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National Center for Mobility Management

SHARED-USE MOBILITY CENTER

UNIVERSAL MOBILITY

AN IMPLMENTATION RESOURCE

JANUARY 2023

ACKNOWLEDGEMENTS

NATIONAL CENTER FOR MOBILITY MANAGEMENT

Primary Authors: Judy Shanley and Enjoli Dixon

The National Center for Mobility Management is a national technical assistance center funded through a cooperative agreement with the Federal Transit Administration and operated through a consortium of three national organizations—the American Public Transportation Association, the Community Transportation Association of America, and Easterseals Inc.

THE SHARED-USE MOBILITY CENTER

Primary Authors: Al Benedict and Alex Rosander

The Shared-Use Mobility Center (SUMC) is a public-interest organization working to replace car-centric transportation with people-focused shared mobility to fight climate change, promote equity, and strengthen community. By connecting the public and private sectors, piloting programs, conducting new research, and providing policy and technical expertise to cities and regions, SUMC seeks to extend the benefits of shared mobility for all.

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What is Universal Mobility?

Evolving rider demographics, travel patterns, and transportation innovation characterize the challenging environment in which we seek to design and deliver efficient, high-quality transportation services. As planners and transportation officials consider the expanding range of transportation options, the concept and practice of universal mobility must be the foundation for mobility innovation.

Universal mobility is a design practice that ensures that all transportation products and services are inclusively designed and available for all user groups. Inclusive design is a design practice that ensures a product, service, or environment is usable by all people regardless of if they have different backgrounds, abilities, and characteristics. In a time when emerging technologies and mobility trends are constantly changing the transportation landscape, considering universal mobility is crucial to establishing an equitable, sustainable, reliable, and convenient transportation system. However, universal mobility is much more than just design. It is an attitude and culture that believes in and affirms inclusive practice. When applied in the transportation sector, this means that attention to inclusiveness is considered in every phase of service delivery.

Figure 1: Individuals using mobility devices to travel along street |Source: Pedestrian Space | Annika Lundkvist, Örebro

The definition of **universal mobility** ties together two well-known concepts within the mobility space: **universal design** and **inclusive mobility**. **Universal design** focuses on the design and composition of an environment so that it can be accessed, understood, and used to the greatest extent possible by all people regardless of age, size, ability, or disability. **Inclusive mobility** sees mobility as a fundamental human right; it leads with the ability to move about one's community by

any mode of transportation. Inclusive mobility considers how to make a diverse range of transportation modes available and accessible to all users. By intertwining the concept of Inclusive mobility with universal design, the need to think about how data, passengers' wants and necessities, and coordination play a role in the provision of accessible transportation comes to the forefront. This learning module identifies and discusses various elements of universal mobility that are necessary to achieving universal mobility: **Understanding Passengers**, **Universal Design**, **Service and Planning Coordination**, and **Mobility Data and Technology**. Together, these elements capture the considerations needed to plan and implement universal mobility.

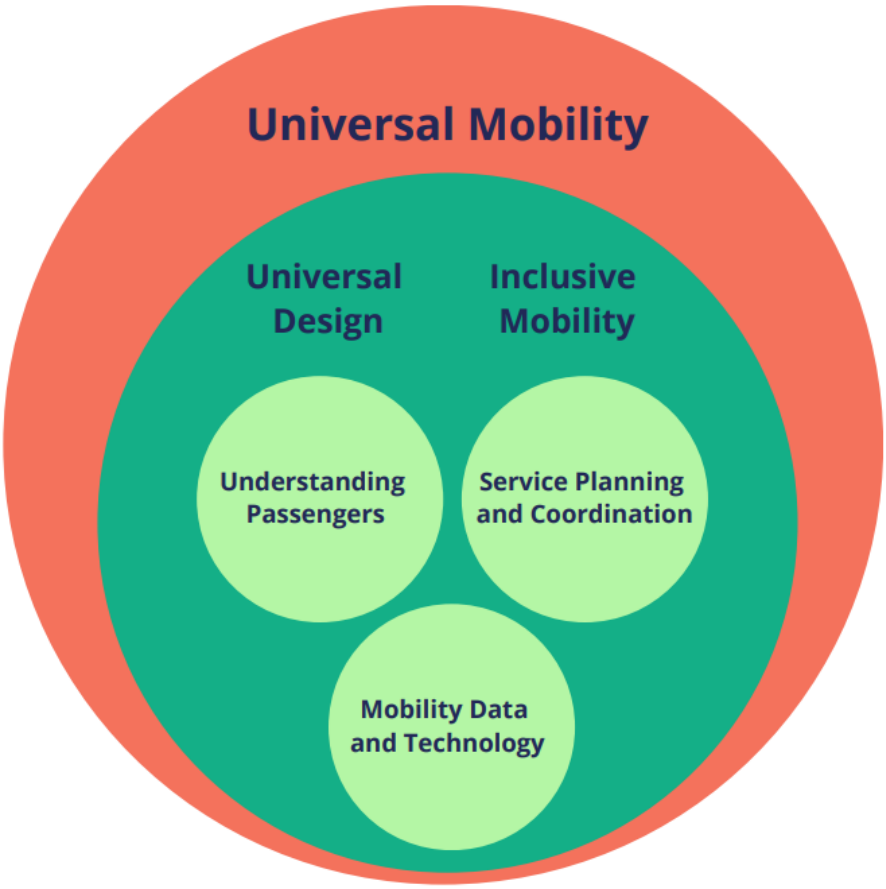

Figure 2: Universal Mobility Elements | Source: Universal Mobility Working Group

New mobility strategies may be planned for and implemented without regard for all user groups. This quick implementation may occur for several reasons. Early adoption can be a reaction by transit agencies who want to use common strategies in the industry – a sort of "keep up with the Joneses" thinking or to take advantage of new funding streams related to innovation that have short implementation times. Regardless, universal mobility is often neglected in the early planning stages of a pilot project or new service, leading agencies to undertake costly retrofits and build-in accessibility considerations after the fact.

In light of the difficulties surrounding the planning and coordination pieces of an accessible mobility system, the Shared-Use Mobility Center (SUMC) and the National Center for Mobility Management (NCMM), in collaboration with other transportation professionals, developed this resource intended to support mobility service innovators, planners, designers, and implementers in their effort to incorporate universal mobility practices into their planning process. This resource can also be useful to human services professionals and end-users as a guide of talking points and considerations to engage in discussion with transportation professionals about service and innovation.

The Development Process

In phase 1 of creating this universal mobility resource, SUMC and NCMM convened a working group composed of a diverse range of mobility and transportation professionals to discuss challenges and strategies toward reaching universal mobility. The working group brought together leaders in the transportation and accessibility fields to examine what universal design means in the context of a complete trip and identify ways to scale successful models that maximize mobility benefits for all users.

These conversations played an integral role in understanding common barriers that inhibit users from accessing usable, convenient, and safe services from the on-the-ground perspective of mobility practitioners. Through continued research, working group discussions, and collaborative meetings, information was synthesized, an understanding of key universal mobility principles and accessibility issues was formed, and subsequent recommendations were developed.

Working Group Objectives

The working group was at the center of this process. Through targeted group discussions, the working group helped inform the challenges and recommendations to achieving a universal mobility system. The working group was guided by these objectives:

- Tracking promising practices that encourage inclusive, accessible service
- Identifying barriers that limit the scalability of accessible service models
- Identifying needed interventions and tools to address barriers
- Recommending ways that mobility management can support and advance inclusive mobility innovation
- Suggesting strategies that support the sustainability of mobility innovations
- Validating and deploying new metrics that capture the value of mobility services
- Facilitating opportunities to coordinate efforts across federal agencies under the Coordinating Council on Access and Mobility (CCAM).

Members

SUMC and NCMM would like to acknowledge the working group participants and thank them for sharing their time and expertise to inform this work.

- Bob Franklin, Customer Access & Accessibility Department Manager, BART
- Carol Tyson, Government Affairs Liaison, Disability Rights Education & Defense Fund (DREDF)
- Caroline Rodriguez, County Manager, Executive Director, High Valley Transit District
- Carrie Diamond, Co-Director National Aging & Disability Transportation Center / Senior Director Transportation & Mobility Easterseals, Inc.
- Chad Ingle, Fixed Route Services Manager, Kootenai County, Idaho
- Chuck Dyer, Project Manager, Ohio Department of Transportation
- Donna Smith, Manager of Accessibility Services, Sound Transit*
- Don Chartock, Deputy Director, WSDOT Public Transportation Division
- Frank Lee, Former Transportation Director, Center for Pan Asian Community Services
- Laura Saltzman, Transportation Policy Analyst, Access Living
- Lina Aragon, Customer Service Administrator, Palm Tran Conference of Minority Transportation Officials (COMTO)
- Matthew Schriefer, Transportation Planner, Evansville MPO
- Namecca J. Parker, Acting Assistant GM of Operations, NJ TRANSIT
- Olivia Hook, Manager of Development, Oklahoma Transit Association
- Paul Hamilton, Senior Manager of Paratransit Services, Regional Transportation District (RTD)
- Perian Carpenter, Mobility Manager, Biddeford Saco Old Orchard Beach Transit
- Quemuel Arroyo, Chief Accessibility Officer, MTA
- Richard Price, Program Manager, Transit Policy and Technical Assistance, AASHTO (Formerly AASHTO)
- Yochai Eisenberg, PhD, Assistant Professor, Department of Disability and Human Development, University of Illinois Chicago

*Donna Smith, Manager of Accessibility Services, Sound Transit passed away unexpectedly during the production of this toolkit. We honor Donna and her years of service at Easterseals and Sound Transit to promote universal mobility and accessibility in the transportation industry.

We would like to recognize Rik Opstelten, from the Federal Transit Administration (FTA), Program Officer for the Shared Use Mobility Center (SUMC) who supported our work to develop the toolkit.

Element 1: Understanding Passengers

From the rider perspective, accessing transportation services can be difficult if there is not appropriate infrastructure and communication systems in place to accommodate user needs. In order for a transportation system to accommodate mobility for all user groups, it is important that those planning, designing, or operating the system not only have an understanding of passengers' travel needs, but also an established process for how to address those needs. Furthermore, communities should be positioned to guide transportation investments and upgrades as the incorporation of their feedback and needs is essential to mobility solutions reaching their intended outcomes.

Understanding the passenger involves diverse social service and community-based organizations working together to provide accessible and sustainable transportation services and facilities. Some coordination strategies include community forums, ride-alongs, walking tours, or third-party assessments to aid in understanding how to better plan for the passenger.

To address user needs and fully understand passengers' travel perceptions and choices, mobility systems should establish high-quality communication processes, carry out consistent community engagement, and be open to change. Thus, the Understanding Passengers element discusses Customer Service, Engaging the Community, and Evaluation and Performance Metrics.

Engaging the Community

Ongoing community engagement is essential to understanding passengers because it is how you get to know and empathize with the community's needs and wants. Thus, it is a fundamental step in planning, implementing, or updating universally accessible services and facilities. While community engagement is not a new concept in the transportation field, the emergence of new technologies, community-based shared mobility projects, and inclusive design frameworks have put a renowned focus on user impact. Meaningful community engagement helps projects reflect the needs and realities of the community they seek to serve with helpful and inclusive solutions. Using various individuals' knowledge on accessibility barriers to inform changes to existing services and facilities will strengthen the quality and impact of transportation investments.

Community engagement is a process that needs to be budgeted, both in terms of time and associated financial costs. Community engagement will help inform projects and guide other communities looking to implement similar mobility solutions. When there is understanding of how people get around and what influences their transportation choices, mobility practitioners are better equipped to customize services and expand mobility among their targeted audiences.

Figure 3: Engagement for Indego, Philadelphia's bike share system |Source: Better Bikeshare Partnership

Challenges

Following are some specific challenges around community engagement and the unintended consequences when it is not carried out.

1. Agencies may be unaware of the types of mobility options/models that may best align with their community (both in relation to passenger needs and geographic context). Without an understanding of passenger needs it becomes difficult to provide mobility options that are convenient, usable, and address mobility challenges.

2. Lack of understanding and evaluation framework to understand rider travel patterns, destinations hotspots and mode choice preference. This is an important part of the mobility needs assessment and should be coupled with an evaluation of current mobility services to identify opportunities and needs.

3. No budget or system is in place to collect rider feedback, or when there is, that information is not communicated across a transit agency from its operations team to the planning office.

4. Riders are indicating that the new mobility solution is not helping meet their mobility needs. This can occur when new mobility solutions are implemented without first understanding the mobility need, meeting with riders, and conducting community engagement.

5. Ridership is low and the mobility service is not reaching its intended users. This can occur when the target audience does not have awareness, ownership, or trust in the mobility solution.

