



SPECIALIZED TRANSPORTATION STRATEGIC PLAN

JANUARY 2020



Prepared by WSP in partnership with IBI Group,
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Source: SAANDAG

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Source: MTS

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EXECUTIVE SUMMARY

The San Diego Association of Governments (SANDAG) is updating *San Diego Forward: The Regional Plan (Regional Plan)*, which outlines the overall vision for the future of the San Diego region. An important component of the Regional Plan is the Coordinated Plan, a guide for the implementation of public transit and social service transportation. The specialized transportation element of the Coordinated Plan focuses on the mobility needs of seniors and persons with disabilities who cannot use regular transit services.

In order to assess the transportation needs of our growing senior and disabled populations and make recommendations for improvements in service, a *Specialized Transportation Strategic Plan* is needed that will:

- Identify transportation needs and current gaps in service;
- Survey best practices for specialized transportation from other agencies nationwide;
- Develop near- and long-term strategies for improving specialized transportation; and
- Incorporate study recommendations into the update of *San Diego Forward: The Regional Plan*.

This executive summary highlights the key work and findings from the development of this *Specialized Transportation Strategic Plan*.





Specialized Transportation Services in San Diego County

Numerous specialized transportation services are offered within San Diego County through both publicly- and privately-operated programs. On the public sector side, both the Metropolitan Transit System and the North County Transit District provide complimentary paratransit services in conformance with the Americans with Disabilities Act of 1990 (ADA). ADA paratransit service is an origin-to-destination, shared ride, advanced reservation public transit service available to pre-qualified persons who are unable to use regular fixed-route transit services. ADA paratransit provides service to and from destinations within $\frac{3}{4}$ -mile of regular fixed-route bus service.

Several other entities offer specialized transportation services within San Diego County, including social or human service agencies and local jurisdictions.

Facilitating Access to Coordinated Transportation (FACT) is a nonprofit agency that was designated in 2006 by SANDAG as the region's Consolidated Transportation Services Agency (CTSA). As the region's CTSA, FACT is responsible for the coordination of public, nonprofit, private, and other transportation services in San Diego County. FACT operates a mobility management center that provides transportation referrals. Individuals looking for transportation are referred to the most appropriate service based on their needs.

Identified Needs and Service Gaps in San Diego County

Though transportation needs can vary between population groups, access to key destinations is one of the primary needs regardless of the population itself. Many people who need specialized transportation need access to many of the same destinations that other members of the population need, including access to jobs, medical facilities, educational and job training centers, and adult day care facilities.

There are a number of factors that affect the provision of specialized transportation services within San Diego County. Key 'service gaps' categories include:

- Underserved Populations – inability to access fixed-route services increases demand for specialized transportation.
- Service Unreliability – delays in pick-up and/or drop-off times and transfers impact passengers' ability to arrive to appointments on time.
- Lack of Coordination – poor coordination of specialized transportation services between the two transit operators and social service providers, as well as among social service providers.
- Lack of Funding and Affordability – scarce funding for specialized transportation services inhibits service providers from expanding or otherwise enhancing existing services.
- Personnel Needs – many providers don't have the resources to meet current demand and/or lack the resources to properly train personnel.
- Lack of Knowledge – many people are not aware of all transit services that are available, notably seniors who have not previously used transit and then become transit-dependent.

Agency Peer Review and Workshop

A peer review was undertaken centered on the operational and financial performance of peer public agencies throughout the country that provide specialized transportation services. Paratransit in San Diego performs as well as or better than peer averages in terms of vehicle productivity and cost per trip.

SANDAG held a workshop with six peer agencies from around North America to gain an understanding about their experiences – what has worked and what hasn't worked. Attendees from six agencies - Los Angeles, Sacramento, Portland OR, Seattle WA, Denver CO, and Dayton OH – provided suggestions to SANDAG on ways to improve paratransit program including:

- Look for the "sweet spot" in terms of how service providers use all available modes.
- Leverage the CTSA more to coordinate paratransit and other specialized services.
- Mobility as a Service (MaaS) is the future of transit with its focus on enhancing the integration of mobility services across the transportation network; suggestion that SANDAG or another public agency needs to own that or the private sector will fill that gap.

- Consider how much is spent on fare collection and take into account future technology that automates payment.
- Don't over complicate things – sometimes you have to “go back to simple.” It is not always the best idea to have a large team where bureaucracy often impedes progress and efficiency.
- Now is a good time to take some calculated risks with technology.
- Rider education is important and the CTSA can play an important role.
- Coordination can be difficult because lots of agencies don't want to give up their power; change often comes slower than desired.
- Try to integrate paratransit and fixed route transit as much as possible.
- Paratransit should be included in all trip planners; all coordination efforts need to be available to those that need paratransit.
- Encourage tech companies to create open software that accepts third-party apps.
- Focus should always be on the customer – provide as much freedom and flexibility as possible.

Industry Best Practices

As the mobility landscape continues to evolve, connected travelers, continued advancements in transportation technologies, and private sector involvement present unprecedented opportunities for public transportation improvements, in general, and the delivery of specialized transit, specifically.

In recent years, concepts such as microtransit and mobility-on-demand have helped agencies provide a range of mobility options for the senior and disabled communities by developing and integrating unconventional modes into their services, engaging the private sector in the form of transportation network companies (TNCs), taxis, and other modes as complementary alternatives to traditional specialized transit delivery schemes. However, while transit agencies continue to experiment with new business models, suppliers, and technologies to extend service (and mobility options), challenges related to providing cost-effective, efficient, and equitable service to all people remain.



Source: <https://www.yrt.ca>

Transit agency initiatives related to innovative service delivery models are highlighted by a number of business strategies:

- Mobility on Demand (MOD) – such as Uber, Lyft, taxis, and private microtransit – may expand customer travel opportunities and offer customers spontaneity of travel.
- The Family of Transportation Services (FTS) approach encourages eligible paratransit riders to complete all or part of their journey using conventional transit services, which can help reduce the average travel distance for dedicated specialized transportation trips. The transfer locations are designed to facilitate a consistent, accessible transfer to or from the conventional service.
- Public-private partnerships (P3) allow transit agencies to partner with private companies to improve service, and sometimes to expand the geographic area served. Private companies can complement agency services by extending service into lower-density areas by offering first-mile/last-mile solutions. Potential private partners include TNCs, taxis, and private microtransit.
- Mobility as a Service (MaaS) takes the integration of mobility services across the transportation network to another level. Within the MaaS framework, public transit is the backbone and other mobility solutions expand the service area and complement the fixed-route public transit backbone network. The goal is to provide people with more options for efficient and convenient travel. MaaS can help improve transportation network equity by providing these opportunities better than can public transit alone.
- Consolidated Transportation Services Agencies (CTSAs) in California were created to promote the consolidation of social service transportation services. CTSAs can be effective in reducing costs and promoting operating efficiencies in areas such as: combined purchasing of equipment and management software; joint training of drivers; joint procurement of insurance; centralized administration, dispatching and maintenance; and identification and consolidation of existing funding for social service transportation services.

Source: Pexels

TNCs such as Uber and Lyft are examples of public-private partnerships

FACT is the consolidated transportation service agency in San Diego County

Emerging Technologies



There are several emerging mobility technologies and concepts that are either still in their infancy or yet to be tried in the specialized transportation environment. Opportunities have been identified in trip planning, trip booking, fare payment, service delivery, and customer information and wayfinding.

Emerging technologies are best categorized by their current stage development and usage:

- **Mainstream technologies** refer to technologies that are widely deployed in the industry for solutions relevant to customers and agencies. These technologies include:
 - » Real-time information on vehicle arrivals and service alerts.
 - » Account-based payment systems.
 - » Self-service portal for demand response/specialized transit trips where customers can register, apply for, and track their eligibility and book and manage trips.
 - » Trip notification via interactive voice response system the night before the trip and a configurable number of minutes prior to arrival of a vehicle at pickup location.
 - » Better adoption of schedule optimization software to support same-day trips and vehicle assignments.

- **Limited commercial deployment** refers to technologies that have seen some experimental deployments, but have not matured or there is not enough acceptance for mainstream use by customers and/or agencies. Such technologies include:
 - » Ridehailing or ridesourcing apps have been prevalent in recent years and have provided travelers additional travel alternatives.
 - » Cashless payment systems enable customers to pay for trips electronically.
 - » Wayfinding is one of the key issues in specialized transit, particularly with the senior and disabled population who may not be familiar with the transit service area.
- **Pilot deployments:** There have been some deployments, typically funded by USDOT grants or under public/private partnerships. Concepts or technologies are still in their infancy.
 - » Connected vehicle technology can assist with ensuring pedestrian safety (an important factor in mobility planning for older and disabled passengers) to a great extent through collision avoidance and warning systems.
- **Advanced research, but no deployments:** These technologies or solutions should be considered high-risk to deploy since no field testing has yet been performed.

Specialized Transportation Strategies

A number of potential strategies were developed to address the identified needs and gaps discussed earlier.

These strategies and a subsequent recommended approach for going forward, were considered within a framework of *Guiding Principles, Objectives, and Evaluation Criteria*.

Guiding Principles:

- Preserve the integrity of the Region's specialized transit services for those with no alternative
 - Maximize benefits from investments made in accessible fixed route transit & provide flexible mobility options
 - Compliance with Americans with Disabilities Act (ADA) & Title VI
 - Be fiscally responsible and accountable
-

Objectives:

- Maximize use of existing resources
- Increase efficiencies in service delivery
- Enhance the customer experience
- Leverage use of technology to improve future services

Evaluation Criteria:

- Effectiveness – population served and number of trips generated;
- Economy – total costs, capital vs. operating costs, large capital outlays, and present-valued expenditures over the long-term;
- Efficiency – cost per trip, per vehicle-hour, plus costs to customer and funding partners;
- Level of Service – reservation constraints, hours of service, frequency of service, and trip purpose;
- Quality of Service – enhanced customer experience - convenience, transfers, travel time, comfort, dignity, and flexibility;
- Socio-Economic Factors – impact on employment access and social well-being;
- Civil Rights Implications – ADA and Title VI compliance; integration;
- Organizational Issues – operational flexibility, control and accountability, human and labor relations, and ease of implementation;
- Technical Risk – if new or modified equipment is required;
- Public Policy Risk – the potential for changes in direction of local or state policies; and
- Financial Risk – if large capital outlays are required.

Strategies will be driven by consensus of an overall long-term vision, goals and objectives, including but not limited to:

- Growth (and changes) in the transportation disadvantaged population including the need to manage changing demographics;
 - Fiscal responsibility;
 - Enhancing the customer experience (integrated trip planning, booking, real-time customer
-

information, broadcast trip arrival information, etc.);

- Next-generation mobility including e-hailing/ride-share services;
- Opportunities to leverage technology including mobile payment; and
- Recognition of the dynamic market for 'essential' services from shopping (changing retail landscape) to the delivery of medical/diagnostic services (and virtual experiences).



Recommended Strategies and Phasing

A phased approach for the deployment of preferred strategies is outlined, reflecting near-term (up to 5-years), mid-term (5 to 10 or 15 years) and long-term (15+ years).

Near-term strategies that have consensus, are lower cost, are relatively easy to implement, build off strengths of current operations, and may result in positive changes/ near-term “wins” include:

- Amended eligibility and certification processes.
- Operations and service delivery reflecting multiple tiers of service including the use of supplemental taxi/TNC services.
- Deployment of proven technologies to enhance the customer experience reflecting App based or through a web portal – trip booking, confirmations, cancellations, tracking pick-up times, mobile payment, etc.
- Demand management measures including accessibility enhancements to fixed route bus and rail services.
- Enhanced coordination between the current specialized transit services (MTS Access and NCTD LIFT and FACT/CTSA regarding information dissemination, travel/ mobility training, brokering of trips, etc.).

Mid-term strategies based on promising new technologies/service delivery options that require longer lead time, involve higher costs to implement, and/or a desire to see lessons learned from other systems, may require further study/assessment. Further, mid-term strategies may require seeking federal and/or state funding opportunities for pilot programs.

Mid-term strategies include:

- Advancing alternate governance scenario that may include an evolving Mobility on Demand (MoD) strategy.
- Next-level application of (emerging) technologies such as trip planning tools and accessible fixed-route (bus and rail) services.
- Alternate fuel vehicles/zero emission vehicles and electrification of fleets.
- Monitor the progression of wearable technologies, advanced wayfinding, enhanced safety solutions.

Long-term strategies based on promising new technologies and service delivery options that are just beginning to be tested in the marketplace typically have higher costs and risks, and/or require considerable complexity to implement. Near-term actions may just be to monitor progress to better assess a potential implementation timeframe. Long-term strategies include:

- Determine the role of autonomous vehicles.
- Monitor the evolution of the design of mobility devices.

Next Steps

The *Specialized Transportation Strategic Plan* is a “living document” that is meant to be updated over time as conditions change, lessons learned from early deployments, and the on-going monitoring of the experience with next-generation service delivery and technology deployments throughout the country.

1 INTRODUCTION

1.1 STUDY PURPOSE

The San Diego Association of Governments (SANDAG) is currently updating *San Diego Forward: The Regional Plan (Regional Plan)*, which outlines the overall vision for the future of the San Diego region. An important component of the Regional Plan is the Coordinated Plan, a guide for the implementation of public transit and social service transportation. The specialized transportation element of the Coordinated Plan focuses on the mobility needs of seniors and persons with disabilities who cannot use regular transit services. In order to assess the transportation needs of our growing senior and disabled populations and make recommendations for improvements in service, SANDAG is developing a *Specialized Transportation Strategic Plan*.

The *Specialized Transportation Strategic Plan* will:

- Identify transportation needs and current gaps in service;
- Survey best practices for specialized transportation from other agencies nationwide;
- Develop near- and long-term strategies for improving specialized transportation; and
- Incorporate study recommendations into the update of *San Diego Forward: The Regional Plan*.

1.2 REPORT STRUCTURE

This report is divided into the following sections:

Section 1: Introduction

The purpose of this report is outlined.

Section 2: Specialized Transportation Services in San Diego County

The current state of affairs with specialized services in the San Diego region is assessed.

Section 3: Peer Review

The peer review focuses on the operational and financial performance of peer agencies and includes a commentary on how MTS Access and NCTD's LIFT paratransit services perform relative to the peer agencies. The peer agencies that were analyzed include:

- Los Angeles County (CA) Access

- Orange County (CA) Access
- Sacramento (CA) Paratransit Inc
- Portland (OR) Tri-Met LIFT
- Boston (MA) The RIDE
- Broward County (FLA) TOPS
- Denver (CO) Access-a-Ride
- Seattle (WA) Metro Access

Section 4: Industry Best Practices

This section presents a discussion of specialized transportation industry best practices. It captures the essence of operating characteristics of peer agencies as well as a broader range of national experiences and opportunities for enhanced mobility, including greater integration between specialized and conventional transit services.

- Outlines the current mobility landscape in North America, including a description of the impacts of transportation on people and cities, overview of current challenges, factors driving change, new mobility solutions and suppliers, and where the industry is headed.
- Provides a discussion of the emerging role of transit agencies as mobility managers, new business models, and challenges and opportunities transit agencies may face.
- Discusses various business models in use, including Mobility on Demand (MOD), Family of Transportation Services, Public Private Partnerships, and Mobility as a Service concepts. Also included is discussion of California's Consolidated Transportation Services Agencies (CTSAs)
- Presents a description of the general state of mobility in the United States, including services, contexts, partners, and initiatives, and provides case studies.
- Provides a description of some of the challenges and considerations as they apply to deploying new service models, engaging the private sector, and using other strategies for specialized transportation.
- Presents a discussion of specialized transportation operations and common industry practices. These include key functional/operational elements in the delivery of specialized transit, ranging from eligibility and certification processes to trip management and reporting. Contained within is a discussion of supplemental service delivery elements including the use of transportation network companies (TNCs) and accessible taxis.

- Discusses emerging mobility technologies including: mainstream, limited commercial, and pilot deployments as well as mobility technologies for which there is advanced research, but no deployments.

Section 5: Overview of Potential Strategies

A comprehensive discussion of potential strategies for addressing and improving paratransit is presented.

- Outlines potential strategies that address identified gaps in service from Section 2 and present opportunities for improvements in paratransit based on governance, technology, funding, coordination with regional plans, and public-private partnerships.
- Presents an analysis of these strategies and evaluation of those strategies that have the most relevance for the San Diego.
- Provides thoughts on phasing strategies for short-term, mid-term, and long-term improvements.

Section 6: Next Steps

This final section provides thoughts on next step actions for SANDAG and the region to set in motion for the *Specialized Transportation Strategic Plan*.

Appendix

Literature Search Findings: Includes a synopsis of pertinent reports and articles relevant to the development of this report.

2 SPECIALIZED TRANSPORTATION IN SAN DIEGO COUNTY

2.1 EXISTING PROGRAMS

Numerous specialized transportation services are offered within San Diego County through both publicly- and privately-operated programs. To better understand both the characteristics and needs of existing service providers, a survey was developed and distributed to local transit agencies and other key providers in January 2018. The survey was designed to understand overall program characteristics and unmet needs, program operations, and technologies used in the provision of services.

2.1.1. TRANSIT AGENCIES

There are two public transit operators within San Diego County: The Metropolitan Transit System (MTS) and the North County Transit District (NCTD). Each agency offers a variety of fixed-route bus and rail transit services that they directly operate or contract with other companies to provide. Both MTS and NCTD receive state and federal funding as public transit operators and are therefore subject to state and federal regulations. These regulations include the requirement to provide complimentary paratransit services in conformance with the Americans with Disabilities Act of 1990 (ADA).

ADA paratransit service is an origin-to-destination, shared ride, advanced reservation public transit service available to pre-qualified persons who are unable to use regular fixed-route transit services. ADA paratransit provides service to and from destinations within $\frac{3}{4}$ -mile of regular fixed-route bus service.

ADA paratransit hours of operation typically mirror those of regular fixed-route bus service and riders typically pay one-way fares. Fares are unique to the agency that is providing the service but conform to federal regulations.

The characteristics of each agency are described in more detail below in Sections 2.1.1.1 and 2.1.1.2.

2.1.1.1. SAN DIEGO METROPOLITAN TRANSIT SYSTEM (MTS) ACCESS

MTS is the provider of transit services in the urbanized southern part of San Diego County. MTS' complimentary ADA is provided through its MTS Access program. MTS Access provides ADA paratransit service throughout the MTS service area, which includes parts of North and Central San Diego, South Bay, and East County areas.

The MTS Access service area is divided into four zones and are roughly defined based on

the location of existing fixed-route services and municipal boundaries. Passengers may be required to transfer to another MTS Access vehicle if traveling between zones, similar to a passenger transferring between two fixed-route bus services.

As of September 1, 2019, the one-way fare is \$5.00 for travel within all MTS Access zones. Transfers between MTS Access zones do not require additional payment; however, transfers to NCTD LIFT service requires a fare payment to NCTD. An overview of MTS Access service and financial characteristics is provided in **Table 2-1**, along with a map in **Figure 2-1**.

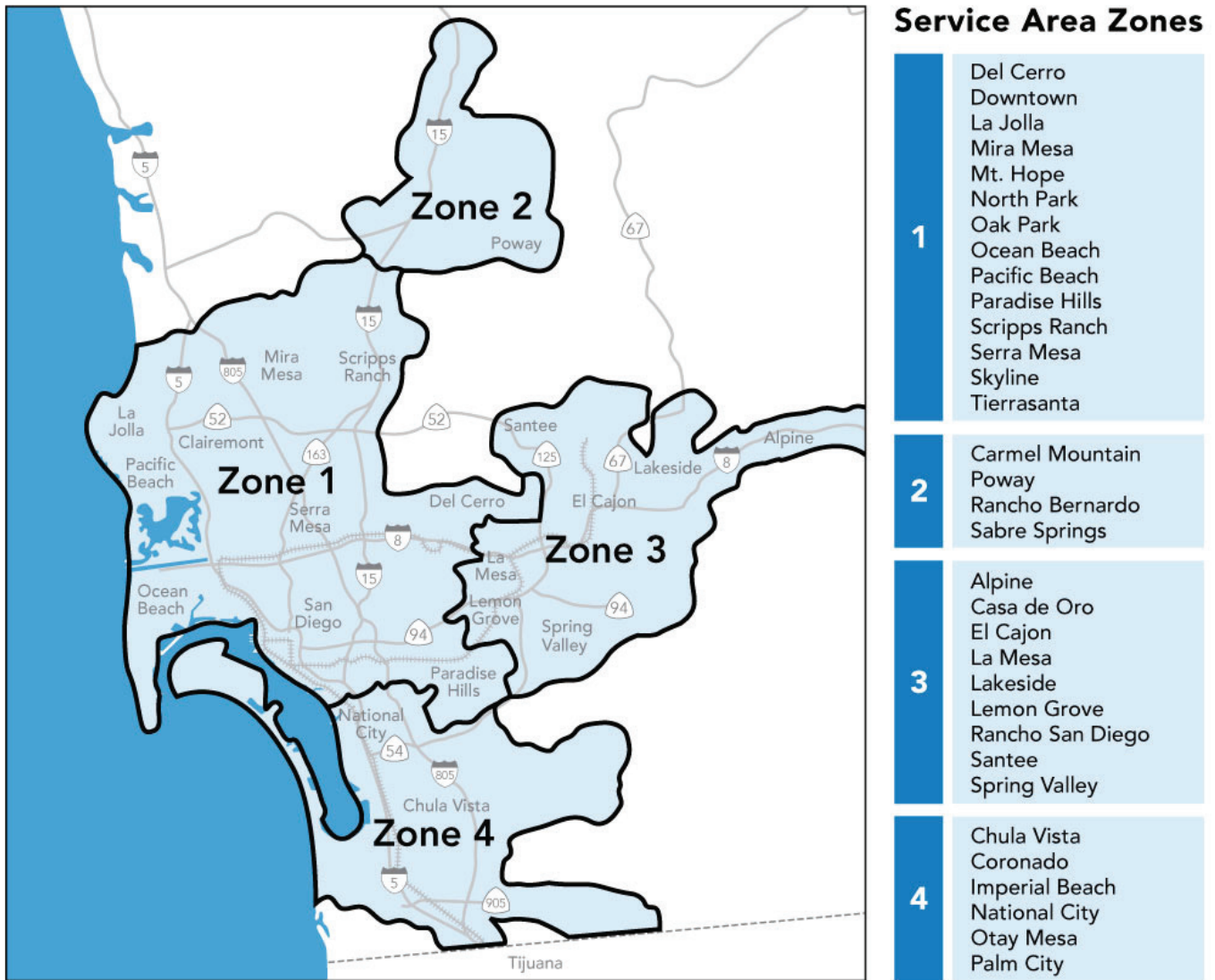
Table 2-1.
MTS Access
Characteristics

CHARACTERISTIC	DESCRIPTION
Number of Clients	9,854
Annual Trips Provided	529,090
Average Weekday Ridership ¹	1,690
Percentage of Registrants Who Use a Mobility Device (e.g. wheelchair, walker, etc.)	20% (approx.)
Client Population Served	Persons with physical and cognitive disabilities, sensory impairments
Total Operating Costs	\$19,764,550
Fare Revenue Earned	\$2,773,603
Net Operating Costs (Total Operating Costs – Fare Revenue)	\$16,990,948
Total Operating Cost Per Trip	\$37.36

Note: information obtained from MTS for FY2017 unless otherwise noted. Some numbers may not total due to rounding.

¹ Average weekday ridership calculated by dividing the total annual trips by an annualization factor of 313. This factor was obtained from SANDAG and is based on historic ridership data for MTS and NCTD transit services.

Figure 2-1. MTS Access Service Area



Source: MTS (2018)

2.1.1.2. NORTH COUNTY TRANSIT DISTRICT LIFT

NCTD is the primary transit operator for the North County area within San Diego County. NCTD provides transportation service primarily by contracting with other entities. NCTD’s transportation program also includes the use of taxis.

NCTD offers ADA and paratransit services throughout its service area through its NCTD LIFT program. The NCTD LIFT service area includes areas within a ¾-mile buffer of fixed-route bus service, as well as within one mile of FLEX routes 392 and 395, which provide service within Camp Pendleton. FLEX routes are fixed bus routes that allow for passengers to request drivers

deviate from the route by up to ¾-mile to perform pick-ups and drop-offs. An overview of NCTD LIFT service and financial characteristics is included in **Table 2-2**, along with a map in **Figure 2-2**.

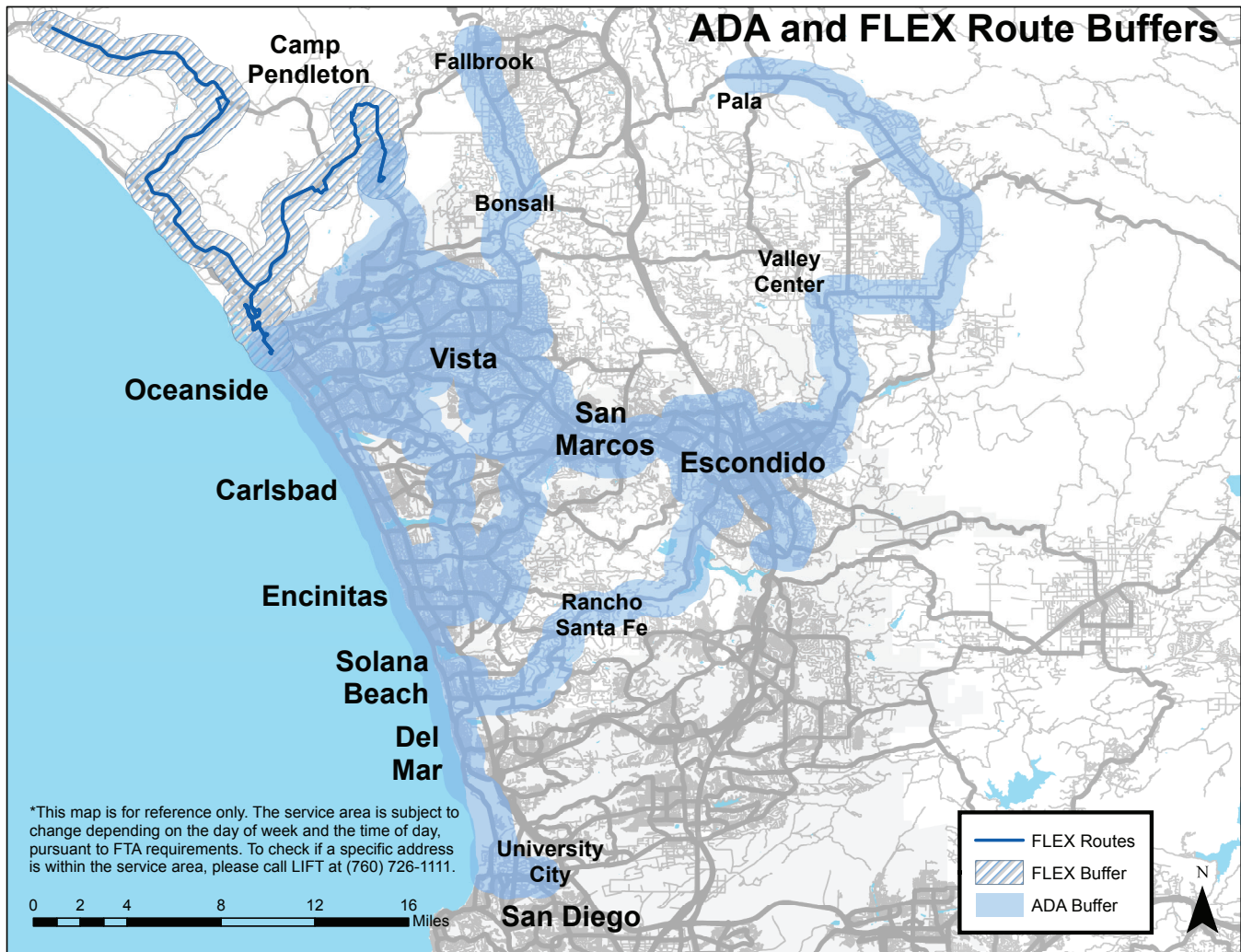
Table 2-2. NCTD LIFT Characteristics

CHARACTERISTIC	DESCRIPTION
Number of Clients	9,348
Annual Trips Provided	202,173
Average Daily Ridership ¹	646
Percentage of Registrants Who Use a Mobility Device (e.g. wheelchair, walker, etc.)	Approximately 20%
Client Population Served	Persons with physical and cognitive disabilities, sensory impairments
Total Operating Costs	\$9,544,922
Fare Revenue Earned	\$788,103
Net Operating Costs (Total Operating Costs – Fare Revenue)	\$8,756,820
Net Operating Cost per Trip	\$47.21

Note: information obtained from NCTD for FY2017 unless otherwise noted. Some numbers may not total due to rounding.

¹ *Average weekday ridership calculated by dividing the total annual trips by an annualization factor of 313. This factor was obtained from SANDAG and is based on historic ridership data for MTS and NCTD transit services.*

Figure 2-2. NCTD LIFT Service Area



Source: NCTD (2018)

2.1.2. OTHER KEY PROGRAMS

Several other key programs offer specialized transportation services within San Diego County. The sections below provide an overview of a select number of these other transportation and mobility programs. Many are provided by the social or human service agencies and often provide client-specific transportation. Others are provided by local jurisdictions, typically for residents. The transportation landscape includes volunteer driver programs, shuttle services, taxi voucher programs, and non-emergency medical transportation services. **Table 2-3** provides a summary of the operating and financial performance for several programs that provide transportation service under each respective program.

2.1.2.1. FACILITATING ACCESS TO COORDINATED TRANSPORTATION

Facilitating Access to Coordinated Transportation (FACT) is a nonprofit agency formed in 2005, and in 2006 designated by SANDAG as the region's Consolidated Transportation Services Agency (CTSA). As the region's CTSA, FACT is responsible for the coordination of public, nonprofit, private, and other transportation services in San Diego County. FACT seeks to improve access to transportation for seniors, persons with disabilities, veterans, and the income disadvantaged and fill gaps in existing services.

FACT operates a mobility management center that provides transportation referrals. Individuals looking for transportation are referred to the most appropriate service based on their needs. Transportation referrals are provided via telephone and through the web-based trip planner, Find-A-Ride.

If passengers are not able to access MTS Access, NCTD LIFT or other social service agency transportation programs, FACT uses a transportation brokerage model – comprised of a network of transportation agencies and called RideFACT – to provide transportation through a contracted brokerage provider. RideFACT services all 18 cities within San Diego County as well as the communities of Ramona and Spring Valley. These providers respond to individual trip requests with their availability and estimated trip cost. FACT then procures trips based on transportation provider availability, trip cost, and the individual passenger's needs. Using this model, FACT can offer trips at competitive rates, which promotes cost-effective transportation services.

FACT is governed by a Board of Directors comprised of elected officials, transportation professionals, and stakeholders, including one member of SANDAG's Transportation Committee.

