Between Public and Private Mobility

Examining the Rise of Technology-Enabled Transportation Services

KATHERINE KORTUM

The author is Senior Program Officer, Studies and Special Programs, Transportation Research Board, Washington, D.C., and served as study director for this project.

The rapid innovation and growth in technology-enabled mobility services has raised many policy issues. To learn more about the services, how they are used, how they relate to established transportation modes, and what implications they have for policy development, regulation, transportation planning, and infrastructure investment, the Transportation Research Board (TRB) Executive Committee initiated a study, convening a committee of subject-matter experts through the National Academies of Sciences, Engineering, and Medicine (see box, page 8).

The committee's findings and recommendations are published in TRB Special Report 319, *Between Public and Private Mobility: Examining the Rise of Technology-Enabled Transportation Services*. The report includes discussion of a variety of mobility services, such as carsharing, bikesharing, taxis, and the new app-based ride service companies, known as transportation network companies (TNCs).

Protecting the Public Interest

Many of the new technology-enabled mobility services are welcome additions for travelers. The new options, however, pose significant public policy concerns—for example, the insurance for many services, especially TNCs, and helmet requirements for bikesharing.

Bikeshare users in San Francisco, California, use a credit card to pay for their ride. Mobility services facilitated by credit card readers and other technological advances raise public policy issues.

PHOTO: BAY AREA BIKE SHARE

TNCs are the most controversial new services, disrupting the regulated for-hire taxi industry and posing a series of challenges to transportation policy makers and regulators. The main challenge is to encourage and facilitate innovations that meet the public's mobility needs yet maintain a public policy that is consistent for the new services and the traditional taxi and livery services. At issue is protecting the public interest in matters of safety, driver pay and working conditions, and accessibility for people with disabilities.

Addressing this challenge in a rapidly growing and evolving industry requires political will, more information about the scale and nature of the services, and insightful guidance for the evolution of these services to enhance mobility and sustainability.

In the longer term, widespread use of services that involve concurrent vehicle sharing could have implications for land use patterns, automobile ownership, and public transit ridership in ways that could affect the goals of resource-efficient and environmentally sustainable lifestyles. Definitive statements are premature, but the potential benefits and risks of shared mobility services are an important topic for exploration.

Study Findings

Innovative mobility services are expanding travel choices and are being widely embraced by millions of travelers.

The rapid growth of these new services has occurred amid an upswing in travel via taxis and public transit that began more than a decade ago. App-enabled transportation services are among the most remarkable urban transportation innovations in a generation; the technologies deployed for these services are improving mobility in ways that have been proposed and discussed for decades but never realized on a large scale.

By requiring users to possess both a credit card and a mobile phone, TNCs have the potential to exacerbate generational and socioeconomic divides.

Although TNCs have received the most media attention, car- and bikesharing, employee shuttles, microtransit services, and apps that aggregate all travel options are growing, evolving, and affecting travel behavior for many users in profound ways.

Experience suggests that car- and bikesharing programs in the United States reduce personal vehicle travel, emissions, and vehicle ownership. Although travel by innovative mobility services represents a small share of total trips, the programs are having effects on travel behavior, and the continued rapid expansion of their reach and use may significantly affect personal travel in the years ahead.

On its current course, continued expansion of TNCs threatens to exacerbate the "digital divide," although these services also have the potential to enhance mobility for low-income and older adults.

The lack of access to services by those without credit cards or connection to the Internet is an economywide phenomenon, and innovative mobility services are bringing this issue to the fore for transportation. Most shared mobility services require users to have a credit card on file with the service provider and to arrange service via a smartphone. Substantial numbers of Americans, however, fail to meet one or both of these prerequisites.

Roughly 8 percent of U.S. households lack bank accounts and credit cards. Moreover, 36 percent of Americans currently do not own smartphones, and the rate is higher in some groups—50 percent among those who earn less than $30,000 annually and 73 percent among those over age 65.

Smartphone ownership rates have risen rapidly, but the leveling-off point is not clear, particularly for those with low incomes; the current ownership rates leave substantial portions of the population without

Transportation network companies (TNCs) such as Lyft have risen rapidly in popularity amidst a general rise in public transit and taxi use.

access to most shared mobility services. This becomes a greater concern if growth in the new services—especially TNCs—reduces the availability of options such as taxi services, which can be summoned with a landline or basic mobile phone and which receive payment in cash.

