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Examining the Potential for Uber and Lyft to be Included in Subsidized Mobility Programs Targeted to Seniors, Low Income Adults, and People with Disabilities

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16. Abstract Public agencies have subsidized taxi rides for people who have difficulty driving a car or using the regular transit system – targeting older residents and people with disabilities. There is interest among public agencies to add transportation network companies (TNCs), such as Uber and Lyft, to subsidized ride programs as a travel option due to the widespread availability of TNCs and high-quality service. Key issues include the need for wheelchair accessible vehicles, subsidy needs, and clients who lack or are uncomfortable using a smartphone and credit card. This research included a review of programs nationwide and interviews with program managers and clients to identify best practices. Best practices from agencies included contracting for wheelchair accessible TNC services, offering classes to help clients learn how to use the needed technologies, arranging for prepaid debit cards, creating a centralized billing system, providing a concierge service for those who need extra assistance, and setting subsidies based on need. Other recommended practices include providing high travel needs coverage, developing straightforward pricing structures, and not imposing restrictions on trip distance or trip purposes eligible for subsidy.				13. Type of Report and Period Covered Final Report (September 2018 – May 2020)	
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Table

of

Contents

Table of Contents

- Executive Summary 1**
- Introduction 4**
- Research Approach 6**
- Background 8**
 - Population Trends for Target User Groups..... 8
 - Paratransit Service, Taxis, and TNC Ridematching..... 9
 - Varieties of Taxi Subsidy Programs in the United States 11
- Use of TNCs in Enhanced Mobility Programs..... 15**
- Cases: Five Example Programs..... 17**
 - City of Berkeley – Rides for Seniors and the Disabled.....17
 - Boston – MBTA’s the Rid..... 18
 - New York City – MTA’s Access-A-Ride.....19
 - LIFE ElderCare’s Transportation Programs.....20
 - LAVTA’s Go Dublin! 21
- Findings from Interviews 23**
 - Benefits23
 - Concerns about TNCs..... 24
- Potential Solutions 30**
 - Challenges and Ways to Overcome Them 30
- Conclusion..... 37**
- References..... 38**
- Appendix. Database of Taxi SCRIP Programs 43**

Executive

Summary

Executive Summary

Cities, transit agencies, and social service providers across the U.S. have implemented programs that provide taxi subsidies to fill mobility needs for people who have difficulty driving a car or using the regular transit system — usually targeting older residents and people with disabilities. These taxi programs usually can provide curb to curb or door to door services at a fraction of the cost of paratransit, for which the per-ride fares can be in the \$30-\$60 range. However, as transportation network companies (TNCs) such as Uber and Lyft have entered markets around the country, fewer taxi services are available. Because there are more TNCs, they typically can provide a ride with a shorter wait than for a taxi, at about the same price. In addition, the TNC service model allows the ride to be charged to a pre-established credit or debit account. For these reasons, many agencies are now looking into adding TNCs as an option for their subsidized rides programs.

In this report, we present an assessment of subsidized taxi programs in operation in the U.S. and an analysis of the potential for TNC integration into these programs — or in some cases, the possible replacement of taxis with TNC services. We present background information on target markets for these ride services and the types of services that have been offered, examining the design of some 40 subsidized rides programs. We present five brief case studies of programs that have incorporated TNCs in their services, and report on the findings from nearly 100 interviews with rides program users, providers, sponsors, and caregivers. Based on this work, we summarize expected benefits of including TNC services in rides programs as well as concerns that are raised about their inclusion and ways to overcome those concerns.

There are several key issues facing certain potential groups of users that program designers must confront if they wish to do so, which include:

- Those who need a wheelchair accessible vehicle and/or extra assistance getting into /out of the vehicle, storing mobility aids, etc.
- Those who lack a smartphone or are uncomfortable using smartphone apps
- Those without a bank account or credit card, or who are uncomfortable paying other than in cash
- Those who cannot afford the monthly cost of travel even with the basic subsidy
- Those with high travel needs for, e.g., medical trips, work trips, school trips, day care trips.

In addition, there may be boundary issues if programs are set up city by city and funds must be spent within the jurisdiction's boundaries.

While some programs have simply treated these issues as elements for the traveler to consider in deciding whether to use the program, others have aimed to design program elements that overcome or minimize the problems these issues raise. Possible solutions include:

- Provision of wheelchair accessible vehicles, door through door assistance, and driver training to make sure the ride occurs smoothly
- Lifeline programs to make smartphones available to low income households and to make TNC and taxi rides more affordable to those who need extra financial assistance

- Pre-paid debit cards, low cost money management cards, or a centralized billing system to make paying for a trip easier
- Training classes to help users figure out how to use apps and payment methods
- Concierge services in which an organization provides the connection between the user and the rides provider, handling reservations and payments and keeping track of account balances — thus removing the need to be able to use an app, credit card, etc.
- Travel aide services in which a program staff member tracks the trip and makes sure the rider is picked up and delivered as expected
- High travel needs coverage and needs-based subsidies.

Other program elements that many providers and users recommended for consideration include:

- County and region-wide programs or no distance limits
- No per ride subsidy limits
- Straightforward pricing strategies rather than complex cost-sharing formulas
- No restrictions on trip purposes eligible for subsidy
- Extension of the program to other users, for example, for commuter access to transit, with the user paying the equivalent of a transit fare (potentially a cost saving measure in areas where feeder services are costly).

Programs that use federal funds will need to comply with additional Federal Transit Administration requirements. Programs that are funded with state and local taxes, and do not supplement these with federal funds, have more program design flexibility. The majority of programs in California are supported with state and local funds.

Local governments and transit agencies across the United States are running demonstration projects and pilot projects to test various aspects of such programs, as the case studies illustrate. By tapping into information on pilot program performance, program managers should be able to identify design aspects that are suitable for their own situation.

TNCs have the potential to provide quick-response, high quality transportation services for seniors and people with disabilities, and in many communities and they can usefully complement or even replace taxi services while reducing the burden on sponsoring agencies. By focusing on problem-solving strategies, program sponsors should be able to develop affordable, responsive programs that will serve the full community of interest.

Contents

Introduction

A substantial portion of the population wants to travel independently but finds driving a car or using public transit or paratransit difficult or impossible. Cities, transit agencies, and social service providers across the U.S. have implemented enhanced mobility programs that provide taxi subsidies, also called “taxi scrip,” to fill this mobility gap. Taxis can provide curb-to-curb, door-to-door, or even door-through-door service, providing critical transportation services and supporting social and economic engagement. In many cases they can provide these services at a lower per-ride cost than paratransit. However, current program designs often generate considerable paperwork for the cities and taxi companies. Further, in many areas, complaints about service are frequent: users report no-shows or late arrivals; some drivers refuse to accept scrip or vouchers or to accommodate a wheelchair or service animal; service is sometimes less than gracious. In some markets there are limited options for taxi service and even in markets that once had numerous taxis available, their numbers have declined as ride-matching services supported by transportation network companies (TNCs), like Lyft and Uber, have cut into the market that taxis formerly enjoyed.

Cities and subsidized taxi users have expressed interest in allowing subsidies to be used for either taxis or the new ride-matching services. While pilot programs for subsidized ride-matching have been established in several cities across the U.S., there are barriers to such a move, especially for people with disabilities. One such barrier is a shortage of wheelchair-accessible vehicles (WAVs) — vehicles that can accommodate wheelchairs that do not fold. Another barrier is that a significant number of clients of subsidized taxi programs do not have smart phones and credit cards, which are needed to use TNC services without an intermediary.

In this report, we present an assessment of subsidized taxi programs in operation in the U.S. and an analysis of the potential for TNC integration into these programs — or in some cases possible replacement of taxis with TNC services. We present background information on the people who need rides services and the types of services that have been offered, examine the design of various subsidized rides programs using taxis and the emerging role of TNCs in these programs, review five case studies of programs that have incorporated TNCs in their services, present findings from interviews with users, providers, sponsors, and caregivers on the benefits of the programs as well as problems that they must confront, and discuss ways that services might overcome potential barriers.

The impetus for this project was a 2018 request from City of Berkeley staff, seeking assistance in researching best practices and helping them to design a potential TNC pilot program that could be tested as a supplement to their taxi scrip program. The UC Berkeley team applied for and received an SB1 grant to support its work on the project. The City of Berkeley provided letter of intent to collaborate on the project and work began with the city’s program coordinator. However, a few months after the grant was underway, the program coordinator departed for other employment, and while he remained engaged in the project for a transition period, the City eventually re-staffed the program and in so doing decided that the project should focus on providing information and recommendations on best practices rather than designing a pilot program for Berkeley. During this transition period several other cities in the region embarked on relevant pilots. Hence this report uses the City of Berkeley as the principal case for identifying key issues that a subsidized TNC program would need to address rather than providing a pilot project design for Berkeley, and draws upon cases from California and other states to illustrate the range of programs that have used TNCs.

The report reviews the pros and cons of the program designs tested in other pilots and identifies program designs through which California cities can include ride-matching services such as Uber and Lyft in subsidized mobility programs. The

findings identify ways to expand subsidized mobility service options to ride-matching and identify ride-scheduling and payment methods that are workable for users. These findings should be of interest to cities across California that support taxi subsidy programs for seniors, low income adults, and people with disabilities.

Research Approach

The study is based on a literature review, brief case studies of several programs using taxis and/or TNC services in transit and special needs rides programs, interviews with taxi subsidy and TNC pilot program managers and other experts in the field, and interviews with program users and in some cases, their caregivers.

The literature review covered scholarly publications (journal articles, research reports, working papers) as well as professional literature including government and non-governmental organization (NGO) documents, newsletters, and blogs, and was the basis for an initial assessment of the current state of paratransit services and the opportunities for and barriers to integrating TNC ride-matching into such services. Special attention was given to California reports. Through the literature review and snowball referrals¹, a database of 40 subsidized taxi programs was compiled and reviewed (Table 1; details in the appendix), including 28 California programs and 12 programs in other states. We also identified and reviewed several pilot projects that are incorporating TNC ridesharing into their programs (Table 2). We note that additional programs are in operation in other countries, but we did not include them because of significant differences in context. Also, this is a fast-changing field, and while the information in the tables was verified at the time of data collection (2018-2019), changes may have been made to the listed programs, and additional programs may have been initiated. We did not deem this to be a critical issue since our goal was not to document all programs but rather to identify strengths and weaknesses of program designs, and there were enough programs to allow us to accomplish this.

We selected five cases to examine in greater detail — two large pilot projects conducted in other states, a program run by a social services organization focused on the elderly and people with disabilities, and a program run for the general population as an alternative to local transit, as well as the City of Berkeley's taxi scrip program. These programs offered insights into the range of designs that could be utilized as well as the issues that arise with various program designs.

In order to examine how taxi subsidy programs work in practice in greater detail, and to identify issues that specialists in the field — researchers and practitioners — believed would arise in incorporating TNC services into the programs, we then designed and carried out a series of interviews. The reviewed articles, reports and program descriptions informed the design of interview questions. We prepared an interview guide with open-ended questions to allow respondents to discuss the achievements and difficulties of current programs and their thinking about a TNC option. We identified potential interview subjects from organizations involved in the taxi subsidy programs identified in the literature review, and also included selected authors of scholarly studies on the topic and other professionals working with paratransit services and services being offered by TNCs. Contact information for the potential respondents was obtained from the publications reviewed or by searching relevant public sources, such as organization websites. A total of 55 individuals were thus identified and were contacted by email or telephone and asked to participate; 41 interviews were completed. We were unable to reach ten people after three attempts, two had changed jobs and declined the interview for this reason, and two could not be interviewed because of ongoing scheduling conflicts. Most interviews were conducted by phone, though ten in-person interviews were completed.

¹ Snowball referrals, also known as snowball sampling or chain referral sampling, is a method researchers use if the sample for the study is hard to locate or limited to a very small number. The researcher asks the subject to help identify similar people or cases.

We prepared a separate interview guide for users of subsidized taxi services and where relevant, their caregivers. Clients and caregivers were identified through postings in public locations and announcements at public meetings. A total of 82 interviews were conducted, 70 with program users and 12 with caregivers, with 55 of them in California. In keeping with our initial intent to develop a Berkeley-specific program, 41 of the California user interviews were in Berkeley. The sample included people with disabilities aged 20 and up, older adults aged 65-90, and low-income people across the represented age spectrum, reflecting a range of experiences and needs.

Most interviews with professionals in the field lasted 60-90 minutes. User interviews typically lasted 40-45 minutes, though a few extended to sixty minutes.