2.1.2.2. LOCAL JURISDICTION AND SOCIAL SERVICE AGENCY TRANSPORTATION PROGRAMS

There are a number of local jurisdictions and social service agencies in San Diego County that provide specialized transportation services (see **Table 2-3**). Many of them apply for capital and operating funding through SANDAG's Specialized Transportation Grant Program, which distributes local and federal grant funds to support transportation for seniors and individuals with disabilities. SANDAG encourages all social service agencies to participate in FACT's coordination efforts to help coordinate social service agency transportation, share resources, and improve the efficiency of the services provided. Some of the types of programs provided are highlighted below.

2.1.2.3. VOLUNTEER DRIVER PROGRAMS

Several transportation programs in the region use volunteers to provide transportation to seniors and individuals with disabilities. These programs tend to be more cost-effective than

traditional paratransit due to the use of volunteers. An added benefit of using volunteers is that they can provide personalized care and form unique bonds with the passengers they transport. Key volunteer driver programs within San Diego County include Jewish Family Services (JFS), the City of Coronado's *Coronado Seniors Out and About*, and the San Diego County Volunteer Driver Coalition.

2.1.2.4. SHUTTLE PROGRAMS

Shuttle programs within San Diego County provide group transportation to frequently-visited destinations, including trips for shopping, attending social and civic events, or medical appointments. Most shuttle programs use wheelchair accessible buses and are offered on a more limited, but regular basis than other modes of specialized transportation. Shuttle programs provide an added benefit of giving seniors and individuals with disabilities the opportunity to socialize with other passengers. Several providers offer shuttle programs within San Diego County, including JFS, the Peninsula Shepherd Center (PSC), and the City of Vista.

2.1.2.5. TAXI VOUCHER PROGRAMS

Taxi voucher programs subsidize taxi trips for seniors and individuals with disabilities. The agency responsible for managing the social service program purchases vouchers and provides them at a discounted rate or at no cost to their clients. Vouchers have a certain value that can be applied to the cost of a taxi trip. While taxi voucher programs tend to have lower overhead costs, individual trips may be more expensive than those made through other modes due to higher costs of taxi trips themselves. Due to potentially higher costs, agencies may use taxi voucher programs as a back-up to other programs. Taxi voucher programs within the San Diego region include the Senior Service Council in Escondido, among others.

2.1.2.6. NON-EMERGENCY MEDICAL TRANSPORTATION

A large percentage of specialized transportation consists of trips to non-emergency medical appointments. These trips can be made via volunteer driver programs, paid drivers, or via taxi voucher programs. Because these trips tend to be unique to an individuals' personal need, trips cannot be grouped and require more resources, such as drivers, vehicles, and time to complete. Because of this, these trips are therefore more expensive than trips provided through shuttle programs or traditional transit. Non-emergency medical transportation is provided through several programs, including the City of La Mesa's *Rides4Neighbors*, programs at Sharp hospitals, and the Foundation for Senior Care's *Care Vans* program.

Several other providers exist in San Diego County aside from those noted above. To better understand the characteristics of key providers within the region, the project team conducted a survey that gathered information including: the types of services provided, average daily ridership, and annual budget and revenue, among other items. An overview of the survey response is included in **Table 2-3** below.

Table 2-3. Summary Survey Responses for Other Key Providers

PROVIDER	SERVICES PROVIDED	NUMBER OF CLIENTS	AVERAGE DAILY RIDERSHIP	PERCENTAGE OF REGISTRANTS WHO REQUIRE TRANSPORTATION ¹	PERCENTAGE OF REGISTRANTS WHO USE A MOBILITY DEVICE	AVERAGE # OF ONE-WAY PASSENGER TRIPS PER MONTH	GROSS ANNUAL BUDGET	ANNUAL REVENUE	NUMBER OF DRIVERS	AVERAGE DAILY VEHICLES USED	FUNDING SOURCE
TRAVELERS AID SOCIETY OF SAN DIEGO	Volunteer Driver Program, Taxi Voucher Program, Arrange for Transportation Services	1,633	20	100%	90%	7,135	Response not Provided	Response not Provided	73	45	General Funds, TransNet Senior Mini-Grant
ST. MADELEINE SOPHIE'S CENTER	Response not Provided	415	373	95%	9%	Response not Provided	Response not Provided	Response not Provided	Response not Provided	Response not Provided	Response not Provided
CITY OF VISTA	Shuttle Program	350	80	Response not Provided	Response not Provided	800	\$161,057	\$21,607	18	4	General Funds
OPERATION SAMAHAN, INC.	No transportation contracted, operated, or arranged	16,000	300	2%	1%	Response not Provided	Response not Provided	Response not Provided	Response not Provided	Response not Provided	Response not Provided
DEL MAR COMMUNITY CONNECTIONS	Volunteer Driver Program, Shuttle Program, Taxi Voucher Program, Non-Emergency Medical Transportation, Arrange for Transportation Services	Response not Provided	Response not Provided	Response not Provided	Response not Provided	105	\$39,737	Response not Provided	33	5	General Funds, City of Del Mar
FACT	Consolidated Transportation Services Agency	3,000	150	100%	20%	2,600	\$1,599,280	\$837,280	100	75	TransNet Senior Mini-Grant, Caltrans, Contracted Services, FTA Section 5310

PROVIDER	SERVICES PROVIDED	NUMBER OF CLIENTS	AVERAGE DAILY RIDERSHIP	PERCENTAGE OF REGISTRANTS WHO REQUIRE TRANSPORTATION ¹	PERCENTAGE OF REGISTRANTS WHO USE A MOBILITY DEVICE	AVERAGE # OF ONE-WAY PASSENGER TRIPS PER MONTH	GROSS ANNUAL BUDGET	ANNUAL REVENUE	NUMBER OF DRIVERS	AVERAGE DAILY VEHICLES USED	FUNDING SOURCE
JEWISH FAMILY SERVICES SAN DIEGO	Volunteer Driver Program, Shuttle Program	3,500	356	63%	14%	3,805	\$1,930,427	\$260,090	186	44	TransNet Senior Mini-Grant, Neighborhood Reinvestment, CPPS, County Nutrition Contract, Department of Human/Social services, FTA 5310
SENIOR SERVICE COUNCIL, ESCONDIDO	Taxi Voucher Program	80	15	100%	19%	50	Response not Provided	Response not Provided	Response not Provided	Response not Provided	Senior Service Council, Escondido funds taxi voucher program from donations
CITY OF LA MESA- RIDES4NEIGHBORS	Non-Emergency Medical Transportation	600	Response not Provided	25%	3%	750	\$175,000	\$56,000	30	7	General Funds, TransNet Senior Mini-Grant, FTA Section 5310
FOUNDATION FOR SENIOR CARE	Non-Emergency Medical Transportation	2,500	75	20%	4%	Response not Provided	\$123,000	\$33,000	13	4	Private grants (non-governmental)
PENINSULA SHEPHERD CENTER	Shuttle Program	322	10	30%	13%	1,305	\$70,000	\$4,000	40	3	TransNet Senior Mini-Grant, Grants and donors
TRI-CITY MEDICAL CENTER	Shuttle Program, Arrange for Transportation Services	Response not Provided	200+	Response not Provided	35%	Response not Provided	Response not Provided	Response not Provided	Response not Provided	5-10	Drive to Wellness Grant
CITY OF CORONADO	Response not Provided	140	8	100%	32%	Response not Provided	Response not Provided	Response not Provided	Response not Provided	Response not Provided	Response not Provided

Information obtained by the project team through both the survey and a series of public workshops was examined and used to determine key findings including existing and anticipated needs, gaps in service, and potential solutions to address such gaps. An overview of these key findings is included below in **Section 2.2 (Identified Needs)**.

2.2 IDENTIFIED NEEDS

While MTS and NCTD fixed-route and ADA paratransit services provide specialized transportation, they are not always the best fit for everyone. Many individuals have transportation needs that extend beyond the services typically provided. For example, passengers may require door-through-door assistance or flexibility in reservation making. Additionally, different transportation patterns and travel needs exist for different populations. Specialized transportation programs provided by social service agencies help bridge gaps in service or meet specific transportation needs that public transit providers are unable to fulfill.

Existing and anticipated needs were identified using a variety of sources, including through the administration of surveys to key providers and transit agencies, the SANDAG 2016-2020 Coordinated Plan, the SANDAG 2018 Coordinated Plan, and key stakeholder workshops. Key stakeholder workshops include the Specialized Transportation Facilitated Discussion Workshop #2 (Summer 2017) and two public workshops that were held as part of this *Specialized Transportation Strategic Plan* (Spring 2018).

Needs of individuals using specialized transportation include:

- **Access to Destinations:** Passengers need to access amenities at various locations throughout the region, which often requires traveling across or outside of service area boundaries. Passengers may also need to be transported directly to a destination, not to a nearby location such as a bus stop.
- **Reliable Service:** Passengers often depend on transportation service operating on schedule, such as when traveling to work or to medical appointments.
- **Flexible Service:** Some trips need to be made spontaneously and outside of typical operating hours. Trips often need to be completed in a short amount of time.
- **Efficient Connections between Transportation Services:** Passengers need to be able to access specialized transportation services efficiently and safely when transferring from other modes (e.g., bus or trolley). This requires the presence of sufficient wayfinding at stations and accessible paths of pedestrian travel between services.
- **Affordable Transportation:** Passengers need to travel at a cost that is affordable to them.
- **Effective Communication:** Passengers need to be made aware of changes in pick-up and/or drop-off times when planning a trip, and in real-time when necessary. Passengers may also need to communicate in a language other than English.
- **Knowledge of Transportation Services:** Inexperienced passengers need to know how to use public transportation, which can include: purchasing a ticket, boarding and de-

boarding, and transferring between two or more services.

- **Efficient Passenger Certification:** Individuals may suddenly become dependent on specialized transportation services and need to become eligible to use the service quickly.

Needs of agencies operating specialized transportation include:

- **Effective Personnel:** People who work for specialized transportation agencies need adequate resources, including training, to perform their duties effectively.
- **Coordination within Agencies:** Administrators, maintenance staff, and drivers need to operate in a coordinated manner to provide service efficiently.
- **Funding:** Agencies need stable and ongoing funding to provide effective service.

Transportation needs for passengers vary depending on different population groups. For example, the needs of senior citizens between the ages of 65 and 84 are different than those for people ages 85 and older. Individuals with disabilities also have needs that are different than those of seniors. Existing and anticipated needs for each of these population groups are summarized below.

Though transportation needs can vary between population groups, access to key destinations is one of the primary needs regardless of the population itself. Many people who need specialized transportation need access to many of the same destinations that other members of the population need, including:

- **Access to Jobs:** Includes seeking employment, training, and retaining employment.
- **Medical Facilities:** Includes hospitals and healthcare clinics, and pharmacies.
- **Education:** Includes community colleges, four-year universities, private education institutions, and job training centers.
- **Adult Day Care Facilities:** Includes specialized service centers such as the Braille Institute and physical rehabilitation centers.
- **Cool Zones:** Locations where people can seek refuge during extreme heat events. Cool zones are generally located at locations which happen to be key destinations in themselves, including libraries and schools.
- **Other Destinations:** Typically for discretionary travel to major attractors including grocery stores, senior centers, volunteer opportunities, religious services, hotels, key tourist destinations, recreation centers, and libraries. Many of these destinations are located near existing transit services; however, several are outside of the areas currently served by transit.

A map showing key destinations within San Diego County is included in **Figure 2-3**.

2.2.1. SENIORS AGE 65 TO 84

Many seniors in this age group have the need to maintain an active lifestyle, including a strong social network. As many of these people are recent retirees with a desire to assume roles within the community, trips for volunteering or civic engagement are common. A portion of this population can experience a decline in physical and cognitive health that can have a direct impact on their mobility. Declines in health often result in a diminishing ability to operate a motor vehicle, which leaves many people suddenly dependent on transit or other community-based transportation alternatives. Additionally, older adults are likely to have fewer opportunities to earn income as many seniors are retired and/or living on a fixed income.

Many seniors in this age group may be able to use fixed-route transit to complete daily trips. However, many seniors may not live within easy walking distance of transit and are not eligible for ADA paratransit services, be unfamiliar or uncomfortable using transit, or have disabilities, all of which can inhibit use of transit services. For seniors who are eligible for ADA services, some trips can involve long distance travel that are expensive for transit operators to provide and often require several days advanced reservations. The cost incurred by passengers can accumulate quickly and place a financial burden on seniors. Specialized services provided by social service agencies can often be provided with less advanced notice and at less cost both for the provider and the user.

As the population continues to age and life expectancy continues to increase, the number of people in this age group is projected to increase considerably, making the need for efficient, cost-effective transportation options even more important.

2.2.2. SENIORS AGE 85 AND UP

Seniors aged 85 and older typically experience an increase in severity of physical and cognitive issues. As such, they are more likely to require additional caretaking and aid from other individuals, including family, friends, and professional caretakers. Accompaniment is often a supplemental transportation need. Individuals in this age group typically become even less able to complete daily tasks without some level of assistance. This population is less likely to drive, which means public transit and specialized transportation become even more critical to fulfilling their mobility needs. Similar to those ages 65 to 84, the number of people aged 85 is expected to increase in the coming decades, making the need for reliable transportation services imperative.

2.2.3. INDIVIDUALS WITH DISABILITIES

Individuals with disabilities are identified as any persons with physical, developmental, behavioral, mental, visual, and/or hearing impairments. Transportation needs of disabled individuals vary based on each individual's impairment. In all cases, however, access to transportation is a necessity for disabled individuals to fulfill basic daily needs – access to healthcare, education, and work – and maintain their mental and physical well-being.

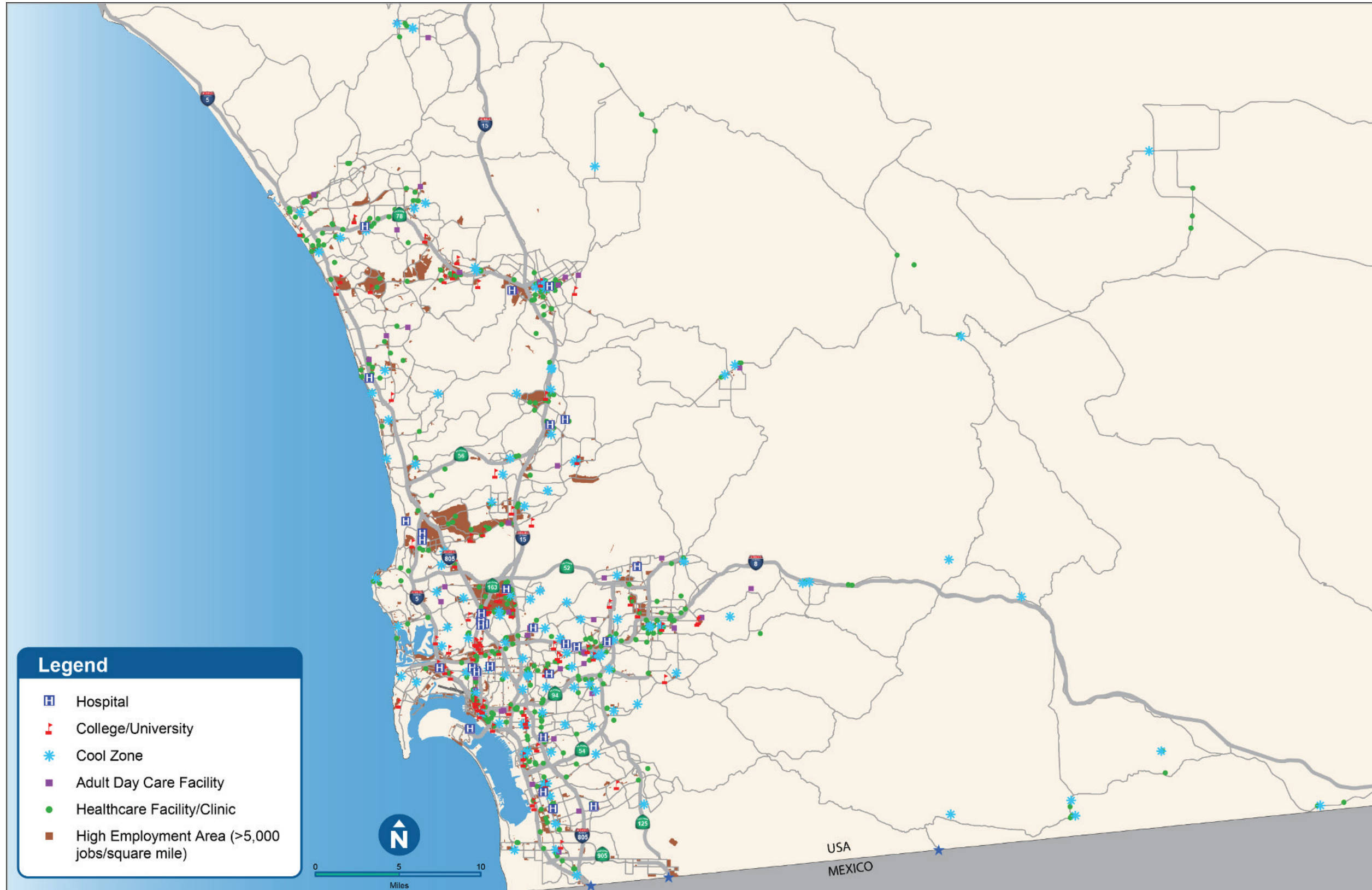


Figure 2-3. Key Attractors and Generators within San Diego County

2.3 IDENTIFIED GAPS

This section presents a summary of gaps between current transportation services and passenger needs and sets the stage for the development of potential solutions. Gaps in transportation services were identified from a variety of sources, including through the administration of surveys to key providers and transit agencies, the SANDAG 2016-2020 Coordinated Plan, and stakeholder workshops.

Gaps in service have been grouped into the categories that are described in more detail below.

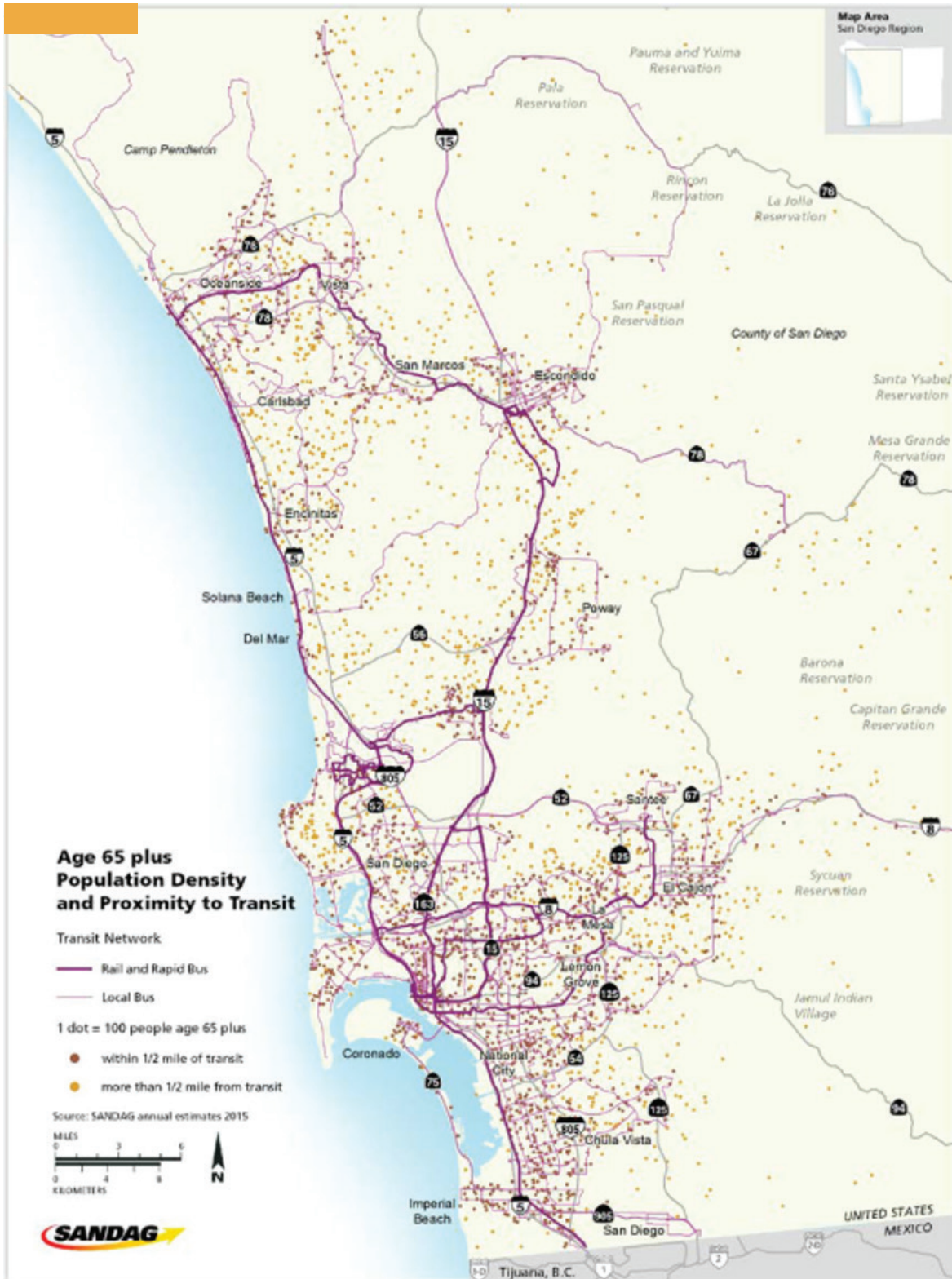
2.3.1. UNDERSERVED POPULATIONS

Transit coverage is available to seniors (age 65 and older) throughout most of the urbanized areas of San Diego County. NCTD provides fixed-route BREEZE bus service, COASTER commuter rail service, and SPRINTER light rail service near all the major freeways and corridors where seniors are concentrated. MTS provides fixed-route bus and light-rail trolley service near many populations of seniors within its service area. While each transit agency provides transit coverage for the majority of seniors in its respective service area, there are some identified gaps. As shown in **Figure 2-4**, areas with high senior populations not within ½ mile access to MTS fixed-route services include areas within Poway, Carmel Mountain, Rancho Bernardo, South El Cajon, Bonita, La Jolla, Lakeside, Tierrasanta, San Carlos, and University City. Areas with high senior populations not serviced within the NCTD service area include Oceanside, Tri-City, Carlsbad, Encinitas, and Del Mar.

Most communities with high populations of seniors 85 and older are served by public transit. However, it is challenging for many of these individuals to walk a half-mile to a transit station. Increasing rates of physical, cognitive, and sensory impairments may impede their ability to use fixed-route services all together. As shown in **Figure 2-5**, there are still areas with high populations of seniors age 85 and older that are not within a half-mile of a transit station. Within the MTS service area, those areas include Poway, Sabre Springs, Scripps Ranch, La Mesa, and El Cajon. Within the NCTD service area, those areas include parts of Oceanside, Tri-City, and Carlsbad.

The majority of individuals with disabilities live within ½-mile of existing transit services. However, several populations of individuals with disabilities are located outside of existing transit service areas, as shown in **Figure 2-6**. Within the MTS service area, those areas include Poway, Sabre Springs, Carmel Mountain, El Cajon, Spring Valley, Santee, and Lakeside. Within the NCTD service area, those areas include Oceanside, Tri City, and Vista. Paratransit expands service to ¾-mile from transit stops, but not all individuals with disabilities qualify for ADA paratransit services.

Figure 2-4. Populations of Persons, Ages 65-Plus Beyond ½-Mile Transit Service Area



Source: SANDAG 2016-2020 Coordinated Plan (2016)

Figure 2-5. Populations of Persons, Ages 85-Plus Within and Beyond ½-Mile Transit Service Area



Source: SANDAG 2016-2020 Coordinated Plan (2016)

Figure 2-6. Populations of Persons with Disabilities Within and Beyond ½-Mile Transit Service Area



Source: SANDAG 2016-2020 Coordinated Plan (2016)

2.3.2. LACK OF COORDINATION

A lack of coordination of specialized transportation services between transit operators (MTS and NCTD) and social service providers, as well as among social service providers, was identified by several key stakeholders as a missed opportunity. A lack of coordination in the provision of service, vehicle maintenance, driver and passenger training, administrative tasks, and other items can cause inefficiencies that create a less-effective specialized transportation network.

2.3.3. SUBOPTIMAL SERVICE RELIABILITY

Service reliability issues primarily include issues with schedule adherence and on-time performance. Delays in pick-up and/or drop-off times and transfers between two or more modes of transportation impact passengers' ability to arrive to medical and other appointments on time. When customers miss their bus ride to medical appointments it can contribute to additional costs for the transportation service provider, medical provider, and others.

2.3.4. GAPS IN SERVICE

Several gaps or deficiencies are present within the existing specialized transportation service that make using transit more challenging for passengers. These include:

- **Lack of Spontaneous Travel Choices:** Need for more spontaneous choices for urgent medical appointments.
- **Insufficient Service Levels:** Providing specialized services outside current service area boundaries as well as later at night and on weekends/holidays. Some service care providers have also noted that both their personnel and vehicle fleets are limited, which prevents them from meeting service demands.
- **Inefficient Transfers:** Transfers between MTS Access and NCTD LIFT services are often time-consuming and can substantially increase overall travel times.
- **Poor First- and Last-Mile Connections:** Improving service to areas that currently require long walk distances to access transit, or along routes that lack sidewalks, or are otherwise not pedestrian-friendly (steep slopes, narrow sidewalks, etc.).
- **Safety Enhancements:** Improving the perception of safety at transit stops and the walking environment to and from transit stops, particularly at night. There is an interest in improving accessibility through Complete Streets – streets that enable safe access for all users including transit riders, pedestrians, motorists, and cyclists – and the use of audible streetscapes.
- **A Need for Door-Through-Door Service:** Need for door-through-door assistance for

some passengers, specifically getting to and from service vehicles. This service may require transportation personnel to enter homes and/or obtain additional insurance or other certifications to transport clients.

- **Insufficient Access to Amenities:** Need for connections to destinations including senior centers, grocery stores, medical facilities, and entertainment destinations, that are located outside of current service areas.
- **Limited Transportation Options:** Providing a variety of services would allow for greater flexibility in scheduling and reduce trip times.
- **Improved Service Announcements:** Improving communication while onboard transit, such as next stop announcements.
- **Transportation Network Company Accessibility:** Ensuring TNC vehicles have wheelchair accessible vehicles and allow service animals, as well as options for those without a smart phone.
- **Inefficient Resources for Passengers:** 2-1-1 San Diego's phone system guides users through an automated menu, which can be time-consuming and doesn't always provide necessary information. Additionally, passengers are not currently able to purchase and load paratransit fares onto their Compass Card, which can cause inefficiencies in purchasing fares. Also, not all paratransit service offers features such as auto-calls to alert passengers of pick up times and other necessary messages.
- **Insufficient Wayfinding at Stations:** An absence of signage/wayfinding at transit stops can complicate transfers between services.

2.3.5. LACK OF FUNDING AND AFFORDABILITY

In general, available funding for specialized transportation services is scarce. A lack of funding inhibits service providers from expanding or otherwise enhancing existing services. Additionally, stakeholders noted there is a lack of resources to facilitate coordination of services from other transportation providers, which, if utilized, could make it easier to effectively use the limited funding that does exist.

Additionally, the high cost of providing paratransit services means fares are more expensive than those for fixed-route services, especially if the trip requires traversing different fare zones or across service area boundaries.

2.3.6. PERSONNEL NEEDS

Opportunities to improve personnel performance were identified through the stakeholder outreach process. Two specific issues that were identified include personnel limitations and a

lack of accountability. Certain providers don't have the resources to meet current demand and many providers lack the resources to properly train personnel. Additionally, passengers feel the need for an easier way to report driver behavior that they feel is inappropriate.

2.3.7. LACK OF KNOWLEDGE OF TRANSIT

Many people are not aware of all transit services that are available. Additionally, seniors who have not previously used transit and then become transit-dependent have a difficult time learning how to use existing services. Declining mental and/or cognitive abilities can also make this transition more challenging for some passengers.

2.3.8. OTHER BARRIERS

Additional barriers to providing specialized transportation include:

- **Language Barrier:** Many non-English speakers require additional resources to successfully use transportation services.
- **Technology Barrier:** Many passengers either do not have access to or possess the ability to use technology, such as smart phones or the internet, to effectively use transit. Additionally, many passengers are unable to use online resources due to visual impairments.

2.3.9. CONCLUSIONS

While San Diego County is served by a number of transportation providers, many gaps in specialized transportation exist. By identifying existing and anticipated needs and gaps, this working paper will serve as one of several resources that will form the foundation for the development of strategies that will address unmet needs, both now and in future years. Strategies for addressing these service gaps is the focus of the Section 5 of this report.

3 PEER AGENCIES

3.1 INTRODUCTION

In partnership with SANDAG officials, eight specialized transit agencies were identified for peer review. Two such agencies in California are also the designated Consolidated Transportation Services Agencies (CTSAs) for their corresponding region. The peer review focuses on the operational and financial performance of peer agencies and includes a commentary on how MTS Access and NCTD LIFT services perform relative to the peer agencies.

Of these eight peer agencies, six participated in a peer agency workshop at SANDAG. The workshop focused on lessons learned – good and bad – from their experience in planning, administering, and operating specialized transportation services and programs.

3.2 PEER AGENCIES OPERATIONAL AND FINANCIAL CHARACTERISTICS

Table 3-1 presents key operational and financial characteristics of MTS Access, NCTD LIFT, and the paratransit services provided by peer agencies. Notable observations include:

- NCTD LIFT and MTS Access provide a comparable number of trips per capita (0.25 and 0.26, respectively), which is 43% less than the peer agency average of 0.44.
- Similarly, NCTD's and MTS' paratransit investment per capita (which measures the amount of investment in specialized transit relative to the population of the service area) of \$9.41 and \$6.72, respectively, is considerably less than the peer average of \$17.18.
- Paratransit in San Diego performs as well as or better than peer averages in terms of vehicle productivity (as measured by trip per hour) and cost per trip.
- While several peer agencies use supplemental contracted services such as taxis to supplement traditional demand response, the financial performance of these contracted services ranges broadly from a low in the \$12 range (Seattle and Orange County) to a high of \$40+ in Sacramento. This cost variance is influenced by how contracts are structured and, more importantly, how supplemental services are deployed. Several cost-effective deployments of taxi/TNC services are discussed further in the case studies presented in Section 4.

It is important to recognize that the review of peer agency operating and financial performance may provide order of magnitude comparisons. However, several other factors specific to the respective local operating environments that may influence performance outcomes (including labor relations, operating policies, advancements in ancillary mobility management strategies, contract structure documents, etc.) need to also be considered.

