative 2 leaves Holly Street in its present location and shifts Weld County Road 15 to the east to realign with the existing East 168th Avenue and Holly Street intersection. This alignment shift would have detrimental impacts to the Paul Jacobucci residence with the proposed roadway going through the existing residence. Access for the residences adjacent to existing Weld County Road 15 would have to be realigned directly onto the realigned Weld County Road 15 or can be consolidated with a single access on Weld County Road 11 or East 168th Avenue. Details such as access locations should be finalized during the final design process of the intersection improvements.

Alternative 2 Advantages:

- ▶ Does not Bisect Parcels South of East 168th Avenue
- ▶ Achieves Intersection Design Criteria
- ▶ Utilizes Existing Road and Right-of-way South of East 168th Avenue
- ▶ Moderate Public Approval (5 Votes)

Alternative 2 Disadvantages:

- ▶ Major Impacts to the Existing Residence north of East 168th Avenue (Paul Jacobucci)
- ▶ Bisects Parcels North of East 168th Avenue
- ▶ Higher Anticipated Construction Costs (\$4.89 million)

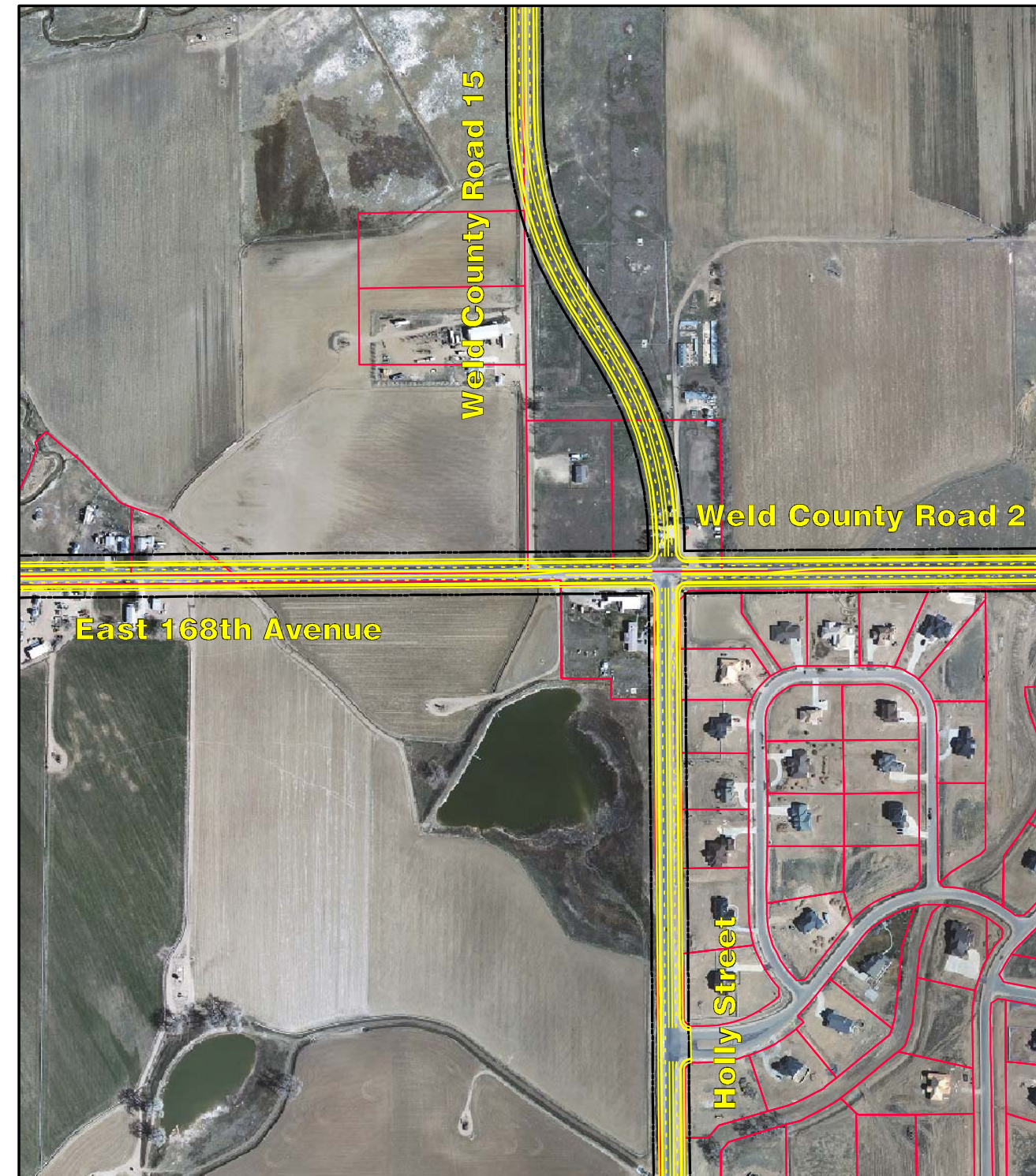


Figure 20

Weld County Road 15/Holly Street & Weld County Road 2/East 168th Avenue Intersection

Alternative 3



Alternative 3

Alternative 3 shifts the Weld County Road 15 to the west to a new intersection location. This alignment shift would have minimal impacts to existing features; however, the intersection improvements would cost more to construct and this alternative does not achieve the established design parameters with sub-par horizontal curves. Existing accesses on Weld County Road 15 and Holly Street could remain with a connecting road to East 168th Avenue or to the realigned alignments. Details such as access locations should be finalized during the final design process of the intersection improvements.

Alternative 3 Advantages:

- ▶ Minimal Impacts to Existing Residences
- ▶ Moves Holly Street away from the Eagle Shadow subdivision

Alternative 3 Disadvantages:

- ▶ Does Not Achieve Intersection Design Speed Criteria
- ▶ Does not Utilize Existing Rights-of-way and Roadway
- ▶ Bisects Parcels on Both Sides of East 168th Avenue
- ▶ Lowest Public Approval (3 Votes)
- ▶ Higher Anticipated Construction Costs (\$4.86 million)

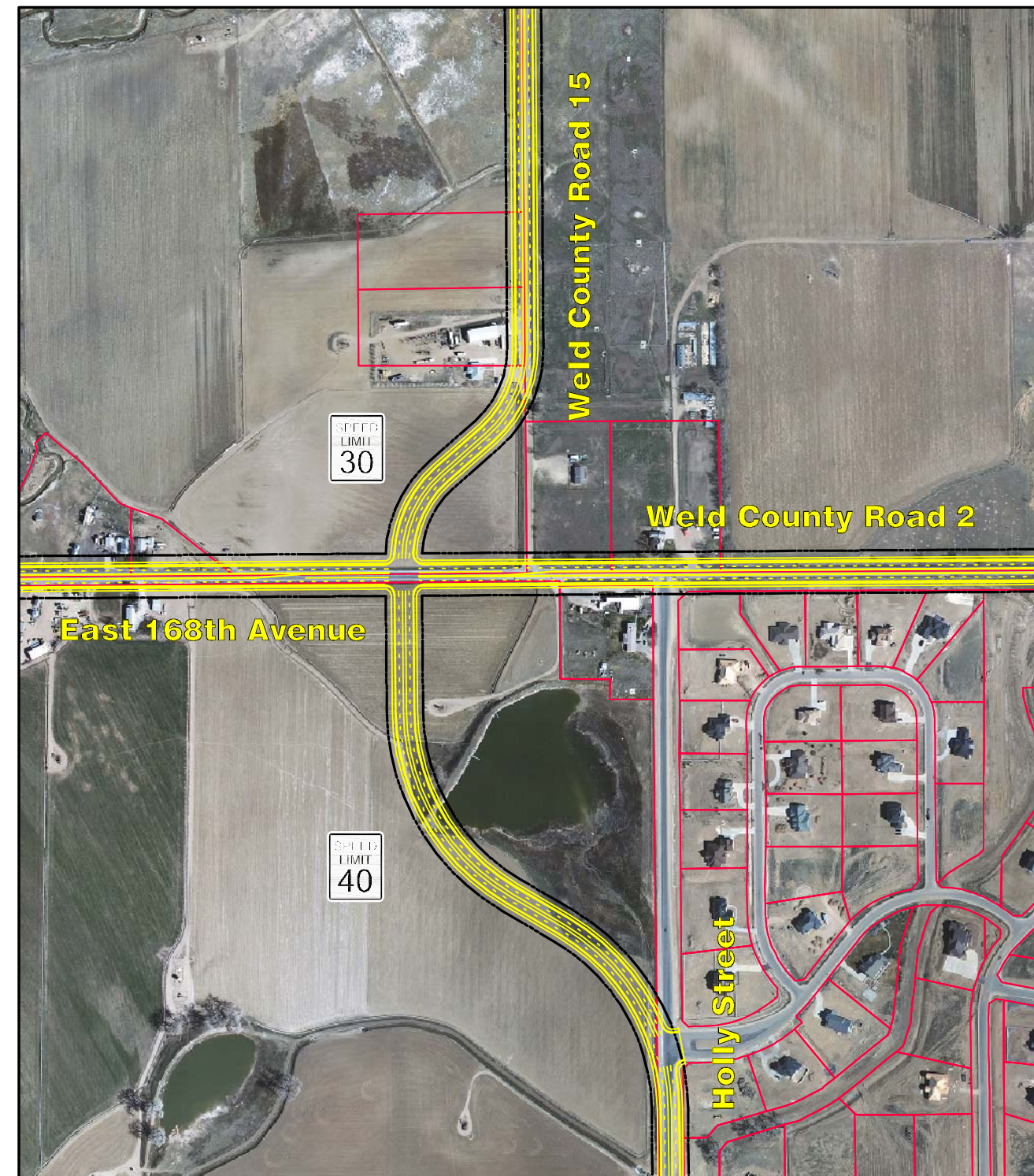


Figure 21



Weld/Adams County Line Crossroads Alignment Study

Preferred Alternative

Alternative 1 and 2 were very comparable after the evaluation process; however, due to lower right-of-way costs including the Jacobucci residence and due to lower anticipated construction costs, Alternative 1 is the preferred alternative for this intersection.