Finally, as we were concluding the report for the study in early spring 2020, the COVID-19 crisis hit. Since some of our interviewees had expressed an interest in participating in follow-up studies, we contacted them and asked whether they would be available to discuss how the pandemic had affected their travel and views toward taxi and TNC options. We were able to reach 29 interviewees and to complete short interviews on the pandemic issue with 24 of them.

The interviews provided depth and nuance to the findings from the literature review, and while the results do not represent a random sample of affected interests, they do include views from a wide range of stakeholders. The program clients who participated in the interviews were reasonably representative of the gender mix of the overall population of interest, although a larger share (64%) were female. The sample included people with low and high incomes, those living alone as well as those living with others, adults who relied on caretakers for assistance with travel arrangements as well as those who handled travel themselves, people with disabilities including some who use wheelchairs and walkers or are assisted by a service animal, older adults of varying ages, and a number of racial and ethnic groups. A limitation of the study is that while portions of the populations of interest speak a language other than English at home, we were unable to conduct interviews in their native languages and so only those who were comfortable conversing in English could be included.

Background

Public agencies throughout California and the United States have implemented programs that provide subsidized taxis for older adults, low income people, and those with disabilities. Sometimes these are done as part of a transit or paratransit program, and sometimes they are done as part of a public health or social services initiative. The specifics of the programs vary widely in terms of the populations served, eligibility requirements, the amount of subsidy provided, and the types of trips that may be taken. There also are differences based on the source of funding. Here we provide some background on population trends for target user groups and the paratransit programs that are offered in the United States, to provide context for the discussion of new program opportunities offered by ride-matching services.

Population Trends for Target User Groups

The three groups that are commonly served by subsidized taxi programs – older adults, people with mobility disabilities, and low-income adults – often overlap. For example, 2018 estimates show that almost 10% of America’s adults over age 65 were in poverty, according to the US Census; among those 18-25 with a disability, almost 26% were in poverty (Semega et al. 2019.) Kraus et al. (2018) report that 41% of the US population with a disability were over the age of 65 and 35% of adults 65 and older had a disability, compared to 11% of adults 18-64. According to the Center for Disease Control (CDC), mobility is the most common disability type, affecting 1 in 7 adults (about 14%); the CDC further notes that with age, disability becomes more common, and estimates that about 2 in 5 adults age 65 and older have mobility limitations (CDC Aug. 2018). These overlaps mean that programs that offer services for adults with disabilities often are also serving low income and elderly clients, and vice versa.

While there is no consensus on who is considered an ‘older adult,’ the lowest threshold tends to be 50 years old as used by AARP (Barrett 2015). Another commonly used threshold for the older population is 65 years old, and this is one of the fastest-growing age demographics in the United States: The population over 65 is projected to grow by 80% between 2014 and 2040, with the population over 80 years old growing by 300% in the same period (Administration on Aging 2015). Adults 65 and older in California parallel the national trends in many dimensions: over one third have a disability and one fifth are poor or near poor (CA Department of Aging, 2017.)

The vast majority of older adults desire and plan to age in place (Barrett 2015), which requires “the ability to live in one’s own home and community safely, independently, and comfortably, regardless of age, income, or ability level” (CDC 2009). Aging in place is only possible when considering not only housing but also transportation, cultural activities, neighborhood networks and all other components to live with a reasonable quality of life (Gardner 2011). Familiar people and places can create a sense of security and, critically, aging in place allows people a sense of independence and autonomy (Wiles et al. 2011). Because many older adults live alone and are no longer in the workforce, it can be important for them to get out of the house to engage with others for social, cultural and recreational purposes and not just for necessary trips such as medical appointments and grocery shopping.

However, for older adults, transportation can be a major roadblock to engagement in activities. Transportation barriers have been shown to increase health risks, including depression in older adults (Choi and DiNitto 2016). While around 80 percent of older adults drive, there tends to be a drop-off beginning at age 75. Age 75 is often considered a transition point between the ‘younger,’ 65-75, and ‘older’ cohorts of the older adult population, who have different abilities and needs

(Alsnih and Hensher 2003). Once they no longer have a car available or lose the ability to drive, older adults make significantly fewer trips (Yang et al. 2018), which can be isolating (Alsnih and Hensher 2003) and can reduce social engagement (Curl et al 2013.)

One contributor to the decrease in trips is that three-quarters of adults over 50 live in auto-oriented neighborhoods, either suburban or rural (Binette and Vasold 2018). In many such neighborhoods there is little or no transit service, and many destinations are beyond walking distances. The relationships are complex, however; for example, studies have shown mixed results regarding whether nearby public transit has a meaningful impact on older adults' transportation deficiency (Kim 2011, Hess 2009). In addition, there are differences in gender that manifest both in overlap with disability, dependence on friends and family, and types of trips made. For example, older women tend to give up driving at a younger age than males, are more likely to have a disability, and are more likely to rely on a family member for rides than are their male counterparts (Alsnih and Hensher 2003, Dobbs et al. 2019).

In the U.S., many states have implemented specialized programs in the land use, transportation, and housing fields to assist older adults to age in place, ranging from assisted living to curb cuts and paratransit services. These programs exhibit a wide variation in eligibility and operating rules as well as in funding levels, and some programs are more difficult to use than others (Farber et al. 2011).

Paratransit Service, Taxis, and TNC Ridematching

Paratransit is a blanket term that has been used since the 1970s to cover many services that fall between the private automobile and conventional transit, from taxis to jitneys to carpool and vanpool programs and subscription bus services (Roos and Altshuler, 1975). Paratransit also refers to services established in response to the Americans with Disabilities Act (ADA), to provide a means of transportation for people with disabilities who could not otherwise take fixed-route public transit service like bus and rail. Under ADA regulations at 49 CFR § 37.131, transit agencies supported with federal funds must provide complementary paratransit service within $\frac{3}{4}$ mile of a stop or station. In addition to the mandated ADA service, some cities, counties, and transit agencies have established non-ADA complementary paratransit services, some of which predate ADA by a decade or more.

The costs of complementary paratransit service have been steadily rising, and the cost per ride is subsidized multiple times more than those for fixed route service. For example, in 2014, transit agencies paid an average of \$36 per ADA-mandated paratransit ride (NTD 2015). Transit agencies sometimes try to avoid these high costs by training operators and drivers to provide assistance that enables paratransit riders to transition to fixed-route service where possible (US GAO 2012, Citizens Budget Council 2016). On the other hand, recognizing that mobility is a critical need, some transit agencies have gone beyond federal requirements to offer additional services. Subsidized taxi rides are one such service.

Taxis can be considered a form of paratransit in their standard operation or through the provision of special services, either under contract or as a local practice. Special services offered by taxis vary from location to location, but have included first and last mile shuttle services (e.g., from a remote parking lot to an employment center), feeder services (e.g., from low density neighborhoods to a regional rail station), guaranteed rides home for employees who participate in transit or ridesharing programs but need a ride for a family emergency or after working past normal hours, and subsidized trips for elderly, low income, and disabled populations. Here the focus is on the latter services, although we also draw upon a transit service pilot program open to the general public including those who might not be able to use conventional transit.

An important feature of the taxi industry is that in most locations, it is highly regulated. Most state and local governments regulate safety aspects of taxis, requiring background checks for drivers and mechanical and emissions inspections of vehicles. The extent and nature of additional regulations vary widely, but in many locales, regulations have long been in place that restrict the number of taxis that can operate, establish fares, and specify the type of vehicle that can be operated and the equipment and markings the vehicle must carry (e.g., a taximeter, washable floor mats and seat covers, door markings, roof sign) (Cetin and Deakin 2019). In addition, cities across the United States have adopted ordinances requiring taxi fleets to add WAVs, sometimes by issuing special permits for such vehicles and sometimes by mandating that a percent of each operator's fleet be accessible (NCST 2011).

A few U.S. cities partially deregulated taxis in the 1980s and '90s, allowing entry to expand, fares to vary, and operators to offer somewhat more flexible service, such as shared ride options. However, the experience with deregulation was mixed, and many cities chose to retain their regulatory policies. With the advent of TNC ride-matching operating with far lower levels of regulation and vastly expanded availability, taxis quickly lost market share, often drastically (Cetin and Deakin 2019). Taxis also went out of business as their incomes declined and as the value of their permits to operate (medallions) plunged; owners were not able cover their costs (which often included debt financing of the medallion) or to sell the medallion for what they owed on it.

In addition to the competition from sheer numbers of TNC vehicles, cost, quality, and convenience were factors that have led to taxi market share losses when the TNC option became available. Ride-matching initially was priced below the cost of taxis and remains so today, though the differential is not as sizeable as it initially was. Currently taxi fares typically run \$2 - \$3 per mile in most cities, with additional charges levied for baggage, traffic delays, and wait time. For people with ambulatory disabilities, wait time can include getting in and out of the taxi and storing a wheelchair or walker if one is used (NCST 2011). In comparison, TNC fares as of 2019 were typically in the \$1.50 - \$2 per mile range, though rates increase in periods of heavy demand.

TNC ridesharing services have also offered convenience, service quality and reliability that surpass those of taxis in many markets. A ride can be secured and paid for through a cellphone app rather than arranged by phoning a dispatcher, hailing a passing taxi on the street, or traveling to a taxi stand, and then paying the fare in the vehicle. The ability to rate vehicles and drivers after each ride provides TNCs a quality assurance measure with more credibility and ease of use than the complaint desk at the taxi company or the regulatory offices typically offers. TNC apps provide real-time information about the taxi's arrival time for pickup and allow the user to map the vehicle's location both while waiting for pickup and during the trip. In many markets, more comfortable vehicles also have been cited as a TNC advantage over taxis.

Attitudes of taxi drivers also have been found to be at issue, especially but not exclusively for older people and people with disabilities. Studies report that taxi drivers perceive older adults as less likely to tip and more likely to take a very short trip and require assistance; as a result, some taxi drivers are reluctant to serve older adults (NCST 2011). Studies also have documented taxi drivers refusing wheelchair service trips because of the added time to handle a wheelchair and perceived low tips from wheelchair users (Koffman et al. 2010). Users complain about no-shows and refusal of service, poorly maintained vehicles, and surly drivers. Older women disproportionately report that they have had negative experiences such as overcharging or a scheduled taxi that never arrives (NCST 2011). Taxi drivers, for their part, report that older adults and people with disabilities are more likely than the general population to cancel trips or not show up for them.

It is unclear whether on balance the challenges posed by TNCs have led taxis to improve their own performance in order to be more competitive (clearly some have done so, introducing apps of their own and upgrading vehicles and driver training)

or has led to a further downward spiral as earnings decline. This most likely varies by location and by the initial size and structure of the local taxi industry. It is clear, however, that in many jurisdictions there are fewer taxis on the road.

In any event, while difficulties with taxis have been observed for many years, taxis have been, and remain, an important option for many older adults, low income households, and people with disabilities, serving trips that otherwise could not be made. For this reason, taxis have been enlisted to provide subsidized mobility services in many cities, at least since the 1970s.

Taxi ride subsidy programs have varied widely in objectives and scope, which largely reflects the objectives of their sponsors — social service agencies, local governments, or transit agencies (Gilbert et al. 2002). A key distinction is whether the taxis are providing a portion of ADA complementary service (Koffman et al. 2012) or are in addition to the ADA services. For programs not tied to ADA, the objectives can range from reducing the costs of short trip services to providing access to health care.

As initially formulated, in the typical taxi program the administrator would give participants tickets, coupons, vouchers or scrip paper and the riders would use this to pay for the trip. Periodically the taxi driver would submit the scrip for reimbursement. In the last decade or two some cities have moved away from paper taxi scrip to a debit card (Koffman et al. 2010), but many have maintained the analog system.

Today, with taxi companies on the decline in many areas and TNCs preferred by many travelers, there is a growing interest among both users and administrators in broadening subsidized programs to include TNCs. However, designing a program that incorporates TNCs can be complicated, both because of the many rules established for subsidized ride programs and because of barriers that some of the intended users of subsidized services would face in using TNCs at present.

Varieties of Taxi Subsidy Programs in the United States

The list of taxi subsidy programs in Table 1 focuses on the United States; while such programs are offered in other countries as well, including Canada and the majority of countries in the EU, review of these programs was deemed beyond the scope of this study. In addition, we omitted programs exclusively aimed at providing ADA complementary paratransit, which are sometimes operated by taxi or bus companies under contract using specialized buses and vans as well as sedans.

