The Innovative Transportation Index

The Cities Where New Technologies and Tools Can Reduce Your Need to Own a Car

FRONTIER GROUP

NMPIRG Education Fund

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Table of Contents

Executive Summary 4

Introduction 8

Technology is Fueling a Revolution in Transportation 10

- Carsharing Provides Mobility without Car Ownership 11
- Ridesharing Facilitates Carpooling On-Demand 12
- Ridesourcing Offers New Options for Short Rides around Town 13
- Taxi Hailing Services Make Finding a Cab Easier 14
- Bikesharing Programs Provide a New Way to Get Around Cities 14
- Static Data Help Riders Navigate Transit Systems 15
- Real-Time Transit Information Eases Travel 16
- Multi-Modal Trip Planning Apps Help Users Weigh Travel Options 16
- Virtual Ticketing Allows Transit Riders to Pay Without Cash 17
- The Shared Mobility Future: Creating Highly Flexible and Personalized Options 18

New Transportation Tools Are Available in a Growing Number of Cities 20

- Cities with Abundant Choices 21
- Cities with Growing Choices 23
- Cities with Emerging Choices 25

Governments Should Encourage Expansion of New Transportation Services 28

Methodology 31

Appendix: Availability of Technology-Enabled Transportation Services by City 34

Notes 36

Executive Summary

Rapid technological advances have enabled the creation of new transportation tools that make it possible for more Americans to live full and engaged lives without owning a car. Many of these new tools have been in existence for less than a decade – some for less than five years – but they have spread rapidly to cities across the United States.

This report reviews the availability of 11 technology-enabled transportation services – including online ridesourcing, carsharing, ridesharing, taxi hailing, static and real-time transit information, multi-modal apps, and virtual transit ticketing – in 70 U.S. cities. It finds that residents of 19 cities, with a combined population of nearly 28 million people, have access to eight or more of these services, with other cities catching up rapidly.

These services make it easier to conveniently get around without owning a car. That is increasingly what city dwellers – and Millennials especially – say they want. These services individually help travelers, but more importantly, they work together to become more than the sum of their parts.

Expanding the availability of shared-use transportation modes and other technology-enabled tools can give more Americans the freedom to live "car-free" or "car-light" lifestyles – avoiding the cost of owning, insuring, maintaining and garaging a private vehicle. Even when these services provide access to a car, they still make it easier for Americans to reduce their auto dependence by enabling easy access to a vehicle without the constant use associated with ownership. These tools have been expanding rapidly, yet public agencies have been slow to integrate these new systems into their planning and policy toolbox. Local, state and federal governments should ex-

plore ways to expand access to these tools and incorporate them into strategies for reducing the congestion, public health and environmental impacts of urban transportation systems.

Technology-enabled transportation services provide new options for millions of Americans.

- **Carsharing services** offer vehicle access on-demand, lowering the cost of vehicular mobility for many while still preserving on-demand access to a car. Options include fleet-based services such as Zipcar or peer-to-peer networks that provide cars for round-trip and, increasingly, one-way trips. **Carsharing is currently available in 69 of the 70 cities surveyed.**
- **Ridesharing services** provide a tool for riders and drivers to find one another. Potential riders can find drivers who are already going in the same direction and use these services to coordinate pick-up location, costs and schedules. **Ridesharing is currently available in 5 of 70 cities.**
- **Ridesourcing services**, such as Lyft, Uber and Sidecar, enable users to solicit a ride from their current location from a pool of drivers using a smartphone. These services differ from taxis in that the drivers are not commercially licensed taxi drivers and, as such, are not permitted to pick up passengers off the street. **Ridesourcing services are currently available in 59 of the 70 cities evaluated in this report.**
- **Taxi hailing services** provide technology to help users locate and call taxis with their smartphone, and (in some locations) pay through the smartphone as well, eliminating the need for cash on hand. **Taxi hailing services are currently available in 34 of 70 cities.**
- **Bikesharing systems** increase options for short journeys (for example, trips too long for walking), and can serve as first- and last-mile connections between transit locations and travelers' final destinations. They also provide a fun and active way to travel without concern for fixed schedules. **Bikesharing is currently available in 32 of 70 cities.**
- **Static transit data** improves usability of transit services by enabling users to access schedules and route maps online via desktop, smartphone or other Internet-connected devices. When accessible on the go, schedule and routing data helps riders navigate transit systems effectively, even when their plans change. **Static transit data is currently available in 66 of 70 cities.**
- **Real-time transit information** builds on the benefits of open static data by providing users real-time information on arrival/departure times and delays. This gives riders the ability to avoid unforeseen wait times, or to change routes at the last minute. **Real-time transit information is currently available in 56 of 70 cities.**
- **Multi-modal apps** knit the transportation landscape together by offering users the opportunity to see side-by-side comparisons of a variety of routes and services for making their trip, including biking, carsharing, public transit, driving and walking. **Multi-modal apps are currently available in 47 of 70 cities.**

- **Virtual ticketing** gives users the opportunity to avoid lost tickets and long wait times at the ticket counter by buying tickets directly through an Internet-connected device such as a smartphone. Riders can set up an account to look after expenses and track ticket validity. **Virtual ticketing is currently available in 6 of 70 cities.**

This report finds:

- **There are at least 19 cities with *Abundant Choices*,** places where at least some residents have access to all or nearly all of these new transportation services. **Austin, Texas**, is the only city in the United States to have access to all 11 kinds of services evaluated here. **San Francisco and Washington, D.C.,** have access to 10 of the services evaluated. (See Table ES-1.)
- **Another 35 cities have *Growing Choices***. Residents of these cities have access to many kinds of innovative transportation services, but not as many as cities with Abundant Choices. **Orlando, Atlanta, Louisville, St. Louis, Baltimore, Cleveland, Kansas City, Newark, Pittsburgh and Raleigh** lead this category, and several are already planning the addition of new technology-enabled services within the next year.
- **The remaining 16 cities have *Emerging Choices*** – these are cities where residents have access to fewer than half of the types of technology-

Table ES-1. Top Cities with Abundant Choices

Rank	City	Number of Services Available	Number of Service Providers
1	Austin, TX	11	18
2	San Francisco, CA	10	23
3	Washington, DC	10	20
4*	Boston, MA	9	19
4*	Los Angeles, CA	9	19
4*	New York City, NY	9	19
7	Portland, OR	9	17
8*	Denver, CO	9	16
8*	Minneapolis, MN	9	16
8*	San Diego, CA	9	16
8*	Seattle, WA	9	16

** Tied for this rank. Cities with more services are ranked higher; among cities that have the same number of services, those with more providers are ranked higher. See Methodology for details.*

enabled services evaluated in this report. Many of these are smaller cities in largely rural states with limited transportation options. These tools are beginning to expand to new areas, and further expansion would signal their potential to benefit a wide variety of American cities.

Technology-enabled transportation services have the potential to reduce driving and car ownership, especially among young people.

- Studies have shown that tools such as carsharing and ridesharing reduce vehicle ownership and the number of miles driven. Other tools, such as real-time transit information, improve the experience of riding transit and have been shown to give a modest boost to ridership.
- Residents in cities that have access to a portfolio of technology-enabled tools are better able to construct "car-free" and "car-light" lifestyles that are less dependent on car ownership.
- Cities with more abundant transportation-enabled services are able to complement public transit by providing mobility options from the train or bus station, and by providing alternatives during unusual times when weather or the need to carry bulky packages make walking, biking or transit less practical or desirable.

Policy-makers should explore ways to tap the potential of technology-enabled services to address transportation challenges and increase the number of people with the option to live car-free or car-light lifestyles. Governments should:

- Adopt clear regulations for new services such as ridesourcing that fully protect the public while allowing the services to operate.
- Require, when negotiating regulatory arrangements for these new transportation tools, that providers share their data with public officials, who can then better integrate these services into their planning.
- Adjust municipal policies, including planning and zoning rules, to encourage the use of these services, such as by reducing parking fees for carshare users, reducing or eliminating minimum parking requirements for new developments that incorporate shared-use transportation, or allocating existing parking spaces for carsharing services.
- Encourage complementarities between public transit and new technology-enabled mobility options, especially by encouraging bikesharing, ridesharing and carsharing around transit stops.
- Support multi-modal transportation options by creating universal payment mechanisms that work for various modes of transportation, and expand the availability of real-time information, especially with public transit.
- Conduct studies on the impact of these services and integration of them into transportation models and plans.
- Explore the potential of new tools to meet the mobility needs of those currently poorly served by the transportation system, including the young, the old, the disabled and those in low-income households.
- Adopt open data and open source software policies in conformity with federal mandates.

Introduction

Most Americans are well acquainted with the cost and hassle of owning a car. According to the Bureau of Labor Statistics, Americans spent close to 17 percent of their household budgets on transportation in 2013 – more than they spent on food, clothing, entertainment or anything other than housing.[1] Reliance on cars not only takes a substantial chunk of our paychecks, but it also takes a substantial chunk of our time. The average commute between 2006 and 2010 was nearly half an hour, with more than 2 million of us driving for nearly an hour a day to go to work.[2] And that doesn't include the time spent fueling and maintaining our vehicles, looking for parking, and having them repaired when something goes wrong.

For most American families, however, owning a car isn't really a choice. It's a necessity – the price we pay for access to jobs, housing, recreation and social opportunities.

Some Americans – largely those living in major cities with good transit systems – have long chosen to live car-free or car-light lifestyles in which they do not own a vehicle or own fewer than one vehicle per adult. Many of these Americans rely on public transportation for the bulk of their mobility needs, supplemented by walking, taxicabs or bicycling. But because most American cities are designed for the automobile (and because of historical under-investment in quality transit services in many cities), living without a personal car has traditionally come with significant trade-offs in lost access to social activities, job opportunities and recreation.

That is starting to change. A slew of new transportation services are taking

advantage of advances in technology to expand the number of Americans who can realistically live car-free and car-light lifestyles. Using these tools, riders can access real-time information about transit services, plan the quickest and cheapest possible journey from among numerous options, save time by paying on the go, and more easily incorporate healthy transportation options such as biking and walking into their daily routines. For those Americans who need or want access to travel by car without owning one, these new tools provide an array of options – from "ridesourcing" services such as Lyft and Uber to a variety of new options for carsharing and ridesharing. With more options more seamlessly connected, more Americans who want to abandon the cost and hassle of car ownership will have the opportunity to do so – a change with potentially transformative impacts on the transportation system and our cities.