The recommend alternative for this intersection is shown on Figure 22. The anticipated typical sections for the interim and ultimate roadways for this intersection are shown on Figure 23.



Weld/Adams County Line Crossroads Alignment Study

Weld County Road 15/Holly Street & Weld County Road 2/East 168th Avenue Intersection

Recommended Alternative

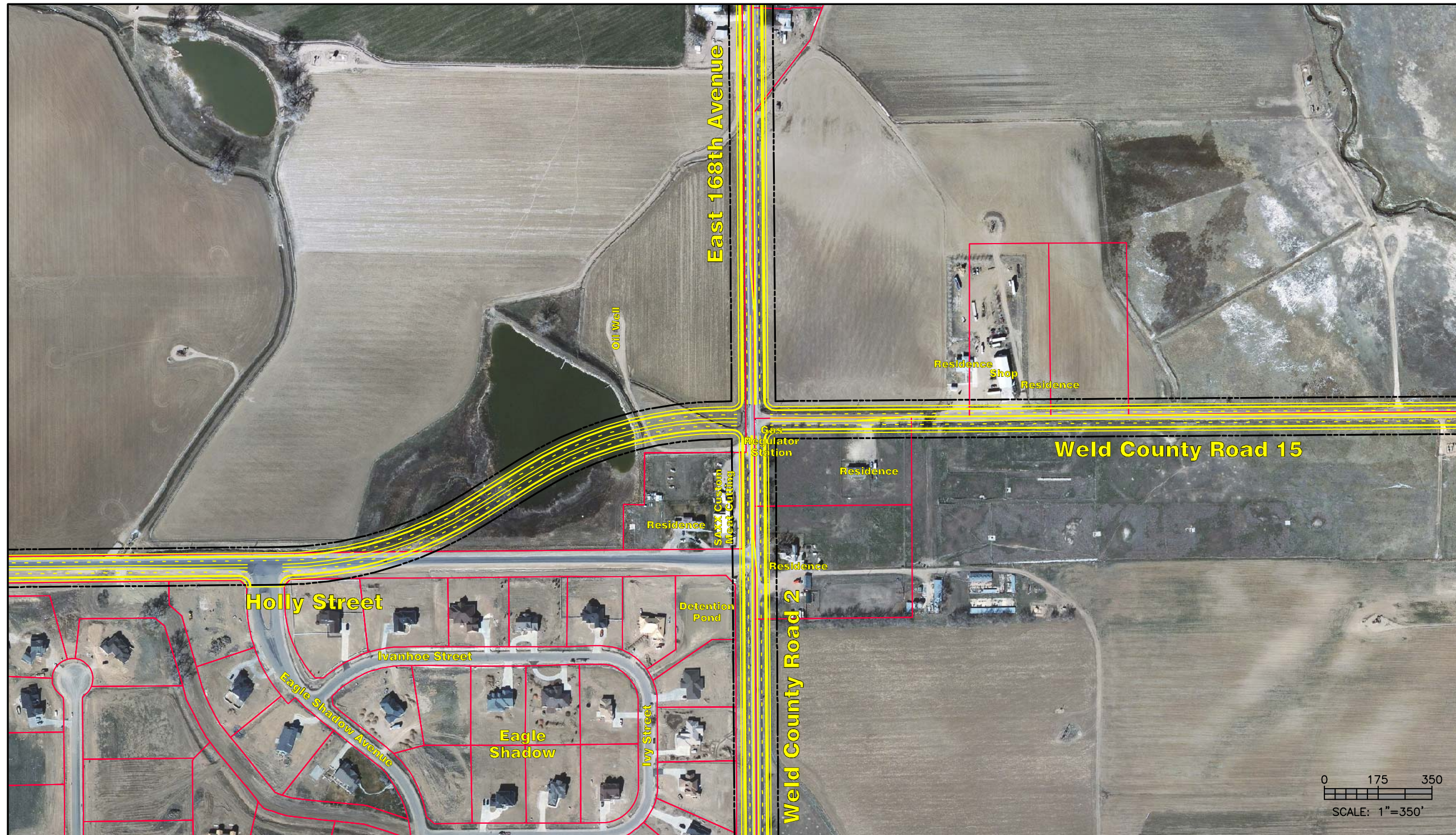


Figure 22



Weld/Adams County Line Crossroads Alignment Study

Weld County Road 15/Holly Street & Weld County Road 2/East 168th Avenue Intersection

Typical Sections

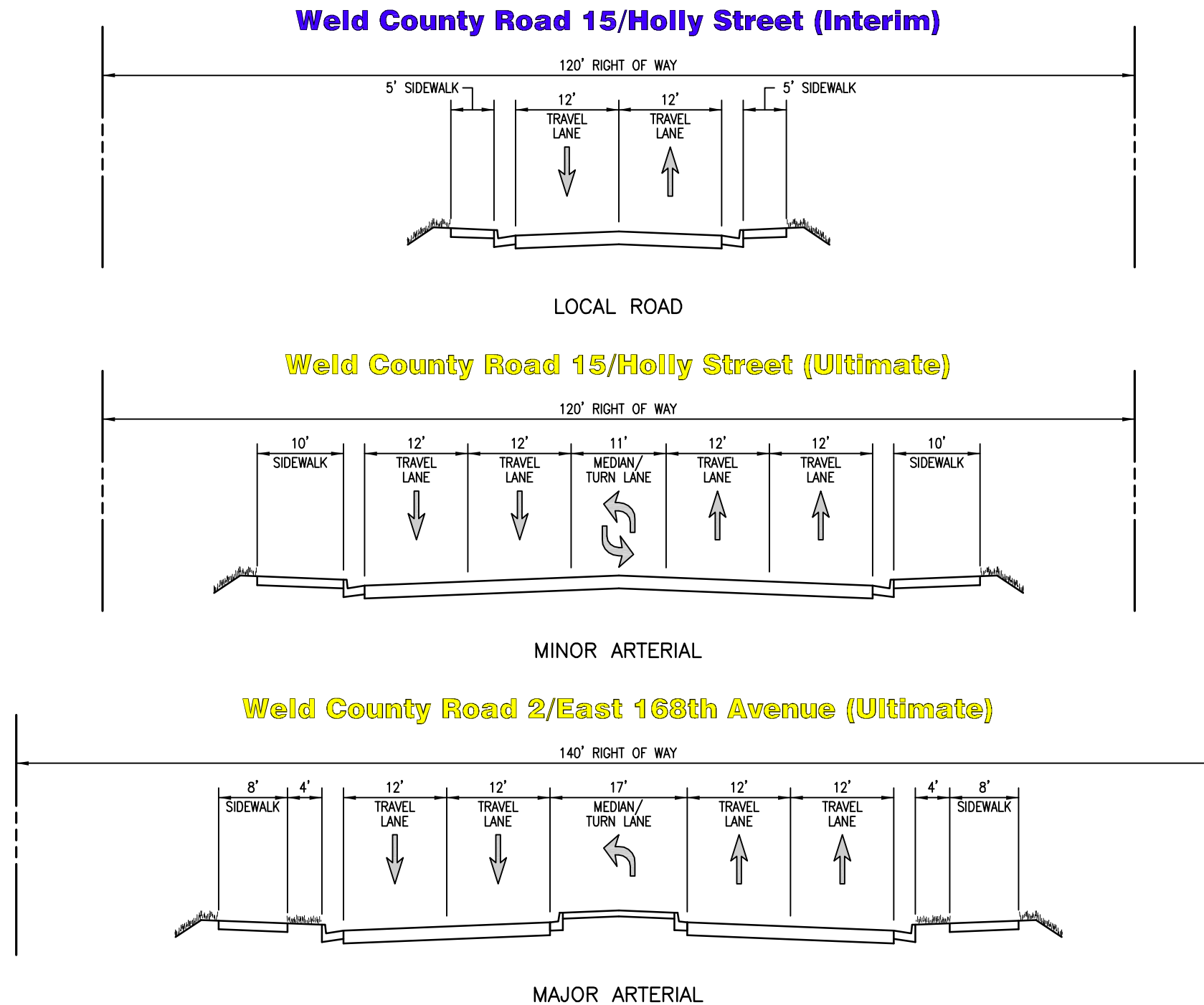


Figure 23

Weld County Road 17/Quebec Street & Weld County Road 2/East 168th Avenue Intersection

Alternative 1



This offset intersection falls within only 2 jurisdictions - Adams County south of East 168th Avenue and Weld County north of East 168th Avenue. Originally, only two alternatives were developed for this intersection; however, a 3rd alternative was generated after the initial open house based on adjacent property owner input. Quebec Street south of East 168th Avenue has been improved and is currently paved. Weld County Road 17 north of East 168th Avenue is an existing gravel road.

Other characteristics of this intersection include:

- ▶ Subdivision within Adams County named Eagle Shadow
- ▶ Current Land Uses are Predominately Agriculture and Estate Residential
- ▶ A 400-foot Separation occurs between the Existing Intersections

The following three alternatives were developed for this intersection.

Alternative 1

Alternative 1 leaves Quebec Street in its present location and shifts Weld County Road 17 to the east to realign with the existing East 168th Avenue and Quebec Street intersection. This alignment shift occurs on the Wycoff parcel that is currently undeveloped. Access for the residences adjacent to existing Weld County Road 17 could be realigned and connected directly onto the realigned Weld County Road 17 alignment or they can be consolidated with a single access to East 168th Avenue as shown in **Figure 24**. Details such as access locations should be finalized during the final design process of the intersection improvements.

