

CHAPTER 7  
INNOVATION  
& NEW  
TECHNOLOGY



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## 7.1 - KEY ISSUES

As part of the Phase 1 existing conditions analysis, the *Advancing Adams* team conducted a future trends workshop called TrendLab+ to explore how local travel behavior might change in the future, particularly in light of the COVID-19 pandemic. TrendLab+ is a Fehr & Peers tool that uses both national research and local trends in Adams County to explore how the response to the COVID-19 pandemic, its impacts on the economy, and other travel-related trends may affect short- and long-term travel behavior, traffic levels, and transit use in the County. Inputs includes changes such as labor force participation, working from home, goods and service delivery, technology, and micromobility. Workshop participants identified a range of trends that may impact transportation in Adams County:

- The local economy is changing, with a potential reduction in fossil fuel-related industries and an increase in warehousing and logistics. This will create a need for technologies that can enable more efficient movement of goods.
- Adams County has experienced growing demand for single family homes, which has led to the increased prevalence of lower density residential areas where residents are vehicle dependent. In addition, during the COVID-19

pandemic, it became evident that workers living in Adams County tend to be employed in essential roles and many do not have the option to replace commute trips with teleworking. These two trends combine to suggest that demand for vehicle travel in Adams County will continue to grow.

- As Adams County continues to see investment in public transit, namely the addition of new RTD commuter rail lines, there will be opportunities to leverage emerging mobility technologies connections to help connect County resident and visitors with transit.

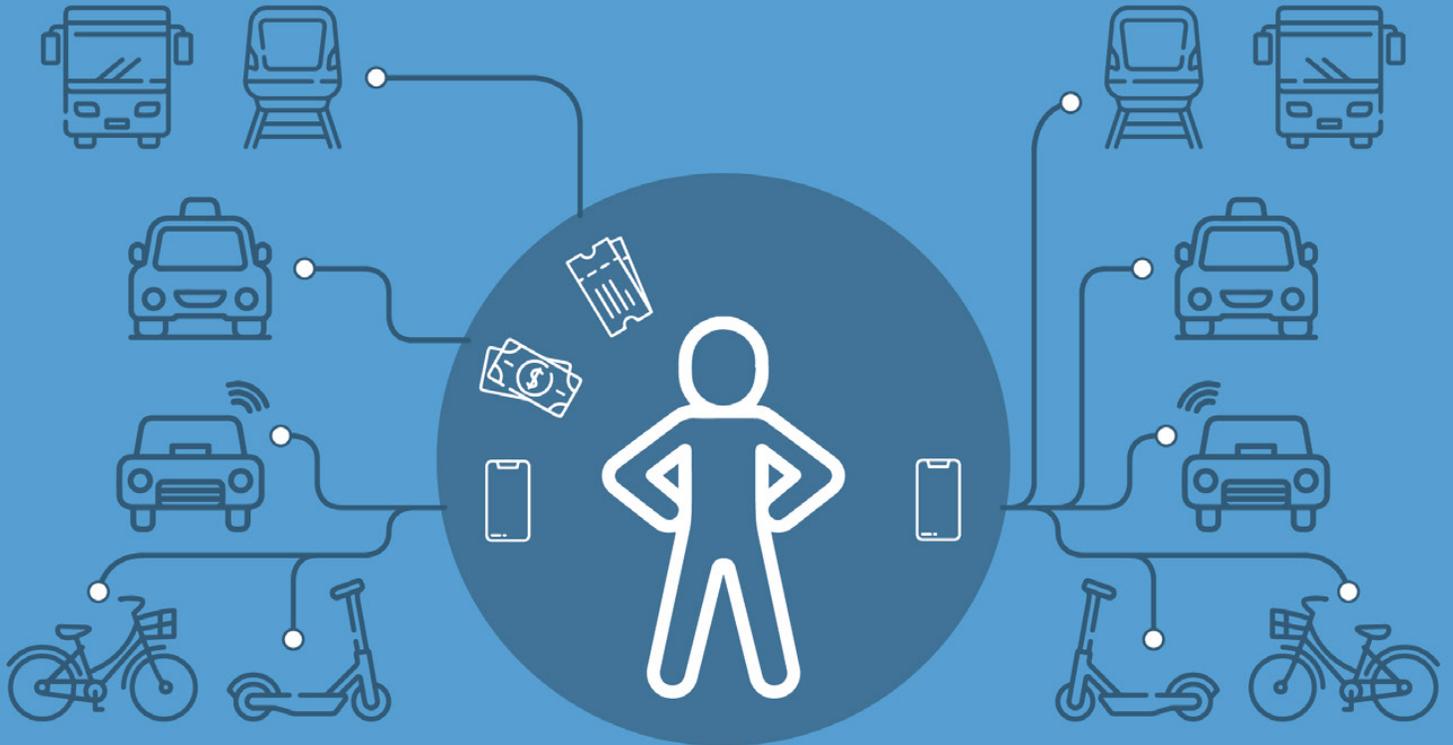
This chapter profiles the strategies Adams County will undertake to ensure it both deploys innovative and technologically up to date resources for managing transportation demand and is prepared the future of mobility across the Front Range.