Name	City/Region	State	Service Area Population	# of Annual Trips		Trips per Capita	Net Annual Operating Expenses (\$)	% Farebox Recovery	Cost per Trip (\$)	Investment per Capita (\$)	# of Peak Vehicles	Vehicle Revenue Hours	Trips per Hour
NCTD Lift	North San Diego County	CA	849,420	213,603		0.25	\$7,990,600	9.2%	\$37.00	\$9.41	61	122,706	1.7
MTS Access	urbanized south San Diego County	CA	2,462,700	632,000		0.26	\$16,550,200	13.1%	\$26.00	\$6.72	166	259,643	2.4
Total/Combined - San Diego County		CA	3,312,120	845,603		0.25	\$24,540,800	11.9%	\$29.02	\$7.41	227	382,349	2.2
Access Services *	Los Angeles County	CA	11,936,100	Demand Response	2,769,800	0.36	\$85,279,000		\$30.79	\$11.75	786	1,698,300	1.6
				Taxi	1,523,570		\$54,964,600		\$36.08		1,170	585,800	2.6
				Total	4,293,370		\$140,243,600	6.9%	\$32.66		1,956	2,284,100	1.9
OCTA Access *	Orange County	CA	3,077,900	Demand Response	1,677,500	0.58	\$76,868,900		\$45.82	\$25.41	491	738,580	2.3
				Taxi	107,800		\$1,338,800		\$12.42		86	16,660	6.5
				Total	1,785,300		\$78,207,700	8.5%	\$43.81		577	755,240	2.4
Paratransit, Inc *	Sacramento	CA	1,035,280	Demand Response	365,350	0.42	\$17,717,300		\$48.49	\$20.19	112	219,570	1.7
				Taxi	72,660		\$3,192,360		\$43.93		22	23,900	3
				Total	438,010		\$20,909,660	8.3%	\$47.73		134	243,470	1.8
Tri-Met LIFT	Portland	OR	1,560,800	Demand Response	925,820	0.68	\$33,364,430		\$36.04	\$24.54	226	487,860	1.9
				Taxi	138,740		\$4,938,100		\$35.59		70	50,660	2.7
				Total	1,064,560		\$38,302,530	21.9%	\$35.98		296	538,520	2
The RIDE	Boston	MA	3,109,300	2,187,790		0.7	\$102,005,000	5.9%	\$46.62	\$32.80	612	1,273,980	1.7
TOPS	Broward County	FL	1,869,425	715,930		0.38	\$22,006,670	5.1%	\$30.74	\$11.77	191	435,280	1.6
Access-a-Ride	Denver	CO	2,920,000	1,185,960		0.41	\$45,378,700	10.9%	\$38.26	\$15.54	404	694,840	1.7
Metro Access	Seattle	WA	2,117,125	Demand Response	870,780	0.46	\$58,765,600		\$67.49	\$28.39	174	685,960	1.3
				Taxi	110,660		\$1,344,100		\$12.15		46	43,545	2.5
				Total	981,440		\$60,109,700	2.3%	\$61.25		220	729,505	1.3
Peer Average						0.44			\$36.49	\$17.18			1.8

* Consolidated Transportation Service Agency (CTSA)

Table 3-1. Key Operating and Financial Performance – Peer Review

3.2.1. PEER REVIEW WORKSHOP

In May 2018, SANDAG held a workshop with six peer agencies from around North America to gain an understanding about their experiences – what has worked and what hasn't worked. Attendees included:

- **Dayton, OH:** Brandon Policicchio – Chief Customer & Business Development Officer, Greater Dayton (Ohio) Regional Transit Authority
- **Denver:** Larry Buter – ADA Manager, Denver Regional Transit District
- **Los Angeles:** F Scott Jewell – Director, Administration, Los Angeles Access Services
- **Portland:** Madeline Steele – GIS Data Analyst, Portland Tri-Met
- **Sacramento:** Tiffani Fink – CEO, Sacramento Paratransit Inc
- **Seattle:** Mark Nash – Supervisor, Access Services, Seattle King County Transit

Highlights from the meeting below reflect information about agency experiences as of May 2018.

3.2.2. OVERVIEW OF STRATEGIES USED AT PEER AGENCIES

Peer agencies shared their experiences in providing specialized transit, highlighted below.

3.2.2.1. PORTLAND: MOD DEMAND SANDBOX PROGRAM AND NEW MOBILITY STRATEGY

- Mobility on Demand (MoD) refers to technological advances aimed at providing travelers with more flexible and convenient transportation options.
 - Received FTA grant for MoD.
 - Problem – single occupancy vehicle solutions to mobility increase congestion.
 - Project Description – More comprehensive open trip planner offering integrated shared-use mobility options: (1.) Open Trip Planner, (2.) Open Pelias Geocoder, (3.) Open Data, (4.) Integrated Payment Plan.
 - Project partners: Cleared for Takeoff (Pelias geocoder), Conveyal, IBI, Moovel (integrated payment plan).
 - Strategy – leverage open source software, data and standards to facilitate wide adoption.
 - OpenTripPlanner – multimodal trip planner to let people access multiple modes from one app.
-

- Moovel will facilitate compatibility with planned booking and payment features in TriMet ticketing app.
- HopPass – multi regional payment card; can pay for card with cash at retail outlets, working with social service providers to provide cards to those in need; also still accept cash fares.
- Goal is to make this platform as replicable as possible.
- Don't collect data from Uber; Lyft has not agreed to be on app – don't want side-by-side display.
- There are many options for non-accessible vehicles, but TNCs don't have many accessible vehicles. Thus, passengers needing accessible vehicles have to generally stick with paratransit.

3.2.2.2. PORTLAND: MOBILITY MANAGEMENT – LONG-TERM VISION

- Pointed out that transit is most efficient way to transport people – driving, TNC, autonomous vehicles still take up largest amount of space and could lead to increased VMTs.
- New mobility approaches to make transit more attractive – AV technology, cleaner fuels, better public information, TSP, provide info about other options available to supplement transit, integrated payment – TriMet won't provide all services but information and integrated payment can help promote transit.
- If public sector doesn't get into mobility management space, the private sector won't necessarily highlight public transit network.
- Portland is also looking at goods delivery things to reduce need for person trips.

3.2.3. GOVERNANCE/ALTERNATE BUSINESS MODELS

The peer agencies provided thoughts on how Next Generation (NextGen)/microtransit mobility more palatable to transit agencies:

- The focus should be on the demographics; the senior population is increasing dramatically there is a need to market directly to them.
- Paratransit, Inc. in Sacramento was established before CTSA, and now have evolved into serving as the CTSA. They partner with ten social service agencies and the contractors move more people that Paratransit does. They are serving in a mobility management role and are looking at taking services and extending them to youth given their mobility issues. There is a need to be creative in thinking about how services for one group that could

apply to others with mobility needs.

- There are some regulatory challenges. For example, charter regulations sometimes prohibited agencies from chartering a service that could be done more efficiently outside the agency.
- In Dayton, the transit union filed a grievance when they entered into a first/last mile agreement with Lyft. Reached agreement with them that trip would be offered to transit first before TNCs. This resulted in large majority of trips shifting to paratransit.
- Paratransit Inc had issues with taxis but won an arbitration. The result is that as long as they can demonstrate that they are not pulling work away from the union, they can contract out work.

The participants also shared information about their agencies' governance models:

- Denver
 - » Have an elected board, some of whom are knowledgeable about paratransit.
 - » Do not follow a specific plan; make sure ADA regulations are followed.
 - » Have an Advisory committee for paratransit that provides input.
 - Portland
 - » Governor appoints Board of Directors.
 - » Have a newly adopted business plan that guides services.
 - Seattle
 - » Do not have a Board, but rather operate under guidance of County Counsel. The agency is led by a General Manager.
 - » Challenge is that the County Counsel does not have much expertise with paratransit.
 - » Are responsive to people who bring up issues.
 - » Have grown and made changes to modernize service delivery and incorporate technology improvements.
 - » Are part of overall mobility division – transit becoming its own department.
 - Los Angeles
 - » Have an appointed Board of Directors from City and County; members are operators, advocates; there are no political officials.
-

- » Contract out services out every five years.
- » Increased costs because of minimum wage law – may require service cuts.
- » Funding derive from Prop C and federal sources.
- » Have fare structure enshrined in law due to the number of transit agencies in Los Angeles County.
- Dayton
 - » Have Board members – six members assigned by County, two assigned from City of Dayton, and two assigned from another local city.
 - » Driven by strategic plan approved by board – current horizon is 2020.

3.2.3.1. CTSA INITIATIVES

- Sacramento – discussed social service agencies that provide transportation for ADA-eligible services. Paratransit, Inc. helps provide vehicles, training, insurance, fuel, reporting for these agencies. Assisting social service agencies takes the burden off them of having to provide these functions themselves. Funding comes from local sales tax, grants, and federal funds.

3.2.3.2. MAAS MOD SANDBOX INITIATIVES

- Mobility as a Service (MaaS) focuses on enhancing the integration of mobility services across the transportation network.
- Dayton – replacing fare collection system – new system must have accessibility at its core which speaks to paratransit.
 - » Partnered with TransLoc to develop a micro-transit platform that can also handle paratransit.
 - » Hi-tech, low cost, accessible solution allows them to equip social service agencies and other service providers to better serve passengers.
 - » MaaS platform needs to integrate with fare collection, bike share, parking and other mobility services – want a seamless experience within the app.
 - » Subscription service will allow for payment of modes.
 - » Fare capping – brings inclusiveness to transit ridership.
 - » Only accepting systems that are on monthly subscription and accepting equipment on

monthly lease – technology changing so fast; avoids making large up-front capital costs – allows for quick updating of technology as necessary.

- » Want to build a system that handles accounting, subsidies, federal monies, etc. on the back end to them pay service providers.
- » Want to blur the line between service providers – utilize all services with regional Spark fare card and smart phone.
- » Trying to utilize an ID card for paratransit/subsidized user for trips provided by social service agencies.
- » State of Ohio is trying to get one card for all providers.
- » Not trying to grow “us.” Agency is a resource to purchase technology to manage mobility and more service gets pushed to service providers.
- » Lyft partnership for first/last mile that will be included in the platform; 100% subsidize cost of trip; have option to charge up to one-way fare but haven’t done that yet. Paratransit does most of these trips, and also have taxi provider available. Has reduced cost of services.

3.2.3.3. OPERATIONAL AND ALTERNATE DELIVERY SCHEMES (TNCS, NEXTGEN MOBILITY)

- There is too much focus counting customers per hour which is sometimes detrimental and doesn’t provide an accurate picture. It doesn’t matter which bus they’re on, just that we can transport them.
 - Micro transit is a demand-responsive service and could cut into demand for fixed route service; competing with other transit service makes it more expensive.
 - It is difficult to compare regions; in San Diego, there may be a case to look at options to serve suburban areas. Microtransit service works in Dayton because it brings rural passengers to main fixed route system; also may increase micro transit service for late night service since it is cheaper than accommodating small numbers rather than running fixed route system.
 - OCTA reduced level of fixed route service in south Orange County and partnered with cities to develop local options that are appropriate for the city. San Clemente partnered with Lyft to subsidize to a limit; incentive to take TNC to bus stop or train stop – pricing policy influences travel behavior.
 - Dayton is getting ready to move paratransit to all same-day booking.
 - Providing more convenient services increases demand and sometimes beyond resources –
-

need to then make some decisions about taking things away. All this adds up to a need to be careful about adding services that are not required.

- Paratransit Inc will deal with demands only when necessary, but not just for convenience. Limited number of drivers and funds. Customer complaints went down because on-time performance increased. Same day trips went from 1,000/month to 80/month which meant that cab trips were reduced and money was saved. Use same day microtransit to fill the gaps.
- Dayton is looking at getting rid of conditional eligibility; it is a constraint and adds work and it doesn't save trips; all this will be done in Pilot to test out.
- The Metro Los Angeles region went to Tap Card eight years ago; a paratransit Tap Card could help understand how customers are also using fixed route.
- Pricing structure can be used to encourage more to go on fixed route.
- Paratransit fares are often relative to the high cost per trip. Decision makers often don't have stomach to cut services.
- Instead of using taxis as overflow, they can be used as a primary mode on shorter distance trips to significantly reduced cost per trip. One issue is there are not a lot of accessible taxis – considering helping cab companies to add more accessible vehicles.
- Taxis are more available for service now because of decline in demand due to TNCs. Some agencies own accessible vehicles and let contractors operate it – they contract out sedan rides for ambulatory passengers.
- Seattle has three contractors; new RFP going out to get one contract to do all booking, planning, dispatching. Biggest desire is same day option and may launch a pilot program.
- Denver caps cab trips at 12 miles; they don't have too many available vehicles so ambulatory trips are sent to cabs. Challenges with using cab companies – language, cultural barriers – but it means 50 vehicles agency doesn't have to purchase. They have found that cabs provide flexibility for passenger and cost savings for agency (same day option); considering subsidizing more accessible vehicles for cab companies.
- Sacramento has a policy that we don't deny any trip; if you start offering same day service, the problem is that there is a higher chance of needing to deny trips.

3.2.3.4. INTEGRATION OF PARA AND CONVENTIONAL TRANSIT SERVICES

- Sacramento has found there is a challenge for who provides accessible vehicle transit – safety is a risk with private TNCs and taxis. Paratransit, Inc won't broker accessible vehicles because there is no guarantee of safety (e.g., wheelchair is properly tied down).

- Segregation of services causes a lot of increased costs. No reason that a paratransit customer can't ride with an on-demand customer. Public transit agencies are in a better position to integrate these services.

3.2.3.5. FUNDING/GRANTS

- There are over 80 federally-funded mobility programs for seniors that are accessibility challenged (e.g., Medicare, Medi-Cal). Agencies should coordinate efforts to with any grants pursued/received to ensure funding would help everyone maximize these resources and be a central mobility management resource.

3.2.3.6. PEER AGENCY THOUGHTS ON EVALUATION CRITERIA AND STRATEGIES FOR SANDAG

- Look at entire customer experience, not just traditional measures (e.g., on-time performance) but the full experience from the time they reach the call center to conclusion of the trip.
- One criteria should be creativity/innovation – the ability to think outside of the box and not be afraid to fail; create a culture where people are encouraged to think ahead.
- Think about maximizing existing resources; look at how much time you spend managing fares for example.

3.2.3.7. POTENTIAL STRATEGIES – ALTERNATE BUSINESS MODELS

- Capitalize on CTSA as they offer a prime opportunity to create true coordination and have a good backbone to drive this. Two services in one county doesn't make sense – it will become a barrier later.
- The Sacramento CTSA moves faster than transit agencies so it has a role in helping to coordinate specialized and fixed route transit; serves as a facilitation point – take the person and connect them through the right mode. CTSA trains people for how to use the system rather than focusing on providing a specific service.
- Many people think that transit agencies should function as mobility managers, and that is the future of the industry. Many agencies, however, don't want to touch it.
- Sacramento's Paratransit Inc serves role of mobility manager and recommends services that are the best fit for the trip. They are also a partner agency to the regional transit agency and they operate under an MOU; provide paratransit services through social service agencies – more flexibility.

3.2.3.8. POTENTIAL STRATEGIES – SPECIALIZED TRANSIT OPERATIONS

- There is a big gap in rider education – how do we help educate the public on how to use transit system and paratransit services? Suggestion to start education when the eligibility screening process starts; more information early on during eligibility screening can help (a one-stop shopping to educate on what services are available).
- One idea is to get certification staff to do the eligibility assessments (occupational therapists, medical professionals, etc.); will reduce the number of approved certifications for people that could use fixed route transit.
- Don't be afraid to say no; if denied eligibility they would be shuttled to travel training to be guided to services that are appropriate.

3.2.3.9. POTENTIAL STRATEGIES – FUTURE OF SERVICE DELIVERY

- Zero emission vehicles mandates in California likely will include paratransit.
- Los Angeles is launching a pilot AV project for paratransit; vehicle testing begins late this summer with service starting in spring 2019.
- Portland is looking toward an AV pilot in the near future.
- There are often conflicts with unions, but sometimes these risks are worth taking. Have to maximize existing resources first then go to supplemental services.
- There is a need to plan for increased demand based on the aging population.
- Budgeting is largely dependent on how much new technology and service options will cost. Will need to get feedback from providers of technology and new services.
- Los Angeles has agency annual budgets but also a 5-year strategic budget to guide annual decisions.
- In California, a big factor in budgeting is what happens with the minimum wage; it could have a big impact on how much service can be provided.

3.2.4. PEER AGENCY SUGGESTIONS

Key suggestions from the peer review panelists to SANDAG on ways to improve paratransit program are summarized below:

- Look for the “sweet spot” in terms of how service providers use all available modes.
 - Regarding eligibility programs, make sure to get information to riders about what they are applying for and other options that may be available.
-

- Leverage the CTSA more to coordinate paratransit and other specialized services.
 - MaaS is the future of transit – someone needs to own that or the private sector will fill that gap.
 - Consider how much is spent on fare collection and take into account future technology that automates payment.
 - Maximize your existing resources.
 - Don't over complicate things – sometimes you have to “go back to simple.” It is not always the best idea to have a large team where bureaucracy often impedes progress and efficiency.
 - Now is a good time to take some calculated risks with technology.
 - Rider education is important and the CTSA can play an important role.
 - Coordination can be difficult because lots of agencies don't want to give up their power; change often comes slower than desired.
 - Try to integrate paratransit and fixed route transit as much as possible.
 - Paratransit should be included in all trip planners; all coordination efforts need to be available to those that need paratransit.
 - Encourage tech companies to create open software that accepts third-party apps.
 - Consider using open source options.
 - Focus should always be on the customer – provide as much freedom and flexibility as possible.
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4 INDUSTRY BEST PRACTICES

4.1 INTRODUCTION

As the mobility landscape continues to evolve, connected travelers, continued advancements in transportation technologies, and private sector involvement present unprecedented opportunities for public transportation improvements, in general, and the delivery of specialized transit, specifically. In recent years, concepts such as microtransit and mobility-on-demand have helped agencies provide a range of mobility options for the senior and disabled communities by developing and integrating unconventional modes into their services, engaging the private sector in the form of transportation network companies (TNCs), taxis, and other modes as complementary alternatives to traditional specialized transit delivery schemes. However, while transit agencies continue to experiment with new business models, suppliers, and technologies to extend service (and mobility options), challenges related to providing cost-effective, efficient, and equitable service to all people remain.

Given such opportunities in innovative service delivery, SANDAG is examining immediate and longer term actionable strategies to best meet the mobility needs of seniors and individuals with disabilities. Strategies include those sought for travelers who could potentially take accessible fixed-route transit (bus and/or rail), but whose origin or destination cannot be conveniently accessed from the nearest available transit service options. In support of this initiative, this section presents examples of transit agency initiatives related to innovative service delivery models.

4.2 MOBILITY LANDSCAPE IN NORTH AMERICA

Mobility refers to the movement of people from one place to another. Efficient, cost-effective access to health, education, employment, and entertainment directly impacts people's lives. Choices in travel also have large-scale societal impacts related to human rights, the economy, the environment, and the development of cities.

In advancing the *Specialized Transportation Strategic Plan*, it is important to embrace the concept of mobility and view senior and disabled communities through a lens of a fully integrated and inclusive transit or mobility market. We must look beyond just enhancements to mandated ADA paratransit/specialized services and imagine possibilities for next generation mobility for the entire community, including seniors and individuals with disabilities.

Over the past 60 years, mobility in the United States has been dominated by the private vehicle. Over this period, challenges have arisen related to people and cities that include:

- Large scale society-shaping trends including:
 - » Congestion and accidents
 - » Personal health impacts and associated rising health costs
 - » Reduced accessibility to important services and opportunities
 - » Greenhouse gas emissions
- Urban environment outcomes such as:
 - » Sprawl
 - » Reduced neighborhood character
- Impacts to individuals such as:
 - Reduced accessibility (e.g., the high costs to own and operate a private vehicle, physical distance from transit and alternative modes of transportation, physical and perceptual barriers)
 - Fewer social interactions

At the same time, more people are shifting their dependency toward public transportation. With increased congestion on roadways and concern over greenhouse gas emissions, SANDAG and other agencies see a need for an increased role in public transportation to address regional mobility needs. As such, transit agencies are under increasing pressure to provide equitable, cost-effective service for all residents, including those of all income levels, needs, preferences, and regions within the service area.

4.2.1. FACTORS DRIVING CHANGE

The landscape of mobility is changing, driven by new alternative mode choices, advancing technologies, and emerging trends in the transportation field.

- **New mobility solutions and suppliers** have entered the market, beginning with Zipcar as a car-sharing service in 2000, followed by Car2Go in 2008, and bike-sharing in 2011. In 2009, ridehailing company Uber was founded, followed by Lyft in 2012, with both companies emerging with a ride-splitting option in 2014 and 2017 respectively. In 2014, private microtransit provider Chariot was founded, resulting in additional choices for people, although not all residents could afford to use these services. (Note: Chariot went out of business in February 2019.)
- **The sharing economy** has transformed how we travel. Is a car public or private, is it delivering goods or services? Sharing economy is a hybrid market model which refers to the sharing of access to goods and services (coordinated through community-based online

services). This has given rise to next-generation mobility solutions including transportation network companies and microtransit services.

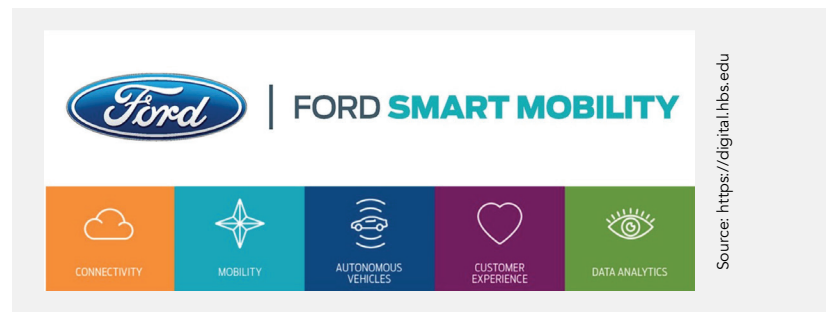
- **Smartphone penetration is increasing**, with more than 75% of Americans owning a smartphone. An even larger percentage owns some type of cellphone. This enables people to be connected at all times and use their phones to receive information in real-time.
- **Advancing technology** has improved access to real-time travel information, allowed for inter-modal payment, and enabled real-time routing and dispatching. Of special importance are the following:
 - **Connected and automated vehicles (CAV)** have the potential to improve traffic safety, transportation efficiency, land-use efficiency, infrastructure, and transit spending if used in the correct context. Major car companies are moving towards CAVs. There is also movement towards using the vehicles in a shared-use, on-demand context.
 - **Beacon technologies**, small Bluetooth radio transmitters, embedded in infrastructure, can assist riders with wayfinding. At the same time, transit agencies can **crowdsource travel patterns** by receiving data on travel habits from riders who are willing to share it. Data can be obtained on which bus stops riders get on, where they disembark, and can track if they get on another bus anywhere within the system. Other opportunities may exist to partner with local businesses to send riders exclusive deals based on their geo-location and nearby retail locations.
 - **Artificial Intelligence/Machine Learning** can use data from multiple sources on traffic patterns and variability, and crowdsourced data from riders can enable self-learning algorithms that can help with delivery of efficient and cost-effective transportation services. Ridehailing is now very common and also popular with travelers. However, as ridehailing service providers start to offer shared ride services (Lyft Line, Uber POOL/Express POOL), it is important for them to improve their ride-matching and routing algorithms. Most shared ride services offered by agencies through conventional demand response software today lack such level of sophistication in their algorithms, particularly when delivering same-day trips that require continuous optimization.

A changing mobility ecosystem:

- **Urbanization and the movement of people back into the city** has created the need to ensure that people can move around the city at any income, age, and ability and has highlighted the need to create cities that are dense and walkable, stimulating a transit renaissance and a reclaiming of streets by people.
- **An increasing population** highlights a greater need for multi-modal options and shared mobility solutions as cities and their surrounding areas become increasingly crowded.

An increasing and aging population means that no transportation system is sustainable unless it is accessible.

- **Environmental awareness and active lifestyles** have contributed to a reduced dependence on private vehicles and shift towards active transportation, such as walking and biking.
- **New funding initiatives and partnerships** are moving the market forward. These include:
 - » **Ford Smart Mobility**, founded under Ford Motor Company, acquired a number of mobility, technology and microtransit companies including Chariot, Autonomic, Inc., and TransLoc Inc.
 - » **New funding opportunities** are available to transit agencies to experiment leveraging existing mobility solution providers, such as the United States Department of Transportation (DOT) Mobility on Demand (MOD) Sandbox Program, part of a larger research effort at DOT that supports transit agencies and communities as they integrate new mobility tools like smart phone apps, bike and car-sharing, and demand-responsive bus and van services.



4.2.2. MOBILITY SOLUTIONS AND SUPPLIERS



Source: www.technoworldnews.com

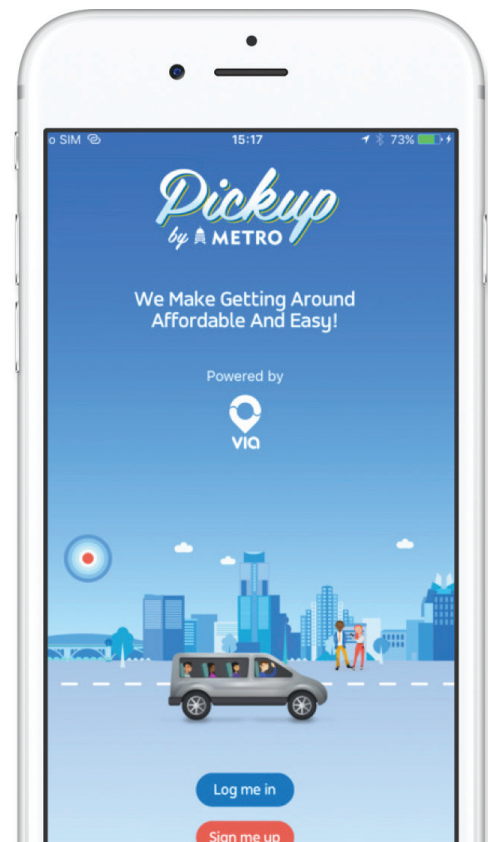
New and existing challenges related to mobility beg the question of how transit agencies and other agencies involved in specialized services like SANDAG can help to provide solutions in a cost-effective manner. Rather than expending effort providing new technologies and mobility solutions for transit riders, transit agencies are generally better off focusing on what they do best: moving people from point A to

point B. It is by partnering or integrating with mobility solution suppliers that transit agencies can help to shape the future of urban mobility without incurring a large cost. Such mobility solutions include:

- **Microtransit:** Microtransit consists of public transit medium capacity vehicles (8 to 15

passengers) operating with on-demand, flexible routing to provide service to areas that are inefficient to serve with a fixed route. The driver operates as an employee of the transit agency or a corporation. The distinguishing feature of microtransit compared to earlier generation demand-response transit is that the passenger does not need to schedule a trip far in advance. Ordering trips can be done on-demand, and the centralized dispatching algorithm automatically adjusts service in response. Eligibility for microtransit service, as with conventional fixed-route service, is open to the public, and fares may be integrated with the rest of the public transit network. Past attempts have been made by transit agencies to achieve this with previous generations of demand responsive scheduling and dispatch technology with only limited success. Much of the current interest in microtransit stems from the apparent ability of the mobile apps-based technology being used in recent years by various third-party ridesharing, ridehailing and ride-splitting service providers (see below) to provide this type of service more effectively.

- **Dynamic Ridesharing:** Ridesharing is a software-assisted modernization of conventional carpooling, in which drivers with their own personal vehicles are matched with passengers using the same subscription service, to split the cost of commuting together. For security and payment management, eligibility as both a driver and a passenger is limited to members who maintain an account with the central service.
- **Ridehailing:** Ridehailing, also known as ridesourcing, consists of a driver utilizing their personal vehicle to provide a private trip to a paying passenger. Unlike carpooling and ridesharing, the driver of a ridehailing service is driving professionally, and not making their own commute in the process of transporting passengers. Ridehailing closely mirrors the service model of traditional medallion taxis and is most familiarly employed by TNCs such as Uber and Lyft.
- **Ride-splitting:** Ride-splitting is a type of ridesourcing. The driver uses their personal vehicle, drives professionally rather than as part of their own commute, and can accommodate multiple independent passengers simultaneously, on a route that dynamically updates in response to new trip requests. Ride-splitting is another service offered by TNCs in major cities, where the likelihood is higher of customers independently booking trips simultaneously, with start and end points that can be conveniently served using the same overall trip. Ride-splitting commonly uses lower capacity vehicles (less than 6 passengers).



Source: <https://platform.ridewithvia.com/cities/>

4.3 EMERGING ROLE OF TRANSIT AGENCIES

As new services and suppliers are important parts of the transportation network, many transit agencies are taking on the role of “mobility manager” to ensure that service is equitable in terms of cost, service area, and vehicles, and to coordinate services to prevent further congestion. An example of an agency moving towards this role is the San Francisco Municipal Transportation Agency (SFMTA) whose mission is to “work together to plan, build, operate, regulate and maintain the transportation network, with our partners, to connect communities.”

According to Brandon Hemily, Ph.D. in Transit and New Shared-Use Modes; Key questions from the transit agency perspective; a Discussion Paper (2016), in this new role, transit agencies are being asked to:

- Open real-time transit data to an ever-growing range of new stakeholders;
- Participate and/or build technological interfaces with the new suppliers;
- Participate in external shared-data platforms;
- Develop integrated trip planning tools or real-time information platforms; and
- Participate in, or develop, integrated payment back-offices, with a variety of public and private organizations, many of which may be in competition with each other.

As part of this emerging role, transit agencies may partner with other for-profit and non-profit partners in order to:

- Connect people to transit;
- Provide service to underserved areas;
- Fill gaps in hours of operation; and
- Reduce costs to providing accessible transportation and low-ridership fixed-route service.

Beyond partnering from a service delivery and/or technology standpoint with new providers, transit agencies are also experimenting with new business models, including in-house, on-demand service (microtransit) for both paratransit and regions with low ridership, and Family of Transportation Services, which encourages eligible paratransit riders to take conventional transit for all or part of their trips.

4.4 BUSINESS MODELS

New business models in use by other transit agencies that can be applied to specialized transportation services are described in this section.

4.4.1. MOBILITY ON DEMAND

Mobility on Demand (MOD) may expand customer travel opportunities and offer customers spontaneity of travel. The service model may be enabled by private companies (such as Uber, Lyft, taxis, or private microtransit) or public agencies, and used to facilitate first-mile/last-mile solutions, paratransit, and travel within low-density zones where it is not economically feasible to provide fixed-route and/or specialized transit services. When used for specialized transit, the focus of MOD is primarily on offering same-day specialized transit services. However, MOD may also be used by transit agencies and TNCs to complement the transportation network and provide more mobility options for travel, in addition to public specialized transit such as those provided by MTS and NCTD.



