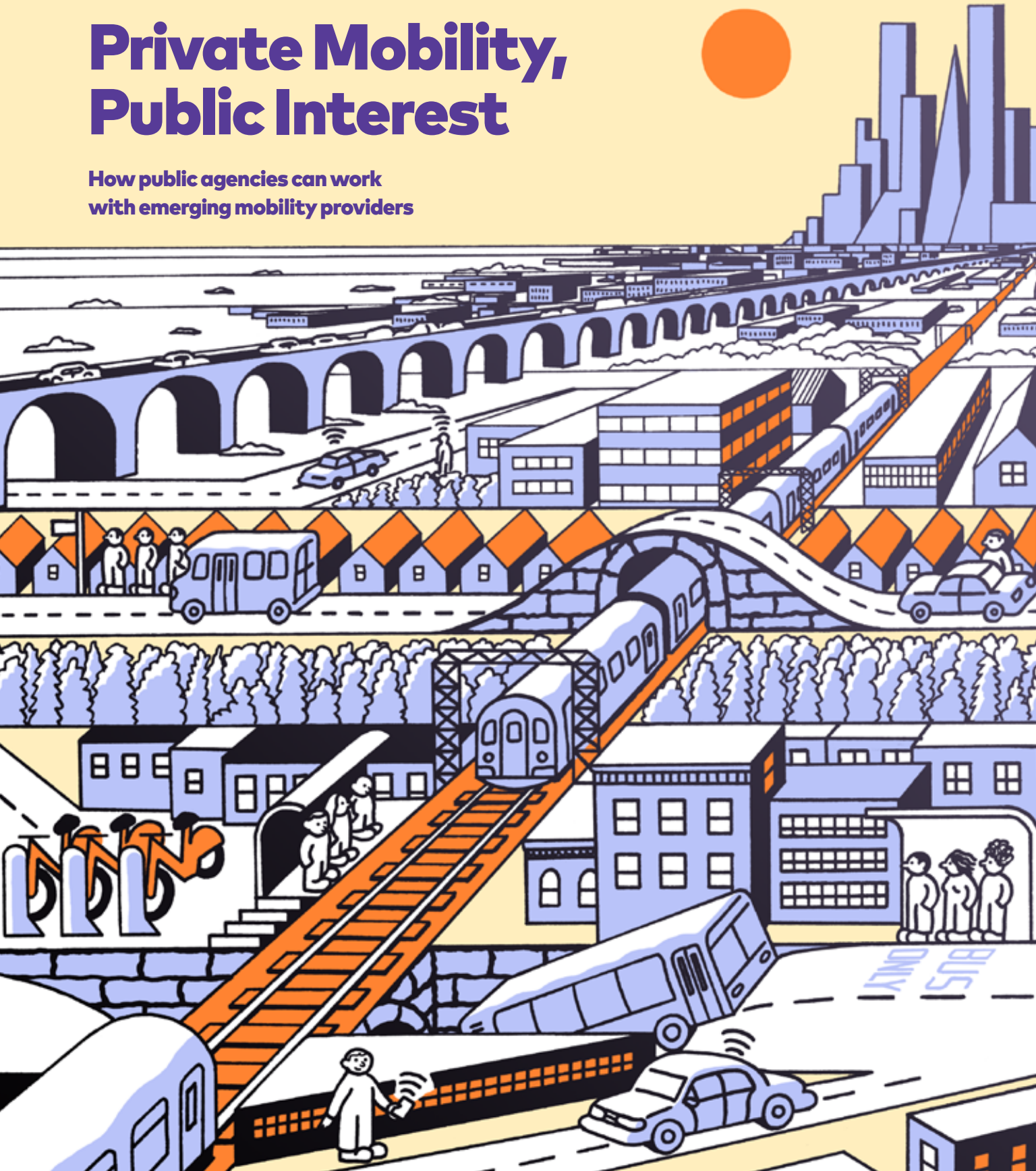
TransitCenter

Private Mobility, Public Interest

How public agencies can work with emerging mobility providers



TransitCenter is a foundation that works to improve urban mobility. We believe that fresh thinking can change the transportation landscape and improve the overall livability of cities. We commission and conduct research, convene events, and produce publications that inform and improve public transit and urban transportation.
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TransitCenter takes full responsibility for any factual errors or irresponsible omissions.

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Key Findings

Emerging mobility services like bikeshare, carshare, on-demand transit, and transportation network companies provide more transportation options for customers to choose how to get where they want to go.

Partner to reinforce transit's strengths

- Emerging mobility services allow for greater transportation efficiency by creating opportunities for more flexible planning by public agencies. If agencies can reduce the cost of providing equivalent or better service in inefficient transit markets, they can reallocate savings to improve service elsewhere.
- Emerging mobility and other third-party data providers hold robust and valuable data that can be used to improve agency planning efforts. Agencies should identify their needs and seek access to these data accordingly, which will in many cases result in stronger reporting requirements.
- Emerging mobility services have not yet transformed public transportation. They will not replace high-quality, fixed-route transit as the most efficient means of moving people along dense urban corridors, and focusing on emerging mobility services is not a substitute for designing walkable, mixed-use neighborhoods or engaging in pedestrian- and transit-oriented planning.

Leverage agency-controlled assets

- The public sector controls valuable assets, like parking spaces and street right-of-way, that can be used to negotiate for contracted services, access to data, or equitable geographic coverage, for example.
- Agencies can subsidize customer trips using emerging mobility providers in order to achieve desired transportation outcomes, such as increased average vehicle occupancy or increased first- or last-mile transit transfers.

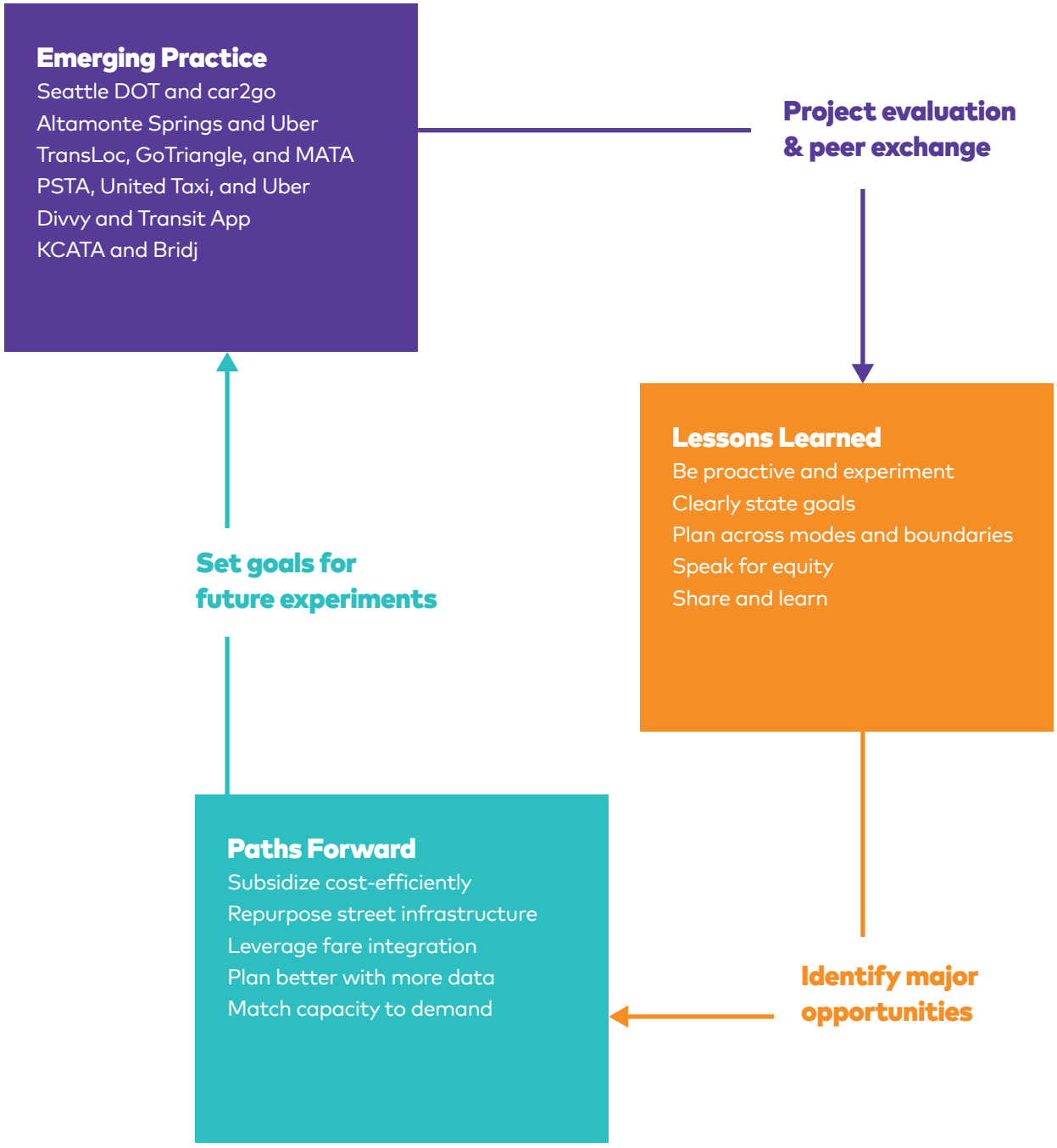
Plan for a streamlined user experience

- Agencies who provide high quality open data, especially real-time transit data, and use open data and technology standards will enable more rapid innovation toward streamlined customer trip-planning and payment systems.
- Integrated fare payment system implementation is a valuable leverage point for agencies working with emerging mobility providers.

Be open to new ways of providing useful transit

- Agencies need to proactively start to break down barriers to collaboration with emerging mobility providers––barriers like restrictive procurement processes, work rules, or agency traditions––by creating clear pathways to working together.
- There is a substantial gap between current practice and the anticipated potential for on-demand transit and transportation network companies to serve paratransit trips and other markets that are particularly expensive to serve using fixed-route transit. Public agencies can close this gap by starting with targeted pilot programs with emerging mobility providers.
- As new and existing providers continue to test different business models and growth strategies, public agencies must also experiment and share lessons learned with one another and with emerging mobility providers.

State of Practice



Executive Summary

With the rise of emerging mobility services like bikeshare, carshare, on-demand transit, and transportation network companies, traditional fixed-route public transportation services face a changing transportation landscape. The transit agencies that provide these services, along with the municipal agencies that own and manage streets, have an opportunity to step up to take advantage of these changes—or they risk being left behind by both their peers and emerging mobility providers in the private sector.

Emerging mobility services present public agencies with two major opportunities: providing more transportation options to improve customer choice, and offering agencies new tools to provide better service, more efficiently. These opportunities are two sides of the same coin—a greater diversity of services means that a transit agency can provide cost-saving on-demand transit service in areas that are poorly suited to traditional bus service, while a customer can choose to use bikeshare to get to her three-mile-away lunch meeting rather than take an expensive taxi.

Private Mobility, Public Interest is a report for public-sector leaders committed to making it easy for their citizens to get where they want to go. We identify actionable short-term opportunities for today's transit agencies and municipalities to work with emerging mobility providers. This report is an independent analysis built on a foundation of more than 100 interviews with industry representatives from the public and private sectors.

Conducting research for this report presented a significant challenge given that practice in this field is constantly evolving. The diagram on the opposite page shows how our findings fit into this broader learning process.

One clear finding is that today's practice does not support the popular but superficial narrative that emerging mobility providers are on their way to replacing traditional bus service. Cities as diverse as Nashville, Jacksonville, and Seattle have seen steadily increasing transit ridership during the past six years—coincident with the rise of transportation network companies and other emerging mobility services.

Emerging mobility services are just one piece of an effective public transportation network in which transit is the backbone—the most efficient means of moving large passenger volumes affordably and equitably—and walking is the preferred option for first- and last-mile travel. The accessibility to, usage of, and general familiarity with emerging mobility services varies widely in the general population—especially with age and income—creating major equity challenges.

Public agencies need to make sure that emerging mobility providers support agencies in addressing their fundamental mission, rather than distracting them from it. Transit agencies' goals should be equitable, efficient, affordable, and sustainable transportation, and their challenges are to gain the public and political support, funding, and organizational capacity necessary to provide their customers with high-quality transit networks. Emerging mobility services do not solve these challenges, but they can help address them in ways we discuss and illustrate in this report.

As important as it is to dispel some of the inflated hype around emerging mobility, we should not lose sight of the opportunities afforded by these new modes. We have identified four successful strategies for working with emerging mobility providers:

Partner to reinforce transit's strengths

Transit is still best at moving large quantities of people through dense urban corridors. Emerging mobility providers can help agencies do more of this by making service in hard-to-serve areas better for customers and more cost-efficient for agencies. Data from emerging mobility providers can improve planning efforts and allow agencies to better evaluate service provision.

Leverage agency-controlled assets

Public agencies can more effectively leverage their resources to achieve agency goals while supporting emerging mobility services. Chief among these resources are public infrastructure, like parking spaces and traffic lanes, and financial resources. Bringing those to the table and putting them to use will ensure positive outcomes.

Plan for a streamlined user experience

Agencies can make it easier for people to compare and pay for a variety of mobility options by providing high-quality open data. Using open data and technology standards will facilitate future innovation within and outside of agencies.

Be open to new ways of providing useful transit

Emerging mobility providers should be welcomed to the transit table. Agencies can build relationships with emerging mobility providers, create pipelines for new ideas from outside the agency, and engage communities to understand their desired outcomes.

Several **lessons learned** emerged from this research Municipal and transit agencies can replicate the most successful aspects of their peers' work with emerging mobility providers by **being proactive in experimenting** with these strategies, **defining goals** and using appropriate performance measures **to evaluate progress,** and working to ensure equity throughout the process. Agencies should also **plan regionally and across modes, publish open data,** and seek out opportunities to **share knowledge with and learn from peer organizations.**

Agencies will advance the emerging mobility state of practice by pursuing several key **paths forward:** beginning to **allocate subsidies for mobility outcomes** rather than just modes, **reallocating street infrastructure** to support efficient movement of people, using **fare integration as a point of leverage,** advancing planning efforts **using data from new sources,** and **exploring the potential of on-demand services** as a complement to fixed-route transit networks.

Our lessons learned are drawn from case studies of projects largely undertaken in the past six months, and these lessons frame the paths forward, which are long-lasting principles that agencies should apply in order to push the boundaries of practice. Experiments pursuing these paths forward will create learning opportunities and yield meaningful benefits to transit agencies and their customers alike. The outcomes of those experiments will provide new lessons, and new paths will emerge.