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## 7.2 - EMERGING MOBILITY SOLUTIONS

The follow section profiles various emerging mobility strategies and solutions for managing transportation demand. These strategies address the range of transportation trends anticipated in Adams County as identified by participants in the *Advancing Adams* planning process.

# The Mobility as a Service (MaaS) Model



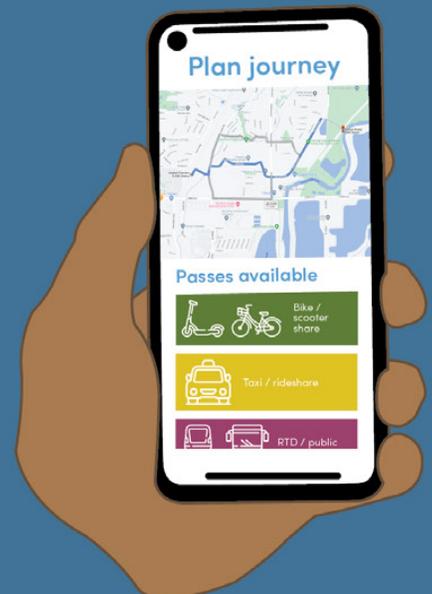
Today

With MaaS

Multiple mobility options brought together in an app, accessed with or without a subscription

Package examples	Base <b>\$60</b> /mo	Weekend <b>\$250</b> /mo	Unlimited <b>\$500</b> /mo	No package Pay as you go
<b>RTD / public transit</b>	30-day pass	30-day pass	30-day pass	Pay as you go
<b>Taxi / rideshare (5 mi)</b>	\$10	-15%	Unlimited	Pay as you go
<b>Car share</b>	\$50	Weekends	Unlimited	Pay as you go
<b>Bike / scooter share</b>	Unlimited	Unlimited	Unlimited	Pay as you go