Alternative 1 Advantages:

- ▶ Minimal Impacts to the Existing Residences in the Eagle Shadow subdivision
- ▶ Utilizes Existing Road and Right-of-way South of East 168th Avenue
- ▶ Crosses Drainageway Approximately at the Existing Road Crossing
- ▶ Most Favored by Public (14 Votes)
- ▶ Lowest Anticipated Construction Costs (\$5.00 million)

Alternative 1 Disadvantages:

- ▶ Bisects the Parcel North of East 168th Avenue



Figure 24



Weld/Adams County Line Crossroads Alignment Study

Weld County Road 17/Quebec Street & Weld County Road 2/East 168th Avenue Intersection

Alternative 2



Alternative 2

Alternative 2 shifts Quebec Street to the west to realign with the existing East 168th Avenue and Weld County Road 17 intersection. This alignment shift occurs within the Eagle Shadow subdivision where existing residences are constructed. Residences in the Eagle Shadow subdivision on Popular Court not impacted by this alignment shift could have their access relocated to East 167th Place. Details such as access locations should be finalized during the final design process of the intersection improvements.

Alternative 2 Advantages:

- ▶ Utilizes Existing Road and Right-of-way North of East 168th Avenue
- ▶ Does not Bisect the Parcel North of East 168th Avenue

Alternative 2 Disadvantages:

- ▶ Major Impacts to Existing Residences in the Eagle Shadow subdivision
- ▶ Expensive Construction Costs due to the Cost of Purchasing Existing Residences
- ▶ Least Favored by Public (4 Votes)
- ▶ Highest Anticipated Construction Costs (\$9.39 million)



Figure 25



Weld/Adams County Line Crossroads Alignment Study

Weld County Road 17/Quebec Street & Weld County Road 2/East 168th Avenue Intersection

Alternative 3



Alternative 3

Alternative 3 is a variation of Alternative 1 that leaves Quebec Street in its present location and shifts Weld County Road 17 to the east to realign with the existing East 168th Avenue and Quebec Street intersection. After the initial public open house, the re-configured Weld County Road 17 alignment was developed in cooperation with the Wycoffs whose parcel was mostly impacted by Alternative 1. The intention of this alternative is to preserve a corridor of developable land between the existing Weld County Road 17 and the realigned Weld County Road 17 that could be developed into estate residential. This realignment of Weld County Road 17 would also provide a consolidated access for the existing residences on the west side of Weld County Road 17 that would have one access point to the realigned Weld County Road 17 alignment or to East 168th Avenue. Details such as access locations should be finalized during the final design process of the intersection improvements.

Alternative 3 Advantages:

- ▶ Minimal Impacts to the Existing Residences in the Eagle Shadow subdivision
- ▶ Minimal Impacts to the Existing Residences adjacent to Weld County Road 17
- ▶ Consolidates Access from Existing Residences adjacent to Weld County Road 17
- ▶ Utilizes Existing Road and Right-of-way South of East 168th Avenue
- ▶ Low Anticipated Construction Costs (\$6.68 million)

Alternative 3 Disadvantages:

- ▶ Bisects the Parcel North of East 168th Avenue

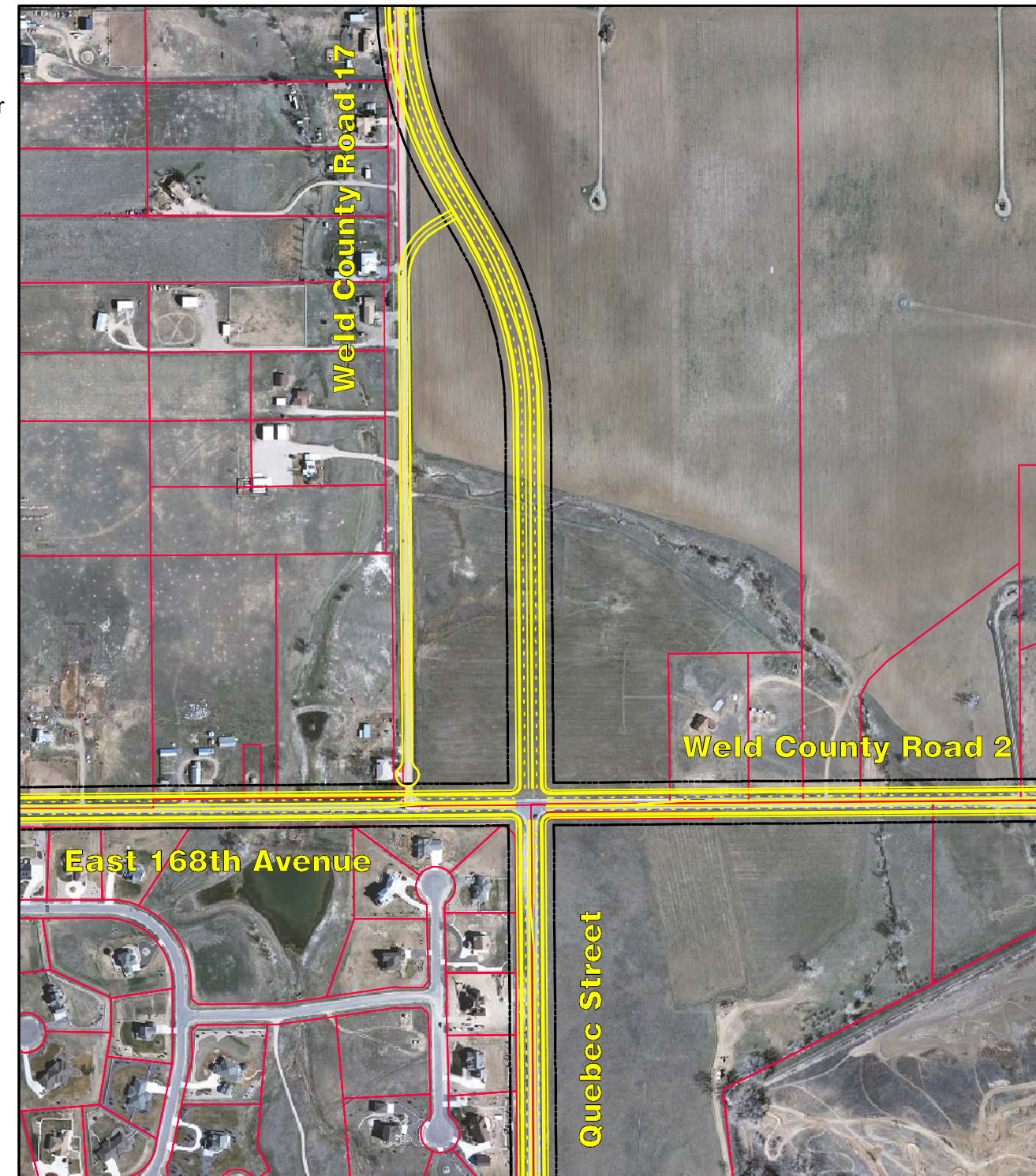


Figure 26



Preferred Alternative

Alternatives 1 and 3 were very comparable after the evaluation process. Even though Alternative 3 has a high anticipated construction costs, other factors such as lower access impacts, lower current and future development impacts and approval from the general public including the property owner most impacted lead to Alternative 3 being the preferred alternative for this intersection.

The recommend alternative for this intersection is shown on Figure 27. The anticipated typical sections for the interim and ultimate roadways for this intersection are shown on Figure 28.



Weld/Adams County Line Crossroads Alignment Study

Weld County Road 17/Quebec Street & Weld County Road 2/East 168th Avenue Intersection

Recommended Alternative



Figure 27

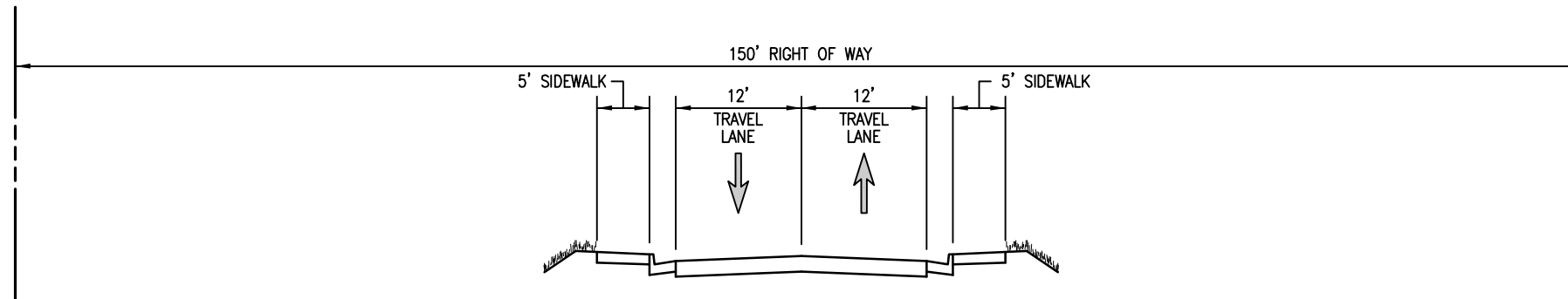


Weld/Adams County Line Crossroads Alignment Study

Weld County Road 17/Quebec Street & Weld County Road 2/East 168th Avenue Intersection

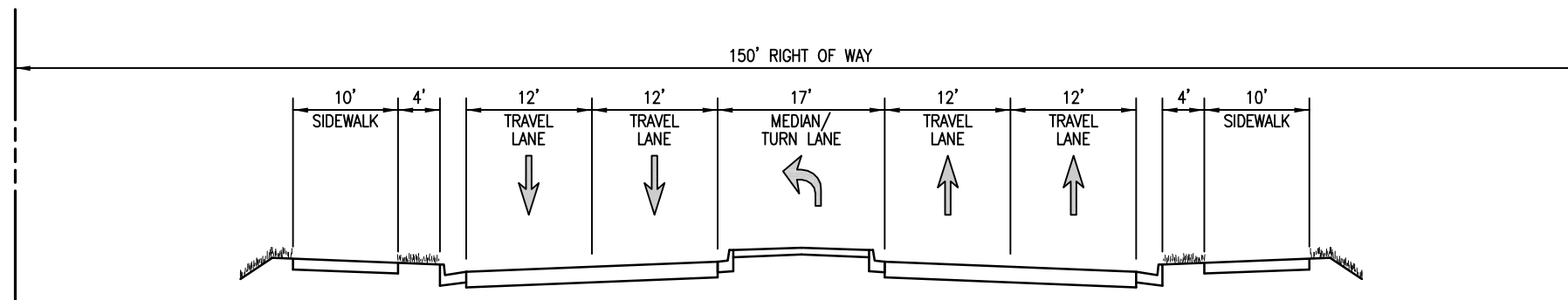
Typical Sections

Weld County Road 17/Quebec Street (Interim)



