American Public Transportation Association

Funding the Public Transportation Needs of an Aging Population



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David Koffman
Richard Weiner
Amy Pfeiffer
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Nelson|Nygaard
consulting associates

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The work was guided by a technical working group with representatives of transit agencies, the Community Transportation Association of America, Easter Seals Project ACTION, the AARP Public Policy Institute, private consulting organizations, and the American Public Transportation Association.

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Executive Summary

Rapid growth in the number of older people in the United States during the coming decades will lead to greatly increased needs for expanded and enhanced public transportation services. This report: a) identifies the range of actions that will be needed to expand mobility options for older people, including accessible public transportation services; b) quantifies the demand for these public transportation services; and c) estimates the funding that will be needed to provide them.

Needed Actions

Needed actions have been identified by means of a review of the extensive literature on this subject. The actions needed to expand mobility options for older people include:

- **Enhancements to fixed-route public transportation operations and planning** such as additional bus operator training, incorporating travel needs of older people in route planning and stop placement, and coordination with other agencies and transportation providers
- **Enhancements to public transportation vehicles** such as low-floor buses, kneeling buses, improved interior circulation, additional stanchions and grab bars, ergonomic seating designed for older riders, and accessibility features either required or encouraged by ADA like lifts and ramps, larger letters on head signs, and stop announcements
- **Actions to help older people take advantage of existing services**, like presenting information in ways that are easy to read and as clear as possible, information and assistance programs to connect older people with appropriate services, and outreach and training programs
- **Expansion of supplementary services** including flexible route and community transportation services, ADA complementary paratransit, non-ADA demand-responsive services, taxi subsidy programs, and volunteer driver programs
- **Application of universal design strategies** at transit facilities, bus stops, and on streets and sidewalks in the immediate vicinity of transit facilities and stops

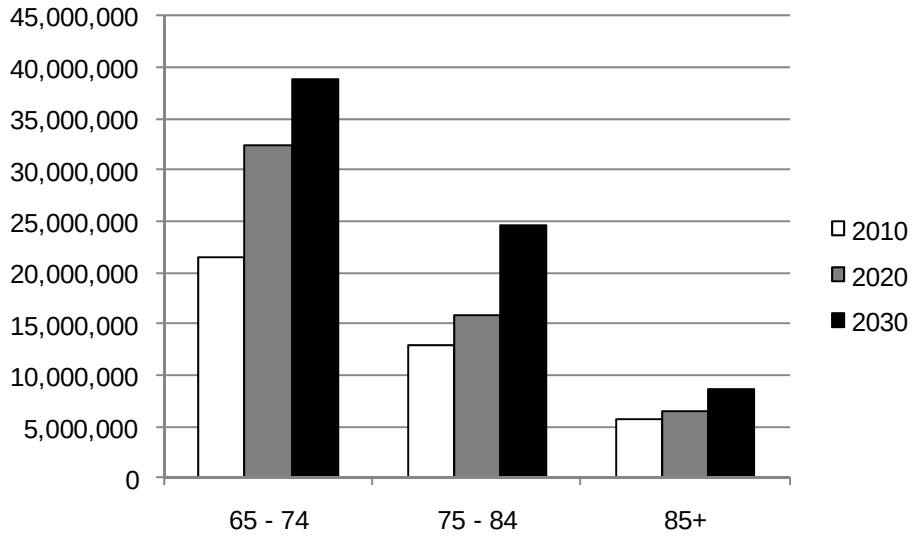
These are the actions of greatest concern to public transportation agencies, but they are not the only actions needed. Other important actions include assuring supportive services to caregivers who provide transportation, encouraging further development of unsubsidized private transportation services, increasing the availability of accessible taxicabs, coordinating with non-emergency medical transportation provided under Medicaid and Medicare, and supporting modifications to automobiles and roadways to increase the safety of older drivers.

The analysis only estimates funding needs for those actions involving public transportation services, and only for those actions for which a portion of the cost can be clearly connected with growth in the older population. These actions and services are: ADA complementary paratransit, non-ADA dial-a-ride services, taxi subsidies, volunteer driver programs, community bus services, outreach and training, information and assistance, and bus operator training. Only the portion of cost due to increasing numbers of older people has been estimated. No distinction has been made regarding whether the needed services would be provided by public transit operators, cities, counties, or community organizations.

Expected Growth of the Older Population in the United States

The aging of the Baby Boom generation (people born between 1946 and 1964) is expected to produce a 79% increase in the number of people over the age of 65 in the next 20 years. For the next ten years, most of the growth will be in the 65 – 74 age group, which will grow 51% by 2020. People in this age range typically have relatively few mobility limitations but still have unique travel needs. In the decade after 2020, there will be continued growth in the 65 – 74 age group but there will be especially rapid growth in the number of people age 75 - 84, whose numbers are expected to increase by 55%. People in this age range commonly have many more mobility limitations.

Projected Population Increase of Subgroups of Older People



Since older people in different stages of life commonly have different travel needs and often have different limitations, this uneven growth in the older population needs to be considered in estimating the need for various mobility options.

Methodology

Demand for the variety of needed public transportation services has been quantified using the experience of 27 programs that were identified as “model programs” because they provide a notably high level of service and were able to provide the type of data needed. The 27 programs are identified and described at the back of the report. There is no guarantee that these programs are truly meeting all current mobility needs, but they provide as close a measure of these needs as can be quantified.

In order to take account of uneven growth in the older population, and to reflect the different needs of people in each age group, data was requested from the model programs about the ages of their riders, and this data was used to calculate trip rates for each subgroup of older people for each type of service. These trip rates were then applied nationwide to obtain national estimates of needed trips for each age group in 2010. A similar process was applied to numbers of information and assistance requests and outreach and training events. Average costs per unit of service were then applied to arrive at funding needed in 2010. The 2010 demand and funding

needs for each age group were then increased by the expected population growth in each group to arrive at 2020 and 2030 demand and funding need.

Ideally, the analysis would take account of expected numbers of older people with various levels of mobility limitation, since this rather than age itself is what determines the mobility options that are needed. Since there are no accepted projections of future levels of mobility limitation, age was used as the best available substitute. Data does demonstrate increased incidence of chronic disease as people age, especially after the age of seventy-five, and there is a direct correlation between increased chronic conditions and mobility limitations.

In addition, the process distinguished among different types of service areas, especially differences between urban and rural areas. The analysis tool developed for the research also distinguishes among large, medium, and small urbanized areas. Insufficient data was found to distinguish among urbanized areas with respect to trip rate, but differences in cost per unit of service were identified and applied.

The analysis tool used for the demand and funding estimates is available for download on the website of the American Public Transportation Association at www.apta.com. It can be used to make projections with different assumptions than were applied for this report, or to make projections for a single metropolitan area, region, or state.

Funding Needed to Provide Public Transportation for Older People

The analysis estimates that in 2010 $4.2 billion dollars would be needed to operate a desirable level of public transportation services for older people in the United States. In addition, $616 million in capital costs would be needed. By 2020 annual operating costs would grow by $1.2 billion and annual capital costs would grow by another $254 million. By 2030 total required annual funding would grow by $3.3 billion for operating and $598 million for capital. All costs are in 2010 dollars, with no adjustment for inflation. A summary table is provided on the next page.

The action with the highest cost would be expanding non-ADA dial-a-ride services provided by transit agencies as a supplement to ADA services, by local governments and community organizations, and in rural areas where no ADA paratransit is required. This is followed closely by the cost of providing that portion of ADA paratransit service which represents trips taken by older people.

The operating and capital costs are based on projections that indicate that demand for ADA paratransit, non-ADA dial-a-ride service, subsidized taxis, volunteer drivers, and community bus service will grow from 217 million trips in 2010 to 282 million trips in 2020 and 393 million trips in 2030 (see figure on the next page). Note that the demand for non-ADA dial-a-ride service, is about 85% higher than the demand for ADA paratransit, but the funding needed for non-ADA dial-a-ride is only 10% greater. The cost per trip for non-ADA dial-a-ride is about $18 compared to about $31 for ADA paratransit. Note that conventional fixed-route public transportation currently carries 386 million trips per year by people age 65 and older according to transit system surveys.

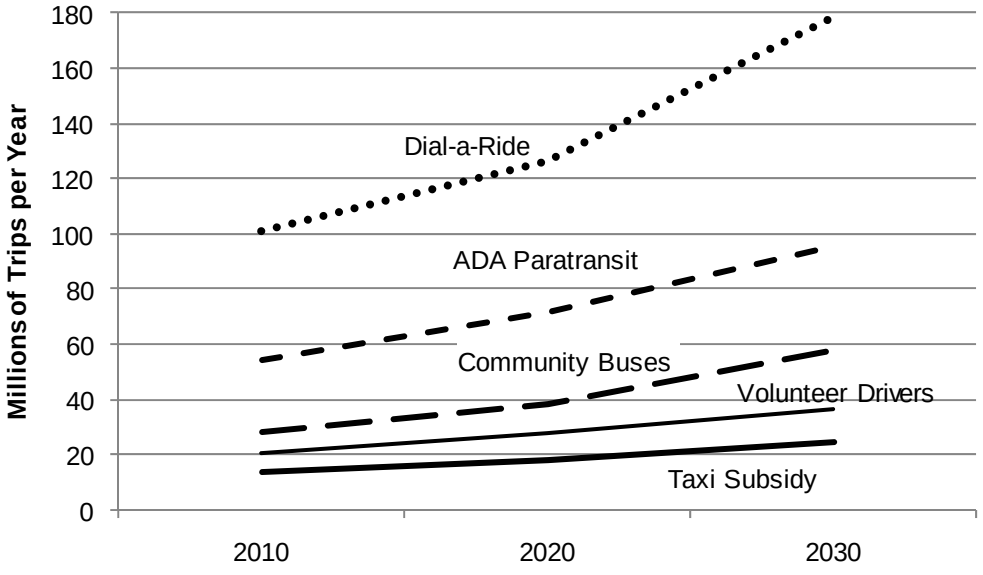
The analysis did not determine what portion of the services needed in 2010 are currently being provided. To provide a rough notion of how current services compare to needs, an analysis was conducted of data from the National Transit Database, the Administration on Aging, and the National Household Travel Survey, as well as transportation service inventories from five regions conducted for planning and coordination studies. This separate analysis suggests that current services provide trips amounting to about one-half to two-thirds of the estimated need.

Funding Needs Summary

(Millions of 2010 Dollars per Year)

Mode and Cost Type	Total Funding Need			Increase over 2010	
	2010	2020	2030	10 years	20 years
Operating Cost					
ADA Paratransit	$1,661.7	$2,190.5	$2,923.4	$528.7	$1,261.6
Dial-a-Ride	$1,822.0	$2,285.6	$3,228.2	$463.6	$1,406.1
Taxi Subsidy	$176.3	$234.4	$317.7	$58.1	$141.4
Volunteer Drivers	$192.0	$260.7	$341.4	$68.6	$149.4
Community Buses	$261.1	$351.8	$535.3	$90.7	$274.3
Outreach and Training	$24.1	$32.9	$43.3	$8.7	$19.1
Information and Assistance	$13.3	$18.1	$23.8	$4.8	$10.5
Bus Operator Training	$6.1	$6.6	$7.3	$0.6	$1.2
Total	$4,156.6	$5,380.6	$7,420.3	$1,223.9	$3,263.6
Capital Cost					
ADA Paratransit	$179.2	$236.1	$315.1	$57.0	$136.0
Dial-a-Ride	$332.2	$416.9	$588.5	$84.7	$256.3
Community Transit	$92.9	$125.2	$190.6	$32.3	$97.6
Volunteer Drivers	$11.9	$91.9	$120.2	$80.0	$108.3
Total	$616.2	$870.1	$1,214.5	$254.0	$598.3

Demand for Public Transportation by Older People



Future Research

This research only begins to define and quantify the public transportation needs of older people. To carry the research to a new level it would be desirable to quantify how older people decide what means of travel to use, and how the availability of various services changes their ability and decisions to engage in activities outside the home. This type of research could lead to a more precise understanding of what should reasonably be considered a "need." It would also help to understand how the various types of service interact, that is the extent to which the various modes analyzed here can substitute for each other or are needed to meet a variety of different travel needs. For example it could determine the extent to which taxi subsidy programs that supplement ADA paratransit reduce demand for ADA paratransit or simply add another desirable travel option.

Aside from research about travel behavior, it would also help to have better data about the services that currently exist. Since these services obtain their funding from a wide variety of sources, no one mandatory reporting system is likely to be practical. However, several methods of improved data gathering may be possible, such as:

- A program of obtaining consistent data from recipients of funding
- Establishing a basic set of required data items to be included in transportation inventories conducted for coordinated public transit-human services transportation plans
- Creating a voluntary system of reporting under an initiative such as the National Center on Senior Transportation. To be useful and to achieve sufficient participation, such a reporting system would need to use a limited number of carefully defined and chosen data categories.

1. Introduction

This report provides a national estimate for the United States of the costs over the next 20 years of providing public transportation to the advancing "age wave" of older adults who will be looking to maintain their transportation independence as they age in place. As stated by the Working Group assembled to guide this research:

> "Over the coming decades, public transportation agencies throughout the United States will face new challenges as our population ages and the demands for innovative transit services increase. While some research efforts have documented the coming changes in our nation's demographics and potential approaches for serving the aging population with public transportation, missing from this research is detail on (1) the various service options that may be considered to meet the mobility needs of a large, heterogeneous aging population living in urban, suburban and rural areas and (2) the associated costs of providing appropriate public transportation services."

The research was intended to provide a national estimate of resources required to provide appropriate transit services for the increased population aged 65 and older in the United States. It was not intended to include an agency-by-agency analysis. In many cases, assumptions had to be made about matters for which adequate data was not available. The spreadsheet tool created to produce the national estimates has been designed in a way that allows it to be used to create estimates for particular areas or to create estimates using different assumptions than the ones used in this report. The spreadsheet tool is available on the website of the American Public Transportation Association at www.apta.com.

The research set out to examine the costs of a comprehensive set of actions needed to provide accessible transportation options to serve older people, including:

1. Enhancements to fixed route services
2. Developing more flexible route and community transportation services
3. Improving vehicle design to provide vehicles that are better suited to everyone (e.g., low-floor buses, improved interior circulation)
4. Developing universal design strategies to improve infrastructure at transit facilities and bus stops (including the built environment that interfaces with these facilities)

Many of these actions benefit the general public as well as older people. For example, overall improvement in the quality, coverage, and frequency of transit services is one of the most important steps to help older people maintain mobility (AARP, 2004). Similarly, better vehicle designs and applying universal design concepts can benefit all riders. In principle, it could be possible to assign a percentage of the cost of these improvements that would be considered attributable to meeting the needs of older people. These considerations are described in more detail later in this report. However, the result of the analysis has been to concentrate on those actions that can be clearly connected to increasing numbers of older people. Generally these actions fall in category two in the list above, namely increasing the availability of community transportation services, including demand-responsive services, volunteer driver programs, subsidized taxi services, community circulator routes, and help learning to use public transportation.

