

# Private data islands or public data oasis?

Why cities need mandatory  
mobility APIs.

# Executive summary

Public, real-time Application Programming Interfaces (APIs) are critical pieces of data infrastructure that facilitate multimodal, multi-operator trips, promote a fair and competitive mobility marketplace, and enable the public to help determine whether a public mobility program's goals are being met.

While NGOs have drafted initial principles that promote public APIs for services that operate on public streets, there is still a lack of specific guidance about how to require these important open real-time feeds. With this policy paper, we point to specific examples as best practices for public, real-time API policies.

We also look to the future, envisioning what mobility APIs can achieve beyond simply conveying real-time availability information, with a focus on the evolution of payment APIs.

## **Our enlightened self-interest**

It's true: our app exists because of public APIs from transit agencies and mobility operators. While Transit benefits from open APIs, so do other companies — and the general public. Open transport data has led to an entire generation of consumer apps that turn real-time data into useful tools for riders. Requiring public APIs from services that operate on public streets extends a mobility tradition that's open and fair, while promoting innovation and competition.

# What are public, real-time APIs?

A public, real-time Application Programming Interface (API) allows a mobility operator to provide universal access to real-time information about their service, using a standard data format.

Translation: a transit, ridehail, bikeshare, scooter or carshare operator can use a public, real-time API to provide information about where it has vehicles available for use, or when its service is going to arrive, opening up information so potential riders can find and use the service.



# Why is this important?

There are three key policy reasons to require public, real-time APIs from transportation operators.

## **01 Integration into the transportation network to reduce private auto trips**

With public real-time APIs, information about separate modes and services can be integrated together for multimodal trips. This way, the public can easily mix-and-match options — whether that's an Uber car, a Lyft bike, a Bird scooter or a city-operated bus. Thanks to public APIs, leading transport apps like Google Maps, Citymapper and Transit support different types of multimodal trip planning, maximizing the utility of options that reduce car ownership.

## **02 Ensure a competitive marketplace**

Public real-time API requirements help harness the power of the market, providing consumers with information about competing options and helping them make better transportation decisions. Mobility operators have little incentive to show information about a competitor — you probably won't see a Lyft-owned service appear in the Uber app, for example. Public APIs help level the playing field, fostering competition and helping new, innovative entrants improve service for the public.

## **03 Public oversight of city transportation**

Public, real-time APIs are available not only to app developers, but also to the general public. Public APIs, which do not reveal personal information, can be used by civic technologists and policy advocates to help ensure that a city's mobility program is adequately serving communities of need and helping the city achieve its policy goals. Advocates in New York used Citi Bike's public API, for example, [to verify a sudden drop](#) in the number of available bikes and press for service improvements.



# What's the current state of public APIs in mobility?

Public APIs are a standard offering from North American transit agencies, thanks to the development of the General Transit Feed Specification ([GTFS](#)) beginning in 2005. Public APIs are also offered by most dock-based bikeshare systems, thanks to the General Bikeshare Feed Specification ([GBFS](#)), which was [adopted by the North American Bikeshare Association in 2015](#).

## GBFS? MDS? What's the difference?

The Los Angeles Department of Transportation (LADOT) has led the development of the [Mobility Data Specification](#) — a real-time, two-way communication between mobility operators and regulating agencies to manage operations and planning. Because MDS is not intended for use by the public or third-party apps, the MDS specification [requires a public GBFS feed be made available](#).



However, voluntary adoption of APIs by free-floating mobility services has been less consistent.

**Dockless  
bikeshare  
and scooters**

GBFS can be used to show vehicle locations in free-floating systems such as dockless bikeshare and scooter operations. Some operators, like Bird, provide GBFS feeds in some of their cities, but most operators do not consistently provide public, real-time APIs in all the cities they serve.

**Carshare**

Most carshare services have never provided a public API showing real-time vehicle availability. When they are offered, public APIs are not guaranteed. Daimler-owned car2go [provided its own public API](#) to show cars available for use, before revoking API access for transport apps in January 2018. (Under merger conditions for a Daimler-BMW joint venture [approved by the European Commission](#) in November 2018, Daimler will partially reinstate this API, offering it in six European cities, but not in North America.)

**Ridehail**

Ridehail services were relatively early adopters of APIs, starting with [Uber](#) in 2015 and [Lyft](#) in 2016. While these APIs enable real-time ETAs, pricing information, and even the ability to book a ride, Uber and Lyft have been known to discourage apps that use their APIs from also including other ridehail services.

# What's missing from existing guidance to policymakers?

An array of NGOs have offered general principles in support of public APIs or guidance on other types of mobility data, but they currently lack enough specificity about how to require public APIs.