As Table 1 shows, we identified some 40 programs in 10 states offering deep discount taxi rides to seniors, people with disabilities, and in a few cases, low income people. Most programs were operated by cities, while some were offered by transit agencies and some by other organizations including regional agencies and nonprofits. Many of the programs in California were funded with voter-approved transportation sales tax funds; others were funded from city budgets or as part of a non-profit organization's activities (which in turn are funded, in many cases, in whole or in part from government grants and contracts).

Most programs required a participant to have a verified disability or to be an older adult; the minimum age for use without a disability ranged from 55 to 80. Several programs had income requirements, usually 200-300% of the federal poverty line (FPL) as the maximum. Others differentiate price based on income level.

Deep-discount scrip or vouchers typically can be bought in-person at city administrative offices or community centers, by mail, or online. The subsidy available varies widely and is often administered on a monthly basis. The typical ride subsidy is

in the range of \$30-\$50 per month. Some programs instead set a flat user fee for the service, e.g., the user pays \$3 per ride, with the program covering the rest of the ride up to a ride maximum, e.g., \$20.

Many programs require that both the origin and destination be within the sponsoring city/county. A few programs require that the trips be for medical appointments. One or two programs only provide service to and from areas within ¼ mile of a transit station; these are programs designed to reduce the need for costly feeder bus services.

Table 1. Taxi Programs Reviewed for this Study (2019 Data)

City/County	State	Program Name	Program Administrator
Alameda	CA	Premium Taxi Service	City of Alameda
Albany	CA	Taxi Subsidy Program	City of Albany
American Canyon	CA	Taxi Scrip Program	City of American Canyon, Parks and Recreation Dept/
Berkeley	CA	Taxi Scrip Program	City of Berkeley, Housing and Community Services Det.
Concord	CA	Get Around Taxi Program	City of Concord Commission on Aging
Dublin	CA	Go Dublin!	Livermore-Amador Valley Transit Authority (LAVTA)
El Cerrito	CA	Taxi Subsidy Program	City of El Cerrito
Emeryville	CA	Taxi Reimbursement Program	City of Emeryville
Escondido	CA	Taxi Voucher Program	Senior Services Council Escondido (nonprofit)
Fairfield and Suisan	CA	Reduced Fare Taxi Program	Fairfield and Suisun Transit (FAST)
Fairfield and Suisan	CA	Adult Recreation Center (ARC) Taxi Program	Fairfield and Suisun Transit (FAST)
Fremont, Newark and Union City	CA	Ride-On Tri-City Taxi Service	Cities of Fremont, Newark and Union City
Fresno County	CA	Senior Taxi Scrip Program	Fresno COG
Hayward and San Leandro	CA	Central County Taxi Program	Cities of Hayward and San Leandro
La Mesa	CA	Senior Taxi Scrip Program	City of La Mesa
Lafayette	CA	City of Lafayette - GoGoGrandparent PPP (pilot)	City of Lafayette Senior Transportation Program

City/County	State	Program Name	Program Administrator
Lafayette/Moraga/Orinda	CA	Lamorinda Spirit Van	City of Lafayette
Los Angeles	CA	CityRide	LADOT
Monterey	CA	City of Monterey Senior Taxi Scrip Program	City of Monterey
Napa	CA	Lifeline Taxi Program	Vine Transit
Oceanside	CA	Taxi Scrip Purchase	Oceanside Senior Transportation Program (nonprofit)
Pleasant Hill	CA	Pleasant Hill Senior Van Service	City of Pleasant Hill
San Francisco	CA	SF Paratransit Taxi program	SF Paratransit
San Mateo	CA	Get Around Senior Rides Program	City of San Mateo Parks and Recreation Dept.
San Pablo	CA	San Pablo Senior Transportation	City of San Pablo
Santa Cruz County	CA	Lift Line	Community Bridges (nonprofit)
Seaside	CA	City of Seaside Senior Taxi Scrip Program	City of Seaside
Solano County	CA	Solano County Intercity Taxi Scrip Program (Part of ADA Service)	SolTrans
Vallejo and Benicia	CA	SolTrans Local Taxi Scrip Program	SolTrans
Hartford	CT	Freedom Ride	Greater Hartford Transit District
Delaware	DE	Senior Citizens Affordable Taxi (SCAT)	Delaware Transit Corporation (DART First State)
Chicago	IL	Taxi Access Program	Pace Suburban Bus Service
Montgomery County	MD	Call-n-Ride	Montgomery County/ MDOT
Boston	MA	Taxi Discount Coupon Program	City of Boston Elderly Commission
Brookline	MA	Brookline Elder Taxi System (BETS)	City of Brookline

City/County	State	Program Name	Program Administrator
Newton	MA	Newton Senior Taxi Voucher Program (“Yellow Vouchers”)	City of Newton
Las Vegas	NV	Taxi Assistance Program (TAP)	Clark County
Oklahoma City	OK	Share-A-Fare Taxi Program	Embark
Kitchener/ Cambridge/ Waterloo	ONT	TaxiScrip	Grand River Transit
Houston	TX	Metrolift Service Plus (MSP)	Houston Metro
Arlington County	VA	Super Senior Taxi	Arlington Transit (ART)
Seattle/King County	WA	Taxi Scrip Program	King County Metro

Use of TNCs in Enhanced Mobility Programs

Relatively few enhanced mobility programs to date allow for the use of TNCs in addition to (or instead of) taxis, and many of these programs are pilots currently being tested or are recently ended pilots for which a final evaluation had not been issued at the time of this study. Here we present an overview of issues that have arisen concerning the use of TNCs in mobility programs in addition to, or as a substitute for taxis.

A key issue is the level of familiarity with TNCs among the target population groups. Taxis are a time-honored mode of transport in most cities, but TNCs are new, and while they have proven to be extremely popular, their riders tend to be younger adults. A 2018 study by the American Association of Retired Persons (AARP), a nonpartisan organization that empowers people to choose how they live as they age, found that almost all Americans over 50 (94%) had heard of ride-hailing options like Uber and Lyft, but less than one-third had ever used them and two-thirds reported that they were not likely to do so in the next year (Binette and Vasold 2018).

Still, both service providers and some users of current programs have expressed interest in a TNC option. Applications are cropping up among transit agencies as well as among social service agencies.

A growing number of transit programs are subsidizing TNCs as an alternative to conventional bus services on low-volume suburban transit routes or on feeder routes to transit stations in such areas. For these programs, the transit agency is typically the lead; many of the programs have been implemented under the Federal Transit Administration (FTA) mobility on demand “sandbox” initiative (FTA, 2020.) Among the operators participating in this program are:

- Bay Area Rapid Transit (BART) Integrated Carpool to Transit Access Program
- The Vermont Agency of Transportation (VTrans) OpenTripPlanner
- Pierce Transit (PT) Limited Access Connections
- Dallas Area Rapid Transit (DART) First and Last Mile Solution
- Valley Metro Mobility Platform Project
- Pinellas Suncoast Transit Authority (PSTA)-Public Private-Partnership for Paratransit Mobility on Demand Demonstration (P4MOD)
- Chicago Transit Authority (CTA) Integrated Fare Systems from Transit Fare to Bike Share Project
- City of Palo Alto and Bay Area Fair Value Commuting (FVC) Demonstration Project
- Los Angeles County and Puget Sound MOD First and Last Mile Partnership with Via
- Tri-County Metropolitan (TriMet) Transportation District of Oregon -- OpenTripPlanner Shared-Use Mobility (OTP SUM)
- Regional Transportation Authority (RTA) of Pima County Adaptive Mobility with Reliability and Efficiency (AMORE) Project.

Transit agencies are often motivated to try TNC services for cost savings — many of the programs are being offered in low-density areas, or as a way to provide night service, trips for which the cost per ride for conventional transit and paratransit is very high — as well as a desire to use technology to improve service quality. In addition to Uber and Lyft, the company VIA is a major actor in these programs. Some programs also include taxis using a taxi app that mimics many Uber and Lyft app features. Typically, riders use their cellphone app to book a ride within the service area. For many of these projects, the ride is shared if other riders are traveling along the same route.

Transit agencies also have been partnering in programs to connect major jobs centers such as airports to transit via subsidized TNCs. One example is the Ontario International Airport-Metrolink connection offered through Lyft. Travelers can take up to \$35 off Lyft rides between the airport and the Ontario-East, Montclair, Upland, or Rancho Cucamonga Metrolink stations.

One issue that arises when cities and transit agencies consider allowing users to opt for TNC services is that, absent a separate contract agreement, localities have little say over TNCs as compared to taxis. While in most states, taxis continue to be regulated at the local level, about two-thirds of the states have passed legislation to preempt local regulation of TNCs, with notable exceptions including New York, Pennsylvania, and Washington. Typically, TNCs must agree to only four requirements to be issued a permit to operate: a zero tolerance policy for drugs and alcohol, compliance with vehicle safety and emissions requirements, established nondiscrimination and accessibility policies, and record maintenance guidelines. Most states use general language regarding access for people with disabilities and rarely require WAVs. TNCs are instead told to direct passengers towards available alternative providers such as local Dial-A-Ride. However, some states have added, or have permitted localities to add, a wider range of requirements, including fare parameters, required driver training, requirements for a specified number of WAVs available, and per-ride surcharges to cover oversight costs, mitigate adverse impacts, or support supplementary services not covered by the TNCs (Waite 2018).

A shortage of WAVs in the TNC fleet is a major concern, and states are beginning to address it. Connecticut, Massachusetts, and Maryland have mandated studies on how to implement and fund equivalent service for people with disabilities including the use of a per-ride surcharge. In California, a bill doing this, the TNC Accessibility for All Act (Senate Bill 1376 (Hill)), was signed into law in September 2018. SB 1376's aim is to provide accessibility to people with disabilities, particularly those who use non-folding mobility devices. The bill imposes a per-trip "access fund" fee on TNC trips. A TNC may offset the fees due by amounts it spends on eligible actions to improve WAV service, or may be exempt from fees if it meets a level of WAV service based on the geography of where the trip originates, as established by the California Public Utilities Commission (CPUC).

The CPUC is in the process of a multi-stage action to establish rules for the new program. The Commission has designated the county as the appropriate geographic unit for the program and identified clusters of counties for which similar level of service rules will apply. Beginning on July 1, 2019, TNCs must collect a ten cent fee on each trip in California, to be deposited into an access fund, unless the fees are offset by expenditures on WAV services or the WAV service level meets the exemption level. The funds generated from the fee are to be used to support the expansion of on-demand transportation for non-folding wheelchair users and are to be distributed on a competitive basis to providers of on-demand WAV service in each county. In addition, the CPUC has established reporting requirements for TNCs and access providers, including reporting on the availability of WAVs, number of trips requested and fulfilled, and response times (CPUC Decision Track 1 Issues 2019; CPUC Decision Track 2 Issues 2020).

Cases: Five Example Programs

As part of this research, we reviewed five programs that offer insights into different ways to provide taxi or TNC paratransit rides: the City of Berkeley’s long-standing taxi subsidy program, two relatively large paratransit pilot programs in Boston and New York City (Parker 2020), the high-assistance program offered in Southern Alameda County by LIFE ElderCare, a nonprofit organization serving Alameda County, and the GoDublin! program run by the Livermore-Amador Valley Transportation Authority (LAVTA), serving anyone over 18. For the Berkeley, Boston, and New York City cases, team members conducted interviews with program riders, disability advocates and government officials. For the LIFE Eldercare and LAVTA programs, project team members interviewed only representatives of the agencies offering the programs. Here we present brief sketches of these programs, in the forms they took in 2019. The five cases illustrate the range of programs that are currently in operation, varying from taxi-only to TNC only, older residents only to all residents, limited geographically or only limited by funding. They also reveal some of the pros and cons of various program designs.

City of Berkeley – Rides for Seniors and the Disabled

The City of Berkeley’s Rides for Seniors & the Disabled (BRSD) offers four paratransit programs: a taxi scrip program, a wheelchair-van program, East Bay Paratransit tickets, and a high medical need program. BRSD is run through the City of Berkeley Housing and Community Services Department and the Aging Services Division. Funding is provided in part through voter-approved Alameda County sales taxes for transportation, Measure B and Measure BB, which are administered by the Alameda County Transportation Commission. Each of the four programs has separate eligibility criteria (City of Berkeley HCSD, 2019).