These public transportation services are provided by a variety of organizations, including public transit authorities and municipal operators, cities, and non-profit community organizations. In fact, from one community to the next, the same service might be provided by any type of organization. Recognizing this, the national estimates produced by this research do not distinguish among public transportation services on the basis of what type of organization might provide each one.

Organization of the Report

The report is organized into the following sections:

- A brief review of what is known about growth of the older population and the methods used
- A description of all of the transportation services and improvements that will be needed by older people, and an explanation of which ones were included in the funding projections
- A detailed explanation of the analysis methods used for each service or improvement
- A description of improvements for pedestrians that will benefit older transit riders, with unit costs in lieu of national estimates
- Presentation of the national funding estimates.
- Conclusions

Limitations of the Analysis

Previous research has helped to clarify what types of transportation services older people want and will use, and has identified model programs. The size of the advancing age wave has been documented. There have been estimates of the number of people who may have to limit or give up driving. But no prior research has attempted to quantify the future demand for public transportation by older people or the cost of serving that demand. While the research has been successful in developing such quantitative estimates, the analysis has been subject to multiple limitations, including:

a) Due to lack of comprehensive databases of most service types, estimates of public transportation ridership and costs have had to be based on data from a very small number of model programs chosen to represent a desirable level of service.

b) Even in the case of these model programs, the extent to which the mobility needs of older people are in fact being met is unknown.

c) Due to lack of comprehensive data, only a very rough estimate of actual total levels of service compared to desirable levels of service has been possible.

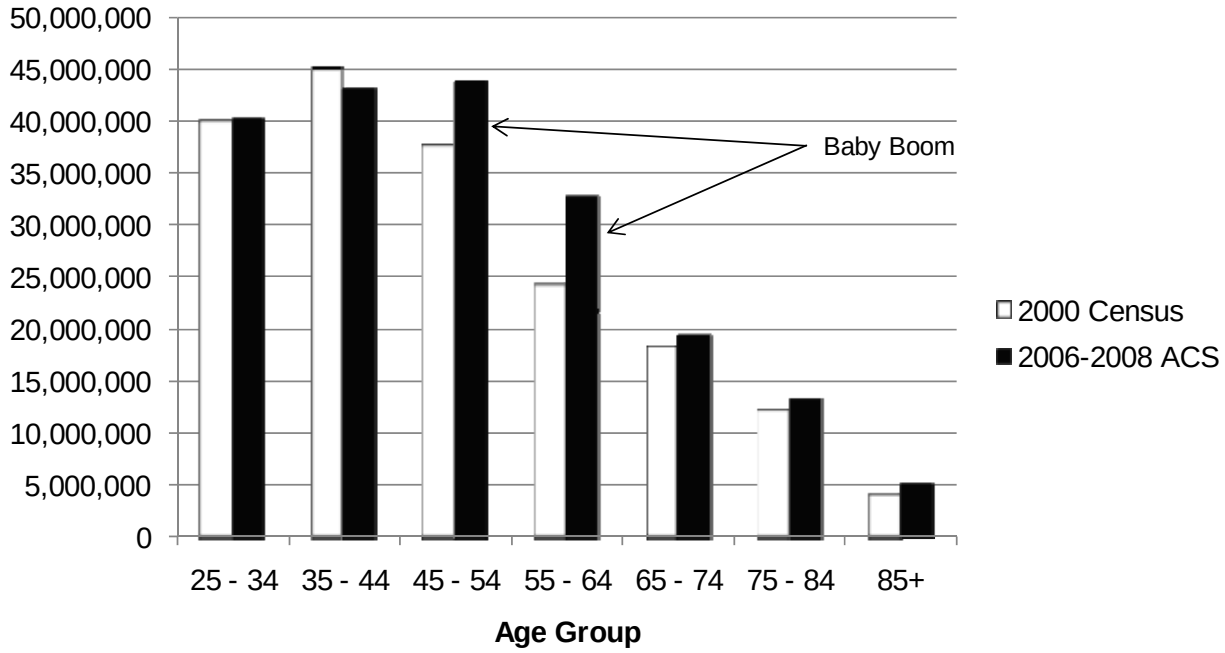
d) Many improvements of interest have not been analyzed because there is no practical way to distinguish the cost that can be attributed to increasing numbers of older persons from costs that benefit people with disabilities or members of the general public of all ages.

Growth in the Older Population

Examination of recent Census data confirms that the aging of the Baby Boom generation (people born between 1946 and 1964) (U.S. Census, 2005) is about to produce a marked increase in the number of people in the over-65 age groups in the United States. Figure 1 compares age data from the 2000 Census and American Community Survey data from the period 2006 to 2008. The figure shows how the advancing age wave has increased the size of the 45-54 and 55-64 age groups in just a few years; the same group is poised to move into the 65 and older age groups in the next two decades.

Figure 1. Population by Age Group

(2000 Census compared to 2006-2008 American Community Survey)



The Census Bureau has prepared numerical projections of the likely size of the older population for the next 40 years. An extract of these projections, shown in Figure 2, confirms that the older population (age 65 and older) will grow by 36% in the next 10 years and by 79% in the next 20 years. In the next ten years, most of the growth will be in the "young-old" group, age 65 to 74, which will grow by 51%. Looking 20 years ahead, this group will continue to grow rapidly (by 81%), but the most rapid growth will be in the age 75 to 84 group, which will grow by 89%. The old-old age group of people 85 and older will grow more than the general population in the next ten years, but will not see really rapid growth until the period after 2030.

Older people in different stages of life commonly have different travel needs and different limitations, so the differences in growth rate among older age groups will have important implications in planning for transportation needs. The projections in this research have been prepared using a methodology that is sensitive to these differences. The methodology is described in outline in Section 3 and in detail for each action in Section 4.

Figure 2. Growth of the Older Population

Population in Each Year (Millions)

Age Group	Year			
	2000	2010	2020	2030
65 – 74	18.4	21.5	32.3	38.8
75 – 84	12.4	13.0	15.9	24.6
85 and older	4.2	5.8	6.6	8.7
All 65 and older	35.0	40.2	54.8	72.1
All Ages	281.4	310.2	341.4	373.5

Percentage Growth over 2010

Age Group	Growth Period	
	10 Years	20 Years
65 – 74	51%	81%
75 – 84	22%	89%
85 and older	15%	52%
All 65 and older	36%	79%
All Ages	10%	20%

Source: U.S. Census Bureau, Projections of the Population by Selected Age Groups and Sex for the United States: 2010 to 2050 (NP2008-T2), August 14, 2008.

Concepts and Methods

Who is an Older Person?

While there is no universal definition of "older" people, this research focuses on people age 65 and older. The Older Americans Act uses age 60 for its services, but age 65 is most commonly used for transportation purposes. It is the age at which the Federal Transit Administration (FTA) requires an off-peak half-fare to be offered on Sec. 5307 funded services and it is also the age for age-based eligibility for Medicare. The estimates are based on the expected increase in the number of people age 65 and older, as well the portion of those people who will be age 75 and over, and age 85 and older.

Incremental Need

The research estimates the added cost for public transportation services due to demographic change. This means that:

- For improvements that benefit or serve older people and others, including non-elderly people with disabilities or the general population, only the cost directly attributable to increasing numbers of older people has been included.
- The cost of currently meeting all needs of older people has been estimated, and also how this cost will increase over the next twenty years, but only a very rough estimate has been possible of the size of the gap between the current need and actual existing services.
- Costs already required by the Americans with Disabilities Act (ADA) are not generally included. In the case of ADA complementary paratransit, an estimate is made of the current nationwide cost to provide ADA-compliant service to older people. This estimate is used for the purpose of providing a baseline to estimate the added cost of providing ADA-required services specifically due to increasing numbers of older people in future years.

Sensitivity to Differences among Age Groups

While it is generally understood that the aging of the Baby Boom will cause a rapid increase in the number of older people, it is important to distinguish among subgroups among the broad "older population." As noted before, older people in different stages of life commonly have different travel needs and often have different limitations. Throughout the analysis, differences among age groups have been carefully observed. Ridership for various service types has been divided among people age 65 to 74, 75 to 84, and 85 and older. Population projections for each age group have been applied separately to the ridership in each age group.

Ideally, the analysis would make a similar distinction based on ability (or disability) rather than age, since that is what determines whether older people need various types of service, including whether they need alternatives to driving themselves or alternatives to conventional public transportation. A number of planning studies have identified a "continuum of services" or "spectrum of services" that respond to various needs. Ideally, estimates of future need would be based on projections of the future number of older people (1) in good health, (2) with some level of limitation who would benefit from incremental modifications to conventional services, (3) with significant limitations requiring alternative services, (4) with limitations that require ADA paratransit, and (5) with limitations that require services that offer more assistance than ADA paratransit.

Unfortunately, useful projections of disability are not available. For example, an authoritative 2006 report from the Institute of Medicine notes, "demographic trends—notably, the aging of the American population—promise to increase substantially the numbers of people at risk for disability. Whether such trends will translate in the future into increasing numbers of people with limits on their activities and participation in community life is less clear." The report presents research showing that some types of disability affecting older people have declined in recent years, but goes on to note that, "Researchers are still trying to explain the declines in certain aspects of late-life disability and are debating whether past patterns are likely to continue." The report cites research projecting numbers of older adults with activity limitations (based on a variety of definitions) in 2030 ranging from 28 million to 38 million. Further, research connecting the types of limitations addressed by health statistics to transportation needs does not seem to be available.

Faced with this lack of information, this report uses age as an indicator of differing travel needs. While age is not the ideal measure, it is well established that the prevalence of disabilities, including those that affect ability to travel, increases with age. For example, data from the 2005 – 2007 American Community Survey indicate that 9.2% of people age 65 to 74 have a "go outside the home" disability, while 26.8% of people age 75 and older have such a disability. Age-related conditions (and their treatments) that affect vision, cognition, flexibility, strength, wakefulness, or stamina may result in an older person who previously drove needing some form of public transportation, or may result in an older person who previously used conventional public transportation needing an alternative.

The analysis uses an empirical approach to assessing how much people in each age group need or want to use various forms of public transportation. That is, actual usage rates for each age group from model programs are combined with population data from the programs' service areas to calculate trip rates for each age group. The projections by age group published by the Census (see Figure 2 above) then provide a basis for projecting increases in the number of older people needing various types of transportation.

Constant Dollars

The estimates are expressed as annual costs in 2010 dollars, without inflation. This avoids adding speculation about inflation rates over the next 20 years to the many other uncertainties in the projections, which would only obscure the essential conclusions of the research. In some cases, cost data from 2007 or 2009 are used without further adjustment, since this has been a period of low inflation and the uncertainty of the data far exceeds any adjustment that might be made.

2. The Public Transportation Needs of Older People

The public transportation needs of older people have been addressed in a voluminous literature, including research by AARP and other national organizations, as well as many plans conducted by local planning agencies. For this research, a list of public transportation services and improvements of interest to older people was synthesized from this prior literature. A list of sources consulted is provided at the end of this report.

Older people rely on and need a wide spectrum of transportation modes including informal, personal means like walking, driving themselves, and getting rides with family and friends; services provided by a variety of public agencies including transit systems and community organizations; private services such as taxicabs; and services such as ambulances for those with urgent needs. This research is concerned principally with public transportation services provided by public agencies and community organizations, ranging from conventional transit service to ADA paratransit and services for people who need even more assistance or accommodation than provided by ADA paratransit.

The services and improvements of interest fall into two groups: 1) supplemental services and 2) enhancements to conventional transit services. These are described in the next two sections, along with an explanation of why certain items were not included in the analysis.

Supplemental Services

Most of the supplemental services described here are included in the funding needs analysis. In a few cases, as noted below, costs would be minimal or the portion of cost attributable to the age wave cannot be determined.

ADA Paratransit

All public operators of fixed-route transit service in the United States are required by the Americans with Disabilities Act to provide paratransit service for people who are unable to use the operators' fixed-route services due to a disability. By law, this service already exists in nearly every urban area in the same area and hours served by fixed-route public transportation. The law also requires that service expand as needed to accommodate demand from eligible people. Many, though by no means all, of the users of ADA paratransit are older people, and adding service to accommodate demand from greater numbers of older people will be a significant expense for transit agencies.

Dial-a-Ride Services

Many communities provide other demand-responsive transportation services in addition to ADA paratransit. In some cases these services pre-date the ADA, and in others they have been developed in recognition of the fact that there are many needs that are poorly served by ADA paratransit or not served at all. Many older people who need to limit or stop driving, or who lose access to rides from someone else, are not eligible for ADA paratransit because they are physically and mentally capable of using transit. However, they find that conventional public transportation is unsuitable to their needs such as grocery shopping and medical appointments. Particularly in small urban areas and in low-density areas of large urban areas, ADA paratransit may be very limited because it only operates when and where fixed-route transit service operates. A service designed and marketed specifically with older people in mind may be more acceptable to many seniors than one labeled as being for disabled people. In some cases, services designed around community services (such as senior centers, medical complexes, and grocery stores) are more appealing than one that, by law, treats all trips equally.

Taxi Subsidies

Many communities provide discounted rides on taxicabs for qualifying people, often based on age and disability, to serve same-day, non-emergency travel needs. Sometimes these taxi discount programs are provided by transit agencies partly with the expectation that they will reduce demand for ADA paratransit, but this effect has never been conclusively documented. In other cases taxi discounts are provided by cities for similar reasons as described for dial-a-ride programs. Taxi discounts may be very attractive to many older people because taxis do not require a reservation a day or more in advance, they usually provide a direct ride, and they are usually ordinary sedans rather than special vehicles. In large cities, they can be hailed on the street. Increasing numbers of older people will certainly increase the need for taxi subsidy service.

Community Transit Services

Many cities have introduced local shuttle or circulator routes that supplement the regional services operated by transit agencies. Some transit agencies operate similar routes. The shuttles commonly use small vehicles, operate on neighborhood streets, and link up local destinations of interest to seniors, youth, and commuters needing access to and from rail stations. Routes are not necessarily designed for fast travel, but to get as close as possible to destinations of interest, often going into parking lots or up to the front entrance of a senior living facility. In some cases vehicles will “flex” or deviate off-route. Some services require advance registration or may be limited to participants in a paratransit program, but operate at regularly scheduled times, for example from senior residences to shopping centers. Not all community transit services are designed with the needs of older people in mind, but many are, as confirmed in this research. The needs for such services will increase as the age wave advances.

Volunteer Drivers

Some people need extra assistance in order to travel. Some may just need help to and from the vehicle and the door of their home or destination. This kind of assistance (“door-to-door” service) is provided by many ADA paratransit programs, and FTA has issued guidance that it must be provided if a particular rider needs it, at least for particular trips. But some people, especially older riders, need much more assistance. A very frail senior or one with dementia may need help getting to and from a doctor’s office within a medical center, may need someone to wait with them for an appointment, or may need help with packages while shopping. If such a person does not

have a friend or family member who can give this assistance, providing it as a public service would be very expensive. As a result, assisted transportation is most commonly provided by volunteers. Volunteer driver programs also operate in areas with limited public transportation or where long trips are needed that would not be economically feasible to serve with dial-a-ride.