**Oct 2017**

A consortium of transportation NGOs launched the [Shared Mobility Principles for Livable Cities](#). The project, now under the auspices of the [New Urban Mobility Alliance](#), promotes “public benefits via open data” in addition to “integration and seamless connectivity.” According to the principles, “the data infrastructure underpinning shared transport services must enable interoperability, competition and innovation, while ensuring privacy, security, and accountability... Seamless trips should be facilitated via physical connections, interoperable payments, and combined information.”

What's missing: Unfortunately, public APIs are not consistently required or available, with policy falling short of the principles agreed to by dozens of governments, NGOs, service providers and companies, including Transit, Uber, Lyft, Zipcar and Lime.

**Jul 2018**

The National Association of City Transportation Officials (NACTO) released its [Guidelines for the Regulation and Management of Shared Active Transportation](#). While it said that “at a minimum, data should be provided to the city in GBFS format,” it did not specify that GBFS feeds should be available to the public. Instead, it says, “cities shall require that companies make anonymized trip data available to the public for use in creating apps that are not affiliated with the companies or city.”

What's missing: Unlike real-time GBFS information, after-the-fact trip information is not useful to most app developers and users.





**Jan 2019**

Transportation for America released its [Shared Micromobility Playbook](#). It said that “cities should require public application program interfaces” for micromobility fleets and “strive to require and utilize an authenticated, standardized API.” Finally, it says that “real-time data on vehicle availability and operations should also be available via API for use by the city or third-party analysis platforms.”

What’s missing: The playbook focused on the needs of municipal operations managers and approved research partners, but did not specify the value in having real-time APIs available to the public and app developers.

These documents promote good principles and advance the policy discussion. But without clear, specific guidance to policymakers about what should be included in public APIs and how to secure them from operators, many regulators are not requiring them as part of their permitting or licensing programs. As a result, policymakers are missing opportunities to create a more competitive marketplace and a more deeply integrated transportation system.



# Best practices for requiring public, real-time mobility APIs

A growing number of cities are recognizing the importance of public APIs, and can serve as models for other policymakers.

In December 2018, the Chief Data Officers of 13 major U.S. cities — including Denver, Kansas City, Louisville, Pittsburgh and San Diego — signed a [Dockless Mobility Open Letter](#) from Harvard University’s Civic Analytics Network, recommending that cities require a real-time API “published directly to the public” in GBFS format.

To make it easier for the public to find this required data, the Chief Data Officers recommended that endpoints for the required GBFS feeds be posted on the government agency’s website, following the examples of [Washington, DC](#), and [Arlington County, VA](#).

## Protecting privacy

Public APIs that show the real-time availability of vehicles do not contain personally identifiable information such as user names, addresses, or IDs. They do, however, show the precise locations of vehicles available for use, along with a vehicle ID. As an additional precaution, operators can rotate or randomize vehicle IDs each time a vehicle becomes available. This prevents inferring the precise start and endpoints of trips by seeing when and where a specific vehicle ID “disappears” and then “reappears” in the data.

A wide range of cities have begun requiring public APIs as part of their dockless mobility programs. Three cities with the strongest and clearest language about public APIs are Los Angeles, Washington, DC, and Arlington, VA.

## **Los Angeles, CA**

“All permitted Operators shall provide a publicly accessible API that meets the requirements of the General Bikeshare Feed Specification. The Operator may not change the API URL without notifying the City with at least 30 days’ notice. Operators are required to make the API endpoint available for public consumption.” As part of LADOT’s Mobility Data Specification requirements, the city notes: “Any MDS compatible API... must must also provide a link to your open GBFS.”

- [LADOT Dockless On-Demand Personal Mobility Conditional Permit](#)



**Washington,  
DC**

“(1) Permit holder shall provide a publicly accessible application program interface, clearly posted on the company’s website that shows, at minimum, the current location of any dockless vehicles available for rental at all times.

(2) A smart phone-based application used to rent dockless vehicles does not qualify as a publicly accessible application program interface.

(3) Data must be provided in compliance with the Generalized Bikeshare Feed Specification (GBFS) v1.0. To account for the dockless nature of the vehicles covered by this permit, the following clarifications and modifications are accepted to the GBFS:

(a) There are no “stations” in the parlance of GBFS. As such, station\_status.json should return an empty list and station\_information.json should return an empty list;

(b) free\_bike\_status.json is required;

(c) the field “vehicle\_type” shall be added to the public API to describe the vehicle type. This may be either “bicycle,” “e-bike,” “scooter,” or another type of permitted vehicle that must be specified.

(4) The public API need not be available without authentication; however, any member of the public, including commercial entities, must be able to gain access to the data provided by the API by requesting access through a web interface. Moreover, the provider should provide access on average of at least 50 requests an hour...

(6) If the operator operates more than one type of vehicle, they must provide a separate GBFS version 1.0 API [per vehicle type].”

- [DDOT Public Right-of-Way Occupancy Permit](#)



**Arlington  
County, VA**

“(c) [Company] shall provide a publicly-accessible application program interface, clearly posted on the company’s website that shows, at minimum, the current location of any dockless vehicles available for rental at all times.