For the taxi scrip program, all Berkeley residents certified as disabled by East Bay Paratransit are eligible, as are all residents over the age of 80. Residents age 70-79 with an income below 50 percent of Area Median Income (AMI) are also eligible. Program participants have paper scrip delivered by mail quarterly or can request to pick up the scrip at City Hall or at one of the several senior centers in Berkeley. Users may have someone ride along with them and may use the scrip however they wish, with no distance or per ride cost limits. The scrip expires at the end of each quarter.

Taxi drivers registered for operation in the city must allow payment via scrip. Once a week, the city opens a reimbursement window where taxi drivers can return the scrip to the city in exchange for cash.

Two trends have led the City of Berkeley to consider incorporating TNCs into the taxi scrip program: the decreasing number of registered taxis, and the expectation that TNCs could reduce wait times from the current booking scheme. As in other parts of the country, competition from TNCs has hit the taxi companies serving Berkeley hard and the number of taxis in the city is declining. An additional benefit of TNCs is their willingness to provide rides outside of Berkeley. Currently, some taxi firms take rides outside the city while others will not.

The City of Berkeley conducted a survey of taxi scrip users to determine use patterns and the feasibility of a TNC-based program. Medical trips and grocery shopping were the two most frequent travel destinations. However, only about 40 percent of users reported having a smartphone, suggesting that a TNC-only program would be problematic unless a landline-based call-in option were available.

At the time of this study, the City was not ready to move ahead with a pilot program. Staff are continuing to monitor and learn from TNC paratransit/senior program pilots elsewhere in the region. With some taxi scrip users comfortable using applications like Uber or Lyft while others are not, Berkeley officials would prefer to keep taxis in the program and add a TNC option, assuming both are available. While there are concerns about the future of the taxi industry, City officials envision TNCs for now as a complement to existing options rather than a replacement. In addition, ensuring that WAV levels of service are adequate is a key consideration.

One source of information exchange for City officials has been the Alameda County Transportation Commission (ACTC). ACTC distributes funds gathered from Local Measure B/BB county sales taxes for ADA-mandated services and city-based paratransit programs, and also funds a discretionary grant program for projects intended to reduce the differences in special transportation services available to individuals in different geographic areas of the county. Alameda CTC's Paratransit Advisory and Planning Committee (PAPCO), an all-consumer community advisory committee, makes recommendations to improve the planning and coordination of transportation services for seniors and people with disabilities in Alameda County and advises on the development and implementation of paratransit programs and grants. PAPCO is supported by a Paratransit Technical Advisory Committee (ParaTAC) comprised of Alameda CTC-funded paratransit providers in Alameda County. The two committees occasionally host joint meetings, which provide state-of-practice knowledge for planners and advocates as well as a forum for advocates to raise concerns. In addition, they allow for informal networking among staff, advocates, and program providers. Two meetings in the last year have focused on TNC partnerships for paratransit and senior programs. At these meetings, reports were presented on several TNC pilots underway and the ensuing discussions included city and county officials, transportation consultants, regulators, and accessibility advocates.

Boston – MBTA's the Ride

In 2015, Boston's Massachusetts Bay Transportation Authority (MBTA) launched a 100-person TNC pilot program for its paratransit service, the Ride. This was followed by a larger pilot using Uber and Lyft the following year and an extension of the pilot to any interested Ride user. Curb, an app to request a taxi, was also added later. Riders pay the first \$1 if 'Pooled,' where more people may join their ride, or \$2 if not Pooled, using their Ride account. The MBTA automatically pays any amount up to \$42 per ride. The rider pays any amount above this limit. Pilot program riders are given a monthly trip cap based on their regular Ride usage in the six months prior to the pilot program. For comparison, standard Ride trips are \$3.35 for ADA-mandated service (within $\frac{3}{4}$ of a mile from a MBTA station or stop) and \$5.60 otherwise. Standard Ride trips must be scheduled via phone or online one day in advance. The program was originally intended as a cost-saving mechanism, and to provide a higher level of service.

The Ride pilot program led to significant time savings. Riders reported not using the standard Ride program for medical appointments due to lack of reliability, citing that it had sometimes been two hours late. Time savings also included time spent making reservations, which originally involved a return call the night before where the reservation system informed riders what time they would be picked up the following day. Reliability problems in the pilot program were noted for riders with service animals, where drivers refused to pick up a rider after seeing the service animal. Riders preferred the smartphone application reservation system to phone reservations.

Most riders reported Uber and Lyft drivers as more friendly, professional, and respectful compared to previously where drivers gave the impression that they do not view those they are transporting as adults or equals. Several riders speculated

that the difference in service and professionalism by pilot program drivers was due to a different kind of role as a driver in a customer-service-related industry, involving tips and individual driver ratings. Uber and Lyft operate as a curb-to-curb service, drivers do not need to assist riders. Notwithstanding, riders have received assistance with their seatbelts, folding up wheelchairs, and other such tasks. One rider reported that about half the time, their driver could use more training.

Riders described important service improvements related to vehicle type: a smoother ride, as many Ride vans do not have the same shock absorbers, and better heat regulation, as vans do not have AC and heat can exacerbate some medical conditions. Others appreciated the benefit of allowing a secure place for a service animal, unlike the jump seats on the regular Ride. However, several riders expressed a desire to know ahead of time what kind of vehicle was picking them up. Some riders had even practiced canceling rides quickly if a too-small vehicle was sent through Lyft or Uber. One rider described they were once unable to use the front seat, which caused difficulty getting into the car.

Approximately 15 percent of pilot riders choose to use the Pool option; riders expressed a preference for solo rides, explaining that the Lyft program was set up so that prices were the same across the regular and Pool options. Trip caps were a major concern for riders, who expressed disapproval with the perceived lack of transparency and unfairness of different ride caps (especially knowing that others had higher ones). Due to trip caps, some riders saved their pilot trips for unscheduled rides when needs arose.

New York City – MTA’s Access-A-Ride

The New York MTA manages the Access-A-Ride (AAR) program which provides the ADA paratransit service in New York City. The pilot began in 2017 starting with 200 people and later expanded to 1200 participants (1 percent of AAR users). The pilot involved the Curb app, which allowed users to request New York City (NYC) yellow and green taxis, on-demand or in advance. Similar to Boston, the traditional paratransit needs to be reserved at least 24 hours in advance. The goals of the program were to reduce costs and to assist the taxi industry.

Wheelchair users described difficulty getting pilot rides on occasion, for example in inclement weather, forcing them to use Uber where they paid out of pocket instead. Nevertheless, the pilot program was deemed to be more reliable than regular taxi rides, which reportedly sometimes refused to pick up passengers in wheelchairs.

The rider pays \$2.75 in cash directly to the driver (the price of a regular subway or bus fare) and the MTA covers the remaining cost of the ride. This is the same price riders pay for regular AAR service. Curb taxi rides are unlimited for those in the program. However, in March 2019, the MTA began to offer flat fares to taxi drivers for trips in the pilot program instead of subsidizing the meter fare, significantly reducing the availability of taxi drivers providing pilot program trips. MTA data reveals a marked decrease in the number of rides taken with the program decreased greatly in April and May 2019 a after the change to flat fares. All NYC taxi drivers have accessibility training. Riders described no longer having the time savings or reliability, with multiple drivers canceling or the nearest available driver being 30 minutes away; previously, wait times rarely exceeded 10 minutes.

In NYC, riders overwhelmingly described improved professionalism and friendliness from taxi drivers who are part of the Curb program. The paratransit phone reservation process was onerous compared to the Curb app: riders described needing to schedule the daily 10-minute call, and frustration at the need for repetition of their ride particulars over each call. Riders noted that the Curb app was not as efficient as Uber’s, in terms of routing or suggesting or remembering locations. In the

pilot program, multiple riders described frequently receiving the same taxi drivers for their regular routes and appreciated the comfort and reliability of familiar drivers.

Riders explained how, under the regular paratransit regime, they could plan doctors' appointments 24 hours in advance, but not much else. The pilot program made a variety of new trips possible. Additionally, the return trip is difficult to plan, for almost all types of trips, and many activities like picking up a child from daycare are not suited to the inflexibility of pre-ordered rides. But under the pilot program, riders described being able to wait for doctors, stay longer for tests, and conduct social visits without having to leave beforehand due to a pre-scheduled ride. While most riders described a strong change in professionalism with the taxi drivers, one expressed a wish for more training for the taxi drivers for people with less-visible disabilities.

LIFE ElderCare's Transportation Programs

LIFE ElderCare is a nonprofit organization operating in Alameda County, CA, whose mission is to empower the aging to live with independence. It is funded by government and other grants, contributions and donations, and investment earnings, and benefits from the donated time of many volunteers. Services offered include Meals on Wheels, fall prevention audits and training, a friendly visitors program, and transportation services.

LIFE ElderCare's main transportation program gives rides for medical appointments and errands like grocery shopping, with trained volunteer drivers offering door through door assistance. In 2018-19, this program provided almost 8000 rides and in a client survey, none said finding family or friends to help was difficult and 73percent stated that they would not have taken the trips without the assistance provided (Life ElderCare, 2020).

The nonprofit has worked on several pilot programs for TNC rides for seniors, with funding from the California State Automobile Association and cities in Southern Alameda County. A typical program can be contacted through local government offices or nonprofits, or by dialing 2-1-1 (a dedicated number available in much of the U.S., though which people in need of assistance can be referred, and sometimes connected, to appropriate agencies and community organizations). Applicants who meet age, disability, and residency requirements can enroll by mail or through 2-1-1. They must have a credit or debit card on file for billing. To order a ride, they connect to staff who order the ride and relay the estimated cost; if the ride is accepted the staff also provides the name of the driver, the color and type of car, and expected time of arrival (usually 5-10 minutes). Rides are limited to a specified service area and the rider pays the first increment of the cost plus any amount over the maximum subsidy (e.g., for a \$30 ride, the rider pays the first \$4, then the program pays the next \$20, and then the rider pays the remaining \$6). The service is curb to curb and a cancellation fee is charged if the passenger is not ready within five minutes of driver arrival. The interface used by the staff assisting the caller lets staff track the ride.

Although LIFE has decided that running these programs requires more staff time than the small nonprofit can devote to them, and at the time of this report were planning to hand the program over to a larger organization, they reported a number of lessons learned from their experience with these pilots.

From a client perspective, they report that some of the more difficult aspects of the programs are understanding the billing process and charges for rides, especially when fares exceed the amount that the program will pay (resulting in two charges to the client.) Clients also have had difficulties understanding cancellation fees and that cash payments are not an option. Service area limitations are also a problem for some users. Occasional problems are drivers who do not speak English well, difficulties in booking WAV rides, and difficulties with pickups and dropoffs for clients who are low vision or blind.

LIFE noted that drivers also have relayed problems they have experienced with the program. From a driver perspective, some common problem are locations that are hard for drivers to find, especially locations that have multiple buildings or multiple entrances;, clients who expect the same flexibility from TNC drivers as they have had with taxi drivers (changing/adding destinations, expecting help with packages, getting in/out of the car, driver coming to the door to get the client, etc.).

Staff reported that important services that the organization can provide to improve service and provide smoother client-driver interactions include:

- Providing assistance with boarding, including a clear explanation to the client on how a TNC ride is different from a taxi ride in terms of services offered
- Explaining cancellation fees and how to avoid them
- Testing credit cards to confirm they are active
- Insisting that clients provide exact street addresses for both pickup and dropoff
- Getting a description of items of clothing or assistive devices so that a driver can spot the client easily, and entering this information into a "memo" field
- Monitoring a ride once it's booked to assure that the driver and client connect
- Providing turn-by-turn, live instructions to drivers who seem lost
- Developing procedures for dealing with drivers who try to lengthen their trip by starting the "meter" before the client is in the car, lengthen the miles and/or time of the trip by taking a circuitous or slow path, or avoid being the entity that cancels the trip and thus incur a penalty
- Assisting seniors to travel in groups of friends for certain trips (to lower the cost for all).

LAVTA's Go Dublin!

Go Dublin! is a rideshare program through which the Livermore-Amador Valley Transportation Authority (LAVTA) will pay 50 percent of a TNC fare, up to \$5.00, for rides within the City of Dublin, a small city in the eastern suburbs of the San Francisco Bay Area. Go Dublin! started as a pilot program and had many objectives, among them to replace low volume fixed-route bus services with a less costly and more effective service, reduce private motor vehicle travel and congestion near Dublin's two BART stations, and move some paratransit trips to TNCs (also as a cost-cutting move). Both Uber and Lyft provide services; initially a taxi program was also available and provided WAV services, but it was little used. Uber currently provides WAV services.