Information and Assistance

A frequent comment by older people participating in planning projects is that they want better, more convenient access to information about transit services. Most communities have good resources for information about conventional transit services, but these resources are not always able to provide complete, accurate information about the wide variety of specialized public transportation services available for older people and people with disabilities, including services provided by numerous cities, counties, and community organizations within a metropolitan area. To be useful, this information should be limited to services that are relevant to the caller, so agents should be familiar with eligibility requirements and other limitations of specialized services, and be able to work with callers to determine which services are relevant. The kind of information and assistance service could be provided by a public transportation agency, with specially trained agents, or by an organization that provides general information on all topics of use to older adults, such as an area agency on aging.

Note that information and assistance is one component of mobility management, a much broader concept that includes a wide variety of measures to build coordination among existing public transportation providers and other transportation service providers with the expectation of expanding the availability of service. Information and assistance may be considered a step toward creating one-stop call centers to coordinate transportation information on all travel modes and to manage eligibility requirements and arrangements for customers among supporting programs. Since mobility management covers such a wide variety of concepts, only the cost of information and assistance has been included in this research.

Accessible Taxicabs

A significant percentage of older people use wheelchairs or other mobility devices that cannot be stowed in the back of a conventional taxicab, and many cannot transfer from their mobility device to a car seat. In all likelihood, many of these individuals cannot drive and may have difficulty finding someone who can drive them with their wheelchair. Even if they are eligible for ADA paratransit, accessible taxicab service would fill an important gap, including trips that come up without advance notice and trips that need to be made when transit is not operating. An accessible cab costs more than a standard taxi vehicle, but ADA prohibits taxicabs from charging extra to carry a person using a wheelchair. Some cities have assisted taxi companies in obtaining accessible cabs. It is particularly effective to combine efforts to increase the number of wheelchair-accessible taxicabs with a taxi discount program, since this makes operating an accessible cab more economically viable and makes taking rides more affordable.

A number of cities have implemented or are in the process of implementing programs under which a significant portion of the taxi fleet consists of accessible vehicles. For example, there are more than 100 accessible taxicabs currently operating in San Francisco, while the largest cab company in Arlington, Virginia, operates 40 accessible taxis (Westat, 2008). In Houston, the taxi company that provides sedan service for the paratransit program operates 160 accessible taxicabs (Arndt, 2006). To estimate the cost of adding accessible taxicabs to serve greater numbers of older people, it would be necessary to estimate actual use of accessible taxis by older people in an area with good availability. This would provide a basis for attributing to older riders a

portion of the incremental cost of accessible taxi vehicles compared to conventional taxi vehicles. Unfortunately taxi companies do not normally keep records about their riders or even have any way of knowing the age of riders. In cases where accessible taxi service is part of a taxi subsidy program, it might be possible to obtain such data, but the researchers were able to find only one very small example. As a result the cost of accessible taxi service is not included in the funding projections.

Caregiver Transportation

Analysis of a survey conducted by National Alliance for Caregiving (NAC) and AARP (2009) estimated that there are 43.5 million Americans who have been caregivers for a person age 50 or older in the past 12 months. A caregiver is someone who provides unpaid care to a friend or relative 18 years or older to help them take care of themselves, or who gives unpaid care to a child because of a medical, behavioral, or other condition or disability. The survey found that 83% of caregivers provided transportation for the person they help. If the typical caregiver provided only a few rides for the person they help, the number of these rides would exceed the number of trips calculated for all of the other modes of transportation examined in this research. Since caregiver transportation is part of the informal system of transportation, rather than a form of public transportation, we have not attempted to quantify caregiver transportation needs. However, the NAC/AARP study documents the need for supportive services to help caregivers cope with their responsibilities and maintain their own health and well-being. A recent study by the MetLife Mature Market Institute (MMI) and the National Alliance for Caregiving (NAC), in partnership with the University of Pittsburgh Institute on Aging, documents how, without such supportive services, employees with caregiving responsibilities suffer poorer health and are absent from work more often than employees without such responsibilities, costing U.S. employers an extra estimated $13.4 billion per year (MetLife, 2010).

Medical Transportation

The two major national programs of health care assistance, Medicaid and Medicare, provide millions of trips per year. A 2000 survey of Medicaid agencies conducted by the Community Transportation Association of America (Raphael, 2001) found that more than 100 million non-emergency medical trips were provided by state Medicaid agencies in 2000 at a cost of about $1.75 billion. Medicare provides only ambulance trips. However, multiple studies reviewed by Burkhardt (2002) indicate that between 460,000 and 631,000 ambulance trips per year paid for by Medicare are not actually emergencies requiring an ambulance. Medicare principally serves older people, but Medicaid serves people of all ages. The portion of Medicaid and Medicare transportation used by older people is not known, but any reasonable assumptions imply that it must be many millions of trips per year. However, very few public transportation systems participate in Medicaid, and data about Medicaid transportation is very difficult to obtain. As a result, it is has not been included in the analysis.

Unsubsidized Private Services

Many older people have good incomes and can afford to pay for transportation. The median income for older households, adjusted for inflation, doubled between 1967 and 1997, and the poverty rate for older households is no higher than for households headed by a person age 18 to 64 (U.S. Census, 2005). Taxicabs, without any subsidy, are one example of an unsubsidized private service available to older people who do not drive and for whom transit is not a viable option. In some cities private for-profit transportation services tailored to older people with higher incomes have appeared. Silver Ride in San Francisco is one example (see silverride.com). In

the non-profit sector, the Independent Transportation Network, with affiliates in 14 cities, aims to provide door-through-door transportation for seniors without public subsidies (www.itnamerica.org, accessed 11/6/09). Since these services operate without or mostly without public subsidy, there would be no public funding needs for their operations. Transit agencies should coordinate with them and information and referral services should include them as resources. These actions would have minimal cost.

Enhancements to Conventional Transit Services

Older people account for about 7.1% of trips on conventional transit services, or about 386 million trips per year according to an analysis by the American Public Transportation Association of 130 surveys conducted by transit systems (APTA, 2007). An even larger estimate comes from the 2009 National Household Travel Survey, according to which people age 65 and older take 645 million annual trips on local public transit, commuter bus service, commuter trains, subway or elevated trains, and streetcars (McGuckin, 2010). Enhancements to conventional, fixed-route transit services could help make them a more attractive alternative for older people. A variety of modifications suggested by the literature review and interviews conducted for this study, many of which are already being implemented by transit operators, have been examined for this research. All of these are important and valuable. For most of them, however, costs specific to meeting the needs of older people cannot be identified, because either: 1) the general public benefits as much or more than older people and there is no practical way to separate out the portion of cost that can be attributed in growth in the older population; or 2) the modifications are required by ADA, with no increase in cost that can be attributed to demographic change.

Vehicle Modifications

Vehicle design features that can help seniors include low-floor buses, kneeling buses, improved interior circulation, additional stanchions and grab bars, and ergonomic seating designed for older riders. Features either required or encouraged by ADA also help older riders. These include lifts and ramps, larger letters on head signs, and stop announcements.

The cost of ADA-required features is a given and will not increase along with numbers of older people. As low-floor buses become more widespread, they are becoming nearly the norm in some areas, while other areas do not buy them because of operational concerns. In the long run, it may become difficult to identify any incremental cost for these buses compared to a conventional bus. Other items like interior layout, seating, and additional stanchions and grab bars either have minimal cost or are mainly a matter of developing the right standards and specifications with little significant cost over the long run.

Additional Bus Operator Training

Desirable components of bus operator training include awareness of the needs and vulnerabilities of the elderly, in particular their need for extra time in boarding, getting to a seat, and alighting; the importance of courteousness and politeness; and proper use of accessibility features. Many transit operators no doubt consider that their drivers already receive good training on the needs of older people, but some observers report a need for improvement at least at some transit systems. Provisionally, this can be estimated as the cost of trainee and trainer wages for any added hours of training per bus operator as described further in Section 4.

Planning and Interagency Coordination

Transit agencies will need to coordinate with organizations in their communities that work with older people and that plan and provide for their needs. Examples include area agencies on aging, senior centers, and senior living and care facilities. Most transit agencies already work with these agencies in the context of ADA paratransit service, but involving them in all service planning will become increasingly important as the older portion of population grows. Agencies that receive funding from three Federal Transit Administration programs (New Freedom, Section 5310 transit assistance program for elderly individuals and individuals with disabilities, and Job Access / Reverse Commute) are required by provisions of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA–LU) to participate in a coordinated planning process. All projects funded under these programs must be derived from a locally developed, coordinated public transit-human services transportation plan.

At the federal level, a Coordinating Council on Access and Mobility (CCAM), comprised of 11 federal departments and agencies, was established by Executive Order 13330, "Human Service Transportation Coordination," signed by President George W. Bush on February 24, 2004. To implement the Executive Order, CCAM launched an initiative called United We Ride to break down barriers between programs and set the stage for local partnerships that generate common sense solutions and deliver better performance for everyone who needs transportation. CCAM has adopted a policy statement that, "Federally-assisted grantees that have significant involvement in providing resources and engage in transportation delivery should participate in a local coordinated human services transportation planning process and develop plans to achieve the objectives to reduce duplication, increase service efficiency and expand access for the transportation-disadvantaged populations as stated in Executive Order 13330."

For local transportation agencies, elements of planning and interagency coordination include:

- Incorporating travel patterns of older people and mobility issues in placement of transit stops and route planning
- Identifying and planning for additional services and measures to address needs of older people
- Establishing liaisons between transit agencies and groups that represent or advocate for older people.
- Promoting inclusion of senior mobility in regional land use planning
- Promoting inclusion of senior mobility in local planning, including plans for new residential and commercial development
- Coordinating with efforts to educate seniors about how their location decisions will affect mobility when they can no longer drive
- Working with healthcare providers, including county programs, to incorporate maintaining the ability to walk to transit stops as an element of senior fitness programs
- Coordinating with efforts to educate seniors, families and healthcare providers about safe driving and driving limitation

All of these items are important but do not involve great expenditures. At a large transit system they may justify a full-time staff person or equivalent, while at smaller to medium-sized transit systems, half of a full-time equivalent may be adequate. However, it is not clear that the level of

staffing would increase substantially as the older population increases beyond present levels. In the case of rural systems, older people typically are already a major focus of planning and operations. These systems can probably use additional funding, but that is a present need, not one created by an aging population.

Schedules and Bus Stop Signs

Schedules that are simple and easy to read would be popular with all riders, not just older people. Informative, easy to read signs at bus stops would also be helpful. There is a need to develop good models that can be adopted more widely. Most transit operators would probably be more than happy to make certain changes to their public information materials if they had good models that still communicated all the necessary information. In the case of signs at stops and stations, some models of improved signage have been noted, such as cylinders with route maps and schedules. These have not been widely adopted, possibly due to the difficulty of keeping them up-to-date and well-maintained. It would not be difficult to develop an estimate to purchase, install, and maintain such signage. However, it would be very speculative to assign any particular portion of the cost to growth in the older population.

Outreach and Training

Older people who are beginning to have trouble driving may have little recent experience with transit and may have unrealistically negative impressions based on outdated experience or news stories. Programs that help older people learn about and become comfortable using transit service can include marketing programs, educational programs like presentations and demonstrations at senior centers, “ambassador” programs involving volunteer peers who provide information to fellow seniors, group field trips or training, and one-on-one travel training. This is a clear need that is easily associated with a growing older population. Section 4 describes how cost estimates were developed.

Stop and Station Improvements

Helpful improvements at transit stops and stations include improved lighting, adequate seating, and weather protection. These have been described as “universal design features” because they are useful to everyone, not just older people or people with disabilities (Easter Seals Project ACTION).

These features will definitely have costs for implementation, but it will be difficult to assign a particular portion of the cost to the growth of the older population. The same features that are useful for older people are likely to be implemented at particularly busy locations, regardless of use by older people. Therefore, the cost attributable to older riders would be the cost of improvements at less-busy stops that happen to be near concentrations of older people or destinations important to older people. The cost attributable to growth in the older population would be the cost due to an increase in the number of such stops. If improvements were done as part of a long term program to upgrade stops, the annual cost might be minimal. A cost analysis would require estimating the total number of such stops in the United States and applying a cost for a model package of improvements. A discussion of desirable improvements with unit costs is included in Section 5.

Pedestrian Improvements

Most transit trips, especially non-commute trips, involve some amount of walking to and from transit stops and stations. Older people and other transit users would benefit from pedestrian safety improvements in the immediate vicinity of bus stops. Measures that would particularly favor older pedestrian safety include benches, pedestrian activated longer crossing signals, audible crossing signals, and countdown signals. Removing uneven surfaces in crosswalks and on sidewalks, and providing sidewalks with a clear path of travel for people using wheelchairs, not obstructed by newsboxes, light posts, fire hydrants, etc., help older people and others with mobility limitations. Measures that help all pedestrians also help older pedestrians. These include more visible crosswalks, simplifying intersection geometry to make avoiding conflict with vehicles less confusing, median refuges for crossing wide streets, and improved lighting. Traffic calming measures near transit stops can also improve pedestrian access.

Usually, these improvements are the responsibility of cities rather than transit agencies. As a result there would typically be no cost to transit agencies. A useful program would be one that makes funding for transit-related pedestrian improvements available to cities to be spent in coordination with transit agencies. A discussion of desirable improvements with unit costs is included in Section 5.