If private providers fail to address these access issues on a broad scale, public agencies and regulatory authorities may turn to regulation, mandates, or incentives to make these services fully and equitably available. Shared mobility services have the potential to enhance mobility for disadvantaged populations—the services frequently cost less than taxi services and impose lower up-front costs for travelers than owning a personal vehicle.

Furthermore, if shared- or concurrent-ride TNC services continue to expand and to cost less per trip than most traditional door-to-door services, low-income travelers with access may benefit considerably. The expansion of the relatively new multiple-passenger shared-ride options presents an opportunity for even lower-cost door-to-door service—albeit with stops.

Regulated taxis offer critical lifeline transportation services for people with disabilities. Absent some public policy response, a TNC-fueled decline in taxi services could affect the availability of vehicle-for-hire services to a substantial number of travelers with disabilities.

Roughly 10 percent of the U.S. population—30.6 million people—have a physical limitation of some kind; 3.6 million use a wheelchair, and another 11.6 million rely on a cane, crutches, or a walker. Many cab companies operate wheelchair-accessible vehicles for the general public, often supporting medical providers, social services, and Americans with Disabilities Act–mandated paratransit.

Moreover, several jurisdictions—primarily large cities such as New York, Chicago, and Washington, D.C.—mandate a specified number of wheelchair-accessible taxis, although the efficacy in serving disadvantaged populations is unclear. The more lightly regulated TNCs have introduced pilot programs but have not yet provided wheelchair-accessible services on an extensive or reliable basis. If competition from the increasingly popular TNCs reduces taxi fleets and the number of drivers, the near-term result may be fewer door-to-door transportation services for wheelchair users.

Although some TNCs have refused to accept service dogs—most of the legal cases have yet to be resolved—TNC services can benefit the blind and the visually impaired. TNC apps provide voice options, allowing vehicle requests from a smartphone without

the need to see and hail a taxi on the street. Cashless transactions eliminate questions about the change a taxi driver has provided, and the TNC driver does not know that the passenger is sight-impaired until after accepting the ride.

A wheelchair-accessible taxi picks up passengers in New York City, one of the cities that mandates a certain number of these vehicles in the taxi fleet.

Public safety is a central public policy concern with the new shared mobility services.

Regulation traditionally has rectified market failures, such as a lack of information about the safety of vehicles and drivers and about the quality of the services. Customers of taxi stand and street-hail services, in particular, lack the opportunity to exercise informed choice among providers. Information and communication technologies may have reduced the need for some regulations aimed at service quality, as customers can choose among well-known global brands and can obtain basic information about drivers and vehicles before riding. Public safety, however, remains a regulatory concern.

Public entities at the municipal, regional, and state levels are implementing public safety regulations for TNCs and other shared mobility services, including regulations on helmet wearing by bike-share users. These evolving regulatory processes, however, reveal a long-standing weakness—the paucity of systematic evaluations of the effectiveness or costs of the current and proposed public safety regulations.

A bikeshare user rides without a helmet in San Jose, California. State and local governments are implementing safety regulations affecting TNCs and shared mobility services.

For example, procedures for driver background checks often are based on common practice but have not been evaluated in a rigorous way. As a result, regulators, the taxi industry, and TNC operators may not be following best practices in background checks.

Equally important, minimum limits of automobile liability insurance for taxis, TNCs, and other for-hire services vary across jurisdictions and are not based on a systematic analysis of the risks of for-hire operations. Similarly, the technology may facilitate the production and sharing of driver ratings, photos of operators and vehicles, and electronic itineraries and may mitigate requirements for certain regulations on service quality and safety, but the benefits have not been documented.

Finally, TNC drivers' reliance on smartphones may lead to distracted driving—this possibility should be examined. In sum, the most effective ways to ensure safe operation of vehicles by safety-conscious drivers, as well as appropriate allocation of the costs imposed by the risk of crashes, remain to be established and deserve careful study.

TNC drivers, like most taxi drivers and workers in the shared economy generally, are classified by their companies as independent contractors, not as employees. This status limits their access to benefits that are currently tied to employment.

Independent contractors typically do not receive employer-provided health insurance or employer contributions to Social Security and Medicare, sick leave, workers' compensation for injuries, disability insurance, and other employee benefits. Although many drivers report that they value the part-time and transitional employment opportunities with TNCs, some have sued, claiming that the control that the company exerts over them indicates they are employees under federal law.