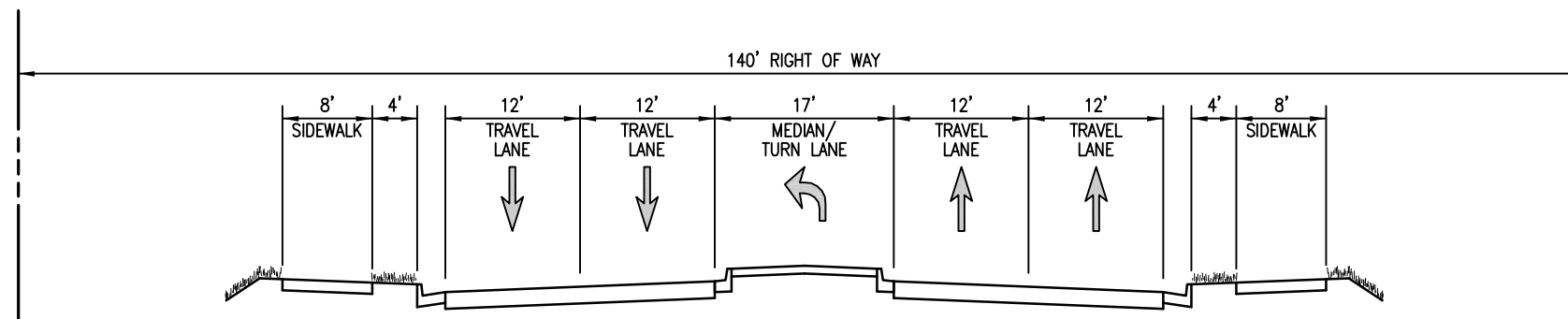
LOCAL ROAD

Weld County Road 17/Quebec Street (Ultimate)



MAJOR ARTERIAL

Weld County Road 2/East 168th Avenue (Ultimate)



MAJOR ARTERIAL

Figure 28



Weld/Adams County Line Crossroads Alignment Study

Weld County Road 19/Yosemite Street & Weld County Road 2/East 168th Avenue Intersection

Alternative 1



This offset intersection falls within only 2 jurisdictions - Adams County south of East 168th Avenue and Weld County north of East 168th Avenue. Only two alternatives were developed for this intersection. Both Yosemite Street south of East 168th Avenue and Weld County Road 17 north of East 168th Avenue are existing gravel roads.

Other characteristics of this intersection include:

- ▶ Existing Utilities include Noble Energy Gas Regulator Station
- ▶ Current Land Uses are Predominately Agriculture and Estate Residential
- ▶ A 435-foot Separation occurs between the Existing Intersections

The following two alternatives were developed for this intersection.

Alternative 1

Alternative 1 leaves Yosemite Street in its present location and shifts Weld County Road 19 to the east to realign with the existing East 168th Avenue and Yosemite Street intersection. This alignment shift occurs on the Robert Seltzer parcel that is currently undeveloped. Access for the single residence adjacent to existing Weld County Road 19 could be realigned and connected directly onto the realigned Weld County Road 19 alignment. Details such as access locations should be finalized during the final design process of the intersection improvements.

Alternative 1 Advantages:

- ▶ Utilizes Existing Road and Right-of-way South of East 168th Avenue
- ▶ Lowest Anticipated Construction Costs (\$4.40 million)

Alternative 1 Disadvantages:

- ▶ Bisects Parcels North of East 168th Avenue
- ▶ Minimal Impacts to Existing Residences
- ▶ Lower Public Preference (0 Votes)

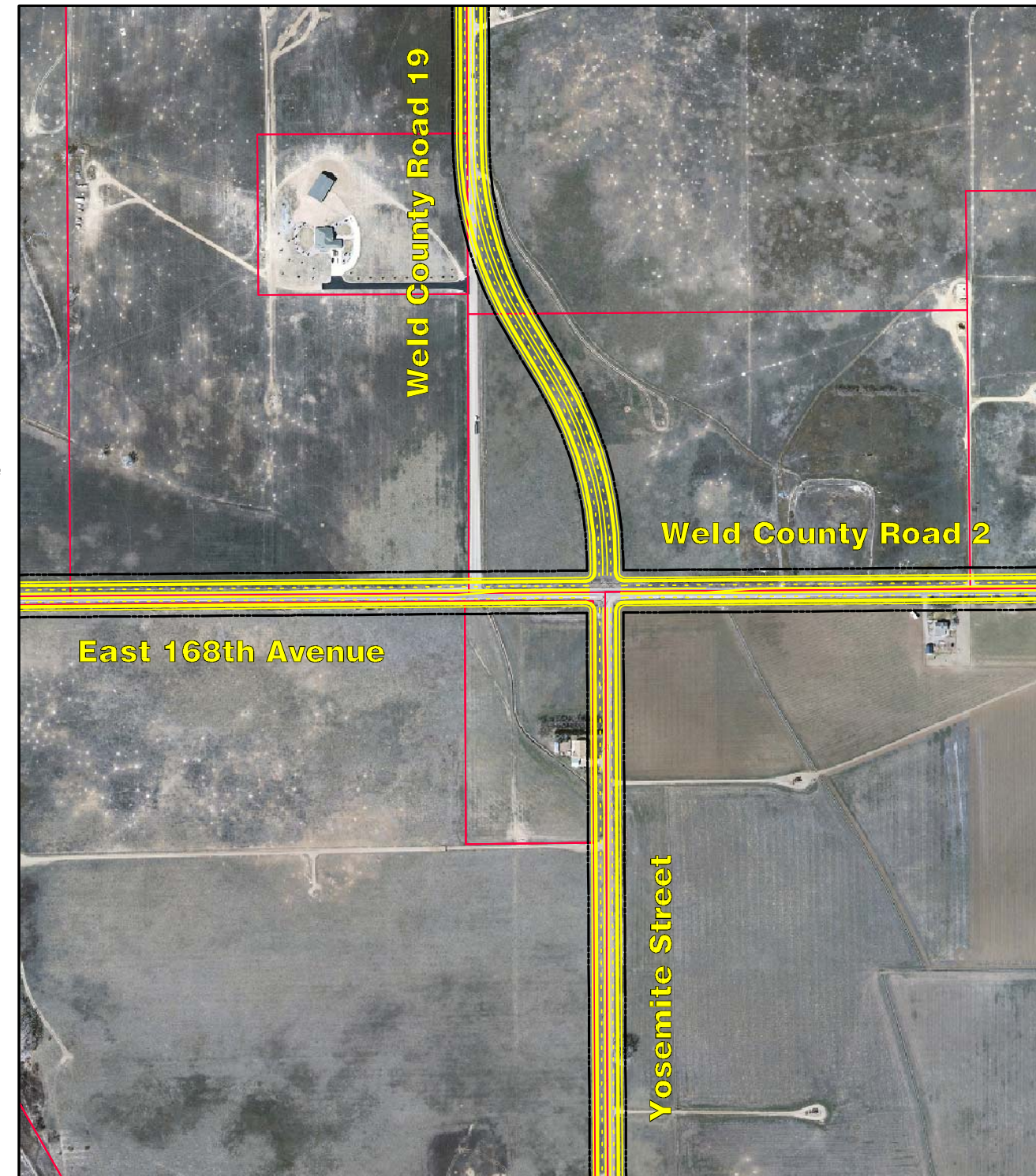


Figure 29



Weld/Adams County Line Crossroads Alignment Study

Weld County Road 19/Yosemite Street & Weld County Road 2/East 168th Avenue Intersection

Alternative 2



Alternative 2

Alternative 2 shifts Yosemite Street to the west to realign with the existing East 168th Avenue and Weld County Road 19 intersection. This alignment shift occurs on Seltzer Farms parcel where an existing residence is constructed on Yosemite Street. Access for this residence could be redirected to the realigned Yosemite Street or to East 168th Avenue. Details such as access locations should be finalized during the final design process of the intersection improvements.

Alternative 2 Advantages:

- ▶ Utilizes Existing Road and Right-of-way North of East 168th Avenue
- ▶ Higher Public Approval (10 Votes)
- ▶ Comparable Anticipated Construction Costs (\$4.60 million)

Alternative 2 Disadvantages:

- ▶ Bisects Parcels South of East 168th Avenue
- ▶ Minimal Impacts to Existing Residences