Every option in the palm of your hand



## 7.2.1 – MOBILITY AS A SERVICE

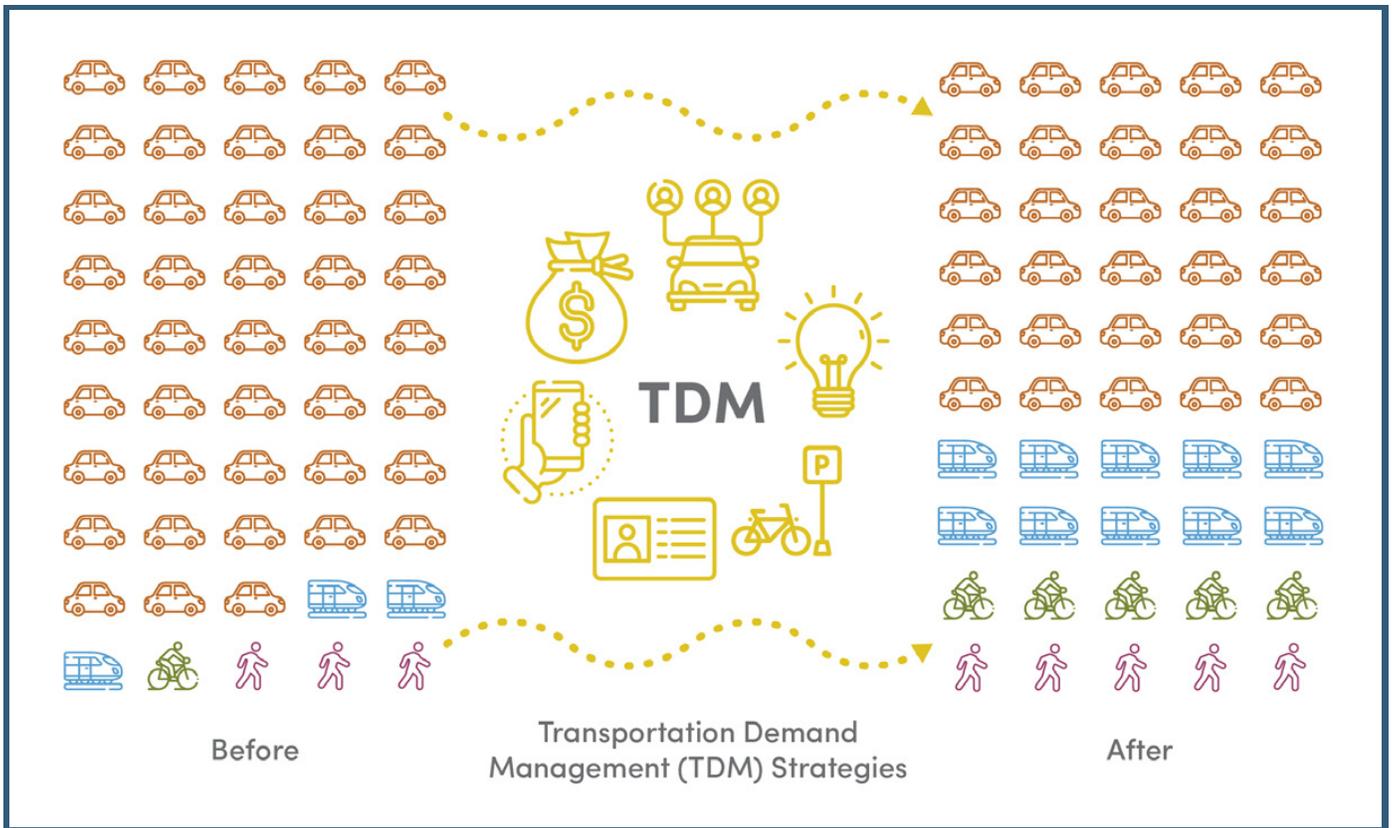
Given that many Adams County residents currently rely on driving due to existing land use patterns and a lack of choice regarding when to travel, the County can promote transportation alternatives by lowering the barrier to identifying ways trips can be made using a combination of walking, bicycling, and transit. Mobility as a Service (MaaS) describes the shift away from privately owned automobiles and toward transportation that is offered as a service. This includes both public and private providers that can work together to provide a holistic landscape of transportation options, either as a subscription or pay-as-you-go service. MaaS provides reliable and comprehensive transportation options and information that can reduce the reliance on or eliminate the need for private automobiles. Instead of incurring auto ownership related costs, like loan payments, insurance, and fuel, MaaS instead shifts personal transportation spending to paying for access to transportation services, which reduces the “sunk costs” of automobile ownership, decreases congestion, reduces emissions, increases the use of public infrastructure, and provides transportation providers with the data they need to be more cost-effective. MaaS can become increasingly appealing and viable through an integration of modes that includes

payment integration, a trip-planning app, and mobility hubs.