None of our recommendations are revolutionary, nor are they applicable only to the challenges posed to public agencies by emerging mobility providers. By and large, transit's biggest challenges remain what they have been for the past several decades: governance, politics, funding priorities and availability, and structural incentives that favor private automobiles.

These challenges must not be forgotten, but emerging mobility services offer valuable help for cities and transit agencies ready to accept it. Agencies that recognize the strengths of emerging mobility services and connect them to a robust transit network will give their riders a more convenient and affordable transportation system than they could have provided alone—redefining public transportation in the process.

"Shared mobility"

Throughout this report we avoid using the term "shared mobility," commonly intended to encompass a diverse set of services ranging from bikeshare to TNCs to vanpool services to peer-to-peer carshare and beyond. We have elected to focus wherever possible on specific services rather than this catchall phrase because carshare is very different from bikeshare, and both of these are very different from TNCs. Even talking about Uber on its own is challenging given the broad and rapidly evolving range of mobility services that it now offers in various markets.

Instead, when we feel it appropriate to write about this range of options in more general terms, we have opted to talk about "emerging mobility" services and providers. If anything is truly shared mobility, it's transit itself. What's novel for the American transit industry today is not the sharing but rather the private-sector nature of many of these transportation services (bikeshare typically being a special public/private case). It is also important that emerging mobility services collectively use a variety of specialized vehicle types and that these services are largely app-enabled—but neither of those characteristics is unique to such "shared mobility" providers.

We also use the terminology of "on-demand transit" to describe providers like Chariot, Bridj, and Via (also commonly referred to as "microtransit")—services that combine the on-demand nature of TNCs with fixed-route transit service efficiencies like larger vehicles and the likely need for customers to begin and end their trip with a short walk.

Introduction

Public transportation has two distinct missions: to move large numbers of people in dense corridors ripe for useful transit, and to provide mobility to people with limited access to private vehicles, even where trips are too dispersed for frequent fixed-route transit services.

In service of both these missions, emerging mobility providers offer an increasingly diverse spectrum of modes better tailored to customers' mobility needs, from both public agencies' and customers' perspectives. Emerging mobility providers can augment transit service in dense corridors—during off-peak hours or as a feeder service, for example. Transportation network companies (TNCs) and on-demand transit services may be able to offer equivalent or improved service at lower cost in corridors that are challenging to serve with fixed-route transit, unlocking funding to improve service elsewhere.

To realize this potential and maximize public benefit, agencies should capitalize on two key opportunities to meet their citizens' mobility needs:

Providing more transportation options to improve customer choice

Many urban residents benefit from being able to use different modes of transportation to suit different trip purposes, especially in households that do not to have a car. Providing more options does not just mean enabling different day-to-day mobility choices, but also enabling the long-term possibility for different lifestyle choices to yield household cost- and/or time-savings. Informed policies can bring these benefits more equitably to a broad range of citizens.

Offering agencies new tools to provide better service, more efficiently

Limited service offerings hamper American transit agencies as they work to address their communities' mobility needs reliably and cost-effectively, particularly in low-demand areas and during off-peak time periods. Having options besides trains, streetcars, and 40-foot buses means that transportation supply can be customized to meet the unique demands of diverse communities.

Emerging mobility services pose no existential threat to fixed-route transit

While these opportunities are widely discussed, capitalizing on them remains challenging. Emerging mobility services are still rapidly evolving, making it difficult for public-sector leaders to know where the real opportunities lie for their agencies and contexts. Bikeshare and carshare are mature enough to provide some concrete success stories; Uber and Lyft seem to announce new mobility programs and services every week and, along with on-demand transit services like Via, Chariot, and Bridj, show potential—as yet unrealized—to more directly complement fixed-route transit.

While the media or casual commentators often speculate about these services' transformative potential, practice to date suggests that their impact will be more targeted. To date, pilot projects have yielded only a few concrete and public results beyond a handful of informative bikeshare and carshare examples. This is unsurprising given that these emerging mobility options are still in their infancy—Zipcar was founded in 1999, car2go in 2008, Uber in 2009, and Bridj in 2014. The first citywide bikeshare system in the US was launched in 2010. The relative novelty and rapid change, particularly among TNCs and on-demand transit providers, have created substantial uncertainty about these emerging services' future. As a result, we cannot claim to have all the answers but intend to share knowledge that can help public agencies to manage change in the mobility landscape.

Emerging mobility services bring important short- and long-term implications for the transit industry, but they pose no existential threat to fixed-route transit. Cities across the US—for example, Seattle, Nashville, and Jacksonville—have seen steadily increasing transit ridership in the past six years in spite of the coincident rise of TNCs and other emerging mobility services.

Today's expanding network of mobility options may be an important precursor to Mobility-as-a-Service (consumers turning from private car ownership to a variety of mobility options), and TNCs may be important precursors to—someday—shared autonomous vehicles. The sheer people-moving capacity of mass transit remains unparalleled, however, and no smartphone app can change that simple fact.[1]

Consider, for example, what traffic would look like in Los Angeles if the 900,000 trips currently taken by bus on an average weekday suddenly were replaced by car trips, whether privately owned or operated by a TNC. Researchers analyzing Los Angeles' traffic patterns

1 National Association of City Transportation Officials, **Transit Street Design Guide** (New York: Island Press, 2016), http://nacto.org/publication/transit-street-design-guide/ .

This report is built upon over 100 interviews with transportation industry leaders

in the wake of a 2003 transit workers strike observed a 47 percent increase in traffic delays.[2]

Uber's recently announced UberPool promotions in Boston and Manhattan (the latter promoted via discount website *Gilt City*[3]) offer commutes at transit-competitive prices, raising red flags with some in the transit industry concerned about the promotions' effect on bus ridership. But local bus ridership has been declining in New York City for more than a decade, and if the NYC Department of Transportation and Metropolitan Transportation Authority addressed the problems that plague the bus (a lack of dedicated right-of-way, slow boarding, etc.),[4] then UberPool would not pose much of a threat during rush hour, least of all in a city as dense as New York. Concerned transit industry members should start by implementing frequent, high-quality transit in corridors where it makes sense and then consider how emerging mobility services can complement it.

This report is for public-sector leaders committed to making it easy for their citizens to get where they want to go. In it we identify actionable short-term opportunities for transit agencies and municipalities to work with emerging mobility providers. TransitCenter's independent analysis is built on a foundation of more than 100 interviews with industry representatives from the public and private sectors, which allowed us to review what emerging mobility providers have offered American public agencies to date and consider the implications for public transportation.

We also seek to cut through some of the hype surrounding these "shared" mobility services. None of these emerging modes will replace high-quality transit in corridors with sufficient population and activity density. Areas with especially low population density are not viable markets for bikeshare for the same fundamental reasons that they are not well suited to fixed-route transit services.

While emerging mobility options will likely help address first- and last-mile barriers in some cases, they are not a substitute for the fundamentals of sound urban design and transportation planning. Walking (and its enabling conditions, like dense, mixed-use, transit-oriented development) is and will remain the most effective first- and last-mile solution.

First- and last-mile behavior is also hard to observe without detailed data on trip chains, but increasing evidence shows that diverse modal options can enable customers to change their behavior.

2 Michael L. Anderson, **Subways, Strikes, and Slowdowns: The Impacts of Public Transit on Traffic Congestion**, (Cambridge, MA: National Bureau of Economic Research, NBER Working Paper Series, 2013), http://www.nber.org/papers/w18757.pdf .

3 "The Uber Commute Card," Gilt City New York, accessed July 18, 2016, https://perma.cc/C88K-D3PW.

4 Tabitha Decker et al., **Turnaround: Fixing New York City's Buses** (New York: NYC Bus Coalition, 2016), http://transitcenter.org/wp-content/uploads/2016/07/Turnaround_Fixing-NYCs-Buses-20July2016.pdf.

Walking is and will remain the most effective first- and last-mile solution

Research by the Shared-Use Mobility Center shows a correlation between lower car ownership and increasingly multimodal travel choices,[5] though causality must be explored and will be challenging to isolate (e.g., people who already own fewer cars may simply be more inclined to adopt and benefit from emerging mobility options).

A recent Pew Center survey also provides a useful reality check. As of December 2015, an estimated 34 percent of 18- to 29-year-olds living in urban areas (21 percent of urban dwellers, or 15 percent of Americans overall) have used ride-hailing services like Uber and Lyft at least once, with 10 percent of this young age group using them on a daily or weekly basis.

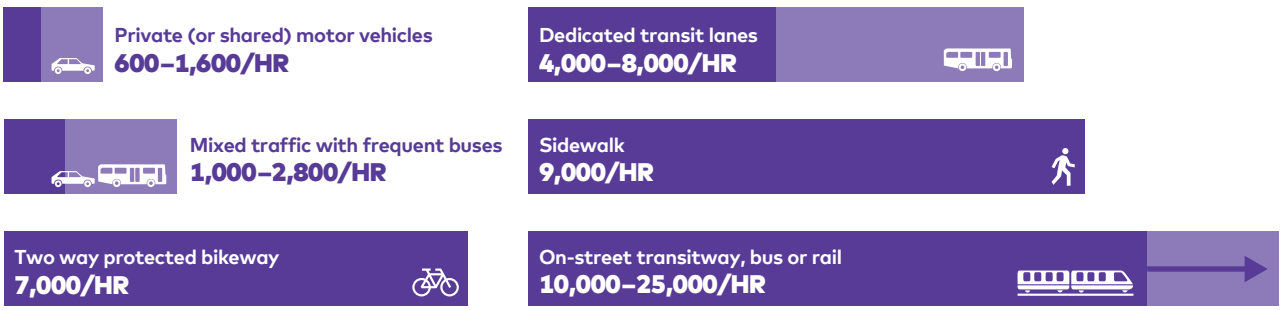
While usage across gender and racial groups does not differ significantly, there remain substantial gaps in use and awareness across generations and income levels. Only four percent of those over the age of 65 have used ride-hailing services. Of those surveyed with incomes greater than $75,000, 86 percent had heard of ride-hailing services (with 26 percent having used them), while 51 percent of those with incomes less than $30,000 had heard of these services (with ten percent having used them).[6]

TNCs continue to gain traction, but they are far from universal. When considering institutional support for TNCs or any other emerging mobility services, the public sector must think carefully about who does and can reasonably afford to use them, even at subsidized rates.

Agencies and emerging mobility providers have a lot to learn from each other. We need to openly discuss both successful and failed partnerships and create ample opportunities for peer knowledge exchange (informally and via formal practitioner networks). The "Emerging Practice" section that follows comprises the case study–driven core of this report and summarizes much of TransitCenter's knowledge on the subject to date.

5 Colin Murphy and Sharon Feigon, **Shared Mobility and the Transformation of Public Transit** (Chicago: Shared-Use Mobility Center and American Public Transportation Association, 2016), http://sharedusemobilitycenter.org/wp-content/uploads/2016/04/Final_TOPT_DigitalPagesNL.pdf.

6 Aaron Smith, **Shared, Collaborative and On Demand:** The New Digital Economy (Washington, DC: Pew Research Center, 2016), http://www.pewinternet.org/2016/05/19/the-new-digital-economy/.



People moving capacity, by street design

Adapted from NACTO

Barriers to progress

Transit and emerging mobility providers can complement each other's operations, but there can also be tensions, as the Shared-Use Mobility Center highlights in its report for the American Public Transportation Association.[7] The potential for these emerging mobility services to strengthen cities' transportation networks is undeniable, but a number of obstacles stand in the way.

While the following challenges are commonly understood in the transit industry, they are worth making explicit—particularly for readers outside municipal and transit agencies.

Land use

Reducing single-occupancy vehicle use will require easy access to transportation services that are not privately owned cars. This is only possible in walkable, dense, mixed-use neighborhoods, which remain the exception rather than the norm in most of the United States.

Equity implications

Transit agencies are subject to Federal Transit Administration, Title VI, Americans with Disabilities Act (ADA), and other regulations designed to ensure equitable transit outcomes for low-income and minority residents. Emerging mobility providers generally are not, however, and simply following perceived market demand is likely to lead to disparities in transportation access.

Procurement requirements

Existing procurement policies and practices can inhibit the dynamic, evolving nature of emerging mobility providers. In multiple case studies, agencies' procurement policies had to be waived or altered to facilitate pilot project agreements.

Existing governance structures

Today's American transit agencies are largely structured to support the traditional model of transportation service provision, optimized for providing vertically integrated planning, construction, operations, and maintenance of a narrow set of transportation modes.[8]

Resistance to change

Many practitioners fear the unknown, especially when it appears to threaten their way of doing things. There's no doubt that emerging mobility providers portend change for the transit industry, but if this change can be channeled for public benefit, agency leadership must come to embrace it.

7 Murphy and Feigon, **Shared Mobility and the Transformation of Public Transit.**

8 For more on today's transit governance, see: Joshua Schank et al., **Getting to the Route of It: The Role of Governance in Regional Transit** (Washington, DC: Eno Center for Transportation and TransitCenter, 2014), http://transitcenter.org/wp-content/uploads/2014/08/Transit-Governance-Final-PDF-10_7_14.pdf.

Federal funding restrictions
Existing federal restrictions on the types of service that are eligible for federal funding and federal paratransit service requirements complicate agencies' calculus regarding whether to invest money in agreements with emerging mobility providers.

Labor-management relationships
Agency relationships with unions are one of the elephants in the room, as they can financially and politically inhibit agencies from forming agreements with emerging mobility providers.

Data access and technical capacity
Emerging mobility providers can have a major analytical advantage given their laser focus on their own operations, flexible financial resources, and technical talent pool. This puts poorly resourced agencies at risk of becoming reliant on those providers to conduct trustworthy analysis to inform policy decision-making.

Safety and liability
Subsidizing privately operated and managed providers to serve rider trips can expose agencies to financial risk. The uncertain future of TNC drivers' labor classification adds an additional risk. Agency staff and members of the public are also keen to understand and ensure the safety of these emerging services.

Uncertain pricing and provider stability
The dynamism of emerging mobility providers engenders significant uncertainty among agencies charged with providing stable mobility options. TNC pricing and service offerings have been subject to frequent change, month-to-month and minute-to-minute when surge pricing is in effect. Some interviewees have even questioned the long-term financial viability of the TNC business model, citing high driver turnover rates and an uncertain degree of current private subsidy.

Institutional and industry silos
The fixed jurisdictions of public agencies and a lack of information sharing among them puts agencies at a disadvantage compared to private companies that quickly build experience and expertise across borders.

Labor-management relationships stand out as a particularly complex barrier. For agencies seeking increased operational flexibility, it is legally and politically difficult to substitute a non-unionized workforce for a unionized one. Agencies cannot unilaterally change work rules enshrined in complex collective bargaining agreements. The federal right to organize that gives rise to collective bargaining agreements is also at the center of the debate regarding TNC drivers' status as either TNC employees or independent contractors. Ongoing lawsuits hinging on this ambiguity must eventually be resolved, and any outcome except strict maintanence of the status quo will likely carry significant impacts for TNCs.

