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Transportation Equity for Older Adults

The ability to go places is not considered in traditional hierarchies of human needs. Yet, society demands that we go places to satisfy basic and physical needs by traveling, whether to the grocery store for food, the doctor for medical care, or the park for a walk with friends. *Transportation equity* means the fair and just access to travel when and how one wants or needs, with minimal constraint (Banister, 2019); it means having transportation that is accessible, safe, and affordable, regardless of an individual's specific situation (Banister, 2019). But a sizeable portion of people in the United States face challenges that make travel inconvenient, costly, slow, uncomfortable, burdensome, or even impossible.

How Equity Issues Fit into Transportation for Older Adults

Older adults are at particular risk of having unmet transportation needs as mobility challenges mount and driving ability declines with age. This Perspective provides an overview of determinants of transportation equity for older adults. Also included is a community-focused framework to guide understanding of older-adult

transportation needs and how older-adult transportation needs are being served, or failing to be served, by existing options. We conclude by outlining directions for the next stage of research in this area.

Defining Determinants of Transportation Equity and Equality

Transportation inequity, the unfair distribution of transportation access (Goh, 2017), exists on a spectrum, with at-will, easy access on one end and complete obstruction to transportation on the other. Structural and systemic barriers resulting in transportation inequity include geographic barriers (e.g., fewer public transportation options or bus routes in certain areas), economic barriers (e.g., high costs relative to income), and technological barriers (e.g., transportation and/or parking can only be accessed through a smartphone app). Another structural barrier might be a lack of adaptive transportation services to meet the functional (cognitive, physical, sensory) needs of older adults.[1]

Abbreviations

AARP	American Association of Retired Persons
COVID-19	coronavirus disease 2019
FHWA	Federal Highway Administration
MBTA	Massachusetts Bay Transportation Authority
NEMT	nonemergency medical transportation
NHTS	National Household Travel Survey
TNC	transportation network company

Causes of transportation inequalities, which are the uneven distribution of transportation resources (Goh, 2017), often occur intersectionally (Noll and Hubbard-Mattix, 2019)—for example, imagine an older adult who lives in a rural area with no cell phone coverage, is not comfortable with smartphones or new technology, and has health comorbidities that affect driving ability. Income especially can exacerbate inequalities: For instance, if this rural nondriver has an income below the poverty line, the person might be unable to afford modified vehicles or specialty services available to higher-income counterparts. Essentially, given similar circumstances, individuals with higher incomes can buy themselves access and nullify barriers in ways that individuals with lower incomes cannot. Although age itself is not a factor in this example, older adults often face challenges at the intersection of multiple factors, a situation that is compounded by age discrimination.
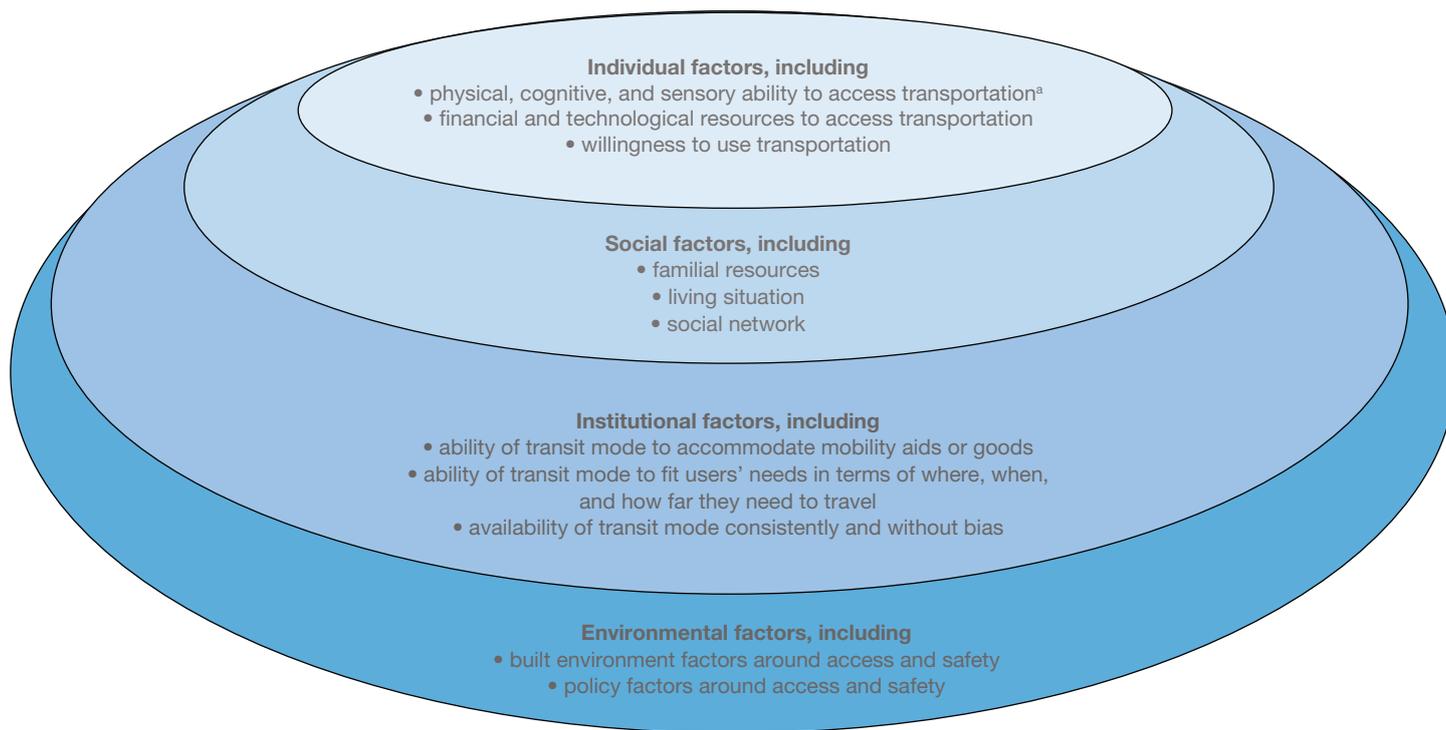
Of course, age can be directly associated with barriers to transportation access. For example, one model predicting personal mobility (e.g., walking and performing activities of daily living) and community mobility (e.g., driving ability and access) found age to have both a direct and indirect negative relationship with community mobility, where indirect effects were mediated through decreases in personal mobility and cognition (Meyer, Janke, and Beaujean, 2013). Another important metric is satisfaction with mobility in one's community. Highlighting the effects of intersectionality, or the moderating effects of other risk factors on the relationship between age and transportation access, older adults have generally reported high satisfaction with their mobility access, but satisfaction decreases—

and dissatisfaction increases—among older adults with poor health and disability status and those who no longer drive (Ritter, Straight, and Evans, 2002).