Recommendations

Following are some recommendations to help address community engagement and implement mobility solutions that benefit all users, including persons with disabilities and older adults.

1. Establish guiding principles for the community engagement your team is conducting. Principles can help ensure that the team's mobility project is connected to the community, their wants, and their needs. Check out SUMC's Community Engagement Module to learn about establishing guiding principles.
2. Do not seek or assume a singular position from the community. Because communities are made up of a variety of people with varying needs and perceptions, the idea of all community members having one unified vision is not realistic and weakens the engagement process.
3. When engaging the community, commit to a transparent and action-oriented process. Project teams have a history of coming into communities to gather feedback without establishing two-way consistent communication channels or sharing how they plan to use the information provided in the decision-making process. Because of this, a project team's processes can have a perfunctory or transactional quality.
    a. Even if the planning and design process may be long, find ways to generate tangible outcomes in the short term to demonstrate progress and action towards the larger objective.
    b. Invest in low-cost ongoing community engagement exercises.
4. Establish partnerships with local community-based organizations (CBOs) and meet with them on a regular basis. The community organization will have insights into mobility needs of the community and they can also serve as a direct access point to meet with and learn directly from riders. Check out LA Metro's Community-based Organization Partnering Strategy to get an idea of how to best partner with CBO's in your area.
5. Develop community transportation needs assessments to better understand individuals' pain points, wants, and abilities when looking to pilot new mobility projects.
    a. The transportation assessments are shaped and led by the communities; They empower residents to guide transportation investments in their communities using various research methods. By analyzing publicly available data, developing and distributing community-sensitive travel surveys, and conducting interviews, communities are equipped to evaluate their existing transportation options and identify safe, accessible and environmentally sustainable solutions. Check out the Needs Assessment Implementation Toolkit for more information on how to carry out and craft community transportation needs assessments.

6. Develop rider personas to understand and empathize with different goals and frustrations a rider may have. Personas are a common tool used in UX Design, in which there are fictional characters that have their own goals, needs, and frustrations surrounding a specific topic. The project team can then reference these personas throughout a project to ensure that the design solutions will meet the end user's needs and provide a good user experience. In addition to informing the final design solution, personas can inform interview or focus group participants and communication design. Read about the four new rider personas taking over transit.

7. Define a marketing and outreach strategy to ensure a mobility pilot reaches the intended users. Measure the effectiveness of these strategies through 1:1 communication with riders and surveys. Check out this marketing and outreach tool created by the Champaign County Regional Planning Commission.

Resources

- **Community Engagement Learning Module**: This resource outlines community engagement processes, strategies, general considerations, best practices, and case studies.
- **Elevated Chicago - Community Engagement Principles & Recommendations**: This resource outlines a set of principles entities should consider when conducting community engagement. Each principle offers inspiration, tools, and resources to help foster meaningful engagement.
- **Incorporating UX Design into Transportation Solutions**: This resource offers urban planners an understanding of UX designers' thoughts about problem solving mobility and design issues. Additionally, it outlines strategies UX designers use to make services more universal, accessible, and inclusive.
- **Promising Practices for Meaningful Public Involvement in Transportation Decision-Making**: This resource offers promising practices for mobility practitioners to promote and incorporate meaningful public involvement during the transportation decision making process and project lifecycle. These practices include some relevant to meeting the requirements of meaningful public involvement and participation under Title VI of the Civil Rights Act of 1964, NEPA, and other federal regulation.
- **Engage the Community: A Guide for Developing a Community Engagement Plan:** This resource offers information about fostering project identity, addressing institutional inequalities, building capacity with residents, creating community buy-in, and developing sustainable ridership.
- **CPACS Ride - Lessons Learned in Four Phases - Phase 4: Planning & Implementation**: This resource documents the Center for Pan Asian Community Services (CPACS) involvement with engaging their community when looking to implement a mobility on demand (MOD) solution for people with disabilities and older adults, through a service called CPACS Ride.
- **The National Center for Mobility Management (NCMM):** Obtain strategies to facilitate agency participation in mobility management.

- **TP4A - Transit Planning 4 All**: This website offers a compilation of inclusive planning resources and guides to meaningfully engage the community.
- **Persona Type Resources:** Several resources are available on developing user personas and how they can help to inform how intended the mobility needs of intended users:

Checklist

Engagement

Developing a systematic customer engagement outline will ensure that the agency's relationship with the rider is not a one-time event. The proper engagement strategy will result in repeat riders and established trust between communities and mobility practitioners.

Community Partnerships

Community partnerships can be beneficial in the following ways: 1. Providing inclusive design, 2. sustainable funding opportunities, and 3. increased ridership.

- What partnership organizations could be developed to assist in the design to maximize the customer experience?
- Has your agency developed customer focus groups to aid in project development?
- Does your agency have a community level board to review all aspects of design, operations, and customer service as it relates to the passenger?
- What is the goal that community partnerships will achieve?
- What can each community stakeholder bring to the table?

User Fit of Mobility Options

An agency can ask the following questions when trying to evaluate, plan, and execute transportation options that include the best mobility for the passengers in the community. They can help daily riders navigate the planning process to find the best fit of mobility options that will be used to transport passengers to their daily destinations.

- Is your agency educated on the mobility options available in the community?
- Do the mobility options connect in the overall transportation system of the community?
- Are there ways to engage passengers with all mobility options to analyze the best fit for the community?
- Are daily riders included in the planning and decision-making process to select the best mobility option?
- Is there a tool kit to analyze the communities needs of mobility per the user demographic?

Customer Service

Establishing good customer service processes and wayfinding signage is integral to individuals reusing a mobility option and deeming it accessible. Moreover, an agency's response to mobility service concerns or requests can influence whether users feel their transportation system is catering to their needs. If individuals feel like drivers, customer service personnel, and the overall system care about their feedback, well-being, and right to mobility, they will likely return and recommend the services to others.

- **Information:** For passengers to access information, those who interact with customers should have the most current information on services provided in the system. Establishing systems that ensure communication between drivers, operations, and planning staff enables transportation employees to address individuals' concerns and provide a better travel experience.
- **Operators:** Operators are the frontline workers in public transportation systems and therefore leave the first impression on the passenger. Customer requests and needs should be acknowledged, and concerns must be reviewed, addressed, and solved. Lack of operator response to customers can result in a request or concern escalating to a more significant issue or complaint, potentially resulting in a loss of ridership. The operator should have the confidence and skill set to quickly assess and understand the diverse customers in the community it serves. When developing the training programs, including modules that discuss customers' perceptions of public transportation and their expectations as customers can help the operator understand the passenger from another perspective.

- **Complaint Process:** When addressing concerns or complaints is siloed or done on a one-by-one basis, it is challenging to identify concerns that stem from the same problem. Customers should be a fundamental aspect of the transit organization, and their feedback is important to the growth and development of the agency. Establishing a customer comment/complaint procedure to ensure that system users have an easy and accessible way to provide feedback is beneficial to the agency. Entities involved in planning and implementing mobility solutions should be available to hear any customer feedback, including complaints, comments, suggestions, or concerns.

- **ADA Compliance:** The Americans with Disabilities (ADA) Act requires that all public transportation, vehicles, and facilities, are accessible for all. When an agency or provider does not provide this right to the customer, a complaint may occur as the agency is no longer compliant with ADA standards. The compliance issues may include violations pertaining to customer environments, facilities, and vehicle components. Under ADA regulations, the customer can request a reasonable modification for a fixed route system. The Federal Transit Administration's (FTA) 's Shared Mobility FAQ offers further information on accessibility requirements.

Figure 4: Travel trainer providing group training to older adults | Source: NADTC

Too often, new modes or pilot projects are introduced into project areas without a good grasp of the target audience's needs and capabilities. Poor communication processes between an agency and their target audience can result in confusion or unsafe conditions. Policies and structures in place for customer complaints help make the organization more effective and transparent. If customers consistently feel their voices are not heard, the transportation system will not feel inclusive. If transportation systems are not operating inclusively, they may suffer from loss of funding, partnerships, and ridership.

Challenges

The following are obstacles that can arise when proper customer service is not provided or updates regarding system information are not disseminated universally to passengers in a timely manner.

- Customers rely on vehicle operators or station guides as sources of accurate information. When operators are not trained and updated on elements such as route information, fare payment upgrades, and special customer requests, it can result in compliance issues as well as leaving a customer stranded.

- When there is no structure or policy for customer complaints, it shows a lack of transparency among the agency or organization.

- Misinformation can result in confusion about how to use a service, or at worst, unsafe travel conditions for the customer.

- When customer requests and/or needs are not being acknowledged the agency is impacted in many ways. The reputation of the agency or organization is put at risk, the agency can face a potential loss in ridership, and the customer may be prevented from independently traveling to work, school, or medical appointments.

- If concerns are not being reviewed, addressed, and solved, it may be a possible violation of Title VI per FTA guidelines. Additionally, this causes a loss of trust and support for the public transportation system.

- Lack of operator response to customers can result in loss of ridership or concern escalating to a larger issue or complaint. Lack of an established customer complaint process prevents a way of tracking duplicate or consistent complaints regarding the same issues that have not been addressed or resolved.

- Agencies are required to provide and maintain accessibility services for all passengers. If customers consistently encounter services that aren't accessible for their use, the transportation system will not feel inclusive.

- If transportation systems are not catering to all users regardless of age or ability, this could result in a loss of funding, partnerships and ridership

Recommendations

The following are recommendations on how to better provide customer service through a variety of avenues within a public transportation system.

1. Set up systems that ensure communication between drivers, and operations and planning staff. Implement software and support technology to enhance and enable your employees to provide a higher level of customer service.

2. Ensure that customer service training is integrated into all new employee training programs. An integral part of onboarding should be about understanding the passenger. This will keep the focus and goal of the employee to have a customer-first attitude. Develop training modules and provide real-world examples in training classes.

3. Utilize the FTA's technical assistance centers to aid in customizing the operator customer service training. An example of a technical assistance center that provides this training is the National Rural Transportation Assistance Program (National RTAP).

4. Develop a review panel to address concerns or complaints with a database to track concerns and complaints. This will allow the agency to see if a concern is a consistent issue that needs to be thoroughly evaluated.

5. Participate in forums that focus on customer service and how to address passenger needs. This will allow an organization to evaluate trends to determine if complaints are systemic issues.

6. Develop and integrate wayfinding signage, maps, educational materials, or technology-based applications to facilitate easier navigation throughout the mobility system.

7. Evaluate ADA guidelines and design on customer environments, facilities, and vehicle components. Assess whether being compliant with the ADA is enough for a service to be truly accessible. Use the ADA guidelines as a foundation and work with the community to determine the optimal level of accessibility. Develop possible solutions to provide accessible service.

Resources

- **National RTAP: Communicating with the Public:** This toolkit is intended to provide guidance on each of the ways a rural transit agency gives information to and engages with the community it serves.
- **National RTAP: Driver Recruitment, Training, and Retention:** This toolkit introduces both requirements and suggested practices in the areas of driver recruiting/hiring, retention/motivation, and training.
- **U.S. DOT: Transit Management Information Dissemination:** This guide provides an example on how to effectively relay information in a timely manner to employees and users.
- **WMATA: Customer Complaint Process:** Offers a transit agency example on how they collect customer complaints through an online portal, call center, and paper form available at transit stations. WMATA's goal is to resolve all complaints within five business days, however some complaints may require additional investigation and follow-up time.
- **National Aging and Disability Transportation Center (nadtc.org):** Offers a wide-range of resources promoting the availability and accessibility of transportation options for older adults, people with disabilities and caregivers.
- **Shared Mobility Frequently Asked Questions | FTA (dot.gov):** This resource offers information on accessibility requirements specific to shared mobility.

Checklist

Customer Service

Information

The following questions on the checklist below can aid in assessing the best practice to get information accurately to customers.

- Are all riders able to access the most current information from drivers or station guides?

- Is the information outdated resulting in misinformation for the customers?
- Does your frontline staff have the tools necessary to provide accurate system information?
- Are individuals with disabilities able to acquire the correct information to use the system successfully?
- Is the passenger information developed through an inclusive process to be presented equally for all (in a variety of languages, formats depending on disabilities and all areas of the community)?
- Has the agency developed a policy to conduct to gain feedback from passengers?

Operators

Operators need to be trained to have the confidence in providing the correct information to assist customers which secures a positive experience.

- Are the operators responsive to customer requests or concerns?
- Are customers' concerns being reviewed thoroughly resulting in a solution?
- Does your entity have Operator customer service training regarding how to address customer requests?
- Do operators complete customer sensitivity training?
- Do drivers have a positive, customer-first attitude to ensure successful passenger experiences?