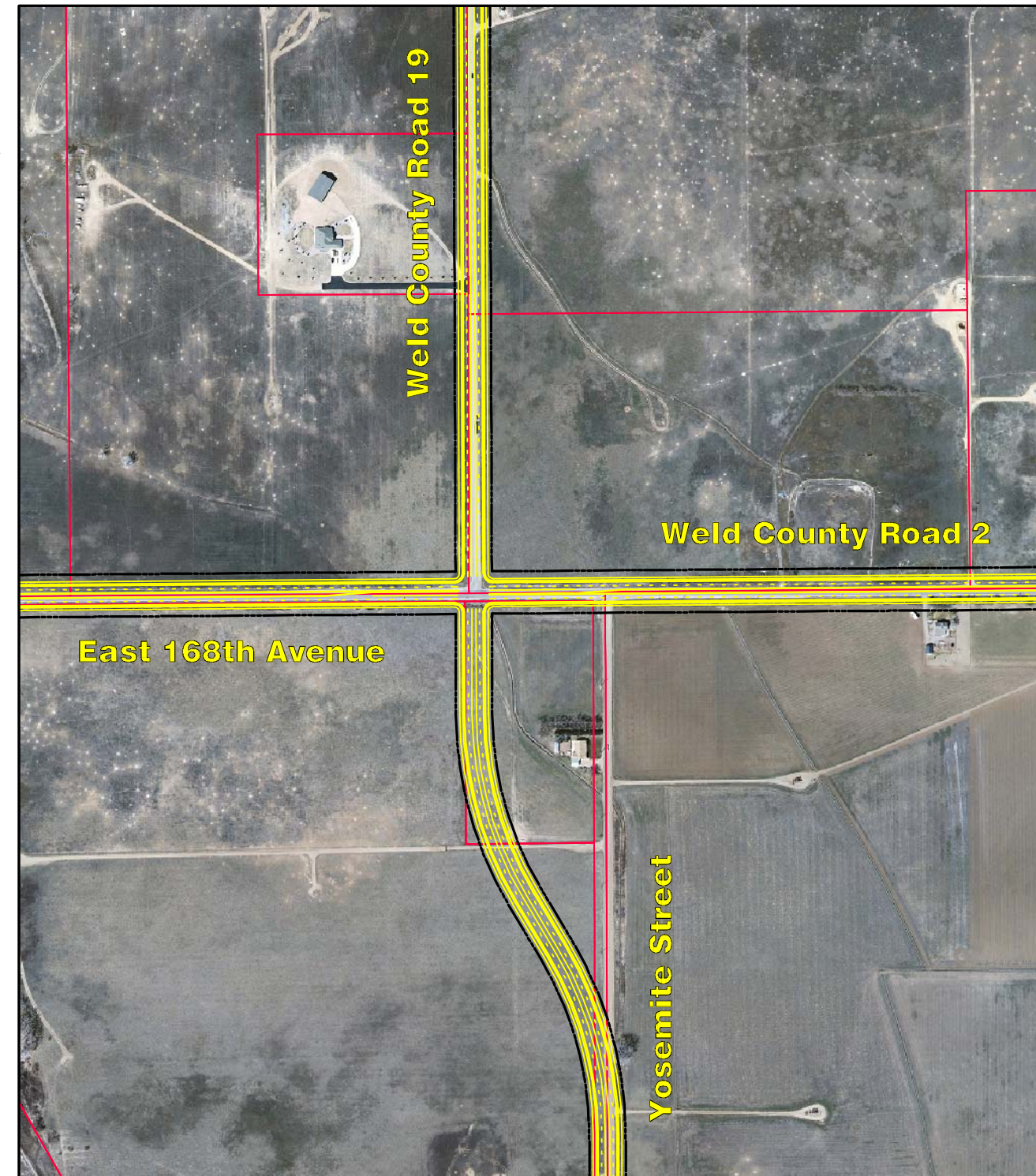


Figure 30



Preferred Alternative

From a design standpoint and based on impacts to existing features, both of these alternatives are very comparable. At the initial public open house, Alternative 2 was unanimously selected as the preferred alternative by the public. Alternative 2 could have more impacts to the existing residence south of East 168th Avenue due to the close proximity of Yosemite; however, when Yosemite Street is improved, it is anticipated the widening will occur to the east away from the residence. Considering these factors, Alternative 2 was selected as the preferred alternative for this intersection.

The recommend alternative for this intersection is shown on Figure 31. The anticipated typical sections for the interim and ultimate roadways for this intersection are shown on Figure 32.



Weld/Adams County Line Crossroads Alignment Study

Weld County Road 19/Yosemite Street & Weld County Road 2/East 168th Avenue Intersection

Recommended Alternative

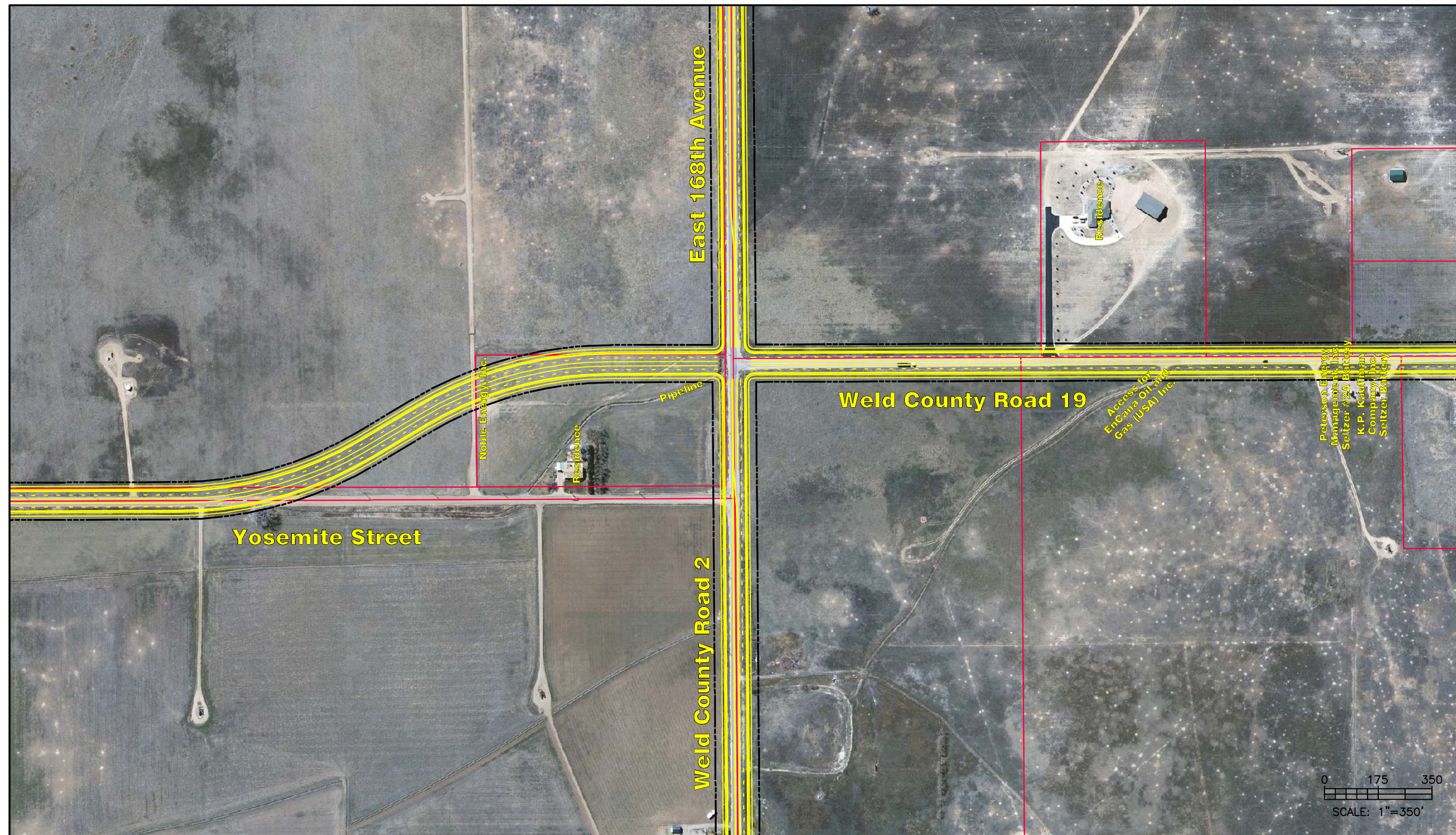


Figure 31

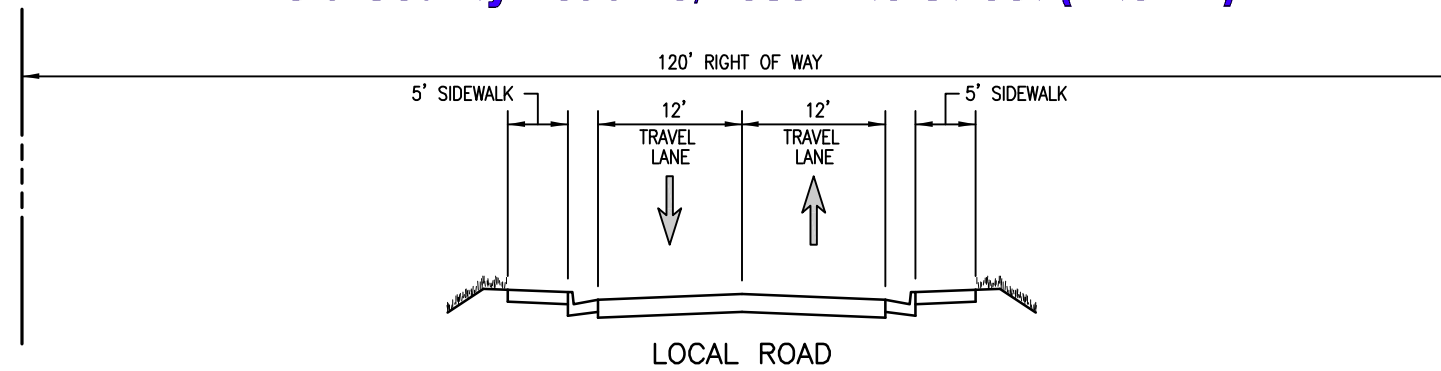


Weld/Adams County Line Crossroads Alignment Study

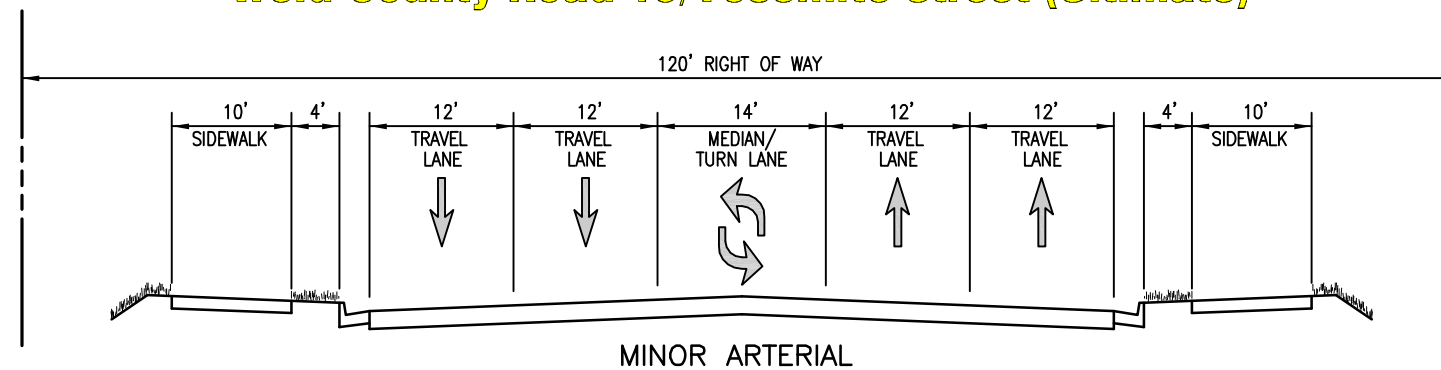
Weld County Road 19/Yosemite Street & Weld County Road 2/East 168th Avenue Intersection