In order to address the challenges that can result from Adams County residents being vehicle dependent, the County can use MaaS as a platform to make transportation alternatives more attractive and easier to use. This can be achieved by working with private transportation providers to share data with the County, which would facilitate providing trip planning resources to County residents. One option is partnering with a third-party vendor to create a trip planning smartphone app for Adams County. Alternatively, the County can promote existing applications that give travelers access to trip planning information for RTD. In areas beyond the RTD service area, the County can explore public-private partnerships that use private providers to provide public transit. These partnerships can also help improve human service transportation provision.

## 7.2.2 – TRANSPORTATION DEMAND MANAGEMENT

Transportation Demand Management is also described under programs and policies in **Chapter 2** but has a focus on innovation in this section. According to Smart Commute Metro North, the Transportation Management Organization that serves the Denver metro north region and is based in Adams County, the main barriers that prevent Adams County commuters from traveling by means other than single occupancy vehicle are the



lack of transit connectivity and the limited opportunities for walking or bicycling to work due to existing land use patterns (Figure 7.1). Previously, the most effective tools for shifting commute trips away from driving were promoting carpooling and raising awareness of the opportunity to take transit for many people commuting from Adams County communities into downtown Denver. Today, with travel behavior being impacted by the COVID-19 pandemic, many workers have either replaced commute trips with telework or scaled back on the volume of commute trips they take each week. Adams County can launch a Transportation Demand Management (TDM) program that closely coordinates with economic

development to understand what types of employers are coming to the County, how their workforces commute, and what opportunities exist to work with major employers to shape TDM strategies that align with *Advancing Adams*.

When working with employers who have essential workers as the core of their workforce, the Adams County TDM program can focus on promoting carpooling, identifying opportunities to put in place microtransit or shuttle systems, and raising awareness on opportunities to connect with high-capacity transit. To ensure the success of these initiatives, Adams County can coordinate with major employers to provide commute incentives like transit passes or toll lane reimbursements

**Figure 7.1:** Transportation Demand Management Concept (source: Fehr & Peers)

and gas vouchers for employees who carpool. In addition, the TDM program could develop tools for lowering the barrier to carpooling like sponsoring a ride matching smartphone application that allows employees who carpool to locate one another and identify the most efficient routes between their home locations and place of work.

For employers with a predominantly white collar, information-based workforce, the TDM program can focus on promoting the benefits of teleworking. Specifically, by reducing the volume of commute trips, the County can help manage congestion and improve air quality.

**Figure 7.2:**  
Example of  
Booking a  
Ride with a  
Transportation  
Network  
Company (source:  
Fehr & Peers)



## 7.2.3 - SHARED MOBILITY

Shared mobility, which is the shared use of a motor vehicle, bicycle or scooter, represents a growing segment of the wider mobility network. Users have short-term access to a mode of transportation on an as-needed basis rather than relying on private ownership of the mode. Shared mobility provides a broader set of transportation options for users that reduces reliance on the private automobile, therefore reducing congestion and carbon emissions. Shared mobility is a key component of MaaS, which was described earlier in this chapter. Shared mobility options require relatively high population densities to be successful, since the providers need to serve a large volume of users making frequent, relatively short trips in order to be financially viable. While shared mobility might not be appropriate for areas like eastern Adams County, the southwestern portion of the County and the future Town Centers are two locations where shared mobility can play a more significant role. Further feasibility studies should be performed to determine if and where shared mobility is appropriate in Adams County. The subsections following go into greater detail on the various forms of shared mobility—ride-hailing, bike/scooter share, and car-share.

### 7.2.3.1 - Ride-hailing

The best known form of shared mobility is ride-hailing, which is

provided primarily by Transportation Network Companies (TNC), like Uber and Lyft (**Figure 7.2**). At its most basic level, ride-hailing is simply the modern version of a taxi, using a website and/or smartphone apps that match passengers with drivers. TNCs currently operating within Adams County and the surrounding region are Uber and Lyft.