Complaint Process

These questions below can help an agency brainstorm to create a basic complaint process that includes how to file a complaint, and what happens after a complaint is filed.

- What is the structure of the customer complaint review process?
- Is there a system or database to track duplicate or consistent complaints regarding the same issues?
- Is compliance training given to high level management based on actual examples of complaints?
- Is the customer complaint process accessible for all?

ADA Compliance

These questions below can help an agency develop guidelines to aid in becoming more inclusive. Collaborating with diverse partners to design a more accessible space can ensure a more inclusive passenger experience.

- Does your entity provide accessibility services for all passengers?
- Is your system designed to be inclusive? Facilities, vehicles, customer environment?
- Are there partnerships in the disability space to aid in designing the accessible passenger experience?
- Does your entity employ an ADA coordinator/officer?

Evaluation and Performance Metrics

Establishing performance metrics and developing a rigorous evaluation framework is necessary to understand if a mobility project or service is reaching its target users and meeting its intended outcomes. Agencies should review peer agencies' approaches to evaluation, community engagement findings, and need assessment insights when establishing performance metrics. Performance metrics should consider quantitative and qualitative outcomes to measure the quality of life and transportation security.

The insights gathered throughout the evaluation process can help entities establish a framework for addressing the impacts of new mobility solutions across different geographies and users. This framework can help advance future universal mobility applications and inform communities looking to implement similar mobility projects. Project performance insights inform what adjustments should be made so that mobility program and infrastructure upgrades better serve the mobility needs of all user groups.

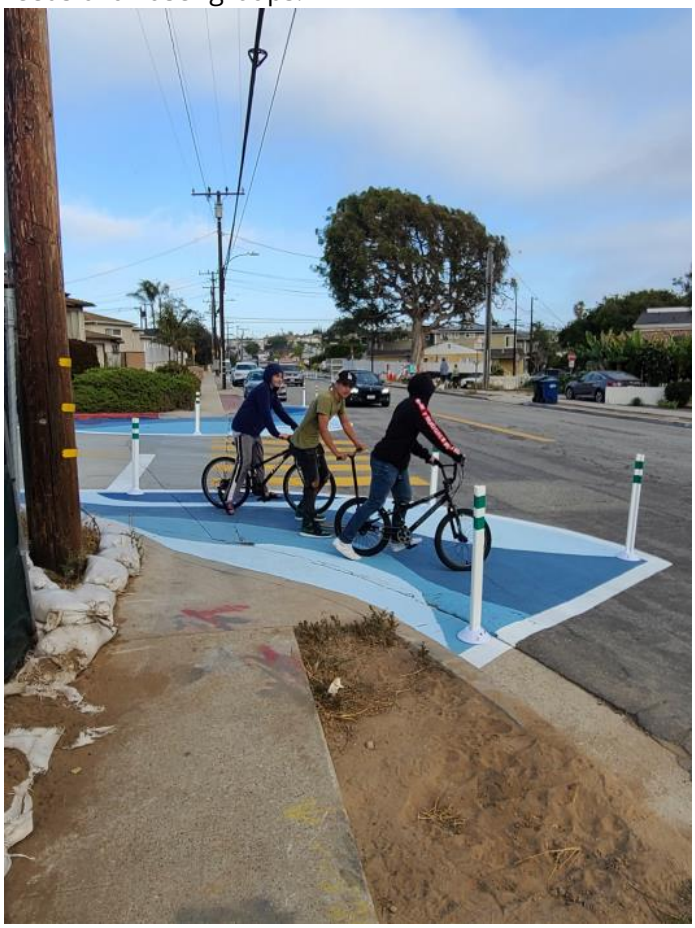

Figure 5: Three teenagers riding bikes on a curb bump-out installation which creates a barrier from vehicle traffic |Source: Street Plans

Challenges

Several challenges are associated with establishing, updating, and evaluating mobility services. Summarized below are a handful of challenges uncovered through the working group discussions.

- Too often, new modes or pilot projects are introduced into project areas without a solid grasp of the target audience's needs and capabilities.
- If a project has multiple partners who have different goals, strategies, and performance metrics, it can be difficult to create a cohesive vision for evaluation and ensure that all parties' needs are met.
- It is sometimes unclear what the unintended consequences of a mobility service, infrastructure, or product change may be.
- Establishing metrics, collecting data, and analyzing a project's performance are perceived to increase the cost and project timeframe.

Recommendations

These recommendations are based partly on the Setting Goals and Performance Metrics Learning Module and discussions among the working group. The needs assessment discussed earlier in this Element should serve as the base for planning and implementing a mobility project or improving existing services. Regular evaluation is needed for existing projects, as there is always going to be a time to reassess how a service currently operates.

1. Clearly define the service area, target users, cost, and other parameters when planning a project.
2. Measuring a service's success solely on reduced costs or the number of trips does not capture the more qualitative aspects of a person's transportation security. Think about human-centered outcomes when establishing performance metrics and how the mobility service or amenity hopes to improve quality of life outcomes.
3. Collect baseline data on the existing service before the pilot, including human-centered outcome and satisfaction questions. These baseline data are essential to measuring the impacts of a mobility pilot.
4. After establishing project goals, list evaluation criteria, data types, and sources, and outline how these will be evaluated. Having an idea of these metrics and required data sources will also help when procuring new technology and mobility solutions so that there is an idea of what data is critical to request from the private vendor or operator.
5. Collect comparison data from a similar group with a comparable service that is unchanged. This requires extra time and funding, but for entirely new mobility pilot and technology solutions being tested, it will allow for a more comprehensive assessment of the mobility pilot impacts.
6. Request and follow-up on the private vendor or operator reference to better understand the

types of data they can and will provide and the available evaluation tools.

7. Establish a data-sharing agreement during the procurement process. Note specific data types that need to be based on the performance metrics but also build some flexibility, given that additional data needs will likely surface during the pilot.

8. Pilot simulations can help understand the impacts of a mobility project and how services can be adjusted before implementation to help mitigate unintended outcomes. Piloting a mobility solution in a small area is still vital because while simulations can help, operational experiences will likely uncover additional challenges.

Resources

- **FTA Mobility Performance Metrics for Integrated Mobility and Beyond Report**: Published in 2020, this resource offers a wide range of information on the importance and applications of performance metrics.
- **SUMC MLC: Mobility Learning Center: Setting Project Goals and Performance Metrics (sharedusemobilitycenter.org)**: This resource provides information and a framework for establishing goals and performance metrics and how to evaluate them.
- **SUMC Microtransit Learning Module**: This learning module offers a planning framework and discusses the role of performance metrics.
- **Clean Mobility Options Mobility Project Toolkit - Clean Mobility Options**: The Clean Mobility Project Toolkit offers resources to help plan and implement a mobility pilot specific to lower-income and disadvantaged communities.
- **MOD Sandbox Demonstration Evaluation Reports**: These independent evaluation reports on mobility innovation projects also discuss the role of performance metrics.
- **Objective Data Driven Data Sharing for Transit Agencies in Mobility Partnerships**: This report offers a framework to understand and enter into a public-private partnership and how to plan for data requirements.
- **Making Transit Count: Performance Measures that Move Transit Projects Forward:** This guide published by the National Association of City Transportation Officials offers insight into choosing the right performance measures that lead to better designs, projects, and street management.

Checklist

Evaluation and Performance

Whether a project involves introducing a new bike-share service, upgrading transit facility infrastructure, or establishing a mobility-management center, establishing performance metrics will help agencies evaluate how well the project has met its overall goals and objectives.

- What staff will oversee the management of this mobility project or service?
- What are your performance requirements?
- What parameters and metrics have you established to measure your project or services performance?
    - How well does the mobility service or project meet the needs of individual travelers?

        - How effectively and efficiently does the service performs while meeting the needs of individual travelers?
        - How does the mobility service or project impact the region/community regarding sustainability, accessibility, environment, etc.?
- What data sources have you identified to functionalize those performance metrics?
    - Are the data available?
    - What would be the format and unit of a given data element?
    - Are you able to obtain the data?
    - Is the data for the metric inaccessible due to privacy, cost, or agreement constraints?
- How do you plan to measure customer satisfaction? What efforts have you undertaken to collect feedback?
- How do your performance parameters align with the overall project or service goals?
- Has your team collected data on several indicators that estimate the broader effect this service or project will have on mobility and accessibility?
- Have you established evaluation criteria?
- Have you established systems to report your mobility performance measures and findings?

Element 2: Universal Design

The Universal Design Element includes two overarching components: facilities and operations. **Facilities** are the physical and architectural characteristics of a transit building that facilitate ease of use, navigation, and access. Along with the transit building, universal design of facilities encompasses the neighborhood infrastructure or paths of travel that individuals use to get to and from a transit building or service. Thinking about facilities as a continuum can help create cohesion of accessibility in and around a transit system. The second component, **operations**, pertains to the features and characteristics related to an individual using a service and taking a trip. Operations encompass multiple steps including, how individuals learn about services, schedules, and costs; procedures for purchasing tickets and paying fares, how individuals board and deboard from a transportation mode; and riding the service. A focus on universal design will ensure that the agency's system is accessible to all. The following elaborates on these components.

Introduction

As services are designed and implemented, and as buildings are developed or modified, it is important to ensure that they are universally designed from the beginning. Addressing universal design as projects are launched or as physical structures are built is efficient, cost-effective, and is more likely to align with the overall features and characteristics of a system. Universal design supposes that the services provided and the infrastructure that supports services are fully compliant, or even go beyond the requirements of the Americans with Disabilities (ADA) Act (Part 38—Accessibility Specifications for Transportation Vehicles).

Figure 6: Woman in wheelchair exiting transit vehicle |Source: Senior Transportation Connection, Cleveland, OH

Regardless of whether an agency is evaluating its accessibility conditions related to facilities or operations, two key elements of the process are critical:

1. The agency needs to have a forum and a consistent opportunity to gather perspective, feedback, and insight from the disability community. Community members with disabilities should be critical decision-makers and informants. This can be referred to as **accessibility information retrieval.**
2. It is equally important that agencies have a reliable and transparent means of sharing information about the accessibility of all components of its system. It is especially important to share and disseminate information about accessibility progress with individuals and human services organizations whose expertise can continuously inform the system. These entities become important partners in building a system that adheres to the principles of universal design and represents the tone and characteristics of universal mobility. This can be referred to as **accessibility information dissemination.**

Facility Design

The first component of universal design is facility design – how facilities look and how their physical features support accessibility. All the physical design features of a transit facility, bus stop, or mobility hub enable riders to use services before they even get on a transportation service. **Fixed facilities** can include the buildings and infrastructure that comprise the transportation system, and the transit stations, stops, and amenities that support transportation services. Facility design focuses on those features that enable a rider to access the transportation service. The buildings or stations an agency operates should be responsive to the needs of a diverse range of individuals with disabilities, including those with sensory or cognitive disabilities. Often, we think about the physical attributes of a facility, such as ramps that enable entry into the facility or elevators that bring passengers to different building floors. However, having information systems, including signage and communication systems that are also universally designed, is critical to respond to the needs of individuals with sensory disabilities, such as those who are blind or those with hearing disabilities.

Figure 7: Person boarding a fixed-route bus at bus stop | Source: NADTC

Neighborhood Infrastructure is another integral piece of facility design that refers to roadway and pedestrian infrastructure, the streetscape, and paths of travel. The way that passengers get to a facility or station is as important as the universally designed features of the station itself. Suppose individuals cannot access the service because the path or pedestrian route into a facility is a barrier. In that case, the features built into vehicles and facilities will not matter, because riders will not have the opportunity to use the service. The path of travel around a transit service should adhere to ADA Regulations. Although ensuring that the pathway around a facility is free from obstructions is legislatively mandated, it is sometimes uncertain which jurisdiction has the authority to ensure that the pathway is accessible. If the city government owns the sidewalks and property around a transit facility, a transit agency might not believe it is responsible for ensuring ADA compliance with that infrastructure. Regardless, when paths of travel are inaccessible, this can result in reduced ridership since pathway obstacles may deter individuals with mobility challenges from using traditional services.

Figure 8: Woman in powerchair using curb cut that is marked with handicapped sign and truncated domes | Source: NADTC

Another neighborhood infrastructure consideration is the physical location of a facility. It is important to assess the geographic location of where transit services are provided. Stations, customer service locations, and venues at which tickets are purchased must be convenient to riders, including those for whom mobility is a challenge. The physical location of transit services should be in close proximity to a diverse range of customers in geographically diverse communities. The idea of a transit hub, where multiple transportation options come together or where riders can also access non-transit services can be a way to attract riders to a public transit service.

Universally designed facilities and accessible neighborhood infrastructure create an opportunity for more riders to use a wide range of transportation services. This opportunity facilitates access to education, employment, health care, and other vital community services that are key determinants of independence in our society. Transit agencies, as community partners, have a vital role in supporting this opportunity for all individuals.