Despite these challenges, public agencies that have begun to integrate emerging mobility services increasingly view them as valuable additions to their mobility networks. Demand management practitioners at cities and transit agencies alike already see bikeshare, carshare, TNCs, and on-demand transit services as transportation options worth promoting to reduce single-occupancy vehicle trips. Staff members across a diverse spectrum of agencies see the potential for emerging mobility services to support more equitable and efficient transit service provision.

Emerging Practice

Cities and transit agencies have adopted a range of strategies and responses to support or integrate bikeshare, carshare, and ride services. While each of these on-the-ground strategies has had varying levels of success—and some are simply too new to evaluate—they illustrate the ways in which public agencies have built policies and practices to take advantage of these services.

These four general strategies have shown the most promise:

1. **Partner to reinforce transit's strengths.**
   Transit is still best at moving large quantities of people through dense urban corridors. Emerging mobility providers can help agencies do more of this by making service in hard-to-serve areas better for customers and more cost-efficient for agencies. Data from emerging mobility providers can improve planning efforts and allow agencies to better evaluate service provision.

2. **Leverage agency-controlled assets.**
   Public agencies can more effectively leverage their resources to achieve agency goals while supporting emerging mobility services. Chief among these resources are public infrastructure, like parking spaces and traffic lanes, and financial resources. Bringing those to the table and putting them to use will ensure positive outcomes.

3. **Plan for a streamlined user experience.**
   Agencies can make it easier for people to compare and pay for a variety of mobility options by providing high-quality open data. Using open data and technology standards will facilitate future innovation within and outside of agencies.

4. **Be open to new ways of providing useful transit.**
   Emerging mobility providers should be welcomed to the transit table. Agencies can build relationships with emerging mobility providers, create pipelines for new ideas from outside the agency, and engage communities to understand their desired outcomes.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Partner To Reinforce Transit's Strengths

Emerging mobility services provide more ways of meeting the diverse needs of American communities

Uber and Lyft cannot and will not replace transit in large American cities. Transit remains the most effective way to move significant quantities of people affordably and equitably, but bikeshare, carshare, TNCs, and on-demand transit services are each capable of serving different and complementary mobility needs. If transportation planners can understand how these services can best complement fixed-route public transportation, they will have more ways of meeting the diverse needs of American communities.

First, transit agencies in particular have an opportunity to optimize their service provision by subsidizing riders to take trips that are hard to serve with fixed-route transit (though, as you will read in the Altamonte Springs case study, city or regional governments may also take on this role). The goal might be to reduce per-passenger subsidies for trips that typically have depended on publicly owned vehicles and public-sector labor. Agencies might also want to absorb unmet transit demand in corridors with high crowding, potentially allowing them to avoid or defer major additional capital expenditures. If realized, operational savings could feed into improved service along corridors that play to transit agencies' strengths. Two transit agencies testing these waters are the Kansas City Area Transportation Authority and the Pinellas Suncoast Transit Authority.

Second, private transportation companies are generating and collecting substantial data that can help agencies make better transportation planning decisions, both in terms of optimizing service provision by mode and with respect to transit network planning more broadly. Public agencies can gain access to these data using several methods, whose pros and cons we explore below with respect to bikeshare systems and TNCs in New York City and Boston.

Public agencies need to be clear about which data-driven insights will be directly useful to them, how exactly they will use private data to glean those insights, and how they can work with emerging mobility providers to ensure data security and safeguard privacy.

Emerging mobility service substitution

The Pinellas Suncoast Transit Authority (PSTA), which serves the St. Petersburg, FL, area, reached out to Uber hoping to address a specific operational challenge. Following a failed transit-funding ballot measure in 2014, PSTA faced significant service cuts and had a mandate

Public agencies need to be clear about which data will be directly useful

from its board to explore alternative service options in neighborhoods where routes with low farebox recovery were marked for elimination. After being introduced to Uber's regional general manager by a local politician, PSTA's CEO thought the transportation network company might be able to help in a way that would support the agency's mission.

PSTA planning staff did their homework and knew that no one in the industry had subsidized trips to specific transit stops.[9] PSTA staff and the agency's general counsel also worked closely together to determine the parameters of a pilot project in which PSTA could legally engage under FTA regulations.

As of March 2016, PSTA offers a 50 percent fare subsidy—up to a maximum of $3—to riders who use Uber or the local United Taxi service.[10] The subsidy is available to customers who access one of two specific bus stops within a designated service zone in the Pinellas Park area between 7am and 7pm any day except Sunday. Our analysis of National Transit Database data shows that $3 is approximately the subsidy that the agency provides to the average transit trip in its system.

To access the subsidy, citizens can use the PSTA option in their Uber app, or make a United Taxi reservation either using the United Taxi app or over the phone. Using the Uber option initially required the additional step of entering a promotional code, but now the PSTA option appears to anyone using the Uber app in the designated service zone. A nearby pilot project in the East Lake neighborhood offers a subsidy only for United Taxi because of local political opposition to subsidizing Uber.

This pilot program includes not just Uber and United Taxi but also Care Ride, a local paratransit provider. Paratransit riders within the service areas can call a vehicle to or from a designated stop location at the agency's standard paratransit fare of $3/ride. For eligible trips, paratransit customers can receive near on-demand service and avoid the typical 24-hours-in-advance reservation requirement. Having multiple providers on board for the pilot program helped alleviate local concerns about safety and customer choice and allowed the program to comply with FTA regulations for drug and alcohol testing as part of driver background checks.

Since the program's launch, the agency has worked with Uber to increase rider outreach efforts at the targeted bus stops, eliminated

9 Since conducting our case-study interviews, the Southeastern Pennsylvania Transportation Authority (SEPTA) has launched a pilot program in the Philadelphia region similar in spirit to the PSTA program. See: "SEPTA and Uber Announce Transit Partnership," accessed July 15, 2016, http://www.septa.org/media/releases/2016/05-25-16a.html.

10 "Introducting Direct Connect: Taking You to the Bus Stop," Pinellas Suncoast Transit Authority, accessed July 12, 2016, https://perma-archives.org/warc/VT2K-5TNY/http://www.psta.net/directconnect/index.php.

Pinellas Suncoast Transit Authority clearly defined goals and worked with Uber to refine operations

the need for Uber app users to enter a promotional code, and recently announced that it would be rolling out a phone-based reservation system for non-app-using Pinellas County residents. All these efforts have been geared toward accelerating participation in the pilot program, which began very slowly and with a low success rate (initially, a high percentage of would-be participants selected the PSTA option in the Uber app but took trips that did not meet eligibility criteria for the PSTA subsidy).

Both executive and political leadership were required to make this experiment possible—without the agency CEO's support, it is unlikely that this project would have gotten off the ground. PSTA also clearly defined its operational goal and worked with providers to refine the details of this pilot program.

Whether PSTA's anticipated operational cost savings will materialize and therefore ease the service cuts imposed by a funding shortfall remains to be seen, but there's much to learn from PSTA's thoughtful approach to experimentation in pursuit of meeting its operational goals.

Takeaways

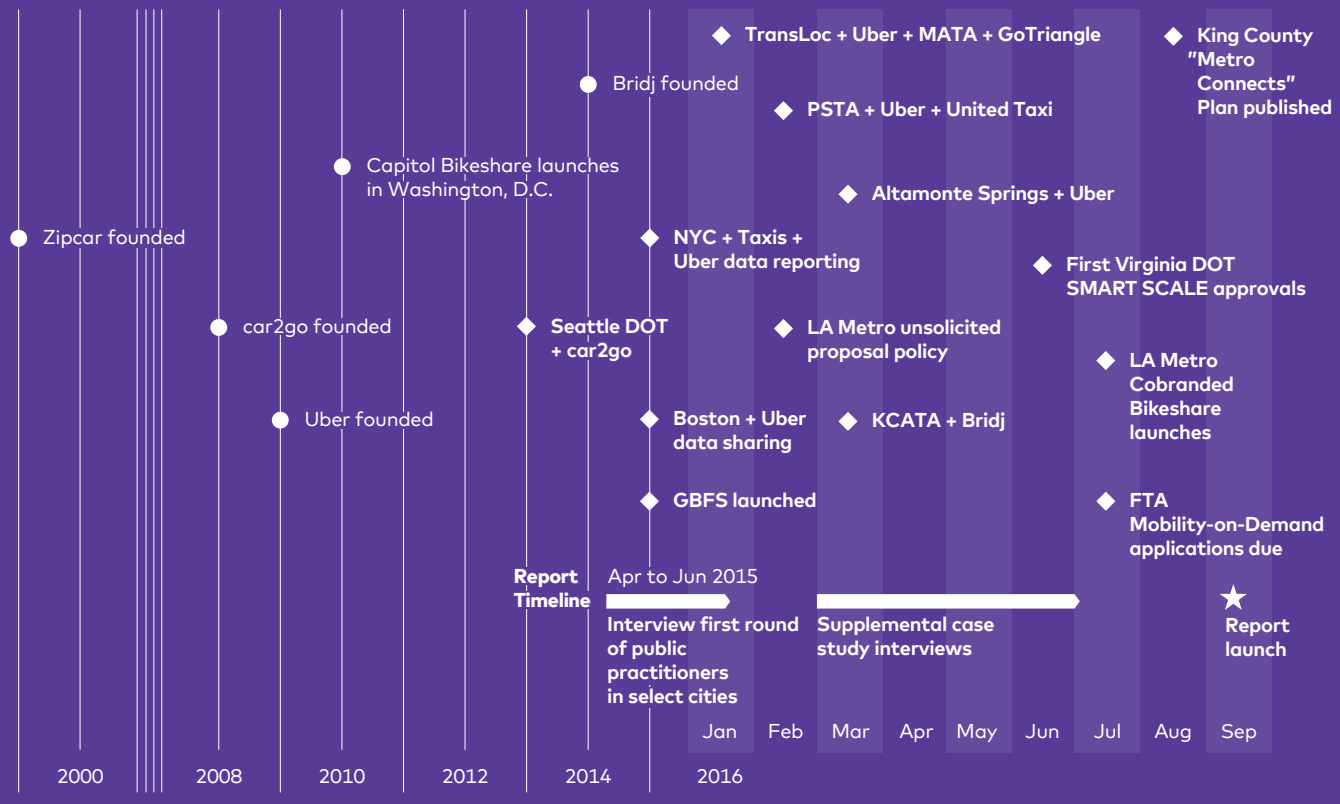
1. **Secure the executive and political leadership needed to push these initiatives forward, especially at this experimental stage of the industry's development.**
2. **Do the necessary research to make sure agency concerns are thoroughly addressed before moving forward—but have a bias toward action. Some uncertainty is inevitable.**
3. **Use emerging mobility subsidies to maximize operational/cost efficiency and meet regional goals.**
4. **Keep refining the project design over the course of the pilot program.**
5. **Plan for robust community outreach. Adding new options requires up-front work to make sure people know these options exist and how to use them.**

Research Method

This report is grounded in case studies informed by practitioner interviews. Sam Schwartz, the Shared-Use Mobility Center, and TransitCenter started by conducting more than 60 in-person interviews with 29 municipal transportation and regional transit agencies, other local government departments, and private-sector stakeholders in Seattle, Los Angeles, San Francisco, Boston, Chicago, and Washington, DC, in the spring and summer of 2015. Recognizing substantial advances in the field's practice, we followed up on those in-person interviews with more than 40 additional interviews (primarily conducted by phone) in the spring of 2016 in order to develop the case studies that now comprise the core narrative of this report. Together, these interviews with public and private stakeholders across the country allow us to dig deeper into the "why" and "how" of emerging mobility pilot projects.

The rapid proliferation of experiments and pilot projects involving emerging mobility providers and public agencies makes the subject a moving target and thus a challenging one to discuss without risk of becoming quickly dated. We have attempted to strike a balance between presenting a comprehensive picture of activities in the industry to date, a nuanced view of the challenges and opportunities at stake, and insights that will last longer than the next few months of continued innovation.

Timeline



Emerging mobility service overlay

A fixed-route transit network will never be all things to all people. Emerging mobility services have the potential to complement and strengthen existing transit and city agency core competencies.

Bikeshare systems provide a clear example—those with access to bikeshare can use it when it makes the most sense, and those trips tend to be different from the types of trips for which transit is best suited. Locating bikeshare stations at or near transit stations enables convenient transfer between services and encourages multimodal choices that can maximize mobility for riders.

Subsidies for private on-demand service are uncharted territory for fixed-route transit agencies, and their potential is still uncertain. The most notable example is the recent contract between the Kansas City Area Transportation Authority (KCATA) and Bridj, an on-demand transit company.[11] Using a sole-source contract, KCATA has partnered with Bridj to provide on-demand service in addition to the agency's fixed-route transit service within and between two central city neighborhoods during peak travel hours.

11 "Rider Guide: Bridj," RideKC, accessed July 13, 2016, https://perma.cc/37KXSCGR.

KCATA waived procurement rules to sign a contract with Bridj

Driving between these neighborhoods is much faster than using transit, which previously required indirect, multi-transfer bus routes. There is existing bus service in both neighborhoods, but they are not well connected to each other within the greater network—in other words, this pilot program is addressing *trips* that the agency did not serve well, not *areas* that the agency did not serve well.

KCATA temporarily waived its procurement requirements in order to sign its agreement with Bridj. We were unable to determine why KCATA entered into this agreement using a sole-source contract. Other providers like Via (in New York City and Chicago) and Chariot (in the San Francisco Bay Area) offer similar services to Bridj in other US cities. In considering agreements with on-demand transit companies, TNCs, and carshare providers, public agencies will still benefit from competitive bidding processes.

Bridj provides service in Kansas City through its own proprietary app. Users enter their desired origin and destination and then are assigned pick-up and drop-off locations, respectively, within a short (less than ten minutes) walking distance of each. While Bridj vehicles are likely to run similar routes throughout their service windows (from 6 to 10am and 3 to 7pm), the platform enables variations depending on riders' requests on any given day.

After agreeing to work together, KCATA and Bridj identified a desirable service area where they saw potential cost savings and latent transit demand. Under the pilot agreement, unionized KCATA employees drive 14-passenger vans that the agency leases from Ford Motor Company, which manufactures the vehicles locally. Fares for the new service are subsidized by KCATA to be the same as the local bus fare: $1.50 per ride.

