

# INTRO TO THE OPEN MOBILITY FOUNDATION, MDS, AND CDS

August 2024



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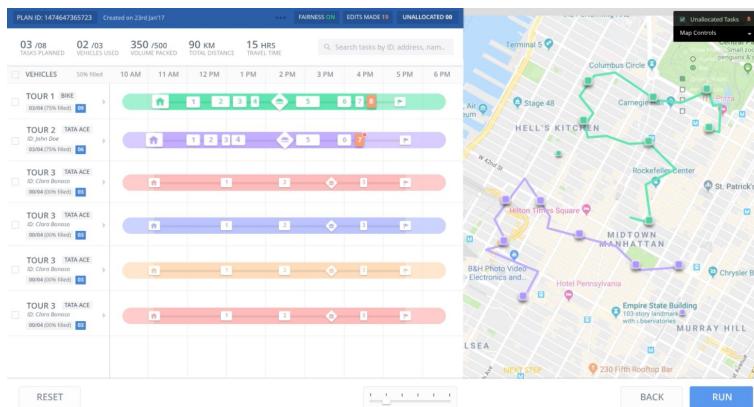
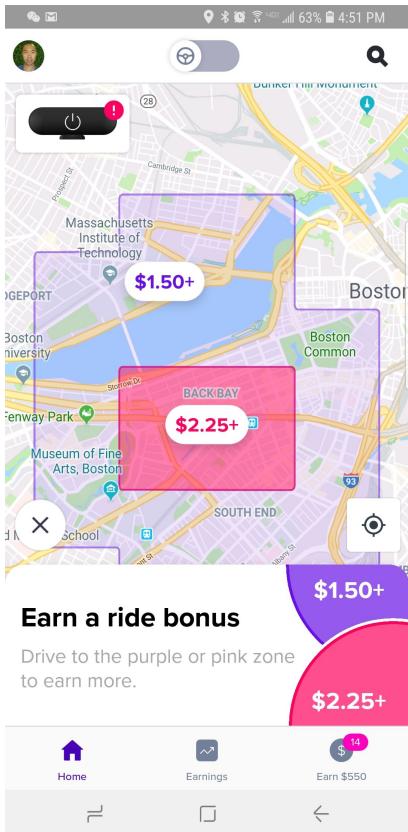
# **THE OPEN MOBILITY FOUNDATION**

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# 1900s-2000s: PHYSICAL INFRASTRUCTURE



# 2010s - 2020s: ALGORITHMS AND DIGITAL INFRASTRUCTURE



# THE OMF VISION

- Digital infrastructure to help cities manage public space for the public good
- Data standards and free open source tools
- Public/private collaboration that encourages responsible growth of new mobility services
- Cross-sector relationships and a shared vision for mobility



# OMF MEMBERS

Some of OMF's 65+ members and counting. Complete list:  
[openmobilityfoundation.org/members](http://openmobilityfoundation.org/members)



LOS ANGELES, CA



LOUISVILLE, KY



MIAMI, FL



BOGOTÁ COLOMBIA  
ALCALDÍA MAYOR  
DE BOGOTÁ D.C.  
SECRETARÍA DE MOVILIDAD



BOSTON, MA



CAMBRIDGE, MA



PITTSBURGH, PA



PORTLAND, OR



PORTLAND, OR (METRO)



MIAMI-DADE COUNTY, FL



MIAMI PARKING AUTHORITY



MINNEAPOLIS, MN



CHICAGO, IL



COLUMBUS, OH



CONTRA COSTA TRANSPORTATION AUTHORITY



PROVIDENCE, RI



SAN DIEGO ASSOCIATION OF GOVERNMENTS



SAN FRANCISCO, CA



NEW YORK, NY (TLC)



NEW YORK CITY, NY



CITY OF OMAHA PARKING & MOBILITY



DENVER, CO (DOTI)