As Figure 1 shows, transportation barriers can be determined by or influenced at the individual level (e.g., financial resources to afford transportation, physical or cognitive ability), at the social level (e.g., social network to either provide transportation or help navigate transportation challenges), at the institutional level (e.g., geographic reach, scheduling, adaptive supports), and at the environmental

FIGURE 1
Barriers to Transportation

Individual factors, including
• physical, cognitive, and sensory ability to access transportation[a]
• financial and technological resources to access transportation
• willingness to use transportation

Social factors, including
• familial resources
• living situation
• social network

Institutional factors, including
• ability of transit mode to accommodate mobility aids or goods
• ability of transit mode to fit users' needs in terms of where, when, and how far they need to travel
• availability of transit mode consistently and without bias

Environmental factors, including
• built environment factors around access and safety
• policy factors around access and safety

[a] *Access* refers to the ability to summon transportation (if using a rideshare model), travel to the transportation mode (e.g., where it is parked), enter the mode, spend the ride safe and informed of the trip's status, exit the mode when the ride is complete, and reach the intended destination. This usage is based on the concept of *complete trips* (Department of Transportation, undated).

level (e.g., policies or community supports to mitigate barriers to transportation for older adults, such as reduced fare and door-to-door services; O'Neill et al., 2019).

Transportation inequity factors are not experienced universally or monolithically among those affected. The transportation experience of—and potential interventions for—low-income older adults are very different in urban settings than they are in rural settings. This is particularly important given the fact that rural areas have a higher percentage of older adults than suburban and urban areas (Parker et al., 2018). Older adults are not—and will continue to not be—uniformly distributed across the country, neither within nor between states. Census data show that four of the top ten U.S. cities with the highest percentage of older adults are in Florida, whereas less than 10 percent of Alaskans are over age 65 (Kent, 2015).

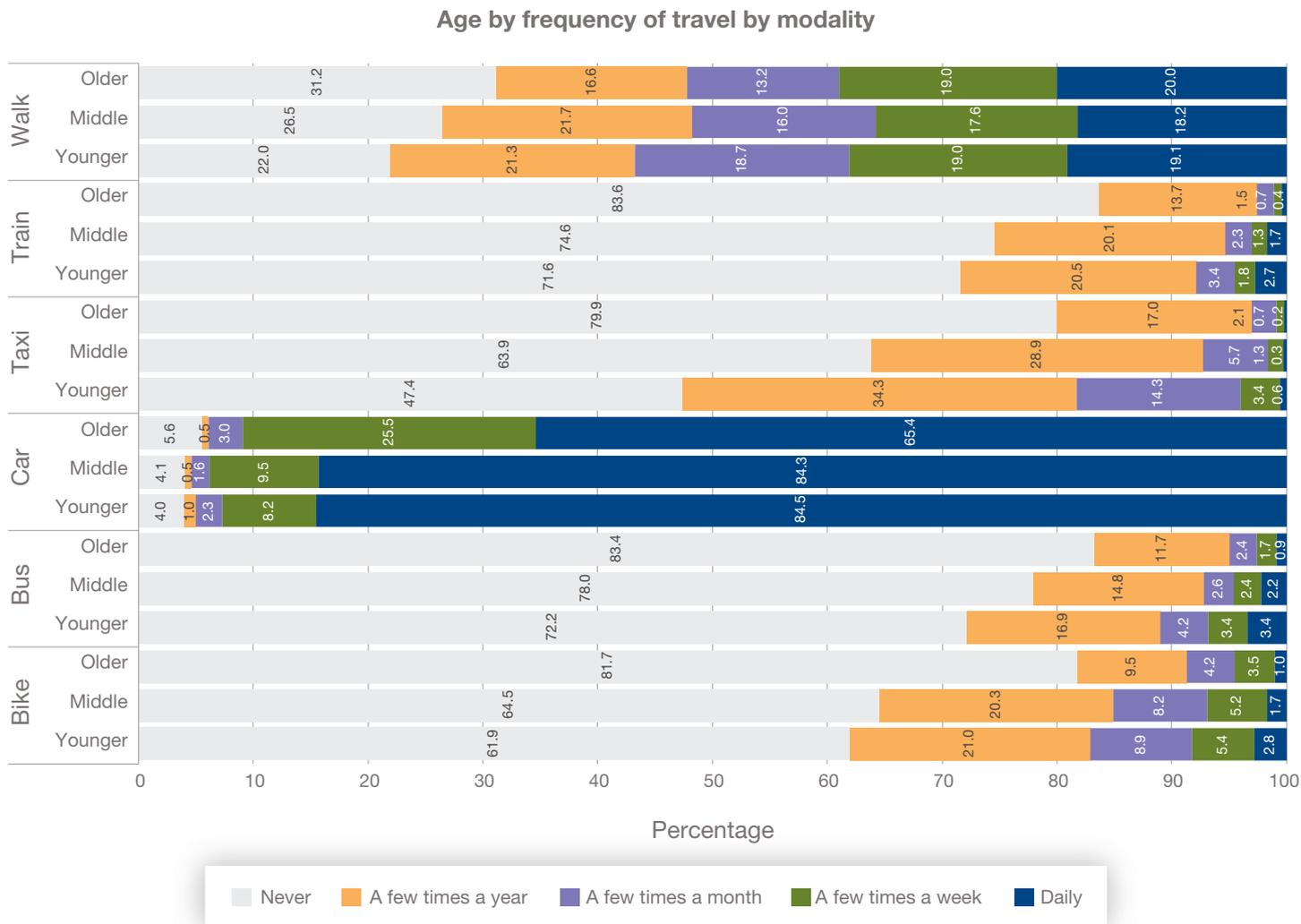## Use and Availability of Transportation for Older Adults Today

To get a picture of older adults' personal characteristics and use of available transportation modes and services, we explored the surveys and daily diaries related to travel from the National Household Travel Survey (NHTS; Federal Highway Administration [FHWA], 2017). In 2017, NHTS data from 73,523 adults ages 65 years and older indicated that use of different transportation options, not surprisingly, varied by age. With the exception of walking and traveling in a privately owned car (though older adults are less likely to report daily travel by car), older adults used transportation options with reduced frequency compared with younger age groups. Approximately 80 percent or greater of older adults reported never using bicycles, trains, taxis, and buses (Figure 2). Figure 2 also highlights the per-

sistent role of the automobile into old age: The great majority of older adults reported at least weekly usage. But—demonstrating a case of intersectionality of inequities—the NHTS survey data revealed that older adults with a household income below $15,000 per year were far less likely to own a vehicle compared with younger individuals with similar household incomes, or all individuals with higher incomes. This supports earlier statements about the link between income and transportation barriers.

Additionally, this data reinforces the dependence on cars by older adults, a dependence that is problematic when coupled with the reality that data shows driving-life expectancy is shorter than life expectancy (Foley et al., 2002). Surveys have shown older adults' good opinion and willingness to pay for technologies that assist or replace driving (Fraade-Blanar et al., 2021), technologies that preserve their independence and prolong their driving life expectancy.

Many of the health factors that limit driving ability also limit the ability to walk long distances or take public transit, limiting transportation alternatives (Fraade-Blanar, Best, and Iyengar, 2021). For the years in between driving restriction (or cessation) and death, older adults must either greatly limit movement, pay for rides (which they might not be able to afford), or seek rides from others (potentially burdening family members and friends). In fact, a poll by the National Aging and Disability Transportation Center found that 39 percent of caregivers spent 5 to 10 hours or more a week providing or arranging transportation, and 28 percent of caregivers said providing transportation to their friend or family member was "overwhelming" (National Aging and Disability Transportation Center, 2018).