Typical Sections

Weld County Road 19/Yosemite Street (Interim)



Weld County Road 19/Yosemite Street (Ultimate)



Weld County Road 2/East 168th Avenue (Ultimate)

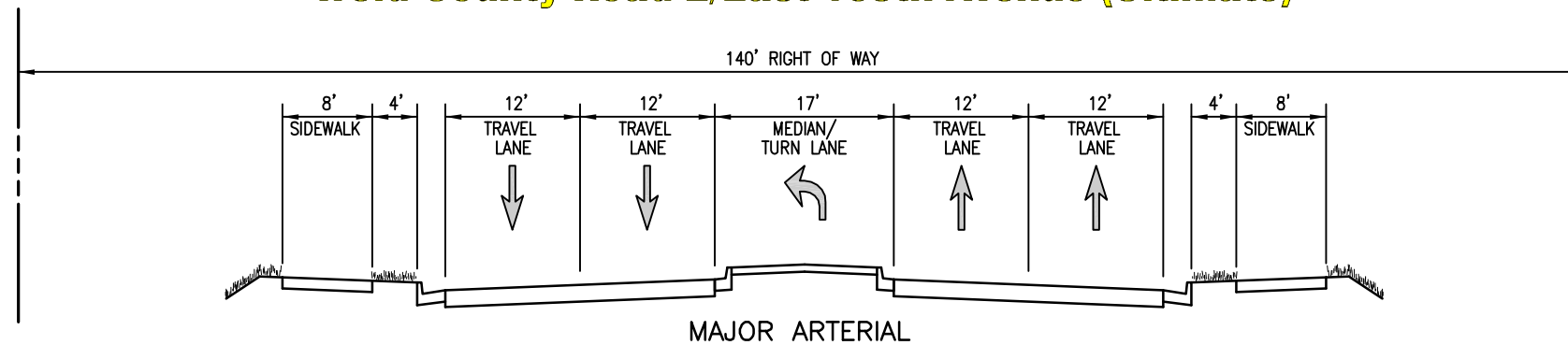


Figure 32

Weld County Road 23.5/Tucson Street & Weld County Road 2/East 168th Avenue Intersection

Alternative 1



This offset intersection falls within only 2 jurisdictions - Adams County south of East 168th Avenue and Weld County north of East 168th Avenue. Three alternatives were developed for this intersection; however, the third alternative was refined after the initial open house based on adjacent property owner input. Tucson Street south of East 168th Avenue has been improved and is currently paved. Weld County Road 23.5 north of East 168th Avenue is an existing gravel road. Parcels around this intersection are drastically different from those shown in the aerial photography due to heavy mining activity occurring within these parcels.

Other characteristics of this intersection include:

- ▶ Both Existing Intersections are located within the Existing Flood Plain
- ▶ An Existing Residence is Located on the North Side of the Tucson Street/East 168th Avenue Intersection (Cristofer Muhler)
- ▶ Current Land Uses are Predominately Agriculture
- ▶ A 460-foot Separation occurs between the Existing Intersections

The following three alternatives were developed for this intersection.

Alternative 1

Alternative 1 leaves Weld County Road 23.5 in its present location and shifts Tucson Street to the west to realign with the existing 168th Avenue and Weld County Road 23.5 intersection. This alignment shift occurs on the Apex Material Specialists LLC parcel that is currently being heavily mined.

Alternative 1 Advantages:

- ▶ No Impacts to Existing Residences
- ▶ Utilizes Existing Road and Right-of-way North of East 168th Avenue
- ▶ Does Not Bisect Future Mining Area North of East 168th Avenue (Hall-Irwin)
- ▶ Does Not Bisect Parcels North of East 168th Avenue
- ▶ Comparable Anticipated Construction Costs (\$3.37 million)

Alternative 1 Disadvantages:

- ▶ Impacts the Gravel Mining Operation South of East 168th Avenue (Front Range Aggregates)
- ▶ Requires Earthwork for the Roadway to fill in Mining Operation South of East 168th Avenue
- ▶ Bisects Parcel South of East 168th Avenue

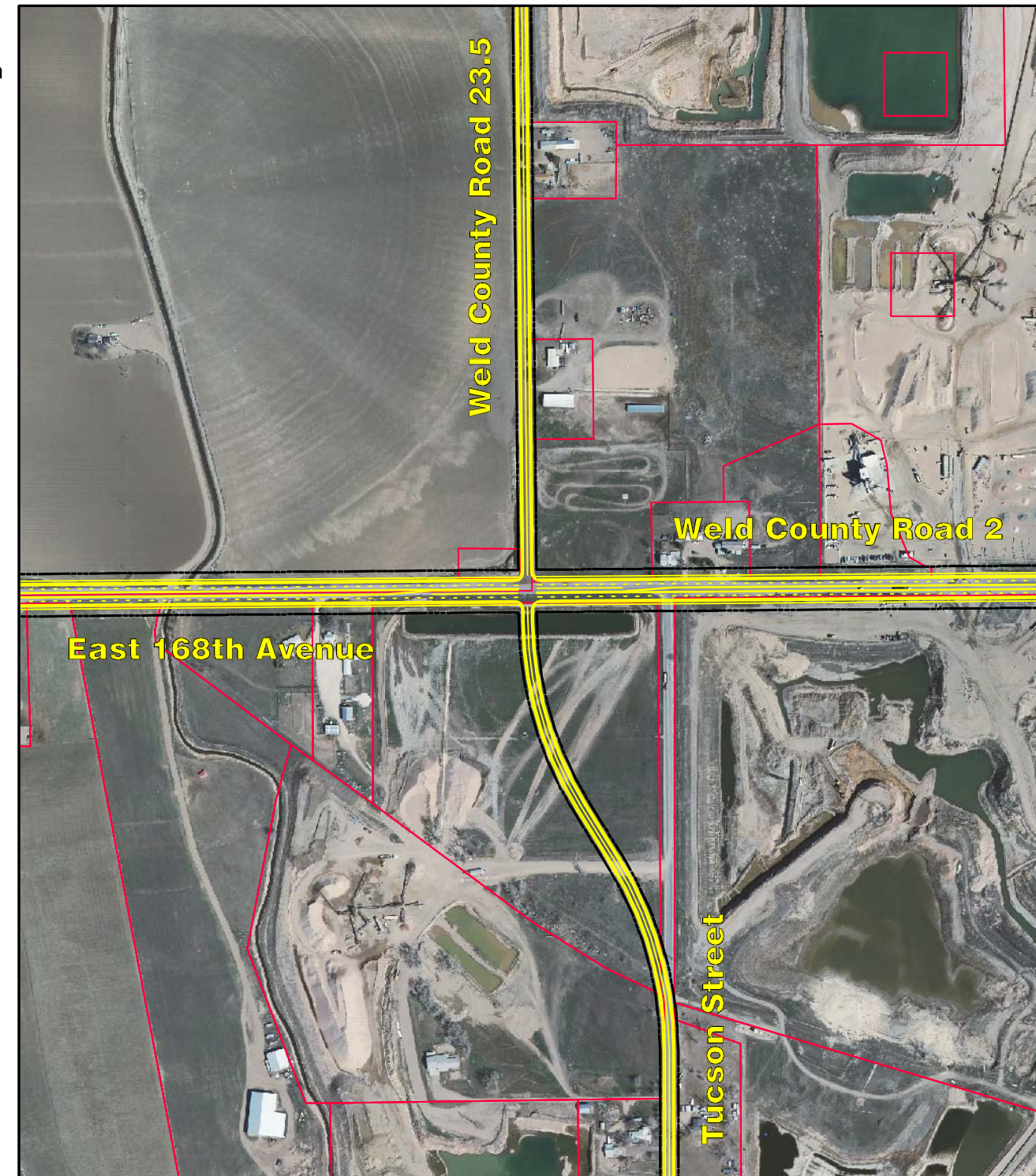


Figure 33



Weld/Adams County Line Crossroads Alignment Study

Weld County Road 23.5/Tucson Street & Weld County Road 2/East 168th Avenue Intersection

Alternative 2



Alternative 2

Alternative 2 shifts Weld County Road 23.5 to the east to realign with the existing East 168th Avenue and Tucson Street intersection. This alignment shift occurs within the Lot Holding Investments LLC parcel that has recently been permitted to be mined. This alternative would have detrimental impacts to the Cristofer Muhler parcel and residence.