For example, the Tri-County Metropolitan Transportation District of Oregon (TriMet) received funding for an *Open Trip Planner Share Use Mobility* project that will create a platform integrating transit and shared-use mobility options. TriMet will build on its existing trip planning app to incorporate shared use mobility options and more sophisticated functionality and interfaces, including data sharing for shared-use mobility providers. By integrating data, the project will allow users to plan trips that address first/last mile issues while traveling by transit.

4.4.2. FAMILY OF TRANSPORTATION SERVICES

The Family of Transportation Services (FTS) approach encourages eligible paratransit riders to complete all or part of their journey using conventional transit services, which can help reduce the average travel distance for dedicated specialized transportation trips. The transfer locations are designed to facilitate a consistent, accessible transfer to or from the conventional service. With the FTS approach, door-to-door service will still be provided to eligible customers. Benefits of the FTS model include improved travel spontaneity and reduced trip time if the entire trip is made on non-paratransit services or combination of conventional transit service and other potential mobility services such as microtransit, ridehailing, or ride-splitting. The ability for specialized transit users to take advantage of non-specialized transportation services may also help enhance user's dignity and inclusivity. The FTS model also has the potential to decrease the cost of providing door-to-door service by reducing the average passenger vehicle revenue-miles for trips. This has the potential to mitigate cost increases to achieve additional ridership.

Many transit agencies including MTS and NCTD provide a range of transit services and may assist paratransit customers in trip planning and connectivity/transfers to fixed route bus or rail services.

4.4.5. CONSOLIDATED TRANSPORTATION SERVICES AGENCY (CTSA)

Consolidated Transportation Services Agencies (CTSAs) are designated by county transportation commissions (CTCs), local transportation commissions (LTCs), regional transportation planning agencies (RTPAs), or metropolitan planning agencies (MPOs) per California Assembly Bill (AB) 120, the Social Services Transportation Act. The goal of AB 120 is “to improve transportation service required by social service recipients by promoting the consolidation of social service transportation services.”

In California, a CTSA, as designated at the county level, is a formalized organization responsible to implement a transportation plan that promotes cost effectiveness in the delivery of county public and social service agency transportation services through service coordination. The range of options for CTSA designations as defined in law are:

1. A public agency, including a city, county, operator [transit operator], any state department or agency, public corporation, or public district, or a joint powers entity created pursuant to Title 21, Chapter 3, Article 7, and Section 6680 of the California Government Code.
2. A common carrier of persons as defined in Section 211 of the Public Utilities Code, engaged in the transportation of persons, as defined in Section 208.
3. A private entity operating under a franchise or license.
4. A nonprofit corporation organized pursuant to Division 2 (commencing with Section 9000) of Title 1, Corporations Code.

While the law provides for a range of governance alternatives, typical CTSA’s are either a transit agency or a nonprofit entity.

A range of efficiency and service quality benefits from coordination were introduced by AB 120.

The following benefits were defined in the Act:

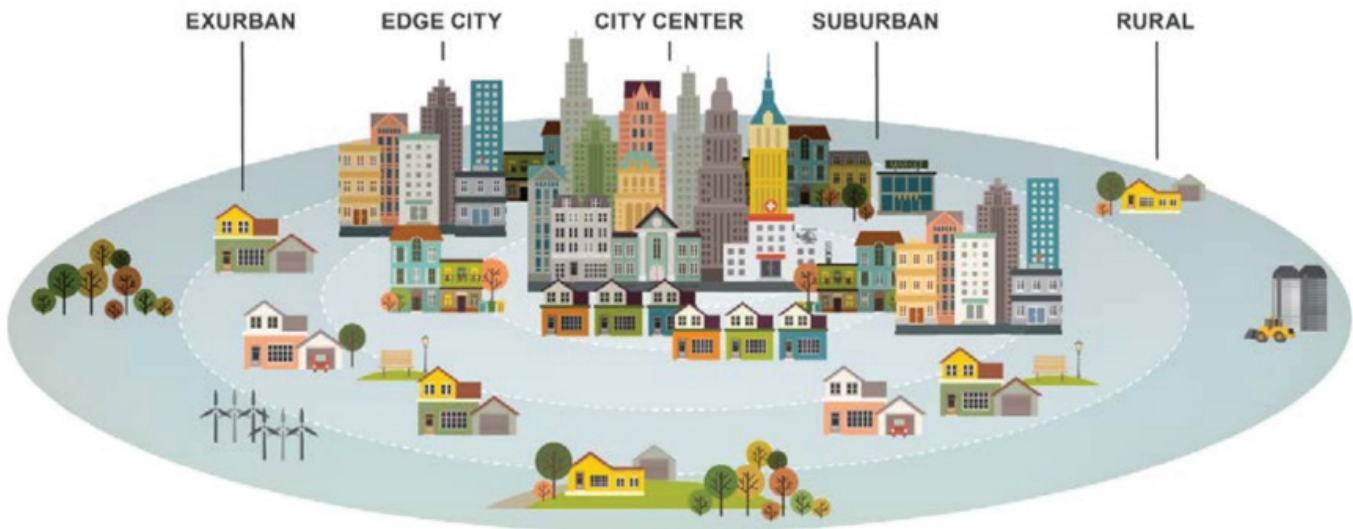
- Combined purchasing of necessary equipment so that some cost savings through larger number of unit purchases can be realized. (This can include the joint procurement of management reporting and trip scheduling software, IT support services and computer hardware, as well as other intelligent transportation technologies.)
 - Adequate training of vehicle drivers to insure the safe operation of vehicles. Proper driver training should promote lower insurance costs and encourage use of the service.
 - Centralized dispatching of vehicles so that efficient use of vehicles results.
 - Centralized maintenance of vehicles so that adequate and routine vehicle maintenance
-

scheduling is possible.

- Centralized administration of various social service transportation programs so that elimination of numerous duplicative and costly administrative organizations can occur. Centralized administration of social service transportation services can provide more efficient and cost-effective transportation services permitting social service agencies to respond to specific social needs.
- Identification and consolidation of all existing sources of funding for social service transportation services can provide more effective and cost-efficient use of scarce resource dollars. Consolidation of categorical program funds can foster eventual elimination of unnecessary and unwarranted program constraints.
- Additional benefits from coordination range from:
 - » Meeting legislative requirements.
 - » Operating cost savings by minimizing service overlap and duplication. The effective accommodation of unmet transportation needs through a centralized trip broker. The focus of many transportation coordination efforts is on serving the mobility needs of seniors, persons with disabilities and the low income.
 - » Effective demand management through a centralized mobility management including the delivery of transit training programs to shift paratransit riders to fixed route options, a centralized call center for information on available transportation alternatives, and the coordination of supplemental programs such as volunteer driver programs or taxi scrip programs.
 - » Joint procurement of insurance coverage including umbrella and supplemental coverage to increase liability coverage.

4.5 STATE OF THE INDUSTRY

Transit agencies are trying new business models, creating new partnerships, and offering new and upgraded services to customers in different contexts, including the city center, suburbs, and rural areas (**Figure 4-2**).

Figure 4-2. Diverse User Base and Contexts

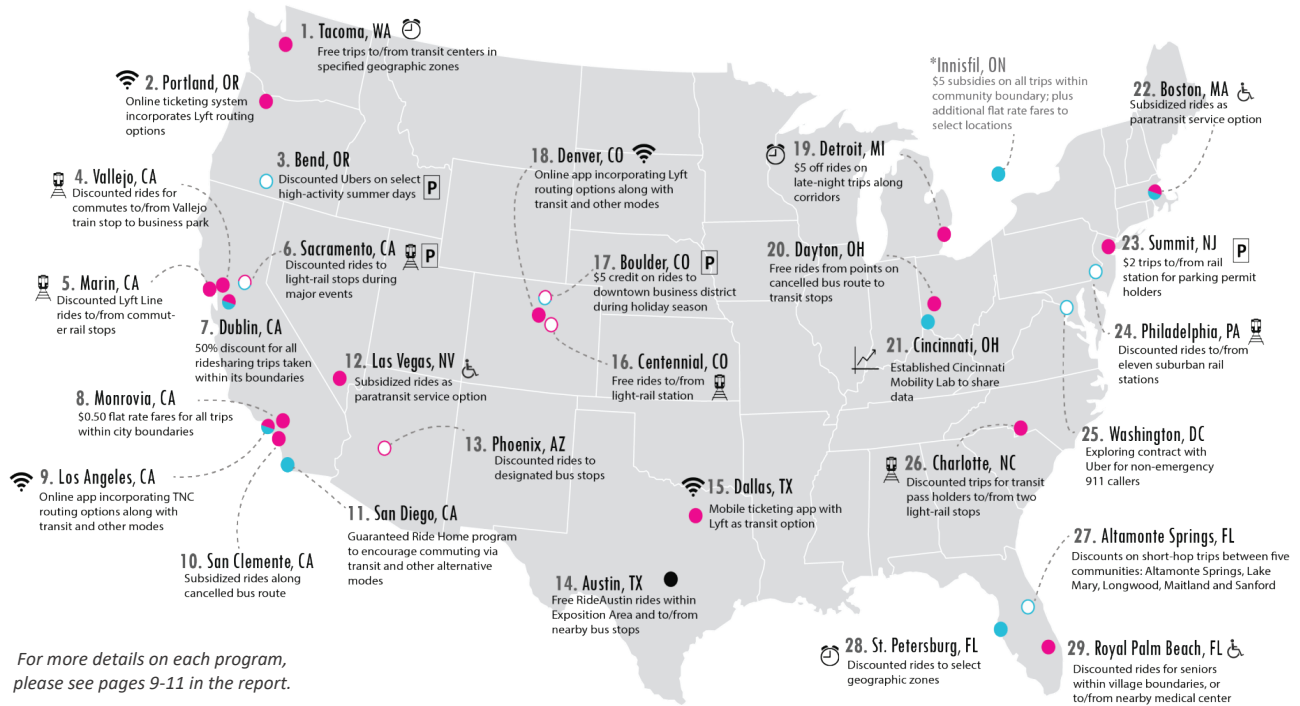
Source: sharedmobility.news by Susan Shaheen and Adam Cohen

Although there are a number of different contexts for implementing new service delivery models, the same vehicular partners are usually considered. Agencies have partnered with vendors to provide primarily the following types of services:

- Full service operation by vendors, where vendors provide a customer app, a software platform for scheduling, dispatching and payment, and operate vehicles.
- Agency-operated vehicles under distinct branding, fulfilling customer trip requests from vendor-provided apps while being managed by a vendor-provided dispatch solution.
- Trips fulfilled by TNCs, either subsidized or paid in full by agencies, or paid by customers.

The graphic below (**Figure 4-3**) presents a summary of partnerships between transportation network companies (TNCs) and public agencies.

Figure 4-3. Partnerships Between TNCs and Public Agencies



- Lyft partnership (○ if no longer active)
- Uber partnership (○ if no longer active)
- Lyft + Uber partnership (○ if no longer active)
- Other active partnership

- P** Program designed to alleviate parking shortages
- 📶 Program allowing for integration of TNC services in route-planning app
- ♿ Program catering to paratransit-eligible populations and/or the elderly
- 🚆 Program primarily designed to promote TNC connections to rail lines
- 📈 Program for increased data-sharing opportunities
- 🕒 Program limited to select times of day and/or days of the week

Source: Partners in Transit – A Review of Partnerships between Transportation Network Companies and Public Agencies in the United States. Chaddick Institute for Metropolitan Development at DePaul University, August 1, 2018.

4.5.1. CASE STUDIES

All of the case studies below include service to seniors and individuals with disabilities.

4.5.1.1. SAN CLEMENTE, CA (OCTA PROJECT V PROGRAM)

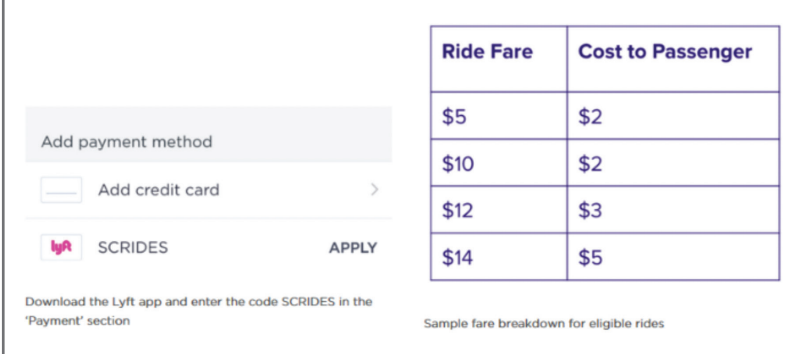
When Orange County Transportation Authority (OCTA) decided to eliminate two of its unproductive routes (191 and 193) due to low ridership in the City of San Clemente, the City and OCTA decided to partner with Lyft to provide on-demand services to riders dependent on those routes.

In October 2016, City Council approved a \$900,000 contract with Lyft to provide on-demand service to riders within the City limits. The contract is funded by an OCTA grant through Measure M2 Project V. Project V



provides funds for local communities to develop their own transit services that complement the regional transit services. Through the grant, OCTA pays 90% of operating deficit and the City pays a local match of 10%. This contract allows riders affected by discontinued routes to travel locally or connect to another OCTA route or Metrolink (rail) service. The contract establishes the following guidelines for trip payments:

- Passenger pays the first \$2.00 of the regular Lyft fare
- City pays remainder up to a maximum of \$11.00 (up to \$9.00 subsidy)
- Customer is responsible for any amount above \$11.00



Ride Fare	Cost to Passenger
\$5	\$2
\$10	\$2
\$12	\$3
\$14	\$5

Download the Lyft app and enter the code SCRIDES in the 'Payment' section

Sample fare breakdown for eligible rides

Riders can use the discount code SCRIDES when booking rides.

Given potential difficulties of senior and disabled riders using services offered by Lyft vehicles and drivers, riders eligible for OCTA Access service can request services from San Clemente's Senior Mobility Program for local trips that provide a comparable level of service. The program offers free on-demand fixed-route service for shopping and senior center trips.

4.5.1.2. AC FLEX – OPERATED BY AC TRANSIT

In early 2017, AC Transit, the transit service operator in Alameda and Contra Costa Counties (California) launched a flexible service in the neighborhoods of Newark and Castro Valley (also available in Union City and Fremont), areas that had low transit demand. The service, AC Flex, is designed as an alternative to unproductive fixed-route service. As part of the service the AC Transit operates 12-passenger buses equipped with wheelchair access, fareboxes, and Clipper Card readers.

All trips must begin and end within the AC Flex service area around Line 275. AC Transit suspended operation of Line 275 from March 2017 through March 2018 to evaluate the service. The service area also includes two BART rail stations. Implemented as a one-call-one-click concept, the service allows trip booking using a web application (smartphone,



tablet, computer) anytime or through the call center during restricted hours. AC Transit recommends trips be booked 30 minutes in advance. Recurring trips can be booked up to 3 months in advance.

The trip booking platform is implemented using MobilityDR platform from Demand Trans. Drivers get turn-by-turn direction on AC Flex vehicles. Riders can also subscribe to receive text or email alerts when their vehicles are 10 minutes away.

4.5.1.3. DIRECT CONNECT SERVICE BY PINELLAS SUNCOAST TRANSIT AUTHORITY (PSTA), PINELLAS COUNTY – ST. PETERSBURG, FL

In 2016, PSTA launched a unique public private partnership program to enhance local mobility by partnering with Uber and United Taxi. This service is designed to address the county's sprawling population and service gaps that require riders to walk long distances to get to a bus stop. The service is designed such that:

- Riders can travel to any destination within a defined geographic service zone; or
- To or from designated stops within a zone

The service was primarily designed to serve areas of PSTA where low ridership bus service was eliminated. Initially, the service was launched in the Pinellas Park and East Lake neighborhoods partnering with Uber and United Taxi. Based on the success of the program, PSTA has expanded the service to the entire Pinellas County and now also partners with Lyft. Thus far, however, rides through Lyft are currently not offered. It is unclear why, though experience with TriMet indicates that Uber and Lyft like to be exclusive partners and generally don't work together with an agency.

PSTA service partners (now include Uber, United Taxi, Care Ride, and Wheelchair Transport) use app-based ridehailing platform. PSTA provides a discount of \$5.00 per trip. Passengers pay an average of \$1.00. Riders can pay by bankcards or Paypal. On taxis, riders can also pay by cash. Provider selection is at the discretion of the passenger. Care



P3 for Paratransit MOD Demonstration

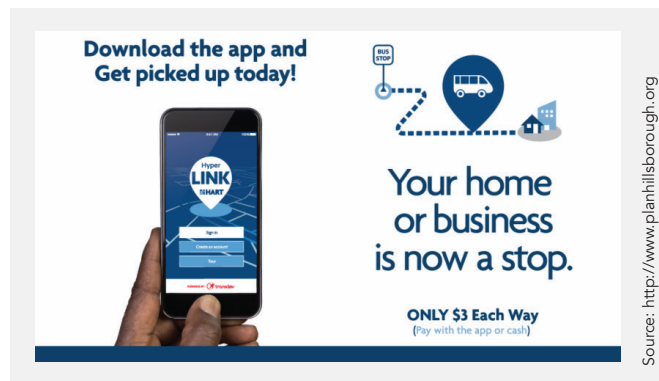
MOD Sandbox Demonstration Federal Amount \$500k + Local Match \$125k.

- Demonstrate a model to provide cost-effective, on-demand door-to-door paratransit service
- Leverage existing partnerships with United Taxi and CareRide with new partnership with Lyft
- Supplement PSTA's DART (ADA paratransit) program

Ride and Wheelchair Transport provide fully accessible services.

4.5.1.4. HYPERLINK PROGRAM – HILLSBOROUGH AREA REGIONAL TRANSIT (HART), TAMPA, FL

HART offers HyperLINK service to provide direct connections to bus stops in Brandon, Temple, Terrace and University Area neighborhoods. Designed as a shared ride service, this first/last mile solution was launched in the University of South Florida area with \$1.2 million capital from Florida Department of Transportation (FDOT). The service is operated by Transdev who is paid \$10 per trip. Riders pay \$1 to connect to a designated HART stop or \$3 to connect to other locations in the service zone. Riders can pay by cash or credit cards.



Private business donors (led by TECO) are funding the \$170,000 two-year leases for four Tesla Model X SUV vehicles used to provide the service. The program aims to expand using Tesla vehicles equipped with autonomous vehicle technology (initially will have "drivers" to ensure safety). Also, in addition to regular shuttle buses, one Mobility Ventures' MV-1 accessible vehicle is used to meet the needs of customers who may need accessible vehicles.

4.5.1.5. NEIGHBORLINK – LYNX, ORLANDO, FL

LYNX offers a flex service called, NeighborLink (NL), for its riders living in low density areas that are underserved by its local bus system. LYNX has currently defined 13 NL routes and zones. Riders can use an app to book trips to travel anywhere within the zone or to and from a stop on a NL route. Similar to AC Flex, LYNX operates small vehicles branded for NL service.



Riders pay fare similar to a regular fixed-route service: \$2 for full fare and \$1 for reduced fare (youth, seniors, disabled).

LYNX has been offering NeighborLink for several years, but it required booking rides two hours in advance until recently when an app was launched. LYNX has partnered with

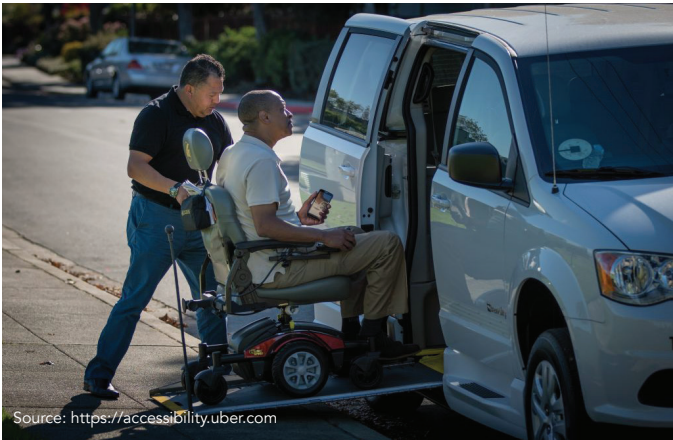
DoubleMap to provide the trip booking and dispatching platform. Also, DoubleMap provides real-time information and alerts to riders.

The service is operated by LYNX's paratransit service (ACCESS) contractor, MV Transportation.

4.5.1.6. NEW LOCAL MOBILITY INITIATIVES

Uber Express POOL: Uber is currently piloting share ride service called Express POOL. Unlike Uber POOL that provides door-to-door service, Express POOL offers services to/from designated stops. Express POOL is currently being piloted in Boston, San Francisco, D.C., Los Angeles, Philadelphia, Denver, and San Diego.

UberWAV and Uber Assist (UberAccess): Uber provides rides for persons with disabilities through branded service called Uber WAV and Uber Assist. Uber WAV is offered for riders who may need wheelchair and Uber Assist is offered for seniors and disabled riders who may require additional assistance getting in and out of the vehicle. Riders can bring Personal Care Attendants (PCA)/ companions with them. Driver-partners providing the service are certified by a third party in safely driving and assisting people with disabilities. As of early 2017, UberAccess services were available in: Chicago IL, Houston TX, Los Angeles CA, New York NY, Portland OR, San Francisco CA, and Seattle WA. Information on ridership and costs were not available.



4.5.1.7. AUTONOMOUS VEHICLES – BISHOP RANCH (SAN RAMON, CA) – 585-ACRE OFFICE PARK

Contra Costa Transportation Authority (CCTA), backed by combination of private companies, public transit operators, and air quality authorities has launched a driverless shuttle service. Two 12 seat shuttles are provided by Easy Mile. CCTA plans to operate nearly 100 driverless shuttles by 2020.

Most of the funding is provided by owners of Bishop Ranch property, a Sunset Development Company. The ranch is a 585-acre office park that includes 550 tenants and where 30,000 people go to work.



Shuttles provide services in the office park area and first and last mile connectivity to nearby a BART station.

The shuttle is operated after the California Assembly Bill 1592 was passed that allows the testing of electric, low-speed, multi-passenger autonomous vehicles that are not equipped with a steering wheel, brake pedal, accelerator or operator.

4.6 CHALLENGES AND OPPORTUNITIES

A public agency considering contracting or otherwise coordinating with a private entity for the provision of transportation service must navigate a number of potentially tricky regulatory standards and public perception issues. With the advent of Uber service in 2009 and Lyft service in 2012, the world of transportation has changed dramatically, but the associated regulatory framework has not kept pace. Several recent studies published by the Transit Cooperative Research Program (TCRP) and the Federal Transit Administration (FTA) has provided some guidance on how they will view any new services. Nonetheless, these new services and contractual arrangements have not been tested in the legal system.

Further changes are likely to result, but the sections below provide guidance on what issues may arise and how best to deal with concerns in the current environment. Most of the discussion applies to Uber and Lyft, but similar considerations would exist for any private company.

While the challenges below are serious and complex, they should not be viewed as “fatal flaws” that would kill the ability to take advantage of the emerging approaches to providing mobility services. They are cautionary concerns that need to be taken into account when structuring any service changes, especially if these changes affect existing services or operator jobs.

4.6.1. EQUITY/TITLE VI

Of principal concern is to ensure that any new service arrangement with a private company meets all requirements related to equity. Equity in this sense encompasses:

- Service availability – where and when service is provided
- Fare – how much is charged to use the service
- Technology access – ensuring that riders have access to the service without requiring a smart phone
- Rider access – non-discrimination based upon rider characteristics, including the Americans with Disability Act (ADA) and Title VI of the Civil Rights Act

Equity in this sense does not mean “equal” or “the same.” For example, a transit agency may establish geographic zones where a private operator provides the service, and the service in that zone may be a different type of service than is offered elsewhere. In an area of low-demand, where traditional fixed-route service is unproductive, a transit agency could contract with Uber or Lyft to provide demand-response service. Or, such service could be provided only late at night when traditional demand decreases.

The transit agency would need to ensure that such an arrangement was not done in a discriminatory fashion, such as only offering demand-response service in low-income or minority communities.

The fare charged for the service would have to be equitable when viewed against the fares charged for traditional fixed-route service, adjusted for differences in the type of service provided. For example, federal law states that fares for ADA riders shall not exceed twice the fare that would be charged to an individual paying full fare for a trip of similar length at a similar time of day (49 Code of Federal Regulations [CFR] §37.131). These laws, however, were established when ADA service was generally demand-response and was being compared with fixed-route service. It is unclear whether a larger difference could be charged for an Uber-type service that was offered to the general public. There is also a fare concern regarding whether a rider could be required to have a credit/debit card account rather than being able to use cash. A ticket vending machine (TVM) overcomes some of this limitation if they can be placed near where riders board. Such an arrangement works well for a service like a park & ride, where there are few boarding locations. However, for a demand-response service with widely dispersed origins and destinations, it would be impractical to provide full coverage with TVMs. At any rate, neither Uber nor Lyft accept cash or ticket fares. MTS and NCTD could implement an account-based fare collection, which has the potential to account for the lack of TVMs and help integrate with TNCs. An account-based fare collection allows riders to maintain an account that they can fund with a bank card or other methods (e.g., mailing check or by paying by cash in-person). At the same time, agency can work with third party solution providers (payment platforms) to build deep linking with TNCs and other providers so riders can pay for their trips when they book or when trips have been completed. Account-based payment also allows agencies to partner with local retailers to sell passes and



other fare products through electronic media (prepaid cards, loading agency smartcards) to riders from low-income neighborhoods and riders who may be unbanked/underbanked.

Technology access is another equity concern. The Pew Research Center has tracked the prevalence of cell phones and smart devices among different population groups. Overall, they found that in the US, 95% of individuals own a cell phone of some type, with 77% owning a smart phone. This widespread adoption indicates that technology access may decline as a consideration over time, but the report did identify some areas of concerns. Notably, older individuals (65+) were less likely to have a cell phone (85%) or a smart phone (46%). People with less than a high school education were less likely to have a smart phone (57%) as were lower income (less than \$30,000/year) individuals (67%). Rural residents were also less likely to have a smart phone (65%). These results are at a national level; further differences may exist at a regional or local level.

Equity is also an issue when it comes to the treatment of individual riders. This issue is primarily a concern when it comes to how an individual driver may treat an individual rider, such as an Uber driver refusing to transport someone from a federally protected population group. Both Uber and Lyft have guidelines for their independent contractors (drivers) that prohibit such discrimination, and even go beyond federal laws by prohibiting discrimination based upon “sexual orientation, marital status, and gender identity”, which are not covered by federal statutes. If a driver is shown to have engaged in such discrimination, he/she will be barred from driving for the company.

4.6.2. DRIVER TRAINING/SCREENING/HOURS OF SERVICE

The safety of the service provided is a paramount concern to a transit agency. Safety relates to both the safety of the driver (discussed here) and safety of the vehicle (discussed in the next section).

The Federal Motor Carrier Safety Administration (FMCSA) has established several regulations to ensure that drivers can safely operate their vehicle. One area of regulation is the “hours of service,” that is, how many hours can a driver safely drive before taking a rest break. For interstate commerce (where federal regulations apply), related to a vehicle that carries nine or more passengers including the driver, there are three hour-of-service limitations. First, a driver cannot be on-duty for more than 15 hours without taking 8 hours off. Second, a driver cannot drive for more than 10 hours without taking an 8-hour break. Third, a driver cannot be on-duty for more than 60 hours during any consecutive 7-day period or 70 hours during any consecutive 8-day period. While these regulations apply only to interstate commerce, most states have similar legislation.

What’s notable about the above regulations is they apply to drivers who operate a vehicle that

carries nine or more passengers. Most Uber and Lyft vehicles are private cars that carry five to seven people, so these regulations do not apply. Uber and Lyft have recently imposed their own hours of service limits. Lyft requires drivers to take a 6-hour break for every 14 hours the driver has the app in service. Uber requires a driver to take a 6-hour break after 12 hours of "driving time." Driving time equals the time the driver has the app in service, less time spent stopped between trips. While these regulations are an attempt to mimic the federal hours-of-service rules, nothing prevents an individual driver who is contracted by both Uber and Lyft from far exceeding these service hours by switching back and forth between the apps.

To drive for either Uber or Lyft, drivers must pass a background check. Neither company reveals precisely what the checks encompass, but they cover a motor vehicle record review and a criminal background check. Uber notes that it periodically re-runs background checks. Generally, a driver is declared ineligible if they exceed a certain number of traffic violations or have a "felony, violent crime, or sexual offense" for both companies, and "drug-related offense, or certain theft or property damage offense" for Lyft. These requirements may not be as strict as the public agency can or does perform on its operators. For example, neither company does a fingerprint check as do some taxi licensing boards.

It should be noted that neither Uber nor Lyft does any drug screening, whether pre-employment, periodic, or for-cause. Instead, both companies rely on their rating system to identify problem drivers. A rider is encouraged to report drivers suspected of driving under the influence and the company will follow up with investigation, discipline, suspension and/or termination.

Neither Uber nor Lyft does any training for their drivers, although Uber does note that some drivers that have been removed from driving can have their privileges reinstated if they complete some training. There is no general operation, safety, or customer interaction training. Instead, these companies rely on the "community guidelines" and rating system to identify where a driver may have a problem. Taxi license boards have differing training requirements depending upon the city or jurisdiction.

4.6.3. VEHICLE STANDARDS

Vehicle standards are important from a safety and accessibility perspective. From a safety perspective, all vehicles must pass the annual state inspection standards, whether owned by a private individual (for Uber and Lyft), a taxi company, or a bus owner. Uber and Lyft further place age limits on their vehicle; generally, a vehicle can be no older than 10-15 years, depending upon the company and location. Neither company conducts in-person vehicle tests, instead relying on the annual state inspections to ensure the vehicle is safe to operate. For non-safety issues, such as body or interior damage, the companies rely on riders to report issues.

Neither Uber nor Lyft have a requirement to operate an accessible vehicle. The guidelines for both companies require a driver to accept wheelchair passengers if their wheelchair can fit into their vehicle. This lack of an individual vehicle being accessible is not a problem for the FTA, assuming that some mechanism exists to provide an equivalent level of service to the rider. As a practical matter, this burden would fall on the public transit operator to be able to dispatch an accessible vehicle when needed. A potential issue is that the accessible service must be “equivalent” to the service provided to those without disabilities, including response time. It is unclear from FTA guidance on how this would work if an accessible vehicle is dispatched from a remote facility while non-accessible vehicles are prevalent throughout a community.

4.6.4. PREVAILING & MINIMUM WAGE

Special requirements relate to the wages and benefits of mass transit employees. According to the US Department of Labor, when federal funds are used to acquire, improve, or operate a mass transit system (public transportation), federal law requires arrangements to protect the interests of mass transit employees (49 United States Code (U.S.C.) § 5333(b) (formerly Section 13(c) of the Urban Mass Transportation Act)). Section 5333(b) specifies that these protective arrangements must provide for the preservation of rights and benefits of employees under existing collective bargaining agreements, the continuation of collective bargaining rights, the protection of individual employees against a worsening of their positions in relation to their employment, assurances of employment to employees of acquired transit systems, priority of reemployment, and paid training or retraining programs (49 U.S.C. § 5333(b)(2)).