FIGURE 2
Frequency of Use of Travel Modes by Age Groups

Age by frequency of travel by modality

		Never	A few times a year	A few times a month	A few times a week	Daily
Walk	Older	31.2	16.6	13.2	19.0	20.0
	Middle	26.5	21.7	16.0	17.6	18.2
	Younger	22.0	21.3	18.7	19.0	19.1
Train	Older	83.6	13.7	1.5	0.7	0.4
	Middle	74.6	20.1	2.3	1.3	1.7
	Younger	71.6	20.5	3.4	1.8	2.7
Taxi	Older	79.9	17.0	2.1	0.7	0.2
	Middle	63.9	28.9	5.7	1.3	0.3
	Younger	47.4	34.3	14.3	3.4	0.6
Car	Older	5.6	0.5	3.0	25.5	65.4
	Middle	4.1	0.5	1.6	9.5	84.3
	Younger	4.0	1.0	2.3	8.2	84.5
Bus	Older	83.4	11.7	2.4	1.7	0.9
	Middle	78.0	14.8	2.6	2.4	2.2
	Younger	72.2	16.9	4.2	3.4	3.4
Bike	Older	81.7	9.5	4.2	3.5	1.0
	Middle	64.5	20.3	8.2	5.2	1.7
	Younger	61.9	21.0	8.9	5.4	2.8

Percentage

Legend: Never | A few times a year | A few times a month | A few times a week | Daily

NOTE: Younger = adults ages 18–34 years; middle = adults ages 35–64 years; older = adults ages 65 years and above.

There also is evidence that driving cessation has downstream effects on actual travel behavior. Compared with older-adult drivers, nondrivers are more likely to stay home on a given day and make fewer trips to medical appointments, social events, and shopping destinations (DeGood, 2011). A survey published by the American Association of Retired Persons (AARP) found that among older adults ages 75 and above, one-third reported not taking a trip on a given day (Fraade-Blanar et al., 2021). Results from a study sponsored by Lyft, in which the company provided older adults with unlimited rides for three months to track usage and other outcomes, suggested that the higher likelihood of staying at home might not be because of older adults' decreased desire to get out and interact with the world. The mean number of rides taken by older adults was 65, more than one ride every two days. Ninety percent of participants reported improved quality of life and 66 per-

cent reported increases in social visits (Saxon, Ebert, and Sobhani, 2019). Twelve percent of trips were to medical appointments (Saxon, Ebert, and Sobhani, 2019), an important point of access because missed appointments cost the United States $150 billion annually and lack of transportation is a common reason to miss medical appointments (Fraade-Blanar, Koo, and Whaley, 2021).

Overarchingly,

> [t]ransportation is a fundamental need that does not decrease with age, driving ability, or changes in physical or cognitive state. Access to transportation, especially driving, confers benefits including the promotion of general life satisfaction. Access is one of the key social determinants of health, and the lack of access is associated with challenges for caregivers and negative health outcomes, including social isolation, depression, and early entry into a long-term care facility. (Fraade-Blanar et al., 2021)

The higher likelihood of staying at home might not be because of older adults' decreased desire to get out and interact with the world.

What the NHTS Shows: Individual Physical Mobility as a Barrier to Transportation Access

In addition to other survey data on attitudes and satisfaction, the NHTS survey sheds light on potential barriers to transportation access through self-reported behavior (FHWA, 2017). Nineteen percent of older adult NHTS respondents reported using mobility assistive devices (e.g., canes, walkers, wheelchairs) compared with only just over 5 percent of younger adults. Although an imperfect metric of the mobility requirements of older adults, this finding reveals the presence of potential mobility-related barriers to the use of some transportation options, particularly public transportation, in which the start and end of the motorized travel mode (e.g., buses) might not necessarily

align with the start and end of the complete trip. Moreover, the motorized travel mode might not accommodate mobility assistive devices—but this might be immaterial because an older adult might not be able to make it to the bus or subway stop in the first place. Older adults are at higher risk of experiencing barriers to transportation access at the individual level, which can then be compounded by additional demographic factors.

What the NHTS Shows: Technology as a Barrier to Transportation Access

Another important factor to consider in transportation equity is access to and use of technology. The internet, in particular on mobile devices, plays an increasingly essential role in satisfying transportation needs. Ride-hail options exist almost exclusively on connected apps, but traditional transportation modes are likewise transferring services and information to the mobile web. For example, bus stops often have quick response (QR) codes and phone numbers rather than printed bus routes and timetables. Paid parking for privately owned vehicles has also increasingly shifted online to the mobile web.

The gap is closing with every passing year, but older adults still lag behind their younger counterparts in internet use. In the 2017 NHTS sample, almost 80 percent of older adults reported daily use of the internet compared with 95 percent of adults younger than 65 (FHWA, 2017). Although more older adults are online than in previous years, a large divide is still present in the use of mobile devices to access the internet. About 35 percent of older adults said that they never use smartphones to access the internet, while just under 50 percent of older adults reported daily use of mobile internet. This divide in mobile

internet use among older adults illustrates a larger issue: As stated earlier, older adults are not a monolith, and single solutions are unlikely to address the needs of older adults as a whole. For example, efforts to improve the user interface of transportation network company (TNC) apps (e.g., Uber and Lyft apps) will not help older adults who lack mobile internet access. Likewise, efforts to connect older adults to TNCs (e.g., by providing mobile internet) will not help connected older adults who find these apps difficult to use. Inequities in transportation exist on a case-by-case basis, and multiple simultaneous solutions will likely be required to address them.

Changing Transportation Choices

A common misconception is the expectation that older adults, as they age and as their faculties decline, take a "stepwise devolution" in transportation mode, from driving to using public transit to walking to using paratransit (Rosenbloom, 2003). But this generally does not occur for two reasons. First, often these options are not available— for example, the individual might not own a car, there might be no public transit, or stores might not be within walking distance. Second, for some older adults, driving is the easiest way to get around, easier than, for example, navigating public transit and walking to the bus station or doing the necessary paperwork to qualify for paratransit, only to then have to book the ride in advance and budget time for a shared ride. This means that for some individuals, when they stop driving, other forms of transportation might already be unavailable or a poor fit for them.

Why and when older adults choose one form of transportation over another is generally specific to their situation. Driving cessation can be incorrectly seen as a first

indication that transportation needs are changing, but it is more often a sign of advanced decline in transportation accessibility. By the time older adults lose their ability to drive, their levels of cognitive and physical abilities might restrict their ability to access other transportation modes.

Assessing the Presence of Older-Adult Transportation Inequity in the Community: A RAND Corporation Framework

To understand transportation inequity locally, communities must measure the scope of the problem. Unfortunately, there is no one measure of transportation equity at the time of this writing (Litman, 2002). Measures that do exist tend to be on the environmental level (Figure 1), and might be insensitive to the accessibility challenges that older individuals encounter based on individual and institutional factors. Faced with this lack of quantitative measurement, communities, activists, and advocates might begin to assess whether they are fulfilling older-adult transportation equity by answering several questions:

Regarding individual and social factors,

1. **Is there unmet need in your community? If so, is it concentrated in a specific group?** This might be the most important question in transportation equity. *Unmet need* means individuals or groups cannot go where they want to go or cannot go on their own timeline and budget. Underlying causes can take many forms; for example, the trip could be too burdensome, cumbersome, expensive, physically demanding, or logistically demanding (e.g., requiring too much advanced planning). The end result is a trip that does not happen even though it could, or it only occurs rarely and with great effort. Unmet need might be difficult to see because it requires being able to identify what *should* have occurred. Often this means identifying something that did not happen given the demand or need. Potential measures include wait lists for transportation assistance programs, attendance of senior center programs in relation to target populations, missed paratransit pickups, and missed medical appointments, which could be noted by health care systems, insurers, and

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focus groups. The content validity (e.g., the signal-to-noise ratio) might vary between measures.