KCATA combined Bridj's expertise on technology and service analysis with the agency's understanding of its own operations and local context. Using its own drivers and vehicles avoids raising issues about outsourcing bus operations and maintenance and keeps the agency closely involved with its core service-delivery mission. Leasing locally produced vehicles helps support the region's labor market. Bridj provides the technology platform for the new services—something that the agency would be challenged to develop internally—including the smartphone app and back-end data processing that enables such on-demand transit service in the first place.

12 Amy Zipkin, "Do-It-Yourself Transit Planning, by App," **New York Times**, July 20, 2016, http://www.nytimes.com/2016/07/21/us/do-it-yourself-transit-planning-by-app.html.

KCATA's contract avoided outsourcing concerns by using agency drivers and vehicles

Bridj hopes to see per-passenger-mile cost savings for the agency compared with existing KCATA service in the same corridors (we received no response to repeated requests for interviews with KCATA staff on the agreement with Bridj). From the perspective of both Bridj and Ford, this pilot agreement was a natural fit because the goals of all involved parties were closely aligned.

Ridership in the pilot program, however, has been modest. KCATA's president and CEO anticipates seeing 200 daily riders participating in the pilot program within its first six months, which would represent $300 in daily farebox revenue.[12]

This is Bridj's first direct contract with a transit agency, and if successful it could demonstrate the service's potential viability in other regions. Ford's Smart Mobility subsidiary is actively exploring what new roles the company can play in a changing American transportation landscape. KCATA is trying to meet its citizens' needs in a regional context where transit does not yet play a big role.

Takeaways

1. **Consider multiple emerging mobility providers, even when planning pilot projects.**
2. **Contract with private providers to fill needs that your agency otherwise finds hard to meet.**
3. **Pursue relationships that add technological capacity that the public sector does not already have.**
4. **Mix and match technological resources and personnel as appropriate, e.g., agency labor and vehicles alongside emerging mobility provider technology.**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Paratransit

Agencies across the country have identified opportunities to augment their operations through agreements with emerging mobility providers. One of the biggest perceived opportunities to work with TNCs and on-demand transit companies is in the provision of ambulatory paratransit services, which often incur especially high per-passenger-trip costs for agencies. Providing service for customers in wheelchairs, however, has not been strongly pursued by on-demand providers, in part because assisting customers in wheelchairs would require specialized vehicles and training that companies have typically been unwilling to provide, and in part because they are generally not subject to ADA regulations.

While many transit agencies have utilized taxi service to augment their paratransit programs,[13] some are hoping to also work with TNCs or on-demand transit providers. The Massachusetts Bay Transportation Authority (MBTA), operating in the Boston area, closed a request for proposals for an on-demand paratransit pilot program at the end of April 2016. The PSTA pilot program described above offers paratransit customers an on-demand option in the particular neighborhoods where the PSTA pilot program with Uber and United Taxi is also active. The Washington Metropolitan Area Transit Authority (WMATA) plans to release an RFP in Fall 2016 that could enable a TNC to provide ambulatory paratransit service in parts of its service territory, as an alternative to the agency's MetroAccess paratransit service. This comes in the wake of Washington, DC's Department of For Hire Vehicles launching the successful Transport DC program—which enabled paratransit customers to reserve taxis at least an hour in advance rather than typical paratransit vehicles at least 24 hours in advance. We should expect to see more pilot programs emerge as agencies around the country begin to pursue this substantial opportunity.

Private providers have varying approaches to filling this gap in paratransit service. Uber and Lyft are exploring phone reservation systems to complement their apps. Uber has launched a service called "Uber Assist," in which drivers meet customers at the door, rather than waiting in the car as they normally would.

This is a key area for further research. A TransitCenter-funded project on emerging, technology-enabled opportunities for paratransit, Intelligent Paratransit, is currently underway at the New York University Rudin Center for Transportation. An upcoming report from the Citizens Budget Commission, also supported by a TransitCenter grant, examines the history and fiscal state of MTA New York City Transit's paratransit service, Access-A-Ride, including the potential impact of working with emerging mobility providers like TNCs. The two reports will combine original research and expert opinions on how emerging mobility technologies can make paratransit work better in New York City.

13 Brian D. Taylor et al., **Between Public and Private Mobility: Examining the Rise of Technology-Enabled Transportation Services** (Washington, DC: Transportation Research Board, 2015), http://onlinepubs.trb.org/onlinepubs/sr/sr319.pdf.

Open data enables advocates and planners alike to study critical urban bike infrastructure needs

Open data to improve planning

Bikeshare systems, which generally have close relationships with (if they are not managed by) city government, have the most widespread practice of sharing trip data with the public sector. Bikeshare is typically publicly subsidized and does not have direct competitors once established in a given jurisdiction, so operators have diminished competitiveness concerns compared to those of TNCs, for example. Further, the collection and release of these open data has generally been planned from the beginning of the system's development (and often included in operating contracts) as a foundational component of an efficient bikeshare system, both from a user and operational standpoint.

The data shared by bikeshare providers generally include real-time bike and dock availability to facilitate basic use of the system. Many cities—including Chicago, Boston, Washington, DC, and New York City—and bikeshare providers make this and other data (including trip origin, destination, time, and duration) available to all. Citi Bike in NYC (owned and operated by Motivate) also releases data on riders' gender for each given trip, as well as what type of membership he or she has (akin to fare data, since fares are consistent according to membership and the duration of each ride). The North American Bikeshare Association, a bikeshare industry group composed of private bikeshare operators, suppliers, and cities, has facilitated this data-sharing process by creating a General Bikeshare Feed Specification (GBFS), a standard data format for bikeshare systems.

Bikeshare data have been analyzed not only by bikeshare operators and sponsoring cities, but also by the press, bike advocates, regional planners, transit agencies, and independent software developers and data scientists. Open data enables this diverse set of analyses to provide valuable insight into urban mobility needs. The data show, for example, corridors where improved bike infrastructure is most needed or where there may simply be unmet demand for public transportation.

Takeaways

1. **Take advantage of the introduction of a new system (e.g., bikeshare) to build/expand data infrastructure.**
2. **Consider the needs and potential uses for the data in advance to inform data-system design.**
3. **Make data available via an open application programming interface (API) to enable additional analyses from independent researchers.**
4. **Standardize open data outputs (e.g., using GBFS for bikeshare) to ensure your data can be easily accessed by third-party apps.**

Regulated data-sharing to improve planning

A number of cities have demonstrated the importance of trip data in understanding the role of TNCs in the transportation system and, thus, in making informed policy decisions. Analyses in New Orleans and Portland, for example, showed that TNCs expanded overall ridership across the for-hire vehicle industry and increased service in neighborhoods that had not been well served by taxis.

Public agencies have gotten access to data from TNCs in a number of jurisdictions—but primarily those with significant leverage in the form of their market size. According to Uber (as of April 2016), California, Chicago, Houston, New York City, New Orleans, Portland, San Antonio, and Seattle have each obtained data from Uber via regulatory requirements, for example. The company attempted to negotiate a narrower scope for regulatory data requests in 79 percent of cases and succeeded more than half the time.[14] Uber has also shared limited data with the City of Boston via a voluntary agreement, as we discuss in the next section.

Perhaps the best publicized use of taxi and TNC trip data has been in New York City, where an independent analysis found that fears that Uber's rapid expansion was causing increased traffic in lower Manhattan were not borne out by the data (the observed traffic slowdown itself was first documented using taxi GPS data).[15]

14 "Transparency Report," Uber Technologies Inc, last modified April 15, 2016, https://perma.cc/8VZR-MACQ.

15 City of New York, Office of the Mayor, For-Hire Vehicle Transportation Study (New York: City of New York, 2016), http://www1.nyc.gov/assets/operations/downloads/pdf/For-Hire-Vehicle-Transportation-Study.pdf.

Cities should not shy away from data-sharing mandates if they are applied uniformly across all players in an industry

In 2015, the New York City Taxi and Limousine Commission (TLC) started requiring industry-wide submission of detailed trip data, requiring Uber, Lyft, and their competitors to comply with data-reporting requirements that had already been in place for taxis. Today, trip origins—but not destinations—are available publicly (though only via Freedom of Information Law requests) for Uber and Lyft, while taxi trip origins and destinations are published regularly as open data by the TLC. Uber agreed to provide more detailed data—including trip destinations—to the city to inform the aforementioned study on TNC congestion effects in the city's central business district.

The TLC's rules apply to all for-hire vehicles, including yellow cabs, black cars, and car services, as well as TNCs. Having started to collect taxi trip data in 2007, the TLC and the New York City Department of Transportation had a definite understanding of what data they wanted and needed from TNCs as well as the analytical systems and skills to readily put the data to use. This also made clear that the data requirements were part of the TLC's normal business processes, not merely a reaction to a new market entrant.

Beyond augmenting their own planning and operations, the TLC and the city have seen additional benefits in the form of interesting analyses conducted by the local civic technology community and national media outlets like the data journalism website *FiveThirtyEight*. Cities should not shy away from data-sharing mandates if they are applied uniformly across all players in an industry.

Takeaways

1. **Collect the same data from all transportation providers providing the same type of service, e.g., taxis and TNCs.**
2. **Leverage pre-existing data analysis infrastructure to analyze data from new providers.**
3. **Do not take providers' claims at face value—if providers are making claims that affect government policy, ask for their data or trusted third-party analysis to evaluate those claims independently before moving forward.**

Emerging mobility data

The data generated, collected, and stored by emerging mobility providers contain a treasure trove of insight into travel behaviors and preferences that can be harnessed for the public good. This information is critical to understanding the scale of the role of private providers in today's transportation networks.

Public agencies need to think in terms of a path to gleaning insight into their transportation system, not just in terms of getting access to private-sector data. The public sector does not always have the technical and staff capacity to effectively analyze data from, say, TNCs to mine useful insights. Smaller agencies may instead benefit from third-party analysis—or in some cases there could be a useful role for regional or state governments to play.

Wherever there is capacity to analyze trip data, key data points seem to be trip origin and destination, time and duration, cost, and vehicle occupancy. Time spent searching for the next trip (non-revenue hours), vehicle miles traveled, information on vehicle wheelchair accessibility and usage, and type of vehicle (e.g., for emissions analysis) are also of interest for TNCs and other for-hire vehicles. Access to "breadcrumb data"—providing the specific GPS-based path traveled by vehicles during trips—would allow particularly data-savvy organizations to dive even deeper.

Private companies also collect more data than many agencies might realize. For example, Uber tracks phone accelerometer data that can detect bumps in the road during each rider's trip, creating the potential to map roadway quality in cities where the company operates. On the other hand, private companies may not have some data that city and transit agencies would be interested in—for example, data on the demographics of users will typically be challenging to come by since very few emerging mobility providers collect this information directly from their customers.

Emerging mobility firms generally view their trip data as proprietary and have several concerns about sharing the data. These include maintaining a competitive advantage, user privacy, the data's commercial value, and a desire to control their public image. They also want to make sure that data are used in appropriate ways, that disclosure not go beyond that which is needed for valid public purposes, and that agencies have the capacity and expertise to both safeguard and utilize the data effectively.

This does not change the simple fact that private transportation companies rely on publicly funded road infrastructure to support their businesses. It is reasonable, then, for public agencies to expect something in return, especially if it would lead to improved transportation planning.

Other transportation agencies do not have access to the data Uber provides to the City of Boston

Voluntary data-sharing to improve planning

Uber's voluntary data-sharing agreement with the City of Boston, signed in January 2015, has been less fruitful. At the time of its signing, it was widely touted as a model for other cities to follow, but in practice the agreement has not yielded data that are useful to the city and its data-sharing restrictions limit potential applications.

This case highlights the importance of clear vision and expertise during contract negotiations and suggests the limitations of voluntary agreements. Given that between July and December 2015 Uber tried to reduce reporting requirements for nearly 80 percent of regulated data-sharing requests, it seems likely that the company—and its competitors—will be reluctant to disclose useful data voluntarily.

The Boston-Uber data-sharing agreement was conceived in one of the mayor's taxi advisory committee meetings. City and Uber staff followed up by separately negotiating the agreement's specifics. Like New York, Boston had already required substantial data sharing on the part of taxi companies.

The final agreement commits Uber to sharing data with the city quarterly for all trips that begin and end within the City of Boston, aggregated to the zip-code level. This quarterly reporting is intended to provide Uber with time to clean and aggregate the data.

Since the signing of the agreement, it has become evident that the specific data provided by Uber and the city's analytical needs do not match. Many of the partnership's stated goals (memorialized in the contract itself—analysis to support Vision Zero, traffic planning, emergency/event response, zoning, and parking-policy development, among others) are clearly not supported by this zip code–level data. Data aggregated at a similar level could potentially be useful for broader transportation network planning, but regional agencies (including the MBTA and the Metropolitan Area Planning Council) bear most of that planning responsibility and have no access to the data Uber provides to the City of Boston.

The agreement also includes language forbidding the city from releasing Uber's data in response to Massachusetts Public Records Law requests and makes Uber liable for any legal issues arising as a result. These confidentiality provisions are so strong that the city has been wary of analyzing the data using internet-based (cloud) computing because of concerns that doing so could be a breach of contract.

Agencies undervalue their physical assets (like street space) and should bring those to the emerging mobility negotiating table

Boston has spoken with Uber about updating the agreement. In these conversations the city has worked to clarify the specific purposes for which it wants to use Uber's data and, as a result, which data would be necessary to meet those needs.

Analysis conducted by trusted third-party consultants or researchers offers another way to benefit from TNC data. The Natural Resources Defense Council and UC Berkeley are studying the environmental impact of TNCs in the Bay Area, for example, with funding from the San Francisco County Transportation Authority and the Hewlett Foundation.

Having access to TNC data is particularly valuable when considering regulatory and policy changes pertaining to the for-hire vehicle industry, but agencies should also consider pursuing additional data sources that can augment planning practices. Companies like AirSage, INRIX, StreetLight Data, and Teralytics have emerged to provide new insight into travel demand, and in many cases their data—gathered from cell phones and/or GPS units—will paint a more comprehensive picture of regional trip-making than TNC data would alone. Data from these sources can increasingly be acquired through transportation consulting firms with whom many agencies already have contracts, potentially facilitating the procurement process.

The City of Boston's agreement with Uber is instructive and highlights the limitations of voluntary data-sharing. Cities and transit agencies are more likely to gain access to valuable data either through regulation or in exchange for access to other public-sector assets, as discussed in the following section.