Challenges

In many ways, the transportation industry is still learning about universal design, including how to implement accessibility from the beginning and respond to the variety of transit-related needs of individuals with disabilities, particularly for those riders with cognitive or sensory disabilities. Designing the physical attributes of facilities or the building design features of a transportation

mode may be more easily achievable than creating services that respond to individuals with sensory and cognitive disabilities. It may be beneficial for agencies to identify their challenges and address them as they move forward with a universally designed system.

- Too often facilities and infrastructure related to transit service are not universally designed as they are built or implemented. Universal design becomes an afterthought.
- Transportation planners and engineers may lack the knowledge or skill about universal design to fully integrate its tenets in design.
- Agencies may devalue the significance of building in universal design from the beginning and underestimate the return on investment of ensuring projects and services are universally designed from the beginning.
- There may be ambiguity regarding who has the authority to ensure that the neighborhood infrastructure around a transit facility is accessible and ADA-compliant. This ambiguity, in addition to federal or local regulations, may lead to agencies having limitations in what funding they can use to improve facilities, which can hinder making a facility more accessible.
- Agencies may be penalized for accessibility violations under the ADA; however, there are few opportunities for agencies to be recognized for their work to go above and beyond ADA requirements.

Recommendations

It would not be practical or realistic for transit agencies or planners to simultaneously address all of the features of their facilities or neighborhood infrastructure. Doing so may be costly and result in service disruption. Integrating activities to aid universal design in strategic planning, transportation improvement plans, and coordination activities may make more sense for transit agencies. Cost and time should not be the sole catalysts in deciding when or how to improve universal design. Recommendations should focus on the challenges an agency faces that inhibit fully inclusive facilities and infrastructures.

1. Ensure that universal design is built into facilities by creating opportunities for transit agency administrators and planners to work with designers, architects, and engineers as projects are considered and launched.
2. Consider inviting individuals with disabilities, including those with sensory or cognitive disabilities, to offer feedback regarding planned projects or service improvements along every step.
3. Identify training and professional development opportunities across your agency – for all staff – to educate them about ADA requirements and universal design strategies that go beyond the ADA requirements. Participate in community forums that provide an opportunity to learn about universal mobility and the needs of a diverse range of riders.

4. Articulate the value of universal design, including its impact on ridership, revenue, and availability of services across a community. Calculate the return on investment both monetarily and on the value to the community.

5. Publicize your work to create a universally designed system through local human service forums and connections with non-profit organizations in your community. Take credit for being responsive to individuals with disabilities.

6. Leverage flex funding to improve accessibility when possible. Flex funding allows agencies to use grants from Federal Highway Administration sources to improve transit connectivity. This way, highway program funding can be transferred to public transportation projects. Pedestrian projects within a half-mile of a fixed-route transit stop or bicycle infrastructure projects within three miles of a fixed-route transit stop that maximize transit-supported infrastructure and improve transit access are generally eligible for funding. For additional funding information, see the Shared Mobility Funding Strategies Learning Module.

Resources

- Learn about current ADA regulations. **Americans with Disabilities Act Regulations and Guidance. US Department of Transportation, Federal Transit Administration.**
- Understand the regulatory requirements of the Americans with Disabilities Act. Code of Federal Regulations, Title 49, Transportation, PART 38—American with Disabilities Act (ADA) Accessibility Specification for Transportation Vehicles. **Authority of public agencies under the ADA.**
- Acquire design guidance. The Transit Street Design Guide provides design guidance for the development of transit facilities on city streets, and for the design and engineering of city streets. National Association of City Transportation Officials (NACTO), **Transit Street Design.**
- Obtain technical assistance. **A Series of Topic Guides Providing Technical Assistance for Transit Agencies, Riders and Advocates on the Americans with Disabilities Act (ADA) and Transportation. Compiled by the Disability Rights Education and Defense Fund (DREDF).**
- **FTA/FHWA Flex Funding:** Learn about flexing federal funds to promote safer routes to transit and better community connections through complete street infrastructure.
- **Flexible Funding for Transit Access:** This site provides simplified resources for various practitioners (i.e. project sponsors, localities, regions, State DOTs, and transit providers) to understand how to use the flex funding provision.

Checklist

Facilities Design

Facilities design includes a focus on the building or physical assets an agency has, along with consideration of the path of travel or neighborhood infrastructure that enables a rider to get to and from transit facilities. The Americans with Disabilities Act (ADA) provides regulatory guidance regarding architectural and design considerations. An agency can ask the following questions when assessing the universal design of its facilities.

Fixed Facilities

- Are the stations and boarding stops where riders begin or end their journey fully accessible without additional equipment or supports?
- How do you evaluate the accessibility of your facilities? Are individuals with disabilities involved in these assessments?
- Do you use Access Board and/or ADA standards as the foundation for your facility assessment?
- Do your facilities enable accessibility for individuals with all types of disabilities, including those with physical, motor, sensory, or cognitive disabilities?
- Do you have informational services at the facility that are accessible to all types of riders?

Neighborhood Infrastructure

- Are the public rights-of-way and sidewalks fully accessible around transportation stops to enable ease of access and safe pedestrian mobility?
- Do you have clear plans and procedures for ensuring that pedestrian access to transit stations are accessible?
- Are individuals with disabilities involved in decision-making and assessment regarding paths of travel?
- Do you use ADA Transition plan data regarding ADA challenges in your assessment of the accessibility of neighborhood infrastructure?
- If you are not responsible for the pathway leading to a transit stop or station, do you work with those professionals who do provide this oversight?
- Are you involved in community committees and advisory councils that can help inform your accessibility strategies (inside and outside of your facilities)?

Operations

The second component of universal design pertains to individuals taking a trip and using a transportation service. Universal design impacts every trip component, including how an individual with a disability learns about transportation service, how they access the service outside of a station, how they navigate throughout a station, and most importantly, the experience of the ride itself – the service and vehicles. Universal design concerns the complete trip. Operations can include those service components related to the knowledge and interactions of transit personnel in the station and on the service. It also consists of the service setting and the ability of individuals with disabilities to navigate comfortably on the service and access critical information related to such things as emergency procedures or stop information.

Transportation service is a continuum of operations that includes:

1. How individuals learn about services, schedules, and costs;
2. Procedures for purchasing tickets and paying fares;
3. How individuals board and deboard from a transportation mode; and
4. Riding the service.

If one of these points in the continuum is not accessible, the entire trip can become inaccessible. A universally designed system considers all of these elements in a holistic way.

Challenges

It can be difficult for transportation planners and providers to think about the varying and diverse needs of riders in a holistic way. All individuals, regardless of whether they have a disability, have preferences and perceptions that can influence their satisfaction with transit operations. Nevertheless, the industry is legally obligated to ensure accessibility across a continuum of service and across all of the access points for riders. The following represent some of these challenges.

- It can be difficult to view transit operations as a continuum, with all of the elements that an individual must use to access a service including learning about transportation service, acquiring payment methods and paying for fares, boarding and alighting a service, and riding a transportation mode.
- Some states, regions, and communities lack true coordination between transit agencies and human services organizations that represent the interests of individuals with disabilities.
- Transit agencies and providers may not have relationships with those community organizations who can support their work around universal mobility and accessibility.
- Mobility management networks are lacking in many states, regions, and communities, therefore, the opportunity for transit agencies to develop relationships and garner the support of mobility management professionals is limited.
- Although the requirements of ADA and US Access Board Standards are documented, accessibility solutions in other areas, such as building relationships with human services and engaging individuals with disabilities as decision-makers, are not as well defined.
- Often there is siloed service between traditional fixed route and paratransit or specialized transportation.

Recommendations

Universally designed operations focus on steps or procedural factors necessary for an individual to access and use transportation services. Planning for administering all of these factors in an aggregated way will ensure that the entire trip is universally designed. These recommendations can support the focus on a continuum of accessibility across the entire transportation journey.

1. Invite a team approach to address universal design across operations that includes those staff responsible for the multiple components of a trip, such as those professionals involved in marketing information about the system, the agency staff who design and maintain the scheduling and payment systems, and the personnel who buy and maintain the vehicles. In these conversations, it is also important to communicate with consumers (i.e. those using the services).

2. Minimize fragmentation and territorialism across agency roles by creating synergistic opportunities to address universal design. These might include activities such as responding to grant programs that necessitate collaboration across agency departments, sharing educational opportunities and training, and seeking forums for production of cooperative work products.

3. Engage community human services organizations in every facet of operations – don't just rely on an annual public engagement forum. Educate consumers and advocates on the operational elements that characterize a transit system.

4. Create spaces where transit agencies, private mobility providers, and human service organizations come together to engage in coordinated mobility planning efforts.

5. Consider engaging in community mobility management activities to share information about the multiple components of operations. Build relationships to learn about accessibility across the continuum of service.

6. Participate in ADA forums locally or nationally that can help clarify regulations, obtain examples from peer agencies, and establish a relationship with ADA experts to support agency operations.

7. Holistically view your agency services by creating connections across fixed route service and paratransit service. There can be fragmentation between agency staff who design and deliver traditional versus ADA service. However, by creating opportunities to learn across these services and share practices and strategies, an agency is creating "one-system" that is accessible to all. This collaboration may even result in improved accessibility across operations that can facilitate ridership by individuals with disabilities, thus, reducing the demand for paratransit service.

Resources

- Learn about accessibility across a continuum of operations. **National Aging and Disability Transportation Center (NADTC).**
- Obtain strategies to facilitate agency participation in mobility management. **The National Center for Mobility Management (NCMM).**
- Acquire information to facilitate accessibility for a range of individuals with disabilities. **How to Make Transportation Accessible to Disabled People.**
- Access resources and strategies related to accessible transit technology**. National Center for Applied Transit Technology (NCATT)**
- Implement policies and practices related to web and electronic accessibility. **Web Accessibility Initiative (WC3 Standards).**

Checklist

Operations

Operations include all of those steps that enable a rider to use the transportation service. This continuum of service starts with the ways that the community, particularly riders with disabilities

learn about transit service, costs, and planning a trip. The continuum includes considerations for transit service, vehicles, and features of those vehicles that affect riders. Finally, a universally designed system and its operations includes opportunities for feedback and communications following their trip.

Marketing, Communications, and Outreach

- Are the ways that riders learn about your services accessible? Do you use multiple media formats to reach diverse audiences? For instance, do you have print material in addition to digital content that can be accessed by screen readers for individuals who are blind or have visual disabilities?
- Is the agency staff communicating about your services representative of the diverse range of riders who use your service?
- Are your marketing and/or sales staff knowledgeable about the range of disability conditions and the implications of these disabilities on rider needs?
- Can riders learn about your services through various forums, such as websites, community meetings, or relationships with mobility management professionals?
- In the materials that your agency produces, are individuals with disabilities included as representative riders of your system?

Vehicles

- Are all riders able to access and ride the range of vehicles in your service network without additional equipment or supports?
- Do you have plans in place to enhance the accessibility of existing vehicles?
- Are your procedures to procure new accessible vehicles sound? Do they align with ADA requirements?
- Does your procurement staff have the necessary expertise to engage in discussions with vendors about accessibility needs and features?
- As new and innovative service modes or vehicle types are considered, is accessibility and a focus on universal design always part of these considerations?
- Are individuals with disabilities involved in your decision-making and plans about new or existing equipment?

Riding the Service

- Are the staff who operate and support your services educated about the traveling needs of riders with disabilities?
- Can individuals with disabilities easily board and exit vehicles safely?
- Can individuals with disabilities access information on their route such as signage about stops, emergency procedures, seating, etc.?
- As passengers are using the service, do the features of the vehicle align with the ADA Standards?

- Do you have a process to obtain feedback from all riders, including those with disabilities, immediately following their riding experience when the information is fresh on their minds?
- If there are disruptions or changes in service, and as new services may have to be implemented, is there a deliberate focus on the riding needs of individuals with disabilities?
- When emergency services are put in place, are these clearly conveyed to diverse riders through multiple formats? Can you solicit the input of community human services agencies or mobility managers and consumers to get ideas regarding how best to communicate this information?

After the Trip

- Are there opportunities for riders with disabilities to provide feedback regarding their travel experience?
- If riders with disabilities experience challenges while using the service, do you have clear plans and procedures related to customer complaints and resolution?
- Have you considered a rider ambassador type program that enables riders with disabilities to share their expertise and knowledge of your system with prospective riders?
- Can individuals with disabilities provide your agency with accolades and positive feedback regarding their riding experience?