DENVER REGIONAL COUNCIL OF GOVERNMENTS



DETROIT, MI



SAN JOSE, CA



SANTA MONICA, CA



SEATTLE, WA



OPEN MOBILITY DATA IN THE NORDICS



OSLO NORWAY



PHILADELPHIA, PA



DUBLIN IRELAND



KELOWNA, BC - CANADA



LONG BEACH, CA



SOUTH FLORIDA REGIONAL TRANSPORTATION AUTHORITY



SOUTHERN CALIFORNIA ASSOCIATION OF GOVERNMENTS

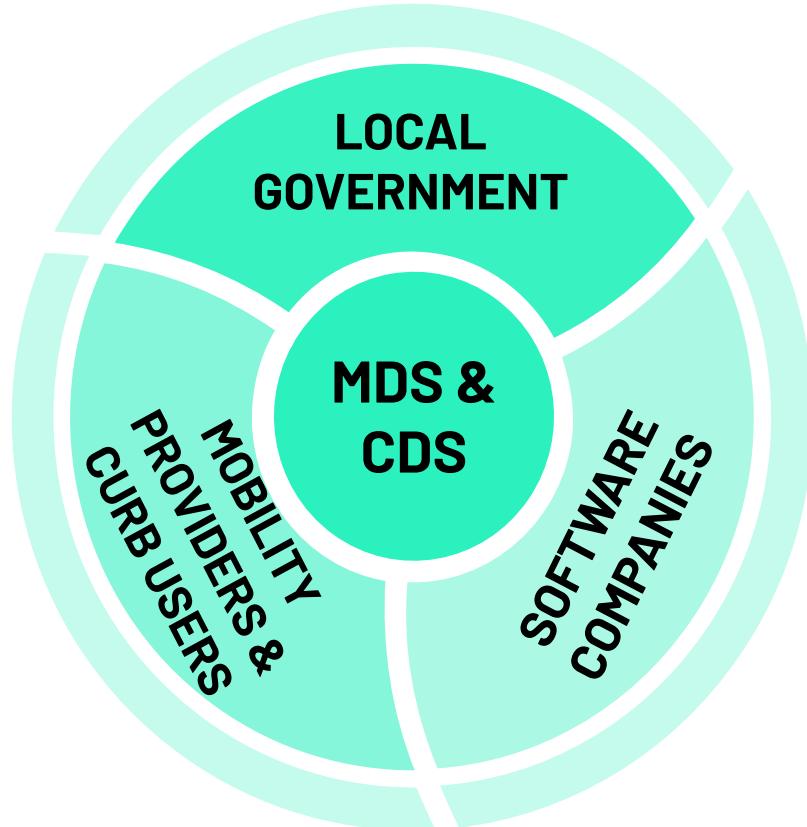


TAMPA, FL



# OMF'S OPEN APPROACH

- Technology built through public and private sector collaboration with emphasis on transparency and formal approval
- Working groups and GitHub repositories open-to-all
- More competitive markets for mobility services and software tools
- Collaboration with other open projects