3. Methodology

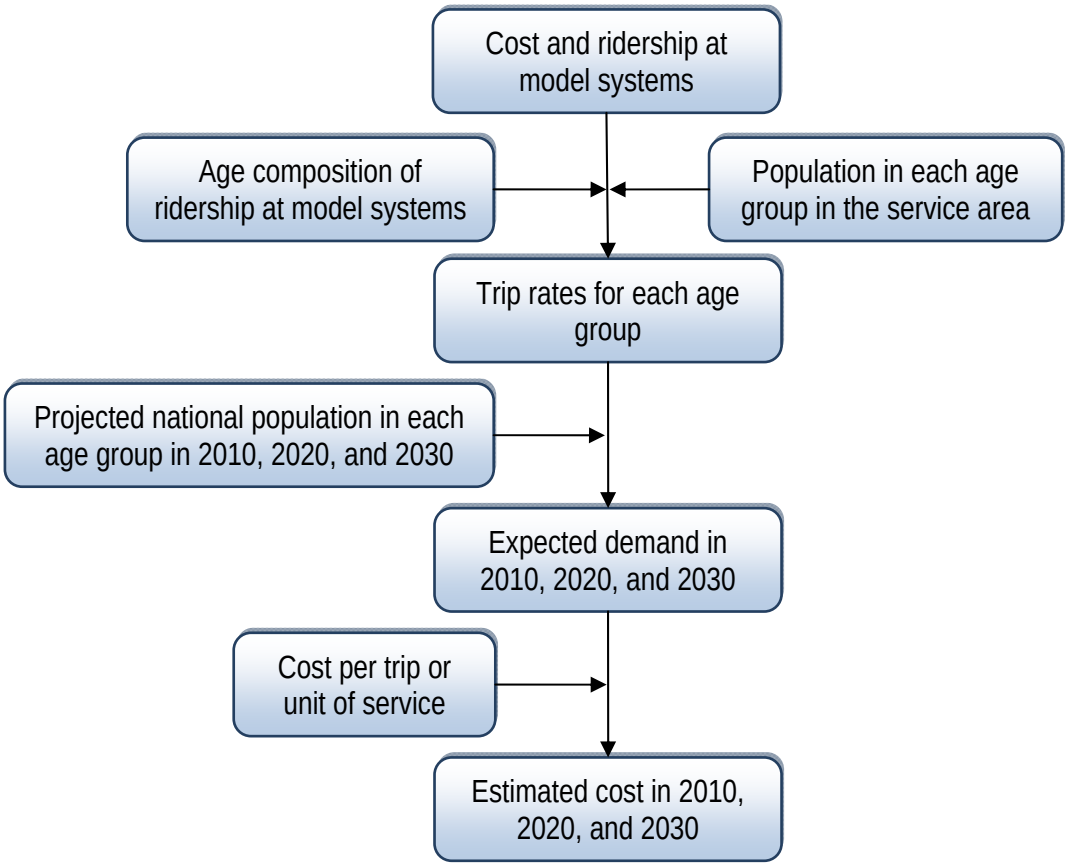
In broad outline, the analysis for a typical service consisted of determining the cost of providing a desired level of public transportation service for older people based on experience at model programs, applying this cost nationwide, and then calculating how this cost would increase along with the older population. In slightly more detail, the analysis was conducted along the following lines (diagrammed in Figure 3):

1. Determine the ridership or usage by older people in places that can serve as models because they operate notable programs. There is no guarantee that these programs are truly meeting all current mobility needs of older people, but they provide as close a measure of these needs as can be quantified. Using these figures as a baseline avoids counting existing service deficits as needs created by increasing numbers of older people.
2. Estimate the specific age groups that benefit from this service, based on the percentage of trips by people in each age category. The age groups used were: under 65, 65 to 74, 75 to 84, and 85 and older.
3. For each age group, calculate trip rates by dividing ridership for that age group by total population in the service area for that age group.
4. Identify the extent to which this service is relevant in large, medium, and small urbanized areas and in rural areas. (Not shown in Figure 3)
5. Combine the estimated trip rates with the projected older population in each age and area category to arrive at the expected demand for this type of service in 2010 and future years.
6. Determine the cost per trip for this type of service, or cost per some other unit for actions not measured in terms of trips, distinguishing among sizes of service where needed.

7. Apply the unit costs to the estimated demand from Step 5 to obtain funding needs for each age category and service area category in 2010 and future years.

The details of the method, especially for steps 1 and 2, vary somewhat depending on the service or improvement. These differences are explained in the discussion of the analysis for each item in Section 4.

Figure 3. Analysis for a Typical Service



Types of Service Areas

The importance of various services and improvements will vary depending on the type of service area. As one example, taxi subsidies are not widely applicable in rural areas. For purposes of analysis, service areas have been classified using categories used by the National Transit Database (NTD) for reporting.

- Large urbanized areas: population of more than 1 million (38 urbanized areas served by 219 agencies or 33% of all agencies reporting).
- Medium urbanized areas: population of more than 200,000 and less than 1 million (114 urbanized areas served by 166 agencies or 25% of all agencies reporting).
- Small urbanized areas: population of less than 200,000 and more than 50,000 (313 urbanized areas served by 286 agencies or 43% of all agencies reporting).

- Rural areas: population of less than 50,000 (1,293 subrecipients submitted data to the NTD through their state Departments of Transportation incorporating data for 2,275 counties nationwide).

This terminology is a little different than that used in FTA grant programs, where the Sec. 5311 program is known as "Rural and Small Urban Areas" and applies to areas with population under 50,000.

Ideally, distinctions would be drawn using categories such as central city, dense suburban, low-density suburban, and rural. However, reliable data about existing population by these categories is not readily available and projections of population growth using these categories are not available. The NTD categories are used as a familiar and available substitute. The NTD categories permit very limited distinctions about the applicability of various services. The clearest case concerns rural areas, where some services have limited applicability. In rural areas, older people commonly account for a major portion of ridership, so most existing service is designed and operated with their needs in mind. As evidence for this, according to NTD's 2007 *National Transit Summary and Trends*, demand responsive service accounts for 67% of rural service, and deviated fixed-route bus services account for another 15%. The balance is made up of conventional fixed-route bus service (8%), combined fixed-route and deviated fixed-route service (4%), private intercity bus (3%), vanpool (1%), and "other" (2%). For purposes of this research, it is assumed that most rural transit services are at least partially services for older people. To the extent that existing riders are older people, the growth in the population of older people will require additions to rural transit services.

Population Projections

In order to project funding needs by the methodology described above, it is necessary to project population in each age group in each type of urban area. The necessary baseline is available from the Census. Figure 4 shows that in 2000 all age groups of people age 65 and older were somewhat under-represented in large urban areas and somewhat over-represented in non-urbanized areas.

The Census provides projections of the total U.S. population by age group (presented earlier in Figure 2). Projections by state are also available. However, projections by area type are not available. Trends between the 2000 Census and the 2005-2007 American Community Survey were examined for changes in the age composition of rural areas and each size of urbanized area, but no clear trend is evident. Therefore, for this analysis the percentages in Figure 4 were applied to the Census projections by age group for 2010, 2020, and 2030.

Figure 4. Distribution of Population by Age and Size of Urban Area

Millions of People

Area Category	Under 65	65 - 74	75 - 84	85+	All Ages
Large	103.3	7.0	4.8	1.6	116.6
Medium	41.2	3.0	2.1	0.7	47.1
Small	24.9	1.9	1.3	0.5	28.6
Non-urbanized	77.0	6.5	4.1	1.4	89.1
All Areas	246.4	18.4	12.4	4.2	281.4

Percentages within Each Age Group

Area Category	Under 65	65 - 74	75 – 84	85+	All Ages
Large	41.9%	37.8%	38.5%	38.4%	41.4%
Medium	16.7%	16.4%	17.1%	16.8%	16.7%
Small	10.1%	10.3%	10.9%	11.1%	10.2%
Non-urbanized	31.2%	35.5%	33.5%	33.6%	31.7%
All Areas	100.0%	100.0%	100.0%	100.0%	100.0%

Source: 2000 Census

4. Analysis of Services and Improvements for Older People

This section describes how the analysis was conducted for each of the services and improvements presented in Section 2 for which it is possible to project funding needs due to the age wave. Assumptions, data sources, and intermediate steps are described. The results of the calculations are presented in Section 6. They are not repeated here except in the case of ADA paratransit for the sake of illustrating the methodology. The analysis relies on data from a number of model programs. Brief descriptions of these programs are given at the end of the report.

ADA Paratransit

ADA paratransit provides an example of how the methodology was applied. ADA paratransit is the second most expensive item in the analysis and illustrates the issues involved in the cost estimation. The analysis is in some ways more complex than the typical one, but it also benefits from availability of more data than is available for many other services.

Determine Ridership

The baseline ridership for ADA paratransit is based on trip rates at systems that can serve as models because they are believed to be providing service that fully meets the requirements of the regulations. Data from a sample of 28 such systems was collected for TCRP Report 119, *Improving ADA Paratransit Demand Estimation* (Koffman et al., 2007). Systems of all sizes are included in the sample, with information about the service area population for all of them. The Report 119 analysis showed that the 28 systems had an average trip rate of 0.59 trips per year per total population in the ADA service area, based on the 2000 Census. The trip data represented ridership in 2005 in most cases.

Estimate the Age Groups that Benefit

Older people may be a majority of ADA paratransit customers but they do not necessarily make a majority of trips on ADA paratransit. Detailed data on age of riders was obtained for ADA paratransit services operated by five transit systems. This data is not commonly available or collected, but could be obtained in four cases because of other work being conducted by the researchers. In the other case the transit agency happened to need the same information for its own purposes. As shown in Figure 5, in all of the systems older people make less than 50% of trips, and much less than 50% in most cases. Two systems, Santa Clara and Lane, stand out for having high percentages of trips by older people, especially in the oldest age group, 85 and older.

Figure 5. ADA Paratransit Trips by Age of Rider

(Percentage of trips taken by ADA eligible customers in each age group.)

Transit System		Age Group				
	Under 65	65-74	75-84	85+	All 65+	All Ages
Ft. Worth Transportation Authority	71%	16%	10%	3%	29%	100%
Pace (Chicago)	63%	19%	13%	5%	37%	100%
Santa Clara Valley Transportation Authority	52%	14%	19%	15%	48%	100%
Lane Transit District	58%	12%	14%	17%	42%	100%
Dallas Area Rapid Transit	77%	12%	8%	3%	23%	100%
Average	64%	14%	13%	9%	36%	100%

These differences may indicate differences in service methods, eligibility process, or availability of other transportation services for older people, or they may represent differences in the age composition of the service area. For purposes of this analysis, these percentages have been converted to per capita trip rates for each age group by dividing total ridership in each age group by total population in the service area in each age group. This adjusts the data for differences in the age composition of the service areas and provides a basis for projection to national totals. Population counts from the 2000 Census were used for these calculations, because the more recent 2005-2007 American Community Survey does not have the needed level of geographic detail. This requires an adjustment later in the calculations.

Figure 6 shows that the two transit systems with high percentages of 85-and-older riders also have high per capita trip rates for this group. These differences among systems show the variety of conditions and methods among ADA paratransit services. Ideally, a much larger sample of systems would be used for a national analysis. However, for purposes of the present research, an average of these five systems is the best information available.

As a last step the average trip rates among the five sampled transit systems were factored up to the average of 28 systems studied in TCRP Report 119 to represent a national average for service that fully meets the requirements of the regulations, and then adjusted to represent population changes since the Report 119 analysis was conducted. The fact that the individual paratransit systems shown in Figures 5 and 6 have trip rates above or below the Report 119 average does not imply that these systems are exceeding or falling short of ADA requirements. There are numerous legitimate reasons why a given system will carry more or fewer trips per capita than the average. For example, TCRP Report 119 shows that trip rates at even the best systems range from as low as 0.20 annual trips per capita to over 1.0 annual trips per capita

depending on factors such as poverty rates, on-time performance policies, fares, and use of conditional eligibility.

Figure 6. ADA Paratransit Trips per Capita by Age Group

(Trips per capita per year)

Transit System		Age Group				
	Under 65	65-74	75-84	85+	All 65+	All Ages
Ft. Worth Transportation Authority	0.48	1.88	1.72	1.58	1.79	0.61
Pace (Chicago)	0.38	1.81	1.88	1.89	1.85	0.54
Santa Clara Valley Transportation Authority	0.27	1.25	2.68	6.67	2.37	0.47
Lane Transit District	0.26	0.84	1.22	3.78	1.43	0.40
Dallas Area Rapid Transit	0.28	0.95	1.05	1.01	0.99	0.34
Average	0.34	1.35	1.71	2.99	1.68	0.47
Adjusted Average to Represent National Need	0.42	1.65	2.24	4.35	2.18	0.59*

*TCRP Report 119 average of 28 systems, with adjustments for population growth in each age group.

Determine Relevant Service Area Types

ADA paratransit is provided only by public entities that operate fixed-route service, typically in metropolitan and small urban areas that report to the National Transit Database. Many rural transit systems also provide ADA paratransit, but it is often closely coordinated or combined with non-ADA demand responsive services. To simplify the analysis, ADA estimates are confined to small, medium, and large urbanized areas, while funding needs in rural areas are based on all demand responsive services, whether or not they are used to satisfy ADA requirements for complementary paratransit service. These calculations are described in the discussion for "Dial-a-Ride" service.

Combine Trip Rates with Population Projections (Estimate Demand)

The trip rates from Figure 6 are multiplied by projected populations in large, medium, and small urban areas to estimate demand for ADA complementary paratransit in each age group and urban area size category (Figure 7). Since the trip rates are applied within each age category, and since older age groups have grown faster, the resulting total trip rate is higher than shown in Figure 6. This level of detail is shown only to illustrate the method.

Figure 7. Demand for ADA Paratransit Service in Urbanized Areas

(Millions of trips per year)

Urbanized Area Type	Under 65	65 - 74	75 – 84	85+	All 65+	All Ages
Year 2010						
Large	45.3	13.0	10.4	8.2	31.6	76.9
Medium	18.1	5.6	4.6	3.6	13.9	31.9
Small	10.9	3.5	2.9	2.4	8.8	19.8
Total	74.3	22.1	18.0	14.1	54.3	128.5
Year 2020						
Large	48.1	19.5	12.7	9.4	41.7	89.7
Medium	19.2	8.5	5.7	4.1	18.3	37.4
Small	11.6	5.3	3.6	2.7	11.6	23.2
Total	78.8	33.3	22.0	16.2	71.5	150.4
Year 2030						
Large	50.5	23.5	19.7	12.4	55.6	106.1
Medium	20.2	10.2	8.7	5.4	24.4	44.5
Small	12.2	6.4	5.6	3.6	15.5	27.7
Total	82.9	40.0	34.0	21.5	95.5	178.4

Determine the Cost per Trip

Reported operating cost and ridership from the 2007 National Transit Database were used to calculate average cost per trip for each size of urbanized area. These costs were inflated using the Producer Price Index for Transportation and Warehousing for June 2009. Considering economic events since then, these rates are assumed to represent an adequate estimate of costs for 2010, at least within the limits of precision of this analysis. The results are shown in Figure 8.

Figure 8. Cost per ADA Paratransit Trip

Urbanized Area Category	Operating Cost per Trip	
	Reported for 2007	Estimated for 2010
Large	$34.14	$34.71
Medium	$27.08	$27.53
Small	$20.43	$20.77

Apply Cost per Trip to Demand to Estimate Funding Need

The estimated demand for each urbanized area category is multiplied by the relevant cost per trip to produce estimated funding need in each year (Figure 9). Detail by area type is shown only to illustrate the methodology, since different cost rates were used for each area type. The relevant result is the total funding need in each year, rising from $1.7 billion in 2010 to $2.9 billion in 2030.

Figure 9. Operating Funding Needed for ADA Paratransit for Older People

(Millions of Dollars per Year)

Urbanized Area Category	Total Annual Funding for Older People			Increase in Annual Funding due to Aging	
	2010	2020	2030	10 Years	20 Years
Large	$1,096.5	$1,446.2	$1,929.2	$349.6	$832.7
Medium	$381.6	$502.9	$671.5	$121.3	$290.0
Small	$183.6	$241.4	$322.6	$57.8	$139.0
All Urbanized Areas	$1,661.7	$2,190.5	$2,923.4	$528.7	$1,261.6

Note: 2010 dollars - no allowance is made for inflation.