Element 3: Service and Planning Coordination

Service and planning coordination is essential to addressing the current mobility assets, needs, and challenges in a city or region. Once assets, needs, challenges, and opportunities are identified, various transportation entities are better aligned to craft and carry out strategies to improve the usability and accessibility of the overall transportation network. Too often, agencies planning for and providing mobility services have operated in silos rather than taking a coordinated approach to expand overall mobility. This element explores how mobility system fragmentation, a foundational barrier to achieving universally accessible transportation, arises from a lack of service and planning coordination.

Figure 9: Staff Looking at Transportation Planning Maps, | Source: NADTC

Coordination involves multiple entities working together to deliver efficient, accessible, safe transportation services and curate safe travel environments. Coordination may include sharing resources, aligning services, improving communication streams, and thinking about all aspects of a transportation journey.

Ongoing coordination of transportation services improves system connectivity and reliability and encourages the use of shared mobility options. It helps break down barriers so that all community members can exercise their right to mobility. The service and planning coordination element outline various mobility challenges arising from a lack of coordination between mobility players. These challenges and recommendations are not isolated and must be considered across the Universal

Mobility Elements in this learning module. In many cases, the challenges and solutions related to coordination are complex and overlap with other elements discussed in this module.

System Fragmentation

System fragmentation occurs when there are various transportation services in an area that operate privately or publicly and at different governance levels: municipal, township, county, or regional. The lack of coordination between local, regional, and private operators often generates a patchwork of services that creates inconsistent travel experiences. Furthermore, a lack of coordination between those operating mobility services and those planning for mobility systems can make attempts to support seamless and accessible journeys for all users fall short.

From the agency's perspective, a fragmented system makes it difficult to inventory the available mobility options; therefore, duplicative services or areas with limited mobility services often exist. Thus, the user has to navigate inconsistent mobility options with different service parameters and requirements, making it difficult to plan and travel.

Challenges

Agencies or organizations that develop, fund, and provide transportation services are often fragmented, with little coordination between mobility providers. Fragmented systems present challenges at both the agency and transit user levels.

Below is a list of challenges that arise within uncoordinated or fragmented transportation systems:

- **Payment:** In fragmented transportation networks, one may need to use multiple modes to complete a trip. Differing fare payment systems among mobility operators cause challenges in using multiple services to get around. Additionally, travel is likely to become more expensive if there is the need to use various uncoordinated modes to complete a trip.

Figure 10: New Fare Payment Option, |Source: METRO

- **Inter-jurisdictional Travel:** For those living on the fringes of city limits or near county lines, the ability to travel across jurisdictions is necessary but may be complicated by the absence of mobility services or varying service hours among mobility options. In areas where state regulation allows for local jurisdictions to opt-out of transit systems, it becomes increasingly difficult for passengers to travel to destinations across county lines or in other jurisdictions.

- **Eligibility:** Service area and rider eligibility requirements can differ between providers, making it difficult to identify and coordinate services.

- **Awareness of Available Mobility Options:** Due to the number of specialized services that run out of human service organizations and the influx of private mobility companies entering the transportation market, it is easy for cities, agencies, and community members to lack an understanding of the current mobility operations in place. Without systemic direction and interagency coordination, the influx of new mobility options will continue to increase the complexity of travel rather than improve performance and customer experience.

- **Micromobility Management:** Over the past few years, there has been an influx of micromobility devices coming to cities with the promise of offering a sustainable mode of travel that helps bridge gaps in current transportation systems. Micromobility often takes the form of bikeshare and scootershare, and provides a convenient way to travel short distances and connect to public transit. However, the dockless nature of many of these micromobility devices has led to safety and accessibility concerns. Frequently, these devices have blocked sidewalks and pathways, posing significant travel obstacles for various types of travelers, including, but not limited to, those who must navigate public spaces with assistive mobility devices, strollers, or visual disabilities. Further coordination is needed between local

governments, micromobility operators, other service providers, and the disability community to address this.

Figure 11: Scooters Blocking Sidewalk, |Source: Curbed |Brock Keeling

- **ADA Accessibility:** ADA transition planning intends to guide municipalities in their transition to a more accessible state. ADA transition plans identify existing programs, services, facilities, policies, and communications that require changes and outline the steps necessary to become accessible. Creating and implementing these plans is crucial to creating safe environments (i.e., streets and sidewalks) so that people of all ages and abilities can navigate and participate in their communities. However, follow-through of these plans becomes difficult because of the disconnect between players who plan for, coordinate, and operate services and facilities that may require improvement. Thus, accountability regarding the removal of accessibility barriers falls short and can result in a disconnect between the pathways used to access transit and the transit services themselves.

- **Existence and Maintenance of Basic Infrastructure:** When working toward universal mobility, the upkeep of existing infrastructure needs just as much consideration as its presence. Uneven and damaged sidewalks create hazardous conditions for many users, particularly those with mobility limitations, as it presents another obstacle to navigating travel. In winter, uncleared snow and accumulated ice can be hazardous to users by impeding pathways and preventing pedestrian and wheelchair access. Additionally, deteriorated paint along crosswalks and bike lanes hinder safe travel because these amenities, which provide spatial whereabouts of alternative transport users, become less visible. Without continual equipment and infrastructure maintenance, there is a reduction in bike and pedestrian infrastructure use, effectiveness, and safety, inhibiting overall accessibility. Unfortunately, responsibility for the maintenance of these seemingly basic

pieces of infrastructure varies: sidewalks are generally the property owner's responsibility, the roadway is the municipality's responsibility, and the bus shelter is the transit agency. Further coordination is needed to ensure accessible mobility connections remain between facilities owned and maintained by different jurisdictions.

Figure 12: Mobility Scooter Traveling Through Snow |Source: University of Toronto

- **Paratransit Implications:** As on-demand mobility opportunities become more prominent, it is important to consider the implications that those services might have on existing fixed-route service and corresponding paratransit service eligibility guidelines. When a fixed-bus route service is replaced with a microtransit zone, complementary paratransit service offered within ¾ mile of the fixed-route is at risk for those transit agencies that strictly adhere to ADA equivalent service requirements. However, this is less of an issue for transit agencies that extend equivalent service to a county or city boundary.

Recommendations

1. Establish a regional mobility management coordinator to survey available mobility options and oversee the different mobility options and payment eligibility criteria to inform and assist riders. Mobility management coordinators can help cultivate partnerships and ensure that there is consistent communication between transportation providers, planners, and other community stakeholders.

2. Develop a strategic regional mobility plan in collaboration with the municipalities, public and private transportation providers, and community service providers that offer a coordinated approach to transportation policy.

3. Establish a regional or metropolitan body to coordinate transportation and land use planning and convene at the local level to consider the varied mobility needs.

    - A metropolitan or regional transportation body in charge of public transportation services can be positioned to address fragmentation in transportation networks. However, most metropolitan areas and regions lack a regional development framework coordinating policy, regulatory, investment, and development decisions. This coordination works best when a local champion and agency lead regional mobility management across the region's transportation providers and services.

4. Find ways to facilitate interaction between transportation providers. Working groups can serve this purpose to bring awareness to what others are doing, talk through issues, and build support for coordination. Working groups may help coordinate transportation options among agencies serving common eligibility and human service mobility operators.

    - Organize a service provider and user working group to connect more people to available services that fit their needs.

5. Develop coordinated fare policies. Standardizing the fare payment process across providers can reduce customer confusion and support a more seamless, cost-efficient trip.

6. Explore interlocal agreements between transit agencies and municipal governments. Interlocal agreements allow municipalities to outsource transit services in geographies that don't provide their own transit services. Often local governments can provide multi-jurisdictional service through interlocal agreements.

7. Open mobility data can help coordinate trips across jurisdictions as they allow for better communication between mobility operators (see Understanding Mobility Data for more details).

8. Increase awareness of mobility options to benefit agencies and users.

    - Inventory the available mobility services in a city or region. This inventory should be used to identify service gaps based on transit user mobility needs and challenges.

    - Engage in intentional marketing of mobility services to specific populations and ensure the information is in various formats, including in languages other than English.

9. Implement the tenets of the Coordinating Council on Access and Mobility (CCAM) at the state, regional, and local levels. This Federal initiative, led by the Federal Transit

Administration (FTA), encourages coordination, resource sharing, and shared funding for transportation across 11 Federal agencies.

10. Local governments must create policies and regulations for micromobility services that work for all parties.

    - Enact municipal ordinances that clearly outline where micromobility devices can and cannot be parked. Ensure that allowable parking for micromobility does not impede curb ramps, bus stops, or disabled parking zones. Follow this by outlining enforcement policies.

    - Adopt Mobility Data Specification (MDS) protocols to help local municipalities standardize and manage micromobility programs (see Understanding Mobility Data for additional details).

    - Cities should include local disability communities in the planning processes surrounding the integration of micromobility devices into the transportation system. For instance, before launching their free-floating e-scooter pilot program, Seattle DOT co-designed the e-scooter permit process by engaging business owners, bicycle advocates, and disability advocates. This coordination resulted in educational resources that convey the importance of properly parking these devices.

11. Designate an employee responsible for coordinating ADA compliance. The ADA coordinator should be aware of engineering challenges associated with accessibility or have a working relationship with relevant staff members. There should be opportunities for ADA personnel to interact with those transportation professionals who are designing and delivering the service.

12. Methods should be in place to communicate inaccessible, unsafe, or deteriorating infrastructure conditions relevant to completing a trip.

    - Establish quarterly meetings between local transit agencies and public works departments to create a strategy for improving and maintaining bus stops and pedestrian facilities.

    - Establish an online tool or application where the general public can inventory pedestrian and bicycle infrastructure and identify areas of concern or needed improvement.

13. On-demand services that operate with accessible vehicles have the opportunity to provide more mobility opportunities with greater flexibility. However, the complementary paratransit service should not be eliminated. To continue to serve these areas, transit agencies should look to expand geographic eligibility to a city or county beyond the ¾ mile radius of a fixed-route. Additional strategies for an on-demand service are having a call-center to accept trip

requests, allowing users to book in advance (important for scheduling medical appointments), and using a mobility manager to communicate available mobility options.

Resources

- **Coordinating Council on Access and Mobility (CCAM)**: A Federal effort to improve transportation coordination across 11 Federal agencies, their state counterparts, and their grantees.
- **NCMM: Resource for Mobility Managers**: The National Center for Mobility Management provides various resources on mobility management that could help users looking to establish or engage in mobility management practices.
- **Easterseals: Mobility Management Certification Program**: This resource offers an opportunity to learn about the complexities of mobility management and the unique way it can support both transportation programs and human services providers in your service area.
- **National Aging and Disability Transportation Center (nadtc.org)**: Offers a wide-range of resources promoting the availability and accessibility of transportation options for older adults, people with disabilities and caregivers.
- **Great Lakes ADA Center:** The Great Lakes ADA Center's mission is to increase awareness and knowledge with the ultimate goal of achieving voluntary compliance with the Americans with Disabilities Act. This is accomplished within targeted audiences through provision of customized training, expert assistance, and dissemination of information developed by various sources, including the federal agencies responsible for enforcement of the ADA. While not an enforcement or regulatory agency, it is a helpful resource supporting the ADA's mission to "make it possible for everyone with a disability to live a life of freedom and equality."
- **Transportation for America - Micromobility: General Provision:** This resource provides guidance to local governments as they craft micromobility policies to ensure that operational and accessibility issues are properly addressed.
- **Where the Sidewalk Ends:** This resource offers insight into the state of municipal ADA transition planning for the public right-of-way in the Chicago region.

Checklist

Service Planning and Coordination

Those who reside in rural areas must travel to urban areas to access specialized medical care. Those without access to personal vehicles must heavily rely on public transportation options to access these essential services; however, if those services cannot provide transportation across jurisdictional or county boundaries, certain population groups will be at a disadvantage.

- Are there options for riders to travel across county lines or jurisdictional boundaries when using transportation services?
- Are there interlocal agreements in place to facilitate regional travel?

Agencies can meet more individuals' needs through communication and sharing resources. Coordination plans help transportation providers in the region identify strategies to achieve goals,

establish measurable outcomes, and determine where there is duplication of services, opportunities for consolidation, etc.

- Do you have a process to identify and resolve coordination issues?
- Does your municipality have an ADA transition plan in place?
- What communication methods are in place to facilitate interaction between municipalities, transit agencies, and the general public?
- Is there regular information sharing among providers and user groups?
- When a new mobility service is introduced to a community, is there coordination between cities or other regulators, private mobility operators, and transit agencies?
- Do you have a staff member dedicated to coordinating service across agencies?
- Does your region have a mobility management coordinator?

