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# INNOVATION & EMERGING MOBILITY

This section takes a deeper dive into Innovation & Emerging Mobility in Adams County by looking at:

- TrendLab+ Outcomes
- The Role of Future Mobility Strategies

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## SUMMARY OF TRENDLAB+ OUTCOMES

The COVID-19 pandemic and associated recession has altered nearly every aspect of daily life, including travel patterns. COVID-19 is a highly contagious disease that spread across the United States beginning in March 2020, and continues to spread at the time of publication of this report. Due to the highly contagious nature of the disease, local and state guidelines have restricted travel, business operations, and severely limited in-person to person contact. This has had significant impacts on transportation trends. Associated impacts like increasing rates of telecommuting, public health concerns leading to a possible increase in suburban-style development, and increased rates of home deliveries for goods have converged to quickly change how much we drive or how often we take transit. The *Advancing Adams* team held a TrendLab+ workshop with Adams County government representatives in October 2020 to explore how local travel behavior in Adams County will change following the recovery from 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. This includes changes such as labor force participation, working from home, goods and service delivery, technology, and micromobility. The following summary describes the topics that were discussed at the workshop along with the implications for Adams County as described by County transportation stakeholders.

## ECONOMIC CONSEQUENCES

By mid-May 2020, unemployment reached almost 15% nationally and 11% in Adams County; in October 2020 the national unemployment rate was 6.9% and Adams County unemployment rate was 7%. To provide perspective, the unemployment rate during the Great Depression was about 25% and during the 2008 recession it was about 10%. Even though the economy began to partially reopen after the most stringent lockdown policies were lifted in mid-May 2020, concerns linger about a second drop in unemployment, and some economists forecast unemployment could exceed that of the Great Depression further into the pandemic. According to the Wall Street Journal (WSJ) economic survey, retail and hospitality employment losses have been at least five percentage points greater than total employment; this economic survey projects that it will take 24 to 30 months for total unemployment to return to 2019 levels (approximately 3% in Adams County). Some companies have established



smaller satellite offices rather than requiring employees to commute to large offices in central cities. The rise in unemployment has also brought lower household incomes, which can lower travel demand. On the other hand, behavior in response to COVID-19 has led to a decrease in fuel consumption, causing a drop in gas prices. A prolonged decrease in fuel prices will lower auto-operating costs, which may result in higher amounts of driving.

A significant portion of the Adams County economy is dedicated to fossil fuels. The Suncor refinery in Commerce City is a major employer, but with the recent drop in demand for oil, the refinery's future is in question. At the time of writing, the refinery had reduced its staff size by 15%. Meanwhile, the County is adding freight and logistics employment opportunities through new Amazon distribution centers and through both the Rocky Mountain Rail Park and the Pecos Logistics Center.

## **BUSINESS RESPONSE AND CHANGE IN LAND USE**

Concerns about compact living and demand for a home office could increase suburban migration, reduce development density, place an emphasis on single-family rather than multi-family development, and lead to a decline in the number of urban commercial development. TrendLab+ workshop participants identified high local demand for detached single-family homes instead of apartments,

which would suggest higher rates of vehicle travel. Adams County offers residential development opportunities that are relatively more affordable than in Denver or other neighboring jurisdictions, which suggests there may be a future increase in vehicle travel due to the growing availability of lower density housing.

A national trend of embracing technologies that support almost universal remote work has been accelerated by the reaction to an increase in working from home in response to COVID-19. Some businesses are stating that they will not bring employees back to physical offices for considerably more time. Dramatic reductions in traffic volumes and transit use since shelter-in-place orders took effect show that for many companies, telecommuting is a viable way to conduct business. However, the trend is not as pronounced in Adams County, where 60% of workers are considered essential and have continued regular commute patterns throughout the COVID-19 pandemic.

Nationally, many schools have not reopened for the Fall 2020 semester; those that do reopen, may be alternating remote learning with in-class participation in order to prevent the spread of the virus. However, in Adams County, schools have resumed in-person learning in almost all instances.