Capital Cost

According to 2007 NTD data, 25% of ADA paratransit is provided by transit operators directly, while 75% is provided by private contractors. Transit agencies that provide service directly presumably purchase vehicles and build facilities to operate them in most cases. Some transit agencies that contract with private providers also purchase vehicles for use by the contactors and provide operating facilities as well, while other transit agencies have the contractors include vehicles, facilities, or both in the contract price. As a result, it is not feasible to build up capital cost in terms of numbers of vehicles and facilities. Instead the total reported capital cost for demand responsive service in the 2007 NTD ($207,329,385) is used to compute overall capital cost per trip. It is assumed that most of this capital cost is for the transit agencies' ADA paratransit service (62,735,974 trips), since non-ADA service often consists of trips provided by taxi companies and non-profit agencies. The result is $3.30 capital cost per trip.

Applying this to the estimated demand in Figure 9, yields an added capital funding need of $57 million per year by 2020 and an added capital funding need of $136 million per year by 2030 (Figure 10).

Figure 10. Capital Cost of ADA Paratransit for Older People

(Millions of dollars per year)

Total Annual Capital Funding for Older People			Increase in Annual Capital Funding due to Aging	
2010	2020	2030	10 Years	20 Years
$179.2	$236.1	$315.1	$57.0	$136.0

Dial-a-Ride

The analysis for non-ADA dial-a-ride parallels the analysis for ADA paratransit. Dial-a-ride turns out to be the most costly item in the analysis in terms of total cost, although not in terms of cost per ride. Usage information was obtained from the following programs:

- Newport Beach, California: Care-A-Van

- Irvine, California: TRIPS
- Buena Park, California: Senior Transportation
- Portland, Oregon: Providence ElderPlace
- Denver, Colorado: Seniors Resource Center
- Philadelphia, Pennsylvania: SEPTA Shared Ride Senior transportation
- Pennsylvania Statewide Shared Ride Senior transportation

These programs do not, for the most part, have the data analysis capabilities of larger ADA paratransit programs, so estimates of ridership by age group were subjective by program staff. Only the first five programs were able to provide detail by age group at all. Figure 11 shows the age composition of ridership and Figure 12 shows the estimated trip rates by age group for these programs. Although all are good programs, they operate on very limited budgets.

Figure 11. Dial-a-Ride Trips by Age of Rider

	Under 65	65-74	75-84	85+	All 65+
Newport Beach Care-A-Van	0%	20%	60%	20%	100%
Irvine TRIPS	25%	9%	33%	33%	75%
Buena Park Senior Transportation	0%	20%	50%	30%	100%
Providence ElderPlace (Portland)	9%	21%	31%	39%	91%
Seniors Resource Center (Denver)	1%	14%	80%	5%	99%
Average	7%	17%	51%	25%	93%

Figure 12. Trip Rates for Dial-a-Ride Programs

(Trips per capita per year)

	Under 65	65-74	75-84	85+	All 65+
Newport Beach Care-A-Van	0.000	0.382	1.762	1.785	1.024
Irvine TRIPS	0.028	0.241	1.457	3.349	1.074
Buena Park Senior Transportation	0.000	0.427	1.274	2.626	1.025
Providence ElderPlace (Portland)	0.014	0.567	1.024	3.409	1.155
Seniors Resource Center (Denver)	0.001	0.224	2.269	0.445	0.909
Average	0.010	0.37	1.56	2.32	1.04
Pennsylvania Shared Ride Program	0.000	1.04*	4.37*	6.50*	2.91

*Calculated based on five other programs with age detail and Pennsylvania trip rate for all age 65 and older

A more generously funded program is the Pennsylvania Shared Ride program funded by a portion of lottery proceeds. Staff responsible for overseeing this program were unable to provide detail by age group, but published statistics show overall ridership by older people. The Shared Ride program provided 5,575,229 trips in fiscal year 2002-2003, the last year for which statewide data are available in published form (PennDOT, 2005). This amounts to 2.91 trips per capita for Pennsylvania's 1,919,165 people age 65 and older, based on the 2000 Census. This is nearly three times the trip rate seen in the other systems. The age composition of five programs that

could provide age detail was used to allocate the Pennsylvania trip rate among the age groups, as shown at the bottom of Figure 12.

The Pennsylvania Shared Ride program is the least constrained of programs reviewed, so its trip rates were used as a basis for projecting funding needs. These trip rates were assumed to apply to all sizes of urbanized areas and to rural areas.

The rest of the analysis for dial-a-ride parallels the calculations for ADA paratransit. Cost per trip was estimated from reported NTD data for urbanized area (Figure 13). The NTD data are limited to transit agencies, but they provide a reasonable average of cost for this type of service, which is less expensive to provide than ADA paratransit. In the case of rural areas, NTD staff provided data that they have collected under a program that is still in testing phases. The database includes cost and trip information for 1,263 rural transit programs, of which 820 reported operating cost and trips for demand-responsive service.

Figure 13. Cost per Dial-a-Ride Trip

Urbanized Area Category	Operating Cost per Trip	
	Reported for 2007	Estimated for 2010
Large	$24.92	$25.33
Medium	$19.22	$19.54
Small	$15.23	$15.48
Rural	$9.86	$10.02

In urbanized areas, there are probably capital costs for non-ADA dial-a-ride that go beyond those reported by transit agencies in NTD, all of which is assumed to be used for ADA service. These capital costs are generally covered by FTA Section 5310 funds claimed by transit agencies, cities, and community organizations; Older Americans Act Title III-B funds; state funding programs; and other sources.

In rural areas, the NTD rural data provided for this research include reported capital costs averaging $1.42 per trip. As in the case of ADA paratransit, this represents only the portion of capital cost that is paid using capital funds by the public operator, and excludes the cost of vehicles and facilities that is included in operating costs under contracts with other entities. Using reasonable assumptions for passenger-trips per vehicle-hour, vehicle cost, and vehicle life, the reported rural capital cost per trip could reasonably represent about half the cost of vehicles in dial-a-ride service. In other words it could cover those vehicles purchased by public or community organizations, with the other half being provided by contract operators and included in operating cost. However, the cost of facilities is probably not represented.

In view of all these limitations, and for lack of better data, the same $3.30 in capital cost per trip is used for dial-a-ride service as for ADA paratransit.

Taxi Subsidies

The analysis for taxi subsidies uses the same procedure as used for ADA paratransit and dial-a-ride. Good data about ridership by age group was obtained from six programs. A seventh was able to provide total ridership; it was used as an indication of demand for a mature program, while the remaining six were used for age composition. The age composition of trips and the resulting trip rates are shown in Figures 14 and 15. These trip rates reflect a wide variety of programs.

Taxi subsidies vary in the amount of subsidy allowed per trip and the number or value of trips that can be subsidized each day or month. Given this variation in practice, the concept of a need for taxi subsidy service is imprecise without specifying what type of subsidy would be provided. However, these programs are a representative sample and are ones that could provide the data by age group needed for this research.

Figure 14. Taxi Subsidy Trips by Age of Rider

Program	Under 65	65-74	75-84	85+	All 65+
Mesa, AZ: Coupons for Cabs	22%	31%	35%	13%	78%
Oakland, CA: Taxi Scrip	34%	11%	22%	33%	66%
Fremont, CA: Tri-City Taxi Voucher Program	36%	17%	30%	17%	64%
Laguna Woods: Taxi Voucher Program	10%	60%	25%	5%	90%
Baltimore, MD: Taxi Access II	85%	7%	5%	2%	15%
Chicago, IL: Taxi Access Program	37%	20%	24%	19%	63%
Scottsdale, AZ: Cab Connection	5%	25%	60%	10%	95%
Average	35%	23%	28%	14%	65%

Figure 15. Trip Rates for Taxi Subsidy Programs

(Trips per capita per year)

Program	Under 65	65-74	75-84	85+	All 65+
Mesa, AZ: Coupons for Cabs	0.014	0.378	0.578	0.535	0.424
Oakland, CA: Taxi Scrip	0.009	0.049	0.140	0.549	0.148
Fremont, CA: Tri-City Taxi Voucher Program	0.007	0.057	0.154	0.204	0.111
Laguna Woods: Taxi Voucher Program	0.446	1.563	0.381	0.149	0.654
Baltimore, MD: Taxi Access II	0.131	0.157	0.166	0.190	0.164
Chicago, IL: Taxi Access Program	0.038	0.333	0.627	1.421	0.563
Scottsdale, AZ: Cab Connection	0.018	0.807	3.068	1.681	1.682
Average	0.095	0.48	0.73	0.68	0.59

The average trip rates in Figure 15 were used for projecting demand. The demand for taxi subsidies was assumed to apply to all urbanized areas, but not to non-urbanized rural areas. The cost of a taxi subsidy trip is as variable and imprecise a concept as the demand, given variations in the amount of subsidy provided. The seven programs had an average subsidy cost per trip of $13.41, as shown in Figure 16, and this is the figure used in projecting funding need. No capital funding need was assumed for taxi subsidies.

Figure 16. Cost per Trip of Taxi Subsidies

Program	Subsidy Cost per Trip
Mesa, AZ: Coupons for Cabs	$10.20
Oakland, CA: Taxi Scrip	$13.00
Fremont, CA: Tri-City Taxi Voucher Program	$11.94
Laguna Woods: Taxi Voucher Program	$29.77
Baltimore, MD: Taxi Access II	$12.23
Chicago, IL: Taxi Access Program	$9.85
Scottsdale, AZ: Cab Connection	$6.92
Average	$13.41

Community Transit Services

Community transit services include circulator routes and shopping shuttles designed to appeal to older people. Many have features that correspond to what have been called "service routes" in the planning literature. Ridership data for community bus services was obtained from five transit systems. Due to the nature of these services, only one operator (Lane Transit District in Eugene, Oregon) was able to provide actual counts of trips by age group. The rest are rough estimates based on impressions of program managers. Figure 17 shows the estimated age composition of the ridership and Figure 18 the resulting per capita trip rates. These trip rates were applied to large and medium size urbanized areas. In small urbanized areas and rural areas, it is assumed that general public transit service where it exists is similar to community bus service in larger areas. In rural areas, the majority of transit service is demand responsive and was included in the estimate for Dial-a-Ride.

Figure 17. Percentage of Community Bus Trips by Age Group

Program	Under 65	65-74	75-84	85+	All 65+
Broward Co., FL: Community Bus Service	70%	12%	15%	3%	30%
Menlo Park, CA: Midday Shuttle	50%	20%	25%	5%	50%
Madison Co., IL: Shuttle Routes	92%	4%	3%	1%	8%
Eugene, OR: Shopper	13%	18%	31%	38%	87%
Las Vegas, NV: Silver Star & Flexible Demand Response	0%	40%	50%	10%	100%
Average	45%	19%	25%	11%	55%

Figure 18. Community Bus Trips per Capita by Age Group

(Trips per capita per year)

Program	Under 65	65-74	75-84	85+	All 65+
Broward Co., FL: Community Bus Service	1.330	2.663	3.828	1.804	2.974
Menlo Park, CA: Midday Shuttle	0.449	2.248	3.005	1.316	2.379
Madison Co., IL: Shuttle Routes		1.383	1.560	1.125	1.415
Eugene, OR: Shopper	0.004	0.089	0.183	0.573	0.198
Las Vegas, NV: Silver Star & Flexible Demand Response	0.000	0.223	0.543	0.479	0.342
Average	0.45	1.32	1.82	1.06	1.468

Four agencies were able to provide sufficient cost information to compute an operating cost per trip, averaging $9.27 (Figure 19). Services which are highly specific to seniors have higher cost per trip, while general public services that include features appealing to seniors have lower cost per trip because they have higher ridership over which to spread the operating costs. The capital cost per trip of community service was assumed to be similar to ADA paratransit and Dial-a-Ride.

Figure 19. Cost per Trip of Community Bus Service

Program	Operating Cost per Trip
Broward Co., FL: Community Bus Service	$3.81
Menlo Park, CA: Midday Shuttle	$6.74
Eugene, OR: Shopper	$12.56
Las Vegas, NV: Silver Star & Flexible Demand Response	$13.96
Average	$9.27

Volunteer Drivers

Five volunteer driver programs were able to provide sufficient information for the analysis. Two programs (in Denver and San Diego) were able to provide exact counts of trips by age of rider, while others provided estimates. Mesa was able to provide overall trip data, which was used to estimate trip rates by age group based on the others (Figures 20 and 21).

Figure 20. Percentage of Volunteer Driver Trips by Age Group

Program	Under 65	65-74	75-84	85+	All 65+
Mesa, AZ: Mileage Reimbursement	Not available				
Huntington Beach, CA: Senior Services Mobility Program	5%	65%	15%	15%	95%
Denver, CO: Seniors Resource Center, Volunteer Driver Program	7%	13%	75%	5%	93%
Howard Co. MD: Neighbor Ride	5%	25%	60%	10%	95%
San Diego, CA: Jewish Family Services Rides and Smiles	4%	15%	38%	43%	96%
Average	5%	30%	47%	18%	95%

Figure 21. Volunteer Driver Trips per Capita by Age Group

(Trips per capita per year)

Program	Under 65	65-74	75-84	85+	All 65+
Mesa, AZ: Mileage Reimbursement	0.006	0.847	0.676	1.250	0.847
Huntington Beach, CA: Senior Services Mobility Program	0.011	1.859	0.752	1.938	1.516
Denver, CO: Seniors Resource Center, Volunteer Driver Program	0.000	0.008	0.069	0.014	0.029
Howard Co. MD: Neighbor Ride	0.001	0.145	0.604	0.280	0.308
San Diego, CA: Jewish Family Services Rides and Smiles	0.001	0.074	0.238	0.844	0.232
Average	0.00	0.59	0.47	0.87	0.581

All five programs provided total cost and trip information. Figure 22 shows that the five programs had an average cost per trip of $14.33. Capital costs for volunteer driver programs tend to be minimal, since for the most part volunteers drive their own cars. Volunteer driver programs do use computer systems to schedule and track rides. The five programs carried an average of about 19,000 trips per year. An outlay of on the order of $10,000 once every three years for computer equipment, software, and programming services would amount to a capital cost of $.53 per trip.

Figure 22. Cost per Trip for Volunteer Driver Transportation

Program	Cost per Trip
Mesa, AZ: Mileage Reimbursement	$7.47
Huntington Beach, CA: Senior Services Mobility Program	$5.33
Denver, CO: Seniors Resource Center, Volunteer Driver Program	$15.49
Howard Co. MD: Neighbor Ride	$24.19
San Diego, CA: Jewish Family Services Rides and Smiles	$19.18
Average	$14.33

Information and Assistance

Very limited information was available about two comprehensive information and assistance programs in which staff trained to work with older people about a variety of issues to provide information and assistance to connect callers with appropriate transportation resources. Data obtained by the researchers in prior work provides an indication of the level of effort at these programs as shown in Figure 23. Both of these programs are located within Area Agencies on Aging. Costs consist of some additional staffing level to handle transportation calls. On the basis of this extremely sparse information, a "usage rate" of 0.03 calls per capita per year has been used for the analysis, and a cost per call of $11.00. These factors were applied to all older people regardless of age or type of area.