The spread of these new technology-enabled transportation tools has been rapid. This report documents the widespread adoption of these new tools in cities across the country. But their spread has also been uneven – large cities, often attracting tech-savvy Millennials, have abundant new mobility options at their disposal, while many smaller cities have not yet been reached by the transportation technology revolution.

Having more options improves mobility for Americans and makes our transportation system more flexible and resilient. Decision-makers at all levels should take full advantage of the potential of these tools to reduce the burdens of vehicle ownership, expand the variety of transportation options available to Americans, and expand access to these tools to communities and populations who currently lack it.

Technology Is Fueling a Revolution in Transportation

Over the last decade, America has experienced a technological revolution. Internet use has become nearly universal; in early 2014, 87 percent of American adults reported using the Internet regularly, compared to just 46 percent in 2000.[3] Smartphones have gone from being nonexistent in 2000 to being owned by 53 percent of American adults in 2014.[4]

Increased access to the Internet has spawned online social media platforms such as Facebook and Twitter, which did not even exist a decade ago. As of January 2014, 74 percent of all Internet users visit social networking sites.[6] Social media, in turn, has facilitated the emergence of a growing "sharing economy," which has been defined as "an economic model based on sharing, swapping, bartering, trading or renting access to products as opposed to ownership."[7] By 2013, it was estimated that the peer-to-peer rental market for all goods and services was worth $26 billion.[8]

These changes – increased access to the Internet, growth in smartphones, social media and the sharing economy – have overturned or threatened many previously stable industries. Now they are revolutionizing the world of transportation by creating new options for getting around that are accessible, convenient and affordable.

This report reviews the presence of different technology-enabled transportation tools in 70 U.S. cities, including the primary cities of the nation's 50 largest metropolitan areas and the largest cities in states without a primary city in the top 50 metro areas. It shows that residents of many U.S. cities have access to an increasingly varied array of new technology-enabled services that are enabling more Americans to consider car-free and car-light lifestyles.

Carsharing Provides Mobility without Car Ownership

Carsharing first made inroads in the United States in 1998, about a decade after it took root in Europe, and the practice continued to grow as emerging technologies such as the Internet and wireless data transmission enabled consumers to reserve cars for daily or hourly rentals online and gain remote access to their vehicles with radio frequency identification (RFID)-enabled cards.[9]

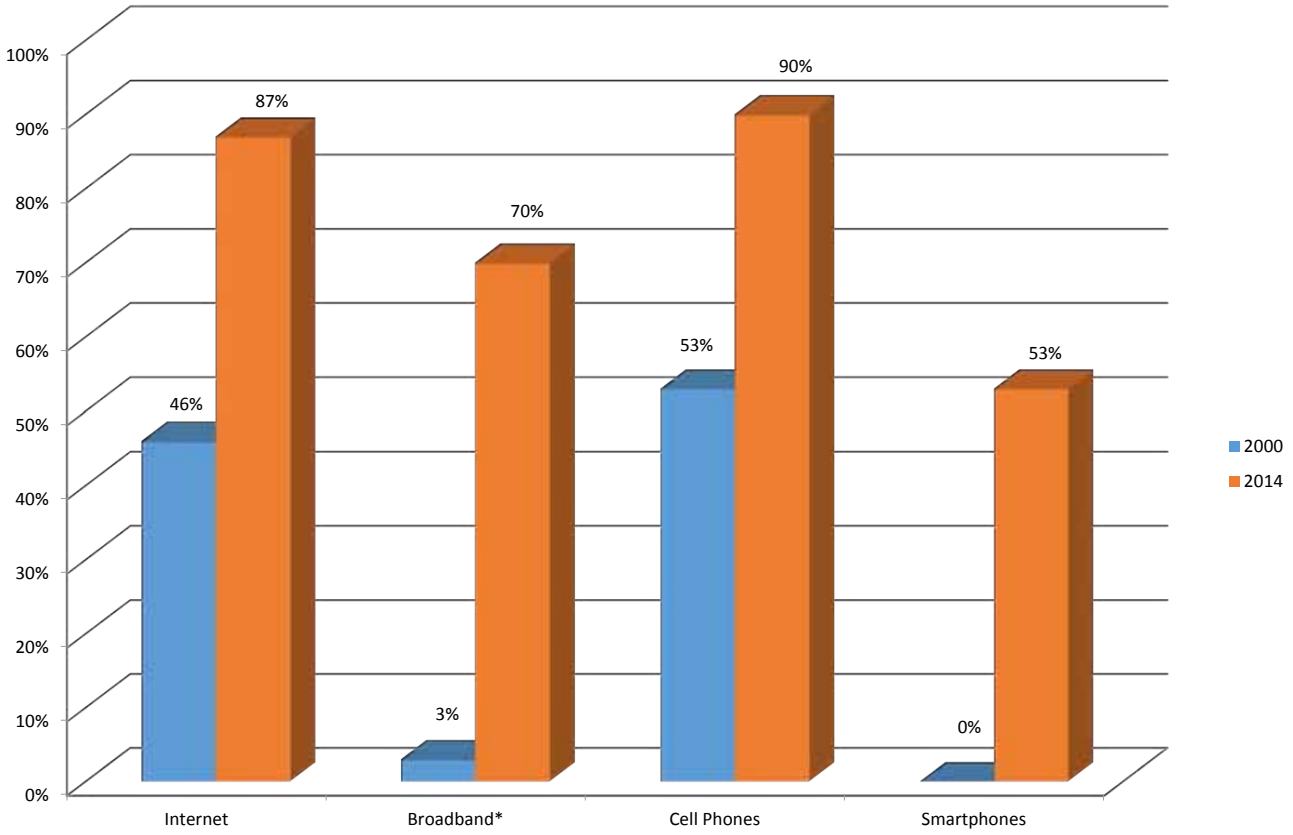
There are several varieties of carsharing, each of which fills a specific set of transportation needs.

Fleet-based Carsharing

In fleet-based carsharing, a company owns all of the vehicles used in the service and positions them throughout a given geographical area for rental. There are several forms of fleet-based carsharing:

- **Round-trip** services enable users to access the car at a specific location, to which they must return the car when they are finished. Round-trip carsharing services are useful for errands (*e.g.*, a run to the grocery store), daily business trips or longer outings such as a day trip. The largest, fleet-based carsharing firm

Figure 1. Market Penetration of Major Technologies in 2000 versus 2013/2014[5]



*Broadband numbers are from 2013. See Note 5.

is Zipcar, now owned by the Avis Budget Group, which has 860,000 members in 32 cities and at 300 college campuses throughout North America and Europe.[10] Other companies offering carsharing services include Enterprise Carshare and Hertz 24/7.

- **One-way** services enable users to pick up and drop off cars at different locations within a given area. "Free-floating" services often allow users to return cars to any legal parking space in a specific zone, while "station-based" services enable users to return cars to specific pick-up and drop-off points. Car2Go is the largest firm specializing in one-way services, located in 10 American cities and throughout Canada and Europe. In May 2014, Zipcar began testing its "One>Way" service – a station-based one-way carsharing service – in Boston.[11]

Peer-to-Peer Carsharing

The peer-to-peer carsharing model arrived in 2010 and uses an Internet-based service to match individuals interested in renting out their cars with willing renters. As with peer-to-peer services in other areas of the "sharing economy," such as eBay and AirBnb, peer-to-peer carsharing services enable users to rate one another, creating accountability and increasing trust among participants. Peer-to-peer carsharing has drawn interest as a model that can expand the benefits of carsharing to suburbs and rural areas where a critical mass of demand might not exist to sustain a fleet-based service. RelayRides, the largest peer-to-peer carsharing firm, has experienced rapid growth in the United States, and now has rental options in over 300 cities.[12] Most recently, peer-to-peer carsharing has entered the airport rental car market. Companies such as RelayRides (with locations in 80 airports across the country) and FlightCar rent the cars of those flying out of town to incoming passengers. The company lures vehicle owners with the prospect of free airport parking and a free car wash—which are provided regardless of whether the car is rented—and attracts renters with low rental rates.

Carsharing is currently available, in some form, in 69 of the 70 cities evaluated in this report. Peer-to-peer carsharing is currently available in 68 of the 70 cities evaluated. Round-trip carsharing can currently be found in 45 of the 70 cities evaluated. One-way carsharing is currently available in 13 of the 70 cities evaluated in this report. (A detailed list of the cities with carsharing services can be found in the Appendix.)

Ridesharing Facilitates Carpooling On-Demand

Catching a ride with a friend or a co-worker has long been a way for Americans without cars, or those simply looking to save on gas or share company on the ride to work, to get where they are going. With the emergence of mobile technology, shared rides can be arranged easily and with less advance planning. Moreover, as the number of users increases, the chance of finding a driver or passenger "going your way" does as well.[13]

While the history of ridesharing is long, recent trends in technology have allowed the practice to evolve in ways that make it more convenient for both potential passengers and potential drivers.

Traditionally, ridesharing has been operated through nonprofit organizations and government agencies working with employers to encourage employees to reduce sole occupant vehicle trips to work in order to reduce congestion on the roadways.[14] These transportation demand management programs utilize

online matching systems to arrange for daily roundtrips back and forth to work and are most attractive to employees who have regular work schedules. Traditional ridesharing services include carpools and vanpools. However, the share of those who share rides to work has declined by about half from the 1980s, when it represented about one-fourth of commuters nationally.[15]

Starting in the late 1990s, new online platforms emerged to help drivers and riders connect for long distance trips as well as for commuting.[16] Companies such as Zimride continue to find new ways to build on those platforms, allowing users to post a planned long-distance trip, and to sell the seats in their vehicle for that trip online. In 2012, the company expanded its services to New York City and Washington D.C., and, in 2013, Zimride was acquired by Enterprise Holdings.[17] The company continues to serve university and corporate networks, in addition to providing ridesharing services to five American cities.

Ridesharing for commuters has been evolving as well. In 2007, Carma (originally Avego) was launched and began offering on-demand or dynamic ridesharing, a business model that uses location-aware devices to allow drivers and riders to arrange shared rides in real time.[18] The service's smartphone app arranges one-way trips for which the passenger pays a modest per mile fee to the driver to cover some of the cost of the trip. The financial transaction occurs through the application so that no cash passes hands at the end of the trip, a convenience that also encourages passengers who might be looking for rides at the last minute.