2. **What spectrum of individual need are your transportation services able to accommodate? Who is excluded?** This question supports the previous one: Once unmet need is identified, the natural follow-up is *whose needs are unmet*? Populations that are less visible might be the easiest to overlook. These likely include the hardest-to-serve populations, also referred to as "nobody's problem" (Fraade-Blanar et al., 2021). Less visible populations might also include older adults who are less comfortable with technology or unable to leave the house and therefore least likely to make their unmet needs known through public online forums or in-person meetings.

3. **Do people actually use the services available in your community?** Localities generally have at least a few services aimed at older adults or other vulnerable groups. Usage rates in relation to the target population, time of day, trip length, destination, and, if available, repeated trips by the same people (suggesting the trip was successful) are all germane. These data shed light on who is using available services, how these services are being used, and who or what is left out. It might also be useful to determine if people who do not fall within target populations are using these services.

4. **Are your transportation services safe?** Injuries can occur when getting to the transportation mode or when in the transportation mode. Older adults have the highest pedestrian fatality (NHTSA, 2020) rate of any age group and, compared with other age groups,

a higher percentage of those deaths occur at intersections (IIHS, 2021a). Sidewalks can also present hazards for slips, trips, and falls for older adults (Li et al., 2006). The FHWA even published an article, "Ice, Snow and Slippery Sidewalks: For Many Seniors, Winter Is 'Hip Season'" (Smith, undated). Essentially, getting *to* the transportation mode can be challenging and dangerous for older adults. Once in the transportation mode, other threats are present. Because of increased fragility (Cicchino, 2015), in the event of a crash, older adults might be at a higher risk of injury or death compared with younger age groups.

Regarding institutional factors,

5. **What types of trips are your transportation services able to accommodate?** What is excluded? Transportation options might only be able to accommodate certain types of trips (e.g., trips planned in advance, trips within a 5-mile radius, trips during normal business hours, trips to certain destinations, or trips along a specific route). Any gap between the variety of trips supported and the variety of trips desired is where unmet need exists.

6. **What does it take for an older adult in your community to get somewhere?** What is the average trip length in relation to travel time? How many transfers are needed? How many different types of systems does one trip involve (e.g., bus to subway with noncompatible payment systems)? And, because dependability is important, how much variation exists in all of the above? How often do the seams of different systems fail to align, potentially stranding an older adult?

Regarding environmental factors,

7. **How resilient is your transportation system? How deep is the bench of options?** As mentioned, one option will not work for everyone. How many different transportation modes and business models are available to provide transportation for the same trip? Is driving the only option? Could an individual alternatively schedule a paratransit ride or take a wheelchair-accessible bus or subway?

8. **Under what conditions (environmental, disaster, etc.) is this system going to fail to meet need?** It is important to consider under what conditions transportation is likely to fail and to create safety nets for vulnerable people. An example of the failure to consider how systems break occurred during Hurricane Katrina. Although nursing homes had contracted with bus companies to evacuate residents in the event of a hurricane, when the decision to evacuate was made, the buses were no longer available. One reason for this was that multiple nursing homes had contracted with the same companies, making it impossible to meet demand in a mass evacuation (U.S. Senate, 2006). As a result, many residents had to shelter in place, often with negative outcomes (Dosa et al., 2010). Although nursing homes were required at the time to have emergency plans, there was no pathway to review those plans for viability or to coordinate between facilities.

9. **Are surveillance systems in place to monitor changes in older-adult transportation needs, transportation system conditions, or both?** Being able to anticipate and meet changes in need because of changes in demography, economics, industries, etc. allows transportation departments to be proactive rather than reactive. Older-adult communities are growing. For example, the Villages, a retirement community in Florida centered around meeting the needs and desires of adults ages 55+, is the fastest growing metro area in the United States, according to the 2020 Census (Burch, 2021). The characteristics of the older-adult population might also change over time as the baby boomers begin to dominate the 65 and older age group, followed by members of Generation X, millennials, and so on. Each new generation brings different transportation needs and different resources to meet those needs (e.g., financial, technological; USF, undated). Similarly, transportation systems change over time. Public transit routes can change, increasing access to some areas and decreasing it to others; construction can make driving in some areas impossible or more complicated; new transportation modes, such as electric scooters, automated vehicles, and electric vehicles can be introduced, etc. And even if older adults do not engage with them, new transportation modes can still have an impact. For example, an older adult might potentially trip and fall over an electric vehicle charging cable on the sidewalk (Krause, 2020).

10. **Are problems being solved without creating new problems?** A transportation system is a living ecosystem and making changes in one place can generate surprising outcomes. For example, expanding a public transit system with the aim of improving access to transportation deserts can create transportation-induced gentrification (Turrentine, 2018). But this can sometimes lead to a situation in

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which the very people that the expansion was meant to help end up getting priced out of their homes—a notable concern for older adults, who might have a fixed income. Or, here is another example: Rideshare provides affordable and on-demand transportation for those who can use traditional passenger vehicles, but the rise of rideshare services might result in lower parking revenue for cities (Brown and Clark, 2020), which often depend on these funds to support maintenance of transportation systems, schools, and libraries.[2]

11. **Are changes that are external to the transportation system affecting access?** Changes that are external to the transportation system can have a large impact on the system itself. Consider how transportation was affected by the coronavirus disease 2019 (COVID-19) pandemic, such as the way people travel by air or by subway. Or, take California's Proposition 13, which keeps property taxes constant until a property is sold, at which point taxes are reassessed. In the face of this, carless, older adults who have lived in their homes for many years might choose to remain in an area that is a poor fit for their transportation needs rather than move to an area that is more age-friendly but entails paying a large tax penalty (Grengs, Levine, and Shen, 2013).

12. **Are older adults involved in transportation planning in your community?** Any transportation planning should always involve representatives from the target population—such slogans as "nothing about us without us" point to a central tenet of community-engaged planning. Involving a variety of older adults in the transportation planning and implementation process is central to achieving procedural equity (Wennink and Krapp, 2020).[3] This could be measured simply by counting the number of older adults involved in or consulted during the planning and implementation processes. Outreach to get feedback could involve surveying senior centers, engaging with such organizations as AARP and others.

Answering these questions should not be a one-time occurrence but rather a continual process. Additionally, each locality is distinct in terms of the populations they serve, the challenges they face, and the resources they have. Hence, these questions might need to be personalized, amended, or added to.

Answering these questions can show both weaknesses and strengths in the existing system's ability to provide transportation to all older adults. But these questions are only the first step in understanding what would ameliorate or solve problems. A key dimension of the first step is to consider the *when*: When in the trip are these issues occurring (Department of Transportation, undated)? As explained in Figure 1's note, transportation inequity can present barriers at any stage of a trip. For example, consider the second question noted earlier: *What spectrum of individual need are your transportation services able to accommodate? Who is excluded?* If a locality identifies older adults using walkers or wheelchairs in a development as unable to access bus services, it might be that the pedestrian bridge connecting the development to the bus stop, which was put in place so pedestrians could avoid crossing a busy road, is difficult, impossible, or unsafe for older adults to use. This is a pretrip problem which stymies the entire trip.