While the reaction to the COVID-19 pandemic is causing many communities to envision land use



differently, the large share of essential workers in Adams County, along with the continuation of in-person learning, suggests that the County is less likely to experience the type of land use change that would impact transportation patterns long-term. Instead, the growing demand for single-family homes is more likely to generate an increased demand for vehicle travel.

## **TRANSIT AND MULTIMODAL MEASURES**

Changes in work habits and travel patterns in reaction to the COVID-19 pandemic has caused a shift in how multimodal transportation options are provided and used. Some communities have designated streets exclusively or primarily for pedestrian and bicycle use. Bike share and electric scooters were gaining popularity in urbanized areas before the COVID-19 pandemic but have dropped in use since March 2020. Bike share and scooter companies may continue to consolidate and adjust their business models to take advantage of the desire for an alternative to transit for short-distance travel and more comfortable streets for biking and walking. There is growing demand for more multimodal connectivity in Adams County and the TrendLab+ participants identified local political support for expanding bicycle and pedestrian facilities.

The immediate future of transit in Adams County is unclear. RTD may attempt to return to its pre-COVID-19

pandemic operating frequencies or revenue loss may require sustained service reductions and/or fare increases. However, ridership in Adams County has proven relatively more resilient than in other areas. RTD ridership is at approximately half of pre-COVID-19 pandemic levels compared to an 80% decline in transit use nationally. New transit service, like the N Line commuter rail, is being added and the County's workforce has a high share of essential workers who may continue to rely on transit. Due to these factors, the workshop participants predicted that transit ridership in Adams County in the long-term will exceed pre-COVID-19 pandemic levels.

## **VEHICLE AVAILABILITY AND RIDE-HAILING**

Concerns about shared vehicles and transit crowding could increase auto ownership and lead to a greater preference for services like Lyft and Uber over transit in more urban settings. For example, upon the reopening of China's economy in the spring of 2020 about 60% of Volkswagen purchasers were first-time car buyers. At the time of the TrendLab+ workshop, it was yet to be seen whether the reaction to the COVID-19 pandemic was causing an increase in vehicle purchases in Adams County.

## GOODS AND SERVICE DELIVERY

INRIX (a phone-based big data source) recorded a 13% reduction in long-distance freight between March and April 2020, and StreetLight and Boston Consulting reported drops in FedEx and UPS delivery truck movements of about 20%. They also reported an increase of 25% in USPS vehicle deliveries. Reductions in deliveries to office buildings, restaurants, and other retail establishments seem to be offset by increases in home deliveries. As the economy recovers, these patterns may return to pre-COVID-19 pandemic patterns, but some needs may continue to be met by electronic (e.g. drone) versus tangible product deliveries.

## SOCIAL NETWORKING AND IN-PERSON INTERACTION

Social networking platforms like Twitter and Instagram have served as substitutes for in-person gatherings when restrictions on in-person gatherings associated with COVID-19 are in place. It remains to be seen whether there is a new age of virtual socializing or if in-person gatherings will return post-COVID-19 pandemic. At the time of the TrendLab+ workshop, the Tri-County Health Department, which represents Adams, Arapahoe, and Douglas Counties, issued an order limiting in-person gatherings. As the COVID-19 pandemic continues, ongoing restrictions on in-person gatherings will naturally reduce

### DID YOU KNOW?

#### COVID-19 IMPACT

In October, RTD ridership was at approximately **1/2** of pre-pandemic levels ↓

National decline was at **80%** ↓

**New transit service**, like the N Line commuter rail, is being **added** and the County's workforce has a high share of essential workers who may continue to rely on transit.

demand for vehicle travel and likely replace those gatherings with online interactions.