(d) A smart phone-based application used to rent dockless vehicles does not qualify as a publicly accessible application program interface.

(e) [Company] shall use the General Bikeshare Feed Specification (GBFS) as documented at <https://github.com/NABSA/gbfs/> for its devices. [Company] shall inform Arlington County of the location of the gbfs.json file on the Internet. The gbfs.json file contains the necessary information to find other files related to the GBFS data. If a token or authentication is required to view that file, the location to apply for the token must also be submitted to Arlington County.

(f) Arlington County requires that [Company] publish in a location accessible by Arlington County staff six of the GBFS v1.1 draft files. Below are the required files that must be published...”

- [Arlington County Memorandum of Agreement](#)



### Ensuring data standards are inclusive of new modes

Transportation data standards like GBFS and MDS are open, allowing data producers, consumers and regulators to collaborate so they include relevant information in usable formats.

The Mobility Data Specification (MDS) developed by LADOT, for example, is designed to be inclusive of any floating mobility service, such as bikes, scooters, and carshare. It is not, however, intended as a publicly-available data feed. Instead, MDS requires that a GBFS feed, the existing specification for public real-time bikeshare data, be made available for public use.

While GBFS was originally designed for dock-based systems, it has already been adapted for use by dockless bikeshare and scooter operators, as required by cities including Los Angeles, Washington, DC, and Arlington, VA. There are discussions underway to update GBFS so it conveys information unique to free-floating systems, such as geofenced service areas that indicate where users can and cannot conclude a trip or unlock a vehicle.



# Moving forward: Using APIs to enable multimodal payments

APIs can offer more than just real-time information about how long a rider must wait for a bus or where the nearest scooter, bikeshare, carshare vehicle is located. APIs can also enable users to sign up, book, and pay for services in whichever app is convenient for them.

The discussion around payment APIs is still evolving, but there are already a number of payment APIs in use or under development, both public and private:

## Ridehail

Ridehail services were the first to offer public APIs that included not just ETAs and estimated price but also booking, starting with [Uber](#) in 2015 and [Lyft](#) in 2016. Today, both services can be booked directly within other apps, including in Transit as part of a Transit+ trip that seamlessly combines public transport and ridehail to solve the “first mile, last mile” problem.







### **Shared Services**

Payment APIs allow Transit users to pay for and unlock bikeshare trips from 10 operators including BIXI, Bike Share Toronto, and Divvy, as well as carshare vehicles from Communauto and Pogo.

### **Transit Agencies**

As public transit operators provide mobile ticketing options and upgrade their fare collection systems, innovative agencies are increasingly looking to payment APIs as a way to make their services easier to use. Mobile payment APIs through vendors such as Masabi and Token Transit, for example, allow users to pay for transit trips using third-party apps. Larger fare collection systems like the MBTA's upcoming [AFC 2.0](#) make APIs [a requirement](#), so riders have flexibility in how they can pay for trips.

Payments are the next frontier for API development. Making it easy to pay across modes and operators will help riders compare options and take multimodal trips that are difficult to execute today.

Indeed, some governments have recognized the potential of public payment APIs to make shared mobility more attractive and reduce trips by personal automobile. As part of its transportation industry deregulation in 2016, [Finland began requiring public and private mobility operators to provide](#) “open information and payment interfaces” as a way to “promote the introduction of interoperable digital ticket and payment systems” and “pave the way for the Mobility as a Service concept.”

North American policymakers could, as Finland does, begin considering payment APIs as a necessary and required component of their transportation data infrastructure, building upon APIs that show real-time availability.

#### Using APIs to enable seamless mobility

- Real-time locations of available vehicles, prices and, if applicable, ETAs. Users must open a separate app to access the service.
- Ability for existing users to securely sign in to their account and book a trip or unlock a vehicle without needing to switch apps.
- Offer new account creation, enabling users to sign up for and use a service from within any app.



## Additional reading about APIs

[The right way to do scooter share: Build the physical and tech infrastructure to manage it — and other new transportation innovations.](#)

**NEW YORK DAILY NEWS OP-ED • JANUARY 22, 2019**

[Transit Series B: we've raised \\$17.5M to build the Switzerland of mobility: From subways to scooters, our app Transit is the open, neutral alternative to "walled garden" transport apps.](#)

**BLOG POST BY TRANSIT • NOVEMBER 5, 2018**

[Why Uber and Lyft want to create walled gardens — and why it's bad for urban mobility](#)

**DAVID ZIPPER IN FAST COMPANY • NOVEMBER 3, 2018**

[Our car-free future will be blocked by Comcast tactics: Monopoly-seeking behaviour and closed data policies will impede the shift away from cars... can our cities help prevent it?](#)

**BLOG POST BY TRANSIT • NOVEMBER 1, 2018**