Takeaways

1. **Make sure you have clarity from analytical staff about what exactly they need and how they'll use it, and negotiate with that in mind.**
2. **Be mindful of legitimate privacy and competitiveness concerns and work with service providers to satisfy both those concerns and your data needs.**
3. **Hire a trusted third party to analyze data when extra capacity or an independent perspective is called for.**
4. **Coordinate your data requests with other agencies and jurisdictions that may also have interest in the data but could have different needs.**

Leverage Agency-Controlled Assets

American cities and transit agencies have two crucial things that emerging mobility providers need in order to operate: road space and money. Infrastructure and finance are key leverage points for the public sector to ensure that its citizens have access to the best mobility system possible. By using these assets to provide incentives that align with a clear regional transportation vision, public agencies will set themselves up for effective working relationships that benefit their constituents.

In several cases, press releases announcing partnerships with Uber or Lyft tout the companies' offers of free or discounted rides for new customers. But these companies already offer the same deal to new customers as a business development strategy. The fact that some public agencies' negotiations resulted in outcomes that would have happened anyway suggests that those agencies are undervaluing the assets they can bring to the table.

Rationally allocating (and pricing) public infrastructure

Parking policy was the first area in which transit agencies started to integrate emerging mobility providers. City and transit agencies own and operate a substantial inventory of parking assets, both on- and off-street, metered and free, and have relative control and leverage when negotiating with carshare (and, increasingly, bikeshare) operators. Agencies can offer parking assets that match the needs of bikeshare and carshare services, which require dispersed locations to store vehicles.

Parking space allocation for bikeshare and carshare is relatively straightforward. Access to a small percentage of total available spaces can often meet the whole-system needs of these service providers. Although competition for the use of even a single parking space can be controversial, emerging mobility options can provide substantial community benefits at a low cost. The Washington Metropolitan Area Transit Authority (WMATA) initially offered parking spaces to carshare providers for free because of this perceived benefit, and many agencies allocate parking space to bikeshare systems at no cost.

Agreements to provide access to public parking spaces have been solicited through memorandums of understanding, single-operator pilot projects, and competitive bidding processes. These agreements have been struck between various combinations of transit agency, city department of transportation, carshare company, and bikeshare

BART challenges carshare providers to demonstrate that parking spaces generate more than 11 transit trips per week

operator and can be structured monthly, annually, or on a multiyear basis. For example, WMATA issues an invitation every four years for competitive bids to award a single carshare operator parking spaces at 42 transit stations' kiss-and-ride areas. Program scope and size are shaped by demand for carshare or bikeshare as well as the availability of parking spaces (the current awardee received 170 spaces).

Fees charged for the use of each parking space are typically based on recovering foregone meter revenue. For example, a carshare provider might be charged a per-vehicle fee on the basis of metered parking's typical operating hours (accounting for hours per day and days per week). Some systems also adjust this cost to account for actual utilization rates, which carshare providers are often able to calculate at a more granular level. Other elements covered by the cost of the carshare permit fees include residential parking zone fees and the city's administrative expenses.

Several agencies have taken important steps to support equitable access to carshare and bikeshare services. WMATA requires carshare providers to allocate vehicles to parking spaces throughout its park-and-ride network rather than at just the highest-traffic stations, and it negotiates with those providers to determine a distribution that works for both parties. The Seattle Department of Transportation (SDOT)'s agreement with car2go does not cap the number of floating carshare vehicles but required the company to provide service across the entire geography of the City of Seattle within two years after launching in 2013. The agreement also incentivizes car2go to serve neighborhoods equitably by rebalancing vehicles to areas that might otherwise be underserved. SDOT then monitors how well the company achieves this.

These agreements can benefit carshare providers by enabling more geographic coverage, increased public visibility, and enhanced legitimacy by virtue of being associated with public agencies. In some cases, particularly for bikeshare and floating carshare, this type of agreement can be essential to the success of these enterprises. These parking agreements also provide cities and transit agencies with a variety of financial, informational, and transit system benefits.

Transit agencies have used these agreements to further fundamental agency goals. For example, Bay Area Rapid Transit (BART) leases parking spaces to fixed-location carshare operators in its park-and-ride areas in the hopes of increasing transportation options, but also with hopes of increasing the rate of transit trips enabled per

Established strategies for carshare and bikeshare can guide agency approaches to other emerging mobility providers

parking space. A transit agency with similar goals could use app-based or on-site validation at transit stations and downtown garages to offer free or reduced-cost parking to vehicles completing TNC-facilitated (or traditional) carpool trips with multiple passengers.

BART has informed carshare providers that if they wish to lease more parking spaces, they must first demonstrate that their existing parking spaces generate more than 11 transit trips per week, the average for non-carsharing parking spaces. Spaces are leased on a monthly basis to Zipcar and City CarShare (which has now merged with Carma) at 10 out of 33 park-and-ride stations. The number of carshare spaces has not grown in San Francisco since the inception of the program, as carshare providers have been unable to show this additional transit-trip generation.

Cities have also measured carshare vehicle turnover in metered spaces to determine whether more citizens are able to park along retail corridors and shop at local businesses. Parking-utilization studies in Seattle, for example, show that that floating carshare vehicles typically park for an average of 30 minutes in paid parking spaces in busy commercial districts—less time than the average for private vehicles. Results in other cities have been mixed, suggesting that context-specific evaluation is valuable.

Transit agencies also allocate space for bikeshare stations, which allows for easy multimodal transfers. BART has granted a blanket permit to San Francisco's bikeshare operator, Motivate, to site docking stations on transit station property for free, but the agency still reviews and approves each proposed site. In Portland, OR, TriMet has a straightforward intergovernmental agreement with the Portland Bureau of Transportation that permits bikeshare stations to be located on transit agency property.

Contracts can also include provisions for sharing data that support transportation planning and program evaluation, which can ease local political concerns. The District Department of Transportation of Washington, DC, receives a database containing every carshare trip's starting and ending location. The Seattle Department of Transportation (SDOT) requires carshare operators to conduct an annual survey of their members that is designed by SDOT under a separate partnership with university researchers. This customer trip data informs SDOT's required annual carshare reporting to the city council.

As the most mature of the emerging mobility market segments, carshare and bikeshare offer valuable examples of constructive working agreements with city and transit agencies. More so than TNCs or on-demand transit companies, these modes are dependent on the allocation of public infrastructure. The same principles that guide these agreements can inform public agencies' approaches to working with all emerging mobility providers moving forward.

Takeaways

1. **Structure provider agreements to incentivize broad agency goals (like equity and sustainability) by clearly articulating those goals, using relevant metrics to evaluate performance, and ensuring that those evaluations will inform possible future expansion.**
2. **Negotiate agreements to ensure equitable service provision.**
3. **Form agreements with private providers or other government agencies that reduce administrative burdens in the long term, e.g., contracts that do not need to be renegotiated to facilitate expansion.**
4. **Leverage agreements to get existing data/generate new data that support planning and program evaluation.**

Equity and emerging mobility

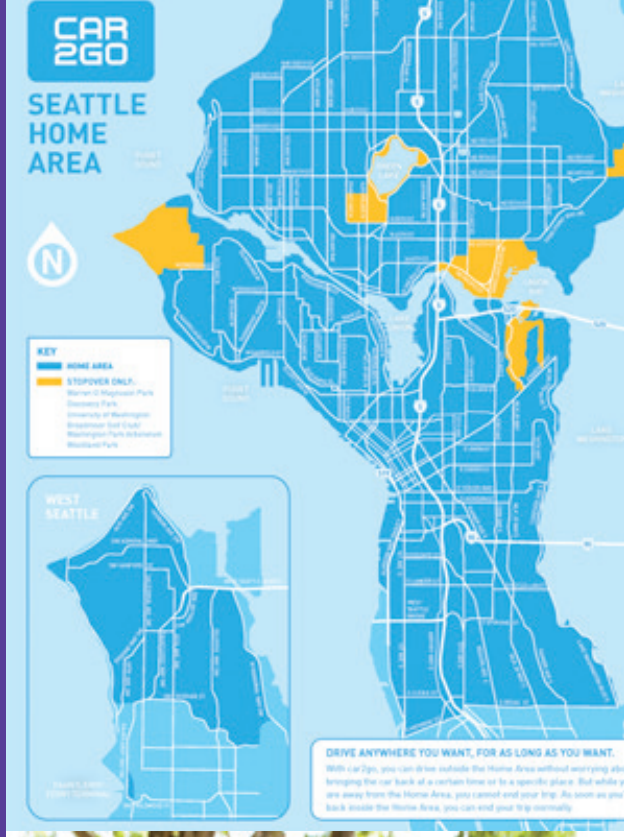
The obligation of public agencies to ensure equitable policies is often in tension with private-sector profit-seeking goals. This creates particular challenges in the context of Title VI of the Civil Rights Act, which prohibits discrimination in federally funded programs.

The Institute for Transportation and Development Policy report **Connecting Low-Income People to Opportunity with Shared Mobility** outlines a few key equity issues when it comes to emerging mobility providers. The report identifies three major categories of equity need:

- Overcoming financial challenges, like serving low-income and/or unbanked populations
- Overcoming structural challenges, like ensuring geographic coverage, ADA accessibility, and smartphone/internet access
- Overcoming informational or cultural challenges, like making communities familiar with emerging mobility options and how to use them

There is a growing list of best practices, including the WMATA and SDOT carshare examples above (Philadelphia's Indego is widely praised as a model for bikeshare system equity, and its and others' best practices are promoted through the Better Bike Share Partnership with the support of The JPB Foundation). TNCs and on-demand transit providers are developing new approaches to addressing these challenges, but they are exploring relatively unknown territory.

The potential equity benefits of emerging mobility services could come from unexpected places. One interesting possibility is that in some cases high per-user (but low total cost) subsidies—even in relatively wealthy communities—could end up yielding equity benefits if they save agencies money that can then be reallocated to improving service in disadvantaged communities.



Emerging mobility providers should be subsidized to meet agency goals when they can do the job more efficiently

Blanket financial subsidy

In addition to using physical assets (e.g., parking spots), public agencies can also use their financial assets to provide consumers with discounts or vouchers to subsidize the use of emerging mobility services. Since transit agencies rarely cover operating or capital costs solely through fare revenues, bus, subway, and train trips are already significantly subsidized. If the motivation behind transit subsidies is to provide low-cost, efficient, and sustainable transportation options, then there's no reason other transportation services should not be subsidized to achieve the same goals if they can meet them more efficiently. City governments already commonly subsidize bikeshare systems (with one prominent exception in the case of New York City's Citi Bike system), but cities and transit agencies are just beginning to explore subsidies for TNCs and on-demand transit companies.

Some of these subsidies resemble transportation demand management. For example, city governments, agencies, and even Lyft and Uber themselves have offered TNC subsidies to riders during emergencies, on New Year's Eve, for major sporting events, or during planned or unplanned transit service disruptions. To date, these augmented service offers have primarily been undertaken either via informal (noncontractual) partnership or, in some cases, completely independently of conversations with public-sector officials. Taking subsidies a step further, Metro Transit in the Minneapolis/St. Paul region will reimburse participants in its Guaranteed Ride Home program for as much as $100 annually for up to four taxi, carshare, car rental, Lyft, or Uber trips that meet its program criteria.

One TNC subsidy pilot program stands alone, however, in its scope and ambition. As part of a one-year pilot program launched in March 2016, the City of Altamonte Springs, FL, is offering a 20 percent subsidy on Uber trips taking place entirely within the city limits. The city offers a 25 percent subsidy on trips that also start or end at a SunRail commuter rail station, which provides a connection to nearby Orlando.[16]

The subsidy is directly accessible to citizens via the Uber app, in which riders must enter a promotional code, select the "Altamonte" option, and enter their origin and destination to request a trip. Riders' eligibility is then verified using smartphone GPS data before they receive the subsidized price.

16 "Uber," Altamonte Springs, FL, accessed July 12, 2016, https://perma.cc/8JAF-983N.


Altamonte Springs Station
SOUTHBOUND TO MAITLAND STATION


UBER
UBER
YUKON

With this subsidy, the city hopes to change its residents' behavior by providing easier access to transit and reducing single-occupancy vehicle trips. This is part of the city's wide-ranging vision for the future of mobility in Central Florida, a future in which the city sees residents relying on on-demand services locally and the commuter rail system regionally.

Starting in the late 1990s and up until 2015, the city pursued an on-demand FlexBus pilot program that garnered substantial interest and was granted state and federal funding—but the project never materialized. The proposed pilot would have included many features that we have instead come to associate with Uber and Lyft: smaller vehicles, real-time trip information, tap-card payment, and a simple reservation process accessible to anyone (either via a web browser or a distributed network of kiosks).

When the door ultimately closed on the FlexBus project in 2015, the City of Altamonte Springs decided to pursue its vision independently of its regional transit authority, LYNX, with whom the city was frustrated in the wake of FlexBus' failure to get off the ground. The city reached out to Uber, the only TNC operating in the area at the time, to discuss how the company could help the city to achieve its goals. These goals included improving livability and accessibility for the city's residents, providing additional mobility to visiting guests, and boosting commuter rail (SunRail) ridership, which the city views as important to Central Florida's success.

With such broad goals (and a lack of public data), it is still too early to assess the program's impact. The magnitude of the program's potential impact is also unclear. Altamonte Springs is denser than neighboring Orlando on average, yet still only 0.2 percent of residents commute by transit. This hints at land-use patterns that are challenging to serve with transit or a lack of local transit coverage—or a combination of both. Either reality would make it difficult for any transit mode, including both TNCs and commuter rail, to reduce single-occupancy vehicle trips in an auto-oriented community.

Altamonte Springs has designed a transportation experiment that aligns with its transportation vision and its identity as a public-sector innovator. The city, frustrated by its regional transit authority, is taking the lead in providing transportation options to its citizens and has clearly articulated its goals as a foundation for its agreement with Uber. City leaders will soon be able to see, at long last, to what degree

Altamonte Springs residents change their behavior in light of having on-demand transportation more readily at their fingertips. Moving forward, they will need to carefully evaluate the efficiency of this user subsidy compared to alternatives (including additional fixed-route transit) and review the potential constraints of their existing land-use patterns.

Takeaways

1. **Set clear goals as a basis for working with emerging mobility providers and then use them to evaluate provider agreements.**
2. **Cities (especially smaller municipalities) can use subsidies to augment transit service provided by a regional agency.**

Plan For a Streamlined User Experience

The public and private sectors alike have identified seamless, multimodal trip planning, including transit, biking, walking, and emerging mobility services, as an important opportunity. TransitCenter's latest national public-opinion research study, *Who's on Board 2016* (for which we surveyed 3,000 transit riders in 17 US metropolitan areas), highlighted the significant value of real-time information to transit riders. In fact, the only transit characteristics that customers clearly consider more important were greater trip frequency, shorter trip times, and cheaper fares. Users of a growing list of apps can see the potential cost- and time-saving benefits of linking trips across modes, and transit agencies recognize that riders often need better first- and last-mile options to get to and from transit stops—though as *Who's on Board 2016* also highlights, the most effective first- and last-mile solution is walking.[17]

The value of real-time information is foundational to the success of emerging mobility providers: bikeshare users need to know whether bikes or docks are available, Lyft customers want to know how long it will be until they'll be picked up, and you cannot use a car2go if you do not know where to find one. Customers have come to expect this information to be at their fingertips, but it is often spread across many separate apps or websites. Trip-planning apps have the potential to integrate information from all these services under one umbrella.