Steps beyond this will vary based on the problem, the groups affected, and available resources with which to build a solution. But as these steps are taken, it is essential to bear in mind question 10: *Are problems being solved without creating new problems?* The transportation ecosystem is extremely interconnected, and changes in one area can reverberate, at times in surprising ways. For example, putting in a subway station in an underserved area for older adults might not improve transportation access if older adults are uncomfortable with or unable to use the subway system. But it might increase gentrification in the area, pushing low-income older adults out of the neighborhood. This is why question 12, *Are older adults involved in transportation planning in your community?* is so important; it means that older adults are involved in every step of the efforts to meet their transportation needs.

The transportation ecosystem is extremely interconnected, and changes in one area can reverberate, at times in surprising ways.

Addressing the Presence of Older-Adult Transportation Inequity in the Community: Selected Examples

This Perspective began with a discussion of the problem of older-adult transportation inequity. Then, we articulated how a community can understand these problems and enact potential solutions locally. But what solutions exist? Broadly, there are two types of approaches: adapt the existing transportation system to be more accessible or support alternative means of transportation. These are not mutually exclusive. Many services, such as public transit, attempt to do both.

The first approach, adapt existing systems with the goal of extending the reach to people who are underserved, might be faster, more efficient, and more familiar than creating a new system from the ground up. In a complex and diverse world, transportation systems that serve *all* individuals might be an unachievable goal. Nonetheless, design practices with the *goal* of reaching everyone can help maximize system accessibility. This concept, referred to as "universal design"[4]—is a key element in the inclusion of older adults in transportation ecosystems. Universal design principles (equitable use, flexibility of use, simple and intuitive use, perceptible information, tolerance for error, low physical effort, and sufficient space; Carr et al., 2013) are already present in numerous areas of transportation. For example, public buses often employ doors that open and close without rider operation and increasingly provide stop-request signals that do not require reaching above one's head. Some train routes allow for platform-level access without a vertical or longitudinal gap. These simple changes improve the experience of all riders while drastically improving access for people with physical declines or disabilities.

Universal design principles can also be used to help older adults digitally access information or physically access areas where transportation is available. For example, mobile app interfaces can be designed with older adults in mind: Menu trees can be made simpler and flatter, text contrast can be increased, and buttons and text can be made larger. Rideshare companies can provide information or training to drivers around how to provide appropriate assistance into and out of vehicles for riders with physical limitations (Lyft, undated). Public transportation systems can hire transportation system ambassadors (Massachusetts Bay Transportation Authority [MBTA], undated), who could assist riders physically or verbally with accessing or understanding the system. Or, advocacy groups can work to make communities more age-friendly, for example, by promoting the walkability and public transportation access of their localities.

Adaptations to existing transportation systems have a track record of success in increasing accessibility for older adults (Table 1). Both private companies and public, governmental agencies have applied this model of addressing transportation inequities. But community solutions are created at the community level. To modify existing services most efficiently and effectively, city and community planners, private companies, and older adults must all come together to identify shortcomings and brainstorm solutions that are relevant to inequities present in a particular area (Dabelko-Schoeny et al., 2020).

Adapting existing systems has clear benefits but is not without drawbacks. Compared with creating new transportation systems, adaptations to existing systems are a broad-brush approach to addressing inequity. Typically, adapting systems to make them more inclusive provides solutions at the point of service rather than increasing the number of people who can initially make contact with the service. For example, transportation ambassadors will do little to help older adults who cannot navigate *to* a public transportation hub, and neither accessible, automated vehicle services nor assistance-trained drivers can improve rideshare transportation for individuals who are unable to summon a ride.

The second approach is to create a parallel transportation system for older adults or subsets of older adults experiencing barriers to traditional transportation access (physical, sensory, or cognitive barriers, or a combination). This approach centers around new transportation

TABLE 1
Examples of Solutions to Age-Related Inequity

Solutions

Door-to-door ridehailing assistance	
Description	This is a rideshare model of transportation, but with additional door-to-vehicle and vehicle-to-door assistance from the driver or other worker. This can meet the needs of some potential riders with physical or cognitive barriers to traditional rideshare travel. But it can increase costs through driver training, insurance, or the addition of another paid employee on the ride.
Examples	CareLinx CareRides with Lyft partnership; Uber Assist
Target population	Individuals with physical or cognitive barriers to rideshare use
Potential for unintended consequences	Travel could be restricted because of bottlenecks in trained-driver or assistant availability. Riders might be taken to destinations where others are not there to receive them.
Public transit ambassadors	
Description	Individuals will be physically present at public transportation stops to provide information or assistance with navigating the system, which can require training and certification of the ambassadors. This can be a relatively low-cost, responsive mode to provide information about the transportation service. But it requires paid employees or reliable volunteers. Also, the distribution will likely favor higher-traffic areas, and it is only viable on public transportation networks with set routes.
Examples	MBTA Transit Ambassador—deployed, Boston; DART's Mobility Ambassador Program—scheduled, Dallas
Target population	Any public transportation consumers with uncertainties about the service
Potential for unintended consequences	Individuals on the outer rungs of the transportation network might be left behind as ambassador deployment is focused on transport hubs or other high-traffic areas.
Older-adult accessible automated vehicles	
Description	These are AVs that are fully or highly automated and are modified or built from the ground up to meet older-adult needs. The challenge with this solution is that AVs are, for the most part, still only in testing and are not publicly or widely accessible.
Examples	Waymo; Cruise; Zoox
Target population	Older-adult riders with one or more barriers to traditional vehicle travel, interaction with an automated vehicle system, or both
Potential for unintended consequences	Availability might be restricted to specific geographic areas as the technology and design develop.

Table 1—Continued

Solutions	
Delivery services	
Description	This is a service that delivers to one's residence, with a variety of delivery categories, such as food, home goods, groceries, and even prescription medications. This service removes the need for travel. It requires a system that is accessible across different levels of technological fluency. It can likely be limited to urban or suburban areas, can be costly, and can contain wasteful packaging.
Examples	PillPack (by Amazon Pharmacy Services); Uber Eats; Instacart; Grubhub; Magic Kitchen
Target population	Individuals with physical, cognitive, or sensory impairment; individuals who require hand-to-hand[a] services to leave the house
Potential for unintended consequences	There could be a breach of private medical information. Low-income and rural older adults might be excluded.
Paratransit	
Description	Paratransit provides transportation for those who cannot use the regular, fixed-route public transportation services available locally. It is generally a door-to-door service. There is variation in cost, how far in advance the service must be booked, etc. This does require that individuals apply for the service, a process that varies by locality (FTA, 2015). Also, this service is only available where public transit service is available. Of note, rides are not free and must generally be scheduled in advance; same-day service might be available at a premium (FTA, 2015).
Examples	Services specific to locality
Target population	Individuals who (1) have a disability and are unable to use fixed-route service, (2) have a disability and could use a fixed-route service, but it is not available (e.g., because the subway station's elevator is broken), or (3) have a disability and cannot travel to or from a station or bus stop (Easter Seals Project Action Consulting, undated); strictness of screening varies by locality (NADTC, undated-a)
Potential for unintended consequences	Individuals in rural areas are left behind.

NOTE: AV = automated vehicle; DART = Dallas Area Rapid Transit.