Element 4: Mobility Data and Technology

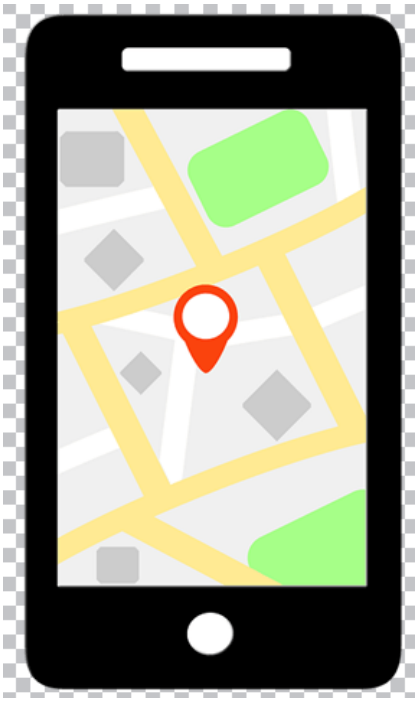

Figure 13: Trip-Planner Graphic

Mobility data is essential to universal mobility because it can help alleviate barriers around accessing and using transit, as well as help create an interoperable mobility system that accommodates all users, including individuals with physical and cognitive disabilities. The Mobility Data and Technology element offers suggestions on how to build staff capacity around data applications, provides a framework to understand the role of mobility data, touches on the importance of involving the mobility user when developing community-focused technology solutions. It is important to realize that leveraging mobility data to expand mobility for all users should not occur in isolation and needs to be implemented with the other recommendations noted throughout this learning module.

There are two components to this Element:

- *Understanding Mobility Data* discusses how agencies can build staff capacity and understanding of mobility data and technology solutions. This section also includes examples of how open mobility data can help address specific issues related to shared mobility access and monitoring.
- *Technology and the Customer Experience* discusses the importance of aligning technology resources to meet all users' needs.

Understanding Mobility Data

An inclusive and well-functioning mobility system requires understanding how mobility services operate in real-time and assurance that mobility service and accessibility information is available to the public. This is where mobility data comes into play. However, not all mobility data's use and implications are the same. For example, data that are available through private operator systems are often specific to that mobility operator, making communication difficult across agencies and other mobility services. On the other hand, the focus of this section is the applications of open data and the role it plays in promoting mobility interoperability. The Mobility Data Interoperability Principles (MDIP) offers a good definition for open data and mobility data interoperability.

- Open Data Standard is a specific ontology, schema, or format used by the mobility industry to facilitate consistent communication between devices. A commonly used open data format is GTFS, which allows for the discoverability of transit services and is open and available to the public.

- Mobility interoperability is defined as the ability of any mobility technology component to exchange data in an open standard or schema with other components in that mobility technology system.

When in place, mobility data helps cities enforce transportation regulations and modify existing regulations to ensure the smooth functioning of transportation services. It also provides a wide range of insights on usage patterns and travel needs which can be leveraged to improve the planning and operations of mobility systems. Interoperable mobility data can also help integrate services across multiple modes or providers of the same mode (e.g., DRT), increasing mobility access and alleviating duplicative services. Subsequently, communicating real-time mobility data to the public can make it easier for people to move around urban and rural spaces. These benefits are far-reaching, impacting all mobility users, including persons with disabilities and older adults.

Figure 14: Mobility Hub demonstrating multi-modal system, including carshare, bikeshare, transit, pedestrian amenities, wayfinding, and transit |Source: CoMoUK

Building Understanding and Capacity

For agencies to use mobility data, they must first understand what it is and its implications. Smaller agencies, or those with limited budgets, can look toward larger governing agencies to help support these efforts. For example, the Minnesota Department of Transportation (MnDOT) was awarded an FTA Accelerating Innovation in Mobility (AIM) grant from the Federal Transit Administration (FTA) to build a regional Mobility as a Service (MaaS) platform. MnDOT worked with many of the smaller rural agencies in the service area to help develop their understanding and capacity for using mobility data and avoid creating an undue burden on those communities.

Having data management systems in place and understanding mobility assets and challenges enables agencies to take on more complex technology-driven solutions. While data can be leveraged to create more inclusive and accessible transportation systems, mobility providers must have the ability to share data across multiple platforms and tools. Open data helps to promote this communication and interoperability across mobility systems. When in place, these interoperable systems enable transit providers to plan services responsive to rider needs and can help to improve service quality and efficiency.

Mobility Data Applications

Following are some example issues that surfaced during the working group discussions and the role that mobility data can play toward promoting universal mobility. For more information on these data specifications and others, see **The Role of Data Specifications in Creating an Interoperable Transportation System** case study.

- **Where are sidewalks available, and are there impediments?** Both the presence and quality of sidewalks are critical to the complete trip. A bus or rail station that is accessible is only a part of a person's trip and cannot fully be considered accessible if there are no clear paths for people to access those mobility services. Two data specifications help to address this issue as they outline criteria to manage curb space and other sidewalk-related information; CurbLR and Curb Data Specification (CDS). CurbLR communicates curb-use regulations from local governments to mobility, delivery, and freight services and the broader public. CDS also provides a formula for sharing regulations between local governments, mobility, delivery, freight services, and the wider public.
- **How do I identify where e-scooters and other shared modes block sidewalk access?** The Mobility Data Specification (MDS) outlines how cities and private mobility providers, like micromobility operators, communicate information, while CurbLR and the Curb Data Specification (CDS) help cities communicate curb regulations.
- **Service capacity constraints limit our agency's ability to provide service**. While under development, the Transactional Data Specification (TDS) is **a** backend tool that enables coordination/interoperability among providers once the user requests a booking. The Operational Data Standard (ODS), a new standard, outlines how transit agencies can relay information areas like non-revenue service and personnel.
- **What mobility services are available for me to plan a trip?** GTFS and some of its extensions, including GTFS-Flex and the General Bikeshare Feed Specification (GBFS), are known as “discovery specifications” because they help transportation users learn about what mobility services are available to them at a given period.
- **What mobility services are available to support my first-last mile connections?** GTFS-Flex adds the capability to model various demand-responsive transportation (DRT) services to GTFS, which currently only models fixed-route public transportation and GBFS is available for micromobility services. Micromobility services, like scootershare and bikeshare, rideshare, and microtransit services have discovery specifications designed uniquely to help users discover their respective services.

- **How can human service transportation providers serve the community, and how might one qualify to use these services?** There are two specific GTFS extensions: Capabilities and Eligibilities. Many human service transportation providers offer service characteristics tailored to specific rider groups or they may require passengers to meet specific eligibility requirements. These Capabilities and Eligibilities extensions help them communicate more specific parameters of this nature to their customers.

The world of mobility data is like a set of building blocks. It is important that people understand and are comfortable with mobility solutions. Ensuring people understand the implications of technology-driven solutions and how those solutions can further the goal of mobility interoperability and universal mobility. Using mobility data does not occur in a vacuum and must align with the other Elements discussed in this Learning Module. For example, implementing any data specifications noted above without understanding user mobility needs and current mobility services will likely not create the on-the-ground support needed for implementation and adoption by the communities. More complex mobility data specifications require greater interagency coordination and community involvement.

Challenges

Mobility data can promote universal mobility by addressing challenges around discovery, access, and management of shared mobility and supporting infrastructure. Here are some of the challenges that surfaced during our discussions with the Universal Mobility Working Group around how to use mobility data and what specific issues it can help to address.

- Partner agencies do not understand the value, uses, and ownership of data to enable multi-modal data platforms to create data silos. As a result, data may not be available when and where they are needed, either because people are unaware of them or they are in an incompatible format.

- Agreed-upon frameworks are essential for communicating transportation data and creating interoperable systems. Transit agencies may not be able to access private mobility data that could help them better understand the mobility landscape in their communities and target their services to meet user needs.

- Some private mobility operators have been hesitant to share data due to concerns about privacy, public records requests, and competition.

- As discussed in the service and planning coordination element, micromobility sidewalk clutter and insufficient ways of managing usage can present significant issues for persons with disabilities. While there is a coordination aspect to it, the regulatory and enforcement can be assisted with the MDS data specification. By using MDS, agencies can manage micromobility operations from a planning perspective.

- The Transactional Data Specification (TDS) is a backend tool that enables coordination/interoperability among providers once the user requests a booking. It is currently being piloted or planned in several communities across the U.S., ranging from rural

applications to urban settings. The TDS implementation is challenging for a number of reasons, such as the limited awareness among transit operators on its applications, the limited support from private mobility operators to adopt the TDS, and differing rider eligibility criteria among mobility services - making it difficult to coordinate trips across multiple agencies.

- An accessible transit station is not accessible if the sidewalk and other paths are missing or in disrepair. This challenge is amplified as trip planning platforms rarely offer information on the station, stop, sidewalk, or street conditions.
- It is challenging to have a meaningful discussion on equity and service access if agencies don't have access to site location and usage data.

Recommendations

Mobility data will not solve all of the impediments to realizing universal mobility. However, it can help address issues around the discoverability of services, accessing those services, and managing supporting infrastructure. The communication that open mobility data promotes across mobility platforms helps to create an interoperable mobility system that better meets the needs of all of its users. Here are some recommendations to promote mobility interoperability and further universal mobility.

1. Agencies should invest in training existing personnel and hire additional personnel to manage IT if needed.
2. Smaller agencies with limited budgets can look for support from neighboring agencies or larger oversight agencies that may have additional resources to help understand and apply mobility data. DOTs and regional MPOs are a good starting point as they can provide tools and resources to smaller agencies, particularly in rural areas.
3. Building support and awareness among regional mobility operators through working groups and other convening opportunities is one of the first steps to a successful open mobility data solution. These opportunities allow neighboring transit agencies and other mobility operators to share experiences, discuss challenges, and learn about opportunities to implement data solutions to improve the discovery and coordination of mobility services.
4. Develop data-sharing requirements for public-private partnerships:
    a. Convene with peer agencies who have established public-private partnerships to get a better idea of the considerations and challenges they have experienced regarding access to data and to understand what data are most important to a pilot’s success.
    b. Agencies should also use broad language when defining their use rights in data-sharing license agreements with mobility providers to allow flexibility and avoid contract renegotiation.

c. Ensure the right to share data with other public sector entities, such as DOTs or MPOs, that have a role in planning, right-of-way management, and service coordination.

d. Prioritize mobility providers who use open-source data standards like the General Transit Feed Specification (GTFS), the General Bikeshare Feed Specification (GBFS), the Transactional Data Specification (TDS), or the Mobility Data Specification (MDS).

5. Encourage the use of data standards and specifications to support the exchange of mobility data and interoperability between systems. Agencies can leverage technology to communicate trip planning information to travelers better. First and last-mile connections to transportation services are vital, and users should have a convenient way to access up-to-date information on accessibility conditions. DRT providers can interoperate their services to reduce service redundancy and increase the opportunity to book a trip. Before implementing an integration solution(s), make sure to consider the following:

    a. What type of data needs to be integrated?

    b. Which applications need to be integrated, and how?

    c. How data will flow within and outside of an agency?

    d. How to implement open standards and specifications?

    e. What policies can be introduced to encourage vehicle sharing, shared funding, and accountability mechanisms that reward entities for creating continuums?

    f. How to document promising practices and guidelines around mobility data interoperability?

    g. Understand that mobility data applications do not occur in a vacuum. The Service and Planning Coordination Element and other Elements discussed in this module are critical for adopting mobility data solutions.

Resources

- **The Role of Data Specifications in Creating an Interoperable Transportation System**: This resource provides an overview of the role and applications of open data. The case study offers a summary table of some of the most commonly used data specifications.
- **White Paper: Objective-Driven Data Sharing for Transit Agencies in Mobility Partnerships**: This resource can help transit agencies determine the right data-sharing approach for their project and consider the benefits and trade-offs of various options. It details current data-sharing practices and real-world scenarios, aiming to guide agencies in establishing mobility partnerships with local operators.
- **A Practical City Guide to Mobility Data Licensing**: This resource can help aid entities as they craft their data-sharing rules and negotiate with mobility providers.