The TNCs have responded that the drivers are contractors—the company exercises virtually no control over the time or place of trips, and the drivers own the vehicles. Legal precedents under the federal Fair Labor Standards Act, however, involve multiple tests—no single test is determinative.

The legal system is likely to decide this issue. Without state or federal legislation, however, classifying mobility service contractors as employees would have major ramifications for drivers, company finances, and consumer costs.

Like many TNCs, Uber is a multinational corporation.

The vast differences in the scale of TNCs compared with taxi services raise new considerations for regulators.

The rise of multinational corporations that provide taxi-like services in cities around the world contrasts sharply with the structure of the taxi and limousine industries. Although a few taxi fleets are large, regional enterprises, most consist of local firms, fleets of widely varying sizes, and highly varied employment and contractual relationships with drivers. In comparison, the TNCs are a few increasingly large entities that operate globally, which imparts multicity brand awareness and potential market power with customers, drivers, and regulators.

In heavily regulated taxi markets, state and local policy makers may need to reduce some constraints, so that taxi and limousine services can compete more effectively. Some aspects of regulation, however—such as labor standards and background checks—may be addressed more logically on a national scale.

Innovations in shared mobility services have the potential to change long-term travel and land use patterns.

By affecting the cost, convenience, and flexibility of travel, technology-enabled mobility services may alter travel behavior and land use patterns. Two possible effects are critical.

First, success in aggregating multiple travelers with similar origins and destinations into a single vehicle will reduce travel costs for users and the negative impacts of vehicle travel. The new services could increase carpooling and ridesharing, which could lead to increased average vehicle occupancies. Ultimately, the reduced vehicle travel could ameliorate automotive externalities such as congestion, nonrenewable energy use, and emissions.

Second, by increasing convenient travel alternatives, the new services may encourage lower levels of household vehicle ownership without sacrificing personal mobility. This would eliminate the bias implicit in vehicle ownership toward high-fixed, low-variable costs in mode choice decisions and could spur travel by public transit, walking, and biking; this could favor urban instead of suburban residential choices. These changes would have profound effects if automated driving becomes widespread.

Less expensive and more convenient travel options encourage more travel and may enhance mobility for dispersed—or "sprawl"—locations, increasing the attractiveness to residents and businesses. TNCs and related services, however, are concentrated currently in central, urban locations. In addition, because TNC drivers often travel without passengers between customers, dispersed services
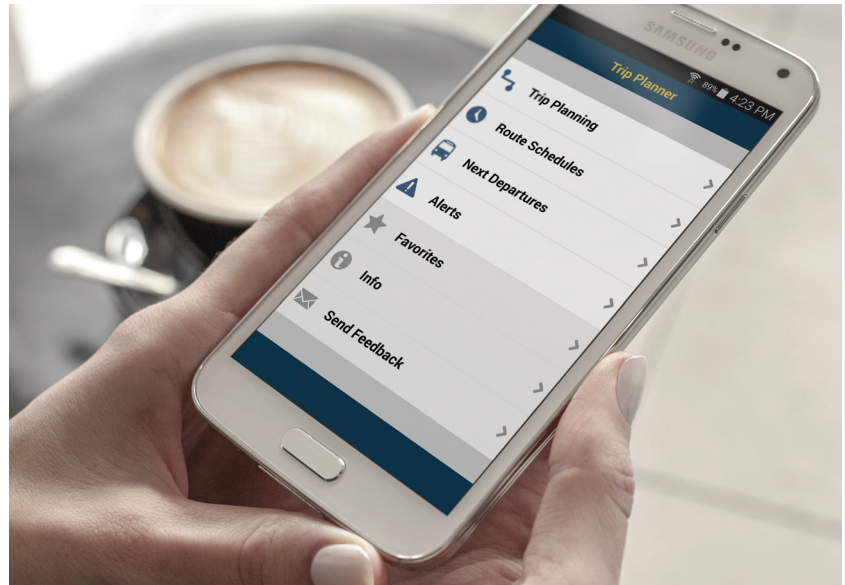
could increase total vehicle travel and contribute to congestion, energy consumption, and emissions.