[a] *Hand-to-hand transportation* (also known as *door-through-door*) involves providing individuals with substantial assistance or support from within the home to the final destination, likely because of a cognitive, sensory, or physical impairment. This might include those who require constant assistance or who cannot travel independently for any distance within their home or outside without support from a companion, assistant, professional driver, or a combination of these supports. This is in contrast to *door-to-door* or *curb-to-curb transportation* (Fraade-Blanar, Koo, and Whaley, 2021).

options that cater and are tailored to older adults' specific needs and resources, either as a group or as individuals (see examples in Table 1).

However, tailoring transportation access and options to individual needs can be challenging. In terms of personal vehicles, services do not yet exist to help older adults match their functional state and transportation needs with vehicle purchases. Contemporary advanced driver assistance systems have been shown to benefit all (IIHS, 2021b) and are desirable to older adults. But the argument that these systems can compensate for declining vision, response time, etc. is questionable. Prolonging driving life among older adults might also create negative externalities: The roadway is a shared environment, and older drivers might crash and injure or kill themselves, or they might crash and injure or kill other road users. For some forms of transportation (e.g., public transportation services, paratransit, and shared mobility, e.g., ridesharing), case managers, social workers, other paramedical workers, and local aging agencies might be able to help older adults identify transportation that matches their needs (NHTSA, 2016). But these services, when available, are not always covered by insurance.

Perhaps a more successful option within this approach is to remove the need to travel. Although superficially attractive because it is easy, at least for services that do not require specialized equipment, this approach does not work for every service or in every environment. Grocery delivery, for example, works well in urban and suburban areas but not in rural areas. Telehealth might be great for initial COVID-19 screenings but not for COVID-19 testing (CDC, 2020). And because voice-only telehealth is an order of magnitude more common than video telehealth (Uscher-Pines et al., 2021), people with impaired hearing might not be able to take advantage of this health care delivery service. As of this writing, between 25 and 50 percent of older adults have disabling hearing loss (NIDCD, 2021).

Although creating new transportation systems focused on older-adult needs is an attractive option, there are two risks:

- Without major commercial or governmental investments, the aforementioned options might not exist. Additionally, without considerable personal financial resources, older adults might not be able to access these options should they be available. These concerns are particularly true for options offered by for-profit organizations, such as delivery services.

We find ourselves at a crossroads, at a point where society needs to appraise the prioritization of transportation access for all.

- If new, tailored transportation systems do exist, a two-tiered system might evolve in which people with the necessary resources and ability (because of wealth and physical and/or cognitive function) will be able to buy themselves sufficient transportation and live in areas with support structures in place, leaving already vulnerable populations with an increasingly archaic and underfunded transportation support system.

Conclusion

In the United States, both demographics and transportation technology are experiencing major transitions. The U.S. population is rapidly aging, bringing barriers to transportation access because of such factors as driving cessation and declines in physical and cognitive functioning. At the same time, the advent of smartphone-based rideshare services, TNCs, and automated vehicles has reduced the rigidity and delineation of public and shared transportation—a paradigm shift that could play a lead role in serving the needs of the older adults who face transportation barriers. We find ourselves at a crossroads, at a point where society needs to appraise the prioritization of transportation access for all. The United States has faced similar questions before in other facets of infrastructure. Telecommunications and postal service, for example, are two areas where the country has sought to ensure that services of adequate quality and reasonable cost are available to the maximum number of people. So the question becomes, then, do we apply this approach to transportation as well? We must also consider how many public resources should be spent and how much pressure should be exerted on private organizations to provide transportation for the widest number of individuals possible.

Is Transportation Access a Luxury or a Necessity?

A key challenge in increasing transportation equity is the fact that the marginal costs of providing service become increasingly pricey for some populations, notably those with intersectional vulnerabilities, and the profit margins decrease for providers. For example, the cost of providing city transportation for an individual who has no physical, cognitive, or sensory function impairments and who is comfortable with technology is very different from the cost of providing transportation for an individual who is in an electric wheelchair, lives in a frontier area, and is unable to use a smartphone because of a lack of motor control. To date, the United States has split the difference, assuring certain transportation needs for certain populations but allowing other needs to become a kind of luxury. Nonemergency medical transportation (NEMT), a service covered by some Medicare and Medicaid plans, is a prime example of this: If, say, a rural nondriver has insurance that provides NEMT and cannot drive, this person is entitled to a ride by taxi, rideshare, bus, etc. to get to a routine medical appointment. But under most health plans, the individual is not entitled to assistance traveling to grocery stores, a senior center, or a park, all of which contribute to health and well-being. And people with health plans that do not cover NEMT are not entitled to the service at all.

Perhaps the most reasonable way to think about transportation, especially for older adults, is as something

akin to a *merit good* (Medda, 2011). These are things that, "although they are private goods, generate strong positive externalities when they are consumed" (ScienceDirect, undated). Merit goods (such as transportation for older adults) can be underproduced and underinvested but need to be provided (Ali, 2016). Merit goods are often supported politically and financially by government (Desmarais-Tremblay, 2019), not only because of their potential societal benefits (if they are available and used) but also because of their potential for negative externalities (if they are not available and not used). For older adults, lacking access to transportation can lead to depression, isolation, early entry into nursing homes, and costly and dangerous delays in accessing care (Fraade-Blanar et al., 2018). Having to carefully plan for every trip can also limit older adults' ability to live spontaneously. For family members, this lack of access also comes at a steep price: Eighty percent of caregivers report assisting with transportation (AARP, 2020), with family caregivers providing 1.4 billion rides for older adults in 2009 alone (NADTC, undated-b). When older adults lack transportation, its costs everyone.

Where to Go from Here?

Potential research recommendations include gaining a clearer picture of the transportation needs of older adults. Although transportation agencies refer to and plan for populations who need hand-to-hand, door-to-door, or curb-to-curb service, there remain unknowns of how big these populations are, where they are, what their transportation needs are, and what would best serve those needs. Additionally, there is even less understanding of how these populations will change as the U.S. population continues to age and what those changes mean for transportation needs. We will need to match the required level of service for each subpopulation to their ability to use transportation modes (e.g., public transit, paratransit, or shared mobility through ridehailing).

A second research recommendation is to create measures of how accessible a transportation system is to older adults. Traditional measures might not apply for older adults: For example, older adults might not live in transportation deserts as traditionally defined but might still face challenges because their needs do not fit what is available. Measures could consider what it means for an

Perhaps the most reasonable way to think about transportation, especially for older adults, is as something akin to a *merit good*.

area to be prepared for older adults so that early warning indicators can flag occurring or imminent unmet needs and the potential impact of subsequent transportation programs and investments.

At the community level, community-based studies can test the proposed framework as a tool to understand their constituents' present and future needs. Along with finding the answers to the framework's questions, the exercise might help identify individuals within communities who are poised to work toward older-adult transportation equity. There is a need to understand who in local government (and to an extent, state and federal government) is primarily responsible for older-adult transportation access surveillance and policymaking. Finding the individuals with the knowledge and authority to answer the framework's questions might help identify these groups or individuals.

The U.S. transportation ecosystem is constantly in flux, and new initiatives, policies, infrastructure, and transportation modes aim to decrease transportation challenges. Disregarding older-adult needs threatens that ecosystem. Impactful solutions must address older-adult transportation barriers across the complete trip—from deciding to leave a residence to entering a vehicle or other mode of transportation to arriving at the destination's front door. Taken together, rapid changes in transportation technologies and business models, shifts in demographics, and evolving transportation needs as adults age means that transportation supply and transportation demand will constantly chase each other. There is the potential for population increases in regions where there are resources to meet older-adult transportation demands.