## CONSUMER CONFIDENCE AND SPENDING

Consumer spending often declines during periods of economic shock such as the 2008 recession and the dot com bubble. Retail sales dropped 16% between March and April 2020, twice as much as they dropped during the 2008 recession. Deloitte forecasts that disposable income and consumer spending will not



return to pre-COVID-19 pandemic levels until at least 2022. Several months after reopening, stores in China have recovered less than 40% of their retail sales. While local consumer spending data for Adams County was not available at the time of the workshop, the Bureau of Labor Statistics reported that the consumer price index (a weighted average of the price of goods) for the Denver-Aurora-Lakewood area, which neighbors Adams County, was up 1.1% year over year in September 2020, with more pronounced increases of 4.5% for items like food. Rising prices during a time of higher unemployment likely means lower consumer spending locally.

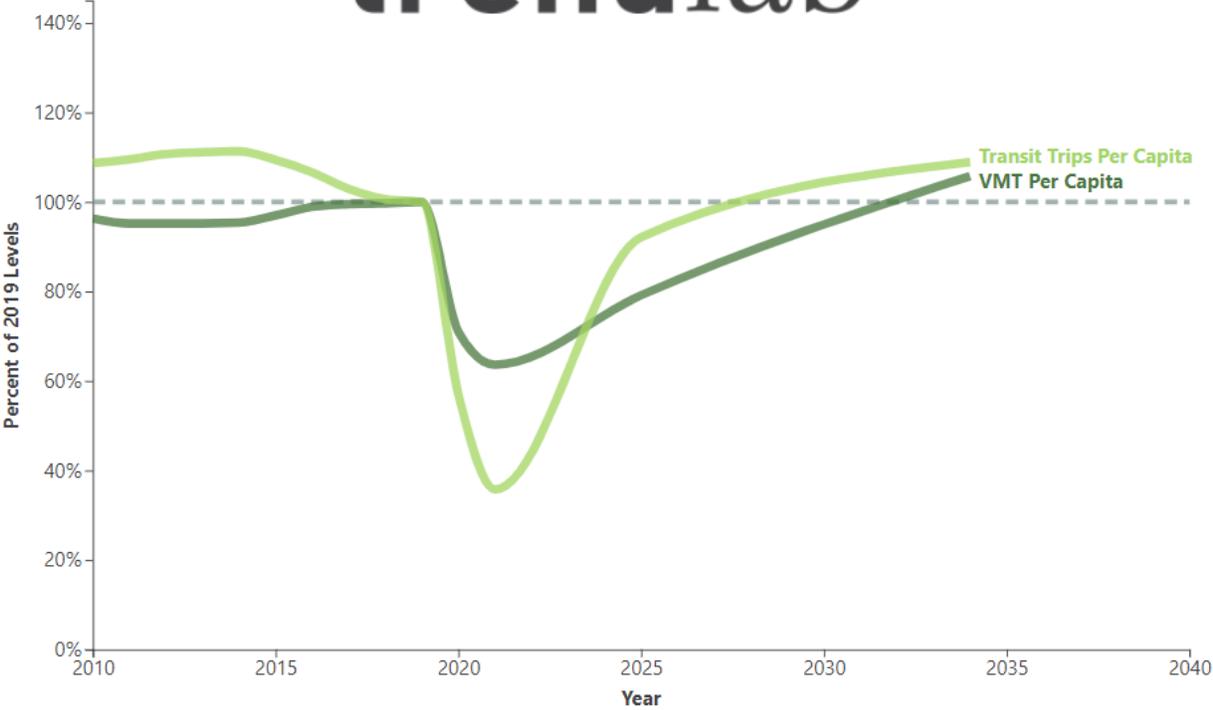
## TRAVEL TRENDS

Vehicle miles traveled dropped 80% to 90% in coastal cities and 70% to 80% in many inland cities during the first two months of shelter-in-place orders. As some states have begun reopening their economies, traffic levels have begun to rise again slightly. Once equilibrium is reached, the new normal may still show lower traffic volumes due to increased telecommuting, remote learning, and social telecommunications; Alternatively, traffic levels may be higher than pre-recession levels as more people move to remote locations or replace carpooling and transit with single occupancy trips. If the outcome results in lower congestion levels, more discretionary travel may be induced.