This could potentially be an issue if any current operator jobs are replaced by lower-wage jobs, especially if the replaced jobs were covered by a collective bargaining agreement.

In the case of using Uber/Lyft, the hourly wage will inevitably be lower than the wages paid to unionized operators. While little data exists on the earnings of Uber and Lyft drivers, the drivers must pay all expenses (gas, maintenance, and insurance) out of their earnings, so their effective hourly rate is dramatically lower, perhaps even less than the federal minimum wage. According to a recent study conducted by MIT’s Center for Energy and Environmental Policy Research (CEEPR), Uber and Lyft drivers earn a median wage of \$3.37 per hour. While Uber has contested this finding by claiming the average gross earning closer to \$20 per hour and MIT is revisiting the research methodology, such a low wage is considerably lower than what transit drivers typically earn, particularly accounting for other benefits they also receive as agency employees.

4.6.5. PRIVATE SECTOR COMPETITION/CHARTER REGULATIONS

Public bus companies are prohibited from providing charter service in competition with

private charter bus companies. In general, these regulations prevent FTA subsidized grant recipients from unfairly competing with private companies.

The FTA website specifically notes that these regulations do not apply to demand-response service to individuals, so they would not apply to any Uber-type services. They could potentially come into play if a transit agency looked at establishing its own service in competition with a Chariot-type operator that provides a customized route for select companies or groups of individuals. In general, this is not likely to be much of a concern for any services contemplated by either MTS or NCTD, but it is another item to take into consideration.

4.6.6. PRIVATE PARTNER DURABILITY

A hard-to-quantify challenge or consideration is the concern over the long-term viability of any private sector partner. This concern has always been present with any private bus company or taxi company, but is, perhaps, more acute with the newer technology-based companies.

In the past, a transit operator faced the risk that its private partner could go out of business. This risk could be controlled by partnering with more than one taxi company, for example, or by owning its own vehicles which would be operated by a private bus company. If the private bus company went out of business, the public transit operator would be able to reclaim its equipment for use by a new contractor in a short amount of time.

For the newest mobility companies, whether bus-based, such as Chariot, or private-car based, such as Uber and Lyft, the risk is greater. Bridj, which was founded in 2014, has already ceased operation, and Uber/Lyft face challenges to their business model that could jeopardize their existence. Already in Europe, Uber has been classified as a "taxi" company, which subjects it to additional regulation, including having to classify its drivers as "employees" rather than "independent contractors." Should that occur in the US, Uber and Lyft's cost of operation will dramatically increase as they will now have to offer benefits to their employees and ensure they meet minimum wage standards.

4.6.7. POLITICAL CONSIDERATIONS

The above challenges have been presented primarily as legal issues that should be structured to avoid any potential regulatory pitfalls. Regardless of any legal consideration, any of these challenges could enter the political realm, either positively or negatively. The political issues could be more acute when changes to existing services are proposed, as opposed to the implementation of new service. SANDAG, MTS, and NCTD should be sensitive to how any changes will be perceived by the community at large and its elected representatives.

4.7 SPECIALIZED TRANSIT OPERATIONS – COMMON INDUSTRY PRACTICES

4.7.1. OPERATIONS

MTS' Access and NCTD's LIFT are complementary paratransit services designed to meet the requirements of the Americans with Disabilities Act (ADA). These are available to individuals whose physical, cognitive or sensory disabilities prevent them from using the accessible fixed route (bus, light rail, and commuter rail) transit systems. The following functional attributes of specialized transit system operations are discussed in context of industry best practices:

1. Eligibility and Registration
2. Reservations and Scheduling
3. Fare Policy
4. Performance Measurement

Through Triennial Review (TR) findings, FTA provides continual guidance concerning the correct interpretation of ADA regulations and requirements. Industry best practices are based partly on the collective findings of TRs of all grantees. In recent years, such findings have drilled deeper into the details of paratransit service; for example, eligibility suspension policies.

4.7.1.1. ELIGIBILITY AND REGISTRATION

Industry best practice favors a relatively strict and precise process for determining who is eligible to use ADA complementary paratransit. The ADA requires that the process "strictly limit" ADA eligibility to people who meet the ADA criteria. This is not intended to discourage eligible applicants from obtaining service; rather to prevent responsible agencies from conferring paratransit access unduly on segments of the general public who are not necessarily covered by the ADA.

Strict eligibility is considered as one of several tools embedded in the ADA regulations to manage limited program resources for the benefit of those who are eligible under the law. On one hand, insufficient limits on eligibility can lead to a system where costs cannot be contained and, as a result, constraints must be placed on service to balance the budget that may be inappropriate or violate ADA law. This jeopardizes transportation for many eligible individuals who have no other option. On the other hand, a complementary specialized or paratransit program that strictly limits eligibility without using best industry practices risks many eligibility denials to people who have a civil right to ADA paratransit service. Therefore, industry best practice typically limits eligibility to people who meet the ADA criteria, and

strives for precise eligibility determinations to ensure that the intent of the ADA is met fully.

Additionally, it is a best practice to have a comprehensive manual describing the eligibility process in detail, including staff responsibilities as well as agency policies and procedures. Formal written documentation is not always standard practice among small transit agencies; however, better program outcomes depend in part on staff familiarity with implementation policies, procedures and materials, as well as the consistency of their use.

Eligibility Criteria/Process

Industry best practice favors robust application of the conditional eligibility provision, which constitutes eligibility determination on a trip-by-trip basis. The National Transit Institute's (NTI) *Comprehensive ADA Paratransit Eligibility* document suggests that 30% to 45% percent of all ADA-eligible individuals require complementary paratransit service only under certain conditions; meaning that they should be considered conditionally eligible. The use of conditional eligibility is an important consideration for both MTS and NCTD.

The ADA provides for some flexibility to design a locally appropriate process for determining paratransit eligibility. Ideally, the application should enable both MTS and NCTD to assess eligibility based on a comprehensive list of skills needed and tasks required to use the County's fixed-route system whenever it is possible. The required skill set should be customized to unique characteristics of the San Diego environment, including not only weather, but topography and pedestrian infrastructure as well. All conditions that affect travel should be considered. For example, the applicant's potential travel throughout the entire service area, during all seasons. Incidental conditions such as disorientation and fatigue must be considered as well.

FTA has found in ADA compliance reviews that some transit providers did not adequately consider path-of-travel barriers, weather, and other possible issues when setting conditional eligibility.

Personal Care Attendants/Companions Policies

The ADA indicates that at least one personal care attendant (PCA) or travel companion may ride with any eligible customer. This means that MTS Access or NCTD LIFT must carry an eligible rider's additional companions if space is available. Both Access and LIFT do ask about travel companions and personal attendants when reservations are made so that the information can be used to develop runs and ensure adequate capacity on vehicles dispatched to deliver service.

4.7.1.2. RESERVATIONS & SCHEDULING

Scheduling Window

The ADA allows MTS and NCTD to negotiate pick-up times within a two-hour window framed by up to one hour before and one hour after requested departure time. Through the Triennial Review (TR) process, FTA has provided significant guidance on best practices that should be applied when booking customer travel requests. A key is to define the window in proper context of a complete understanding of the customer's trip characteristics. Industry best practice tends toward more completely understanding the specific travel need of the individual customer before establishing the pickup window. A preferred strategy is to negotiate pickup time by requesting information about customer time constraints as part of the booking process. A customer's appointment time must be considered when scheduling the ride. This includes whether the time requested is the earliest possible time that a customer can travel, or whether it is based on preferred arrival time or a fixed appointment time. When there is a latest arrival time (e.g., medical appointment), the scheduling window should be set to ensure that the customer gets to the appointment on time. When there is an earliest departure time on a return trip (for example, a time when the rider gets off work and so cannot leave before then), the scheduling window should be from that time to one hour after.

It is acceptable to set the schedule around the requested pickup time (plus/ minus one hour) when the customer's travel plans are not constrained by appointments or earliest departure times.

Scheduling Will-Call Return Trips

Will-calls can provide significant rider benefits for a limited number of trips, when the rider does not know the return time. In some medical situations, will-calls are vital, and it is a good practice for a transit agency to make them available. Yet they are workable only if limited in number, particularly during peak operating times. A large number of will-calls at peak operating times can overburden a system and make it difficult to deliver service on time.

Managing Cancellations & No-Shows

The ADA allows MTS and NCTD to suspend, for a reasonable period of time, access to complementary paratransit service for customers who indicate a pattern or practice of missing scheduled trips.

The intent is to encourage paratransit customers to recognize the substantial value of limited complementary paratransit resources and to avoid no-shows resulting in service capacity lost to the system. Suspension is a tool for handling those who repeatedly fail to appear for their prearranged rides and have a detrimental effect on operational efficiency, cost, and the

quality of the service for other eligible customers. Suspension of eligibility is not intended to be used as a demand management tool. The challenge of no-show policies is to balance customer service and operational efficiency.

FTA guidance speaks to the presence of a pattern or practice with intentional, repeated, or regular actions, not isolated, accidental, or singular incidents. Moreover, only actions within the control of the individual count as part of a pattern or practice. Missed trips due to operator error are not attributable to the individual passenger. The ADA does not allow a suspension of access to service for no-shows that are considered to be beyond the customer's immediate control.

Industry best practice leans toward no-show policies that do not penalize customers after a fixed number of occurrences (usually three) within the fixed time frame (e.g., 60 – 90 days). Years ago, this approach was nearly standard practice; however, recent TR findings suggest that this approach may be found to be overly restrictive, and not necessarily sufficient evidence of a pattern.

Generally, cancellations made at least two hours before the scheduled pick-up time are no longer equated with lost service capacity. Industry best practice increasingly is to accommodate requests for same-day and next-bus-available service when possible, and to implement operating practices to redeploy vehicles in productive service.

As an alternative to a traditional “three strikes and you're out” approach, responsible agencies are increasingly thinking in terms of the percentage of trips missed over a longer period to identify any pattern of missed trips. Some agencies assess the no-show records of individual customers relative to the average no-show rate for the customer base as a whole. Some suspension policies consider the absolute number of occurrences as well as relative frequency to avoid arbitrary outcomes. For example, a customer who travels once and misses the trip would have a 100% no-show record; however, the single data point does not constitute a pattern.

Enhanced customer service is essential to the transit industry as a consumer-oriented retail business. Increasingly, complementary paratransit providers are working with customers in constructive ways to reduce no-shows. Examples of pro-active approaches include keeping customers aware of their record of no-shows, verifying the accuracy of recorded no-shows when customers disagree with particular events, issuing a warning only for the first offense, and giving the customer an opportunity to appeal a suspension.

Other best practices address aspects of the reservations, scheduling, and trip fulfillment. For example:

- Record specific pickup location details and directions and ensure that the instructions are provided to the driver;
- Review cancellations made after 5:00 pm to confirm that if they are unable to cancel a ride in a timely way because cancellation calls are not taken early enough before their scheduled trip. For example, when a customer with a variable condition has an early morning trip scheduled but is unable to anticipate the need to cancel until that morning, best practice might be considered outside of the customer's control if the occurrence is not repeated.

Use of Technology

Advanced technologies, particularly Automatic Vehicle Locator (AVL), Mobile Data Terminals (MDTs), Global Positioning Systems (GPS), and Interactive Voice Response (IVR) systems, are assisting some transit agencies improve on-time performance.

AVL technology allows the agency to monitor the location of its paratransit vehicles on a real-time basis and provide historical location information on trips. Paratransit providers can use this information to enhance proactive dispatching, thereby reducing late pickup and drop-off times.

MDTs facilitate communications between vehicle operators and the dispatcher. Drivers use the terminals to record their arrivals and departures in real time. This information is then used to calculate new estimated arrival times for subsequent trips. Late pickups or drop-offs are flagged to the dispatcher who can then reassign later trips that might otherwise have become backed up.

Automated confirmation and reminder calls using IVR are consistent with industry best practice among systems with computer-based scheduling capacity. Common is the practice to auto-call customers with prior day trip confirmations and same-day reminders to help reduce cancellations and no-shows, and to help improve on-time performance.

4.7.1.3. FARE POLICY

Similar to the strict eligibility requirements and the ¾-mile service area, the maximum fare is intended as another sustainability tool used to manage the total cost of the complementary paratransit (specialized) program. Most US transit providers peg specialized/paratransit fares to twice the regular fare for a comparable fixed-route trip. Comparability considers the presence of zone fare structures, transfer charges, and other attributes of the fixed-route

system fare structure.

Transit agencies may require companions to pay the same paratransit fare as the eligible rider with a disability, which may not exceed twice the full non-discounted fixed-route fare. A personal attendant may not be charged any fare. However, any additional attendants may be required to pay the fare.

The FTA requires grantees to charge no more than half fare to individuals with disabilities (as well as senior citizens) during off-peak times on the fixed route. Many transit agencies have instituted fare incentives for paratransit eligible riders that go beyond this, such as allowing them to ride for free on the fixed-route system. Moreover, more transit agencies permit personal care attendants and some other companions to ride fare-free. This is an important addition because some paratransit eligible riders would not be able to (or would not feel comfortable) riding the fixed-route unaccompanied.

4.7.1.4. PERFORMANCE MEASUREMENT

Beyond just internally focused measures such as operating efficiency, labor productivity, and maintenance effectiveness, industry best practice focuses on key performance measures:

- **On-time Performance:** Maintaining schedule reliability is a key challenge for most paratransit service providers. Schedule adherence is measured against a pick-up window of 30 minutes or less, which is an industry standard.
- **No Capacity Constraints:** Substantial numbers of untimely pickups, trip denials, missed trips, and excessively long trips are considered illegal capacity constraints. It is current practice in the paratransit industry to view an on-time pickup as a vehicle arrival within an established on-time window. It is important to reinforce the pickup window concept with riders, drivers, dispatchers, and reservationists. Riders may otherwise not understand or remember the window, and think the vehicle is late when it is not. A good time to do this is when the rider makes the reservation. When the reservationist confirms the final trip information, instead of saying: "We will pick you up at 9 o'clock," if the transit agency has a zero — thirty (0/+30) window, for example, the reservationist could instead say, "We will pick you up between 9 and 9:30 a.m." The result is that, over time, riders will become more educated about the pickup window.

4.7.2. SUPPLEMENTAL SERVICE DELIVERY

Building on the previous discussion of the evolving landscape of mobility, this section discusses common specialized transit industry practices specifically with the use of supplemental delivery services. These services include the use of taxis, accessible taxis, and TNCs.

4.7.2.1. TAXI BEST PRACTICES / ATTRIBUTES OF AN EFFECTIVE ACCESSIBLE TAXI/TNC PROGRAM

This section provides a general overview of:

- The evolution and development of wheelchair accessible taxi services;
- The barriers that restrict the effectiveness and success of accessible taxi programs;
- How jurisdictions have promoted accessible taxi services; and
- Factors that support the sustainability of accessible taxi services (ability to accommodate a mobility device as well as sensitive to broader aspects of accessibility needs including sensory, cognitive, etc.).

A comprehensive review of taxi participation in paratransit programs and the integration of wheelchair accessible taxi services can be found in the Transit Cooperative Research Program (TCRP) report, [TRCP Synthesis 119: Use of Taxis in Public Transportation Programs for People with Disabilities and Older Americans](#) (2016).

Historically the taxi industry in North America has been characterized by a high degree of entrepreneurial independence. It remains highly market driven with service coverage concentrated in areas with the maximum potential for financial return. Maximum service coverage is often characteristically limited to areas of high demand density or concentrated on markets willing to pay for a higher value (market segments able and willing to pay a premium fare for what may be perceived as premium service) and responsive service.

Traditional taxi firms vary in size and business models and may include:

- Large companies with a concentration of taxi licenses or medallions and a large fleet of vehicles that they operate with staff drivers or lease out to independent drivers;
- Dispatch brokerages that charge monthly dispatch fees to independent owner operators for dispatch and administrative services; and
- Small “Mom and Pop” outfits that operate completely on their own, taking reservations from home offices or by cellphones while on the road.

Operations in small urban centers or rural centers are often undercapitalized, and through time, can go in and out of business as demand fluctuates. Increasing operating and business costs (fuel, vehicle maintenance, insurance, brokerage fees, and permits) as well as rising household living costs can push small or independent taxi operators out of business. The same can be true for the emergent software-based TNCs.

Taxi industry regulation can range from a high level of regulatory oversight, as is the case in

many metropolitan areas, to a very limited level or complete lack of regulation, as can be the case in small communities or rural areas.

In recent years, the traditional taxi industry has experienced significant competition from software based TNCs such as Lyft and Uber. In many markets, traditional taxi companies are losing market share to TNCs with more and more taxi drivers jumping ship and becoming TNC operators. TNCs have also created a regulatory challenge in jurisdictions where for-hire taxi operations are highly regulated. The market penetration, economic viability, and regulation of Lyft and Uber operations will continue to play out over the near-term horizon.

The Taxi Industry and the Americans with Disability Act

Federal legislation does not require taxi operators to purchase accessible vehicles if they only use sedan-type vehicles. The Americans with Disabilities Act of 1990 (ADA) requires taxi operators using vehicles larger than sedans, to provide equivalent service. In addition to the ADA, federal support exists for the purchase of accessible taxi vehicles through tax incentives—including The Architectural/Transportation Tax Deduction (IRS Code Section 190) and the Disabled Access Credit (Section 44)—and capital funding under Federal Transit Administration Section 5310 grant program.

Americans with Disabilities Act of 1990 (ADA)

Basic Requirement: Titles II and III of the ADA provide that no entity shall discriminate against an individual with a disability in connection with the provision of transportation service. The law sets forth specific requirements for vehicle and facility accessibility and the provision of service, including complementary paratransit service and vehicle-for-hire/taxi service.

The ADA further stipulates that taxi companies when buying or leasing a new service vehicle other than a sedan-type automobile, such as a van with a seating capacity of fewer than eight persons (including the driver), the acquired vehicle must be accessible, unless the company is already providing “equivalent service.” Equivalent service is defined as parallel to services provided to the general public including comparable response times and application of published fare structure. ADA also requires that taxi drivers must be trained to provide safe and appropriate assistance and service to individuals with disabilities.

The ADA also requires that taxi companies provide accessible communication services through accessible formats and technology to enable everyone to obtain information and schedule services. If the company offers online reservations or the option to make reservations by phone app, it must provide dispatching that is accessible to callers who are deaf or hard of hearing and accessible to web users who are blind or have visual impairments.

Although required by law, this is not necessarily the case with current taxi operations, especially in smaller communities where oversight may be minimal. Enforcement may only come to the forefront if there is a public non-compliance lawsuit or complaint. In certain cases, an ADA compliance complaint “may be the straw that breaks the camel’s back” and force a decision to cease the operation of accessible taxi services.

TNCs such as Lyft and Uber contend that they are software-based industries, not transportation services, and therefore do not have to comply with ADA accessible transportation requirements.

Evolution of Taxi/Public Paratransit Partnerships and Accessible Taxi Service

The partnership between taxi companies and public agency transportation providers and accessible taxi service initiatives evolved prior to the introduction of the ADA.

During the 1970s and 1980s, paratransit and social service agencies increasingly partnered with taxi companies to provide or supplement their services to their ambulatory clients. Both pre-ADA and ADA complementary paratransit services recognized the potential of taxi partnerships to provide supplemental capacity to:

- Provide backup for bus breakdowns and accidents;
- Offload trips from buses running late;
- Provide service during hours with low productivity (evenings and weekends); and
- Increase capacity when needed to avoid ADA trip denials.

In addition, public transportation agencies have involved taxi companies in subsidized taxi voucher programs as demand management strategies to shift ridership from core paratransit programs.

Much of this partnering has focused on service to the paratransit eligible persons not needing a wheelchair accessible vehicle. Through time, contractual arrangements became more sophisticated with specific performance expectations, driver screening and training requirements and trip assignment criteria to enhance service efficiencies. In a survey conducted of 45 public transportation agencies, 39 (85%) reported the use of taxi contractors.¹

¹ TCRP Synthesis 119, (2016), p.22.

Accessible Taxi Services

Taxi operators have long provided private for-hire services to passengers using wheelchairs. Traditionally, wheelchairs were folded and placed in the back seat or trunks of taxi sedans. However, the provision of this level of service has been spotty, dependent on the willingness of drivers to provide any necessary assistance in and out of the sedan or minivan, and to take the time to fold and stow a passenger's wheelchair. Additional charges were often imposed above the regulated meter, flat rate or zone charges. Service was not available to persons who could not independently transfer or be safely assisted in and out of their wheelchair. This service was not available to persons using power wheelchairs. This is still the case when individuals with disabilities request Lyft or Uber service. Drivers may not be willing to accommodate a passenger using a wheelchair.

As ADA has become more strictly enforced, the lack of consistent for-hire services to individuals with disabilities became increasingly recognized as discriminatory.

Wheelchair accessible taxi initiatives were piloted in the 1980s and have become increasingly important as ADA becomes more strictly enforced. Strategies to introduce wheelchair accessible taxi services have included: the limited issuance of new taxi medallions to companies or individuals who operate wheelchair accessible taxis; regulatory requirements for all taxi companies in a jurisdiction to include accessible taxis within their active licensed for-hire fleet; or the public agency procurement of accessible taxis with grant funding and the leasing of these vehicles to taxi companies willing to operate them. There have also been independent, private initiatives to procure and operate wheelchair accessible taxis to a targeted market specifically including individuals with disabilities. The TCRP reported that 23 (61%) of 38 transportation agencies in the United States using taxi companies had wheelchair accessible taxis available.² In the United Kingdom, 100% of all taxis operating in London are wheelchair accessible.³

Wheelchair Accessible Taxi Vehicle Development

In North America, early wheelchair accessible taxi design ranged from small shop modifications of old Checker Cabs and non-commercial minivans as well as rare research and development prototypes that never made it to commercial manufacture because of high production costs. The objective was to design and introduce vehicles that could accommodate wheelchairs without requiring the passenger to transfer from their wheelchair, as well as accommodate passengers using power wheelchairs and/or scooters.

² TCRP Synthesis 119, (2016), p.5.

³ Massachusetts Community Transportation Series, Wheelchair-Accessible Taxicabs, (October 2013), p.7.

The minivan modifications included side and rear wheelchair ramps and, as was often the case, the modified light weight minivan models marketed in the 1980s through the early 2000s had short service life cycles when put to commercial for-hire service. In a case study summarized in TCRP Synthesis 119, Luxor Cab of San Francisco stated that the life cycle of the ramp taxis they operated was in the range of 220,000 to 250,000 service miles while the life cycle of the taxis sedans they operated was in the range of 350,000 service miles.⁴ Many taxi operators also found modified minivans to be too expensive to purchase for their fleets. The Taxicab, Limousine and Paratransit Association (TLPA) noted in their report, Assessing the Full Cost of Implementing an Accessible Taxicab Program (2010) that used accessible minivans cost up to \$35,000 and new ones cost up to \$49,000, while a typical used sedan purchased for a taxi fleet cost approximately \$5,000 (pre-prep cost).⁵ In contrast, Luxor Cab reported in the TCRP Synthesis 119 that the type of ramp taxis (wheelchair accessible minivans) that they use cost between \$35,000 and \$50,000 while a sedan costs in the range \$15,000 to \$18,000 to purchase.⁶



Source: newatlas.com

AM General has introduced a purpose-built, wheelchair accessible commercial taxi. The Mobility Venture MV-1 (now being manufactured by A-1 Limousine Inc. out of Princeton, NJ.) includes a side loading wheelchair ramp and a forward-facing wheelchair position next to the driver. MV-1s have been in sufficient production volumes to be integrated into commercial taxi fleets as well as use by independent Lyft and Uber drivers. Unit costs are in the \$50,000 plus range.

Barriers That Negatively Impact the Implementation and Sustainability of Accessible Taxi Services

The following provides an overview of factors that negatively impact the implementation and sustainability of wheelchair accessible taxi services.

- **High Cost to Purchase Accessible Taxis:** Traditionally, many undercapitalized taxi companies or independent owner-operators purchased used sedans for their fleets. Typically, these were heavier duty, used law enforcement vehicles purchased at public auctions. More recently, there has been a shift to the procurement of newer (often) electric-gas hybrids as taxis operators become more concerned with image and attempt to reduce

⁴ TCRP Synthesis 119, (2016), p.56.

⁵ TCRP Synthesis 119, (2016), p.12.

⁶ TCRP Synthesis 119, (2016), p.56.

fuel-related operating costs. In many cases, image concerns for the traditional taxi industry has become critical as market competition from TNCs becomes stronger.

As identified above, the purchase cost of a wheelchair accessible taxi tends to be more expensive than the purchase of a more traditional sedan or non-modified minivan. For some taxi operators and many independent TNC operators, this relatively higher cost may discourage the procurement of a wheelchair accessible taxi. As a rule, TNC operators use their personal vehicles for for-hire service. In some cases, the higher purchase price of a wheelchair accessible vehicle may be cost prohibitive.

- **Higher Maintenance Costs and Shorter Vehicle Life Cycle:** Earlier generation wheelchair accessible minivan conversions were often built for private use and not for more rigorous commercial passenger service use. Higher anticipated maintenance costs and shorter useable vehicle life cycles can discourage the procurement of wheelchair accessible taxis.
- **Density of Demand:** Taxi and TNC operators tend to serve areas or locations with a high density of potential trips such as hotels, entertainment areas, transportation terminals, and medical complexes and are not willing to respond to trips far from their preferred areas of operation. They also may choose not to operate during hours when demand is lower. In the case of smaller communities, it can be difficult to ensure 24/7 coverage. Taxi and TNC operators may be reluctant to deadhead long distances to serve short trips originating and ending outside their higher density market areas, or to provide night owl coverage when demand is generally lower. Service coverage is highly market-driven.
- **Perceived Limitations of Market for Accessible Services:** Taxi and TNC operators may view persons requiring an accessible vehicle to be too limited a market to warrant the procurement and operation of a wheelchair accessible vehicle. Many may feel it is more profitable to concentrate on the general public for-hire market requiring a more generic vehicle.
- **Higher Insurance Coverage Requirements for Public Transportation Agencies:** Taxi insurance requirements are generally defined in local taxi ordinances. Generally, liability insurance requirements are lower than those required by contractors working for public transportation agencies. Public transportation agencies can require up to \$2 million liability insurance coverage.
- **Fear of Exposure to Potential Liability:** Taxi and TNC operators comfortable with general public markets may be apprehensive to provide service to individuals with disabilities because of a perceived risk associated with providing assistance to individuals with disabilities, and or risks of injury while in transit. Concerns include passenger injury and workplace injury to the driver.
- **Limited Driver Screening:** In smaller communities without comprehensive taxi regulations

or industry oversight, there may not be adequate driver background screening to comfortably satisfy the criminal background screening requirements of public agencies serving individuals with disabilities or older adults. In some cases, background checks can be limited to ensuring that participants have valid driver licenses.

- **Participation in Random Drug and Alcohol Testing Programs:** Taxi companies or TNC drivers may not be willing to participate in an approved random drug and alcohol testing program for fear that they may, on occasion, not pass. As a way of keeping overheads to a minimum, taxi companies may be reluctant to incur the cost of implementing and maintaining their own ongoing testing program. In some jurisdictions, taxi companies are mandated to have a random drug and alcohol testing program.
- **Limited Industry-Based Driver Training or Disability Sensitivity Training Programs:** Unless motivated by good business practice or mandated under local taxi ordinances, taxi companies may not provide customer service training beyond an overview of key local trip generators and attractors, critical requirements of the local taxi ordinance, and company rules and procedures. To offer accessible taxi services or to effectively partner with a public transportation agency, wheelchair handling and driver assistance training and disability orientation/sensitivity training workshops may be required. In terms of the latter, sensitivity training must include, in addition to the handling of a mobility device, broader aspects of accessibility needs including persons with a sensory, cognitive, and other physical limitations.

In practice, there may exist a resistance of some taxi drivers to provide the necessary assistance to passengers with disabilities. Reasons include inherent personal prejudices or a perception that the time necessary to assist a passenger with a disability adds too much non-revenue time to each trip. This also could be affected by liability risk concerns.

- **Limited Taxi Ordinance Enforcement Resources:** Some jurisdictions may not have sufficient staff resources to effectively monitor and enforce compliance with local taxi ordinances, including the provision of wheelchair accessible taxi services where mandated. With supplemental taxi service contracts, local public transportation agencies may also lack the staff to monitor and enforce compliance with service agreements. One comment frequently heard: "The problems with taxis most frequently cited relate to a lack of accessible vehicles, oversight and contract compliance, and service quality and reliability."⁷

4.8 EMERGING MOBILITY TECHNOLOGIES

This section explores some of the emerging mobility technologies and concepts that are either still in their infancy or yet to be tried in the specialized transportation environment.

⁷TCRP Synthesis 119, (2016), p.60.

Opportunities have been identified in the following areas:

- Trip Discovery/Planning;
- Trip Booking;
- Payments;
- Service Delivery; and
- Customer Information and Wayfinding.

Further, available technologies have been summarized under the following categories:

- **Mainstream technologies:** Refers to technologies that are widely deployed in the industry for solutions relevant to customers and agencies. There are very low risks in deploying such technologies.
- **Limited commercial deployment:** While there have been some experimental deployments, either technologies/solutions have not matured or there is not enough acceptance for mainstream use by customers and/or agencies.
- **Pilot deployments:** There have been some deployments, typically funded by USDOT grants or under public/private partnerships. Concepts or technologies are still in their infancy.
- **Advanced research, but no deployments:** These technologies or solutions should be considered high-risk to deploy since no field testing has yet been performed.

4.8.1. MAINSTREAM DEPLOYMENT

Personal Mobility Enhancements: There are several mainstream technologies available through many vendors that can help enhance the mobility experience of specialized transportation customers. These technologies include:

- Real-time information on vehicle arrivals and service alerts. Specialized transportation customers often have access to real-time information on iPhone and Android devices as well as real-time information on a transit agency's website. Also, trip planner capabilities should incorporate the real-time status of vehicles when displaying travel options to customers.
 - Account-based payment systems.
 - Self-service portal for demand response/specialized transit trips where customers can register, apply for, and track their eligibility and book and manage trips.
-

- Trip notification via interactive voice response (IVR) system the night before the trip and a configurable number of minutes prior to arrival of a vehicle at pickup location.
- Better adoption of continuous optimization of a commercially available scheduling engine to support same-day trips and vehicle assignments.

No identified risks are anticipated in deploying suggested technology enhancements.