Ridesharing differs from ridesourcing provided by companies such as Lyft and Uber in three important ways. Drivers participating in ridesharing take riders on a route the driver is already intending to travel before accepting riders. Generally, the rider pays a fraction of the cost of the trip; the driver makes little to no profit. Ridesourcing involves drivers who take riders on rider-directed routes, for a price that exceeds the cost of the trip, with the surplus going to the driver and the third-party company arranging the ride.[19]

Ridesharing services of the kind described here are currently available in five of the 70 cities evaluated in this report. (A detailed list of the cities with ridesharing services can be found in the Appendix.)

Ridesourcing Offers New Options for Short Rides around Town

Ridesourcing companies such as Lyft, Uber and Sidecar provide services that are similar to taxis, enabling users to solicit a ride from their current location from a pool of drivers using a smartphone. These services differ from taxis in that the drivers are not commercially licensed taxi drivers and, as such, are not permitted to pick up passengers off the street. Using GPS technology, drivers can find their passengers easily and, using e-commerce technology, drivers receive payment through the apps' payment systems.

Ridesourcing companies have emerged into an atmosphere of regulatory ambiguity, with some cities encouraging the services or exempting them from regulation and others seeking to ban or limit them by applying regulations that were developed for taxis. In 2013, the California Public Utilities Commission (CPUC) voted to regulate (and legalize) ridesourcing services, under a new category called "transportation network companies," seeking to guarantee safety and consumer protection while still ensuring that passengers have access to a full range of transportation options.[20]

Under the law, companies such as Lyft and Uber must provide drivers with insurance that covers at least $1 million for incident claims, must ensure that drivers with certain, recent driving violations are not working, and must provide the CPUC with annual reports.[21] Other cities and states are now determining how best to regulate ridesourcing services, with varying approaches.

Ridesourcing is currently available in 59 of the 70 cities evaluated in this report. (A detailed list of the cities with ridesourcing services can be found in the Appendix.)

Taxi Hailing Services Make Finding a Cab Easier

Taxis have long been a transportation backstop for those without access to a vehicle. Taxi service in many cities, however, can be quite expensive and taxis aren't necessarily available immediately when and where you need them. New technology-enabled services make hailing a cab more convenient and, in some cases, less costly.

Taxi hailing services such as Curb (formerly TaxiMagic) provide technology to help users locate and call taxis with their smartphones, and (in some locations) to pay via smartphone as well, eliminating the need for cash on hand. All drivers for these companies are commercially licensed and fully insured.

Taxi hailing services are currently available in 34 out of 70 cities evaluated in this report. (A detailed list of the cities with taxi hailing services can be found in the Appendix.)

Bikesharing Programs Provide a New Way to Get Around Cities

People traveling in and around cities often find themselves needing to make trips that are too long to be made comfortably on foot and are not well served by existing transit. Taking a taxi may be an option, but it is often expensive. Bicycling offers a quick, flexible, healthy – and often fun – transportation solution for these intermediate-length trips. To make these trips by bike, however, one must have a bike available. If you bike one way and there's a rainstorm or your plans change, then you need to find alternative travel options and figure out what to do with your bike. Bikesharing programs overcome these barriers by making bicycles available for one-way or round-trip rental at stations scattered throughout an urban area.

Bikesharing has evolved over three generations globally and, after decades of innovation in new technologies such as smartcards and electronic locking, the service caught on in the United States in 2007 when Tulsa, Oklahoma, opened the first small-scale bikesharing program with 24 bikes.[22] In 2010, the first large-scale bike-sharing program in the United States opened in Denver with approximately 400 bikes.[23] By the end of 2014, more than 45 American cities, and 700 cities globally, had operating bikesharing programs.[24] The Earth Policy Institute has estimated that the United States is on track to double the size of its collective bikesharing fleet to 39,000 bikes by the end of 2015 as new programs start and existing ones expand.[25]

Modern bikesharing systems use proprietary GPS (Global Positioning System) and RFID (radio frequency identification) systems to track the bikes, a method that deters theft but has also been used to allow customers to see how far they rode, how many calories they burned and the amount of carbon pollution avoided by the ride.[27] The payment system charges higher prices for longer trips, a method designed to encourage use for commuting, errands or one-way trips, and discourage longer rides, which

are better accommodated by private bike rental services or other modes.[28] Riders that use the service often have the option to buy annual memberships.

Washington, D.C.'s Capital Bikeshare was the largest program in the country until New York City launched CitiBike in 2013, a program with 6,000 bikes and more than 300 stations.[29] Bikeshare programs continue to grow around the country. Several major cities, such as Atlanta and Philadelphia, have plans to launch programs in the spring of 2015. While there have been some 23 million rides since 2007 in the U.S. alone, there is still room to grow.[30]

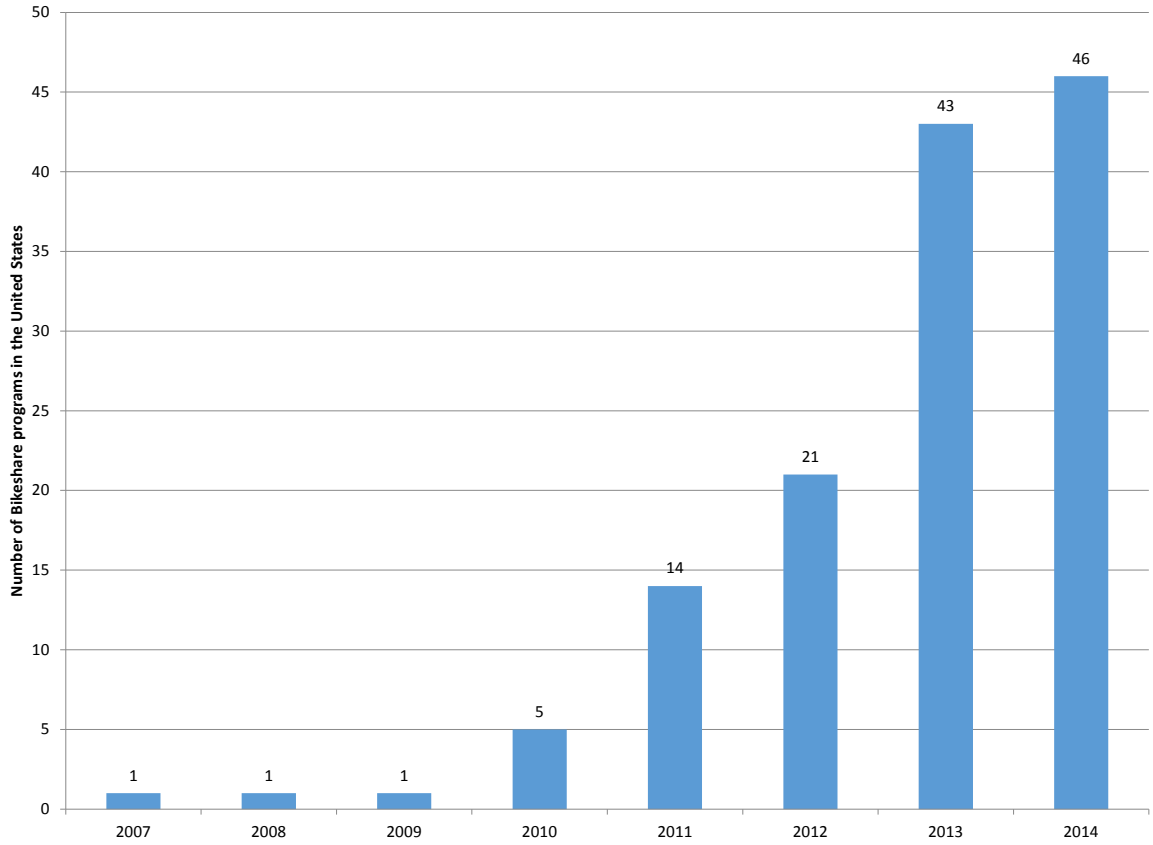
Bikesharing is currently available in 32 of the 70 cities evaluated in this report.[31] (A detailed list of the cities with bikesharing services can be found in the Appendix.)

Static Data Help Riders Navigate Transit Systems

"Static" transit data provide fixed bus schedules and route maps, online or through Internet-connected devices. Many transit agencies provide this information in an open format, which allows third parties to easily access up-to-date information and develop apps with exact schedule and route details. This service allows users to feel more confident in relying on transit for everyday trips.[32]

The true potential of this technology to help riders navigate public transportation began to be tapped in 2005, when Google launched its first online transit mapping and scheduling application.[33] By December 2014, Google had published agency-provided schedules from more than 1,500

Figure 2. The Growth in Bikeshare Programs in the United States (2007-2014)[26]



cities around the world.[34] The availability of public transit data led to an explosion of new mobile transit apps.[35] The advent of the smartphone meant that riders did not just have access to trip-planning and scheduling information at their home computers, but could also access that information in waiting areas and on transit vehicles. In 2008, Google incorporated transit planning functionality into its Google Maps application for mobile devices.[36]

Services such as Google Transit and apps like HopStop, among others, make it possible for users to plan trips and refer to information while on the go. It also means that if their plans change during the day or if they miss a connection or get off at the wrong stop, they can easily reroute. Because smartphones are location-aware, people can also get transit directions to a destination from their current location without having to know where they are.[37]

Static transit data are currently shared in 66 of the 70 cities evaluated in this report. (A detailed list of the cities with Open Static Transit Data can be found in the Appendix.)

Real-Time Transit Information Eases Travel

Increasingly, transit agencies are also supplying real-time information on the location of transit vehicles. In the early 2000s, U.S. transit agencies began experimenting with ways to keep track of service performance on bus and train lines in real time.[38] By installing GPS devices and connecting buses to a communication network, agencies can provide riders with instant information about how long it will be before their bus or train arrives to pick them up.[39] This information is sometimes supplied via electronic signs posted at bus or subway stops but, today, it can also be found in a variety of real-time apps for smartphones.

Apps such as NextBus, Moovit, the TransitApp and Google Transit, among others, greatly minimize the hassles of transit use, such as waiting for a long time at a stop, or just missing the bus. Effective use of the application can greatly increase the perceived reliability of transit as a means to get around effectively. According to a 2011 study, real-time information apps reduce anxiety over taking public transportation, reduce both perceived and actual wait times, and give passengers a stronger sense of freedom.[40]

Real-time information is currently shared in 56 of the 70 cities evaluated in this report. (A detailed list of the cities with real time information can be found in the Appendix.)

Multi-Modal Trip Planning Apps Help Users Weigh Travel Options

In addition to fixed-schedule and real-time information apps, a number of new apps are being developed that knit the entire transportation experience together—helping people get to places in the fastest, cheapest, most convenient way possible, regardless of the mode. Instead of deciding how one will travel and then considering the best timing and route, a full array of options is displayed side by side along with their timing and routes.