Figure 23. Cost and Usage of Information and Assistance Programs

Location	Annual Cost	Transportation Calls per Year	Population 65 and Older	Calls per Capita	Cost per Call
Orange Co. CA	$93,000	10,000	280,763	0.035	$9.28
Riverside Co. CA	$47,000	3,798	195,964	0.019	$12.37

Outreach and Training

The analysis of outreach and training usage drew on published research conducted for the Northern Virginia Transportation Commission (KFH Group, 2008). This research reported on 11 travel training programs throughout the United States, listed in Figure 24. Not all of the programs focus on older people and not all of them provided complete data. However, using the range of information, a rate of 0.003 annual trainings (group events or individuals trained) per capita, based on the older population in an area, has been chosen for projecting funding need. This is consistent with an assumption that, as people enter each age group, one person in 30 will desire training of some form.

Programs that provide intensive one-on-one training spend upwards of $1,000 per person. Programs to assist older people will be much less expensive, involving outreach, targeted promotions, demonstrations, group field trips, and peer programs. Easy Rider, a very active travel training program of Special Transit in Boulder, Colorado, uses a mix of one-on-one and group training for seniors and people with disabilities and had an average cost of $450 per training. For the funding projections, a cost of $200 per outreach or training has been chosen to

represent a program that is limited to seniors and makes less use of professional one-on-one training.

Figure 24. Travel Training Programs

Agency	Target Groups		Name of Program
	Seniors	People with Disabilities	
Fairfax Connector	X		Mobile Accessible Travel Training
WMATA	X	X	Metro System Orientation
Lane Transit District (Eugene, OR)	X		Bus Buddy
Ride Connection (Portland, OR)	X	X	RideWise
Special Transit (Boulder)	X	X	Easy Rider
BC Transit	X	X	Community Travel Training
Delaware Transit	X	X	Travel Training
The Rapid (Grand Rapids)	X	X	Travel Training
PalmTran	X		Seniors in Motion
Chatham Area Transit (Savannah)	X	X	Travel Training
No. Va. Transportation Commission	X		Mobile Accessible Travel Training

Source: KFH Group (2008)

Bus Operator Training

Added training for fixed-route bus drivers does not lend itself to the same method of analysis used for the other actions, since it is only indirectly tied to the size of the older population. For this analysis, the following assumptions have been made:

- All new drivers will receive four hours of training on the needs of older passengers.
- Existing drivers will receive four hours of training on the same topic once every five years.
- Annual turnover of drivers averages 10%.
- There is an average of ten drivers per training class.

The 10% annual turnover rate is consistent with reported rates in a recent survey of 18 transit systems conducted by the Southeastern Pennsylvania Transportation Authority.

To estimate the cost of driver wages for attending training, preliminary data from a survey being conducted by APTA was used. The dataset includes reports from 125 transit systems of all sizes. Each operator reported a low-end, high-end, and average wage. The averages were:

Low wage:	$13.44
High wage:	$19.71
Average wage:	$17.18

Note “average wage” refers to the average among the drivers at each reporting transit system, exclusive of benefits. Many transit systems pay wages significantly above or below the averages. In general, larger systems tend to pay higher wages, though there are many exceptions. Percentiles were used to approximate this effect, as follows:

	Average Wage	High-end Wage
75th Percentile (Large urbanized areas)	$19.43	$22.05
50th Percentile (Medium size urbanized areas)	$17.23	$19.75
25th Percentile (Small urbanized areas)	$15.00	$17.00

These values are close to those found by tabulating the very incomplete driver pay data in the 2007 National Transit Database. For rural systems, continuing the trend suggests an average wage of approximately $12.50 and a high-end wage of about $14.50, exclusive of fringe benefits. Using averages from the National Transit Database, 70% is added for fringe benefits. The average wages were used for drivers attending training, and the high-end wage was used for the cost of a trainer for each class. Figure 25 shows the resulting cost calculation.

Figure 25. Calculating the Cost of Bus Operator Training

UZA Category	Drivers (from NTD)	Trained Each Year	Hours of Training	Training Wages and Benefits	Trainer Wages and Benefits	Total Training Cost in 2010
Large	119,393	33,430	133,720	$4,416,910	$501,250	$4,918,159
Medium	19,784	5,539	22,158	$649,028	$74,395	$723,423
Small	9,102	2,549	10,194	$259,948	$29,461	$289,408
Rural	4,500	1,260	5,040	$107,100	$12,424	$119,524
					Total:	$6,050,514

For future years, the amount of transit service and drivers is assumed to grow in proportion to total population. Since all drivers will need training on the needs of older passengers, the cost of training will also grow in proportion to total population.

5. Pedestrian Improvements near Transit Stops and Stations

People of all ages and abilities benefit from streets that are easy to cross and sidewalks wide enough for walking, chatting, and sitting, with adjacent land uses that are interesting. There are unique needs associated with the variations in perception, cognition, and mobility changes that accompany aging. Older people are especially vulnerable to how these changes influence their use of the street environment. As a result older people are disproportionately represented among pedestrians injured or killed in crashes with motor vehicles each year throughout the U.S. (Chang, 2008).

Walking, Transit, and Older People

From the point of view of public transit, adequate accommodation for walking, especially in the vicinity of transit stops and stations, is critical to enabling passengers to access service. Older people have particular requirements that need to be addressed if they are to take full advantage of transit service. An AARP survey of Americans over 50 found that almost 40% of those polled reported inadequate sidewalks in their neighborhoods, while 55% do not have bike lanes or

paths, and 48% say there is not a comfortable place to wait for the bus. Most sobering, almost half (47%) of poll responders say they cannot cross the main roads in their community safely. Half of those who reported such problems said they would walk, bicycle, or take the bus more if these problems were fixed (Skufca, 2008).

Elements that can create safer environments for senior pedestrians include safe sidewalks, crosswalks, clear pedestrian signals, sufficient crossing time at intersections, benches for resting, reduced traffic speed, and traffic islands. Implementing these features near transit stops and stations will definitely have costs, but it will be difficult to assign a particular portion of the cost to the growth of the older population. In any event, if improvements were done as part of a long term program to upgrade stops, the annual cost might be minimal.

There are some improvements that are particularly relevant to the needs of older people. For example, all transit riders, and especially current older riders, benefit from benches and shelters at bus stops. But providing this amenity to the increased senior population could require providing longer benches or multiple benches and in turn larger bus shelters at some stops. In addition, while all pedestrians benefit from shorter street crossing distances, additional time to cross the street, and the absence of vehicles making right turns during the pedestrian signal, these features are essential to accommodate greater numbers of older adults crossing intersections.

It would be beyond the scope of this research to determine the number of intersections and transit stops in the United States where each of these improvements would be needed, as well as to assign a portion of their cost to demographic change. However, we have identified the most important improvements and compiled unit costs for their components.

The costs of street elements that assist seniors in walking, such as marked crosswalks, crosswalks free of potholes, and curb ramps free of pooling are not a factor of this study because they are routine maintenance costs a municipality would incur regardless of population. Likewise, any street element required under the Americans with Disabilities Act (ADA) such as the existence of curb ramps was not within the scope of this study. Finally, the costs of traffic calming methods to slow down motor vehicles, like bicycle lanes, speed humps, raised crosswalks, and chicanes go far beyond providing safe walking environments for the projected senior population, so are absent from this study. These elements definitely contribute to better walking conditions for everyone, but are not senior-specific street features.

Improvements and Costs

Costs associated with street design improvements have been developed using average rates from multiple sources, including:

- Making Streets that Work, City of Seattle (www.ci.seattle.wa.us/npo/tblis.htm)
- Traffic Calming State of the Practice (Institute for Transportation Engineers/Federal Highway Administration, Chapter 3, 1999)
- Guidelines on the website of the Pedestrian and Bicycle Information Center (PBIC), www.walkinginfo.org
- Pedestrian Facilities Users Guide - Providing Safety and Mobility, Publication No. FHWA-RD-01-102, March 2002.

Each of these manuals or resources provides ranges of costs for street design improvements based on location and existing infrastructure. Almost every city and state in the U.S. has general guidance through Departments of Transportation and/or Public Works on the costs of roadway improvements and street furniture.

Street and Crosswalk Improvements

Medians and pedestrian refuges are physical barriers placed in the center of a crossing to create a safe place for pedestrians to wait to complete a crossing. They are traditionally used on wide, two-way streets, where it is not possible for pedestrians to complete a crossing in one phase. An example of a particularly difficult situation and an effective response is on Broadway in Manhattan, where a wide median separates a crossing distance of 150 feet with a 15-foot refuge area that includes benches and a physical barrier at the edge of the median to stop vehicle encroachment. The provision of median refuges throughout hazardous sections of wider, multilane roads, particularly in areas with many older pedestrians, has been identified as a potentially effective countermeasure for pedestrian safety (Zeeger et al., 2002).

Curb extensions, also known as bulb-outs or neckdowns, extend the sidewalk or curb line out into the parking lane, which reduces the effective street width. Extending a curb into an intersection serves two purposes: it shortens the crossing distance for pedestrians and creates better visual cues between motorists and pedestrians. Some curb extensions have physical barriers such as bollards, edging and planters to provide additional protection to pedestrians from turning movements. Adding barriers on curb extensions along bus routes and truck routes prevents pedestrians from being overtaken by the rear wheels of these larger vehicles.

One study in New York City found that older pedestrians tend to leave the curb before the pedestrian signal on wider streets in order to reduce their crossing distance (Krug, 2007). Other research has documented a tendency for older pedestrians to stand further back from the curb than other people while waiting to cross, presumably due to a greater sense of vulnerability from passing traffic (Harrell, 1990 cited in FHWA, 1998). This behavior increases their required crossing time and reduces their ability to see oncoming traffic. Providing curb extensions, especially where there are large numbers of older pedestrians waiting to cross, can help address both of these behaviors.

Signals. Older people have difficulty crossing streets for a variety of reasons. Some research suggests that their physical limitations make seniors more likely to be involved in accidents than younger adults because failing vision and other physical impairments can limit older pedestrians' awareness of their environment and slow their reaction times. Often, older people simply can't walk fast enough. Studies have shown that many older pedestrians are incapable of crossing a street within the time normally allotted by a crosswalk signal. In a study by Jean Langlois of adults aged 72 and older, fewer than 1% could cross in the time given (Traffic Safety Center, 2002).

In general, pedestrian traffic signals are timed at a walking rate of 4 feet per second, as is the guidance provided in the Manual of Uniform Traffic Control Devices (MUTCD), a standard used by most transportation engineers. However, older adults walk at a slower pace, depending on ability and if they have assistance walking with a cane or walker, so FWHA recommends that pedestrian signal timing be based on a walking speed of 2.8 feet per second (FHWA, 1998 and 2001). In addition to longer crossing intervals to accommodate slower walking speeds, countdown signals, which show how much time is left in the pedestrian crossing phase, are an

additional feature that is helpful for older adults in gauging the effort required to cross an intersection. Larger pedestrian signal heads associated with countdown signals are important in areas with large senior populations to account for low vision.

Leading pedestrian intervals provide pedestrians with additional time to cross the street before motor vehicles are allowed to make through or turning movements. This additional time to descend the curb without turning cars helps seniors establish themselves in the crosswalk. Disallowing right turns during the pedestrian crossing acts like a leading pedestrian interval as it prevents motorists from overtaking people as they begin their crossing. As this is the critical portion of the crossing for senior citizens, this additional protection creates a safer walking environment.

Audible and vibrating signals for pedestrians are designed to help people with visual impairments cross the street by providing a sound when it is safe to begin a crossing. These signals are helpful for older people, especially in environments with higher traffic speeds and volumes to understand when it is safe to cross the street.

Representative costs for street and crosswalk improvements have been assembled from the sources given at the beginning of this section. The costs of installing curb extensions and medians varies greatly based on existing infrastructure, width and length of the facility, and the materials used. Typical costs tend to the lower side of the range rather than the maximum.

Figure 26. Costs of Street and Crosswalk Improvements

Improvement	Cost
No Right Turn on Red Sign	$150
Curb Extension	$5,000-$20,000
Medians/Pedestrian Refuge	$4,000 - $30,000
Benches on median	$800
Accessible/Audible signal	$400-$600
Countdown signal	$400 - $800
Leading pedestrian interval	Installation and programming/labor cost, no material cost.
Larger Pedestrian Signal Head	$500

Pedestrian Comfort and Sidewalks

Sidewalks and Ramps. Sidewalks and curb ramps to access sidewalks are basic features required under the Americans with Disabilities Act (ADA). For seniors, especially those with mobility impairments, adherence to the slope, cross slope, and direction of a curb ramp is essential in safe crossings. However, this report focuses on costs outside of ADA requirements. In addition, pedestrian scale street lighting is essential for senior citizens to feel comfortable walking at dusk and in the evening, but most municipalities have street lighting provisions as part of standard operations, so this cost is not an additional cost to accommodate the increase in the older population.

Benches and Bus Shelters. One of the primary reasons given by older people for not riding the bus is not being able to stand long enough to wait for the bus and not having shelter from the sun

and weather. In turn, older adults have a greater need to find shaded places to sit throughout their daily walking trips than younger adults. In some places with concentrations of older people, it will be necessary to provide more benches or longer benches so older people are able to wait for a bus.

Representative costs for street and crosswalk improvements have been assembled from the sources given at the beginning of this section. The costs associated with these street design improvements vary depending on geographic location, volume, contracts, as well as existing infrastructure.

Figure 27. Costs of Pedestrian Comfort Improvements

Improvement	Cost
Bench - 6 foot	$500
Bench - 8 foot	$800
Bus Shelter - 5' x 10'	$4,200
Bus Shelter - 8' x 15'	$6,700

6. Funding Needs

Funding Needed to Provide Public Transportation for Older People

Using the analysis methods described in Section 4, it is estimated that in 2010, $4.2 billion dollars would be needed to operate a desirable level of public transportation services for older people. In addition, $616 million in capital costs would be needed. These are the estimated costs of providing a desirable mix and quantity of services. Actual current service levels and expenditures are almost certainly much less than the need estimated in this research. It was not possible to determine the size of the gap with any certainty, although some analysis of its possible size is presented below. Over the next 10 years, by 2020, the annual funding requirement will grow by $1.2 billion for operating costs and $254 million for capital costs. Over the next 20 years, by 2030, the annual funding requirement will grow by $3.3 billion for operating costs and $598 million for capital costs. Figure 28 provides detail.

The mix of public transportation services that require this funding to serve growing numbers of older people includes ADA paratransit, non-ADA demand responsive services (dial-a-ride), taxi subsidy programs, volunteer driver programs, community bus service, outreach and training to help older people learn to use public transportation, information and assistance services to connect older people to appropriate services, and additional bus operator training to enhance the experience of older people riding conventional transit services. Figure 28 shows the estimated funding requirements for each of these. The largest amount of current and future funding need is for non-ADA dial-a-ride services. This is closely followed by funding needs for ADA paratransit for older people.