- **CPACS Ride – Lessons Learned in Four Phases – Phase 2: Procurement**: This resource highlights the Center for Pan Asian Community Services (CPACS) experience planning and executing software procurement to support their CPACS Ride microtransit project.
- **National RTAP's GTFS Builder**: This website offers several resources to understand how to use GTFS and build GTFS data files.
- **SUMC MLC: Mobility Learning Center: Mobility Data Specification: A Data Standard for Shared Mobility Providers, Los Angeles, California, 2018 (sharedusemobilitycenter.org);** This resource provides information about the Mobility Data Specification (MDS), a tool developed by the Los Angeles Department of Transportation (LA DOT) to manage shared mobility providers. The open specification allows for two-way communication between service providers and the jurisdictions in which they operate. LA DOT plans to expand it to include other shared modes such as carsharing and ridesharing. The article also discusses some of the data that is shared through the MDS and the intended audience for the specification. This information may be helpful for anyone interested in understanding how LA DOT is managing shared mobility providers and the data they generate.
- **SUMC MLC: Mobility Learning Center: Open Mobility Foundation Releases Candidate for New Curb Data Specification (CDS), 2022 (sharedusemobilitycenter.org)**: CDS specifies how cities and curb users, like taxi and delivery companies, share curb regulations and exchange data. This new specification consists of three application programming interfaces (APIs): The Curbs API, the Events API, and Metrics API.
- **SUMC MLC: Mobility Learning Center: State Agency Releases Operational Data Standard, CA, 2022 (sharedusemobilitycenter.org):** The Operational Data Standard is a new standard that outlines how agencies can provide community information like personnel and non-revenue service.
- **Mobility Data Interoperability Principles (MDIP);** MDIP offers several open data and mobility interoperability resources, including a helpful glossary of the most common terms.
- **Modernizing Demand-Responsive Transportation for the Age of New Mobility:** This resource discusses Transactional Data Specification and its role in helping increase mobility access specific to older adults and persons with disabilities.

Checklist

Understanding Mobility Data

Agencies should understand potential providers' data-sharing approaches and aim to select a partner that aligns with their needs.

- Do you have a data-sharing agreement before launching a new service/project?
- Do you use the same data-sharing licensing format for each mobility provider you work with?
- What is your staff's capacity to understand and implement open data solutions?
- Are there partner agencies that have experience with similar questions and challenges?
- Are there overarching agencies that provide support and resources on open mobility solutions?

- Are there opportunities to implement open data solutions to help address particular challenges and mobility needs?

Technology and the Customer Experience

New technologies and mobility data-driven solutions are continually emerging. Within the last decade, smartphone technology advancements have led to mobility-on-demand solutions that were not previously possible. While these technological solutions are important, they are a piece of the more extensive mobility system that needs to work together. Even more critical, these technology solutions are not always applied to projects with the end user in mind and thus are not sensitive to their personal or cultural means. Technology makes it possible to, among other things, diversify transportation options, offer new services, plan for the complete trip, and obtain/share user data. Still, these technology applications should consider the end user and strive to improve the customer experience. Technology solutions implemented without this understanding often sit idle, given the limited interagency support and misperceptions from the community they aim to serve.

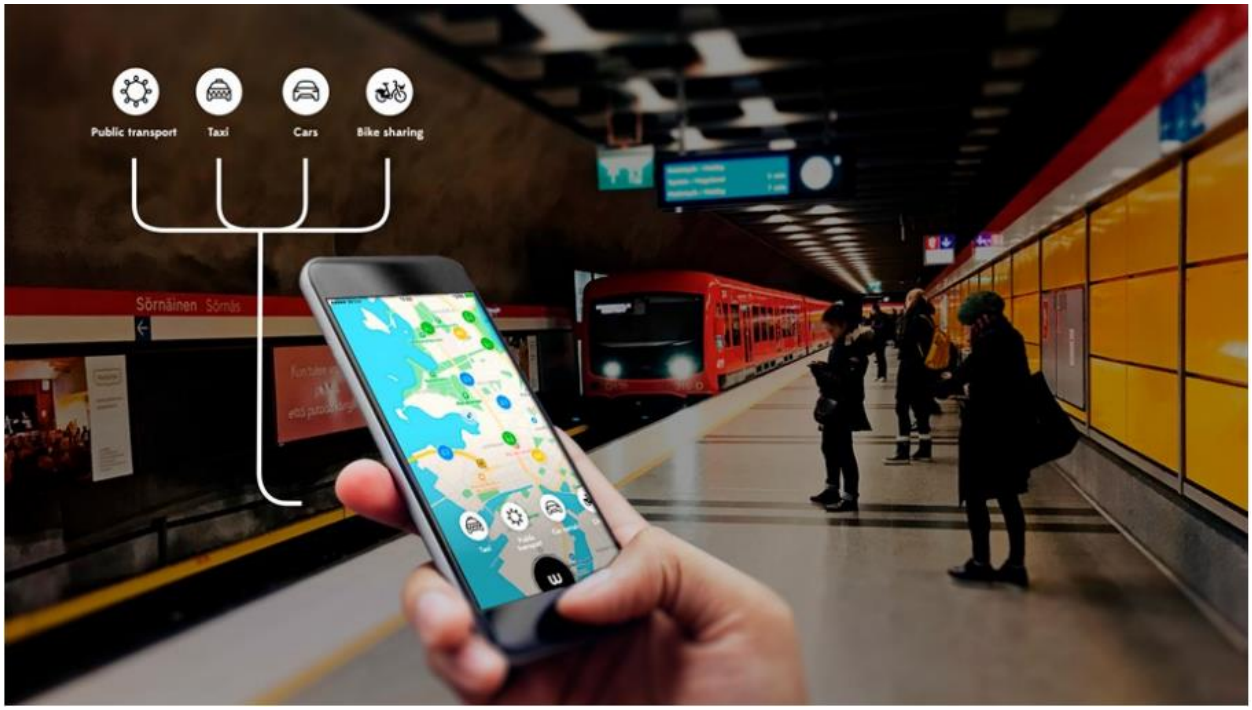

Figure 15: Person using a mobility-as-a service mobile application as they wait for transit |Source: SUMC

There are good examples of where technology has been implemented with the transit user in mind, and these examples demonstrate that this needs to be a deliberate process that is budgeted and planned. Understanding the mobility users' needs extend to the tools themselves, such as the app used to find and book services and assuring that there are multiple ways to access the technology solutions. Meaningful community engagement takes time. Equally important, and similar to the Universal Design Element, when technology solutions are developed in a vacuum, the costs associated with retrofitting them to accommodate all users after the fact can often exceed the costs if they were developed with input from the community throughout the process. When the

community is involved in this effort and the needs of all individuals are considered, then the end product, whether it be a mobility service or a mobility app, works better for all users.

Hopelink, a Seattle-based social service non-profit, is developing a One-Call/One-Click mobility services platform centered on an inclusive planning process in partnership with the King County Mobility Coalition (KCMC). Any individual needing a trip within the boundaries of One-Call/One-Click can access and use its platform at no cost. In the near term, data specifications will include the General Transit Feed Specification (GTFS) and GTFS-Flex; later on, KCMC might also integrate the General On-Demand Feed Specification (GOFS), GTFS-Eligibilities, and GTFS-Capabilities. These discovery specifications can help customers identify information about available transportation services, such as schedules, fares, seating, and accessibility features. In the future, the Transactional Data Specification (TDS), under development, could allow interoperability among providers so when the rider requests to book a trip with one provider they are actually tapping the resources of other providers within the system.

Move PGH began in July 2021 to integrate public transportation with other shared mobility services like carshare, scootershare, and bikeshare. The Department of Mobility and Infrastructure has developed this program in partnership with different technology vendors, like Spin and the Transit app. Move PGH seeks to create a mobility-as-a-service (MaaS) experience for people across Pittsburgh by:

1. Making transit services and different modes of shared mobility discoverable through the Transit app. This adds a new element to trip planning as users can get a more holistic view of different transportation options.
2. Creating dozens of Mobility Hubs where public transportation and shared mobility services are co-located. The City of Pittsburgh hopes this creates an environment where shared mobility becomes a more viable and appealing option to residents and visitors.
3. Piloting a Guaranteed Basic Mobility (GBM) program for 50 low-income residents. In the GBM pilot, users have one year of free access to the mobility offerings in Move PGH.

Challenges

Community engagement is also discussed in the Understanding Passengers Element, but below are some specific challenges related to planning and implementing technology and mobility data solutions.

- Agencies can face difficulties engaging the transit user and building trust with the community.
- Services are not always equitably available throughout a city and to persons with disabilities.
- There may be a misperception that it costs more to involve the community in the planning process.
- Applications and end user tools are not built with all user requirements in mind.

- The impact that technology can have on promoting equity is not always apparent.
- Transit agencies are often behind on technology adoption. With transportation innovation tied to technology, agencies will require training and perhaps new personnel to manage these incoming initiatives.
- The transportation sector is constantly evolving. New technologies are emerging to drive innovation, increase operational and service efficiencies, user safety, and convenience. However, the pace in which technology advancement is occurring makes it difficult for agencies, especially those without as many resources, to fully understand their capabilities and application. Certain agencies may also lack the funds to adopt and maintain the infrastructure required for these technology applications.

Recommendations

There are many resources on how to hold meaningful community engagement, including those highlighted below and the resources listed in our Understanding Passengers Element. These strategies can be effective and should be practiced from the beginning of a project and throughout its implementation. Following are the recommendations we heard from our targeted discussions with the Universal Mobility Working Group specific to the use of technology. Still, these recommendations should be considered within a larger community engagement plan.

1. Budget for meaningful community engagement and input from transit users. Build meaningful partnerships with community groups to better reach mobility users. Recognize that people's time is valuable in these efforts and offer financial support for their time and expertise.
2. Regularly follow up and communicate project progress with those who offered their time and shared their knowledge during engagement efforts.
3. Engage people with disabilities from the beginning of a project and throughout its implementation to ensure the technology and mobility data solution meet their needs.
4. Pilot projects and mobile apps with a small group of people first create a mechanism for obtaining feedback and reporting back to the community regularly. Doing so is critical, given mobility access changes directly impact a person's ability to travel. Technology solutions will require time to implement and fully understand what unintended consequences they may have on the more extensive mobility system.
5. Agencies should work closely with their technology provider(s) and advocate for improvements to address transit user needs. Community engagement and understanding passengers are critical to learning about traveler needs and how mobility services impact their daily lives.
6. When piloting a technology, make sure there is a process for drivers to offer feedback and create a dialogue with the operations team to understand how planning decisions might impact riders.

7. Provide trip planning support information, including information on transportation services available and accessibility conditions, to travelers for their trip.

    a. Incorporate accessibility information into trip planning platforms or applications.

    b. Establish a crowdsourcing app where the public can provide information on current accessibility barriers throughout the system.

        i. Initiatives that incorporate participatory data collection have become more prevalent over the years. In recent years the National Science Foundation funded Project Sidewalk, a web-based crowdsourcing platform where users can label in-accessible sidewalks in some North American cities, including Seattle.

    c. Develop a database of infrastructure obstacles and safety.

Resources

Listed are resources offering strategies to hold meaningful community engagement specific to planning and launching technology and mobility data solutions.

- **Transit Planning 4 All (TP4A) - Community Engagement Strategies:** This website offers a wide range of resources and materials to plan for and carry out meaningful community engagement.
- **Shared Use Mobility Center - Community Engagement Learning Module:** This learning module gives an overview on community engagement and offers strategies to hold meaningful community engagement.
- **Incorporating UX Design into Transportation Solutions:** This resource outlines strategies to obtain user feedback on technology solutions and how to improve user experience.
- **Potential Impacts of Technology on the Customer Experience:** This resource reflects on the delicate balance of using technology while also prioritizing the customer experience and provides key considerations for agencies procuring technology solutions.
- **Hopelink One-Call/One-Click and inclusive planning:** This resource discusses the inclusive planning process undertaken by Hopelink in Seattle in its efforts to develop and launch a one-call/one-click center.
- **Shifting the Mobility Paradigm with Move PGH, Pittsburgh, PA:** Learn about the Move PGH MaaS pilot. Move PGH in Pittsburgh is arguably the most ambitious MaaS-oriented project in the United States. Hosted through Pittsburgh's Department of Mobility and Infrastructure (DOMI), Move PGH seeks to make shared mobility more convenient, accessible, and equitable by offering users an array of transportation options in one app, Transit, and at centrally located mobility hubs. Alongside this, DOMI is also developing a Guaranteed Basic Mobility program that offers fare-free shared mobility options to low-income residents.

- **ELEVATED CHICAGO Community Engagement Principles & Recommendations:** This resource outlines 8 principles—with recommendations and strategies to support each—agencies can use as a guideline to create more meaningful and mutually beneficial engagement with user's mobility projects are intended to serve.
- **The Taskar Center for Accessible Technology** (TCAT): TCAT focuses on pedestrian access and access to transportation, universal access to collaborative work/play environments, and community engagement in the creation of access solutions.

Checklist

Technology and the Customer Experience

While technology is often presented as the solution to streamline efficiencies or improve the customer experience, stakeholders and project managers should consider the real-life implications of technological solutions on an individual's ability to access essential services or participate in project-related engagement efforts.

- What can the organization now achieve by introducing this technology?
- Were community residents engaged in the planning process before implementing a technology solution?
- Does your project consider unbanked users?
- Is the use of technology assisting in meeting goals related to customer experience?
- Do you have metrics in place to measure customer experience?