RideScout is a mobile app that aggregates information about all of the various transportation options available in a given city. A RideScout user simply enters his or her destination and is provided with a menu of real-time transportation options—including transit, taxi service, carsharing or ridesharing.[41] CityMapper, another popular multi-modal app, allows users to create address links to Google Maps to make meeting someone or sharing a destination even easier.[42]

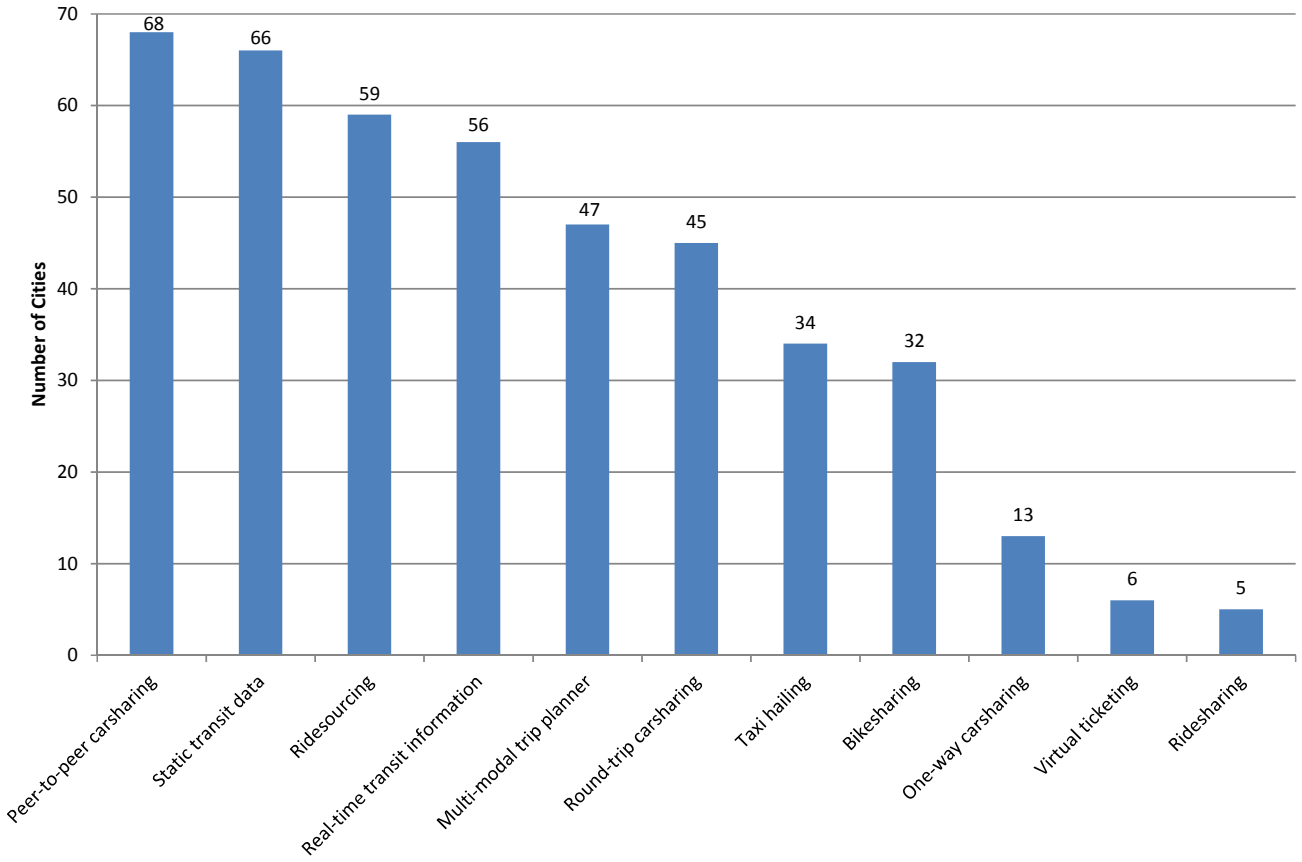
Multi-modal apps are currently available in 47 of the 70 cities evaluated in this report. (A detailed list of the cities with multi-modal apps can be found in the Appendix.)

Virtual Ticketing Allows Transit Riders to Pay Without Cash

Electronic ticketing via smartphones has the potential to reduce the hassle of paying transit fares – and the cost and delay involved in collecting fares – by seamlessly linking fare payments to a credit card account or other digital payment method. These services turn smartphones into both the ticket vending machine and the ticket itself. In places where they have been implemented, mobile ticketing apps have been shown to reduce lines at traditional ticketing locations, lower the overhead costs of maintaining ticketing machines, and reduce the need for riders to carry cash or have correct change.[43] The simplest services work like airline e-tickets. For example, Amtrak launched a national e-ticket program in 2012—delivering tickets purchased online by e-mail.[44] The newest services are more complex, however, and take the form of user-friendly smartphone apps.

Bytemark, Inc., launched in 2011, is one example of innovation in mobile ticketing platforms. Already operating in the New York City ferry system, Capital Metro in Austin and for inter-city services in northern Indiana, Bytemark's system allows passengers to download an app, browse and buy tickets, and find directions for their journey.[45] The transit agencies can choose whether to use tickets that must be visually confirmed by employees or, in fast-paced and high traffic areas, mobile tickets that can be

Figure 3. Extent of Service Availability (Out of 70 Cities Surveyed)[47]



scanned by machines on board. This gives greater flexibility to passengers, cuts down on lines, and can be effective at reducing unpaid fares.[46]

Virtual ticketing is currently available in six of the 70 cities evaluated in this report. (A detailed list of the cities with Virtual Ticketing can be found in the Appendix.)

The Shared Mobility Future: Creating Highly Flexible and Personalized Options

Many of these transportation services have matured only in the past five years, but have already spread across the country and the world. This dynamic landscape continues to evolve as new companies fill the gaps with innovative ideas and spin-offs that are creating new varieties of technology-enabled transportation services.

Some new options blend elements of a variety of shared-use transportation services. Lyft Line, a new option available on the regular Lyft app in San Francisco and Los Angeles, along with Via in New York, calculate unique routes based on current requests for rides in the area, allowing riders to share a ride with other individuals at a fraction of the cost of a solo ride. Bridj, a company that describes its model as a "the world's first pop-up

Young People Are Early Adopters of New Transportation Technologies

Adoption of new mobile communications devices is increasing across all income levels, races, ages and education levels.[48] But young Americans have consistently been the first to adopt new technologies and the first to incorporate many technology-enabled tools into their lifestyles.[49]

Internet use is now nearly universal among young people, with 97 percent of young adults between the ages of 18 and 29 using the Internet on a daily basis.[50] As of January 2014, 83 percent of young adults (18-29 years old) owned some variety of smartphone, compared to 53 percent of adults nationally, and 89 percent of young people used social networking sites.[51]

Members of the Millennial generation (those born between 1983 and 2000) are also among those most attracted to the sharing economy, using online services to rent anything from clothes to vacation apartments.[52] According to one recent summary of trends in the sharing economy: "Millennials [are] more likely to feel positive about the idea of sharing, more open to trying it, and more optimistic about its promise for the future."[53]

Not coincidentally, Millennials have been the most likely to report having used these new, technology-enabled transportation services. Millennials are driving less, and according to a 2013 Zipcar study, new technology-enabled services are helping them do it.[54] A survey of users of the Capital Bikeshare system in Washington D.C. found that 55 percent of annual members and 43 percent of short-term users were between 25 and 34 years old.[55] The age demographic of bikeshare users was found to be younger than that of area bicyclists in general.[56] A 2010 study of carsharing demographics and impacts found that 38 percent of U.S. carsharing members were between 20 and 30 years of age, while an additional 30 percent were between 30 and 40 years old.[57]

mass transit system," and Loup, a car service company that runs predictable routes in various neighborhoods of San Francisco, use publicly available data and rider surveys to build ridesharing/transit routes based on where riders tend to live and commute. The goal of Bridj, in Boston, and Loup, in San Francisco, is to create living transit systems that can easily adapt to changing commuter patterns, allowing for quicker rides and the creation of new services to meet changing needs.

New varieties of services such as bikesharing are also emerging. Social Bicycles (SoBi) has taken bikesharing station technology and put it into the bikes themselves, turning any bike rack in the city into a potential bikesharing station. Riders in any of the seven U.S. cities where SoBi operates reserve bikes through the app, or on the bike itself, and can return it to any of the bike racks registered in the system.[58] In addition, SoBi riders can rent bikes for more flexible periods of time than many current bikeshare systems.

Other types of shared services are also being pioneered. Scoot Networks, now available only in San Francisco, provides riders with access to a network of electric scooters to use for running errands or just riding around town. Such services could also prove to be useful in neighborhoods of cities where topography or other barriers make bicycling challenging.

New Transportation Tools Are Available in a Growing Number of Cities

New, technology-enabled transportation services have the potential to reshape America's transportation system. Individually, these services reduce or eliminate key barriers to the use of non-driving modes of transportation. Collectively, they may make it easier for households to construct viable "car-free" or "car-light" lifestyles that are less dependent on privately owned vehicles.

The potential benefits of integrating these services are greater than the sum of the benefits of each individual service. While many Americans live in communities where they might be able to do the bulk of their travel each day by transit, by bike or on foot, they may choose to own a car mainly for particular circumstances: shuttling the kids to soccer games on a weekend morning, perhaps, or making a weekly shopping run to a supermarket that can only be reached by car. Technology-enabled services can help expand transportation options and provide a vital "safety net" for individuals and families who choose to reduce their vehicle ownership, thereby relieving one burden on household budgets. For instance, a family that would do well 95 percent of the time with one car can feel confident eliminating their second car, knowing that they have a range of options for the unusual circumstances when a second vehicle is needed.

Cities with a wide variety of transportation options enable those who wish to sell or forgo the purchase of a car to do so without sacrificing their ability to meet the needs of daily life. In this re-

port, we seek to identify the cities where technology-enabled transportation tools are making a meaningful contribution to residents' ability to live car-free or car-light lives. Specifically, we review:

- The types of services available in each city.
- The number of individual providers of those services, which indicates the presence of competition within a particular market.

This report does not assess the reach of each service within a particular city. For example, bikesharing service may be available city-wide in one city, but only in the downtown area of another. In this report, both cities would receive equal credit for having a "bikesharing" service. Additional data on the size of bikesharing and carsharing services in some cities can be found in the "Measuring for Scale and Connectivity" text box on page 26. Future research on the extent and accessibility of these services would be welcome.