There is also the potential for older adults to age in their existing living situations (such as in places where they cannot satisfy transportation needs and will suffer the ill effects discussed earlier). As the oldest members of Generation X age into the 65 and over group within the next ten years, they will bring new attitudes and demands on technology, transportation, and aging. Creating new transportation systems to accommodate older adults or figuring out how to adapt existing transportation systems both create viable transportation options to suit the needs of older adults. But without investing time and resources into both of these solutions, we risk leaving the older-adult population isolated and alone.

Notes

[1] Meeting the needs of people with disabilities does not necessarily mean that needs of older adults are also met. Sixty percent of older adults do not have a disability, but they might have some other transportation vulnerability, such as rurality, low-income economic status, etc. Aging and disability issues overlap imperfectly (CDC, undated).

[2] This occurred, for example, in East Lansing, Michigan (Elliott, 2020).

[3] *Procedural equity* is involving the targeted populations in the decisionmaking process.

[4] This approach involves the design of products and environments to allow everyone to use them, regardless of cognitive or physical limitations (Fraade-Blanar, et al., 2021).

References

AARP—*See* American Association of Retired Persons.

American Association of Retired Persons, *Caregiving in the U.S.: 2020 Report*, Washington, D.C., May 2020.

Ali, Christopher, "The Merits of Merit Goods: Local Journalism and Public Policy in a Time of Austerity," *Journal of Information Policy*, Vol. 6, 2016, pp. 105–128.

Banister, David, "Foreword," in Karen Lucas, Karel Martens, Floridea Di Ciommo, and Ariane Dupont-Kieffer, eds., *Measuring Transport Equity*, Amsterdam: Elsevier, 2019, pp. xxiii–xxiv.

Brown, Anne, and Benjamin Y. Clark, *What Makes Cents? How Uber Shapes Municipal On-Street Parking Revenue*, Portland, Oreg.: National Institute for Transportation and Communities, NITC2016-UO-15, August 2020.

Burch, Audra D. S., "The Villages, a Retirement Community in Florida, Was the Fastest-Growing Metro Area over the Last Decade," *New York Times*, August 12, 2021.

Carr, Kelly, Patricia L. Weir, Dory Azar, and Nadia R. Azar, "Universal Design: A Step Toward Successful Aging," *Journal of Aging Research*, Vol. 2013, 2013.

CDC—*See* Centers for Disease Control and Prevention.

Centers for Disease Control and Prevention, "Disability Impacts All of Us," infographic, undated. As of August 15, 2021:
https://www.cdc.gov/ncbddd/disabilityandhealth/infographic-disability-impacts-all.html

———, "Using Telehealth to Expand Access to Essential Health Services During the COVID-19 Pandemic," webpage, updated June 10, 2020. As of August 15, 2021:
https://www.cdc.gov/coronavirus/2019-ncov/hcp/telehealth.html

Cicchino, Jessica B., "Why Have Fatality Rates Among Older Drivers Declined? The Relative Contributions of Changes in Survivability and Crash Involvement," *Accident Analysis and Prevention*, Vol. 83, October 2015, pp. 67–73.

Dabelko-Schoeny, Holly, Noelle L. Fields, Katie White, Marisa Sheldon, Kristen Ravi, Sarah R. Robinson, Ian E. Murphy, and Claire Jennings, "Using Community-Based Participatory Research Strategies in Age-Friendly Communities to Solve Mobility Challenges," *Journal of Gerontological Social Work*, Vol. 63, No. 5, July 2020, pp. 447–463.

DeGood, Kevin, *Aging in Place, Stuck Without Options: Fixing the Mobility Crisis Threatening the Baby Boom Generation*, Washington, D.C.: Transportation for America, 2011.

Department of Transportation, "Complete Trip—ITS4US Deployment Program," fact sheet, undated. As of August 30, 2021:
https://its.dot.gov/factsheets/pdf/ITS4US_Factsheet.pdf

Desmarais-Tremblay, Maxime, "The Normative Problem of Merit Goods in Perspective," *Forum for Social Economics*, Vol. 48, No. 3, 2019, pp. 219–247.

Dosa, David, Zhanlian Feng, Kathy Hyer, Lisa M. Brown, Kali Thomas, and Vincent Mor, "Effects of Hurricane Katrina on Nursing Facility Resident Mortality, Hospitalization, and Functional Decline," *Disaster Medicine and Public Health Preparedness*, Vol. 4, Suppl. 1, September 2010, S28–S32.

Easter Seals Project Action Consulting, "ADA Complementary Paratransit Requirements," slides, Washington, D.C., undated. As of August 15, 2021:
https://www.mdt.mt.gov/publications/docs/brochures/transit/2016-workshop-ADA-Complementary-Paratransit.pdf

Elliott, Emily Joan, "Parking Enforcement, Normally Profitable, Is Costing East Lansing," East Lansing Info, October 13, 2020.

Federal Highway Administration, U.S. Department of Transportation, "National Household Travel Survey," data set, 2017. As of August 15, 2021:
https://nhts.ornl.gov

Federal Transit Administration, U.S. Department of Transportation, "Frequently Asked Questions," webpage, updated August 21, 2015. As of August 15, 2021:
https://www.transit.dot.gov/regulations-and-guidance/civil-rights-ada/frequently-asked-questions#21

FHWA—*See* Federal Highway Administration, U.S. Department of Transportation.

Foley, Daniel J., Harley K. Heimovitz, Jack M. Guralnik, and Dwight B. Brock, "Driving Life Expectancy of Persons Aged 70 Years and Older in the United States," *American Journal of Public Health*, Vol. 92, No. 8, August 2002, pp. 1284–1289.

Fraade-Blanar, Laura, Ryan Best, and Vijeth Iyengar, "Ridesharing Can Help Older People Be Functionally Independent in Their Homes, Communities," STAT News, August 10, 2021.

Fraade-Blanar, Laura A., Beth E. Ebel, Eric B. Larson, Jeanne M. Sears, Hilaire J. Thompson, Kwun Chuen G. Chan, and Paul K. Crane, "Cognitive Decline and Older Driver Crash Risk," *Journal of the American Geriatrics Society*, Vol. 66, No. 6, July 2018, pp. 1075–1081.

Fraade-Blanar, Laura, Tina Koo, and Christopher M. Whaley, *Going to the Doctor: Rideshare as Nonemergency Medical Transportation*, Santa Monica, Calif.: RAND Corporation, RR-A1019-1, 2021. As of April 25, 2022:
https://www.rand.org/pubs/research_reports/RRA1019-1.html

Fraade-Blanar, Laura, Nico Larco, Ryan Best, Tiffany Swift, and Marjory S. Blumenthal, *Older Adults, New Mobility, and Automated Vehicles: A Framework for Harnessing Emerging Technology for Individual and Societal Benefit*, Washington, D.C.: AARP Public Policy Institute, Research Report 2021-28, February 17, 2021.

FTA—*See* Federal Transit Administration.

Goh, Shyan, "Say What You Mean, Mean What You Say: Inequality and Inequity," *BMJ*, Vol. 356, No. j556, February 13, 2017. As of December 12, 2021:
https://www.bmj.com/content/356/bmj.j556/rr-8

Grengs, Joe, Jonathan Levine, and Qingyun Shen, *Evaluating Transportation Equity: An Intermetropolitan Comparison of Regional Accessibility and Urban Form*, Washington, D.C.: Federal Transit Administration, Report No. 0066, June 2013.