Offering information on the station, stop, sidewalk or street conditions plays a large role in an individual's ability to access shared services like transit. Technology can be leveraged to ensure real-time accessibility information is readily available to travelers.

- Are trip-planning applications available in your planning area?
- How is traveler information (i.e., delays, incidents, weather-related messages, travel times, emergency alerts) relayed to users and passengers?
- Do the trip planning applications available in your area obtain accessibility condition information that is pertinent to people both with and without disabilities?

Whether the functions needed to run a successful pilot service are performed in-house or contracted out, agencies must be prepared to overcome operational and service issues that stem from incorporating technology-based solutions. While it's become common for transit agencies to partner with transportation technology companies when launching a new on-demand microtransit service, these companies are constantly in flux.

- Does your agency have the staff capacity, knowledge, and funding to adopt, maintain, and operate the infrastructure needed to pursue mobility software solutions?
- Do you have processes to keep your mobility services running when software vendors have outages? What course of action do you take?

Implementing this Universal Mobility Toolkit

This Universal Mobility Tool is not intended to be implemented in its entirety nor is the expectation that all components will be considered or tried at one time. We organized this toolkit in "chunks" of dimensions and purposely included checklists to facilitate implementation. The steps to facilitate an accessible and inclusive organization, with accessible and inclusive services, involves incremental steps. Universal mobility is important for transit and non-transit agencies to implement because of its far-reaching impacts in a community. The participation of a range of diverse perspectives can enhance the acknowledgement that universal mobility is good for everyone and will add value to a community. The following are some considerations for implementation

1) **Include individuals with disabilities, and others from diverse sectors in all facets of implementation.** Universal mobility benefits from the perspectives and experience of a range of community participants, particularly those with lived experience, such as individuals with disabilities.

2) **Understand current needs**. These components assume that you have "taken stock" in where you are regarding each dimension. Examining needs in relation to each of these dimensions helps you plan and prioritize your activities.

3) **Prioritize implementation**. Don't let current resources be the predictor of which strategy your agency will address first. Assess each component based on factors important to your organization such as the impacts on the services you provide (this could mean the impacts on costs or revenue, policy, or regulatory implications of a strategy, etc.). There is often not one compelling characteristic that drives which dimension should be implemented first, or second, etc.

4) **Assess and amend**. Universal mobility is not a one and done process. Workgroup members agreed that universal mobility needs to be systemic, systematic, and a natural and ongoing condition within an organization. Continuously reflecting on whether your strategies related to universal mobility reflect your objectives can enable an organization to make real-time corrections and amendments.

5) **Build universal mobility into strategic Plans.** Most agencies have strategic plans and logic models or theories of change that guide their internal management processes. Universal mobility tenets and activities should be integrated into these business functions.

6) **Integrate universal mobility in other organizational plans.** Whether it's a transportation improvement plan, a human service coordinated transportation plan, or some other blueprint for an organization, consider how universal mobility work can align with activities suggested in these plans.

7) **Leverage existing projects and initiatives**. For instance, the ITS4US Deployment Program is a $40 million multimodal effort, led by the US Department of Transportation's, Intelligent Transportation Systems Joint Program Office (ITS JPO) and supported by OST, FHWA, and FTA. Projects identify ways to provide more efficient, affordable, and accessible transportation options for underserved communities that often face greater challenges in accessing essential services. The program aims to solve mobility challenges for all travelers with a specific focus on underserved communities, including people with disabilities, older adults, low-income individuals, rural residents, veterans, and limited English proficiency travelers. This program will enable communities to build local partnerships, develop and deploy integrated and replicable mobility solutions to achieve complete trips for all travelers

8) **Invite the participation of partners.** Universal mobility should be considered by professionals from the transportation services sector, as means of enhancing accessibility. However, because universal mobility affects and is impacted by the community, it is important for transportation professionals to invite the participation of non-transit peers. Individuals representing human services, governmental entities, and those professionals from across industries, such as health, human services, labor, etc. can be important contributors to universal mobility.

9) **Support open and interoperable mobility data solutions.** Interoperable mobility data solutions can help to manage and integrate services across multiple modes or between providers (e.g., DRT), increasing mobility access and alleviating duplicative services. Subsequently, communicating real-time mobility data to the public can make it easier for people to move around urban and rural spaces. Consider pursuing open and interoperable mobility data solutions to achieve universal mobility goals, as doing so can address specific rider needs and the management of shared mobility services.

10) **Consider how universal mobility can serve as the foundation for future funding.** A community and system-wide universal mobility approach demonstrates the capacity of an agency or organization to create an inclusive range of services. The characteristics of universal mobility would be valued by funders who want to ensure that grantees or contractors are welcoming and supportive of a diverse range of individuals. Consider how the services that are provided align with the tenets of universal mobility and capture this work in capabilities statements that can support future funding.

11) **Be a champion, a cheerleader, and a catalyst.** Not all participants in or outside of your organization will "buy in" to some of the principles and strategies suggested by a universal mobility approach. An organization needs educators and proponents to lead, nudge, and reinforce the tenets of universal mobility. Identifying the outcomes related to Universal Mobility implementation –to service, cost efficiency, public engagement, and a new and expanded resource base, can influence naysayers, who may have not seen the value of universal mobility.

The SUMC and NCMM Team that developed this content, along with the significant input of a nationally recognized workgroup, would welcome any suggestions and comments regarding your experiences in implementing universal mobility strategies. Both national TA Centers can offer technical assistance and continued support as agencies create and extend a universally designed organization and service range that is inclusive and accessible.

Thank you for embarking on this universal mobility journey with us.

Al Benedict, SUMC **Judy Shanley, NCMM**

Checklist

This checklist is intended to support agencies as they evaluate their current state, identify pain points, and brainstorm solutions to address various challenges.

Customer Service

Information

The following questions on the checklist below can aid in assessing the best practice to get information accurately to customers.

- Are all riders able to access the most current information from drivers or station guides?
- Is the information outdated resulting in misinformation for the customers?
- Does your frontline staff have the tools necessary to provide accurate system information?
- Are individuals with disabilities able to acquire the correct information to use the system successfully?
- Is the passenger information developed through an inclusive process to be presented equally for all (in a variety of languages, formats depending on disabilities and all areas of the community)?
- Has the agency developed a policy to conduct to gain feedback from passengers?

Operators

Operators need to be trained to have the confidence in providing the correct information to assist customers which secures a positive experience.

- Are the operators responsive to customer requests or concerns?
- Are customers' concerns being reviewed thoroughly resulting in a solution?
- Does your entity have Operator customer service training regarding how to address customer requests?
- Do operators complete customer sensitivity training?
- Do drivers have a positive, customer-first attitude to ensure successful passenger experiences?

Complaint Process

These questions below can help an agency brainstorm to create a basic complaint process that includes how to file a complaint, and what happens after a complaint is filed.

- What is the structure of the customer complaint review process?
- Is there a system or database to track duplicate or consistent complaints regarding the same issues?
- Is compliance training given to high level management based on actual examples of complaints?
- Is the customer complaint process accessible for all?

ADA Compliance

These questions below can help an agency develop guidelines to aid in becoming more inclusive. Collaborating with diverse partners to design a more accessible space can ensure a more inclusive passenger experience.

- Does your entity provide accessibility services for all passengers?
- Is your system designed to be inclusive? Facilities, vehicles, customer environment?
- Are there partnerships in the disability space to aid in designing the accessible passenger experience?
- Does your entity employ an ADA coordinator/officer?

Engagement

Developing a systematic customer engagement outline will ensure that the agency's relationship with the rider is not a one-time event. The proper engagement strategy will result in repeat riders and established trust between communities and mobility practitioners.

Community Partnerships

Community partnerships can be beneficial in the following ways: 1. Providing inclusive design, 2. sustainable funding opportunities, and 3. increased ridership.

- What partnership organizations could be developed to assist in the design to maximize the customer experience?
- Has your agency developed customer focus groups to aid in project development?
- Does your agency have a community level board to review all aspects of design, operations, and customer service as it relates to the passenger?
- What is the goal that community partnerships will achieve?
- What can each community stakeholder bring to the table?

User Fit of Mobility Options

An agency can ask the following questions when trying to evaluate, plan, and execute transportation options that include the best mobility for the passengers in the community. They can help daily riders navigate the planning process to find the best fit of mobility options that will be used to transport passengers to their daily destinations.

- Is your agency educated on the mobility options available in the community?
- Do the mobility options connect in the overall transportation system of the community?
- Are there ways to engage passengers with all mobility options to analyze the best fit for the community?
- Are daily riders included in the planning and decision-making process to select the best mobility option?
- Is there a tool kit to analyze the communities needs of mobility per the user demographic?

Evaluation and Performance

Whether a project involves introducing a new bike-share service, upgrading transit facility infrastructure, or establishing a mobility-management center, establishing performance metrics will help agencies evaluate how well the project has met its overall goals and objectives.

- What staff will oversee the management of this mobility project or service?
- What are your performance requirements?
- What parameters and metrics have you established to measure your project or services performance?
    - How well does the mobility service or project meet the needs of individual travelers ?
    - How effectively and efficiently does the service performs while meeting the needs of individual travelers
    - How does the mobility service or project impact the region/community regarding sustainability, accessibility, environment, etc?
- What data sources have you identified to functionalize those performance metrics?
    - Are the data available?
    - What would be the format and unit of a given data element?
    - Are you able to obtain the data?
    - Is the data for the metric inaccessible due to privacy, cost, or agreement constraints?
- How do you plan to measure customer satisfaction? What efforts have you undertaken to collect feedback?
- How do your performance parameters align with the overall project or service goals?
- Has your team collected data on several indicators that estimate the broader effect this service or project will have on mobility and accessibility?
- Have you established evaluation criteria?
- Have you established systems to report and share out your mobility performance measures and findings?

Service Planning and Coordination

Those who reside in rural areas must travel to urban areas to access specialized medical care. Those without access to personal vehicles must heavily rely on public transportation options to access these essential services; however, if those services cannot provide transportation across jurisdictional or county boundaries, certain population groups will be at a disadvantage.

- Are there options for riders to travel across county lines or jurisdictional boundaries when using transportation services?
- Are there interlocal agreements in place to facilitate regional travel?

Agencies can meet more individuals' needs through communication and sharing resources. Coordination plans help transportation providers in the region identify strategies to achieve goals, establish measurable outcomes, and determine where there is duplication of services, opportunities for consolidation, etc.

- Do you have a process to identify and resolve coordination issues?

- Does your municipality have an ADA transition plan in place?
- What communication methods are in place to facilitate interaction between municipalities, transit agencies, and the general public?
- Is there regular information sharing among providers and user groups?
- When a new mobility service is introduced to a community, is there coordination between cities or other regulators, private mobility operators, and transit agencies?
- Do you have a staff member dedicated to coordinating service across agencies?
- Does your region have a mobility management coordinator?

Understanding Mobility Data

Agencies should understand potential providers' data-sharing approaches and aim to select a partner that aligns with their needs.

- Do you have a data-sharing agreement before launching a new service/project?
- Do you use the same data-sharing licensing format for each mobility provider you work with?
- What is your staff's capacity to understand and implement open data solutions?
- Are there partner agencies that have experience with similar questions and challenges?
- Are there overarching agencies that provide support and resources on open mobility solutions?
- Are there opportunities to implement open data solutions to help address particular challenges and mobility needs?

Technology and the Customer Experience

While technology is often presented as the solution to streamline efficiencies or improve the customer experience, stakeholders and project managers should consider the real-life implications of technological solutions on an individual's ability to access essential services or participate in project-related engagement efforts.

- What can the organization now achieve by introducing this technology?
- Were community residents engaged in the planning process before implementing a technology solution?
- Does your project consider unbanked users?
- Is the use of technology assisting in meeting goals related to customer experience?
- Do you have metrics in place to measure customer experience?

Offering information on the station, stop, sidewalk or street conditions plays a large role in an individual's ability to access shared services like transit. Technology can be leveraged to ensure real-time accessibility information is readily available to travelers.

- Are trip-planning applications available in your planning area?

- How is traveler information (i.e., delays, incidents, weather-related messages, travel times, emergency alerts) relayed to users and passengers?
- Do the trip planning applications available in your area obtain accessibility condition information that is pertinent to people both with and without disabilities?

Whether the functions needed to run a successful pilot service are performed in-house or contracted out, agencies must be prepared to overcome operational and service issues that stem from incorporating technology-based solutions. While it's become common for transit agencies to partner with transportation technology companies when launching a new on-demand microtransit service, these companies are constantly in flux.

- Does your agency have the staff capacity, knowledge, and funding to adopt, maintain, and operate the infrastructure needed to pursue mobility software solutions?
- Do you have processes to keep your mobility services running when software vendors have outages? What course of action do you take?