Alternative 2 Advantages:

- ▶ Does Not Impact Mining Operations south of East 168th Avenue (Front Range Aggregates)
- ▶ Utilizes Existing Road and Right-of-way south of East 168th Avenue
- ▶ Does Not Bisect Parcel south of East 168th Avenue
- ▶ Comparable Anticipated Construction Costs (\$3.40 million)

Alternative 2 Disadvantages:

- ▶ Major Impacts to the Existing Residence north of East 168th Avenue (Cristofer Muhler)
- ▶ Bisects Future Mining Area north of East 168th Avenue (Hall-Irwin)
- ▶ Bisects Parcels North of East 168th Avenue

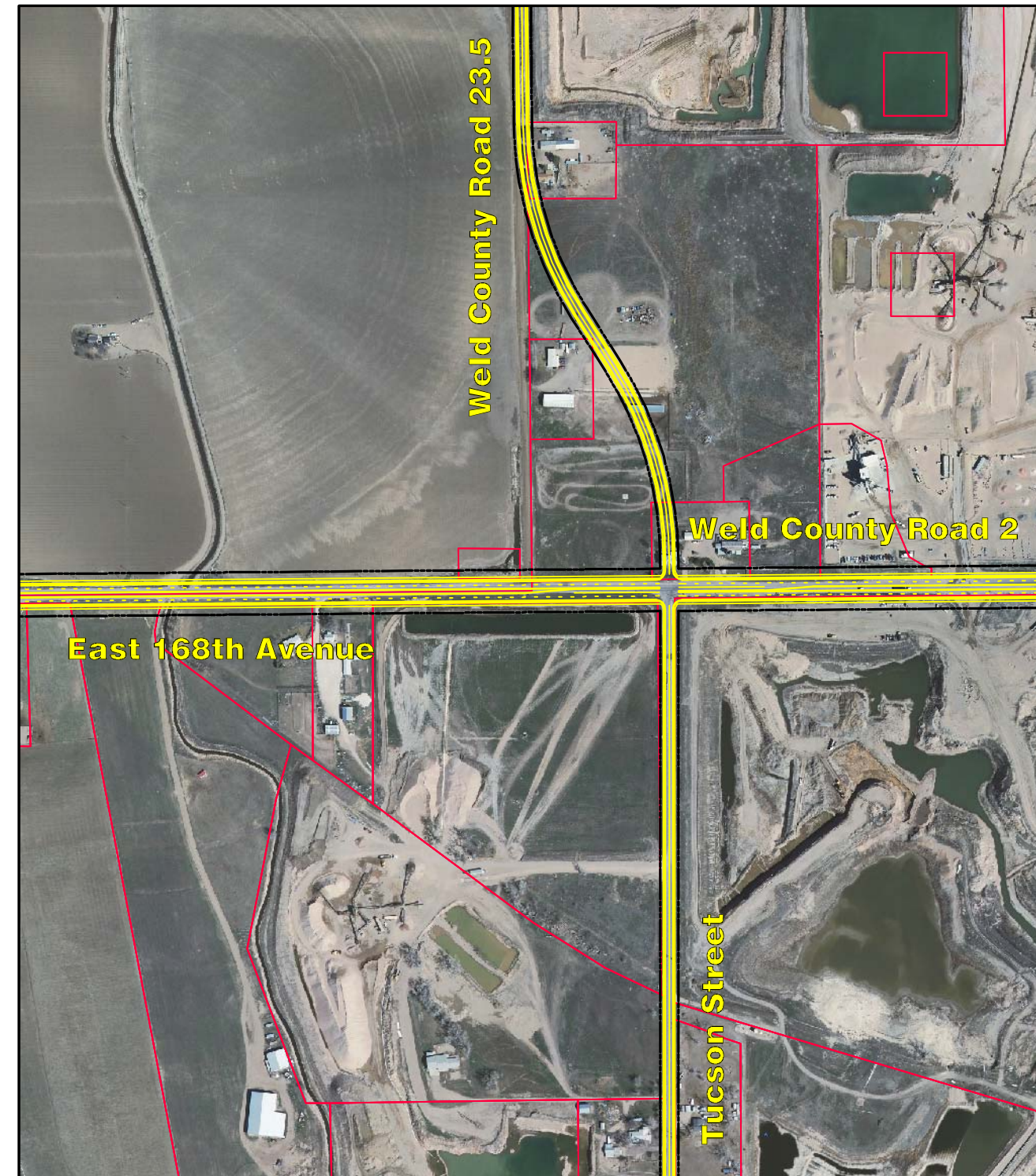


Figure 34



Weld/Adams County Line Crossroads Alignment Study

Weld County Road 23.5/Tucson Street & Weld County Road 2/East 168th Avenue Intersection

Alternative 3



Alternative 3

Alternative 3 splits the difference between the two existing intersections at Weld County Road 23.5 and Tucson Street on East 168th Avenue. This alignment shift would affect the proposed mining operations north of East 168th Avenue and the existing mining operations south of East 168th Avenue equally.

Alternative 3 Advantages:

- ▶ Does Not Require the Relocation of the Existing Residence North of East 168th Avenue (Cristofer Muhler)
- ▶ Bisects Both Mining Operations North and South of East 168th Avenue Equally
- ▶ Most Favored by Public (4 Votes)
- ▶ Comparable Anticipated Construction Costs (\$3.23 million)

Alternative 3 Disadvantages:

- ▶ Does Not Utilize any Existing Rights-of-way and Roadways

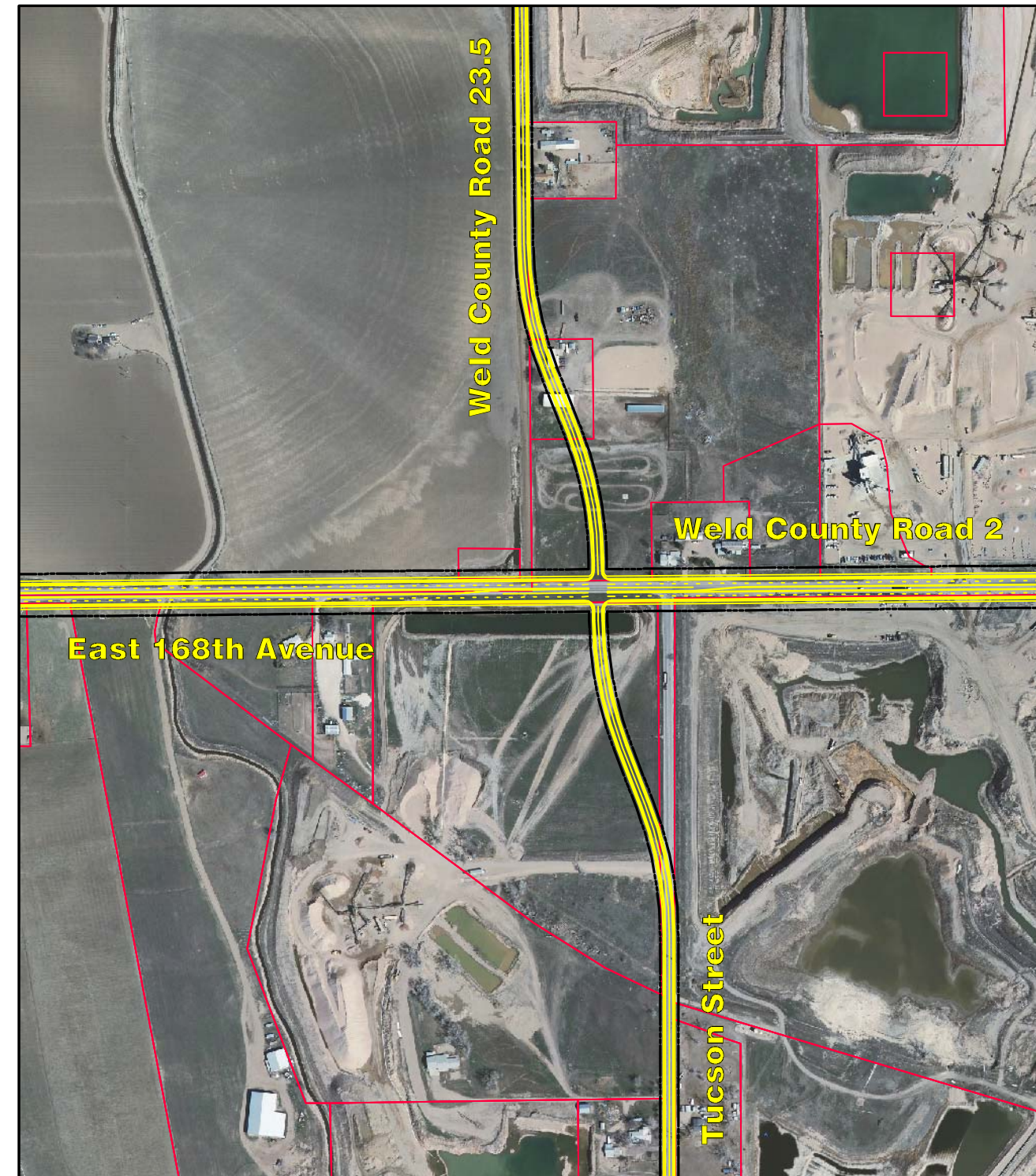


Figure 35



Weld/Adams County Line Crossroads Alignment Study

Weld County Road 23.5/Tucson Street & Weld County Road 2/East 168th Avenue Intersection

Alternative 3a



Alternative 3a

Alternative 3 is a variation of Alternative 3 as the proposed intersection shifts slightly to the east towards Tucson Street. This alignment shift would affect the proposed mining operations north of East 168th Avenue more than the existing mining operations south of East 168th Avenue.