We divide the cities into three categories – those with abundant choices, growing choices, and emerging choices of technology-enabled services – and tell the stories of how cities are benefiting from those services or are grappling with the challenges and opportunities they present.

Cities with Abundant Choices

Nineteen cities, with a combined population of nearly 28 million people, offer **abundant choices** when it comes to technology-enabled tools that promote shared mobility. Each of these cities has eight or more of the technology-enabled transportation services considered. They are on the frontlines of technological innovation by providing the public with open data for public transportation. All of these cities have multi-modal apps that enable passengers to use an array of transportation options on any given trip.

Austin, Texas: Pioneer of Tech-Enabled Transportation

Austin is one of the nation's fastest growing cities. According to 2013 estimates, Travis County, Texas, (of which Austin is the county seat) has seen a 9.4 percent increase in population from 2010-2013, with concurrent increases in traffic congestion.[60]

Traffic could be much worse, though. Over the last decade, the average number of vehicle-miles traveled per capita has decreased by 11 percent – from 26.2 miles per day to 23.3 miles per day.[61] Austin residents have been increasing their use of non-driving modes of travel: Capital Metro reported ridership increases in its rail, bus and carpool programs in 2013, and the city's bikeshare program recently increased the number of locations from 11 to 40 due to growing demand.[62]

Austin is the only one of the 70 cities surveyed to have each of the 11 technology-enabled transportation services reviewed in this report. And its status as a tech leader should not be surprising. Austin is home to a young, technologically savvy population, and its famous South by Southwest Festival (SXSW), with its interactive exhibitions, has contributed to the national dialogue around the potential of technology to transform urban transportation. The 2014 SXSW schedule, for example, featured sessions on crowdsourcing, social businesses, entrepreneurism and smart apps. Those tools and philosophies have been integrated into Capital Metro's innovative real-time information communications and multi-modal apps.[63] The same year,

the festival played a role in creating new transportation options in a different way, by sponsoring the kickoff of the city's bikesharing program: Austin B-cycle.

Austin has also taken the lead in services such as carsharing. Austin was the first American city to pilot Car2Go's one-way carsharing service following its success in Ulm, Germany. The program now has 300 cars located around the city, some of which are electric, and has recently launched its airport service, "theParkingSpot."[64] In this model, travelers leaving for vacation pick up a car in town, drive to the airport and park in a designated spot where the car becomes available for people arriving in the city who need a ride downtown. Once downtown, visitors and residents are able to use multi-modal apps, such as RideScout (started in Austin), to discover the variety of ways they can get around town without owning or having a car full time.

Portland, Oregon

Portland, Oregon, has a history of being a transportation pioneer. The city had one of the first community bike projects in the United States during the 1990s (The Yellow Bike Project) and was an

Table 1. Cities with "Abundant Choices" (Those with 8 or more services out of 11 surveyed)[59]

Rank	City	Number of Services Available	Number of Service Providers
1	Austin, TX	11	18
2	San Francisco, CA	10	23
3	Washington, DC	10	20
4*	Boston, MA	9	19
4*	Los Angeles, CA	9	19
4*	New York City, NY	9	19
7	Portland, OR	9	17
8*	Denver, CO	9	16
8*	Minneapolis, MN	9	16
8*	San Diego, CA	9	16
8*	Seattle, WA	9	16
12	Dallas, TX	9	14
13	Columbus, OH	9	12
14	Chicago, IL	8	17
15*	Houston, TX	8	12
15*	Miami, FL	8	12
15*	Milwaukee, WI	8	12
15*	Tampa, FL	8	12
19	Nashville, TN	8	11

** Tied for this rank.*

early adopter of modern light rail transit. Today, however, much of Portland's innovation takes place in the virtual world, in the form of open source software, open data and virtual ticketing opportunities.

Portland's TriMet was the nation's first transit agency to work with Google Transit and helped to develop GTFS (General Transit Feed Specification), the standard data format now used for sharing of scheduling data by transit agencies worldwide. The agency became a model for innovation in open data communications when it opted to build a specific website for the app developer community that allows any third party developer to access transit data as it changes.[65] This site not only saves time and money for TriMet by letting others build critical apps for them, but it also gives the public better products by encouraging outside entrepreneurs to build up-to-date and effective apps that the agency does not have the specialized personnel to build. Most recently, TriMet has shared its open source software with other transit agencies so that they are able to implement the same system.[66] In 2014, Portland became one of a small group of cities that offers mobile ticketing services on smartphones.

Cities With Growing Choices

Of the 70 cities surveyed, 35 offer **growing choices** for technology-enabled services. They have a combined population of 19 million people. Nearly all of the cities in this category (33 of 35) are home to at least one "ridesourcing" service, roughly half have bikesharing programs and every city has open static transit data available to the public. Two of the cities have virtual ticketing.

Pittsburgh, Pennsylvania

After decades of population decline, Pittsburgh is making a comeback. [68] The city is consistently ranked as one of the most livable cities in the United States, its population has stabilized according to recent Census estimates, and the city is increasingly becoming a hotbed of innovation, including in transportation. [69] City officials, businesses and residents have pushed to lower barriers to living car-free and car-light lifestyles. And while the city continues to lag behind many others in the availability of technology-enabled transportation services, those efforts are beginning to bear fruit.

Pittsburgh officials have staked out an aggressive stance on the operation of ridesourcing companies, battling with state officials to allow Lyft and Uber to operate within the city. Mayor Bill Peduto has argued for legislation that would create a new category of regulation for these services.[70] In December 2014, both companies were operating in the city under temporary licenses from the Pennsylvania Public Utilities Commission, but did not have permanent status yet.[71]

In addition to bringing ridesourcing companies to Pittsburgh, the city also has plans for a bikeshare program to begin in the spring of 2015. Funded with donations, federal highway funds and support from a corporate sponsor, the bikeshare program will start with 500 bikes in 50 stations.[72]

In 2014, the Allegheny County Port Authority, the transit agency serving Pittsburgh, announced it was in the process of expanding its real-time information service to all of its transit services, a process that will be completed by 2015.[73] Should that and other efforts succeed, Pittsburgh will join a growing number of cities whose citizens have access to a wide variety of technology-enabled transportation services.

Table 2. Cities with "Growing Choices" (Those with 5 to 7 Services Out of 11 Surveyed) [67]

Rank	City	Number of Services Available	Number of Service Providers
20	Orlando, FL	7	13
21*	Atlanta, GA	7	12
21*	Louisville, KY	7	12
21*	St. Louis, MO	7	12
24*	Baltimore, MD	7	11
24*	Cleveland, OH	7	11
24*	Kansas City, MO	7	11
24*	Newark, NJ	7	11
24*	Pittsburgh, PA	7	11
24*	Raleigh, NC	7	11
24*	Sacramento, CA	7	11
24*	Salt Lake City, UT	7	11
32*	Cincinnati, OH	7	10
32*	Memphis, TN	7	10
32*	Phoenix, AZ	7	10
35	Charlotte, NC	7	9
36	San Jose, CA	7	7
37	Philadelphia, PA	6	12
38*	Albuquerque, NM	6	11
38*	Honolulu, HI	6	11
40*	Detroit, MI	6	10
40*	Oklahoma City, OK	6	10
42*	Indianapolis, IN	6	9
42*	Las Vegas, NV	6	9
42*	San Antonio, TX	6	9
45*	Jacksonville, FL	6	8
45*	Omaha, NE	6	8
47	Des Moines, IA	6	6
48	Buffalo, NY	5	9
49*	New Orleans, LA	5	8
49*	Providence, RI	5	8
49*	Virginia Beach, VA	5	8
52	Wichita, KS	5	7
53	Richmond, VA	5	6
54	Columbia, SC	5	5

** Tied for this rank.*

Cities With Emerging Choices

Sixteen cities in our sample, with a combined population of nearly 3 million people, provide **emerging choices** when it comes to technology-enabled transportation tools. While all but one city have access to a peer-to-peer carsharing service, only two have any other form of carsharing. Nearly half have some form of ridesourcing available. None of the cities have a bikesharing program, and only two currently provide real-time transit information.

Most of the cities with emerging choices are smaller cities, along with a few larger cities that saw the vast majority of their development occur after World War II in the form of sprawl. Technology-enabled transportation services potentially have much to offer residents of these cities, but progress has been slow.

Table 3. Cities with "Emerging Choices" (Those with 4 or Fewer Services Out of 11 Surveyed)[74]

Rank	City	Number of Services Available	Number of Service Providers
55	Little Rock, AR	4	7
56*	Anchorage, AK	4	5
56*	Boise, Idaho	4	5
56*	Burlington, VT	4	5
59	Birmingham, AL	3	5
60	Wilmington, DE	3	5
61	Hartford, CT	3	4
62	Portland, ME	3	4
63	Manchester, NH	3	3
64	Riverside, CA	2	3
65*	Jackson, MS	2	2
65*	Sioux Falls, SD	2	2
67*	Billings, MT	1	1
67*	Charleston, WV	1	1
67*	Cheyenne, WY	1	1
67*	Fargo, ND	1	1

** Tied for this rank.*

Measuring for Scale and Connectivity

This report's analysis provides information about whether a type of service is available within a city. This does not include qualitative differences such as whether a city has just a few bikeshare bicycles available in the center of downtown, or a great many bikes spread throughout the city. Here, Sharon Feigon, Executive Director of the Shared-Use Mobility Center, offers some perspective on that method of evaluating options in several cities.

There are many ways to gauge the level of access to shared mobility in a particular city. Communities with a large number of mobility services, for instance, are better able to serve a wide spectrum of needs and support the growth of the transportation-service industry – but that can also depend upon where in a city those services are located or available. In addition to measuring the number of services and their locations, it can be useful to evaluate the size and scale of mobility operators.

For instance, while Austin is home to 11 types of shared transportation services – more than any other city analyzed in this report – some of those services are relatively limited in size. An analysis of publicly available data shows that Austin has 300 bikeshare bikes and 522 carshare vehicles, or about 3.8 bikes and 6.5 cars per 10,000 residents.

Meanwhile other cities with fewer services have them on a much greater scale. Chicago has eight shared mobility services, for example, but those services include 3,000 bikeshare bikes, or about 11.1 bikes per 10,000 residents. Boston also ranks below Austin with nine total services, but is home to 1,189 carshare vehicles, or approximately 19.2 per 10,000 residents.