These trip-planning apps can be built using public- or private-sector funding, but both rely on high-quality data provided by transit agencies and emerging mobility providers. As of now, the most successful among these apps have been developed by the private sector, regardless of their funding sources. Third-party software development firms have larger, dedicated teams who are able to work nimbly, continuously push updates to their apps, and gather user-experience data in dozens of markets simultaneously—a level of intensive, focused effort difficult to achieve in public agencies.

The public sector has an important role to play in streamlining the user experience, but that role will likely look different in each regional context. Agencies must, for example, ensure equal transportation access to riders without bank accounts and across cities' distinct demographic landscapes.

Agencies can achieve a streamlined user experience by following several different paths, though these paths share some key features. Public agencies can (but should not in most cases) choose to build their own apps in-house, commission apps from the private sector,

17 Steven Higashide, Who's on Board 2016: What Today's Riders Teach Us About Transit That Works (New York: TransitCenter, 2016), http://transitcenter.org/wp-content/uploads/2016/07/TransitCenter-WOB-2016.pdf.

Open data and technology standards facilitate trip-planning and fare payment integration across providers and jurisdictional boundaries

produce open data and leave trip-planning to the private sector entirely, or do something in between. Any trip-planning approach will rely on high-quality open data from agencies, and will only thrive when implemented in conjunction with open data and technology standards that can ultimately facilitate both trip-planning and fare integration across providers and jurisdictional boundaries.

Open data–enabled apps

Trip-planning apps have become increasingly sophisticated, taking into account not just origin, destination, and the date and time of the trip, but also optimizing routes to avoid traffic or account for user preferences like minimizing transfers or walking distance, avoiding rain, or even avoiding dangerous roads and intersections. Some apps can also provide cost estimates, and many agency trip-planning services help users find ADA accessible routes.

These apps come in a few different forms. Private companies like Transit App, Citymapper, and Moovel (formerly RideScout) build their trip-planning software independently of transit agencies by integrating publicly available schedule and real-time data sources into their platforms. TransLoc—which we discuss further in the next section—contracts directly with transit agencies to build custom apps and analytics platforms tailored to each agency's needs. Finally, Xerox has built apps for the Cities of Los Angeles and Denver (branded as "Go LA" and "Go Denver").

Collectively, these apps represent the state of the art in trip planning. Citymapper, Moovel, Xerox, and TransLoc have each built the capacity to recommend trips that include more than one mode (e.g., bikeshare and bus, or Uber and light rail). Xerox's platform is currently unique in allowing users to compare modes not only according to time, cost, and calories burned, but also according to estimated environmental impact. Their Go LA and Go Denver apps also allow users to customize which modes they would like to be presented with as options when planning a trip.

As it stands now, customers can use these centralized trip-planning apps to help choose how to get from A to B but then generally must figure out how to pay for each mode individually. This is beginning to change, and each of these third-party app providers is working

Public agencies can better use their scarce resources to publish open data rather than developing trip-planning apps in-house

towards a unified fare-payment interface that would allow users to pay for transportation directly within the app.

This constellation of apps goes far beyond what's currently offered by Google or Apple, let alone any app we have seen that was built by a public agency. Even large agencies that can afford to pay for a fully customized app will struggle to compete with companies that have large, full-time teams devoted to building trip-planning apps over the course of many years and in dozens of cities.

Generally, public agencies (especially transit agencies) can better use scarce resources to build and maintain high-quality open data sets while working to facilitate fare payment beyond paper tickets and plastic fare cards. When agencies do want to build and maintain their own apps, however, it is a valuable opportunity to make the source code open to all and/or to work with other agencies directly to share knowledge and make it easier for others to share as well. Boston's MBTA is pursuing an alternative approach: having app providers compete for an official endorsement, marketing, and additional data provided by the agency in exchange for app user data and additional feature integrations supplied by the provider during the contract term.

The MBTA's plan avoids one important limitation of simply publishing open data for third-party providers to use: namely, that if agencies do not own the planning app, then they may not have access to the valuable data on travel behavior collected by app providers. One staff member we spoke with from another transit agency even cited the ability to collect user data as a major driver for that agency deciding to commission its own trip-planning app.

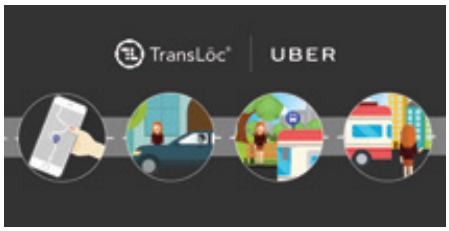
From what we have heard, however, agencies have also not been proactive about seeking access to user data or even starting conversations with private app developers about what level of data sharing might be possible. In cases where providers are hesitant to fully share data, there are other ways of accessing key data insights—like working with third-party researchers or consultants—that can add value for both public and private stakeholders.

Takeaways

1. **Build and maintain high-quality open data sets and make them easy for the public to access.**
2. **Pursue access to data from third-party trip-planning apps—through incentives, formal agreements, or independent third parties—to gain insights into rider travel patterns and choices.**

Agency-driven apps

Other private businesses do not share the same regulatory hurdles that transit agencies face when trying to contract with emerging mobility providers. In some cases, transit agencies have been able to take advantage of this difference to provide a more streamlined user experience to their riders by contracting with trip-planning companies to create apps for their systems. Transit agencies in Memphis (MATA) and Raleigh-Durham (GoTriangle) have taken this approach by entering into contracts with their existing trip-planning provider, TransLoc, who in turn developed a agreement with Uber.[18]



Unlike the other trip-planning providers mentioned, who have direct relationships with customers, TransLoc contracts with transit agencies to provide them with trip-planning software. As a paid consultant, TransLoc also markets customized data analytics to the agencies with whom it works. TransLoc's agreement with Uber has enabled TransLoc to add functionality that provides users with directions using both transit service and Uber on a single trip. The company receives a small monetary payment from Uber when TransLoc app users book Uber trips for the first time.

The potential for multimodal trip-planning integration is not yet fully realized. Users usually must have separate accounts and keep track of various fare-payment systems as they move from one transportation mode to another. TransLoc's Uber integration advanced the state of practice by enabling users to make reservations and pay for their trip without leaving the TransLoc trip-planner. TransLoc and Uber are working to further streamline this process, with a longer-term vision to make it possible for riders to plan their transit trips and reserve an Uber ride that will meet them, for example, at their bus stop, ready to shuttle them the last mile to their final destination.

This partnership leveraged existing contractual relationships between TransLoc and the transit agencies in Memphis and Raleigh. The agencies did not have to do anything different operationally, nor did they have to procure new services. TransLoc, like other trip-planning app developers, plans to incorporate more transportation providers into its multimodal trip-planning app, and the transit agencies with whom they work stand to benefit.

This last point is worth emphasizing, as the public benefit of trip-planning apps can erode when one provider (in this case, Uber)

18 **TransLoc Uber Partnership,** TransLoc, accessed July 18, 2016, https://perma.cc/TF26-HPFC.

MATA and GoTriangle did not need to make operational changes or procure any new services to benefit from TransLoc's relationship with Uber

is able to monopolize access to app users, potentially exposing users to higher prices and a risk of service disruption if that provider leaves the market. Transit and city agencies have an important role to play in avoiding provider exclusivity in competitive market segments (not in the case of natural monopolies, like bikeshare), especially in the context of government-endorsed planning and payment apps.

For example, Uber revoked Xerox's access to its application programming interface (API) days after the launch of the Go LA app, which initially allowed users to toggle between Uber and Lyft as options within the same app. Uber considered this to be a violation of the exclusivity clause in their API terms of use. Now Lyft remains the lone TNC option in Xerox's trip-planning apps. Other private trip-planning apps (Transit App and Citymapper, among others) currently feature Uber as the only TNC provider.

Users benefit from being able to easily compare options and make informed choices about how to get around. Several approaches will enable more robust trip-planning options for the public, and agencies should weigh the different options on the basis of their functionality, cost, the level of competition in their region's trip-planning app market, and their alignment with agencies' technical capacities. Whatever approach agencies take, high-quality, standardized, and open transit data feeds will make it easier for customers to rely on transit, no matter which app they use.

Takeaways

1. **Use existing contracts to test new programs with minimal procurement burden.**
2. **Work toward integrating multimodal trip-planning and fare payment.**
3. **Avoid giving specific providers exclusive coverage in trip-planning apps, in order to promote industry competition.**
4. **Consider trip-planning software and app options on the basis of their functionality, cost, the level of competition in your region's trip-planning app market, and alignment with your agency's technical capacity.**

Open data and technology standards allow agencies to stop relying on costly proprietary systems

Integrating fare-payment systems

A transit provider's fare-payment system is a critical interface for integrating fixed-route transit and emerging mobility services. Beyond simplifying the customer experience, integrated fare-payment systems enable more comprehensive data collection and, thus, improved service operations and planning. Integration comes in two forms. The first is fare *technology* integration, or enabling the same fare card, cell phone, or user account to be used for multiple transportation services; the second is fare *policy* integration, in which fares are aligned across modes, sometimes including free or discounted transfers between services. We are starting to see the former in cities across the country, while the latter idea is in its infancy.

Complex fare-payment systems inhibit increasing transit ridership. With a growing menu of options, today's rider is less interested in learning how to pay for each additional service or figuring out how much each trip will cost and more interested in just tapping a fare card or scanning his or her cell phone, perhaps after doing a quick trip time and cost comparison.

Transit agencies also have much to gain through fare integration, financially and operationally. Agencies will avoid unnecessary expense down the road by using open technology and data standards, which will allow them to stop relying on costly, proprietary systems. Open technology and data standards also allow for simpler integration with a diverse array of software platforms—increasingly necessary in our diverse transportation marketplace.

A few US transit agencies have moved to or are considering systems using credit cards and smartphones, but neither are yet widespread. Emerging mobility providers have pushed ahead, with Lyft and Uber's simple account-based systems now serving as the prototypical cases of fare-payment simplicity. Differing rate structures (single-use, daily, weekly, monthly, and annual, as well as transfer credits, potentially) complicate integration across modes. Some bikeshare and carshare services use keycards or keychain fobs, while transit agencies use paper tickets, magnetic stripe cards, hard plastic fare cards, or even mobile ticketing.

Fare integration is currently underway in US cities where a single agency oversees multiple modes. LA Metro's subway, bus, and soon its bikeshare system can be accessed through its TAP fare card, an

integration enabled by the fact that LA Metro operates all of those services and controls the fare-payment system. Because of its broad authority, LA Metro allows customers to use their TAP fare cards to pay for some regional and local services, such as commuter express buses, the LA Department of Transportation's DASH circulator bus service, and the Santa Monica and Beverly Hills bikeshare systems.

In some cases, private service providers have adapted their systems to accept a public agency's payment system. Hourcar, a carshare provider in Minneapolis, engaged in a pilot program with Minneapolis's Metro Transit that enables riders to use the regional transit fare card to access Hourcar vehicles parked throughout the city. Hourcar adapted its software so that its members can use a Metro Transit fare card in place of the company's regular keycard, requiring no software changes or operational input on Metro Transit's end.

Under the recently announced partnership between Transit App—a trip-planning app company based in Montreal—and Chicago's Divvy bikeshare, riders can register for the bikeshare system, pay for their memberships, and unlock bicycles without leaving Transit App. This builds on similar Transit App partnerships in Chattanooga, Columbus, and Aspen, and we are sure to see more of this soon, as private trip-planning app companies see a major business opportunity in facilitating this type of integration for their users.

Intermodal fare integration is in its early stages in the US, but agencies across the nation recognize its value and are beginning to consider ways of easing transfers across modes. Integrated trip-planning platforms and open data and technology standards will facilitate this and enable agencies to apply increasingly sophisticated transportation demand management strategies.

Takeaways

1. **Use the introduction of a new mode as an opportunity to standardize fare-payment systems and plan for integration.**
2. **Include as many regional mobility systems as possible (public and private) to make transfers seamless.**
3. **Build the technical capacity to support simple fare-payment integration by using open technology and data standards.**

Be Open to New Ways of Providing Useful Transit

How does an emerging mobility provider know where to start in reaching out to a public agency?

High-quality transit—that which connects places people need to go, runs frequently and reliably, enables short travel time, and is affordable and safe—is not threatened by emerging mobility providers. But not all transit meets these criteria, and bikeshare systems, carshare companies, TNCs, and on-demand transit companies play an increasingly important role in our urban mobility networks. City and transit agencies need to be thinking about their roles in this broadening context because they are likely to be affected by these private companies both operationally and politically.

Even if public agencies across the country recognized the potential benefits of emerging mobility partnerships, the untested nature and novelty of these partnerships create barriers to further experimentation and learning. For example, as an emerging mobility company, how do you know where or with whom to start if you're interested in working with a transit or city agency? What if your company and its services do not fit neatly into agencies' preexisting boxes—boxes built for an industry whose common policies and practices were established long before your company existed (or could have existed)?

To counteract this reality, agencies need to proactively break down barriers to collaboration by creating clear pathways to partnership. All the case studies we have touched on embody this strategy because they demonstrate a willingness to experiment with new ideas. Still, most of these cases are one-off pilot projects. A handful of policy initiatives highlight the potential for institutionalizing the embrace of today's diverse mobility options at the transit agency, state, and federal levels.

Creating a pipeline for new ideas

LA Metro's open, unsolicited proposal policy provides a useful example. LA Metro CEO Phil Washington brought the policy from Denver's Regional Transportation District (RTD), where he was previously CEO. At RTD, the policy was intended to attract proposals from private contractors to improve physical infrastructure. At LA Metro he and Joshua Schank, the agency's chief innovation officer, expanded the program to include emerging mobility providers, creating a single point of contact and a standardized process for providers to propose new service ideas.

Agencies should

- Publish high-quality open data
- Use open data & technology standards
- Capture customer mobility behavior data

So that customers can

- Choose between many transportation options on the basis of real-time availability estimated travel time and cost
- Pay simply using an account tied to their fare card, smartphone, credit card, or other fare media

LA Metro's unsolicited procurement policy broadcasts that the agency is open to good ideas from anywhere.