## SUMMARY

TrendLab+ workshop participants provided predictions for each of the trends discussed in this section. The participants identified that Adams County will continue to witness travel behavior related impacts related to responses to COVID-19 into 2021. However, in the coming years, the high share of essential workers and preference for lower density housing will cause a rise in VMT and transit ridership that will near pre-COVID-19 levels by 2025 and begin exceeding those levels in 2030 (Figure 38). When considering future travel demand, Advancing Adams will take into account the trends that local transportation stakeholders shared during the workshop and also factor some of the forces that will impact transportation locally.

# trendlab+



Based on your predictions, we think VMT per capita and transit ridership per capita will change as shown above. The table to the right indicates the net effect of your predictions (all values are shown as a percentage of 2019 levels).

	2020	2021	2025	2030+
VMT Per Capita	71%	64%	79%	106%
Transit Trips Per Capita	57%	36%	92%	109%

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Figure 30: Adams County TrendLab+ Workshop Results

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## MOBILITY STRATEGIES' ROLE IN ADAMS COUNTY IN THE FUTURE

When the *2012 Adams County Transportation Plan* was developed, the concept of individuals using smartphones to rent shared electric scooters seemed far off. Less than ten years later, scooter share and other technology-enabled transportation options are becoming ubiquitous throughout the region. This section identifies both emerging technologies and approaches to leveraging these technologies for improving future mobility in Adams County.

### 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 Mobility-as-a-Service, described later in this section. 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 is a potential area where it might play a role.

### 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. At its most basic level, ride-hailing is simply the modern version of a taxi, using website and smartphone apps that match passengers with drivers. TNCs 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, 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 also 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 vehicles, it is unlikely that TNC trips will replace a significant share of trips in a personal vehicle. As the southwestern portion of the County continues to densify and receive more transit service, however, TNCs may begin to play a larger role.

## BIKE/SCOOTER SHARE

Bike share systems for both human-powered and electric bicycles, and more recently electric-scooter share, have been a rapidly evolving trend over the last decade and have become a growing presence in communities around the country. 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 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; the small wheels of the scooter are more sensitive to potholes, cracks, and debris.

## 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 reserved through a few clicks 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 choose not to own a car.



## ELECTRIC VEHICLES

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 would be an important outcome 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 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. 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.

## MOBILITY AS A SERVICE

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.

Adams County can promote MaaS by working with private transportation providers to share data with the County, which would facilitate



providing trip planning resources to County residents. This may include working 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.

## AUTONOMOUS AND CONNECTED VEHICLES

Autonomous and Connected Vehicles (AV/CV), are two technologies that are rapidly evolving with the potential to impact travel patterns 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, to improve roadway use and safety. As discussed in the TrendLab+ workshop summary, near-term use of AVs in Adams County is not likely, but the County can use *Advancing Adams* as an opportunity to prepare 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. *Advancing Adams* will include strategies to address the potential impacts of AVs and CVs; examples of potential strategies 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 for using AVs as a formal first/last mile connection to transit stations.

## ADDITIONAL TECHNOLOGIES FOR IMPROVING TRANSPORTATION NETWORKS

In addition to the more general innovations in transportation described previously, there are some more specific technologies that have recently been changing the way users travel. For example, Intelligent Transportation Systems (ITS) are new technologies that are reshaping people's experience on roadways. ITS examples include technologies like Adaptive Signal Control, which automatically adjusts traffic signal timing based on current traffic conditions. This type of technology

can dynamically manage bicycle and pedestrian street crossing times while also providing transit vehicles additional time to pass through intersections, which helps buses stay on schedule.