Anyone 18 years or older may use the program. The user must book the ride via smart phone and must request the shared ride option (UberPOOL, UberWAV, or Lyft Shared Rides). From the app, the user either requests a voucher or enters a discount code, depending on the company chosen. The discount is credited at the end of the trip.

Concierge services for those who are not able to use a smart phone or credit card are not currently available. Interested parties who cannot afford a smart phone are referred to a state program that offers subsidies; those without a credit card are referred to a no- or low-cost money management card.

An evaluation done after the first phase of the program (Shaheen and Martin, 2018) found that about 1000 passengers a month were using the service. Typical subsidies per ride were in the \$2-5 range, averaging \$3 per ride, compared to the \$8 a ride subsidy for regular feeder bus service. However, the fare paid by users was also far greater than the transit fares,

with rideshare users typically paying \$4-\$6. Probably because of costs, the local bus services have continued to capture by far the largest share of local trips.

Data on travel patterns were limited to what service providers were willing to share, which varied by company. From the data available, it appeared that many of the trips were to or from the BART station areas. It was not possible with available data to determine whether the program had attracted people who otherwise would have used paratransit; the evaluators noted that since paratransit trips (in 2016) averaged \$33, cost savings would be likely if there were TNC substitution. However, the boundary limits and lack of WAV service in the TNC programs raise questions about comparability. Data on vehicle occupancy indicated that only 4 percent of trips were actually shared, despite the requirement for allowing such sharing, which suggests that the impact on vehicle miles traveled (VMT) and congestion are likely modest as well; this finding is consistent with other reports in the literature.

Findings from Interviews

The interviews we conducted with program sponsors, service providers, and users allowed us to further delve into pros and cons of various program designs. The interviews confirmed the list of benefits that are being sought by including TNC services in the transportation mix, and also documented perceived barriers to partnering with TNCs and drawbacks of the services as currently put forward.

Benefits

The key benefits sought from taxis and TNCs were cost savings, greater flexibility, and shorter lead times for arranging rides, fewer cancelled trips, and better quality of service from drivers and their vehicles.

TNC and Taxi Advantages over Conventional Paratransit

Program sponsors and service providers emphasized costs and quality of service in listing advantages they saw or anticipated from including TNCs and taxis in their services for the elderly and disabled. They cited the high costs per ride with paratransit services, noting that either taxis or TNCs would be less expensive in most cases. The interviewees also saw advantages for taxis and TNCs in terms of shorter lead times for ordering vehicles, faster response times, and fewer cancelled trips. Some also mentioned more comfortable vehicles with better suspensions. Several of the respondents also noted, however, that taxis were on the decline in their cities and service quality was mixed.

Among the program users interviewed, a major benefit of taxi and TNC services was the ability to schedule return trips when they were ready for them, rather than having to estimate a likely departure time a day or more in advance. This was brought up in about half of the interviews with elderly and disabled persons and was seen as especially valuable for return trips from medical appointments, where the doctor's schedule sometimes slips, or additional tests are ordered. Some paratransit systems have special programs for medical trips that are better able to deal with this, but for others, the strategy for handling potential delays at the doctor's office or hospital is to build in extra time, often an hour or more, to the scheduled return trip for the patient. This often results in long waits for patients who in many cases are exhausted from treatments. The ability to call a taxi or TNC for the ride home when the patient is ready to depart is a major advantage.

Emergency care and short notice social trips were highly valued by older TNC users. As one respondent put it, "When I have somewhere I would like to go on short notice, paratransit is worthless — you just can't do it. The [TNCs and taxis] are a blessing." Another noted that she greatly valued being able to accept a same-day invitation to join a family member for dinner, requiring a trip that paratransit could not serve.

TNC Advantages over Taxis

While most of those interviewed felt that both taxis and TNCs offered advantages over paratransit for those who could use the smaller vehicles, many also saw advantages that TNCs offered over taxis. In this context it should be noted that while service providers and program sponsors are commenting based on expertise in the field, data reviews, and professional information exchanges, most program users are commenting based on personal opinion, some developed through experience and some through conversations with friends and family and from media reports. Only about a third of the program participants / service users we interviewed had actually used a TNC service for one or more trips, although this did

include a variety of users including people with difficulty walking and standing for more than a few minutes as well as users of folding wheelchairs, walkers, and crutches. Hence their comments about TNCs are based more on reputation than on experience.

Faster response times and fewer cancelled trips were key advantages most respondents attributed to TNC services compared to taxis. In part this was attributable to availability: there were many more TNC vehicles operating in their cities than taxis. In part this was attributable to better technology support for TNC drivers than for taxi drivers: TNC vehicles could be tracked and dispatched efficiently, with accurate arrival times provided to the customer, and the TNC drivers had GPS wayfinding systems and the ability to contact the customer upon arrival, whereas taxi operators either lacked these supports or had only limited versions of them. Cities with a large number of owner-operators of taxis were especially aware of the technology gap.

Polite drivers and clean and well-maintained vehicles were also frequently cited as advantages for TNCs compared to taxis. This was usually attributed to the driver and car rating systems the TNCs offer. As one service provider put it, "Taxis aren't always a great option because some of the drivers are unhelpful to say the least and there is no accountability. So, if my clients could call Uber and get someone who has an incentive to be polite, have a clean car, and come fairly quickly, that would be great." Several of the program participants echoed these sentiments, commenting that they felt that TNC drivers were courteous and professional and that their vehicles were well maintained and clean, whereas their experience with taxi drivers and their vehicles was far more mixed.

Concerns about TNCs

Despite the fact that many of those interviewed saw TNCs as having advantages over taxis, the interview respondents also raised concerns about the use of TNCs in programs to provide services to the elderly and disabled. Issues raised included a shortage of WAVs, other equity issues, safety concerns, and concerns about the long-term viability of the TNC business model. Public agencies and administrators viewed TNCs' reluctance to share data that public agencies believe they need to manage programs also was seen as a major problem.

In the interviews, program funders and administrators often cited literature to support their points, and we have reported that literature here. Program users were largely responding based on personal experience or viewpoints developed from reading about TNCs or discussing them with friends and family members.

Wheelchair Accessible Vehicle (WAV) Availability

As noted earlier in this report, a shortage of WAVs has been a major concern about TNCs. Several of the service providers cited details: In the US, 2.9 million people use wheelchairs or scooters, and of those, 1.2 million use motorized scooters or wheelchairs (Brumbaugh 2018) and would therefore need a WAV or a specialized paratransit vehicle if the wheelchair is unfoldable. Currently, non-WAV vehicles will take a rider who can transfer without assistance into the vehicle, but most taxis and TNCs are not WAVs.

Both Uber and Lyft have faced lawsuits from disability advocates claiming they have not complied with the ADA. For many years Lyft would refer wheelchair users to local taxi WAV providers, but with a limited number of taxis meeting the WAV criteria, users remained dissatisfied. Uber began providing a connection to WAVs in 2015 (Uber 2015) and in November 2018, announced a six-city partnership with MV Transportation to begin providing WAV service through its app (Siddiqui

2018). MV Transportation would provide the vehicles and trained drivers; Uber set a goal of 15-minute response time. In July 2019, Lyft announced their partnership with First Transit to begin a similar service (First Transit 2019).

During the same period, California and several other states passed laws to increase WAV availability. In many jurisdictions, taxi companies have been required to provide WAV service, although this had often been a battle to achieve. WAV vehicles are expensive, and few people purchase them without being mandated to do so or having a contract that provides assurance of, at minimum, cost recovery. In the absence of government mandates, the TNC model, in which drivers provide the vehicles and have been considered to be independent contractors, has made it difficult to deliver WAV services. Recognition of this has been one impetus for the state and city legislation to add a fee per TNC ride dedicated to funding additional WAV and related services. Early adopters included Seattle, Tacoma, and Kings County, Washington, which all levy \$0.10 per trip originating in the city/county for taxis, for hire vehicles and TNCs, with funds distributed for documented itemized costs of wheelchair accessible taxis (Seattle CB 2014). Another early adopter was the City of Chicago. Chicago levies a \$0.10 surcharge on rides, with the proceeds deposited into an Accessibility Fund; since 2014, \$5.4 million has been distributed from this fund to purchase wheelchair accessible taxis or retrofit taxis to WAV status and subsidize their service. The number of wheelchair accessible taxis quadrupled between 2011 and 2019, from 91 to 384 (City of Chicago 2019). Portland, OR, is another well-established example; the city charges \$0.50 per-ride for each taxi and TNC trip, and the funds cover TNC administration and enforcement as well as a WAV rider subsidy of \$15 per ride completed (Portland Bureau of Transportation 2020). The relatively recent California legislation on WAVs should help California counties replicate these examples.

Providers of services to elderly and disabled contractors commented that it is not just WAV availability that matters, but also driver training in how to effectively serve people with frailties and disabilities. They argue that drivers of WAVs should be trained in how to safely secure passengers and equipment and how to communicate with WAV clients. However, as long as TNCs classify drivers as independent contractors, there is a disincentive for them to provide such training, which might provide further justification to claims for changing their status to employer (Waite 2018). As a result, both the availability and quality of WAV services offered through TNCs remains a topic of concern among service providers and users.

Other Equity Issues

Four additional equity issues were brought up during our interviews: call-in options for those without or unable to use the features of smartphones, payment options for people without credit or debit cards, barriers for people with visual limitations, and language barriers for those with limited English.

Over half of those over age 60 who were interviewed either had only a landline or a limited cell phone they used for calling family and a few others. This aligns with national data that show 47 percent of those over 65 lack a smartphone (Pew Research Center 2019). Even for some of those who did have a smartphone, they are not comfortable using all of its features. As one respondent answered, “I am trying to use the camera, but I am not very good at it. I phone people with it, but I don’t text or blog or tweet.” About a quarter of the respondents did not have a computer or lacked internet service at home. Both are barriers to signing up for and using transportation programs that rely on these technologies.

In addition, about ten percent of the respondents, primarily low-income people of color, did not have a credit card or debit card or were uneasy about using one to pay for trips, request discounts, and track monthly expenditures. As one respondent said, “But where do you look up the balance [on a monthly allotment for travel subsidies]? Is it online somewhere? Besides, I don’t have internet at home so I would have to ask my daughter to do this for me. So they could

charge me anything, how would I know?" Several service providers and caregivers saw this as a major barrier for the frail elderly who could more easily handle scrip.

Service providers reported on efforts being made to overcome these issues. For payment, options include government-provided or subsidized smart phones, free or deep-discount bank cards, and prepaid cards, although these options still require the ability to enter the information into an online account and replenish it periodically. Several respondents indicated that training programs offered at community centers could help program participants to set up accounts and show them how to use the technologies involved, as well as concierge services that handle the travel and payment arrangements for the traveler and keep track of charges for them. Still, the providers noted that some of their current clients, especially older adults, would prefer to stick with scrip or cash payments that are reimbursed.

For users, another barrier was finding the right car. One program participant succinctly expressed a view voiced by many: "I can watch out my window and tell a cab by its markings, but I have no idea how to tell an Uber." Twenty percent of the interviewees over 65 and about ten percent of those with disabilities said they would have difficulty identifying the car, driver, or license plate of a TNC vehicle, particularly after dark. People with visual impairments were particularly concerned that they would have trouble with vehicle identification.

Caregivers brought up the difficulty some of their clients have with last minute adjustments, for example, when the driver needs to pick the client up at the corner instead of in front of the building because the street is blocked. This exacerbates vehicle identification problems and, in some cases, can mean the difference between a mobility limitation and a mobility barrier.

Caregivers of frail elders expressed concern that getting them to their destinations was not too much of a problem because the caregiver would help with the arrangements, but getting them home again often depended on others having the willingness to help, either by calling the caregiver to make the arrangements or by helping with them directly. Caregivers stated that most medical offices were ready to provide assistance, but pharmacies, grocery stores, and other shopping destinations were mixed in their ability and willingness to do so.

Finally, language can be a barrier for both taxi and TNC programs, especially if the person requesting a ride is not fluent in speaking, reading, and writing English. This is also an issue at times if the driver is not fluent in English.