The improvements shown in Figure 28 are not the only improvements that are needed, but they are the ones for which a specific portion of cost can be tied to the needs of older people and the expected growth in the older population. Detail about these and other needs is provided in Section 2. Note that the cost of bus operator training is the only portion of the cost of providing conventional, fixed-route transit services that was included in the analysis, since no particular portion of the cost of other enhancements to fixed-route service can be readily assigned to growth of the older population.

Figure 28. Funding Needs Summary

(Millions of 2010 Dollars per Year)

Mode and Cost Type	Total Funding Need			Increase over 2010	
	2010	2020	2030	10 years	20 years
Operating Cost					
ADA Paratransit	$1,661.7	$2,190.5	$2,923.4	$528.7	$1,261.6
Dial-a-Ride	$1,822.0	$2,285.6	$3,228.2	$463.6	$1,406.1
Taxi Subsidy	$176.3	$234.4	$317.7	$58.1	$141.4
Volunteer Drivers	$192.0	$260.7	$341.4	$68.6	$149.4
Community Buses	$261.1	$351.8	$535.3	$90.7	$274.3
Outreach and Training	$24.1	$32.9	$43.3	$8.7	$19.1
Information and Assistance	$13.3	$18.1	$23.8	$4.8	$10.5
Bus Operator Training	$6.1	$6.6	$7.3	$0.6	$1.2
Total	$4,156.6	$5,380.6	$7,420.3	$1,223.9	$3,263.6
Capital Cost					
ADA Paratransit	$179.2	$236.1	$315.1	$57.0	$136.0
Dial-a-Ride	$332.2	$416.9	$588.5	$84.7	$256.3
Community Transit	$92.9	$125.2	$190.6	$32.3	$97.6
Volunteer Drivers	$11.9	$91.9	$120.2	$80.0	$108.3
Total	$616.2	$870.1	$1,214.5	$254.0	$598.3

Demand for Service

The funding needs are driven by expected increases in ridership by older people, as shown in Figure 29. Total demand for public transportation services by older people (given a desired mix and level of services) amounts to 217 million trips in 2010, and will grow to 282 million trips per year in 2020 and 393 million trips in 2030. In percentage terms, demand will grow by 30% by 2020 and by 81% by 2030. As in the case of funding, the current actual level of ridership on public transportation (excluding conventional fixed-route services) is unknown, but is almost certainly much less than the estimated demand; discussion about the possible size of the gap is provided below.

As the demand for public transportation service by older people increases, seniors will constitute an increasing portion of the ridership on many services. Figure 30 shows the portion of demand due to each older age group in 2010 and 2030. Non-ADA dial-a-ride and volunteer transportation are almost exclusively used by older people. A very small amount of ridership by people between the ages of 60 and 64 is not included in the calculations. On ADA paratransit older people account for 42% of trips, while for taxi subsidies, which are run in parallel with ADA paratransit by transit agencies in two of the cases studied, older people account for 45% of trips. In the case of community transit services, only very rough estimates were available, indicating that older people make about 30% of the trips on these services. By 2030, if current ridership rates by individuals in each group do not change, older people will make more than half of the trips on ADA paratransit and taxi subsidies, and over 40% of the trips on community transit services. The increase is concentrated in the 65 – 74 and 75 – 84 age groups.

Figure 29. Projected Demand by Older People

Trips on Public Transportation (Millions per Year)

Service Type	Annual Trips			Increase over 2010	
	2010	2020	2030	10 years	20 years
ADA Paratransit	54.3	71.5	95.5	17.3	41.2
Dial-a-Ride	100.7	126.3	178.3	25.7	77.7
Taxi Subsidy	13.6	18.0	24.4	4.5	10.9
Volunteer Drivers	20.5	27.9	36.4	7.4	15.9
Community Buses	28.2	37.9	57.7	9.8	29.6
Total	217.2	281.7	392.5	64.6	175.3

Supportive Services (Millions per Year)

Service Type	Annual			Increase over 2010	
	2010	2020	2030	10 years	20 years
Outreach and Training – Trainings	0.12	0.16	0.22	0.04	0.10
Information and Assistance – Calls	1.2	1.6	2.2	0.4	1.0

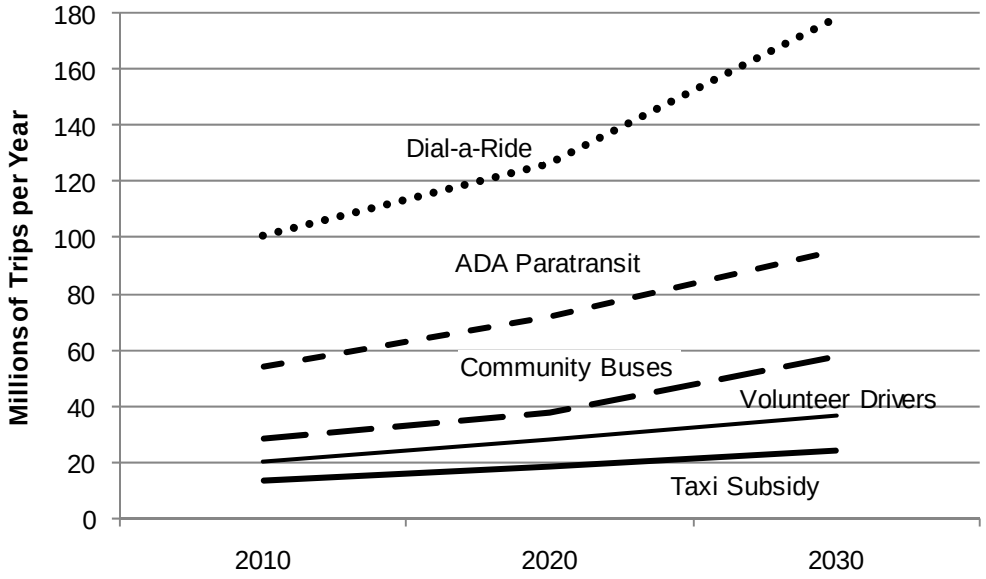
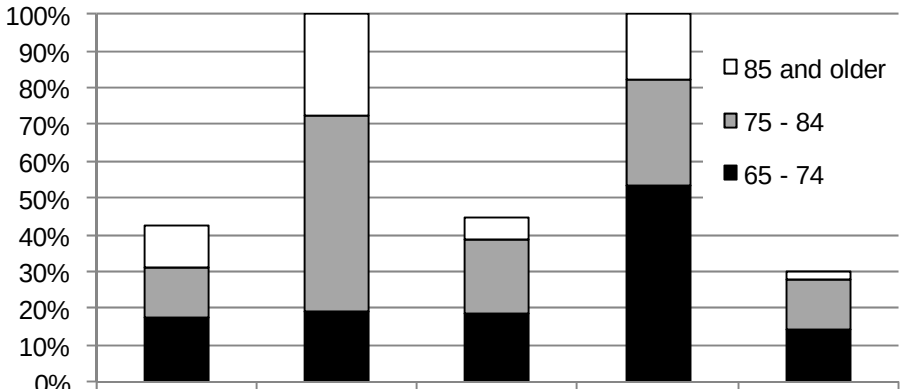


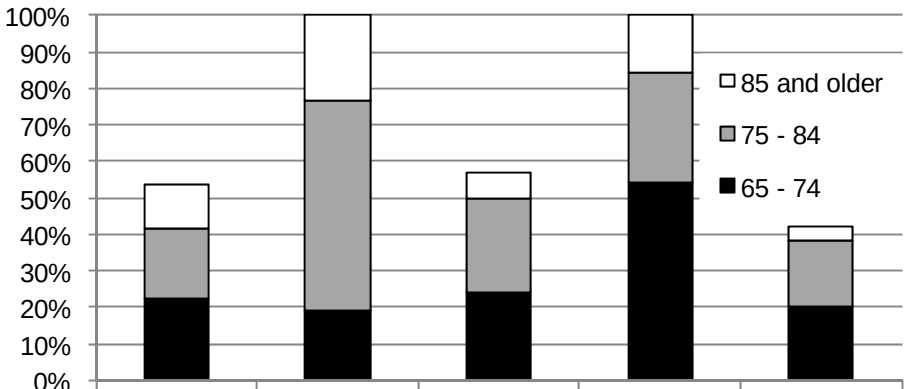
Figure 30. Portion of Ridership by Older Age Groups

2010



	ADA Paratransit	Dial-a-Ride	Taxi Subsidy	Volunteer Drivers	Community Buses
85 and older	11%	27%	6%	18%	3%
75 - 84	14%	54%	20%	29%	13%
65 - 74	17%	19%	19%	53%	14%

2030



	ADA Paratransit	Dial-a-Ride	Taxi Subsidy	Volunteer Drivers	Community Buses
85 and older	12%	23%	7%	15%	4%
75 - 84	19%	57%	26%	30%	18%
65 - 74	22%	19%	24%	54%	20%

The Gap between Current Services and Current Needs

National data sources about use of public transportation by older people do not allow for a precise comparison of current services to needs. However, a sense of how ridership compares to the needs estimated here can be gained from a variety of sources.

In the case of ADA paratransit, the most recent National Transit Database results are for 2008 (released after most of the analysis for this research was completed). They show 66.9 million unlinked trips on ADA paratransit. Using the estimate that 42% of ridership is by older people age 65 and older, approximately 28.1 million ADA paratransit trips were provided to older people, about 52% of the estimated 54.3 million trips needed. This does not necessarily imply that numerous ADA paratransit systems are not complying with the requirements for comparable service. The estimates of need were based on demand at model systems that were chosen because they are employing best practices in providing high quality service.

Three additional national sources provide partial information about modes other than ADA paratransit. First, the NTD for 2008 reports 28.7 million non-ADA demand responsive trips. These are trips provided by transit systems in urbanized areas receiving federal aid, not including rural transit systems or the many cities, counties, and community organizations that provide dial-a-ride and other transportation services for older people. Most of these 28.7 million reported trips are probably services for older people and people with disabilities, for example offered as a supplement to ADA paratransit, but some are general public dial-a-ride services. The total would also include services to limited areas that are considered hard to serve with conventional fixed-route service, such as the Denver Regional Transportation District's Call-n-Ride and Dallas Area Rapid Transit's DART On-Call service. Some portion of the 28.7 million trips would correspond to the categories "Dial-a-Ride" and "Taxi Subsidies" in the needs analysis.

Second, an experimental NTD program of reporting for rural recipients of federal transit assistance reports 41.4 million demand responsive trips for 2007, the most recent year available. These trips would include trips in the need analysis categories "ADA Paratransit", "Dial-a-Ride", and "Taxi Subsidies."

Third, the U.S. Administration on Aging (AoA) reports transportation provided using funding under Title III-B of the Older Americans Act. This funding is distributed locally by Area Agencies on Aging. Transportation is just one of the "supportive services" eligible for funding under Title III-B, so the amount of transportation provided varies a lot from place to place. The most recent compilation of state reports made public by AoA show 29.4 million trips in federal fiscal year 2007. Nearly all of these trips were taken by people age 60 and older, most of them by people age 65 and older.

Combining these three data sources allows a rough comparison with the needs analysis. As shown in Figure 31, the NTD and AoA reports imply about 57.3 million annual trips by people age 65 and older on modes corresponding to Dial-a-Ride and Taxi Subsidy in the needs analysis. This total is about 50% of estimated need of 114.2 million trips (100.7 million on Dial-a-Ride and 13.6 million on Subsidized Taxi). However, the three data sources do not include many trips provided or subsidized by cities or community organizations that do not receive funding under the Title III-B program.

Figure 31. Reported Trips from National Sources

Source	Types of Trips Reported	Needs Categories	Reported Trips	Percent of Trips by People Age 65+	Estimated Usage by 65+
National Transit Database	Non-ADA demand responsive service	Dial-a-Ride, Taxi Subsidy in urbanized areas	28,653,927	42%	12,034,649
NTD rural reporting	Rural demand responsive	Dial-a-Ride	41,409,512	42%	17,391,995
AoA State Reporting	Title III-B trips, age 60+	Dial-a-Ride	29,388,440	95%	27,919,018
				Total:	57,345,662

A fourth national source of data is the National Household Travel Survey (NHTS) conducted by the Bureau of Transportation Statistics. The most recent NHTS was concluded in 2009. The NHTS collected data from over 155,000 households in 2008 and 2009, including a national sample of 25,000 and 125,000 state and local surveys through an Add-on Program (Contrino, 2010). The survey obtained information about all trips by all modes on a selected travel day for each household, which has been weighted by NHTS to provide estimates of annual travel. One mode on the NHTS questionnaire corresponds reasonably well to categories used in this needs analysis—"special transit for people with disabilities (dial-a-ride)" for which respondents would most likely have reported trips corresponding to the needs analysis categories "ADA Paratransit" and "Dial-a-Ride." A special tabulation by NHTS staff shows 99.6 million trips by people age 65 and older on these modes (McGuckin, 2010). The total estimated need in 2010 for these modes is 155 million trips, so the NHTS results would imply that actual usage amounts to about 64% of the estimated need.

Another way to compare actual service to desirable levels of service is to look at data from regions where comprehensive inventories of existing service have been prepared in recent years. Five regions from which data were readily available are the San Francisco Bay Area, the Portland (Oregon) Tri-County area the Salt Lake City region, New York City, and Northern Virginia.

The data come from the following sources:

- San Francisco Bay Area – A "Social Service Transportation Inventory" conducted by Nelson\Nygaard Consulting Associates for the Metropolitan Transportation Commission in 2002.
- Portland Tri-County Area – The "TriMet - Ride Connection Elderly and Disabled Transportation Report" for October 2009.
- Salt Lake City Area – An inventory conducted by Nelson\Nygaard in 2009 as part of a *Mobility Management Study* for the Wasatch Front Regional Council.
- New York City – An inventory conducted as part of a *Coordinated Public Transit-Human Services Transportation Plan* prepared by Nelson\Nygaard for the New York Metropolitan Transportation Council in 2009.

- Northern Virginia – A tabulation of specialized transportation services included in the report, *Meeting the Needs of Northern Virginia's Seniors: Recommendations for Public Transit Systems and Other Mobility Providers*, prepared by KFH Group for the Northern Virginia Transportation Commission in 2006.

The available data do not usually show the portion of ridership on many services that is made up of older people, so it was necessary to make assumptions using the results presented earlier. In each case, data from the available inventories was compared to a calculation of need made by entering population data for that region only in the analysis tool created for this research. The inventories and the need calculations included all types of supplementary service operated by public agencies and community organizations other than ADA paratransit and conventional transit service services, including dial-a-ride, subsidized taxis, volunteer transportation, and services by organizations such as senior centers and adult day care centers. Community bus services operated by public transit agencies are not generally included in the type of inventories used, so they were also excluded from the needs calculations. The results of the comparison shown in Figure 32, indicate that the estimated number of trips provided ranges from 27% and 77% of the estimated need for supplementary non-ADA service. The average for the five regions is 48%.