Finally, lower fares may draw travelers from public transportation to shared-ride services in large numbers. This too could increase total vehicle miles traveled, emissions, and energy consumption. Which of these competing forces will predominate remains to be seen, and the effects may play out in different ways, depending on local circumstances.
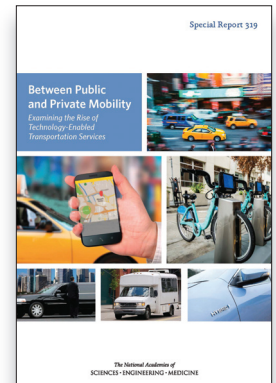
Study Recommendations

Innovative mobility services already are enhancing mobility for millions and have the potential to yield even greater benefits and to serve other societal goals. To realize the potential of these services, policy makers and regulators will need to address the issues discussed in this report. The committee offers the following recommendations to expand the promise of these services with effective and appropriately scaled public oversight:

1. Policy makers and regulators should formulate public policies and regulations designed to steer the development of innovative services to improve mobility, safety, and sustainability.

   1a. To the extent that technology features can accomplish the same customer service protections that previously required regulatory intervention, regulations should be adapted to embrace that opportunity. Local and state governments should reassess current taxi, limousine, and (where separately adopted) TNC regulations for market entry, geographic coverage, span of service, and the like in light of these new services and the service quality information available to passengers and drivers.

A free mobile app from King County, Washington, displays transit information from 11 public transit agencies, including buses, rail, and ferries.

TRB Special Report 319, *Between Public and Private Mobility: Examining the Rise of Technology-Enabled Transportation Services*, is available from the TRB online bookstore, https://www.mytrb.org/Store/Product.aspx?ID=8082; to view the book online, go to www.trb.org/Publications/Blurbs/173511.aspx.

Study committee Chair Brian Taylor, UCLA, answers audience questions at the release of Special Report 319 in Washington, D.C., in December 2015.

uations of safety requirements, examining the core issues of effectiveness and cost.

1*e*. Given the importance of accessibility for all users (which is frequently operationalized in terms of vehicles that can accommodate wheelchairs), policy makers and regulators should address the potential disparity between access for people with various disabilities and other travelers as these new services expand.

2. Policy makers, planners, and regulators should identify the information needed to set policies on, plan for, and regulate mobility services, and should require this information from all regulated entities.

3. Policy makers and regulators should carefully examine and consider the pros and cons of alternative employment classifications for TNC and taxi drivers.

4. Policy makers and regulators should seek to integrate the features of TNCs and other innovative shared mobility services into transportation systems and services in ways that leverage the new services' strengths and features.

1*b*. These assessments also should examine public safety requirements for drivers and vehicles, which should be applied in similar fashion across competing industry segments, ensuring consistency and a level playing field.

1*c*. Similarly, in consideration of both the multijurisdictional travel patterns in metropolitan areas and the large scale of business operations, state and local governments should assess how the regulations governing the various industries relate to one another, particularly when multiple jurisdictions regulate different industry segments within the same geographic area. Policy makers and regulators should consider whether traditional for-hire and shared mobility services are best monitored and regulated at the state, regional, or local level on the basis of market and service characteristics and regulatory capabilities.

1*d*. Policy makers and regulators at the state and federal levels should conduct systematic eval-

Continued Transformation

Innovative urban mobility services will continue to evolve, and the research and public policy communities will need to react quickly and in partnership. Use of these and yet-to-be-developed technology-enabled transportation services is likely to continue transforming passenger travel, and the many stakeholders will need to cooperate to ensure that the outcomes are in the public interest.

Collaboration among these various stakeholders may set precedents, as connected and automated vehicles develop and become common. Addressing this report's findings can provide a foundation for the technological evolution of the U.S. transportation system.

Committee for Review of Innovative Urban Mobility Services

Brian D. Taylor, UCLA Luskin School of Public Affairs, Los Angeles, California, *Chair*
Ryan Chin, Massachusetts Institute of Technology, Cambridge
Melanie Crotty, San Francisco Bay Area Metropolitan Transportation Commission (resigned from committee as of June 14, 2015)
Jennifer Dill, Portland State University
Lester A. Hoel, University of Virginia (emeritus)
Michael Manville, Cornell University, Ithaca, New York

Steve Polzin, University of South Florida, Tampa
Bruce Schaller, Schaller Consulting, Brooklyn, New York
Susan Shaheen, University of California, Berkeley
Daniel Sperling, University of California, Davis
Marzia Zafar, California Public Utilities Commission, San Francisco
Susan Zielinski, University of Michigan, Ann Arbor