Scale is an important consideration because shared modes work best when connected and integrated with one another, and with public transit. Providing more choices for more people throughout a community means not only offering more options but also making those choices more accessible by increasing both their density and their geographic spread. In cities with robust transportation offerings, bike, car and ridesharing services help to serve as first- and last-mile connections between transit locations and travelers' final destinations, and to increase the reach and interconnectivity of existing transit systems.

To help further explore the issues of scale and connectivity, the Shared-Use Mobility Center is in the process of developing an interactive tool that tracks the number and location of shared vehicles in key U.S. cities, and examines how they correspond to existing transit systems and service gaps.

The Shared-Use Mobility Center (SUMC) is a public-interest partnership working to foster collaboration in shared mobility (including bike-sharing, car-sharing, ride-sharing and more) and help connect the growing industry with transit agencies, cities and communities across the nation. Through piloting programs, conducting new research and providing advice and expertise to cities and regions, SUMC hopes to extend the public benefits of shared mobility for all. For more information on the Shared-Use Mobility Center, visit sharedusemobilitycenter.org.

SHARED-USE MOBILITY CENTER

Infrastructure and Transit Service Are Critical Tools for Car-Free and Car-Light Living

The presence of technology-enabled services is just one ingredient in making a city amenable to car-free and car-light living. Transit service is often the backbone of car-free or car-light lifestyles, while the ability to access key services and amenities on foot or by bike makes such lifestyles both more possible and more appealing.

The cities that rank at the top of our survey of technology-enabled transportation tools vary a great deal in their friendliness to transit, bicycling and walking. Walk Score's measurements of transit, pedestrian and bicycling accessibility provide a rough idea of how these cities compare. (See Table 4.)

Table 4. Walk Score, Transit Score and Bike Score for Top Cities with the Greatest Number of Innovative Transportation Tools (Scale of 0 to 100)[75]

Innovative Transportation Index Rank	City	Walk Score	Transit Score	Bike Score
1	Austin, TX	35	33	45
2	San Francisco, CA	84	80	70
3	Washington, D.C.	74	70	65
4*	Boston, MA	80	75	68
4*	Los Angeles, CA	64	50	54
4*	New York City, NY	88	81	62
7	Portland, OR	63	50	70
8*	Denver, CO	56	47	70
8*	Minneapolis, MN	65	58	79
8*	San Diego, CA	49	36	48
8*	Seattle, WA	71	57	64

** Tied for this rank.*

Of the 11 cities with at least nine technology-enabled transportation services in our survey, only three have a Walk Score, Transit Score or Bike Score below 50. Both Austin, the nation's leader for tech-enabled services, and San Diego score less than 50 on all three measures, while Denver has a Transit Score below 50. Several other cities – including San Francisco, New York and Boston – excel in one or more measures.

This brief review suggests that tech-enabled tools can enhance the effectiveness of the transportation system in cities that are already well-positioned to support car-light lifestyles, while also filling an important gap in growing cities whose urban form and lack of high-quality transit would otherwise leave most residents fully dependent on cars.

Governments Should Encourage Expansion of New Transportation Services

New, technology-enabled transportation services have the potential to provide more Americans with the freedom to adopt car-free or car-light lifestyles – reducing transportation costs for them and reducing congestion and pollution for the rest of us. That is increasingly what city dwellers – and Millennials especially – say they want. These services individually help travelers, but more importantly, they work together to become more than the sum of their parts.

While private industry has a large role to play, the full potential of these tools will only be realized if policymakers take appropriate steps to integrate them into a broader view of a multifaceted transportation system.

Specifically, governments and transit agencies should consider the following:

- **Expanding access to cellular networks, Wi-Fi, and electric outlets** in transit stations, and aboard transit vehicles. These steps can assure riders that they will have access to trip planners and real-time information while traveling, and enable those who wish to use electronic devices to remain connected while in travel.
- **Providing public access to transit data,** including static and real-time information. By providing open data, rather than developing their own apps, agencies can allow for the creation of a variety of innovative apps at minimal cost.

- **Expanding data available to the public.** When negotiating regulatory arrangements with providers of new transportation services, public officials should insist on the sharing of service data, allowing the impact of the services to be better understood and helping public officials to integrate these services into transportation plans. In January 2015, Uber announced that it would share more of its data with local governments in the hopes that it will lead to a better understanding of traffic congestion or areas that lack sufficient public transportation.[76] Other companies should take similar steps in order to ensure that city planners have access to the most up-to date information when planning for transportation investment.
- **Encourage complementarities between public transportation and new mobility tools**. Creating access to technology-enabled services in transportation "hubs" near transit stations can help users make "first mile/last mile" connections between transit stations and their homes or businesses. Allocating special parking for carshare and bikeshare services would give users confidence that these mobility tools will be a stable option for getting to and from transit stations. Additionally, developing common payment systems for various shared-use modes, engaging in cross-promotions (such as discounted carshare rates for transit users), and providing real-time multi-modal information online and at transit stops can help create a seamless transportation network that takes full advantage of the strengths of each new technology-enabled tool.
- **Clarifying regulations on new services**. Local governments should adopt clear regulations for new services such as "ridesourcing" that protect the public but allow those services to operate.
- **Implementing electronic ticketing systems** by smartphone for services where such systems may be more efficient and cost-effective than traditional methods of fare collection.
- **Integrating technology-enabled transportation tools into transportation planning**. Local and state governments should investigate the potential for technology-enabled services to address transportation challenges such as traffic congestion and parking availability in new ways.
- **Adjusting planning and zoning requirements to accommodate new tools**. Local governments should adopt parking policies that support carsharing, such as reduced parking costs for carshare vehicles at curbsides and public garages, heightened enforcement to prevent illegal parking of non-carshare vehicles in carsharing spaces, and policies that enable one-way carsharing.[77] Cities and states should consider extending incentives – such as relaxation of minimum parking requirements – to developers who make available space for shared vehicles.
- **Exploring the potential of new tools to meet the mobility needs of those currently poorly served by the transportation system**, including the young, the old, the disabled and those in low-income households.

- **Studying the effects of new transportation tools – both individually and in combination – and incorporating the findings into transportation models.** Technology-enabled transportation services create new options and conditions that have not yet been factored into transportation modeling and planning. Governments at all levels should fund studies of the implications of these technologies for transportation planning and ensure that these technologies are factored into transportation models.

- **Adopting open data and open source software policies** in conformity with federal mandates, including President Obama's executive order calling for open data sets and machine-readable government data.[78] This benefits not only transit agencies and other governmental and quasi-governmental agencies, but also developers who want to integrate that data into apps and services, as well as current and prospective users of those apps and services.

Using New Technology to Expand Transportation to New Communities

Technology-enabled transportation services have, to date, been largely available in dense urban areas. But many Americans in suburbs and smaller cities could benefit from these services.

Ridesourcing companies, such as Lyft and Uber, have already moved into a number of suburban areas such as those surrounding Chicago.[79] In Portland, Oregon, TriMet teamed up with Zipcar to provide carsharing opportunities for commuters from the suburbs.[80] Those leaving the suburbs can pick up a car to drive to the transit station, and commuters from the city can pick it up from the station and drive to work. The biggest obstacle to this model is the time the cars spend resting during the day at the commuters' workplace – time that cuts down on revenue. A model attempted in Austria matched local businesses that did not want the cost of owning a fleet, but needed a vehicle for occasional deliveries or errands, with the cars left by commuters to employ them during the day.[81]

In areas with less density, an adaptation of the model being implemented by Bridj in the Boston area could use innovation in data collection and organization to revamp local bus services. Potential passengers could insert their destination and the time they would like to travel, and bus technologies could create new, "on-demand" routes to serve them.[82] Rather than having fixed stops that people must seek out, the bus stops would change according to peak demand and efficiency. This technology could allow rural and suburban areas to attract more people to transit.

Methodology

The goal of this report is to document the availability of certain technology-enabled transportation services in the largest cities in America. In doing so, this report makes clear that these technologies and services are rapidly expanding throughout the country, even beyond those cities known for being traditional transportation hubs.

Determining Cities and Services to Evaluate

The list of cities to be surveyed started with the primary cities in the top 50 most populous Metropolitan Statistical Areas in the United States, according to the U.S. Census Bureau's 2013 American Community Survey 1-Year Estimates. If a state did not have a city included in that list, its largest city – according to the U.S. Census Bureau's 2011-2013 American Community Survey 3-Year Estimates – was added to the list to be surveyed. For a complete list of cities, see the Appendix.

To determine the providers of innovative transportation services in each city, private companies and transit agencies were reviewed. Private companies were found based on Internet searches; searches of app stores for Androids and iPhones; and lists of companies mentioned in previous research work. This field changes rapidly, and as such, there are companies that provide, or used to provide, these services that are not listed in this report.

Every effort was made to find not only those companies with a nationwide footprint, but also local providers who may offer services in only one city.

Data collection for this report had a

cut-off date of December 31, 2014. As a result, any service or company launch that happened after this time is not included.

Researching the Services

Ridesourcing services: The companies Lyft, Uber and Sidecar were chosen. Cities in which their services are currently available were determined from the lists provided on their respective websites. These companies are currently involved in legal battles around the country over permits to operate. This report did not seek to determine whether these companies are or are not legally operating in individual cities.

Carsharing services: This category is divided into two sections: fleet-based and peer-to-peer. The fleet-based section is further divided into two subsections: round-trip and one-way services.

Round-trip services: The companies Zipcar, Enterprise and Hertz 24/7 were surveyed. In addition, several cities have local companies or organizations that provide these services. The list of cities in which they operate was determined from their websites.

One-way services: The company Car2Go was the only company we found offering services in multiple cities. Zipcar's testing of one-way services in Boston and DriveNow's testing in San Francisco were counted. The locations in which Car2Go operates were determined from the company's website.

Peer-to-peer services: RelayRides, Getaround, FlightCar and JustShareIt were surveyed. Peer-to-peer networks are more widely available, mostly likely due to the low capital costs associated with their start up. If a city had a peer-to-peer carsharing network that had cars available at the time of research, we counted the service as existing there.

RelayRides' locations were found on the company's website under the tab "Rent Cars In Your Neighborhood." Getaround's locations were found on the company's website under the tab "cities." Flightcar's locations were found by going to the home page, and clicking on the down arrow in the box "Location." JustShareIt's locations were found by going to the company's home page and looking at the cities listed under "Featured Cities."

Ridesharing Services: The companies Zimride and Carma were surveyed. Zimride's locations can be found on the company's home page listed as "Now Serving…" Carma's locations can be found at the bottom of the home page listed under "Locations."