IIHS—*See* Insurance Institute for Highway Safety.

Insurance Institute for Highway Safety, "Fatality Facts 2019: Pedestrians," webpage, posted March 2021a. As of August 15, 2021:
https://www.iihs.org/topics/fatality-statistics/detail/pedestrians

———, "Older Drivers," webpage, updated April 2021b. As of August 15, 2021:
https://www.iihs.org/topics/older-drivers

Kent, Lauren, "Where Do the Oldest Americans Live?" Pew Research Center, July 9, 2015. As of April 25, 2022:
https://www.pewresearch.org/fact-tank/2015/07/09/where-do-the-oldest-americans-live/

Krause, Riley, "Council Confirms Electric Car Owners at Fault Should Injury Occur as a Result of Charging Cords," *Wandsworth Times*, February 10, 2020.

Li, Wenjun, Theresa H. M. Keegan, Barbara Sternfield, Stephen Sidney, Charles P. Queensberry, and Jennifer L. Kelsey, "Outdoor Falls Among Middle-Aged and Older Adults: A Neglected Public Health Problem," *American Journal of Public Health*, Vol. 96, No. 7, July 2006, pp. 1192–1200.

Litman, Todd, "Evaluating Transportation Equity," *World Transport Policy and Practice*, Vol. 8, No. 2, Summer 2002, pp. 50–65.

Lyft, "Foldable Wheelchair Policy," webpage, undated. As of August 15, 2021:
https://help.lyft.com/hc/ko/articles/115012926827-Wheelchair-Policy

Massachusetts Bay Transportation Authority, "Transit Ambassadors," webpage, undated. As of August 15, 2021:
https://www.mbta.com/customer-support/transit-ambassadors

MBTA—*See* Massachusetts Bay Transportation Authority.

Medda, Francesca, "Transport Accessibility as Merit Good," *European Regional Science Association Conference Papers*, January 2011.

Meyer, M. Renée Umstattd, Megan C. Janke, and A. Alexander Beaujean, "Predictors of Older Adults' Personal and Community Mobility: Using a Comprehensive Theoretical Mobility Framework," *The Gerontologist*, Vol. 54, No. 3, 2013, pp. 398–408.

NADTC—*See* National Aging and Disability Transportation Center.

National Aging and Disability Transportation Center, "ADA and Paratransit," webpage, undated-a. As of August 15, 2021:
https://www.nadtc.org/about/transportation-aging-disability/ada-and-paratransit/

———, "Unique Issues Related to Older Adults and Transportation," webpage, undated-b. As of August 15, 2021: https://www.nadtc.org/about/transportation-aging-disability/unique-issues-related-to-older-adults-and-transportation/

———, *Transportation Needs and Assessment: Survey of Older Adults, People with Disabilities, and Caregivers*, Washington, D.C., December 2018.

National Highway Traffic Safety Administration, U.S. Department of Transportation, *Clinician's Guide to Assessing and Counseling Older Drivers*, 3rd ed., Washington, D.C., Report No. DOT HS 812 228, January 2016.

———, "Traffic Safety Facts: 2018 Data," fact sheet, March 2020. As of August 15, 2021: https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/812850

National Institute on Deafness and Other Communication Disorders, National Institutes of Health, "Quick Statistics About Hearing," webpage, updated March 25, 2021. As of August 15, 2021: https://www.nidcd.nih.gov/health/statistics/quick-statistics-hearing

NHTSA—*See* National Highway Traffic Safety Administration.

NIDCD—*See* National Institute on Deafness and Other Communication Disorders.

Noll, Samantha Elaine, and Laci Nichole Hubbard-Mattix, "Health Justice in the City: Why an Intersectional Analysis of Transportation Matters for Bioethics," *Essays in Philosophy*, Vol. 20, No. 2, 2019.

O'Neill, Desmond, Elizabeth Walshe, Daniel Romer, and Flaura Winston, "Transportation Equity, Health, and Aging: A Novel Approach to Healthy Longevity with Benefits Across the Life Span," commentary, *National Academy of Medicine Perspectives*, December 2, 2019. As of August 15, 2021: https://nam.edu/transportation-equity-health-and-aging-a-novel-approach-to-healthy-longevity-with-benefits-across-the-life-span/

Parker, Kim, Juliana Horowitz, Anna Brown, Richard Fry, D'Vera Cohn, and Ruth Igielnik, *What Unites and Divides Urban, Suburban and Rural Communities*, Washington, D.C.: Pew Research Center, May 22, 2018.

Ritter, Anita Stowell, Audrey Straight, and Ed Evans, *Understanding Senior Transportation: Report and Analysis of a Survey of Consumers Age 50+*, Washington, D.C.: AARP, 2002.

Rosenbloom, Sandra, *The Mobility Needs of Older Americans: Implications for Transportation Reauthorization*, Washington, D.C.: Center on Urban and Metropolitan Policy, Brookings Institution, July 2003.

Saxon, Leslie, Rebecca Ebert, and Mona Sobhani, "Health Impacts of Unlimited Access to Networked Transportation in Older Adults," *Journal of mHealth*, August 13, 2019.

ScienceDirect, "Merit Goods," webpage, undated. As of August 15, 2021: https://www.sciencedirect.com/topics/economics-econometrics-and-finance/merit-goods

Smith, Emily, "Ice, Snow, and Slippery Sidewalks: For Many Seniors, Winter Is 'Hip Season,'" Partnership for a Walkable America, University of North Carolina Highway Safety Research Center, undated.

Turrentine, Jeff, "When Public Transportation Leads to Gentrification," *OnEarth*, National Resources Defense Council, June 1, 2018.

University of South Florida, "Generational Differences Chart," undated. As of August 15, 2021: https://www.usf.edu/hr-training/documents/lunch-bytes/generationaldifferenceschart.pdf

Uscher-Pines, Lori, Jessica Sousa, Maggie Jones, Christopher Whaley, Christopher Perrone, Colleen McCullough, and Allison J. Ober, "Telehealth Use Among Safety-Net Organizations in California During the COVID-19 Pandemic," research letter, *Journal of the American Medical Association*, Vol. 325, No. 11, March 16, 2021, pp. 1106–1107.

USF—*See* University of South Florida.

U.S. Senate, *Challenges in a Catastrophe: Evacuating New Orleans In Advance of Hurricane Katrina, Hearing Before the Committee on Homeland Security and Governmental Affairs*, Washington, D.C., U.S. Government Printing Office, January 31, 2006.

Wennink, Audrey, and Agustina Krapp, "Equity-Oriented Performance Measures in Transportation Planning," memo, American Planning Association, Planning Advisory Service, March/April 2020.

Acknowledgments

About This Perspective

In the United States, older adults are at particular risk of having unmet transportation needs as individual mobility challenges mount and driving ability declines with age. Furthermore, these risks are occurring in an economic environment of rapid change in transportation technology and in a societal environment that does not always support or prioritize older-adult mobility. This Perspective provides an overview of—and weighs solutions to—the equity concerns surrounding older-adult transportation. Next, a framework is presented for communities to explore and assess how well they are serving the transportation needs of older adults as a population and specific older-adult subpopulations. Last, ideas for future exploration and action are presented. This Perspective is intended to provide guidance for communities and advocates for older adults in identifying and strengthening transportation systems.

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