Benefits: Suggested enhancements will have the following benefits as perceived by riders:

- Improved customer experience
- Service reliability
- Seamless mobility

4.8.2. LIMITED COMMERCIAL DEPLOYMENT

4.8.2.1. ENHANCED RIDEHAILING/BOOKING

Ridehailing or ridesourcing apps have been prevalent in recent years and have provided travelers additional travel alternatives. They are most suitable solutions for supplemental service. Most of the ridehailing companies now provide their public application programming interface to third party developers. This could potentially allow specialized transportation riders to book their trips with one click. However, the experience is not as seamless as it might be expected, as is the case with most mobility aggregator apps. Google Transit for example, provides a trip discovery or planning platform and booking is done by individually going to ridehailing company websites or apps. Often, transit agencies may also partner with a suitable mobility aggregator such as Moovel who provide an integrated trip brokerage platform for booking and payment for multiple services (e.g., TNC, carshare, bikeshare, and transit) through a single trip planning app. TriMet is currently implementing such a solution as part of their Mobility-on-Demand (USDOT Sandbox) grant.



Source: www.mytransport.sg

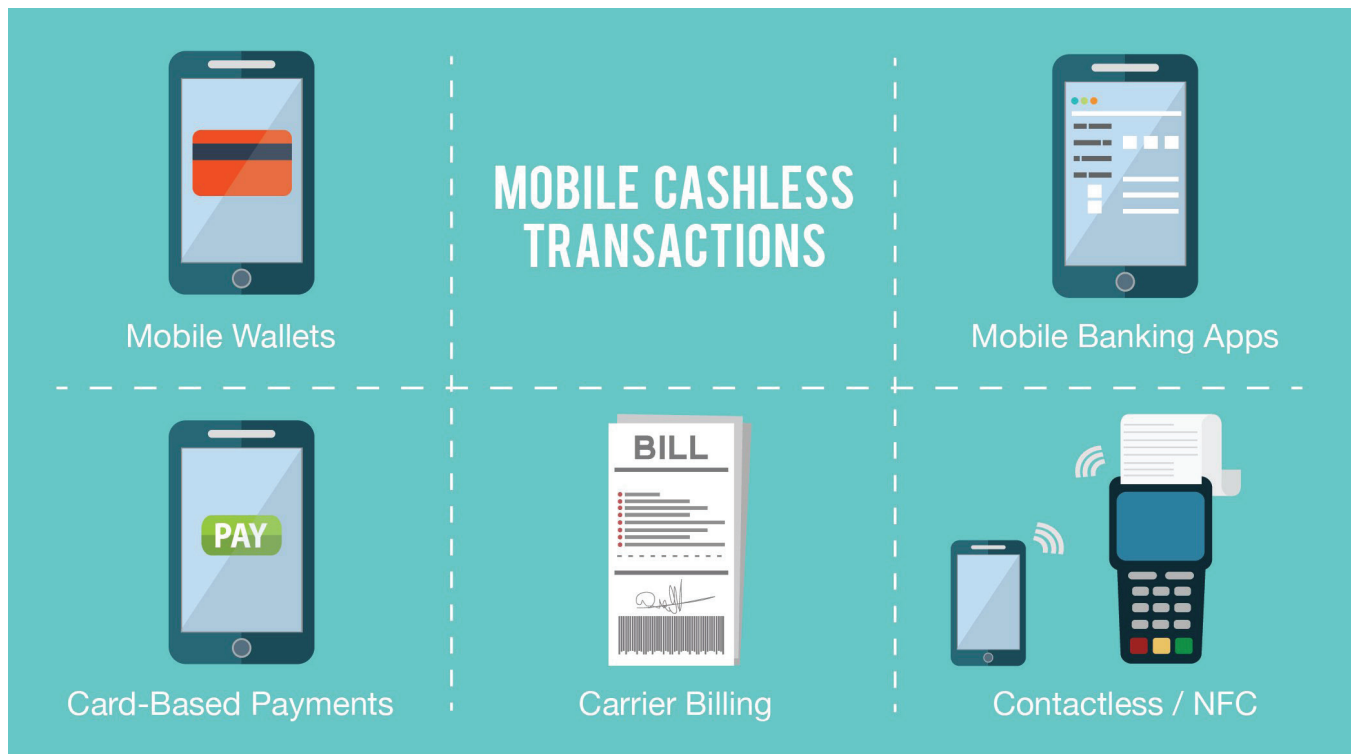
Ridehailing solutions by now have been integrated with transit agencies under various models (e.g., fully or partially subsidized by agency or paid by customer) and pose limited risks.

Benefits: Suggested enhancements will have the following benefits:

- Enhanced trip booking and payments experience;
- Seamless door-to-door mobility via multiple modes;
- Increased personal mobility alternatives and first/last mile connectivity; and
- Cost-savings to agency by reduction in the number of expensive demand response/ specialized transit trips.

4.8.2.2. CASHLESS PAYMENTS

Cashless payment systems enable customers to pay for trips electronically. A cashless system would potentially allow agencies to eliminate fareboxes, which are expensive to maintain, especially factoring in the cost associated with the daily cash collection, accounting, and reconciliation processes. However, cashless payment systems require customers to have access to banking, which is an issue for historically unbanked and underbanked populations. Cash-based fare collection ranges around 10-30% of fare payment at most agencies. For example, even after many years of their rollout of the Ventra open payment system, Chicago Transit Authority's cash payment ratio exists at 8%. Cash payments at suburban agency Pace are even higher at 20%.



Source: www.GlobalLogic.com

Considering a best-case scenario for banked customers, a cashless payment system requires a series of strategies to reduce the amount of cash usage by targeting specific rider market segments. Infrequent specialized transit riders and socio-economically challenged riders resort to cash-based payments. Targeted strategies could and should be developed for these market segments to steer them towards adopting cashless payments.

With the advent of account-based payment, agencies now have more flexibility in steering customers towards electronic media by establishing an extensive retail network so customers have access to locations where they can buy or reload smartcards using cash, with no need for a bank account. For example, Massachusetts Bay Transportation Authority (MBTA) in Boston is planning to achieve fully cashless payment by 2020. Part of this strategy involves developing a retail reload network such that 98% of its stops have a retail location within walking distance (typically a quarter mile).

Specialized transit systems have greater opportunities in adopting cashless payments since those customers have registered accounts and could potentially be provided electronic fare media which is tied to their accounts. Also, customers could pre-pay for some of the trips online when booking.

Opportunities and technologies now exist more than ever to adopt cashless payment to a certain degree. There will always remain a segment of the population that will not be able to use electronic media due to lack of a bank account - unless they use cash to replenish at a retail location. The private sector is also advancing technologies such as PayNearMe where customers can pay using cash at a participating retail location such as CVS or 7/11 for online transactions. PayNearMe has now also partnered with Blackhawk Network where customers could go to retail locations that are interfaced with Blackhawk Network for prepaid card sale and distribution.

Adopting 100% cashless payment may leave out a significant section of ridership that is unbanked or underbanked and might also raise Title VI compliance concerns.

4.8.2.3. ENHANCED WAYFINDING

Wayfinding is one of the key issues in specialized transit, particularly with the senior and disabled population who may not be familiar with the transit service area. Reasons why wayfinding is an issue may include the rider's unfamiliarity with routes and stops, poor signage, temporary relocation of stops, stops located within a large transfer center, and shared stops with another agency. In some cases, particularly with riders with a disability, their inability to locate a fixed-route stop often prompts them to use the more expensive paratransit service option.

Agencies have conventionally relied on map and text-based signage and tactile guideways to help riders locate stops and other transit facilities, but modern technologies based on radio-frequency identification (RFID) or Bluetooth Low Energy (BLE) beacons open greater possibility in helping riders orient towards a bus stop and navigate. Typically, there are the following components involved in beacon-based wayfinding:

- BLE tags that transmit Bluetooth signal and can be installed anywhere, indoors or outdoors. These signals can be preprogrammed to transmit specific information, such as a bus stop number; and
- Riders' smartphone that has an app to detect BLE signal and help navigate the rider through built-in accessibility features of the phone. This could be visual, audio, or haptic (e.g., vibration) feedback.



Some agencies and vendors use additional features in improving the navigation aid. These include defining a geo-fence around a stop so the app on a rider's device knows when to start the navigation. Also, BlindWays, the app developed and deployed by Perkins Institute for the Blind and Raizlabs in partnership with MBTA in Boston has a crowdsourcing feature that allows riders to mark obstructions or physical objects (e.g., tree, fire hydrants, potholes, broken sidewalks) on the map which helps the app to use that information and provide proper guidance to visually impaired riders. PathVu is also a crowdsourcing application that allows riders who use a mobility device (scooters or wheelchairs) to navigate safely to their location.



There are apps meant to address specific types of disabilities as well. For example, WayFinder 3 by AbleLink, also featured by USDOT's Accessible Transportation Technology Research Initiative (ATTRI) program, allows riders with cognitive disabilities to orient and navigate themselves while traveling.

For general public riders, vendors are starting to launch apps that use augmented reality for better wayfinding. These apps use the

smartphone camera to display real-time information to the stop location at which the camera is pointing. Such tools can be very useful to infrequent users of transit.

While there have been several deployments of BLE-based beacons, they are still not mainstream, particularly in a transit environment. Key issues with this approach are the training of customers with a disability and the need, in most cases, for a smartphone. Also, it is important to make sure the navigation map being used for directions has an updated database of not just locations, but also any physical obstructions.

Maintenance of beacons is also a concern. Beacons operate on battery power and there will need to be a way for an agency to know the battery level to ensure beacons can be serviced when running out of power.

The biggest beneficiaries of wayfinding solution will be riders with disabilities. However better wayfinding solutions will also assist general public riders and could prompt more riders to take fixed-route transit service.

4.8.3. PILOT DEPLOYMENTS

4.8.3.1. CONNECTED AND AUTONOMOUS VEHICLES

A self-driving vehicle (sometimes called an autonomous vehicle or driverless vehicle) is a vehicle that uses a combination of sensors, cameras, radar and artificial intelligence (AI) to travel between destinations without a human operator. While most agencies are still running pilot programs for field testing in a controlled environment, some municipalities such as Las Vegas have already started running Connected and Autonomous Vehicles (CAV) shuttles in mixed traffic.

A key component of a CAV shuttle solution should be to link these vehicles with an overall control center, so riders can hail these shuttles like any other ridehailing service and board them at designated stops. Given the size of these vehicles (16 seats or less) these shuttles can be operated on most streets in any neighborhood given their lower turn-radius needs.

Further, the “connected” aspect of these shuttles can be utilized for ensuring pedestrian and passenger safety as discussed in the next section. V2X sensors installed on the vehicles can interact with other vehicles and roadside equipment for collision avoidance.



Advanced vision sensors such as those offered by MobileEye can be used for object detection and collision avoidance as well.

While agencies are running pilot programs with key CAV providers such as Navya, EasyMile, Local Motors, and operators such as Transdev and Keolis, safety and reliability continue to be an issue. The shuttle Keolis ran in Las Vegas was involved in an accident on Day 1 of testing. Even though the vehicle was not at fault, it stopped to avoid a collision with the vehicle in front instead of backing up a little as a human driver would do.

These shuttles could still be operated in dedicated guideways, similar to Jacksonville Transit Authority's experimental Urban Circulator project. Manufacturers continue to test and perfect the technology behind autonomous driving.

CAV shuttles offer a promising future for providing additional mobility options including first/last mile connectivity given the small size of these vehicles, "connected" nature, and reduced operating cost due to being driverless.

4.8.4. ENHANCED SAFETY SOLUTIONS

Pedestrian safety is an important factor in planning mobility solutions for older adults and individuals with a disability. Connected vehicle technology can assist with ensuring safety through collision avoidance and warning systems. There are the following types of technologies in testing/pilot stages:

- V2X Safety Solution: Vehicle to vehicle (V2V), vehicle to infrastructure (V2I), vehicle to pedestrian (V2P) and similar technologies where vehicles and road side equipment communicate over secure, dedicated short range communication (DSRC) to alert pedestrians or bikers at intersections and other vehicles equipped with V2V sensors; and
- Vision-sensor and Range Sensor based Collision Avoidance: Technology used in autonomous vehicles could also be installed in regular (transit) vehicles for object detection and collision warning/avoidance. This technology includes vision and/or range sensors on vehicles that interact with an on-board vehicle computer to process data and detect objects. Drivers or pedestrians are warned about potential collisions. In some cases, breaks could be applied automatically to avoid an accident.

V2X technology is still being developed and not available in commercial space. USDOT pilot demonstrations have used after-market kits from Savari Networks and others for providing V2X functionality. However, given DSRC has been widely adopted as the standard in the industry, several car manufacturers are starting to include DSRC connectivity functionality in their vehicles. There is no expected timeline on any transit vehicles or transit system vendors incorporating such connectivity in their solutions.

Vision and range sensor-based technology is more widely available from Mobile Eye (now part of Intel). These units are expensive though and cost \$5,000-\$7,500 per vehicle and hence restrict agencies from widely deploying these units.

Benefits: Safety is critical to transit industry, particularly given Vision Zero initiatives that seek to eliminate traffic-related fatalities. While safety technologies mentioned in this section are not mainstream yet they are expected to be widely deployed in coming years. Presence of such technologies, particularly on autonomous vehicles will give riders extra confidence when riding the vehicles.

As with any technology deployment, equipment installed on vehicles or at roadside infrastructure will require maintenance to ensure failsafe operation. This may have staffing impacts on the organization.

4.8.4.1. MOBILITY AS A SERVICE

Mobility as a Service (MaaS) takes the integration of mobility services across the transportation network to another level. Within the MaaS framework, public transit is the backbone and other mobility solutions complement the public transit foundation by expanding the service area. The goal is to provide people with more options for efficient and convenient travel. MaaS can help improve transportation network equity by providing these opportunities to more people, beyond the population served by public transit alone.

Beyond simply providing more travel options, MaaS dissolves boundaries between various transportation modes and can offer mobility as a “package.” At its most advanced, MaaS offers a monthly subscription, similar to a cell phone plan, where users can choose which services (e.g. Uber, bikeshare) to include in their package. With transit as the backbone, we can also foresee transit agencies in regions with MaaS transitioning more towards becoming “mobility managers.”



Source: www.transportadvancement.com

As many of the nation's transit agencies advances Smart City initiatives, there are opportunities to consider integrated trip planning and payment and move towards a MaaS model. Electronically, different transportation modes and mobility solutions may be integrated through a mobile device application, generally complemented with a web portal and/or call center. (The latter recognizes that not all riders will be able and/or willing to use a mobile device application.) Such an integrator is equipped with functions including inter-modal real-time information, inter-modal trip planning, inter-modal trip booking, and inter-

modal payment. There are potential benefits related to an integrated platform for mobility. For instance, in San Francisco when a new transit agency is added to the integrated fare management system, all transit agencies in the management system have seen an increase in ridership.

In North America, MaaS is not yet as advanced as in Europe where this concept originated. Key elements of a MaaS framework are open data, service interoperability, and an account-based payment system. While agencies in the US have adopted open data for trip discovery/ planning and real-time passenger information, there are no standards for transactional data exchange such as trip booking, service coordination, payment, billing, and invoicing.

The MaaS framework changes the way agencies do business today. Agencies have the flexibility to take on a role of a brokerage service, particularly for demand response trips, and work with regional public and private players for fulfilling service requests. However, agencies will have to develop appropriate business models for service delivery. MaaS is basically the “Netflix or Amazon of Transportation” where agencies can provide their own service but also offer services from other operators in the MaaS marketplace. Agencies should develop institutional agreements with providers to cover legal and other concerns such as customer safety, security, data privacy, driver and vehicle due diligence, and other aspects.

MaaS framework can provide several benefits as follows:

- Ubiquity of travel options involving a variety of modes and operators;
- Seamless travel across modes offered by participating service operators;
- Better management of discounts and travel incentives;
- Reduced use of car travel resulting in reduced vehicle miles traveled (VMT), and better air quality; and
- Ability of agencies to serve larger geographic areas by partnering with public and private service operators.

4.8.5. ADVANCED RESEARCH BUT NO DEPLOYMENTS

4.8.5.1. BETTER SERVICE INTEROPERABILITY WITH TRANSACTIONAL DATA STANDARDS

The consulting firm, Demand Trans, under contract with the Transportation Research Board (TRB) is conducting research to address the development of standards for data exchange between demand response service providers. The key focus of the research involves (per research statement from the TRB):

- Develop specifications that may evolve, at some future time, to standards for transactional
-

data;

- Consider privacy and security in the transmission and storage of transactional data;
- Identify key strategies to encourage adoption of the proposed specifications;
- Propose and carry out an approach for testing the specifications;
- Create an open source tool for data producers to validate their data against the specifications;
- Create and convene a forum for consensus-based refinement of the technical specifications; and,
- Demand Trans is still conducting the study and has not released any information in the public domain yet.

Benefits: Key benefits of transactional data standards are as follows:

- Better coordination among demand response/specialized service providers at regional scale;
- Increased integration among demand response systems from different vendors; and
- Efficient deployment of platforms such as MaaS.

4.8.5.2. BLOCKCHAIN-BASED TRIP BOOKING AND PAYMENT

Blockchain is the technology that is behind cryptocurrencies, such as Bitcoin, but it has much wider applications. Blockchain is considered the “new Internet” where every transaction record ever created is stored in permanent information blocks. This can be perceived as a distributed ledger that does not reside in one single database. Blockchain has the potential to eliminate huge amounts of record-keeping and save money. Blockchain is a public electronic ledger that can be openly shared among disparate users and that creates an unchangeable record of their transactions, each one time-stamped and linked to the previous one. Each digital record or transaction in the thread is called a block (hence the name), and it allows either an open or controlled set of users to participate in the electronic ledger. Each block is linked to a specific participant. Given the distributed/decentralized nature of Blockchain, it can allow individual customers to book and pay for trips using systems that don’t necessarily have access to a central database or booking or payment system. Booking or payment systems used by customers will essentially be written transactions in the same Blockchain. Providers and users of those individual systems can also execute contracts and agreements electronically. Those agreements are part of the Blockchain as well. Further, peer-to-peer transactions between customers and service providers are verified against contractual terms and conditions. This concept can help with service models such as MaaS where the

decentralization of trip booking, and payment ledger can help expand participation of service providers across a large geographic area.

Blockchain is still in its infancy in terms of its application in the transportation industry. There are few examples, and none that involve human transportation. However, it is likely that MaaS solution providers may realize the benefits of the decentralized nature of transactional database and start commercial deployments as pilot programs.

There are a couple of examples of Blockchain-based implementations for carsharing and other related applications where customers can execute smart contracts, book, and pay. These include a DOVU partnership venture between Toyota Research Institute and MIT Media Lab, and Tesseract platform from EY.

Benefits: As discussed, decentralized database, particularly in the context of demand response transportation, autonomous shuttles, and MaaS service delivery model can help attract customers who typically do not use transit due to difficulty in accessing booking and payment application. This problem is especially acute when different system providers are used by entities such as a parking operator, toll operator and transit service operators.

4.9. CONCLUSIONS

Transit agencies in the United States have been partnering with private sector such as TNCs, private microtransit companies, and real-time routing and dispatching software providers for more than two years now, particularly since the MoD Sandbox initiative was launched by USDOT. However, transit agencies are still assessing how best to position themselves in the shifting paradigm of mobility. Throughout this time agencies have experimented with replacing existing services, complementing current services, and adding new services. Given most of the operating cost in transit industry is attributed to direct driver employment and vehicle ownership, agencies have experimented with a variety of models, where they 1) operate a service on their own; 2) use a contractor to run their services; or 3) partner with TNCs or taxis and subsidize trip cost. There is no clear conclusion on the best model, and it varies largely depending on the type of service being provided and the ridership demography. The experiments continue.

The transit industry is witnessing a rapidly changing world fueled by internet-age technologies. The power of the internet allows agencies to plan and deploy technologies at a rapid pace even in situations when multiple service providers are involved. Several technologies/solutions identified in this document have either been field tested as part of a pilot program or have been widely deployed. Solutions such as MaaS, while still having very limited deployments, promise a great future given their ability to bring different providers together under a common service model.

5 SPECIALIZED TRANSPORTATION STRATEGIES

Informed by outcomes from identified gaps or needs (Section 2), this section presents a menu of opportunities to advance short-term and long-term specialized transit improvements.

5.1 OVERVIEW OF POTENTIAL STRATEGIES

As the mobility landscape continues to evolve, connected travelers, continued advancements in transportation technologies, and private sector involvement present unprecedented opportunities for public transportation improvements in general and the delivery of paratransit, specifically. In recent years, concepts such as microtransit and mobility-on-demand have helped agencies provide a range of mobility options for the senior and disability communities by developing and integrating unconventional modes into their services, engaging the private sector in the form of transportation network companies (TNCs), taxis, and other modes as complementary alternatives to traditional paratransit delivery schemes. However, while transit agencies continue to experiment with new business models, suppliers, and technologies to extend service (and mobility options), challenges related to providing cost-effective, efficient, and equitable service to all people remain.

In support of SANDAG's initiative to examine short- and long-term actionable strategies to best meet the mobility needs of seniors and people with a disability, this section presents potential strategies addressing core business processes.

Factors Driving Change: The landscape of mobility is changing rapidly and is driven by new alternative mode choices, advancing technologies, and emerging trends within the transportation field.

- **New mobility solutions and suppliers** have entered the transportation market, beginning with Zipcar, the car-sharing service, founded in 2000. This trend continued with the integration of ride sourcing options such as Uber and Lyft, which were introduced in 2009 and 2012. While the introduction of these alternative transportation modes has resulted in the increase of the transportation market, they are not affordable to all demographics.
- **Smartphone use is increasing** with more than 75% of Americans owning a smartphone. Because of the widespread use of smartphones, people are now connected to a broader array of mobility options including ridesourcing apps such as Uber and Lyft. Increased smartphone usage also allows people to receive transit updates in real-time.
- **Advancing technology** has enhanced access to real-time travel updates, allowed for inter-modal payment and ride-splitting within ridesourcing apps, and for real-time routing and

dispatching information. The following emerging technologies should be considered:

- **Connected and Automated Vehicles (CAV):** CAVs have the potential to improve traffic safety, transportation and land-use efficiency, and transit spending. Many transportation authorities are moving toward CAVs due to their ability to send and receive real-time traffic and safety updates. There is also movement toward using CAVs in shared-use and on-demand mobility options.
- **Beacon Technologies and Crowdsourcing Travel Patterns:** Beacons can assist both riders with wayfinding and transit agencies with data acquisition regarding the travel habits of its riders. Data would be collected from riders regarding which bus stop they loaded onto and disembarked from, while also tracking whether a rider transferred to another bus in the system or completed the route.
- **Artificial Intelligence & Machine Learning:** E-hailing is now a very common and popular alternative transportation mode. However, shared ride services such as “Lyft LINE” and “Uber Pool” and “Uber Express Pool” are still lacking in their ridematching and routing algorithms, particularly when scheduling optimized same-day trips. Use of data from multiple sources regarding traffic patterns and variability could be crowdsourced from riders. Furthermore, these technologies can enable self-learning algorithms which could assist in the delivery of efficient and cost-effective transportation services.
- **Changing transit preferences** are a result of an evolving transit mobility ecosystem creating shifts in the following categories:
 - » **Urbanization and the movement of people back into the city** has created the need to ensure efficient mobility for city dwellers regardless of income, age, and ability. Moreover, this shift in demographics has reinforced the need for urban centers to create dense and walkable cities in an effort to reclaim streets for pedestrian life.
 - » **An increasing and ageing population** emphasizes the urgent need for multi-modal and shared mobility solutions to meet the needs of our increasingly diverse cities. Moreover, a population that is both increasing in size and advancing in age demands that only truly accessible transportation systems can be sustainable.
 - » **Environmental awareness and active lifestyles** have contributed to a reduced dependence on private vehicles and an emergence in trends such as cycling and a pedestrian lifestyle.
 - » **New funding opportunities** have been made available to transit agencies to allow for experimentation with new and existing mobility solution providers. Funding programs such as the US DOT MOD Sandbox Program, allows transit agencies to enhance their preparedness for “mobility on demand” projects. The FTA offers funding to several other mobility projects including the “Access and Mobility” partnership grants and

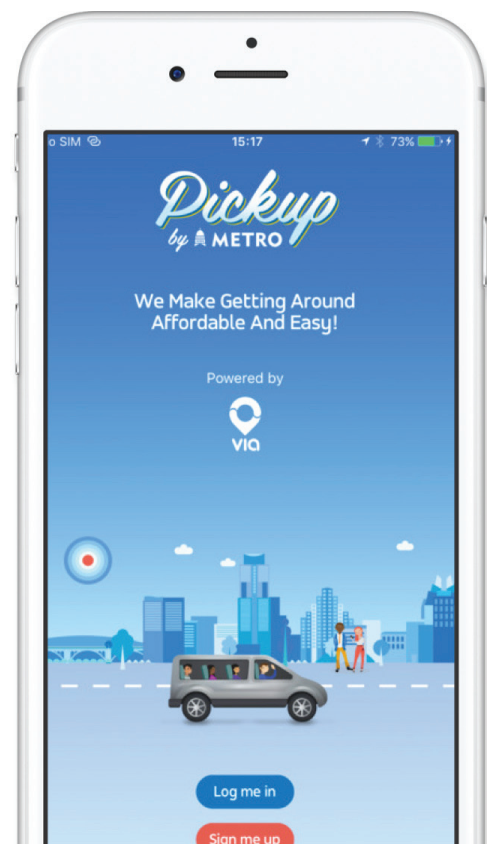
the “Enhanced Mobility of Seniors & Individuals with Disabilities.” Funding is offered to projects which serve the elderly or individuals with disabilities who are at the disadvantage of existing transportation networks.

Mobility Solutions and Suppliers: Developments related to mobility challenge transit agencies to provide solutions in a cost-effective manner. Rather than expending resources to provide new technologies for transit riders, transit agencies should partner with mobility solution suppliers to better shape the future of urban mobility. Such mobility solutions include:

- **Microtransit:** Microtransit consists of public transit medium capacity vehicles (8 to 15 passengers) operating with on-demand, flexible routing to provide service to areas that are inefficient to serve with a fixed route. The driver operates as an employee of the transit agency or a corporation. The distinguishing feature of microtransit compared to earlier generation demand response transit is that the passenger does not need to schedule a trip far in advance – ordering trips can be done on-demand, and the centralized dispatching algorithm automatically adjusts service in response. Eligibility for microtransit service, as with conventional fixed route service, is open to the public, and fares may be integrated with the rest of the public transit network. Past attempts have been made by transit agencies to achieve this with previous generations of demand responsive scheduling and dispatch technology with only limited success.

Much of the current interest in microtransit stems from the apparent ability of the mobile apps-based technology being used in recent years by various third-party ridesharing, ridesourcing and ridesplitting service providers (see below) to provide this type of service more effectively.

- **Ridesharing:** Ridesharing is a software-assisted modernization of conventional carpooling, in which drivers with their own personal vehicles are matched with passengers using the same subscription service, to split the cost of commuting together. For security and payment management, eligibility as both a driver and a passenger is limited to members who maintain an account with the central service.
- **Ridesourcing:** Ridesourcing consists of a driver utilizing their personal vehicle to provide a private trip to a paying passenger; unlike carpooling and ridesharing, the driver of a ridesourcing service is driving professionally, and not making their own commute in the process of transporting passengers.



Source: <https://platform.ridewithvia.com/cities/>

Ridesourcing closely mirrors the service model of traditional medallion taxis and is most familiarly employed by Transportation Network Companies (TNCs) such as Uber and Lyft.

- **Ridesplitting:** Ridesplitting is a close counterpart of both the ridesourcing and microtransit models. The driver utilizes their personal vehicle, drives professionally rather than as part of their own commute, and can accommodate multiple independent passengers simultaneously (as distinct from ridesourcing that is oriented to individual paying passengers), on a route that dynamically updates in response to new trip requests. Ridesplitting is another service offered by TNCs such as Uber and Lyft in major cities, where the likelihood is higher of customers independently booking trips simultaneously, with start and end points that can be conveniently served using the same overall trip. Ridesplitting commonly uses lower capacity vehicles (less than 6 passengers).

Specialized Transit – Core Business Processes: NCTD’s LIFT and MTS Access paratransit services are designed to meet the requirements of the Americans with Disabilities Act (ADA). ADA paratransit services are available to individuals whose physical, cognitive or sensory disabilities prevent them from using the accessible fixed route (bus and rail) transit systems. The following functional attributes (core business processes) of specialized transit system operations present an opportunity for MTS and NCTD to review current practices/processes for consideration of amending same to reflect industry best practices as reflected in Section 4.2:

1. Eligibility and Certification
2. Reservations, Scheduling and Trip Management
3. Fare Policy
4. Performance Measurement



Source: busride.com



Source: NCTD

Alternate Service Delivery Models: A variety of service delivery models have been used to successfully provide paratransit services for transit agencies nationwide. Larger transit agencies have utilized a variety of approaches to deliver services that may adjust and evolve as contract structures play out due to factors such as changing agency needs, changing industry practices, new technologies, and lessons learned.

The Transportation Research Board (TRB)’s Transit Cooperative Research Program (TCRP) studied 29 paratransit programs to synthesize the types of paratransit service delivery models. The report details different structures of service delivery, categorizing them into 3 groups:

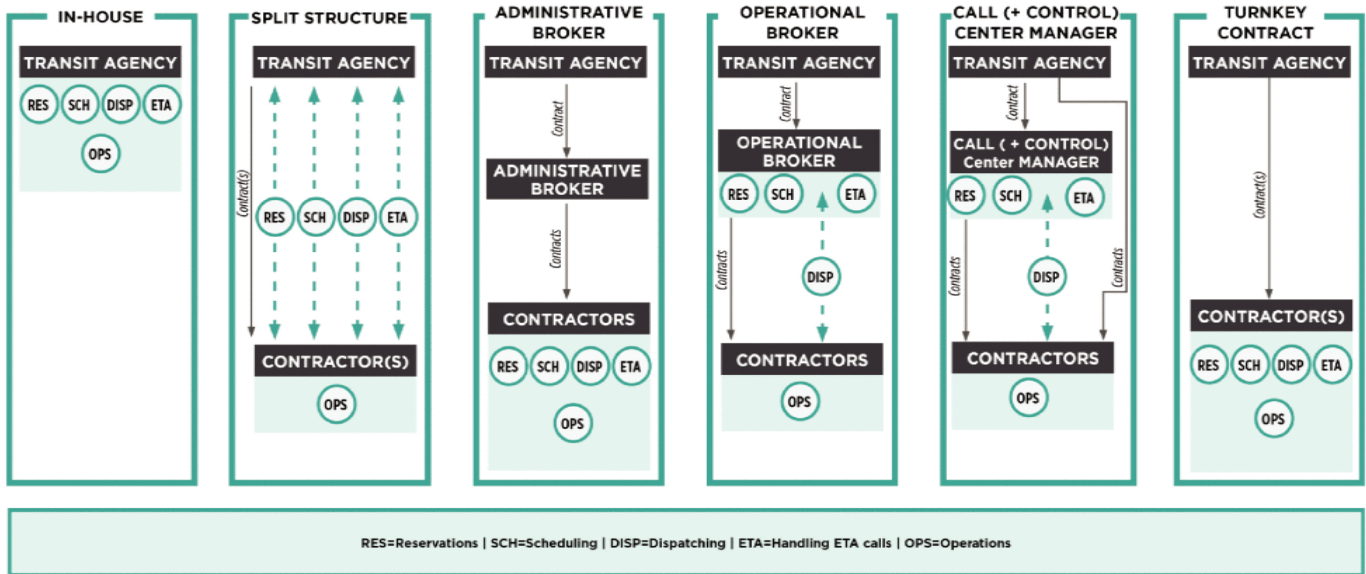
1. Systems in which all or some of the primary functions were directly performed by transit agencies.