Nationally, TNCs/ride-hailing represent the fastest growing transportation mode. Ride-hailing services meet a wide range of travel needs including evening and weekend trips when transit does not operate, airport trips that can be easily timed, or trips to locations where parking will be difficult or expensive. Ride-hailing also has some negative impacts. TNC drivers must spend time driving alone between trips (called deadhead time), which can lead to increased cars on the road, energy use/greenhouse gas emissions, and traffic congestion. This problem is especially prevalent in lower density areas where riders are spread out. In more urbanized settings, TNC vehicles compete for curbspace with freight vehicles, people seeking to park, bicyclists, and other users. Ride-hailing is also not always equitable, since lower income households cannot rely on ride-hailing. This is predominantly due to TNC providers using dynamic pricing, which causes trips during periods of higher demand to be a higher price. Without being able to predict the price of a trip, lower income households



cannot know in advance whether a TNC trip will be affordable.

Because Adams County residents have a high rate of reliance on their private vehicles, it is unlikely that TNC trips will replace a significant share of trips in a personal vehicle. However, as the southwestern portion of the County continues to densify and receive more transit service, TNCs may begin to play a larger role. Adams County can partner with TNCs to provide subsidized rides to and from transit stations in order to help boost transit ridership. This strategy has successfully been employed in other communities to help bridge first and final mile gaps in lower density areas.

### 7.2.3.2 - Bike/Scooter Share

Bike share systems for both human-powered and electric bicycles, and

**Figure 7.3:**  
Image of Dockless Electronic Scooters (source: Fehr & Peers)

more recently electric-scooter share, have been a rapidly evolving trend over the last decade and have growing presence in communities around the country (**Figure 7.3**). Bike share and scooter share have the potential to increase transportation options available in Adams County, especially in the areas surrounding transit stations. For example, the new Pecos Junction Station is close (one mile) to the Midtown development, but far enough away to make walking access difficult for some users. With the addition of more comfortable multimodal facilities – something that can be planned through *Advancing Adams* – bike share or scooter share can serve as a first and last mile solution for accessing transit. Introducing these types of mobility options would require the County to manage the services so they complement land use and transportation goals, while mitigating potential issues. Up-to-date policies on where and how users can operate these mobility devices are needed to ensure that users are safely using these devices and integrating

with other modes. The integration of scooters into the network would have an impact on the maintenance needs and even design of roadways, sidewalks, and bicycle facilities; for example, the small wheels of the scooter are more sensitive to potholes, cracks, and debris.

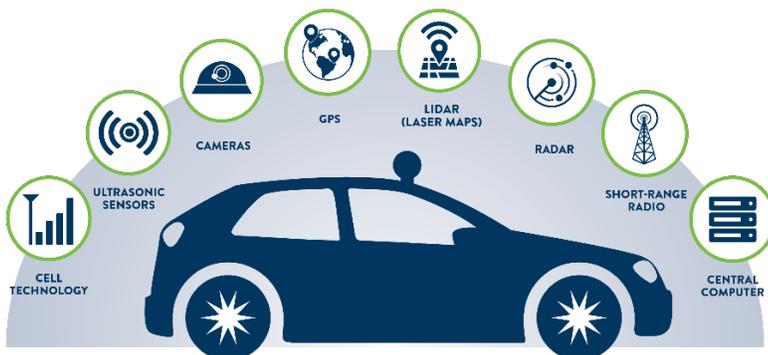
### 7.2.3.3 - Car-Share

Car-sharing is a model for car rental, similar to bike share or scooter share, which allows users to pay for access to vehicles for limited periods of time. Car-share systems tend to have vehicles dispersed throughout an area and can be easily reserved on a webpage or smartphone app. Adams County can support car-share in the future by dedicating parking spaces for car-share providers both on-street and partnering with RTD to provide car-share services at rail stations. In addition, the County can provide incentives or requirements for new developments to provide car-share and/or car-share parking. The appetite for introducing car-share depends on the extent to which people can travel by foot, bicycle, and transit, all of which afford the ability to travel to and from designated car-share parking without a private automobile.