Taxi hailing services: The companies Flywheel and Curb were surveyed. Flywheel's locations were found on their website under the tab "Locations." Curb's locations were found on the company's website under the tab "Cities."

Bikesharing services: Due to the amount of physical and public infrastructure required for a bikesharing network, cities usually have only one, city-wide network. There have historically been two well-known companies that provide the infrastructure for city bikesharing networks: Motivate (formerly Alta Bicycle Share) and B-Cycle. Cities with bikesharing programs operated by these two companies were found by searching their respective websites. Alta's locations can be found under the tab "Locations" and B-Cycle's locations can be found under the tab "Locations & Rates." To supplement those findings, Google was used to search "[City Name]" and "Bike sharing" to find if they had a bikeshare program.

Static transit data: There are many apps that provide trip planning/schedule information for major cities. Google Transit, HopStop and transit agencies

listed on the GTFS Data Exchange and Google Transit Data feed as providing information publicly were chosen as representative of the field.

The best case scenario is when transit agencies provide schedule and route information publicly and in an open data format. In other cases, developers can get the information elsewhere (by sourcing it from schedule files on transit agencies' websites for example).

Google Transit's locations can be found on its website under the tab "Cities Covered." HopStop's locations can be found by going to their homepage and clicking the "change location" button, and a list of cities appears. Transit agency data availability was found by going the GTFS Data Exchange website and the Google Transit Data Feed website.

Real-time information: NextBus, Moovit, the Transit App and transit agencies' websites were surveyed. NextBus' locations were found by going to the home page, clicking on "change" in the location box and documenting the list provided. The Transit App's locations were found by going to the company's home page and clicking on the "see full list" button under the map of coverage. Transit agencies' websites were evaluated individually by looking for real-time information planners on the website.

Moovit's locations were found by going to the home page, and clicking on the tab "cities." This report recognizes that Moovit is a bit different than the other companies listed because it sources its information from riders, rather than GPS devices on the buses themselves. It is included in this report because it represents an innovative model of collecting real-time information, and a model which could be expanded into places where the transit agency is reluctant to share the information or lacking the resources to publish it.

Multi-modal apps: RideScout, City Mapper and transit agency websites were surveyed. RideScout's locations were determined by going to the company's homepage and clicking on the "Locations" tab. City Mapper's locations were determined from the list provided on the home page of the company's website. Transit agencies were evaluated individually by visiting their respective websites and searching for a multi-modal app embedded into the site.

Virtual ticketing apps: Virtual ticketing apps are tightly connected to transit agencies since they involve payment of fares. Thus far, cities with virtual ticketing have only one provider of that service. As a result, we evaluated the presence of this service by going to individual transit agency websites and searching for the tool.

Ranking the Cities

This report discusses the availability of these services not only individually but also in the context of each other: Having a larger number of different services offers more choices to residents of these cities. As such, cities with more services were ranked higher.

Looking at the number of companies providing these types of services can also provide a view of residents' transportation options. If a particular kind of service is offered by competing companies, consumers have more choices. The number of companies offering services was used as a secondary ranking factor: Among cities with the same number of services available, those with more providers are ranked higher.

Appendix: Availability of Technology-Enabled Transportation Services by City[83]

			RIDESOURCING			ROUND-TRIP CARSHARING				ONE-WAY CARSHARING		PEER-TO-PEER CARSHARING			
Rank	City	City Population	Lyft	Uber	Sidecar	Zipcar	Enterprise	Hertz 24/7	City Specific[i]	Car2Go	Other[ii]	RelayRides	Getaround	Flightcar	JustShareIt
1	Austin, TX	885,400	YES	YES	NO	YES	NO	NO	NO	YES	NO	YES	YES	YES	NO
2	San Francisco, CA	837,442	YES	YES	NO	YES	NO	NO	YES	NO	YES	YES	YES	YES	YES
3	Washington, DC	646,449	YES	YES	YES	YES	YES	NO	NO	YES	NO	YES	NO	YES	NO
4*	Boston, MA	645,966	YES	YES	YES	YES	YES	NO	NO	NO	YES	YES	NO	YES	NO
4*	Los Angeles, CA	3,884,307	YES	YES	NO	YES	NO	NO	YES	YES	NO	YES	NO	YES	YES
4*	New York City, NY	8,405,837	YES	YES	NO	YES	YES	YES	YES	YES	NO	NO	NO	NO	YES
7	Portland, OR	609,456	NO	YES	NO	YES	NO	NO	NO	YES	NO	YES	YES	NO	YES
8*	Denver, CO	649,495	YES	YES	NO	YES	YES	YES	YES	YES	NO	YES	NO	NO	NO
8*	Minneapolis, MN	400,070	YES	YES	NO	YES	YES	NO	YES	YES	NO	YES	NO	NO	NO
8*	San Diego, CA	1,355,896	YES	YES	YES	YES	NO	NO	NO	YES	NO	YES	YES	NO	NO
8*	Seattle, WA	652,405	YES	YES	NO	YES	NO	NO	NO	YES	NO	YES	NO	YES	NO
12	Dallas, TX	1,257,676	YES	YES	NO	YES	NO	NO	NO	NO	NO	YES	NO	YES	NO
13	Columbus, OH	822,553	YES	YES	NO	YES	NO	NO	NO	YES	NO	YES	NO	NO	NO
14	Chicago, IL	2,718,782	YES	YES	YES	YES	YES	NO	NO	NO	NO	YES	YES	NO	YES
15*	Houston, TX	2,195,914	YES	YES	NO	YES	NO	NO	NO	NO	NO	YES	NO	NO	NO
15*	Miami, FL	417,650	YES	YES	NO	YES	NO	NO	NO	YES	NO	YES	NO	NO	YES
15*	Milwaukee, WI	599,164	YES	YES	NO	YES	NO	NO	NO	NO	NO	YES	NO	NO	NO
15*	Tampa, FL	352,957	YES	YES	NO	YES	YES	NO	NO	NO	NO	YES	NO	NO	NO
19	Nashville, TN	634,464	YES	YES	NO	YES	YES	NO	NO	NO	NO	YES	NO	NO	NO
20	Orlando, FL	255,483	YES	YES	NO	YES	NO	YES	NO	NO	NO	YES	NO	NO	NO
21*	Atlanta, GA	447,841	YES	YES	NO	YES	YES	NO	NO	NO	NO	YES	NO	NO	NO
21*	Louisville, KY	609,893	YES	YES	NO	YES	YES	NO	NO	NO	NO	YES	NO	NO	NO
21*	St. Louis, MO	318,416	YES	YES	NO	YES	YES	NO	NO	NO	NO	YES	NO	NO	NO
24*	Baltimore, MD	622,104	YES	YES	NO	YES	NO	NO	NO	NO	NO	YES	NO	NO	NO
24*	Cleveland, OH	390,113	YES	YES	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO
24*	Kansas City, MO	467,007	YES	YES	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO
24*	Newark, NJ	278,427	YES	YES	NO	YES	NO	NO	NO	NO	NO	YES	NO	NO	NO
24*	Pittsburgh, PA	305,841	YES	YES	NO	YES	NO	NO	NO	NO	NO	YES	NO	NO	NO
24*	Raleigh, NC	431,746	YES	YES	NO	YES	NO	NO	NO	NO	NO	YES	NO	NO	NO
24*	Sacramento, CA	479,686	YES	YES	NO	YES	NO	NO	NO	NO	NO	YES	NO	NO	NO
24*	Salt Lake City, UT	191,180	YES	YES	NO	YES	YES	NO	NO	NO	NO	YES	NO	NO	NO
32*	Cincinnati, OH	297,517	YES	YES	NO	YES	NO	NO	NO	NO	NO	YES	NO	NO	NO
32*	Memphis, TN	653,450	YES	YES	NO	YES	NO	NO	NO	NO	NO	YES	NO	NO	NO
32*	Phoenix, AZ	1,513,367	YES	YES	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO
35	Charlotte, NC	792,862	YES	YES	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO
36	San Jose, CA	952,576	NO	NO	NO	YES	NO	NO	NO	NO	NO	YES	NO	NO	NO
37	Philadelphia, PA	1,553,165	NO	YES	NO	YES	YES	NO	NO	NO	NO	YES	NO	YES	NO
38*	Albuquerque, NM	556,495	YES	YES	NO	YES	YES	NO	NO	NO	NO	YES	NO	NO	NO
38*	Honolulu, HI	347,884	YES	YES	NO	YES	YES	NO	NO	NO	NO	YES	NO	NO	NO
40*	Detroit, MI	688,701	YES	YES	NO	YES	NO	NO	NO	NO	NO	YES	NO	NO	NO
40*	Oklahoma City, OK	610,613	YES	YES	NO	NO	NO	YES	YES	NO	NO	YES	NO	NO	NO
42*	Indianapolis, IN	843,393	YES	YES	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO
42*	Las Vegas, NV	603,488	NO	YES	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO
42*	San Antonio, TX	1,409,019	YES	YES	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO
45*	Jacksonville, FL	842,583	YES	YES	NO	YES	NO	NO	NO	NO	NO	YES	NO	NO	NO
45*	Omaha, NE	434,353	YES	YES	NO	YES	NO	NO	NO	NO	NO	YES	NO	NO	NO
47	Des Moines, IA	207,510	NO	YES	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO
48	Buffalo, NY	261,325	NO	NO	NO	YES	NO	NO	YES	NO	NO	NO	NO	NO	NO
49*	New Orleans, LA	378,715	NO	YES	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO
49*	Providence, RI	177,994	YES	YES	NO	YES	NO	NO	NO	NO	NO	YES	NO	NO	NO
49*	Virginia Beach, VA	448,479	YES	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO
52	Wichita, KS	386,552	NO	YES	NO	YES	NO	NO	NO	NO	NO	YES	NO	NO	NO
53	Richmond, VA	210,309	NO	YES	NO	YES	NO	NO	NO	NO	NO	YES	NO	NO	NO
54	Columbia, SC	133,358	NO	YES	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO
55	Little Rock, AR	724,385	NO	YES	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO
56*	Anchorage, AK	300,950	NO	YES	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO
56*	Boise, Idaho	214,237	NO	YES	NO	YES	YES	NO	NO	NO	NO	YES	NO	NO	NO
56*	Burlington, VT	42,282	NO	YES	NO	NO	NO	NO	YES	NO	NO	YES	NO	NO	NO
59	Birmingham, AL	212,113	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO
60	Wilmington, DE	71,292	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO
61	Hartford, CT	124,775	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO
62	Portland, ME	66,214	NO	YES	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO
63	Manchester, NH	110,378	NO	YES	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO
64	Riverside,CA	316,619	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO
65*	Jackson, MS	172,638	NO	YES	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO
65*	Sioux Falls, SD	164,676	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO
67*	Billings, MT	109,059	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO
67*	Charleston, WV	51,400	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
67*	Cheyenne, WY	62,448	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO
67*	Fargo, ND	113,658	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO
	Number of Cities with Each Service		59			45				13		68			

i "City-specific" round-trip carsharing companies are: in San Francisco, City CarShare; in Los Angeles, Hubber; in New York, NY, Carpingo; in Denver, eGo; in Minneapolis, Hourcar; in Oklahoma City, TimeCar; in Buffalo, Buffalo CarShare.

ii "Other" one-way carsharing companies are: in San Francisco, DriveNow; in Boston, Zipcar One>Way.