Call-in centers and concierge programs have been implemented in several cities to address these barriers, but smaller cities often lack the financial resources to address all needs. An example was given by a transportation planner for a city of around 200,000 people in California where staff preferred not to be identified in this report. The staff reported that the city introduced taxis into the mix in order to serve the ambulatory portion of the population who could use curb-to-curb taxi service. The city's paratransit service was averaging over \$60 a ride, and while this highly supervised and regulated service was deemed the best option for people with dementia or who required door-through-door assistance, analyses had shown that taxis would be less costly and more flexible for most trips made by the rest of the target population. A complication was that while there were sufficient taxis to meet community needs before the program was started, a large share of local taxi companies were owner-operator services or very small businesses with only a handful of vehicles, and these small operators were unable to expand to cover the added requests from the program. As a result, the city decided to add a TNC option.

City A established a call center for people without smartphones or would prefer not to order through an app, but limited its hours of operation to those in which a paratransit vehicle could be scheduled, believing this to be more equitable than

offering ambulatory customers more options than those offered to the non-ambulatory. The call center relies on volunteers as well as on staff and while it often has a Spanish speaker on call, none of the volunteers speak Mandarin or Cantonese, major languages in the area. Staff recognize this as an equity problem but are unable to address it within current budgets. Indeed, they noted that they are able to offer their program only because there is no federal funding involved; were they to use federal funding, the language gap would potentially be viewed as a civil rights violation and the limited hours of operation also could raise issues.

A cash option or scrip is available for paratransit and van services in City A, but not with the TNC option. Staff noted that here, too, there is an equity gap, but not one they can fill easily.

Safety Concerns

Safety concerns include vehicle operability, driver distracted or reckless driving, other violations of the vehicle code, driver operation while under the influence of controlled substances, and driver felonious acts against the passenger (and in some cases, vice versa), including serious crimes such as robbery, assault, and rape. Uber and Lyft both require background checks on driving and criminal records and have “zero tolerance” policies for drugs, but do not do regular drug testing or updates of background checks unless a jurisdiction where they operate mandates it. Nor do they provide detailed data on crimes and other safety hazards reported to them, and their enforcement of policies such as zero tolerance for drugs has come into question. News reports of safety violations by TNCs have raised public concerns, and some sources report that the rate of violation is many times higher than that acknowledged or than that occurring in regulated transportation services such as taxis and buses. In response, states and localities have taken a variety of actions to improve safety, ranging from required driver training, to frequent safety inspection of vehicles, to DMV checks of reported moving vehicle violations, to periodic checks and testing of drivers. (See, e.g., SFCTA, 2017; Hyde, 2019; Marshall, 2019.)

Rides program sponsors noted that safety checks can become a big issue if federal funds are involved; these tests focus on drug and alcohol testing. In particular, the Federal Transit Administration (FTA) requires, at 49 CFR Part 655, that agencies who take federal funds give drivers and other safety-critical employees periodic drug and alcohol tests. In interviews with multiple city and transit agency accessibility planners, this regulatory requirement was discussed as a potential barrier to the use of TNCs if funding from federal sources is used to support the program. However, there is a loophole: the FTA has long had a policy known as the “taxicab exception” that states that the testing requirement’s applicability to taxi companies depends on whether the passenger can choose when selecting a ride (49 CFR Parts 653). The FTA Shared Mobility FAQs explains that to qualify for the taxicab exemption, a city or agency must “contract with at least two ridesourcing companies and/or taxicab companies to ensure the passenger has a choice of which provider to contact for a ride.” (FTA 2017). This allows TNC companies to escape the testing regulation as long as competition is in place.

Some states and cities require drug and alcohol testing regardless of whether federal funds are used. For example, a recent survey of 18 TNC-transit agency partnerships found that 28 percent had TNC drivers tested for drug or alcohol testing due to state or city requirements (Curtis et al 2019). New York City’s Taxi and Limousine Commission requires that all TNC drivers submit to drug testing annually in order to register for their license.

Safety registered as a concern among those interviewed for this project, but it was not as prominent a concern as the basic problems with being able to access and use TNC services.

TNC Viability Concerns

A number of the experts we interviewed raised concerns about the long-term viability of TNCs. Noting that TNCs have consistently been losing money and are kept afloat by venture capital, the experts raised the specter of venture capital walking away before the future of automated vehicles with few labor hassles (hence a bigger chance of lower costs, a large market share, and profitability) becomes a reality, or of drastically rising prices if TNCs kill off much of the competition. They raised questions like: What would happen if the regulated part of the cars-for-hire market, which is mostly taxis, were to fade into oblivion? What would happen if for-hire ride prices rise to their unsubsidized costs (and what are those costs?) What would happen if drivers are classified as employees instead of independent contractors and the companies must meet labor standards and pay payroll taxes for such employees? What would happen if drivers are employees, and the minimum wage is set at \$15/hr.? Such questions have implications not only for the TNC companies and their employees but also for public agencies that contract with taxis and TNCs for services.

Current debates over TNC drivers' employment status are tied to debates over the classification of workers as independent contractors. In a recent Supreme Court of California case, *Dynamex Operations West, Inc. v. Superior Court* (2018), the court held that most workers are employees and that the burden of proof for classifying individuals as independent contractors belongs to the hiring entity. A state law, AB 5 (2019), has recently codified this decision and its test for determining employment classification. Workers classified as employees are entitled to an array of benefits included minimum wage protection, sick leave, Social Security and Medicare contributions, and unemployment and workers' compensation insurance. Since AB 5 was enacted, California courts have ruled that TNC drivers are employees. Uber and Lyft attempts to gain an exemption from this legislation have so far been denied, and as of this writing litigation and political wrangling over this matter continues. An initiative is on the California statewide ballot for 2020 and if it passes, the law would be set aside and rideshare and delivery drivers will be classified as independent contractors.

A related issue is ongoing litigation and wrangling over the level of WAV service that TNCs can be required to provide. Both Uber and Lyft are facing several lawsuits that claim they have violated ADA (Hu 2017). These have not been resolved as of this writing but raise dual threats: for the TNCs, the risk has to do with potentially having provide greatly increased levels of WAV service; for local agencies, the risk is how reliant to become on TNC WAV service.

Data Sharing

A major concern raised by professionals working in this field is data sharing. Put simply, TNCs have been unwilling to provide the level of detail about users, their trips, travel patterns, and costs that public agencies would like to have in order to manage rides programs. Agencies would like to have specific person-trip data so that they can evaluate per-client usage rates, the purpose of trips made, trip lengths, wait times and travel times, and the time of day of travel and consequent impacts on traffic and environmental performance. They would also like information on cancelled trips, the vehicle type used, and whether the rider required extra assistance. In the case of the TNC partnerships for older adults, cities typically want at minimum information on trip origin and destination, times of arrival and departure, fare paid, response time, and whether the vehicle is a WAV or not. What they typically get is more aggregated and general. The TNCs argue that doing more would violate customer privacy and put their competitive advantages at risk.

Debates over data ownership and sharing are ongoing across emerging mobility technologies, from TNCs to micromobility to autonomous vehicles. Cities, states, private mobility providers and privacy advocates are all engaged in a larger conversation of what level of data granularity cities may access and use. The issue is bigger than rides programs and has been politicized in many jurisdictions.

TNC policy managers have expressed concern about the privacy of their riders if data such as origin-destination information were provided, as this could result in disclosure of personally identifiable information. Organizations such as the ACLU and other privacy groups also have weighed in with concerns about required reporting of detailed travel times and paths. Yet one TNC staff member acknowledged that many agencies have had agreements that provide both user information and O-D data (trip start and end), and another noted that some social service programs have negotiated the ability to follow their client's trip door to door. Hence opportunities for negotiation clearly exist. Public agency staff members pointed out that recoding street addresses to major destinations (transit stations, hospitals, grocery stores) or trip purposes (school, grocery shopping, healthcare, etc.), assigning trip ends to block groups, and/or replacing personal information with a coded ID would provide the same level of privacy that travel surveys assure.

Currently, different policies on data sharing are in place in different states and cities (SFCTA, 2017) and in several states, legislatures have stepped in to prevent cities from requiring detailed data submissions. This is problematic, since the data cities are seeking have policy consequences for designing rides programs. For example, one transit agency accessibility manager who chose not to pursue a partnership with TNCs framed the need to receive data (and the TNCs' unwillingness to share it) as a barrier to ensuring equity between WAV users and other users. As she put it, "If we don't know the wait time and fare for [wheelchair] accessible [vehicles] versus those that are not accessible, how can we say it provides equivalent service?" She rejected the idea that a program with Uber, Lyft and WAV-taxis together provided equivalent service due to differential (and unreported) wait times.

Efforts are underway to create better data sharing understandings and agreements. As examples, the City of Toronto's model data-sharing agreement (n.d.) provides details on the sorts of information a city would wish to have; a recent FTA presentation discusses how a number of agencies have dealt with data sharing and privacy issues (Schneider, n.d.). Still, more work is needed in this area.

Potential Solutions

Through the literature review, case studies, and interviews, we have identified key challenges to enhancing mobility among older adults and people with disabilities through the introduction of TNC services, as well as ways to overcome the challenges. We also have identified some characteristics of programs that, in our view, are best practices. Here we discuss the key challenges raised and potential solutions to those challenges — most of which have already been piloted in one or more settings. We then discuss additional program features that both professionals in the field and users of rides services have recommended as ways to maximize equity, flexibility and dignity for the users while recognizing budget constraints that agencies must respect.

Challenges and Ways to Overcome Them

Table 2 presents a list of challenges and possible ways to overcome them in designing rides programs seeking to include TNCs as well as taxis. For many challenges, there is more than one way forward.

Users Needing Assistance and WAV Provision

Many service providers support taxi and TNC options as a less costly service that also can provide higher quality service than conventional paratransit, and in many cases, regular transit as well. However, for those who need assistance getting in and out of the vehicle, storing appliances, etc., a wheelchair-accessible taxi or TNC vehicle is a preferred option. WAVs typically are less expensive on a per ride basis than paratransit, though the level of assistance can vary.

While many jurisdictions have implemented programs that mandate WAV services as part of taxi and TNC services, and an increasing number of jurisdictions are providing means of subsidizing WAVs, additional steps are needed for WAVs to be a fully integrated part of taxi and TNC rides programs. First, level of service standards are needed — for example, an expected response time of 15 min. or less. Second, drivers of WAVs must be trained in both how to safely secure passengers and equipment in vehicles, and how to deal with frequent client needs. This can be provided through online or classroom training addressing passenger assistance and passenger sensitivity, observation training behind the wheel, and meeting staff members at “frequent trip generators” such as senior centers and health care facilities.

Smartphone Issues

Cities and nonprofits can offer classes to seniors at community centers or other comfortable, easy to reach venues to teach them how to use key smart phone features and offer assistance in setting up apps on their phones.

If the cost of a smart phone is at issue, programs that offer lifeline rates for such phones can provide a solution. The Federal Communication Commission’s LifeLine Assistance program is designed to help low-income households acquire smartphones, minutes, and data. LifeLine provides a monthly subsidy of \$9.25 per month for low income households, defined as 135% of the federal poverty line, for wireline or wireless service. Service providers provide the discount to verified customers and then seek reimbursement from the Universal Service Administrative Company (USAC), a non-profit that administers the federal Universal Service Fund. The USAC is overseen by the FCC. In California, the Lifeline program is run through the California Public Utilities Commission and discounts are available to people who meet specified income criteria or qualify for any of a number of public assistance programs (CPUC, n.d.)

An issue with telephone lifeline programs has been that potential clients do not always know about their availability or how to request participation. Training programs and information on rides program websites can help in this regard.

Table 2. Challenges and Potential Solutions

Challenge	Potential Solution
Users who need assistance getting into /out of the vehicle, storing mobility aids such as wheelchairs, etc.	WAV provision; door through door assistance Driver training
Users who lack a smartphone	Lifeline program subsidizing smartphone acquisition and use Concierge services
Users who are uncomfortable using smartphones and apps	Training classes on use of apps Concierge services
Users without a bank account/credit card	Pre-paid debit cards, free money management cards Centralized billing system (concierge or agency-based)
Users who are used to paying in cash	Training classes on use of credit or debit cards Money management cards that allow cash deposits that are then charged for each trip
Users who cannot afford the monthly cost of travel at the basic subsidy	Means-tested subsidy
Users with high travel needs for, e.g., medical trips, work trips, school trips, day care trips	High travel needs coverage
Trip distance and boundary Issues	County and region-wide programs No distance limits (may require funding choices)

Payment Issues

For some users, the lack of a credit or debit card to which to charge trips made in a TNC is a barrier to their use. TNCs generally will accept a variety of forms of payment in addition to credit and debit cards, such as GooglePay, ApplePay, PayPal, etc., but not cash. The requirement for an established payment account with a minimum balance available is standard.