2. Systems that utilized brokers or call and control center managers.
3. Systems in which service provider contractors were also involved in some or all of the primary call and control center functions.

The report identified a total of 25 different service models that fell into these three groups out of the 29 agencies studied, confirming that most transit agencies had similar, but slightly different nuances that were notable enough to identify. The service models were differentiated based on three primary elements:

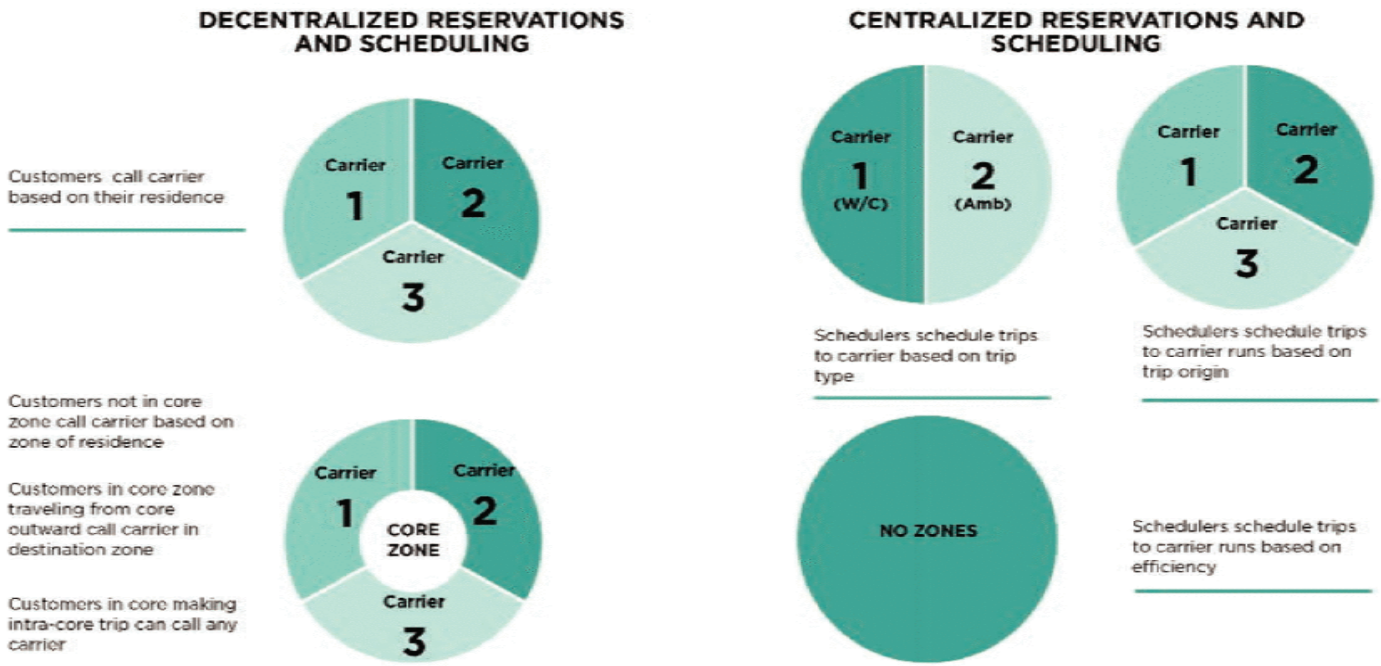
- **Management Structure:** The major division of responsibilities relative to the four primary call center functions of reservations, scheduling, dispatching and handling trip status or estimated time of arrival (ETA) calls, and service operation. These functions can be performed by the transit agency itself, a broker or call and control center manager, and/or one or more contractors. The responsibility for providing supporting assets such as the call center or operations facilities, vehicles, the in-vehicle communication equipment, the paratransit scheduling software, the radio system, and the telephone system can also be included under management structure. These management structures are illustrated in **Figure 5-1**.
- **Division of Work Among Multiple Carriers:** In the cases where multiple dedicated fleets are used to deliver service, regardless of whether the vehicles are operated by the transit agency and/or one or more contractors, this element generally focuses on whether a service area is organized into zones, with carriers assigned to one or more zones, or the service area is unzoned, with carriers assigned “packages” of work. This multi-carrier division is illustrated in **Figure 5-2**.
- **Service Mix:** The third component of service models is NDSPs such as taxis and livery operators, which are used as a resource for serving ADA paratransit trips. The service mix is the split between dedicated and non-dedicated service providers. (Note: The use of NDSPs to provide ADA paratransit trips is not to be confused with the use of taxis, transportation network companies, and other non-dedicated resources to provide an alternative service for ADA paratransit customers via transit-sponsored subsidies.)

Figure 5-1. Common Paratransit Management Structures



Source: Nelson\Nygaard Consulting Associates

Figure 5-2. Division of Work Among Multiple Carriers



Source: Nelson\Nygaard Consulting Associates

In considering changes to its service delivery model, MTS and NCTD may take the case studies reviewed in this report into account, as well as the benefits and challenges of each of the three groups of models as described in the TCRP report:

- **Group 1:** Transit agencies performing all or some of the primary functions
 - » **Benefits:** Control over service quality, control over service productivity/cost.
 - » **Challenges:** The use of contractors for service delivery may have a negative effect on service quality due to the variable of contract compliance.
- **Group 2:** Contracting with Call and Control Center Managers
 - » **Benefits:** Cost efficiency by fostering competition among multiple carriers, centralized scheduling and dispatching provides more direct control over the balance between service quality and productivity, lowered administration costs using a broker.
 - » **Challenges:** Potential conflicts between broker and service providers as a result of centralized scheduling and dispatching.
- **Group 3:** Use of Turnkey Contractors that Perform All or Some Call and Control Center Functions
 - » **Benefits:** Cost efficiency by fostering competition among multiple carriers, more control over cost and service quality, flexibility to adjust service, greater resiliency.
 - » **Challenges:** Duplication of costs, more difficult role of monitoring and ensuring consistency, potential for inconsistent service quality if not closely monitored.

5.1.1. ADDRESSING IDENTIFIED GAPS

Table 5-1 matches the identified gaps or needs as discussed in Section 2 to potential solutions.

Table 5-1. Identified Needs/Gaps and Potential Solutions

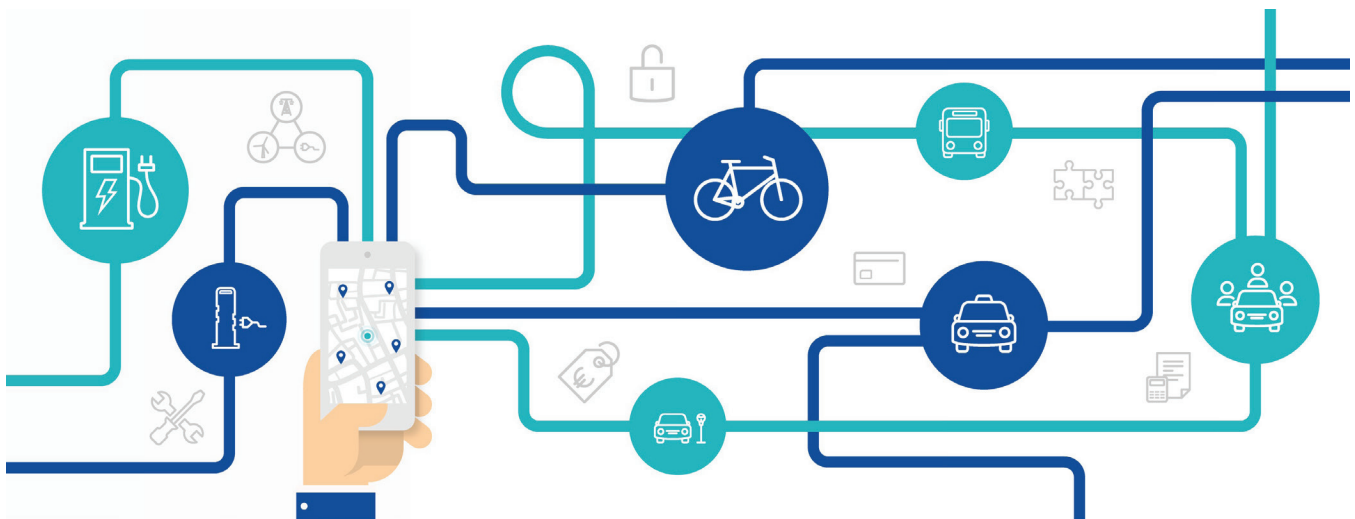
IDENTIFIED NEED/GAP	POTENTIAL SOLUTION
Access to Destinations: passengers need to access amenities at various locations throughout the region, which often requires traveling across or outside of service area boundaries.	Enhanced coordination of current business practices of MTS Access and NCTD LIFT services. Use of supplemental services to accommodate trip requests where trip densities cannot be effectively served by core specialized services.
Reliable Service: passengers often depend on transportation service operating on schedule, such as when traveling to work or to medical appointments.	Review of current business process including scheduling (route optimization) and service monitoring.
Flexible Service: some trips need to be made spontaneously and outside of typical operating hours.	Use of supplemental (taxi/TNCs) services including e-hailing.
Efficient Connections between Transportation Services: passengers need to be able to access specialized transportation services efficiently and safely when transferring from other modes (e.g. bus or trolley).	This requires the presence of sufficient wayfinding at stations and accessible paths of pedestrian travel between services.
Affordable Transportation: passengers need to travel at a cost that is affordable to them.	<ol style="list-style-type: none"> 1. Through the CTSA, coordination with volunteer driver programs. 2. Subsidized transportation: user-side subsidy program building on Flexible Services (identified need/gap) with the use of supplemental services including e-hailing.
Effective Communication: passengers need to be made aware of changes in pick-up and/or drop-off times when planning a trip, and in real-time when necessary. Passengers may also need to communicate in a language other than English.	Enhanced branding, marketing and communication strategies, information dissemination and the leveraging of pertinent technologies including real-time customer information and the broadcasting of trip pick-up times.
Knowledge of Transportation Services: Inexperienced passengers need to know how to use public transportation, which can include: purchasing a ticket, boarding and de-boarding, and transferring between two or more services.	Enhanced information dissemination, travel/mobility training.

5.1.2. GOVERNANCE/BUSINESS MODELS

Informed by industry best practices and recognizing that emerging business models have been integrated by other transit agencies which are applicable to the delivery of specialized transit services in San Diego County, the following business models reflect opportunities to address administrative and customer enhancements. Taking a more holistic view of the delivery of transit/mobility services for older adults and people with a disability, consideration of a hierarchy of strategies reflecting:

- Mobility on Demand – high-level governance
- Family of Services – range of service delivery scenarios
- Consolidated Transportation Services Agency (CTSA) – regional coordination

Mobility on Demand (MoD): Mobility on Demand (MoD) has the ability to expand customer travel opportunities by increasing spontaneity and availability of transit. This trend has emerged in response to a growing, aging, and urbanizing population whose travel trends emphasize the need for more diverse transit market. This service model may be facilitated by private companies including, Uber, Lyft, taxis, and private micro transit companies. These private entities may be utilized in optimizing first-last mile solutions for fixed line transit, paratransit, and travel within low density zones with limited transportation. In the context of paratransit services, the intention of MoD is to offer same-day service to ADA eligible (specialized transit) customers.



Source: Medium.com by Nigel Zhuwaki

Family of Services: The Family of Services (FoS) approach encourages transit agencies to provide a wide array of transportation options to meet the needs of all community

demographics, including those of older adults and individuals who identify as having a disability. By integrating the FoS approach, door to door service would still be provided. Furthermore, it is also expected that the cost of this service would be significantly reduced by limiting the average passenger vehicle revenue miles for trips.

CTSA: This strategy would build on the success and responsibilities of FACT's (Facilitated Access to Coordinated Transportation) role since 2006 as the designated CTSA for San Diego County. SANDAG could work with FACT to expand their activities in coordinating transportation services in San Diego County to reduce current service gaps.

5.1.3. TECHNOLOGY

This section explores some of the emerging mobility technologies and concepts that are either still in their infancy or yet to be tried in the specialized/paratransit environment, summarized under the following categories:

- Mainstream technologies
- Limited commercial deployment
- Pilot deployment
- Advanced research but no deployments

5.1.3.1. MAINSTREAM DEPLOYMENT

Mainstream deployment refers to the wide deployment of technologies throughout the industry for solutions relevant to customers and agencies. Deployment of these technologies is considered to be very low risk.

5.1.3.2. PERSONAL MOBILITY ENHANCEMENTS

There are several mainstream technologies available through many vendors that can help enhance the mobility experience of specialized transit customers. These technologies include:

- Real-time information on vehicle arrivals and service alerts. Specialized transit customers often have access to real-time information on iPhone and Android devices as well as real-time information on a transit agency's website. Also, trip planner capabilities should incorporate the real-time status of vehicles when displaying travel options to customers.
- Seamless travel across San Diego's modes using a single fare medium by capitalizing on account-based payment systems.
- Self-service portal for demand response/specialized transit trips where customers can register, apply for and track their eligibility and book and manage trips.

- Trip notification via interactive voice response (IVR) system the night before the trip and a configurable number of minutes prior to arrival of a vehicle at pickup location.
- Better adoption of continuous optimization a commercially available scheduling engine to support same day trips and vehicle assignments.

No risks are anticipated in deploying suggested enhancements.

Benefits: Suggested enhancements will have the following benefits as perceived by riders:

- Improved customer experience
- Service reliability
- Seamless mobility

5.1.3.3. ENHANCED E-HAILING/BOOKING

E-hailing or ridesharing apps have been prevalent in recent years and have provided travelers additional travel alternatives. However, these services are not an alternative to agency provided specialized transit. They are most suitable solutions for supplemental service. Most of the e-hailing companies now provide their public API (application programming interface) to be used by third party developers. This could potentially allow paratransit riders to book their specialized transit trips with one click. However, the experience is not as seamless as might be expected, as is the case with most such mobility aggregator apps. They typically provide a trip discovery platform and booking is done by individually going to e-hailing company websites or apps. Often, transit agencies may also partner with a suitable mobility aggregator such as Moovel who provide an integrated trip brokerage platform for booking and payment for multiple services (e.g., TNC, carshare, bikeshare and transit) through a single trip planning app. TriMet is currently implementing such a solution as part of their Mobility-on-Demand grant.

E-hailing solutions by now have been integrated with transit agencies under various models (e.g., fully or partially subsidized by agency or paid by customer) and pose limited risks.



Benefits: Suggested enhancements will have the following benefits as perceived by riders:

- Enhanced trip booking and payments experience;
- Seamless door-to-door mobility;
- Increased personal mobility alternatives and first/last mile connectivity; and
- Cost-savings to agency by reduction in the number of expensive demand response/ specialized transit trips.

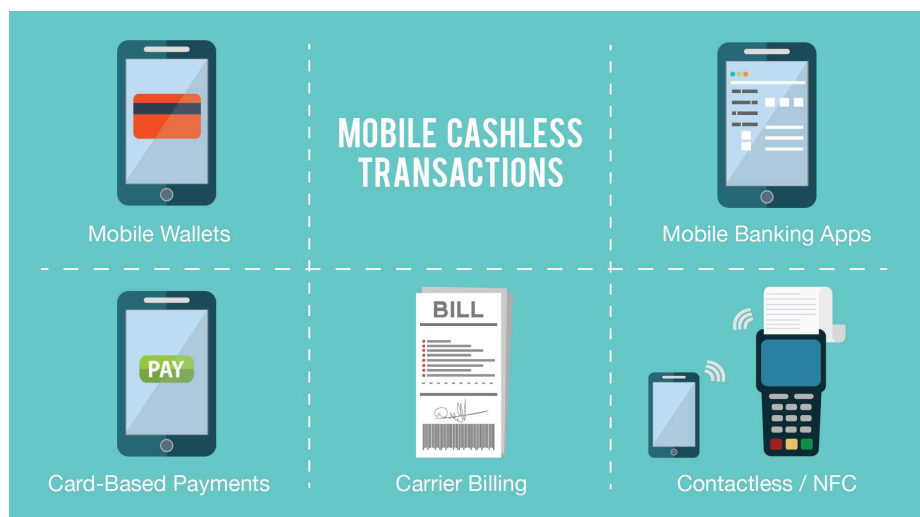
5.1.3.4. LIMITED COMMERCIAL DEPLOYMENT

Limited commercial deployment refers to the deployment of either experimental technologies or solutions. These experimental technologies or solutions have not yet matured or have not yet received wide acceptance for mainstream use by customers and/or agencies.

Cashless Payments

Cashless payment enables customers to have the ability to pay for trips electronically, which in turn requires customers to have access to banking. Historically, unbanked and underbanked populations have not allowed agencies to adopt cashless payment strategies, as cash-based fare collection continues to be around 10-30% at most agencies. For example, even after many years of their rollout of the Ventra open payment system, Chicago Transit Authority's cash payment ratio exists at 8%. Cash payments at suburban agency Pace are even higher at 20%. Need

for cash payments require agencies to install fareboxes, which are expensive to maintain, factoring the daily cash collection, accounting and reconciliation processes.



Source: www.GlobalLogic.com

Considering a best-case scenario for banked customers, a cashless plan requires a series of strategies to reduce the amount of cash usage by targeting specific rider market segments. Infrequent specialized transit riders and socio-economically challenged riders resort to cash-based payments. Targeted strategies could and should be developed for these market

segments to steer them towards adopting cashless payments.

With the advent of account-based payment, agencies now have more flexibility in steering customers towards electronic media by establishing an extensive retail network so customers have access to locations where they can buy or reload smartcards. For example, MBTA (Boston) is planning to achieve fully cashless payment by 2020. Part of this strategy involves developing a retail reload network such that 98% of its stops have a retail location within a walking distance (typically ¼ mile).

Specialized transit systems have greater opportunities in adopting cashless payments since those customers have registered accounts and could potentially be provided electronic fare media which is tied to their accounts. Also, customers could pre-pay for some of the trips online when booking via the internet.

To conclude, opportunities and technologies now exist more than ever to adopt cashless payment to a certain degree. There will always remain a segment of the population that will not be able to use electronic media due to lack of a bank account to replenish - unless they use cash to replenish at a retail location. The private sector is also advancing technologies such as PayNearMe where customers can pay using cash at a participating retail location such as CVS or 7/11 for online transactions. PayNearMe has now also partnered with Blackhawk Networks where customers could go to retail locations that are interfaced with Blackhawk Network for prepaid card sale and distribution.

As stated earlier, adopting 100% cashless payment may leave out a significant section of ridership that is unbanked or underbanked and might also raise Title VI compliance concerns.

Enhanced Wayfinding

Wayfinding is one of the key issues in specialized transit, particularly with the senior and disabled population who may not be familiar with the transit service area. There are various reasons, including but not limited to unfamiliarity with routes and stops, poor signage, temporary relocation of stops, stops located within a large transfer center, shared stops with another agency, among many others. In some cases, particularly with riders with a disability, their inability to locate a stop often prompts them to use the more expensive specialized transit (Access or Lift) service option.



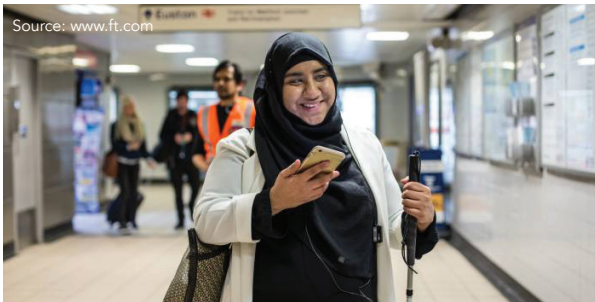
Agencies have conventionally relied on map and text-based signage and tactile guideways

to help riders locate stops and its facilities, but modern technologies based on RFID or Bluetooth Low Energy (BLE) beacons open up greater possibility in helping riders orient towards a bus stop and navigate. Typically, there are the following components involved in beacon-based wayfinding:

- BLE tags that transmit Bluetooth signal and can be installed anywhere, indoors or outdoors. These signals can be preprogrammed to transmit specific information (e.g., stop ID); and
- Riders' smartphone that has an app to detect BLE signal and help navigate the rider through built-in accessibility features of the phone. This could be visual, audio or haptic (e.g., vibration) feedback.



Some agencies and vendors use additional features in improving the navigation aid. These include defining a geo-fence around a stop so the app on a rider's device knows when to start the navigation. Also, BlindWays, the app developed and deployed by Perkins Institute for the Blind and Raizlabs in partnership with MBTA has a crowdsourcing feature that allows regular riders to volunteer in the program and mark obstructions or physical objects (e.g., tree, fire hydrants, potholes, broken sidewalks) on the map which help the app to use that information and provide proper guidance to visually impaired riders. PathVu is also a crowdsourcing-based application that allows riders who use a mobility device (scooters or wheelchairs) to navigate safely to their location.



There are apps meant to address specific types of disabilities as well. For example, WayFinder 3 by AbleLink, also featured by USDOT's Accessible Transportation Technology Research Initiative (ATTRI) program, allows riders with cognitive disabilities to orient and navigate themselves while traveling.

For general public riders, vendors are starting to launch apps that use augmented reality for better wayfinding. These apps use the smartphone camera to display real-time information to the stop location at which the camera is pointing. Such tools can be very useful to infrequent users of transit.

While there have been several deployments of BLE-based beacons, they are still not mainstream yet, particularly in a transit environment. Key issues with this approach are that of training customers with a disability and that most solutions require the use of a smartphone.

Also, it is important to make sure the navigation map being used for directions has an updated database of not just locations but also any physical obstructions. Maintenance of beacons is also a concern. Beacons operate on battery power and there will need to be a way for an agency to know the battery level to ensure beacons can be serviced when running out of power.

Benefits: The biggest beneficiaries of wayfinding solution will be riders with disabilities. However better wayfinding solutions will also assist general public riders and could prompt more riders to take fixed route transit service.

5.1.3.5. PILOT DEPLOYMENTS

Pilot deployments are concepts or technologies that have not yet been widely deployed and therefore, are still in their infancy. Furthermore, these deployments are typically funded by USDOT grants or under public/private partnerships.

Connected and Autonomous Vehicles

Connected Autonomous Vehicles (CAVs) are being considered as a shuttle service to connect areas with low transit availability to urban centers. Furthermore, a CAV shuttle proposes an interesting solution to the ongoing challenges created in response to a growing demand for paratransit services. While most agencies are still running pilot programs for field testing in a controlled environment, the Jacksonville Transit Authority (JTA) has initiated an experimental Urban Circulator project.

This project was launched in December 2017, and is in collaboration with NACYA AV. The JTA intends to use this experimental project to support its goals of creating an autonomous transportation network. By implementing technologies that are accessible on the street level, the JTA plans to vastly increase their service area in a cost-effective manner. As automated vehicles (AVs) are known to make more precise traffic decisions, they are expected to provide a safer experience for riders, and therefore, could be considered for implementation into paratransit service. Implementation of connected and autonomous vehicles would allow paratransit riders to have more frequent service and flexibility in reaching their destinations.

Enhanced Safety Solutions

Pedestrian safety is an important factor in planning mobility solutions for older adults and people with a disability. Connected vehicle technology can assist with ensuring safety to a great extent through collision avoidance and warning systems. There are the following types of technologies in testing/pilot stages:

- **V2X Safety Solution:** Vehicle to vehicle (V2V), vehicle to infrastructure (V2I), vehicle to pedestrian (V2P) and similar technologies where vehicles and roadside equipment

communicate over secure, dedicated short range communication (DSRC) to alert pedestrians or bikers at intersections and other vehicles equipped with V2V sensors; and

- **Vision Sensor- and Range Sensor-Based Collision Avoidance:** Technology used in autonomous vehicles could also be installed in regular (transit) vehicles for object detection and collision warning/avoidance. This technology includes vision and/or range sensors on vehicles that interact with an on-board vehicle computer to process data and detect objects. Drivers or pedestrians are warned about potential collisions. In some cases, breaks could be applied automatically to avoid an accident.

V2X technology is still being developed and not available in commercial space. USDOT pilot demonstrations have used after-market kits from Savari Networks and others for providing V2X functionality. However, given DSRC has been widely adopted as the standard in the industry, several car manufacturers are starting to include DSRC connectivity functionality in their vehicles. There is no expected timeline on any transit vehicles or transit system vendors incorporating such connectivity in their solutions.

Vision and range sensor-based technology is more widely available from Mobile Eye (now part of Intel). These units are expensive though and cost \$5,000-\$7,500 per vehicle and hence restricting agencies from widely deploying these units.

Benefits: Safety is critical to transit industry, particularly given Vision Zero initiatives. While safety technologies mentioned in this section are not mainstream, yet they are expected to be widely deployed in coming years. Presence of such technologies, particularly on autonomous vehicles will give riders extra confidence when riding the vehicles.

Like any technology deployment, equipment installed on vehicles or at roadside infrastructure will require maintenance to ensure failsafe operation. This may have staffing impacts on the organization.

5.1.4. FUNDING

SANDAG currently takes advantage of many federal, state, and local funding sources for paratransit capital and operations that are outlined in the Coordinated Plan. The SANDAG Specialized Transportation Grant Program (STGP) funds projects and programs that expand mobility options for seniors and individuals with disabilities. Funding for the STGP comes from two sources, the Federal Transit Administration (FTA) Section 5310 program and the TransNet Senior Mini-Grant program.

Looking towards additional funding opportunities, the peer review panel noted there are over 80 federal programs numerous funding sources available for paratransit programs, including Medicare and Medi-Cal. As SANDAG and its partner agencies decide on a roadmap forward

based on the Analysis/Evaluation and Phasing Strategy discussion in Section 5, a robust analysis of these federal resources to assess those that best align with next step actions. As grant proposals are being developed, the experience of peer agencies represents a good resource SANDAG should tap.

The MTS ballot measure proposed for 2020, and any future funding program(s) for implementation of SANDAG Five Big Moves also present opportunities for increased funding devoted to paratransit. Gaining regional consensus for a *Specialized Transportation Strategic Plan* phasing strategy will allow it to be incorporated into any funding programs.

Transportation Development Act (TDA) Funds: The use of supplemental service options may involve partnerships between MTS and/or NCTD and local taxi and TNC providers. A growing number of transit operators are implementing this Personal Mobility on Demand (PMoD) model to provide service to areas (or times of day) where it is not cost-effective to operate regular specialized transit. While there are no documented cases that TDA was being utilized toward TNC service, Caltrans has not heard of any issues regarding the use of TDA to fund TNC supplemental services. Therefore, it would be permissible for San Diego County's transit agencies to use TDA to support supplemental on-demand services as it would be treated similarly to contracting service out to known transit industry contractors such as MV Transportation, First Transit, Transdev and other companies. Such initiatives tend to be pilot programs and would have likely received special limited time grant funding specific to fare reduction or subsidy.

Potentially TDA could be a source although these new programs would be competing against existing services for the TDA. As shown in **Table 5-2**, several public transit agencies in California partner or have partnered with TNCs.

Table 5-2. Partnerships Between TNCs and Southern California Agencies

TRANSIT AGENCY/PUBLIC AGENCY	TNC/SERVICE PROVIDER
San Diego Metropolitan Transit System	Uber
City of Los Angeles Department of Transportation	Xerox State & Local Solutions/Lyft
Livermore Amador Valley Transit Authority	Uber/Lyft/Local Taxi Services
Solano Transportation Authority	Lyft
Transportation Authority of Marin	Lyft
Sacramento Regional Transit District	Uber/Lyft
City of Monrovia	Lyft
Orange County Transportation Authority/City of San Clemente	Lyft

5.1.5. COORDINATION WITH PLANS AND POLICIES

The *Specialized Transportation Strategic Plan* will inform the strategic direction of the bi-annual updates of SANDAG's *Coordinated Plan*. Further, the *Coordinated Plan* is subsequently reflected in the *San Diego Forward: The Regional Plan* (updated every four years). Paratransit will undoubtedly play an important role in both of these efforts given the significant increases in senior and disabled populations expected over the coming years.

With the development of SANDAG's Five Big Moves concept, there is an opportunity to incorporate paratransit firmly into the discussion on how to improve transit. SANDAG should take the findings of this report and clearly outline a long-term strategy that includes near-term, mid-term, and long-term phasing plans to ensure the needs of paratransit are woven into the overall transportation plan. Not only is additional funding for paratransit important, but focus should be placed on taking the programs and ideas from new technologies and the experience of peer agencies to making improvements in effectiveness and efficiency from both the customer and agency perspectives. As experience is gained from new programs and services, along with evolving technologies, the long-term paratransit policy can be updated in the *Coordinated Plan*.

5.1.6. PRIVATE-PUBLIC PARTNERSHIP OPPORTUNITIES

Transit agencies are partnering with private companies to both improve service and sometimes expand the service area geographically. Private companies can complement agency services by extending service into lower-density areas, offering first-mile/last-mile solutions, and serving as an alternative to private vehicles. Potential private partners include TNCs (e.g., Uber, Lyft), taxis, and private microtransit (i.e., private shuttles). With public private partnerships, both MTS and NCTD may further transition increasingly towards the role of "mobility manager." For example, where the Family of Service (FoS) approach may encourage connectedness across a transit agencies' services, public private partnerships can extend this integration across a broader range of the entire transportation network.

5.2 ANALYSIS/EVALUATION

A broad range of strategies (Alternate Business Models, Specialized – Supplemental Service Delivery, Specialized Transit Operations, and Mobility Technologies) and a subsequent recommended approach for going forward, were considered within a framework of Guiding Principles, Objectives, and Evaluation Criteria as presented herein.