The policy's key innovation is simply to broadcast that LA Metro is open to ideas from and agreements with any type of firm or organization—not just the usual suspects. The process is broken up into two phases. First, interested providers submit a conceptual proposal that the Office of Extraordinary Innovation evaluates and responds to within 60 days. Second, LA Metro will work with providers to craft a detailed proposal that furthers the agency's mission and does not financially displace other budgetary priorities. LA Metro also reserves the right to open any given proposal up to competition or, with the CEO's approval, move forward with a sole-source contract.

LA Metro has clearly articulated its goals, how quickly it will respond to proposals, and the proposal evaluation criteria, compelling applicants to align their ideas with the agency's vision and internal procurement requirements. In the early months of the policy's adoption, between February and April 2016, LA Metro was already receiving one or two proposals on average from service providers each week.

Takeaways

1. **Create a clear pathway to partnership by making it easy for private-sector actors to engage with your agency.**

Hiring from outside the public sector

When it comes to planning for emerging mobility services, some of the most advanced agencies have made progress in part because they have diversified the talent pool from which they draw new staff. A larger mobility technology ecosystem is good news for transit agencies as long as they are able to compete in the labor marketplace for people with increasingly advanced data-analysis skills. The industry will benefit from competition among emerging mobility providers and the public sector for the industry's top talent.

Takeaways

1. **Pursue talented personnel who have worked in the private sector, including those who have worked for emerging mobility providers.**

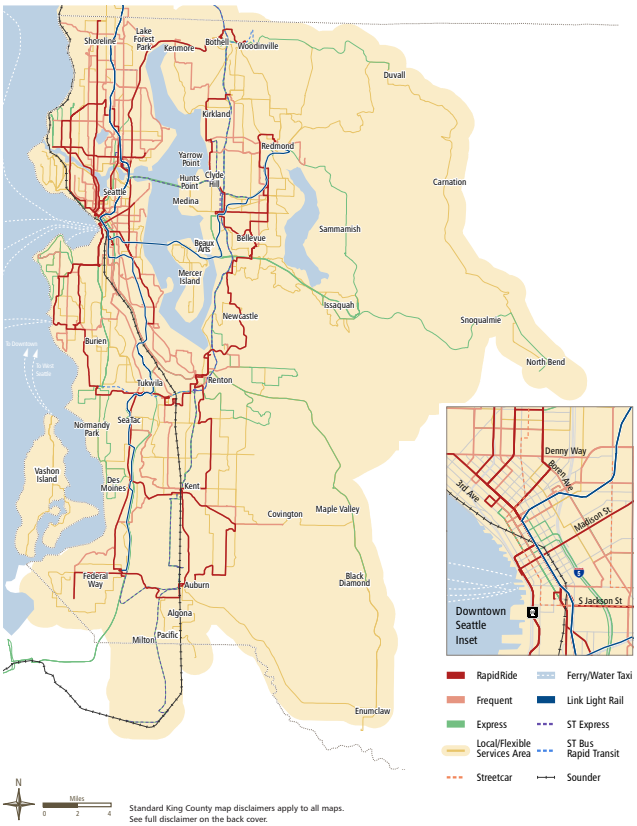
Offering options to local jurisdictions

King County Metro Transit's twenty-five-year transit plan, Metro Connects, outlines the roles TNCs, on-demand transit, and bikeshare will have in their transit network. They identify them as "alternative services," and the plan makes them interchangeable with "local service," or infrequent bus routes that provide geographic coverage. In doing so, King County Metro acknowledges that new modes may be more efficient in some cases and that these services are worth subsidizing. The Metro Connects plan enables the agency to work with municipalities to determine the best service fits for their mobility needs, and then to implement them.

Takeaways

1. **Create policies and practices that allow for more flexible, context-appropriate mobility service provision.**

Fig. 19: METRO CONNECTS 2025 Network



Moving from modes to outcomes

Institutionalized support for new partnerships can come in other forms. The Virginia Department of Transportation (VDOT) now scores all transportation projects eligible for state funding according to the same evaluation criteria, in line with the requirements of the state legislature–passed House Bill 2, now dubbed SMART SCALE. The highest-scoring projects receive priority for state funding. Evaluation categories include safety, congestion mitigation, environmental quality, accessibility, economic development, and land use.

VDOT's first round of applications did not include any partnerships similar to those discussed in this report, but some could be eligible, likely under the banner of transportation demand management. Virginia's outcomes-oriented evaluation system moves the focus of the conversation from specific modes to finding ways to meet the agency's core goals. The transparency of the specific evaluation criteria also puts would-be applicants on equal footing and in this case also requires that the applicants themselves be public agencies—meaning that interested private providers would first need to partner with local or regional governments before submitting proposals.

Takeaways

1. **Set clearly articulated, transparent, and mode-agnostic goals and ensure that your proposal and project evaluation criteria mirror them.**

Shifting national incentives

Federal policy barriers to partnership between emerging mobility providers and local, regional, and state agencies can seem intractable, but the Federal Transit Administration (FTA) has provided clear indications that it is working to change that. In the face of increased transportation options across the country, the FTA has recognized the need for new regulatory guidance to ease the integration of emerging mobility services into existing transportation networks. The US Department of Transportation (DOT)'s Smart City Challenge and the FTA's Mobility on Demand program, in which funding applicants are required to partner with private transportation companies, are two examples that show that the federal government is trying to understand its role in the evolving mobility ecosystem.

DOT staff will be carefully monitoring these partnerships and trying to understand how they can support mobility needs in American communities. State and local agencies will do well to share what they have learned publicly, directly with their peers, and also with the federal government so that it can inform policies at all levels of governance.

Takeaways

1. **Share what you have learned from experiments with emerging mobility providers with peers and representatives from other levels of government.**

VDOT's SMART SCALE evaluation system is focused on achieving the agency's core goals, not supporting a particular mode

Lessons Learned

Where do we go from here? Cities' mobility systems are changing, and it seems like new pilot projects are being announced every week. Public agencies are responding to the recent expansion of transportation options in a variety of ways, with some emphasizing the opportunities for cooperation and others asking why Uber cannot just replace transit altogether. One thing is clear: the combination of these new services' genuine strengths and the extraordinary hype that surrounds TNCs in particular will create major challenges for today's transit agencies and city governments responsible for ensuring that their citizens' mobility needs are met.

Transit agencies and cities have made the most progress using emerging mobility services to strengthen their transportation networks when they leverage their assets to create a clear mutual benefit for themselves and private providers. The case studies described in this report demonstrate agencies' interest in and experimentation with emerging mobility services as an extension of existing transportation networks, but the promise of public benefit will only be realized if public agencies claim a leadership role in this dynamic industry.[19]

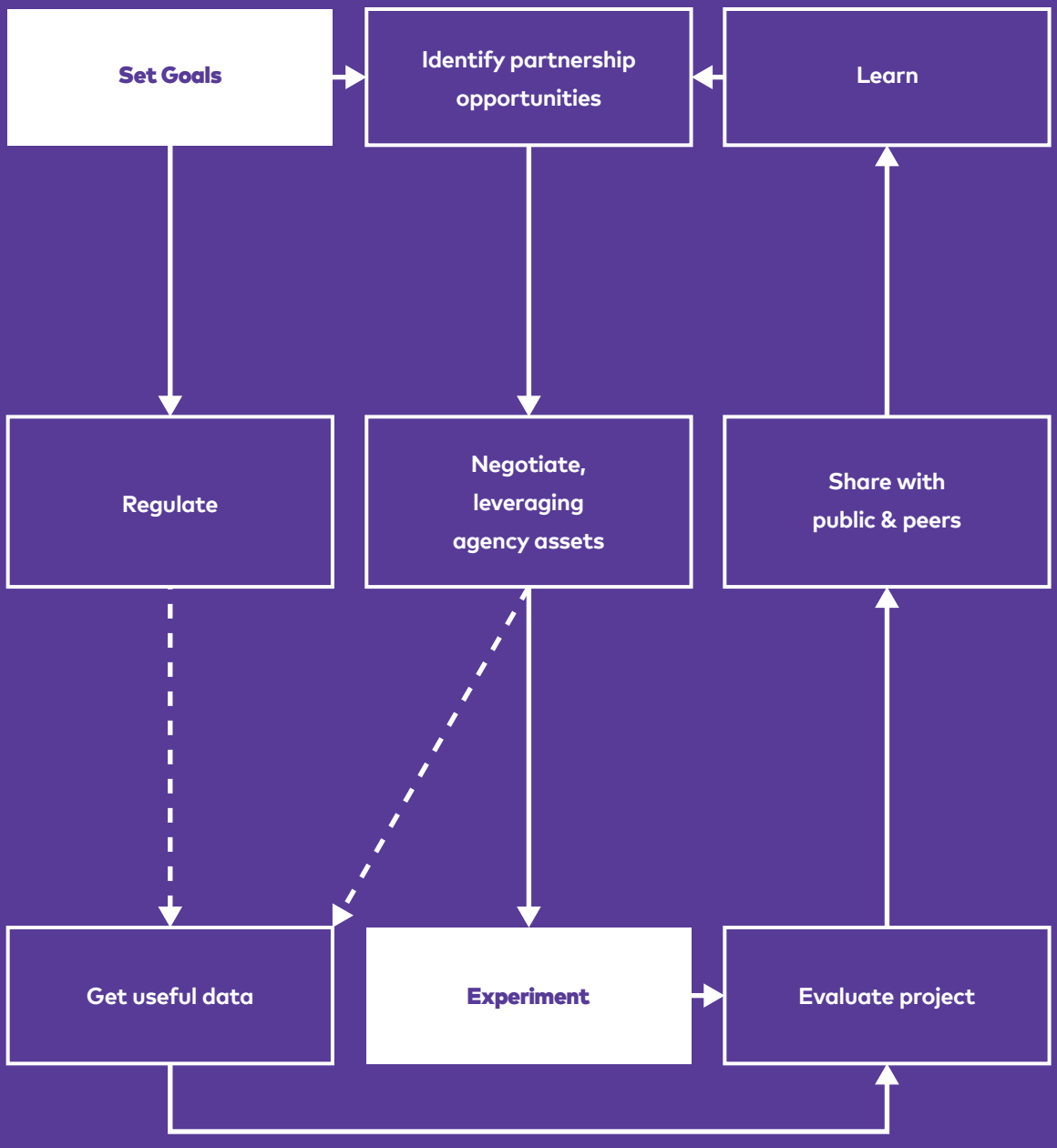
Agencies will not be able to move the industry forward by simply treading the same path of existing success stories. While bikeshare and carshare agreements provide several models worth replicating, there remains too much uncertainty around TNCs and other on-demand transportation services to know what success there really looks like. We are still in the early stages of a new mobility era, and there is too much untapped potential to improve mobility and accessibility in our cities—and too much risk of falling behind—for the public sector to rest on its laurels.

Thus, it is important to assess obstacles and opportunities in areas that have not seen as much progress. Obstacles may involve agency commitment and leadership, technical skills and expertise, funding or spending constraints, political pressures, or a combination of these.

These obstacles loom particularly large when public benefit is speculative, as is frequently the case when dealing with new business models and technologies. Approaching partnerships with curiosity and an attitude of "How can this benefit the public?" will lead to better results than an uninterested response of "I don't know how this will

19 For a more in-depth exploration of transportation leadership, see: Shin-pei Tsay et al., **A People's History of Recent Urban Transportation Innovation** (New York: TransitCenter, 2015), http://transitcenter.org/wp-content/uploads/2015/08/A-Peoples-History-of-Recent-Urban-Transportation-Innovation-Report-Pages.pdf.

Framework for agencies to apply strategies & lessons learned



FTA has recognized the need for new regulatory guidance to ease the integration of emerging mobility services

benefit the public." And as always, it's critical that agencies have a vision for what can be accomplished, a strategy to show benefits in a timely fashion, and commitment to build on demonstrated successes.

We will close by first summarizing what we know so far ("Lessons Learned") and then discussing areas where more progress is particularly needed ("Paths Forward"). The lessons learned are drawn from the complete list of takeaways highlighted throughout the "Emerging Practice" case studies. Paths forward include diversifying public subsidies, allocating street infrastructure to emerging mobility services, integrating fare-payment systems, providing access to data, and experimenting with on-demand transportation services.

Today, we have just begun to see how public agencies can link transit and the management of urban streets with emerging mobility providers in order to serve the public interest. Nonetheless, public agencies already have much to learn from the diverse experiences of transit agency and municipal partnerships with these emerging mobility providers. To build on this experience and toward a multimodal transportation system that meets Americans' mobility needs:

Be proactive and experiment to figure out what works

Public agencies benefit when they actively pursue relationships with emerging mobility providers based on their particular circumstances and shrewdly-calculated mutual benefit. Compared to large metropolitan areas, small, low-density cities face different issues and have less staff capacity to analyze data from emerging mobility providers. Just as these providers thrive through trial and error, so too must agencies experiment to identify mobility service models that support their communities' needs.

This experimental approach is on display throughout the case studies in the report, from KCATA and Bridj to Altamonte Springs and Uber to BART and carshare providers. Moving forward, experimentation will be especially important for agencies interested in subsidizing emerging mobility service users. Being open to working with emerging mobility providers in the first place—like LA Metro with its open, unsolicited procurement policy—is a necessary precondition to creating an environment that supports this experimentation.

Successful public agencies have identified clear mutual benefit for themselves and emerging mobility providers

Define what you want, then measure it

Public agencies should articulate clear goals—whether they represent a broad mission or specific operational needs—and seek out services that meet their needs. KCATA's approach to integrating Bridj was collaborative in the sense that both parties examined the community's transit needs and then matched their respective strengths in operations and technology to meet those needs. KCATA will be able to evaluate the pilot project's success (by measuring its cost per passenger-trip, for example) and learn from the experience. BART determined how many transit trips it wanted its carshare-allocated parking spaces to generate and has used that benchmark to decide if it should reserve additional spaces for carshare companies.

Foster an open environment

The best transportation systems have multiple options tailored to meet a diversity of travel needs. Working with the private sector to provide these services is attractive in part because substantial competition in the private mobility marketplace drives improved service for riders. Agencies that do not capitalize on this dynamic by enabling open participation by and/or competition among multiple providers will be foregoing one of the emerging mobility sector's primary value propositions.

Additionally, as the bikeshare industry has demonstrated, open data sharing can unlock substantial additional benefits, and open technology and data standards will create valuable operational and policy flexibility for transit agencies. Open data also reinforces transparency and experimentation in a way that can benefit public agencies and emerging mobility providers alike.

Though there will be cases where data cannot be fully transparent in light of privacy concerns, agencies should pursue openness whenever feasible, and planning processes should be transparent. Collecting data on the use of emerging mobility services is essential to charting the growth of new and existing services, measuring their effects on transportation systems and the environment, and prioritizing next steps in allocating resources to support these services.