A possible solution for those who lack credit or debit accounts is a money management account. Such an account typically can be set up with cash or check, requires a low minimum balance, and is relatively low-cost to use. An example is Bluebird, offered by American Express, which functions almost like a checking account. Assistance may be necessary to instruct the user how to use an app on their cellphone or how to log on via computer to access the account to check expenditures and balances.

The need for an account is likely to still be a barrier for those with bad credit, but a money management card in which a public subsidy can be deposited periodically may be a way forward, as long as the subsidy allows the minimum balance to be achieved and maintained.

Once an account is established, subsidies from a sponsoring agency can be made through direct deposits or fund transfers to the account or may be provided to the user via gift cards usable only on the specified TNC. The gift cards can be linked to the money management account and can be provided monthly or quarterly. Many agencies prefer to make such payments via gift card (limited credit card) because unrestricted deposits to a credit or bank account could be used for purposes other than transportation.

For other users, especially older users, there is a strong preference to use cash, especially for small expenses (Kiger, 2017). Taxi rides programs typically avoid this being a problem by giving clients scrip to pay for their trips; in our interviews we found that users viewed scrip as a form of money or a coupon, both familiar and acceptable items. If the issue is discomfort in using a credit system rather than cash, a prepaid card to which the user deposits cash may be an acceptable solution, especially if accompanied by training on how to use it. However, if the issue is paying at the time of service through a physical transaction — which seems to be the case for some of our respondents — the only way forward we can propose is additional training and guidance in use of new media.

Affordability and Use Levels

As we have noted earlier, many rides programs serve disabled and elderly persons, and some also serve low income clients. These groups overlap but are not identical. For low income program participants, cost sharing for trips by taxi or TNC can be burdensome. A way to reduce this burden would be to tie the level of subsidy to user means. For example, a person who is not low income might receive a subsidy set at the same level as the marginal transit rider subsidy for the transit system, or some multiple of it to account for higher costs in serving people with disabilities. A low-income person might receive a higher subsidy based on a means policy, which in turn could be tied to eligibility for other public assistance programs.

Programs also could include provisions for extra assistance for high-needs clients, who may need to travel frequently — daily or many days a week — for medical services, work or school, or day care. Programs that have a cutoff monthly subsidy without consideration of need can leave some users in the lurch.

Boundary and Trip Distance Issues

Some taxi and TNC programs limit access to within city or county boundaries, while make exceptions for life-saving trips such as trips for dialysis. While such limitations are often the result of using funds with their own jurisdictional limitations, they can create unintended hardships, especially for those who live close to a boundary and for those who must make trips that are longer than average, for example to a hospital for specialized treatment. Programs that provide for consumer choice regarding trip purpose, trip distance, and trip frequency clearly give the user greater flexibility and are more respectful of user autonomy than those that set top-down limits.

Concierge Services

Concierge services can address several of the challenges that are raised by programs seeking to include TNCs as well as taxis in offering rides to older populations, people with disabilities, and/or low-income people. Concierge services can handle situations where the target population does not have access to a smartphone or is uncomfortable using one, by serving as an intermediary in making and confirming reservations. It is also possible to arrange for concierge services to handle and

track payments, stay in touch with users about how much of their allotment has been expended, etc., which can remove the credit card problem.

Another potential benefit of concierge service is improving efficiency and containing administrative costs. Typically, the concierge tracks trips made by program enrollees and distributes the subsidy to the providers, reducing paperwork for the program sponsor. In addition, the concierge can manage the database of eligible users, ensuring it is up to date and accurate; monitor and report usage by user categories; and provide customer assistance. This is in contrast to programs where much of this work falls on a city department. Concierge programs also have been credited with reducing the proportion of non-eligible riders receiving the subsidy, on the grounds that it is more difficult to share electronic ride scheduling with non-eligible users than to pass scrip along to family members or friends, but we were not able to find hard data to confirm this.

An example of a concierge service is GoGo Grandparent, a private company whose mission is to assist senior citizens and other non-drivers to use transportation services without needing a smartphone. GoGo Grandparent connects the caller with an agent who requests the transportation network service on behalf of the caller.

The GoGo Grandparent service is operational 24/7. Additionally, callers can highlight specific needs they have, and the GoGo Grandparent operators will make sure that the TNC drivers are capable of meeting those needs (e.g., wheelchairs, low floor vehicles, accommodation of guide animals). Frequent destinations can be programmed into the app, making its use easier (e.g., set 1 for home). There is also an option for GoGo Grandparent to send a text message to a family member or friend to keep them updated on the caller's ride and let them know that they arrived safely.

GoGo Grandparent is operational all over the United States and Canada. As of May 2019, partners included transit agencies, cities, senior centers, and hospitals.

Membership fees vary with the program design and services provided, as shown Table 3 in the Appendix (2019 data). In addition to these membership fees, GoGo Grandparent charges a concierge fee of \$0.27/minute on top of the fare (GoGo Grandparent FAQ, 2018). Thus a 15-minute trip will incur a surcharge of about four dollars, which for typical urban/suburban speeds of 15-20 mph translates into a surcharge of \$.80-\$1.00/mile, on fares averaging \$1.50-\$3/mile depending on the area, time of day, etc. This is not a minor charge and it sometimes puts the costs of subsidized, GoGo Grandparent-assisted rides above those of unsubsidized TNC rides.

One issue that has been raised about using GoGo Grandparent is that the rider is unsure of how much they will have to pay until after the ride is complete. This is because they cannot see how much the vendors' fee is when it is ordered, and they are unsure of how long the ride will take. In addition, wait times can be longer than typical TNC rides when the app must find drivers who are able to meet a specific riders' needs. Drivers are given training, but there have been complaints about its adequacy. There also have been complaints from drivers saying they have to do more work for these rides but receive no additional pay for their efforts. (Emerson, 2017.)

Concierge services also can be offered through nonprofit organizations, which may be able to offer services tailored to local needs to a greater degree than national organizations can accommodate. For example, the LIFE ElderCare program has provided a variety of rides assistance, ranging from TNC arrangements to door-through-door services with volunteer drivers, and public partners have been able to establish different services for different categories of riders, as well as different subsidy rates (e.g., higher subsidies for very low-income recipients). The NGO's services include many of those

offered by GoGo Grandparent, for about the same costs; for 2019 the LIFE ElderCare costs were slightly lower, at 25 cents/minute. Other Best Practices

Several additional policies and practices were identified by interview respondents — both providers and users — as making a big difference in the quality of services provided in rides programs. They include the following.

For all taxi and TNC services:

- Vehicle safety inspections — annually or based on mileage (e.g., every 50,000 miles)
- Periodic driver checks — annually or randomly
- Driver training, for all drivers but especially for WAV drivers and others who serve older adults and people with disabilities.

For government subsidized programs:

- Response time standards — aiming for service comparability whenever possible
- Data sharing agreements — to allow sponsors to track performance and determine whether goals are being met; also, to allow for audits of charges (as elements in contracts for service)
- Concierge services to assist those unable to make use of cell phones or credit cards or both
- Retention of taxis as well as TNCs as program options for those who prefer taxis
- 24/7 service hours if possible — otherwise match to transit schedules
- No restrictions on trip purpose or frequency unless mandated by the funding source
- No restrictions on trip length — provide flexibility for user, dollar amount subsidy per month or per quarter preferred over city or county boundaries
- Lifeline rates for low income users, or needs-based subsidies
- Additional assistance for users with high needs, e.g. daily or high frequency of trips for medical, work, school, day care, etc.

Providers also were interested in possibilities for combining services for older adults and ambulatory seniors with disabilities with services for other transit users, especially in suburban settings; however, they agreed that more study would be needed to work out details.



Standard Account

- Members are registered individually under one partnership
- A special registration page that you can use to register your riders
- A dashboard to keep track of your members and the rides that they take.
- Staff, management or members can order rides.
- The company or organization can choose how much of each ride they will cover

Account Restrictions

- None

Pricing:

Option One:

- \$500 one time payment

Option Two:

- \$99.00 set up fee
- \$2 per member/per month (PMPM)

Billing:

- You can elect to have a credit card charged after each ride or prepay for the services by check or credit card. If the rider is expected to pay for a portion of the ride, we will charge them directly.



Standard Account

Nonprofit

- Members are registered individually under one partnership
- A special registration page that you can use to register your riders
- A dashboard to keep track of your members and the rides that they take.
- Staff, management or members can order rides.
- The company or organization can choose how much of each ride they will cover

Account Restrictions

- None

Pricing:

Option One:

- \$400 one time payment

Option Two:

- \$99.00 set up fee
- \$2 per member/per month (PMPM)

Billing:

- You can elect to have a credit card charged after each ride or prepay for the services by check or credit card. If the rider is expected to pay for a portion of the ride, we will charge them directly.


 <p>GO GO GRANDPARENT</p>	 <p>GO GO GRANDPARENT</p>
<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;">Premium Account</div>	<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;">Premium Account</div>
<ul style="list-style-type: none"> • Members are registered individually under one partnership • Partners control ride ordering and scheduling through an operator portal • A special registration page that you can use to register your riders • A dashboard to keep track of your members and the rides that they take. • The company or organization can choose how much of each ride they will cover • Partners can order rides through their operator portal or have their members call us 	<p style="text-align: center;">Nonprofit</p> <ul style="list-style-type: none"> • Members are registered individually under one partnership • Partners control ride ordering and scheduling through an operator portal • A special registration page that you can use to register your riders • A dashboard to keep track of your members and the rides that they take. • The company or organization can choose how much of each ride they will cover • Partners can order rides through their operator portal or have their members call us
<p>Account Restrictions:</p> <ul style="list-style-type: none"> • Minimum of 30 members 	<p>Account Restrictions:</p> <ul style="list-style-type: none"> • Minimum of 30 members
<p>Pricing:</p> <p><i>Option One:</i></p> <ul style="list-style-type: none"> • \$2500 one time payment <p><i>Option Two:</i></p> <ul style="list-style-type: none"> • \$199.00 set up fee • \$3 per member/per month (PMPM) 	<p>Pricing:</p> <p><i>Option One:</i></p> <ul style="list-style-type: none"> • \$1500 one time payment <p><i>Option Two:</i></p> <ul style="list-style-type: none"> • \$199.00 set up fee • \$3 per member/per month (PMPM)
<p>Billing:</p> <ul style="list-style-type: none"> • You can elect to have a credit card charged after each ride or prepay for the services by check or credit card. If the rider is expected to pay for a portion of the ride, we will charge them directly. 	<p>Billing:</p> <ul style="list-style-type: none"> • You can elect to have a credit card charged after each ride or prepay for the services by check or credit card. If the rider is expected to pay for a portion of the ride, we will charge them directly.

Figure 1. Example: GoGo Grandparent Options

Conclusion

TNCs have the potential to provide quick-response transportation services for seniors and people with disabilities, and in many communities and for many users they have outstripped taxis in terms of availability, response times, ease of ordering and billing, reliability, comfort, and even price. The TNCs' focus on customer service has raised expectations for the entire transportation ecosystem. However, the standard TNC service delivery system does not work well for some; wheelchairs users are in a particularly difficult position, and those who are not equipped with smart phones and e-payment options may be left out as well. This can exacerbate equity issues of income, accessibility, and the digital divide. However, none of these difficulties seems impossible to overcome, and ways to do so have been set forth and in many cases have been tested in one or more cities.

The provision of faster, higher-quality, and still affordable on-demand services for seniors and people with disabilities through TNCs is an area of interest to many cities and transit agencies. As program sponsors continue to experiment with ways to address concerns, information sharing will almost certainly allow most barriers to be overcome.