Figure 32. Estimated Trips and Need in Five Regions

Region	Estimated Need	Estimated Trips	Trips as a Percent of Need
S.F. Bay	3,217,596	2,064,048	64%
Portland Trimet	638,794	246,450	39%
Northern Virginia	519,243	482,172	77%
New York	3,814,076	1,247,594	33%
Salt Lake City	1,329,604	358,277	27%

To summarize, none of the available sources is definitive, but in broad terms it appears that existing public transportation services are meeting on the order of one-half to two-thirds of need for demand-responsive services, including ADA paratransit, dial-a-ride, and taxi subsidies.

7. Conclusions

The analysis has documented that the cost of providing public transportation for older people will grow by about $3.9 billion over the next 20 years, and that existing services do not serve all the current mobility needs. All of the estimates and analyses are very approximate and rely on small numbers of cases and numerous assumptions.

This research only begins to define and quantify the public transportation needs of older people. To carry the research to a new level, it would be desirable to quantify how older people decide what means of travel to use, and how the availability of various services changes their ability and decisions to engage in activities outside the home. This type of research could lead to a more precise understanding of what should reasonably be considered a “need.” It would also help to understand how the various types of service interact, that is the extent to which the various modes analyzed here can substitute for each other or are needed to meet a variety of different travel needs. For example it could determine the extent to which taxi subsidy programs that

supplement ADA paratransit reduce demand for ADA paratransit or simply add another desirable travel option.

Aside from research about travel behavior, it would also help to have better data about the services that currently exist. Since these services obtain their funding from a wide variety of sources, no one mandatory reporting system is likely to be practical. However, several methods of improved data gathering may be possible, such as:

- A program of obtaining consistent data from recipients of funding
- Establishing a basic set of required data items to be included in transportation inventories conducted for coordinated public transit-human services transportation plans
- Creating a voluntary system of reporting under an initiative such as the National Center on Senior Transportation. To be useful and to achieve sufficient participation, such a reporting system would need to use a limited number of carefully defined and chosen data categories.

Program Descriptions

The analysis in Chapter 5 used data from model programs that are briefly described here.

ADA Paratransit Programs

The **Fort Worth Transportation Authority**'s ADA paratransit program, called Mobility Impaired Transportation Service (MITS), provides service that is comparable to FWTA's fixed-route service using a fleet of directly operated vehicles and six supplementary contract providers. In fiscal year 2008, 383,273 passenger trips were provided.

Pace is the provider of transit service in the suburbs of Chicago and the provider of ADA paratransit service throughout the region, including the city of Chicago. Data for the city of Chicago only were used in this report. Pace's Chicago paratransit is provided by three principal contract providers operating their own vehicles. In 2008, 1,925,000 passenger trips were provided. Pace also administers a taxi subsidy program for ADA-eligible riders in the city of Chicago which provided 266,000 trips in 2008.

The **Santa Clara Valley Transportation Authority** serves the city of San Jose, California and nearby cities. ADA paratransit service is provided through a contract with Outreach, a non-profit organization that also provides senior services and employment transportation. Outreach schedules and dispatches service operated by private subcontractors. In 2008, 1,055,426 passenger trips were provided.

Lane Transit District serves Eugene and Springfield, Oregon, and nearby communities. ADA paratransit is provided through a contract with a non-profit agency that operates LTD-owned vehicles from an LTD facility. Under the same contract, the same agency manages and/or operates a variety of other related programs including non-emergency medical transportation, waivered non-medical transportation, senior shopping shuttles, and service to a preschool for children of disabled adults. In 2008, 84,797 ADA passenger trips were provided.

Dallas Area Rapid Transit serves Dallas, Texas and environs. DART schedules and dispatches ADA complementary paratransit trips operated by a private contractor. In 2008, 722,323 passenger trips were provided.

Demand-Response Service

The **Irvine,** California, TRIPS provides two types of demand-response services: Door-to-door service which is similar to but more flexible than ADA paratransit service, and weekly shopping shuttles that pick up seniors and people with disabilities at their homes in designated neighborhoods and take them to various shopping destinations. TRIPS is open to Irvine residents, 65 and older, who are unable to drive due to a permanent physical and/or cognitive impairment. The cost is $1.90 each way within the City of Irvine and $3.80 to/from neighboring cities for medical needs. There is a $1.90 surcharge for non-medical trips within this zone.

Newport Beach, California, provides curb-to-curb transportation through its Care-A-Van and Shuttle programs. The Care-A-Van program provides transportation to medical appointments, grocery shopping and other errands within city limits. The Shuttle program provides transportation to the OASIS Senior Center for classes and activities. Participants must be age 60 or older, live at home, reside within Newport Beach, Corona del Mar or Newport Coast, and be

unable to drive. Participants pay $2 each way for the Care-A-Van program and $1 each way for the Shuttle program. Service is available Monday – Friday, 8:00 AM – 4:30 PM. Reservations must be made 3-5 business days in advance.

The **Buena Park**, California, Senior Transportation Program provides bus service for lunch, to senior center activities, Alzheimer day care, special events, concerts, and grocery shopping within the City of Buena Park. Medical appointments for residents can be arranged up to three miles outside Buena Park city limits. Eligibility is limited to Buena Park residents, age 60 years and older. No fee is charged except for medical appointments and grocery trips which cost $1.00 each way.

Providence ElderPlace in **Portland**, Oregon, follows the PACE (Program of All-inclusive Care for the Elderly) model, providing and coordinating all of the care services necessary for seniors to remain active in the community. Organizational vans are available to transport clients between service locations. To be a member of the program, individuals must be over the age of 55, able to live in the community, placeable in the community, have the ability to pay the match rate of Medicaid if not eligible for Medicaid and reside in Multnomah county. Approximately 500 rides per day are provided in lift equipped vehicles.

Seniors' Resource Center, based in **Denver**, Colorado, operates accessible door-through-door transportation to older adults and persons with mobility impairments in Adams and Jefferson counties. Riders can travel to medical/dental appointments, grocery shopping, meal sites, community-based care programs and personal trips. Rides are available from 8 AM to 4 PM Monday through Friday in Jefferson County and from 6 AM - 6 PM Monday through Friday in Adams County. They are provided at no fee, although donations are accepted. SRC uses small buses and many small service providers and vehicles to maximize funding and extend hours and boundaries. In 2008, 72,729 passenger trips were provided.

Taxi Subsidy Programs

The **Mesa**, Arizona, Coupons for Cabs program is part of a larger program that provides affordable cab service for senior citizens age 65 and over and persons with disabilities who live in Chandler, Gilbert, Mesa and Tempe, Arizona. The program is administered as part of Valley Metro's East Valley Ride Choice program. Only the Mesa part of the program, which is the most mature part, was used in this analysis. Residents of the participating cities can purchase 10 books per month per person ($100 value for $25). One cab company provides accessible service at regular taxi rates for program participants. Coupons may be used for the taxi fare and the tip as well.

The City of **Oakland**'s Taxi Voucher Program serves people of all ages who cannot ride public transportation either because of a disability or due to their age (70 or above). Riders purchase $10 books of vouchers for $3, and the limit of vouchers allowed for purchase varies based on quarterly budget trends. The approximate annual usage is 48 trips per person registered with the Taxi Program. Four taxi companies, accounting for about 2/3 of the taxi drivers in Oakland, participate in the program.

Fremont, California operates an Accessible Taxi Program, a pilot program designed to provide same day taxi service to approximately 2,000 residents of the cities of Fremont, Union City, and Newark, California, who are seniors (age 60 or older) or people with disabilities. Registrants can call the taxi company between 8 AM and 8 PM, seven days a week, and receive a trip within 45 minutes of their call. An accessible taxi minivan is available for non-ambulatory registrants. In

order to ensure that the service is affordable, registrants are able to purchase from their City office taxi vouchers for $2 per voucher; each voucher is worth $12. Registrants are responsible for fares beyond the $12 meter rate (trips that are more than 3.75 miles long).

The City of **Laguna Woods**, California Taxi Voucher Program provides taxi service 7 days a week, 24 hours a day to residents of Laguna Woods, a large retirement community in Orange County. Residents may purchase voucher books worth $100 for $40. The number of vouchers required for a taxi trip depends on trip distance. Special reduced fare taxi vouchers are available for trips to John Wayne Airport (which is the most frequently used trip). To be eligible, residents must be aged 60 and meet one of the following:

- Qualified for Orange County Transportation Authority's ADA paratransit service
- Qualified for Leisure World Lift bus service
- Be a member of a household that does not own a car

In **Baltimore**, Maryland, the Taxi Access II program of the Maryland Mass Transit Administration (MTA) is open to people who have been certified for MTA's ADA paratransit program Mobility Service for at least 90 calendar days and are at least 13 years old. A very limited number of wheelchair accessible taxis and sedans are available. Passengers must present a swipe card to the driver and pay a $3.00 fare plus any meter amount over $20. The card is used only for identification and tracking. There does not appear to be any monthly usage limit. Trips must be within MTA's ADA paratransit service area. All trips must be scheduled by telephone.

The **Chicago** Taxi Access Program is administered by Pace as an adjunct to its Chicago paratransit program. TAP is available to people who are certified for Pace's ADA paratransit program. Customers must obtain a TAP swipe card and preload it with some value by paying over the internet, by mail, at five Chicago Department on Aging locations, or at a check cashing service in downtown Chicago. The card is swiped at the beginning of each trip and $5.00 is deducted from the card. Pace will pay the balance of the meter up to $13.50. Any meter amount over $13.50 must be paid by the customer in cash. All trips must be within the city of Chicago. Wheelchair accessible service is available. Participants may purchase up to 30 trips per week. A maximum of four trips may be used per day. Twenty taxi companies participate in the program. Trips may be requested by phone or hailed on the street.

The **Scottsdale**, Arizona, Cab Connection program was implemented in November 2000 as an alternative to the regional Dial-a-Ride program for some users. The program offers 16 vouchers per month per user. Vouchers are subsidized by the City of Scottsdale at the rate of 80% up to a maximum of $10.00. All users must be a resident of Scottsdale, obtain a Valley Metro Reduced Fare ID card, and have a disability or be age 65 or older.

Community Transit Services

Broward County Transit's Community Bus Service consists of 64 routes operating in 22 municipalities within Broward County. The routes generally provide local circulation, connecting with BCT's regional routes, and emphasize connecting community points of interest rather than speed of operation. Through interlocal agreements, the County leases wheelchair accessible buses to the municipalities for $10 per year per vehicle and provides an operating subsidy of $20/revenue service hour/vehicle for operating costs. Cities that contract out the service or provide their own vehicles, receive an annual $12,000 capital contribution for each vehicle in

operation. The municipalities have the option of supplementing the County financial support with fare revenue, local option gas taxes, and/or revenues generated from advertising on buses, shelters, and bus benches. The Community Bus Program is operated with a fleet of 78 vehicles and provided 2,072,711 passenger trips in 2008.

The **Menlo Park**, California, Midday Shuttle is a free bus route that operates between 9:30 AM and 3:30 PM. Two 20-passenger buses operate on a single route connecting senior housing, grocery stores, senior centers, the library, shopping centers, and downtown Menlo Park. The Midday Shuttle was designed to serve the needs of older adults. The buses drive into major activity centers such as Safeway to pick up and drop off passengers at the front door, and drivers are able to help passengers carry packages and groceries onto the bus. The shuttle provided about 23,000 passenger trips in fiscal year 2009.

Madison County Transit operates 10 local circulator routes (called "shuttles") and one point-deviation service within single communities that supplement the agency's cross-county routes and regional and express services into St. Louis. These services carried 530,564 passenger trips in fiscal year 2009.

In **Eugene**, Oregon, Lane Transit District operates a shopper shuttle as an alternative for clients of its ADA paratransit program. The shopper shuttle makes pickups at clients' home, goes to selected major shopping locations, and returns to the passengers' homes. Drivers provide assistance with loading purchases on the bus. About 5,700 passenger trips were provided in fiscal year 2009.

In **Las Vegas**, Nevada, the Regional Transportation Commission operates 13 Silver Star routes. These are loop routes that operate two days a week in a limited area. The service is open to the entire community, but was designed with senior citizens in mind including stops at assisted living and senior community centers and various shopping locations. Every Silver Star route connects with regular RTC fixed-route service. The Silver Star routes are partially funded by the State of Nevada Department of Health and Human Services Division for Aging Services. RTC Flexible Demand Response (FDR) operates in three communities. Though targeted towards senior citizens within the communities, anyone who registers for the program and receives an identification card can ride along with one guest. FDR operates three days a week in each area on a limited schedule. Rides must be reserved three days in advance. Silver Star and FDR carried about 47,000 passenger trips in fiscal year 2009, about 85% of which were on Silver Star.

Volunteer Driver Programs

The **Mesa**, Arizona, Mileage Reimbursement Program provides senior citizens age 65 and over and persons with disabilities the opportunity to have a volunteer driver take them where they need to go. Qualified Mesa residents can receive per mile reimbursement which they are required to turn over to their volunteer driver. The volunteer driver can be a friend, neighbor or relative, but the driver cannot live in the same household as the participant. Mileage is reimbursed at the current IRS mileage reimbursement rate. Participants can receive reimbursement for up to 300 miles each month. Participants submit Mileage Log Sheets for each month's travel by the 5th day of the following month and reimbursement checks are mailed out on the 15th of the month. Reimbursement was provided for 39,664 trips in fiscal year 2009.

The **Huntington Beach**, California, Senior Services Mobility Program provides volunteer-based (almost exclusively) transportation to medical appointments, grocery shopping, senior center classes/nutrition site, special events, the adult day center and life supporting medical trips, such

as dialysis and chemotherapy within the City, as well as to local hospitals. The service is available on weekdays, and reservations are required five days in advance. Riders must be age 55 and over, and reside in the City of Huntington Beach. There is no charge for the service. In fiscal year 2009, 37,542 passenger trips were provided.

Seniors Resource Program, based in **Denver**, Colorado, operates a volunteer driver program that provides personal trips and occasional medical rides to individuals age 50 and older by volunteers in their personal vehicles. The service is available in a seven-county area, depending on the availability of volunteers in each area. The program provided 6,722 passenger trips in 2008.

In **Howard County**, Maryland, the Neighbor Ride program provides transportation for Howard County residents, age 60 and over. Trips are provided for all purposes throughout Howard County and into Baltimore and Washington, DC, up to a maximum of 35 miles, depending on volunteer availability. Rides must be scheduled three business days in advance. Depending on the length of the ride, passengers pay from $6 to $33 per ride by establishing a pre-paid account which is debited as needed. Passengers must also pay for any tolls and parking charges. Neighbor Ride carried 5,994 passenger trips in fiscal year 2009.

In **San Diego County**, California, Rides & Smiles, administered by Jewish Family Services of San Diego, is currently the largest volunteer-based transportation service in the county. Over 100 volunteer drivers provide more than 500 door-to-door rides serving a wide variety of trip purposes each month. The suggested donation for each ride ranges from $5.00-$25.00, depending on the length of the trip. JFS periodically sends riders a record of the trips they have made and suggests a donation based on a schedule. Riders must reserve at least one week in advance and can request trips up to end of next calendar month. Volunteer drivers receive training, mileage reimbursement, and secondary auto insurance. The program provided 5,891 passenger trips in fiscal year 2009.

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