Make trip-planning and fare payment multimodal and regional

Creating a simple user experience is easier said than done given the current fragmentation of the mobility industry, but it is an important ideal to pursue. This simplicity must extend not just to already-savvy app users, but to populations that are not yet familiar with the growing menu of transportation options as well as those who do not use smartphones. Regional coordination will be challenging but necessary. Agencies can ease such coordination by fostering an open environment. Competition in the private app marketplace can help accelerate the realization of great trip-planning and fare-payment systems for mobility customers.

It's critical for agencies to have clear goals and a strategy for evaluating whether goals are being met

Be the voice of equity

Some of emerging mobility providers' greatest strengths—being profit-driven, being easily able to experiment, and operating across jurisdictional boundaries, for example—also create equity blind spots. These private companies' purpose is to return value to their shareholders, so they cannot be expected to share the communities' interests everywhere they operate. Agencies must work to ensure that the particular needs and concerns of their communities can be addressed in any working agreement with emerging mobility providers. Some equity issues will be relatively universal (e.g., ADA accessibility and unbanked and low-income populations), while others will be highly context-specific (e.g., needing access to a specific hospital, particular geographic concentrations of vulnerable people).

Share lessons with peers and continue to evolve

The rapid changes in the world of emerging mobility services make it challenging even to know what approaches and service models exist from one week to the next. Public agencies are focused on maintaining their existing infrastructure and often do not have time to follow emerging trends and practices all around the country. And within a matter of months of this report being printed, its case studies (though hopefully not its recommendations) will be outdated.

Sharing experiences with peers is a crucial way of sorting through this avalanche of new information. Learning from others will lead to more rapid improvements and better coordination on the part of public agencies, who can otherwise be at a disadvantage compared to well-funded companies like Uber and Lyft—particularly since these private companies are more naturally positioned to learn from the various transportation experiments taking place in the US and abroad. Keeping up with emerging mobility providers will be a challenge no matter what, but it will be much more manageable if public agencies work together.

Paths Forward

The following areas of exploration offer significant opportunities for forward-thinking transit and city agencies—in other words, this is where agencies should be aiming based on our research and conversations with more than 100 practitioners. We've only just begun to scratch the surface of these practices, which offer substantial—dare we say transformative?—potential to improve mobility outcomes in American communities.

Subsidizing users to achieve regional goals

American transit service is heavily subsidized for riders, and for good reason—transit's societal benefits in terms of equity, economic development, and environmental outcomes are well documented (Roads and private automobiles are also heavily subsidized, albeit less transparently). The emerging mobility ecosystem offers several potential ways of increasing the efficiency of this subsidy since it allows constituents to spread the subsidy across a more diverse pool of services that fill more specific niches in the transportation market, some of which have lower underlying costs. Service types eligible for such subsidy ought to align with regional goals, including the public interest in health, safety, sustainability, and worker rights.

More carefully tailored user subsidies need to be outcome-oriented, and agencies that are willing to put money on the table will have a much stronger negotiating position. Transit agencies could offer these user subsidies themselves, or they could be administered by the municipal (as in the case of Altamonte Springs), regional, state, or even federal government (Congress is currently considering a pre-tax transit-commuter benefit for federal employees who use bike-share or TNCs to commute in Washington, DC).[20] In an increasingly mobility-diverse world, traditional fixed-route public transportation's relative monopoly on public subsidy is unlikely to hold, especially in cases where emerging mobility services can be demonstrated to provide greater benefits to the public at a lower cost.[21]

At the same time, agency leaders must ensure that any services contracted to emerging mobility providers align with their agencies' goals, as well as with the values of the communities in which those

20 Martine Powers, "SafeTrack Got You Down, Federal Workers? Transit Benefits May Soon Apply to Uber," **Washington Post**, July 8, 2016, https://www.washingtonpost.com/news/dr-gridlock/wp/2016/07/08/safetrack-got-you-down-federal-transit-benefits-may-soon-apply-to-uber/. For a more in-depth exploration of the impact that pre-tax commuter benefits have on American travel behaviors, see: Tony Dutzik and Jeff Inglis, **Subsidizing Congestion: The Multibillion-Dollar Tax Subsidy That's Making Your Commute Worse** (New York: TransitCenter and Frontier Group, 2014), http://transitcenter.org/wp-content/uploads/2014/11/SubsidizingCongestion-FINAL.pdf.

21 A recent report from the Center for American Progress provides one possible framework for considering such a subsidy. See: Kevin DeGood and Andrew Schwartz, **Can New Transportation Technologies Improve Equity and Access to Opportunity?** (Washington, DC: Center for American Progress, 2016), "plainCitation":"Kevin DeGood and Andrew Schwartz, "Can New Transportation Technologies Improve Equity and Access to Opportunity?" (Washington, DC: Center for American Progress, April 27, 2016 https://cdn.americanprogress.org/wp-content/uploads/2016/04/20121438/TransportEquity1.pdf.

providers will operate. In its pilot program, KCATA avoided potential labor conflicts by ensuring that Bridj drivers would be unionized KCATA staff. In response to local political concerns, PSTA only subsidizes riders to take Uber trips in one of two neighborhoods in their pilot program. While context-specific concerns inhibit total freedom of experimentation, these are trade-offs that any agency will need to make.

Repurposing street infrastructure (beyond parking)

Allocating more street space for fixed-route transit and high-occupancy ride services has long been desirable, but installing dedicated bus lanes is a major challenge even in the congested areas where they are most needed. Allowing private providers to use those lanes may further complicate prioritization of street space for designated uses. In addition, transit agencies often do not have jurisdiction over streets, creating interagency coordination challenges in prioritizing street space for fixed-route transit, let alone emerging mobility providers.

Street space should be allocated to ensure safety, create vibrant public places, and maximize the efficient movement of people, which suggests that agencies should more explicitly prioritize passenger-dense modes on city streets. Tentative progress highlights the challenges involved.

The San Francisco Municipal Transportation Agency (SFMTA), which is responsible both for street operations and taxi regulation, allows taxis into their transit-only lanes, excluding them only from their less common "Muni-only" lanes. SFMTA bars private operators like Lyft, Uber, and Chariot from both types of lanes. This arrangement is in place partially because SFMTA does not have regulatory authority over these private operators, which are instead regulated by the California Public Utilities Commission. Public acrimony over the use of bus stops by large technology firms' employee shuttles has also made SFMTA wary of providing additional preferred access on its streets to large private companies.

In one example of interjurisdictional cooperation, LA Metro's *First Last Mile Strategic Plan* provides recommendations to municipalities within Los Angeles County on how to prioritize street space proximate to LA Metro stations. LA Metro also provides one-on-one training for city staff to support the design guidelines' implementation.

Cities and transit agencies have already found mutual benefit with bikeshare and carshare providers by providing access to parking assets, and agencies may identify new mutual benefits by reprioritizing street infrastructure. Major urban centers are chronically congested, yet when bus lanes are perceived to be lightly used—while drivers in adjacent lanes are stuck in traffic—it is difficult for city officials to gain public support for bus-priority lanes. The introduction of bikeshare systems has in many cases broadened public support for bike infrastructure by expanding the constituency of bike riders. Similarly, if excess capacity in bus-priority lanes were made available to emerging mobility providers who could demonstrate high-occupancy trips, for example, it could become easier to gain public support for such dedicated lanes.

More broadly, reallocating infrastructure assets could help transit systems become more efficient, with greater transit and private vehicle utilization, improved livability in surrounding communities, and increased safety for users, for example, which in turn would help transit agencies achieve their regional goals.

22 "Call-n-Ride," Regional Transportation District, accessed July 18, 2016, https://perma.cc/B2S5-GMPA.

Fare integration as a point of leverage

In many cases, new institutional structures can facilitate full fare integration. When there is a clear benefit—such as for LA Metro and its bikeshare-system integration with the TAP card or when a private provider benefits from the integration and it requires little effort on the agency's part, as was the case for Hourcar in Minneapolis—progress follows.

Achieving full fare integration may require creating a dedicated and well-funded entity equipped with the necessary resources and technical expertise. This could be done internally or through a neutral third party. LA Metro's long-term bikeshare and transit fare-integration plan recommends identifying a public-sector entity or a private third party to be the clearinghouse for fare data. Internationally, the Paris region established a separate agency, STIF, which sets and collects fares for all transit agencies in the region. The San Francisco Bay Area Clipper card, which can be used to pay fares to 17 Bay Area transit agencies, was developed by a consortium of agencies driven by the metropolitan planning organization, which is not itself a transit operator. This level of interagency coordination took years to develop, but it demonstrates the technical feasibility of integrating across many different fare-payment systems.

Simple fare-payment integration enabled by open data and technology standards would result in more collected data, which would help agencies paint a more comprehensive, multimodal picture of regional travel demand. These new fare-payment systems, which allow agencies to observe customer behavior across modes, can also facilitate direct user subsidies in a variety of contexts and to a range of mobility providers.

The ability to provide targeted user subsidies opens up a lot of doors for transit and city agencies. Agencies can practice more sophisticated transportation demand management using variable pricing by time-of-day. The value of simple fare payment to customers can also be leveraged to negotiate with private mobility providers for data sharing, regulatory compliance, or additional equity programs when fare integration supports provider' bottom line. Public agencies are uniquely suited to take advantage of this enormous opportunity.

Using private data for public planning

There are several ways for agencies to obtain data from private providers. Voluntary data-sharing is theoretically possible but has not yet been proven to work, regulatory requirements have been relatively effective, and third-party agreements have not yet been thoroughly explored. Moving forward, barring major, proactive initiative on the part of emerging mobility providers, the latter two possibilities seem likely to be the most common.

Requirements for emerging mobility providers to report their trip data have been controversial but, with time and experience, should become a routine and accepted practice. It is increasingly clear that the public can benefit from this information, and providers themselves could also gain from sharing their data by enabling third party analysis and integration with other technology platforms, not to mention building trust with the public sector and their users alike. There is also ample precedent for the systematic submission of industry data. Airlines, for example, are required to submit detailed data on their operations, including passenger volumes, revenue, load factors, and passenger origins and destinations. All of these data are openly available on the US Department of Transportation's website.

Privacy and data-security concerns could push some cities in the direction of working with third parties. Companies that work with GPS or cell phone data sources (like AirSage, INRIX, StreetLight Data, and Teralytics) show the value and viability of specializing in data acquisition, management, security, and analysis. These companies compile data on travel patterns and traffic speeds and provide those data and/or related insights to their clients. There's no reason a similar arrangement could not work for emerging mobility providers. This approach could ease privacy concerns and reduce technical burdens for agencies.

It's also worth reiterating that data from, say, TNCs, is not a panacea, but rather one of many complementary data sources, including traditional travel surveys. Cities and transit agencies should think about their data needs in the context of their broader goals and system needs.

Going where people want to go (and not where they don't)

Public transit services are primarily offered on a fixed-route, fixed-schedule basis, primarily with large vehicles that seat 40 or more passengers. In recent years in the US there has been substantial public investment in expanding fixed-route rail service, particularly light rail, commuter rail, and streetcar lines. Much of the public and political appetite for expansion comes from lower-density locales where these high-capacity modes require high capital investment and operating subsidies and take years to plan and implement—yet these suburban-oriented projects often do not yield substantial ridership relative to fixed-route transit investment in dense, walkable urban neighborhoods.

Transit officials and transit supporters are caught in a quandary—they want to expand service to suburban areas and even have the political and public support to do so, yet they are faced with expectations of an unrealistic level of service. Emerging mobility services provide the opportunity to better tailor service models to service needs.

There has been much discussion among TNCs and on-demand transit services and transit agencies about complementing fixed-route transit service. The specific land-use contexts and trip types for which service contracts will make the most sense, however, will vary.

On-demand transit service is not entirely without precedent. RTD in the Denver area launched an on-demand transit service dubbed "Call-n-Ride" in 2000, making it the first to engage in sustained experimentation with on-demand transportation for the general public. Today riders can make reservations in real time or in advance (which the agency recommends), over the phone or internet.[22]

RTD (since followed by Dallas Area Rapid Transit) has refined and expanded the service model since its launch and now offers its Call-n-Ride service in over 30 small service territories anchored by transit centers, light rail, or park-and-ride stations. The service characteristics within each territory are tailored to the travel patterns and other specialized needs of these local communities.

The longevity of RTD's Call-n-Ride service shows that even without using smartphone apps—critical to the success of today's emerging mobility services—on-demand services can provide viable service

in relatively low-density communities. The fact that RTD has needed to adjust service to meet the specific needs of each community, however, limits the scalability of this model.

Within the industry, TNCs currently seem best positioned to address that scalability challenge. To date, private on-demand transit providers operate exclusively in urban environments, but largely without subsidy (Bridj's pilot program in Kansas City being an exception). Even TNCs provide dramatically more efficient service in dense urban environments, however, so their ability to provide practical, cost-efficient suburban transportation service for more than a niche rider population remains uncertain. If nothing else, citizens' increasing familiarity with TNCs and on-demand transit providers may increase the public's appetite for experimenting with such services moving forward, which could improve the efficiency of suburban transit investment in the long run.

Conclusion

Today we can rely not just on private cars or public transportation (or biking or walking) but on a diverse spectrum of modes tailored to our mobility needs. Providers of emerging mobility services like carshare, bikeshare, transportation network companies, and on-demand transit blur the lines between private and public transportation. In doing so, they provide their customers with greater prospects for living without the financial and logistical burdens of car ownership.

The strategies and best practices laid out in this report are intended to help practitioners more effectively accomplish their goals. This starts with lessons learned, which draw on case studies from across the country undertaken by a diverse set of stakeholders. These lessons are that agencies should be proactive and experiment, define goals and evaluate progress, work towards an equitable mobility system, plan regionally and across modes, publish open data, and share knowledge with peer organizations.

This learning points toward several powerful paths forward. These include subsidizing mobility outcomes rather than modes, efficiently allocating street infrastructure, using fare integration as a point of leverage, advancing planning efforts using new data, and exploring the potential of on-demand services. Experiments that pursue these paths forward will create learning opportunities and yield meaningful benefits to transit agencies and their customers alike.

The relationship between public transportation and emerging mobility options only shows signs of strengthening as emerging modes become more widespread, better understood, and hopefully more accessible to customers. To develop this relationship in a way that supports the public interest, cities and transit agencies should set clear goals and experiment to identify the most effective means of meeting them by measuring progress against those goals. Agencies must also continue to compare notes and collaborate with their peers, today's spectrum of emerging mobility providers, and with new service providers still to come.

Cities and transit agencies that are able to recognize the strengths of emerging mobility services and connect them to a robust transit network will give their riders a more convenient and affordable transportation system than they could have provided alone——redefining public transportation in the process.

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