Alternative 3a Advantages:

- ▶ Does Not Require the Relocation of the Existing Residence North of East 168th Avenue (Cristofer Muhler)
- ▶ Minimal Impacts to the Mining Operations South of East 168th Avenue (Front Range Aggregates)
- ▶ Comparable Anticipated Construction Costs

Alternative 3a Disadvantages:

- ▶ Does Not Utilize any Existing Rights-of-way and Roadways
- ▶ Bisects Parcels on Both Sides of 168th Avenue
- ▶ Bisects Future Mining Area North of East 168th Avenue (Hall-Irwin)

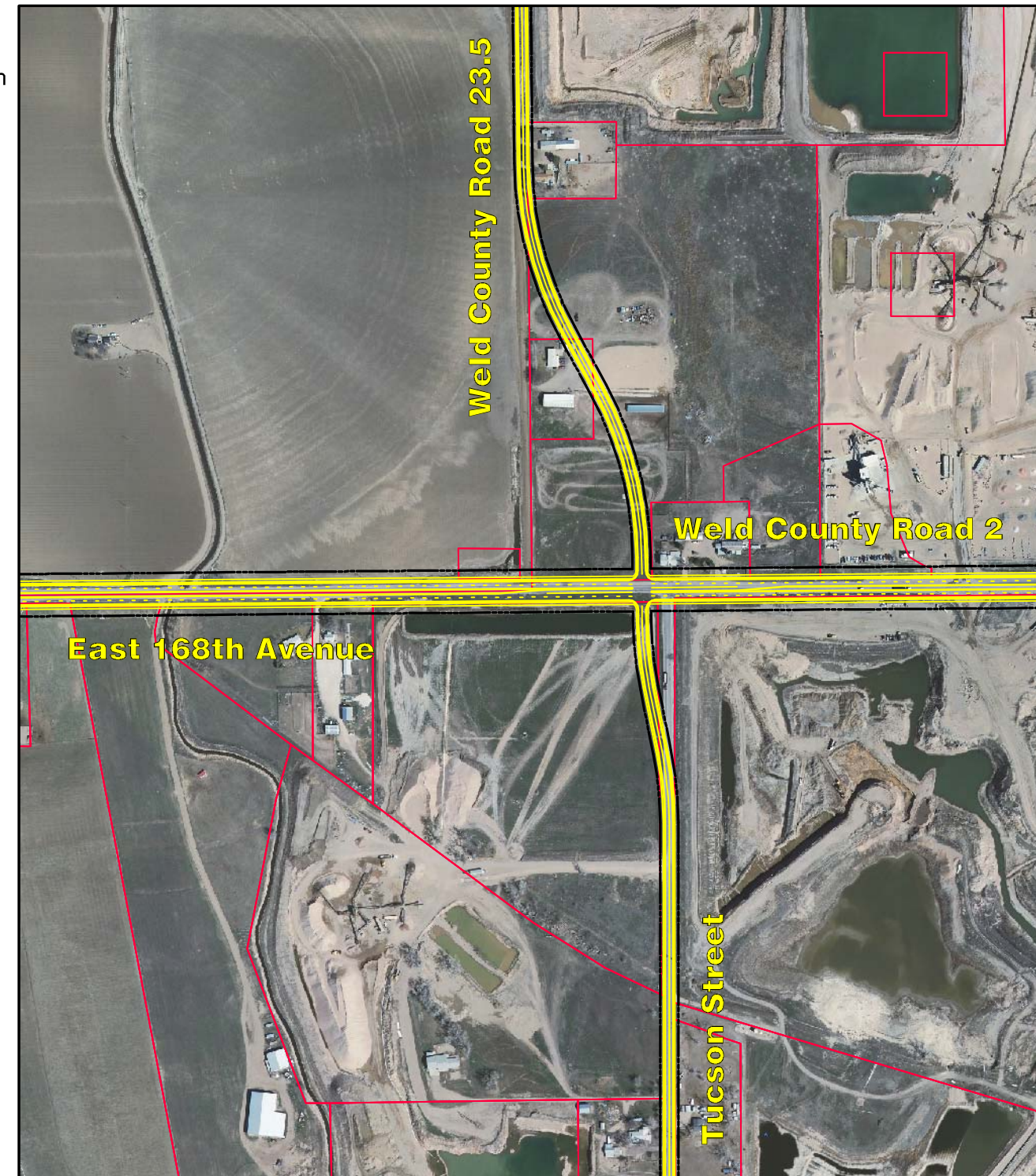


Figure 36



Weld/Adams County Line Crossroads Alignment Study

Preferred Alternative

After the evaluation process, Alternative 3 was the preferred alternative for this intersection. However, due to mining operations constraining the alternatives that were developed for this intersection, additional coordination was conducted with Front Range Aggregates and Hall-Irwin in order to better define potential cost implications with implementing any of the intersection alternatives.

Front Range Aggregates:

Front Range Aggregates reclamation plan shows permanent water storage and is already permitted for this use. The mining adjacent to Tucson Street is in the process of being completed for permanent water storage, but this pond has not been lined yet. In order to revise Front Range Aggregates reclamation plan to accommodate a realigned Tucson Street, the costs would have to include a re-engineering of the site and an amendment to their reclamation plan that would have to be approved by the Colorado Division of Reclamation Mining and Safety. Other concerns associated with reducing their current permanent water storage facility is that this reduction in size may be less attractive to prospective purchasers of the water storage and may yield this site as unusable as well. The lining of the Front Range Aggregates is anticipated to occur this fall (2008). If Front Range Aggregates reclamation strategy needs to be altered, it would need to be done before they begin the placement of the liner.

Hall-Irwin:

Hall-Irwin is already in the process of constructing slurry walls for the mining operations and tentatively plans to start gravel mining next summer (2009). Hall-Irwin does show a water storage reservoir on their reclamation plan that has already been sold to Aurora Water for future water storage.

Recommendation:

Due to the mining constraints around this intersection and based on the low traffic demand on Weld County Road 23.5 (198 vehicles per day) and Tucson Street today, Weld County Road 23.5 and Tucson Street are not anticipated to be a major traffic route. Therefore, the final recommendation for this intersection is to leave it in its current configuration.

The recommend alternative for this intersection is shown on Figure 37. The anticipated typical sections for the interim and ultimate roadways for this intersection are shown on Figure 38.



Weld/Adams County Line Crossroads Alignment Study

Weld County Road 23.5/Tucson Street & Weld County Road 2/East 168th Avenue Intersection

Recommended Alternative



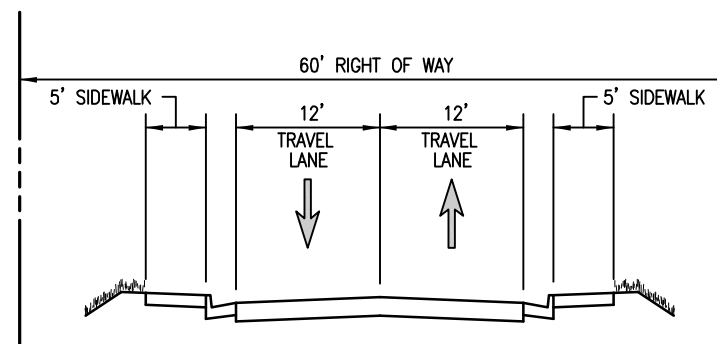
Figure 37



Weld County Road 23.5/Tucson Street & Weld County Road 2/East 168th Avenue Intersection

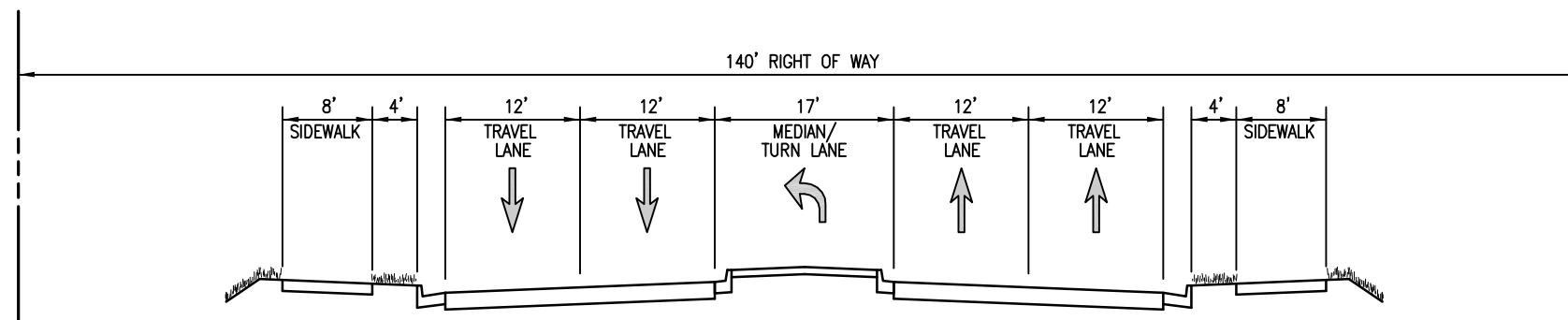
Typical Sections

Weld County Road 23.5/Tucson Street (Interim/Ultimate)



LOCAL ROAD

Weld County Road 2/East 168th Avenue (Ultimate)



MAJOR ARTERIAL

Figure 38



V. CONCLUSION

Intersection Configurations

The layout of the intersection configurations of the preferred alternatives as outlined in Chapter 4 are approximate in the capacity that the alignments can shift subtly in order to better fit the planned developments and existing features surrounding the intersections; however, the overall functionality of the intersections should not be compromised as a result of any modifications. It is envisioned that East 168th Avenue and the north-south roadways would be constructed as 2 lanes plus auxiliary lanes where required in an initial phase with the ultimate roadway width being constructed when traffic demand warrants additional lanes.

Study Implementation Process

When the study is complete, it is anticipated that every agency will have a different approval and implementation process. Weld County staff will present the findings of the study to the Board of County Commissioners for consideration and approval at a public hearing. Adams County will amend the County's transportation plan to include the intersection alignments and designate classifications and ultimate build-out widths for the crossroads and East 168th Avenue. Other agencies may not formally approve the final report through their city councils, but it is anticipated that they will still utilize the report as a planning tool as development occurs in the study corridor area. In order to confirm that the involved agencies are planning these recommended intersection improvements cooperatively, Intergovernmental Agreements (IGAs) between the involved agencies may be pursued to ensure that the intersection improvements are preserved for future implementation.

Intersection Improvement Implementation Process

Presently, there is no specific schedule for the construction of these identified intersection improvements. The construction schedule for these intersection improvements will be highly dependent on the growth and development that occurs within the corridor study area. Weld County, Adams County, the City and County of Broomfield, the City of Northglenn and the City of Thornton will use this study as a basis to preserve rights-of-way for the intersection improvements as development in the area occurs. Rights-of-way not preserved through the development process may be purchased as needed. Furthermore, as development occurs, it is anticipated that developments adjacent to the intersections will be responsible for the construction required to mitigate their impacts. The jurisdictional agencies surrounding each intersection within the corridor study area will be responsible for the improvements not funded by developments.



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