## 7.2.4 - AUTONOMOUS VEHICLES

Autonomous and Connected Vehicles (AV/CV), are two technologies that are rapidly evolving with the potential to significantly impact travel patterns

**Figure 7.4:** Illustration of the concept of Autonomous Vehicles (source: Minnesota Department of Transportation)



and trip choices in the future. AVs are capable of sensing the environment and moving through the street network with little or no human input. CVs are vehicles that communicate with other vehicles on the road, as well as connected infrastructure (e.g., signals), to improve roadway use and safety. As discussed in the TrendLab+ workshop summary, near-term widely adopted use of AVs in Adams County is not likely, but the County can use *Advancing Adams* as an opportunity to prepare for and have a foundation of policies in place for this new mode and its associated challenges. For example, research on travel behaviors suggests that AVs may decrease transit usage except for high-frequency transit services like trains or bus rapid transit that operate on a dedicated facility. AVs may pose new risks to pedestrian safety or implications for lower income communities who are not able to adopt the new technology as quickly. AVs may also increase vehicle miles traveled (VMT) as the opportunity cost of driving goes down. Strategies for proactively addressing any potential negative impacts from AVs include:

- Setting maximum speed limit standards that vehicles must adhere to on local streets where bicyclists and pedestrians are more likely to be present.
- In the case of shared AVs, adopting policies that overcome the digital divide by enabling users without smartphones to have equal access to the mobility service.



- Establishing programs and incentives for using AVs as a formal first and last mile connection to transit stations.

**Figure 7.5:** Example of an EV Charging Station (source: Colorado Energy Office)

It is recommended that Adams County pursue these strategies during implementation of the Transportation Master Plan.

## 7.2.5 - ELECTRIC VEHICLES AND CHARGING INFRASTRUCTURE

Electric vehicle (EV) technology continues to advance at a rapid pace with increasing regulatory and financial incentives to encourage production and use at both the State and Federal level. While EVs do not reduce traffic congestion, they do reduce emissions, which is in line with the environmental sustainability goals for Adams County. The presence

of oil and gas refineries as well as other industrial land uses causes Adams County to have somewhat poor air quality. The United States Environmental Protection Agency reported that in 2019, Adams County had the third highest number of days with a moderate Air Quality Index in Colorado. Moderate air quality is defined as air quality being acceptable, though people who are unusually sensitive to air pollution, like individuals with underlying health conditions or older adults, may be at risk. In Adams County, Air Quality Index was in the moderate range for nearly 39% of days in 2019. Achievement of lower emissions through EVs can partially offset the air quality impacts caused by these other users. In planning for future EV integration, Adams County can consider provision of on-street and off-street EV charging stations and preferential parking and increasing the number of charging stations on public property as well as incentives and requirements for provision of EV charging stations and infrastructure by developers. An example of a public EV charging station is shown in **Figure 7.5**. In addition, I-25 is a federally recognized alternative fuel corridor, where infrastructure upgrades are being made to support the use of electric and other alternative fuel vehicles.

## 7.2.6 - ESTABLISHING MOBILITY HUBS

As discussed in the profile of Washington Street in **Chapter 2**, mobility hubs could play a role in the future Adams County transportation network. Mobility hubs are enhanced transit stops where bus and/or rail lines converge to provide rapid connections for transit riders. Mobility hubs are designed to act as a user-friendly travel resource that lowers the barrier to using transit. Mobility hubs can include TNC loading zones, secure bike parking, charging stations for e-bikes, free wi-fi, power outlets, and real-time transit information so anyone arriving at the mobility hub can easily plan the rest of their trip (**Figure 7.6**). Adams County can partner with RTD to implement mobility hubs on corridors with high levels of transit ridership or in locations where transit supportive land uses are anticipated.



**Figure 7.6:** Illustration of a Mobility Hub  
(source: Fehr & Peers)