	RIDESHARING		TAXI HAILING		BIKESHARING	OPEN STATIC DATA			REAL-TIME INFORMATION				MULTI-MODAL APPS			VIRTUAL TICKETING		
City	Zimride	Carma	Curb	Flywheel	Municipal/ Private	Google Transit	HopStop	GTFS	NextBus	Moovit	Transit App	Transit Authority	Ridescout	CityMapper	Transit Authority Apps	Transit Authority App	Number of Services Available	Number of Service Providers
Austin, TX	NO	YES	YES	NO	YES	YES	YES	YES	NO	YES	YES	YES	YES	NO	NO	YES	11	18
San Francisco, CA	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	NO	NO	10	23
Washington, DC	YES	NO	YES	NO	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	NO	NO	10	20
Boston, MA	NO	NO	NO	NO	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	NO	YES	9	19
Los Angeles, CA	YES	NO	YES	YES	NO	YES	YES	YES	YES	YES	YES	YES	YES	NO	NO	NO	9	19
New York City, NY	YES	NO	NO	NO	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	NO	NO	9	19
Portland, OR	NO	NO	YES	NO	NO	YES	YES	YES	YES	YES	YES	YES	YES	NO	YES	YES	9	17
Denver, CO	NO	NO	YES	NO	YES	YES	YES	YES	YES	YES	NO	NO	YES	NO	NO	NO	9	16
Minneapolis, MN	NO	NO	YES	NO	YES	YES	YES	YES	NO	YES	YES	YES	YES	NO	NO	NO	9	16
San Diego, CA	NO	NO	YES	NO	YES	YES	YES	YES	NO	YES	YES	YES	YES	NO	NO	NO	9	16
Seattle, WA	NO	NO	YES	YES	YES	YES	NO	YES	YES	YES	YES	YES	YES	NO	NO	NO	9	16
Dallas, TX	NO	NO	YES	NO	YES	YES	YES	YES	NO	YES	NO	YES	YES	NO	NO	YES	9	14
Columbus, OH	NO	NO	YES	NO	YES	YES	YES	YES	NO	YES	NO	NO	YES	NO	NO	NO	9	12
Chicago, IL	NO	NO	YES	NO	YES	YES	NO	YES	NO	YES	YES	YES	YES	YES	NO	NO	8	17
Houston, TX	NO	NO	YES	NO	YES	YES	YES	YES	NO	YES	YES	NO	YES	NO	NO	NO	8	12
Miami, FL	NO	NO	NO	NO	YES	YES	NO	YES	NO	YES	NO	YES	YES	NO	NO	NO	8	12
Milwaukee, WI	NO	NO	YES	NO	YES	YES	YES	YES	NO	YES	YES	NO	YES	NO	NO	NO	8	12
Tampa, FL	NO	NO	YES	NO	YES	YES	NO	YES	NO	YES	YES	NO	YES	NO	NO	NO	8	12
Nashville, TN	NO	NO	YES	NO	YES	YES	YES	NO	NO	YES	NO	NO	YES	NO	NO	NO	8	11
Orlando, FL	NO	NO	YES	NO	YES	YES	YES	NO	YES	YES	YES	YES	NO	NO	NO	NO	7	13
Atlanta, GA	NO	NO	YES	NO	NO	YES	NO	YES	NO	YES	YES	YES	YES	NO	NO	NO	7	12
Louisville, KY	NO	NO	NO	NO	YES	YES	YES	YES	NO	YES	YES	NO	YES	NO	NO	NO	7	12
St. Louis, MO	NO	NO	YES	NO	NO	YES	YES	YES	NO	YES	NO	YES	YES	NO	NO	NO	7	12
Baltimore, MD	NO	NO	YES	NO	NO	YES	YES	YES	YES	YES	NO	NO	YES	NO	NO	NO	7	11
Cleveland, OH	NO	NO	YES	NO	YES	YES	YES	YES	NO	YES	NO	YES	YES	NO	NO	NO	7	11
Kansas City, MO	NO	NO	YES	NO	YES	YES	YES	YES	NO	YES	NO	YES	YES	NO	NO	NO	7	11
Newark, NJ	NO	NO	NO	NO	NO	YES	YES	YES	NO	YES	YES	NO	YES	NO	NO	YES	7	11
Pittsburgh, PA	NO	NO	YES	NO	NO	YES	YES	NO	NO	YES	YES	YES	YES	NO	NO	NO	7	11
Raleigh, NC	NO	NO	YES	NO	NO	YES	YES	YES	NO	YES	NO	YES	YES	NO	NO	NO	7	11
Sacramento, CA	NO	NO	NO	YES	NO	YES	YES	YES	NO	YES	NO	YES	YES	NO	NO	NO	7	11
Salt Lake City, UT	NO	NO	NO	NO	YES	YES	YES	NO	NO	YES	YES	NO	YES	NO	NO	NO	7	11
Cincinnati, OH	NO	NO	NO	NO	YES	YES	YES	YES	NO	YES	NO	NO	YES	NO	NO	NO	7	10
Memphis, TN	NO	NO	YES	NO	NO	YES	YES	NO	NO	YES	NO	YES	YES	NO	NO	NO	7	10
Phoenix, AZ	NO	NO	YES	NO	YES	YES	YES	YES	NO	YES	NO	NO	YES	NO	NO	NO	7	10
Charlotte, NC	NO	NO	YES	NO	YES	YES	YES	NO	NO	NO	NO	YES	YES	NO	NO	NO	7	9
San Jose, CA	NO	NO	YES	NO	YES	YES	NO	NO	NO	NO	NO	YES	YES	NO	NO	NO	7	7
Philadelphia, PA	NO	NO	NO	NO	NO	YES	YES	YES	NO	YES	YES	YES	YES	NO	NO	NO	6	12
Albuquerque, NM	NO	NO	NO	NO	NO	YES	YES	YES	NO	YES	NO	YES	YES	NO	NO	NO	6	11
Honolulu, HI	NO	NO	YES	NO	NO	NO	YES	YES	NO	YES	YES	YES	NO	NO	NO	NO	6	11
Detroit, MI	NO	NO	NO	NO	NO	YES	YES	YES	NO	YES	YES	NO	YES	NO	NO	NO	6	10
Oklahoma City, OK	NO	NO	NO	NO	YES	YES	YES	NO	NO	YES	NO	YES	NO	NO	NO	NO	6	10
Indianapolis, IN	NO	NO	NO	NO	YES	YES	YES	YES	NO	YES	NO	NO	YES	NO	NO	NO	6	9
Las Vegas, NV	NO	NO	NO	NO	YES	YES	YES	YES	NO	YES	NO	YES	YES	NO	NO	NO	6	9
San Antonio, TX	NO	NO	NO	NO	YES	YES	YES	YES	NO	YES	NO	NO	YES	NO	NO	NO	6	9
Jacksonville, FL	NO	NO	YES	NO	NO	NO	YES	NO	YES	YES	NO	NO	NO	NO	NO	NO	6	8
Omaha, NE	NO	NO	NO	NO	YES	YES	YES	NO	NO	NO	NO	NO	YES	NO	NO	NO	6	8
Des Moines, IA	NO	NO	YES	NO	YES	YES	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO	6	6
Buffalo, NY	NO	NO	YES	NO	NO	YES	YES	YES	NO	YES	NO	YES	YES	NO	NO	NO	5	9
New Orleans, LA	NO	NO	YES	NO	NO	YES	YES	YES	NO	YES	YES	NO	NO	NO	NO	NO	5	8
Providence, RI	NO	NO	NO	NO	NO	YES	YES	YES	NO	NO	NO	NO	YES	NO	NO	NO	5	8
Virginia Beach, VA	NO	NO	NO	NO	NO	YES	YES	YES	NO	YES	NO	YES	YES	NO	NO	NO	5	8
Wichita, KS	NO	NO	NO	NO	NO	YES	NO	YES	NO	YES	NO	YES	NO	NO	NO	NO	5	7
Richmond, VA	NO	NO	NO	NO	NO	YES	YES	NO	NO	NO	NO	YES	NO	NO	NO	NO	5	6
Columbia, SC	NO	NO	NO	NO	NO	YES	NO	NO	NO	NO	NO	YES	NO	NO	NO	YES	5	5
Little Rock, AR	NO	NO	NO	NO	NO	YES	YES	YES	YES	YES	NO	NO	NO	NO	NO	NO	4	7
Anchorage, AK	NO	NO	NO	NO	NO	YES	NO	NO	NO	YES	NO	YES	NO	NO	NO	NO	4	5
Boise, Idaho	NO	NO	NO	NO	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	4	5
Burlington, VT	NO	NO	NO	NO	NO	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	4	5
Birmingham, AL	NO	NO	NO	NO	NO	YES	YES	YES	NO	YES	NO	NO	NO	NO	NO	NO	3	5
Wilmington, DE	NO	NO	NO	NO	NO	YES	YES	YES	NO	YES	NO	NO	NO	NO	NO	NO	3	5
Hartford, CT	NO	NO	NO	NO	NO	YES	YES	NO	NO	YES	NO	NO	NO	NO	NO	NO	3	4
Portland, ME	NO	NO	NO	NO	NO	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	3	4
Manchester, NH	NO	NO	NO	NO	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	3	3
Riverside,CA	NO	NO	NO	NO	NO	YES	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	2	3
Jackson, MS	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	2	2
Sioux Falls, SD	NO	NO	NO	NO	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	2	2
Billings, MT	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	1	1
Charleston, WV	NO	NO	NO	NO	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	1	1
Cheyenne, WY	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	1	1
Fargo, ND	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	1	1
Number of Cities with Each Service	5		34		32	66			56				47			6		

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