The Strategies ranked relative to Guiding Principles, Objectives and Evaluation Criteria are presented in **Table 5-3: Strategies Evaluation Matrix**. The ranking is presented on a scale ranging from Positive to Negative as follows:

2 = Positive
1 = Somewhat Positive
0 = Neutral / No Significant Change
-1 = Somewhat Negative
-2 = Negative

Guiding Principles: A preferred approach reflects the following guiding principles:

- Preserve the integrity of the Region’s specialized transit services for those with no alternative
- Maximize benefits from investments made in accessible fixed route transit & provide flexible mobility options
- Compliance with Americans with Disabilities Act (ADA) & Title VI
- Be fiscally responsible and accountable

Objectives:

- Maximize use of existing resources
- Increase efficiencies in service delivery
- Enhance the customer experience
- Leverage use of technology to improve future services

Evaluation Criteria: In consideration of the above guiding principles and objectives, the following evaluation criteria are proposed for advancing near, mid and long-term strategies:

- **Effectiveness** – population served and number of trips generated;
- **Economy** – total costs, capital vs. operating costs, large capital outlays, and present-valued expenditures over the long-term;
- **Efficiency** – cost per trip, per vehicle-hour, plus costs to customer and funding partners;



- **Level of Service** – reservation constraints, hours of service, frequency of service, and trip purpose;
 - **Quality of Service** – enhanced customer experience – convenience, transfers, travel time, comfort, dignity, and flexibility;
 - **Socio-Economic Factors** – impact on employment access and social well-being;
 - **Civil Rights Implications** – ADA and Title VI compliance; integration;
 - **Organizational Issues** – operational flexibility, control and accountability, human and labor relations, and ease of implementation;
 - **Technical Risk** – if new or modified equipment is required;
 - **Public Policy Risk** – the potential for changes in direction of local or state policies; and
 - **Financial Risk** – if large capital outlays are required.
-

Strategies	Guiding Principles				Implementation Considerations					Evaluation Criteria											Overall Rating		
	Preserve Integrity of Specialized Transit	Maximize Use of Investments	Compliance with ADA / Title VI	Fiscally Responsible and Accountable	Diversify Service Offerings	Synergies with Transit (bus & rail)	Technologies - Enhance Customer Experience	Community Support	Organizational Capacity	Effectiveness - population served & ridership potential	Economy - total cost of service	Efficiency - cost per trip, per veh. Hour	Level of Service	Quality of Service	Socio-economic factors	Civil Rights Implications	Organizational - operational flexibility, control, accountability	Ease of Implementation	Technica Risk	Political Risk		Financial Risk	
Alternate Business Models																							
· Mobility on Demand (MOD)	2	2	2	2	2	2	2	1	1	1	1	2	2	1	1	1	1	1	1	1	1	1	30
· Family of Services (FoS)	2	2	2	2	2	2	1	1	1	1	1	2	2	1	1	1	1	1	1	1	1	1	29
· Public Private Partnerships (P3)	2	2	2	2	1	1	1	1	1	1	1	2	2	1	1	1	1	1	1	1	1	1	27
· Mobility as a Service (MaaS)	2	2	2	2	2	2	1	1	1	1	1	2	2	1	1	1	1	1	1	1	1	1	29
· Consolidated Transportation Services Agency (CTSA)	2	2	2	2	1	1	1	1	1	1	1	2	2	1	1	1	1	2	1	1	1	1	28
Specialized – Supplemental Service Delivery																							
Taxi (sedan & accessible) / TNCs / Microtransit	-1	-2	-1	2	2	0	2	1	1	2	2	2	2	1	2	1	2	2	1	1	2	2	24
On-demand rideshare / e-Hailing	-1	-2	-1	2	2	0	2	1	1	2	2	2	2	1	2	1	2	2	1	1	2	2	24
Specialized Transit Operations																							
Eligibility & Certification	2	0	2	2	1	0	0	1	1	1	2	1	0	0	1	1	2	2	2	-1	2	2	22
Reservations, Scheduling and Trip Management	2	0	2	2	1	0	0	1	1	1	2	1	0	2	2	1	2	2	2	1	1	1	26
Fare Policy	2	0	2	2	1	0	0	1	1	1	2	1	0	1	1	1	2	2	2	1	1	1	24
One Call / One-Click	2	0	2	2	2	0	2	2	0	1	1	1	0	2	1	1	2	2	2	1	1	1	27
Performance Measurement	2	0	2	2	1	0	0	0	1	0	1	1	0	2	2	1	2	2	2	1	1	1	23
Integration - Specialized / Fixed Route	2	2	2	2	2	2	2	1	1	2	2	2	2	2	2	1	2	2	2	1	2	38	
Mobility Technologies																							
Trip discovery (trip planning)	2	2	2	1	2	2	2	2	1	1	2	2	2	2	2	1	2	2	2	1	1	1	36
Trip booking (e-Hailing)	2	0	-1	2	2	0	2	2	1	1	2	2	2	2	2	1	2	2	2	1	2	1	31
Self-serve portal	2	0	-1	2	2	0	2	2	1	1	2	2	0	2	2	1	2	2	2	1	2	1	29
Cashless payments	2	0	-1	2	2	2	2	2	1	1	2	2	0	2	2	1	2	2	2	1	0	1	29
Service delivery - supplemental & on-demand rideshare	2	0	-1	2	2	1	2	2	1	1	2	2	2	2	2	1	2	2	2	1	2	1	32
Vehicles (ZEVs & CAVs)	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	1	2	2	1	0	0	8
Customer information (wearable technologies)	0	0	0	0	1	0	1	1	1	1	1	1	2	2	1	1	1	1	2	1	0	0	18
Wayfinding / Beacon Technologies	0	0	0	0	2	1	1	1	1	1	1	1	2	2	1	1	1	1	2	1	0	0	20
Enhanced safety solutions (V2X)	0	0	0	0	2	1	1	1	1	1	1	1	2	2	1	1	1	1	2	1	0	0	20
Transactional data standards	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	1	2	1	0	0	6
Blockchain-based trip booking & payment	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	1	2	1	0	0	6

Table 5-3: Strategies Evaluation Matrix

Legend

- 2 Positive
- 1 Somewhat Positive
- 0 Neutral/No Significant Change
- 1 Somewhat Negative
- 2 Negative

5.2.1. SUMMARY AND CONCLUSIONS

As the mobility landscape continues to evolve, connected travelers, continued advancements in transportation technologies, and private sector involvement present unprecedented opportunities for public transportation improvements in general and the delivery of paratransit, specifically. In recent years, concepts such as microtransit and mobility-on-demand have helped agencies provide a range of mobility options for the senior and disability communities by developing and integrating unconventional modes into their services, engaging the private sector in the form of transportation network companies (TNCs), taxis, and other modes as complementary alternatives to traditional paratransit delivery schemes. However, while transit agencies continue to experiment with new business models, suppliers, and technologies to extend service (and mobility options), challenges related to providing cost-effective, efficient, and equitable service to all people remain.

In support of SANDAG's initiative to examine short- and long-term actionable strategies to best meet the mobility needs of seniors and people with a disability, reflect opportunities for enhanced operational efficiencies, cost effectiveness, and customer experience.

Strategies will be driven by consensus of an overall long-term vision, goals and objectives, including but not limited to:

- Growth (and changes) in the transportation disadvantaged population including the need to manage changing demographics;
- Fiscal responsibility;
- Enhancing the customer experience (integrated trip planning, booking, real-time customer information, broadcast trip arrival information, etc.);
- Next-generation mobility including e-hailing/ride-share services;
- Opportunities to leverage technology including mobile payment; and
- Recognition of the dynamic market for 'essential' services from shopping (changing retail landscape) to the delivery of medical/diagnostic services (and virtual experiences).

5.3 PHASING STRATEGY

The following present a phased approach for the deployment of preferred strategies, reflecting near-term (up to 5-years), mid-term (5 to 10 or 15 years) and long-term (15+ years).

5.3.1. POTENTIAL NEAR-TERM STRATEGIES

Near-term strategies that have consensus, are lower cost, are relatively easy to implement,

build off strengths of current operations, and may result in positive changes/near-term “wins” include:

- Amended eligibility and certification processes. This would include NCTD adopting the MTS process of including all applicants to participate in an in-person interview and assessment. Further, both MTS Access and NCTD LIFT to advance the application of conditional (trip by trip) eligibility category to channel some specialized/paratransit travel demand to accessible fixed route (bus and rail) services.
- Operations and service delivery reflecting multiple tiers of service including the use of supplemental taxi/TNC services.
- Deployment of proven technologies to enhance the customer experience reflecting App based or through a web portal – trip booking, confirmations, cancellations, tracking pick-up times, mobile payment, etc.
- Demand management measures including accessibility enhancements to fixed route bus and rail services.
- Enhanced coordination between the current specialized transit services (MTS Access and NCTD LIFT and FACT/CTSA regarding information dissemination, travel/mobility training, brokering of trips, etc.).

5.3.2. POTENTIAL MID-TERM STRATEGIES

Mid-term actions based on promising new technologies/service delivery options that require longer lead time, involve higher costs to implement, and/or a desire to see lessons learned from other systems, may require further study/assessment. Further, mid-term strategies may require seeking federal and/or state funding opportunities for pilot programs.

Mid-term strategies include:

- Advancing alternate governance scenario that may include an evolving Mobility on Demand (MoD) strategy.
- Next-level application of (emerging) technologies such as trip discovery/planning integrated complementary MoD elements including accessible fixed-route (bus and rail) services.
- Alternate fuel vehicles/ZEVs – electrification of fleets.
- Monitor the progression of wearable technologies, advanced wayfinding, Bluetooth Low Energy (BLE) beacons, enhanced safety solutions (V2X – vehicle to vehicle, vehicle to infrastructure, vehicle to pedestrian).

5.3.3. POTENTIAL LONG-TERM STRATEGIES

Long-term actions based on promising new technologies and service delivery options that are just beginning to be test in the marketplace typically have higher costs and risks, and/or require considerable complexity to implement. Near-term actions may just be to monitor progress to better assess a potential implementation timeframe. Long-term strategies include:

- Determine the role of autonomous vehicles.
 - Monitor the evolution of the design of mobility devices.
 - Monitor the progress of virtual medicine.
-

6 NEXT STEPS

The *Specialized Transportation Strategic Plan* is a “living document” that is meant to be updated over time as conditions change, lessons learned from early deployments, and the on-going monitoring of the experience with next-generation service delivery and technology deployments throughout the country.

An immediate next step is to share the *Specialized Transportation Strategic Plan* outcomes with the community as a companion effort to SANDAG’s *Coordinated Plan* outreach efforts.

7 APPENDIX – LITERATURE SEARCH FINDINGS

The following section presents a synthesis of several relevant documents on specialized transportation that are germane to the development of SANDAG's *Specialized Transportation Strategic Plan*. For each document, a summary is provided, and an explanation is provided on the relevance to the development of the SANDAG Plan.

7.1 INTEGRATING AMERICANS WITH DISABILITIES ACT PARATRANSIT SERVICES AND HEALTH AND HUMAN SERVICES TRANSPORTATION

Source: *Transit Cooperative Research Program. Research Results Digest. April 1997 – Number 10.*

Summary: This report explains how public transit operators can coordinate ADA paratransit and transportation programs supported by the Department of Health and Human Services (HHS) in order to reduce the cost of providing such services. The report gathers information on successful programs and recommends how more programs can achieve a higher degree of effectiveness. The report concludes that further research is needed at all levels (local, regional, and statewide) to:

- Develop and publish ADA/HHS coordination best-practice model programs demonstrating costs savings and service improvements.
- Examine different levels of paratransit service to determine the distinctions between ADA paratransit service and medical transportation.
- Develop a methodology for human service providers to measure their true transportation costs.
- Develop informational material to help agency staff understand the impact and implications of ADA on paratransit services.
- Identify the statutes, the availability of funding, and a method to determine the cost of a trip to recover the full operating costs.

7.2 FLORIDA STATUTE: TITLE XXX, CHAPTER 427: SPECIAL TRANSPORTATION AND COMMUNICATIONS SERVICE, CURRENT

By statute, the primary legislative purpose for the Commission for the Transportation Disadvantaged is as follows:

The purpose of the commission is to accomplish the coordination of transportation services provided to the transportation disadvantaged. The goal of this coordination shall be to assure the cost-effective provision of transportation by qualified community transportation coordinators. Therefore, the Commission has two essential functions: to provide cost-effective transportation services to a class of transportation-disadvantaged citizens and, second, to deliver those services in each locality of the state through locally acting, qualified community transportation coordinators.

(427.0155) Community Transportation Coordinators; Powers and Duties: Community transportation coordinators shall have the following powers and duties:

- (1) Execute uniform contracts for service using a standard contract, which includes performance standards for operators.
- (2) Collect annual operating data for submittal to the commission.
- (3) Review all transportation operator contracts annually.
- (4) Approve and coordinate the utilization of school bus and public transportation services in accordance with the transportation disadvantaged service plan.
- (5) In cooperation with a functioning coordinating board, review all applications for local government, federal, and state transportation disadvantaged funds, and develop cost-effective coordination strategies.
- (6) In cooperation with, and approved by, the coordinating board, develop, negotiate, implement, and monitor a memorandum of agreement including a service plan, for submittal to the commission.
- (7) In cooperation with the coordinating board and pursuant to criteria developed by the Commission for the Transportation Disadvantaged, establish priorities regarding the recipients of non-sponsored transportation disadvantaged services that are purchased with Transportation Disadvantaged Trust Fund moneys.
- (8) Have full responsibility for the delivery of transportation services for the transportation disadvantaged as outlined in s. 427.015(2).
- (9) Work cooperatively with regional workforce boards established in chapter 445 to provide assistance in the development of innovative transportation services for participants in the welfare transition program.

7.3 ECONOMIC BENEFITS OF COORDINATING HUMAN SERVICE TRANSPORTATION AND TRANSIT SERVICES

Source: Executive Summary of TCRP Report 91 – Economic Benefits of Coordinating Human

Service Transportation and Transit Services, Transportation Research Board, Washington, D.C. 2004

This report describes “basic coordination concepts, typical economic benefits of coordination, strategies that enable transportation operators to achieve significant economic benefits from coordinating their operations, and potential overall industry impacts” through the integration of paratransit services.

Coordination: Providing for shared authority, responsibility, management, and funding are seen as the key elements to coordination. Significant savings can result from the coordination of such functions as:

- Service planning
- Purchasing
- Vehicle operations
- Maintenance activities
- Marketing

Envisioning coordination as a “political process” is important to success and recognizing that efforts to establish coordination may require an initial investment of time and energy spent discussing and negotiating collaborative agreements. Bringing together multiple organizations and levels of government is often necessary, and a willingness to be open-minded toward change is critical.

Economic and Non-Economic Benefits of Coordination: Economic benefits ascribed to coordination of transportation services include:

- Additional opportunities for funding
- Increased efficiency: reduced costs per vehicle hour or per mile
- Increased productivity: more trips per month or passengers per vehicle hour
- Enhanced mobility: increased access to jobs or health care, or trips provided to passengers at a lower cost per trip; and
- Additional economic benefits: increased levels of economic development in the community or employment benefits for those persons associated with the transportation service.

Other, non-economic benefits that may result from coordination of services can include:

- Improving service quality (on-time services, better trained drivers, better vehicles, and more safety equipment)
- Increasing the number of people and groups served
- Expanding service areas
- Centralization of management and oversight activities
- More accurate reporting of costs and outputs

Strategies for Achieving the Benefits of Coordination: Analysis of existing conditions is seen as a primary tool for achieving benefits through coordination of service. Is the service experiencing low vehicle utilization or do high trip costs exist? These are just some of the results that can be revealed. Once issues have been identified, it is important to establish specific goals and strategies to address identified issues.

To increase revenues and improve utilization, it is suggested that opportunities to provide additional service under contract to Medicaid or other “human service agencies” be explored, or to augment school district bus services. Such joint service programs could be beneficial for both transit service providers and the clients of these programs. Two major programs of this nature include implementations by Miami-Dade Transit, and Portland, Oregon’s Tri-Met.

Another strategy would be consideration of an area-wide coordinated dispatching system, and vehicle sharing arrangements. As noted in the report, dispatching vehicles from a centralized point would address:

- Overlapping routes
- Duplication of service
- Inefficient route design
- Poorly timed schedules

Coordinated dispatching can result in lower per trip costs, increased productivity per vehicle, and improved community service. Reduced per trip costs and increased productivity mean that more services can be provided with the existing level of funding.

Ultimately, the aggregate potential benefits of coordination will depend on a number of factors. Total savings would be determined after an assessment of changes in the existing system to be undertaken as part of the coordinated provision of services.

Conclusions:

- Strategies that coordinate shifting paratransit services to fixed route services, and having ADA paratransit services provided by non-transit agencies.
- Partnership arrangements that expand transportation services into areas not now receiving public transit services.
- Coordination of the transportation functions of multiple human service agencies.
- Generation of additional income for transit authorities through the provision of travel services to clients of human service agencies.

7.4 INNOVATIVE STATE AND LOCAL PLANNING FOR COORDINATED TRANSPORTATION

Source: United States Department of Transportation, Federal Transit Administration, 2002.

Congress has directed the Secretaries of the Departments of Transportation (DOT) and Health and Human Services (DHHS) Coordinating Council, to work together to develop guidelines for state and local planning agencies to achieve transportation coordination objectives.” These include but are not limited to:

- Joint identification of client transportation needs;
- Identification of the appropriate mix of services to meet these needs;
- The expanded use of public transportation to deliver human service transportation; and
- Cost-sharing arrangements for program clients transported by paratransit systems.

In support of this process, the U.S. DOT’s Volpe National Transportation Systems Center (Volpe Center), working with the Federal Transit Administration’s (FTA) Office of Planning, undertook this study of “Innovative State and Local Planning for Coordinated Transportation.”

The study examines seven specific planning strategies that can be used as part of a flexible regional planning process for coordinating transportation services of health and human service and transit agencies. The DOT/DHHS Coordinating Council on Access and Mobility has also authored “Planning Guidelines for Coordinated State and Local Specialized Transportation Services,” which complements this report and is cross-referenced.

This report focuses on 15 case studies of transportation coordination. On a statewide level, in urban areas, and in rural communities, various organizations come together through many different forums to take advantage of the benefits of greater coordination of local

transportation services. As the case studies presented illustrate, coordination can occur through many different forums including:

- Statewide task forces and coordinating councils
- Local health and human service agencies
- Local advisory boards
- A grass roots coalition
- MPOs
- Transit agencies
- Local brokers

Through these forums, coordinated transportation planning is occurring to improve access to transportation through inter-agency coordination resulting in more efficient uses of available resources, cost savings, and expanded services.

In each of the case studies, coordination has resulted from a combination of the seven planning strategies examined in this report. Because these strategies are interdependent and often blended together, in many cases it is difficult to single out specific strategies.

7.5 TRANSPORTATION DISADVANTAGED POPULATIONS: SOME COORDINATION EFFORTS AMONG PROGRAMS PROVIDING TRANSPORTATION SERVICES, BUT OBSTACLES PERSIST

Source: United States General Accounting Office (GAO) Report to Congressional Requesters. GAO-03-697; 2003. (Washington, D.C.).

The **General Accounting Office** is the audit, evaluation, and investigative arm of Congress. GAO exists to support the Congress in meeting its Constitutional responsibilities and to help improve the performance and ensure the accountability of the federal government for the American people. GAO examines the use of public funds, evaluates federal programs and activities, and provides analyses, options, recommendations, and other assistance to help the Congress make effective oversight, policy, and funding decisions. In this context, GAO works to continuously improve the economy, efficiency, and effectiveness of the federal government through financial audits, program reviews and evaluations, analyses, legal opinions, investigations, and other services. GAO's activities are designed to ensure the executive branch's accountability to the Congress under the Constitution and the government's accountability to the American people. GAO is dedicated to good government through its commitment to the core values of accountability, integrity, and reliability.

This study was completed by the GAO to access federal programs that exist to serve the “transportation disadvantaged.” Specifically, this GAO study:

1. Identifies the federal programs that fund such services and the expenditures
2. Assesses the extent of coordination among the various programs, and
3. Identifies obstacles to coordination and potential ways to overcome such obstacles.

Background: Throughout the United States, many senior, disabled, and low-income individuals face significant challenges in transportation mobility and access.

A recent survey and analysis of consumers age 50+ (AARP survey) concluded that 16 percent of respondents over age 75 reported not having a driver’s license, and 25 percent of the respondents had not driven at least once in the last month according to the survey. Older adults are also more likely to have difficulty accessing traditional public transportation due to physical ailments.

Thirty percent of respondents with disabilities reported difficulty in accessing transportation, compared to 10 percent of respondents without a disability.

Low-income households are less likely to own a car than other households due to the prohibitive cost of purchasing, insuring, and maintaining a car, and public transportation may not provide sufficient options for their needs. Over 90 percent of public assistance recipients do not own a car.

Study Conclusions – Identified Federal Programs: Overall, the title of this GAO report states its general conclusion, that “some coordination efforts [exist] among programs, but obstacles persist.”

The GAO identified 62 federal programs that fund transportation services to populations that are transportation-disadvantaged, most of which are administered by four federal agencies – the Departments of Health and Human Services ([HHS] 23), Labor ([DOL] 15), Education ([DOE] 8), and Transportation ([DOT] 6). The remaining 10 programs are in the Departments of Housing and Urban Development (HUD), Veterans Affairs, Agriculture, and the Interior.

Many of the 62 programs are significantly involved in providing transportation services to their recipients. Sixteen of them are routinely used to provide transportation and an additional 11 programs spent at least \$4 million for transportation services to transportation-disadvantaged populations. The remaining programs also fund transportation services, but do so minimally, or the extent of transportation services funded is unknown, according to program officials.

Expenditures: The full amount these programs spend on transportation is unknown because transportation is not always tracked separately from other spending. However, available information on 29 of the programs indicate that federal expenditures are at an estimated \$2.4 billion. The amount spent on transportation services by the remaining federal programs is unknown, mainly because the majority of programs do not require recipients of federal funds to report transportation spending information to the federal agency. It is however estimated that the total program obligations for the remaining 33 programs were approximately \$14.8 billion (it is unknown how much of the \$14.8 billion was devoted to providing transportation services).

Approximately half of the 62 programs have matching requirements that require states and localities to contribute between 5 and 50 percent of total costs. Total state and local spending for transportation services, which supplements federal spending for such services, is likely significant, at least in the hundreds of millions. It is difficult to determine the amount of nonfederal contributions to transportation services on the basis of matching requirements because grantees are generally required to match total program spending rather than spending for a particular service, such as transportation. Detailed information is also not available due to the lack of reporting requirements.

Coordination Efforts: Under most of these federal programs, funding recipients typically purchase transportation services from existing sources, including contracting for services with private transportation providers or providing bus tokens, transit passes, taxi vouchers, mileage reimbursement to volunteers or program participants, or some combination of these methods.

Efforts to improve services and achieve cost savings through coordination of transportation activities (sharing resources/information or consolidation of services) among federal agencies vary.

Several of these programs have requirements for grantees to coordinate their services with other agencies providing similar services. For example, Head Start grantees are required to make every reasonable effort to coordinate transportation services they provide with other human service transportation in their community. In addition, some programs have provisions designed to avoid duplication of efforts and encourage the use of existing community resources.

It was shown that in some areas, coordination efforts among providers including those mentioned above, has shown promising benefits including improved customer service, service improvements and lower unit costs. However, examples of overlapping, fragmented, or confusing services resulting was also cited due to lack of coordination.

Federal Level: At the federal level, the DOT, HHS, and DOL have all undertaken some activities to improve coordination among their programs, largely by with the assistance of the *Coordinating Council on Access and Mobility*.

However, DOT and HHS make few references for coordinating services for the transportation-disadvantaged in their strategic and annual plans, and other agencies do not mention such activities at all. Also, several federal agencies that provide services to the transportation-disadvantaged are not involved in coordination efforts at the national level.

State and Local Levels: Efforts to coordinate transportation activities and services at the state and local levels varies widely, more so than at the federal level. Approximately 50 percent of States have a State organization which oversees the coordination of most of the transportation services for the transportation-disadvantaged. In some states however, no such statewide coordination body exists, but even in states without coordination organizations, some of the state and local agencies were engaged in coordination efforts.

Examples of coordination efforts include:

- **Coordinated planning:** this type of effort uses a combination of human service and transportation agencies and providers working together to plan transportation services, i.e. Wisconsin's Area Consortium on Transportation formed to improve the planning and provision of transportation for the disabled and those who are transit dependent. This council consisting of consumers, transit providers, county and city officials, disability organizations, and aging groups has implemented various pilot coordination programs.
- **Brokerage:** In this type of coordination effort, one agency or provider serves as the central point of contact for providing ride and eligibility information for actually arranging transportation services for clients of multiple programs, i.e., officials in several counties in New York wanted to maximize residents' mobility by coordinating transportation services offered by various federal and state programs, but lacked the expertise or start-up costs to do so. Using grant funds from the Departments of Transportation and Health, the counties instituted a coordination demonstration project whereby one agency coordinates service for patrons for all the counties involved.
- **Shared use of vehicles among multiple programs:** In this type of coordination effort, one agency may provide transportation for patrons of multiple programs, or each program may own its own vehicles but allows them to be shared by other programs. In Arizona, vans from one county's vocational rehabilitation center travels to a neighboring county to pick up program clients. Costs are split equally between the participating program authorities.

Effects of a Lack of Coordination: Examples of overlapping services have been found in areas where some populations are eligible to receive transportation services from multiple

programs. This lack of coordination between providers results in duplication and inefficiency. In areas where it is too difficult to mix clients due to complicated fee structures and paperwork requirements imposed by the state, some providers have experienced two vehicles overlapping service on the same route at the same time, one for medical trips and one for paratransit.

Workforce development programs have suffered from a lack of coordination, resulting in high average cost per trip, due to low ridership and diluted ridership (each program utilizes their own separate vans for service).

Other consequences may include fragmented services and confusion in localities without coordinated programs. A lack of coordination results in fragmented services, placing a burden on people who receive transportation through many different programs/jurisdictions, depending on trip purpose, because they must be familiar with multiple systems, rules, and requirements. Fragmentation also occurs when adjoining counties do not coordinate their public transportation routes leaving riders stranded due to unconnected transit systems. In some states, paratransit services do not extend beyond county lines, so people have to schedule two separate trips with usually two different programs to successfully complete their planned trips.

For providers in other states that have contracts to provide transportation services for clients in multiple human service programs, a lack of coordinated efforts has led to the need to purchase separate dispatching and reservation systems for its vehicles to comply with differing reporting and eligibility requirements.

Strategic Planning Efforts: One reason that coordination efforts have not been more effective is because the Council is not a federal executive branch agency, the Coordinating Council is not subject to the requirements of the Government Performance and Results Act (GPRA) of 1993 and, therefore, does not have to follow the act's guidance for producing strategic plans, annual performance plans, and annual reports.

However, there are some best practices in strategic planning that could be applied to the next update of the Council's strategic plan and action plan. For example, the current plan does not have an overall mission statement for the Council or performance measures that clearly relate to its long-term goals and objectives. In addition, there are no explicit links between the stated goals and objectives in the strategic plan and the activities in the action plan.

The Council's dependence on HHS and DOT is also an issue. Because the Council has no funding or full-time staff of its own, it is dependent on support from HHS and DOT. However, neither of these departments considers coordination of services for the transportation-

disadvantaged as a priority in its long-term strategic plan or annual performance plan.

The strategic and annual performance plans of many federal agencies that fund transportation services for the transportation-disadvantage generally do not mention coordination of services, i.e., DOT's and HHS's most recent strategic plan and performance plan do not explicitly mention the Council.

7.6 STATEMENT OF FINDINGS – SENIOR RELATED TRANSPORTATION ISSUES

Source: California Commission on Aging Forum "Planning for an Aging California," 2005.

Coordinated transportation options are required for the many older Californians who do not or cannot use private automobiles. Large numbers of older adults are served by conventional transit and paratransit services required by the Americans with Disabilities Act (ADA). However, there are some useful steps that can be taken in order to provide appropriate services.

Recommendations and findings from this forum included:

1. A continuum of coordinated services
 - a) Helping create mechanisms for increased coordination of transportation services, and connecting seniors with them.
 - b) Assisting community-based transportation services with training, as well as with access to funding, and the encouragement of favorable insurance regulations.
 - c) Including in "mature-driver" education programs information regarding alternative mobility programs.
2. Dealing with the isolation in rural areas which presents challenges to seniors trying to reach essential services
 - a) Encouragement of innovation in services and service delivery through flexibility in farebox recovery requirements, as defined in the Transportation Development Act (TDA).
 - b) Additional guidance and oversight of the TDA's "unmet transit needs process", to ensure fair consideration of proposed transit services.
3. Integrate transportation into delivery of Health and Human Services
 - a) Establishment of a Mobility Task Force, to be comprised of representatives from the Health and Human Services Agency and Caltrans.

b) Creation of mobility managers in each locality, who would be responsible for “connecting clients with appropriate services.”

4. Coordination

While addressed in the recommendations above, it was suggested to convene a “mobility summit” to implement strategies and recommendations from the transportation component of the Statewide Strategic Plan on Aging.

5. Planning and Design of communities with the mobility needs of older people in mind

People can become stranded in their own communities when they experience difficulty in driving, especially in those communities that are difficult to serve by transit and require a car to access basic services. Features that limit the ability to provide transit service include:

- Lack of through streets
- Long distances between residential areas and essential services
- Separation from other built up areas – the ability to walk and to get to and from transit service is limited by lack of sidewalks

Street patterns that create excessive walking distances between homes and potential transit routes and wide streets without adequate provision for pedestrian crossings should be avoided.

Even older adults who do drive can find their mobility limited by the layout of residential and commercial developments if these do not take their needs into consideration. In some cases, communities specifically marketed to attract older people lack provision for transit and walking. In other cases, major residential facilities or services for older adults have been built in hilly areas and on the fringes of built-up areas where transit access and walking are difficult.

Many communities are promoting “smart growth” principles that emphasize pedestrian access and other design features to create more community feeling. However, the features of smart growth developments are not necessarily designed with the needs of older drivers and pedestrians in mind. The California Task Force on Older Adults and Traffic Safety has focused on the concept of “walkable communities” and identified the following features to help create safe walking environments for older pedestrians:

- Mixed-use zoning (combined commercial and residential)
- Fixed lighting installations
- Rest spots and benches on sidewalks

- Well-maintained, obstacle-free sidewalks
- Adequate safe and accessible roadway crossings

6. Funding – Identification and quantification of current state-administered spending on transportation by seniors

Additional information regarding senior's attitudes and issues regarding transit services was provided. Results of research and statistical information included:

- Transit service is lacking or very limited in many suburbs, especially in more recently developed areas, and in rural areas.
- Transit service is often limited in off-peak periods when many seniors prefer to travel.
- Seniors' ability or willingness to use transit may be limited by long travel times, long distances to stops, difficulty boarding vehicles, inconsistent announcement of stops, confusing presentation of information (e.g. rolling destination signs, wrapped buses), fear of crime, lack of shelters and benches, and uncomfortable seats.
- Many seniors find it hard to switch from driving to transit.
- Many trips require transfers between transit operators, and centralization of medical services is increasing the need for multi-operator trips. These multi-operator trips can be confusing to plan and difficult to complete.
- Despite reduced fares on transit, some very low-income seniors have difficulty affording transportation.
- Many seniors cannot travel independently on transit.
- Transit services appropriate to seniors making local intra-community trips are often not available.

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