Mobility Hubs are another way that new technologies are reshaping the transportation experience. Mobility Hubs are centers that integrate various transportation modes to allow users to make seamless connections as they travel. Often centered around transit stations, Mobility Hubs enable quick transfers from a bus onto a scooter or shared bike, and can also share real-time information on connecting buses, availability of shared-use mobility devices, and walking directions to nearby destinations. Mobility Hubs rely on integration across transportation services as well as close communication with users through smartphone apps that enable users to trip plan, pay fares, and be notified of transit service disruptions.

## FUNDING SOURCES

There are a variety of funding measures that Adams County in partnership with its local municipalities can pursue to support the implementation and operations of innovative transportation programs and services.

### FEDERAL GRANTS

There are a variety of grants that could be used to fund innovative programs and services.

- **Advanced Transportation and Congestion Management Technologies Deployment Program (ATCMTD) grants**

In July 2020 The U.S. Department of Transportation's Federal Highway Administration (FHWA) published a Notice of Funding Opportunity NOFO for \$60 million in ATCMTD grants to fund new technologies that improve transportation efficiency and safety.

- **5310 Enhanced Mobility of Seniors and Individuals with Disabilities**

This formula fund supports public transportation for seniors and individuals with disabilities by funding eligible capital, purchased service, and preventive maintenance projects for transportation providers. Eligible projects include vehicle purchases, passenger shelters, purchased services, preventive maintenance, travel training, marketing programs, development of centralized call centers, and other equipment that supports transportation to meet the special needs of seniors and individuals with disabilities. DRCOG administers 5310 funding for the Denver-Aurora Urbanized Area, which includes Adams County.

- **FTA Mobility On-Demand (MOD) Sandbox Program**

The MOD program envisions a multimodal, integrated, automated, accessible, and



connected transportation system in which personalized mobility is a key feature. The Sandbox Demonstration Program seeks to fund project teams to innovate, explore partnerships, develop new business models, integrate transit and MOD solutions, and investigate new, enabling technical capabilities such as integrated payment systems, decision support, and incentives for traveler choices.

- **US DOT’s Better Utilizing Investments to Leverage Development (BUILD) Transportation Discretionary Grants (formerly TIGER grants)**

This formula grant program funds investments in transportation infrastructure. Projects are evaluated based on merit criteria that include safety, economic competitiveness, quality of life, environmental protection, state of good repair, innovation, partnership, and additional non-Federal revenue for future transportation infrastructure investments. In 2020, BUILD awarded 70 projects across 44 states.

- **Surface Transportation Block Grant**

A formula grant distributed to states who then distribute it through discretionary grants. This grant primarily funds capital improvements.

- **Public Transportation Innovation Program**

The program is a competitive grant process that provides funding to develop innovative products and services assisting transit agencies in better meeting the needs of their customers. It funds research, development, demonstration and deployment projects, and evaluation of technology of national significance to public transportation.

## LOCAL FUNDING

While local funding is more limited, it is also feasible to supplement State and Federal funding options.

- **Farebox Revenue and Advertisements**

These are direct revenues from fares for shared mobility programs or advertisements through transit or bike share. Raising fees and fares would increase income from this source but may lead to decreased ridership and reduced mobility options for underserved populations. Increasing advertisement options could increase revenue from local sources.

- **Local Property Taxes**

Cities/towns and counties may levy property taxes to support transit. These can either be permanent or a local option tax that is subject to voter approval.



- **Community Partners**

Shared mobility programs could seek funding from large employers in Adams County or interested community partners could contribute to mobility services as they serve their users and provide better access to their services, including Business Improvement Districts (BID), Front Range Community College, or local Urban Renewal Authorities. These local partners may gift funds to the program, or they could help to subsidize trips for their employees or students. The Lone Tree Link is a strong example of shared mobility funded in part by local partners.

- **Local Payroll Tax**

It is an option to assess a local payroll tax on employers or employees. This can raise funds but can also burden low-income workers and may not have public support.

## NEXT STEPS

*Advancing Adams* will expand on the opportunities for future mobility presented in this report by developing both specific recommendations for adopting new technologies on key corridors and developing a policy framework for adopting those technologies equitably and efficiently.