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Appendix. Database of Taxi SCRIP Programs

Table 3. Data as of Fall 2019

City/County	State	Program Name	Program Administrator	Eligibility Criteria	Subsidies, Co-Pays, Restrictions
Alameda	CA	Premium Taxi Service	City of Alameda	Residents 70 and older	Pay full cost and submit receipt for 70% reimbursement. NOTE: service discontinued Jan. 28, 2020 due to decreasing taxi services.
Albany	CA	Taxi Subsidy Program	City of Albany	Residents 80 and older or 18+ with a disability	Pay full cost and submit receipt at Albany Senior Center for 75% reimbursement, up to \$100.
American Canyon	CA	Taxi Scrip Program	City of American Canyon, Parks and Recreation Department	Residents 65 and older or with a disability	Buy \$20 voucher booklet for \$10; max. 3 booklets/ month. Service area includes Vallejo.
Berkeley	CA	Taxi Scrip Program	City of Berkeley, Housing and Community Services Department	Residents over the age of 80 OR 70-79 with income below 50% of AMI OR certified disabled	\$120/quarter; high medical needs clients can get additional scrip. East Bay pickup.
Concord	CA	Get Around Taxi Program	City of Concord Commission on Aging	Residents 65 and over	Buy \$30 booklet of scrip for \$15 (\$15 subsidy/booklet), max. 2 booklets/month. May not use scrip to tip. Service area includes neighboring cities. Cancellations no less than one hour before pickup time or \$15 cancellation fee applies.
Dublin	CA	Go Dublin!	Livermore-Amador Valley Transit Authority (LAVTA)	Dublin residents 18 or older (not limited to older adults or people with disabilities)	50% discount, up to \$5/ride, for UberPOOL, UberWAV, or Lyft Line rides. Taxi service initially but discontinued. No maximum subsidy.
El Cerrito	CA		City of El Cerrito	El Cerrito residents age 65 or older or over 18 with disabilities.	Buy \$20 booklet of 10 tickets. Each ticket can be used to pay for a one-way ride, which must begin and end in El Cerrito. Can schedule same day or up to two weeks in advance.

City/County	State	Program Name	Program Administrator	Eligibility Criteria	Subsidies, Co-Pays, Restrictions
Emeryville	CA	Taxi Reimbursement Program	City of Emeryville	Residents age 70 and older	Pay full cost and submit receipt for 90% reimbursement up to \$80/mo.
Escondido	CA	Taxi Voucher Program	Senior Services Council Escondido (nonprofit)	Residents age 50 and older with no other means of transportation and annual income under \$30k (for 1-2 person household).	Taxi voucher valued at \$14 each way. Medical appointments only.
Fairfield and Suisun	CA	Reduced Fare Taxi Program	Fairfield and Suisun Transit (FAST)	Residents of Fairfield and Suisun City who are 60 years or older.	Buy \$20 booklet of scrip for \$10 (\$10 subsidy/booklet). Up to 25 booklets/mo. Proof of eligibility each trip. Service in sponsoring cities and nearby unincorporated areas.
Fairfield and Suisun	CA	Adult Recreation Center (ARC) Taxi Program	Fairfield and Suisun Transit (FAST)	Resident over 60 or certified disabled	Pay \$2 for a ticket one-way ride to the Adult Recreation Center when it is open. Tickets cannot be used to tip.
Fremont, Newark and Union City	CA	Ride-On Tri-City Taxi Service	Cities of Fremont, Newark and Union City	Residents age 70 and older (Fremont + Newark), age 80 and older (Union City) or disability	Pay \$4 per ride up to \$20, passenger pays excess of \$20 up to \$16/ride. Up to 300 one-way trips a year; trips within sponsoring cities only.
Fresno County	CA	Senior Taxi Scrip Program	Fresno COG	Fresno County residents age 70 and older.	Buy \$20 booklet of scrip for \$5; max. 5 booklets/mo. May use scrip to tip. Not all taxi companies accept scrip and user must notify dispatcher that scrip will be used.
Hayward and San Leandro	CA	Central County Taxi Program	Cities of Hayward and San Leandro	Residents age 70 and older or with a disability	Voucher costs \$3.50 per ride; min. 10 vouchers, max. 30 vouchers /mo.
La Mesa	CA	Senior Taxi Scrip Program	City of La Mesa	Residents of a community within the Grossmont Healthcare District age 65 and older or with a disability that prevents driving or using existing public transit services	Buy \$20 booklet of scrip for \$10; max. 5 booklets/mo. Scrip can be used for up to 50% of the cost of a ride or the first \$12. Off-peak and advance scheduling recommended.
Lafayette	CA	City of Lafayette - GoGoGrandparent PPP (pilot)	City of Lafayette Senior	Residents of Lafayette age 70 and older	50% subsidy of ride not including \$.19/minute oversight fee by GogoGrandparent; up to \$50.

City/County	State	Program Name	Program Administrator	Eligibility Criteria	Subsidies, Co-Pays, Restrictions
			Transportation Program		Service anywhere served by Uber or Lyft.
Lafayette/Moraga/Orinda	CA	Lamorinda Spirit Van	City of Lafayette	Resident of Lafayette, Moraga or Orinda (Lamorinda) age 60 and older. Discount for low income residents.	Rides with destinations inside Lamorinda are \$5, \$10 outside Lamorinda to Concord, Martinez, Pleasant Hill and Walnut Creek Senior Center. Rides for low income residents are \$4 whether inside or outside Lamorinda. Available M-F 9am-5pm. Schedule 2 days in advance by 1pm.
Los Angeles	CA	CityRide	LADOT	City of Los Angeles (and some additional part of the County) Residents age 65 and older or with a disability	Pay \$4 per ride up to \$20, passengers pay excess of \$20; \$84 of scrip per quarter (pay \$21); CityRide card for payment.
Monterey	CA	City of Monterey Senior Taxi Scrip Program	City of Monterey	Resident age 65 and older	Buy \$20 booklet of scrip for \$10. Service area includes Monterey, Seaside, Sand City and Del Ray Oaks.
Napa	CA	Lifeline Taxi Program	Vine Transit	65 and older OR ADA certified OR Disabled (any age). If they do not have ADA certification, they can submit signed medical documents evidencing their disability	Buy \$20 booklet of scrip for \$10; up to 3 booklets/mo. Taxi scrip ID and photo ID must be shown each trip. Scrip cannot be used to tip. Rides must begin and end in the City of Napa.
Oceanside	CA	Taxi Scrip Purchase	Oceanside Senior Transportation Program (nonprofit)	Oceanside residents age 65 and older	Buy \$20 booklet of scrip for \$10 (\$10 subsidy/booklet). North County service area.
Pleasant Hill	CA	Pleasant Hill Senior Van Service	City of Pleasant Hill	Resident of Pleasant Hill and age 55 and older	\$1.50/ ride. Rider may tip but automatically calculated at 10% up to \$2. Service area includes Pleasant Hill M-F, certain days in Walnut Creek, Concord or Martinez for medical appointments. Available M-F 9am-5pm. Schedule 2 days in advance by 1pm

City/County	State	Program Name	Program Administrator	Eligibility Criteria	Subsidies, Co-Pays, Restrictions
San Francisco	CA	SF Paratransit Taxi program	SF Paratransit	Residents who are wheelchair users, kidney dialysis patients or over 80 years old. Agreements in place allow trips to Alameda and Marin Counties	Pay \$6 to add \$30 to SF Paratransit Debit card which must be used. Rider may tip but automatically calculated at 10% up to \$2. Call at least 30 min. in advance.
San Mateo	CA	Get Around Senior Rides Program	City of San Mateo Parks and Recreation Dept.	Residents age 60 and older	\$5 for a one-way ride (\$2 for low income); 8 one-way rides per month. Rides must begin or end in the City of San Mateo. Service area includes: Belmont, Burlingame, Foster City, Hillsborough, Redwood City, San Carlos, the Veteran's Hospitals in Menlo Park and Palo Alto, and Stanford Affiliated Medical Offices.
San Pablo	CA	San Pablo Senior Transportation	City of San Pablo	Residents over age 55 or with a disability	\$20 booklet of 10 tickets; each ticket can be used to pay for a one-way ride in San Pablo and surrounding area; 24 hr. advance reservation req'd; service M-F 9-4:15.
Santa Cruz County	CA	Lift Line	Community Bridges (nonprofit)	Resident age 60 and older or disabled and income below 300% of the Federal Poverty Level	Buy \$30 booklet of scrip for \$8 if income under 200% FPL, \$16 if income 200-300% FPL. Pay in scrip or scrip and cash. Medical trips may be free. Schedule 8:30 am 3:30 pm.
Seaside	CA	City of Seaside Senior Taxi Scrip Program	City of Seaside	Resident age 65 and older	Buy \$20 booklet of scrip for \$10 (\$10 subsidy/booklet). Service area within Monterey, Seaside, Sand City and Del Ray Oaks.
Solano County	CA	Solano County Intercity Taxi Scrip Program (Part of ADA Service)	SolTrans	ADA-qualified residents	

City/County	State	Program Name	Program Administrator	Eligibility Criteria	Subsidies, Co-Pays, Restrictions
Vallejo and Benicia	CA	SolTrans Local Taxi Scrip Program	SolTrans	Vallejo or Benicia Resident AND 65 and older OR Medicare cardholder OR have a disability as defined by the Regional Transit Connection Discount Card program	Buy \$10 booklet of scrip for \$5; can buy 10 booklets/wk. or 20/mo.
Hartford	CT	Freedom Ride	Greater Hartford Transit District	ADA-qualified residents	50% discount of rides up to \$100 value per month; value loaded on debit or voucher card and matched dollar for dollar. Trip must begin or end in requested taxi company's service area.
Delaware	DE	Senior Citizens Affordable Taxi (SCAT)	Delaware Transit Corporation (DART First State)	Anyone 65 years of age and older or any person with a physical or mental disability which prevents them from operating a motor vehicle	Buy \$10 booklet of scrip for \$5
Chicago	IL	Taxi Access Program	Pace Suburban Bus Service	Senior residents in Chicago already eligible for the Regional Transit Authority's (RTA) ADA program	Pay \$3 per ride up to \$20, passenger pays excess of \$20 (subsidy up to \$17/ride). High needs users eligible for up to 4 trips/day. Uses a special taxi access program card which all Chicago taxis must accept. Trips must begin in City of Chicago; reserve 1 day in advance.
Montgomery County	MD	Call-n-Ride	Montgomery County/ MDOT	Residents age 67 and older or 18-64 with a disability	Buy \$60 value on swipe-n-ride card. Pay on sliding scale from \$5.25 if income under \$16k to \$30 if income \$27k-\$32.5k. Trips must be within the county and for medical appointments.
Boston	MA	Taxi Discount Coupon Program	City of Boston Elderly Commission	Residents age 65 and older or have a disability	Buy \$10 booklet of scrip for \$5, 2 booklets/mo.
Brookline	MA	Brookline Elder Taxi System (BETS)	City of Brookline	Residents aged 60+ with low to moderate incomes	Buy \$10 booklet of scrip for \$5; up to 5 booklets/mo. Trips must be within the city.

City/County	State	Program Name	Program Administrator	Eligibility Criteria	Subsidies, Co-Pays, Restrictions
Newton	MA	Newton Senior Taxi Voucher Program (“Yellow Vouchers”)	City of Newton		One-way trip voucher can be purchased for a requested contribution of \$4 each (minimum contribution of \$2), Trips must be within the city, 3 day advance reservation unless to the Senior Center. NOTE: Program discontinued, City now offers VIA on-demand service.
Las Vegas	NV	Taxi Assistance Program (TAP)	Clark County	Residents with income below 300% FPL AND age 60 and older OR have a disability	Buy \$20 voucher booklet for \$10, \$5 if under 200% FPL. Can buy 6 booklets/mo. Service area includes Clark and Washoe Counties.
Oklahoma City	OK	Share-A-Fare Taxi Program	Embark	Residents age 65 and older or have a disability	\$4 per ride subsidy; up to 52 rides/year. Account is credited quarterly; remaining fares must be paid via debit, credit or prepaid card. OK City and four other cities in service area. Rides must be scheduled in advance.
Kitchener/ Cambridge/ Waterloo	ONT	TaxiScrip	Grand River Transit	Residents who are 65 years and older OR registered blind OR physically challenged OR mentally challenged OR temporarily/seasonally mobility disabled	Buy \$60 booklet of scrip for \$30. Number of booklets available depends on length of time in program - average is 2/mo. Driver will not provide change and scrip cannot be used for tips. Trips must be between townships.
Houston	TX	Metrolift Service Plus (MSP)	Houston Metro	Residents who have a disability that does not allow them to access local bus vehicles or stations	Pay \$1 per ride up to \$9, passenger pays excess of \$9 (subsidy up to \$8/ride)
Arlington County	VA	Super Senior Taxi	Arlington Transit (ART)	Residents age 70 and older	Buy \$20 voucher booklet for \$10; 20 booklets/yea max. WAV must be reserved in advance.
Seattle/King County	WA	Taxi Scrip Program	King County Metro	King County residents age 65 and older OR low income, aged 18-64 and disabled. To register you must have a Regional Reduced Fare Permit	50% discount [unspecified amount] up to 7 booklets/mo.