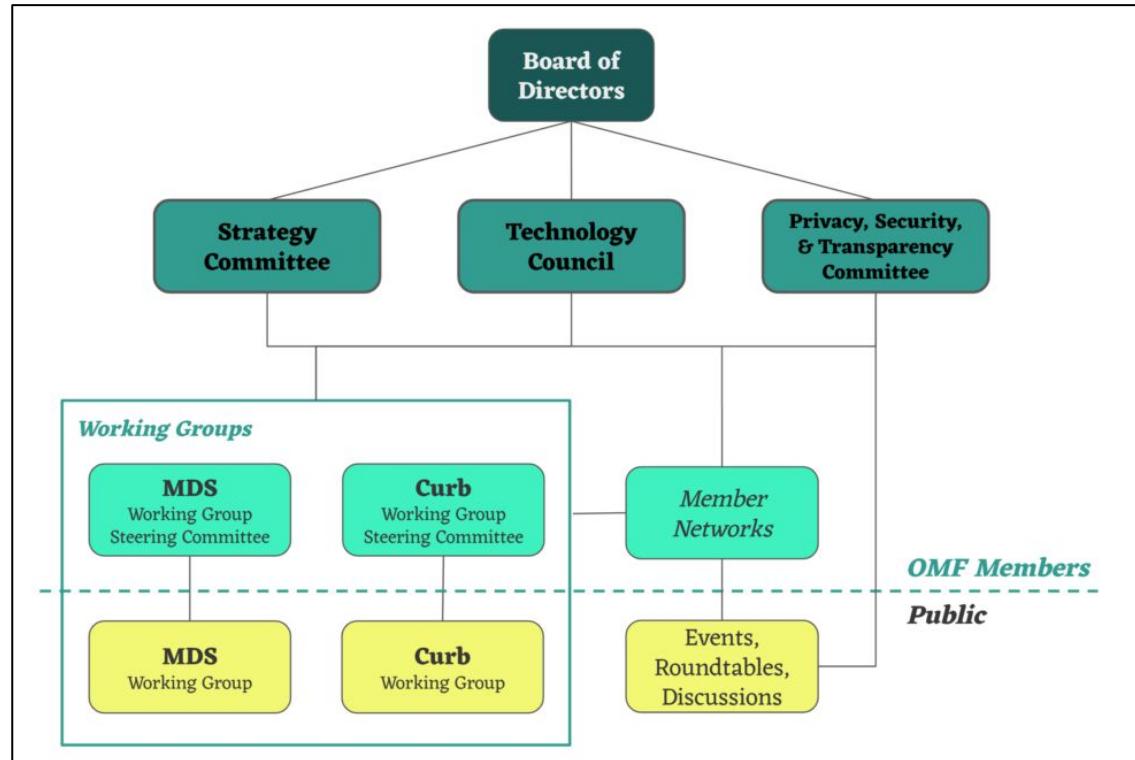


# HOW WE CO-CREATE

Governance focused on  
**transparency, consensus, and formal approval**

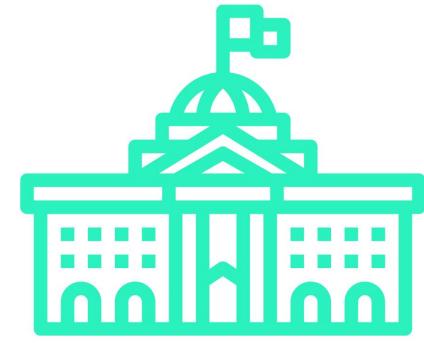
Evaluate changes based on

- Utility
- Adoption
- Simplicity
- Consensus
- Work



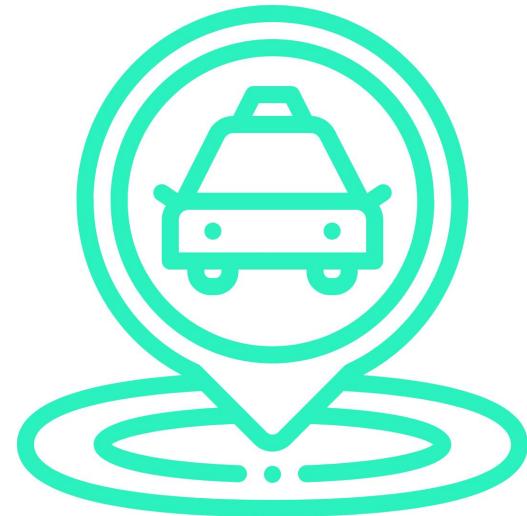
# HOW STANDARDS BENEFIT PUBLIC AGENCIES

- Allows real-time policy changes to be made to **adapt to planned events and emergencies**
- Supports policies that enable dynamic pricing, **equitable access**, and **safety** initiatives
- Accurate and timely data allow **better planning and program management**
- Digital management greatly **reduces operating costs** and staff time spent monitoring mobility programs and service providers



# HOW STANDARDS BENEFIT MOBILITY PROVIDERS

- Streamlines communication between cities and mobility providers, making it easier to **collaboratively solve problems** with data or assets
- Provides a **single reporting standard**, eliminating the need for redundant data formatting and processing
- Helps providers **scale** by offering a platform and best practices that providers can offer to new city markets



# GLOBAL OPEN SOURCE STANDARDS



Our work standardizes communication and data-sharing between public agencies and private mobility providers. This gives cities the tools and information they need to improve the safety, equity, and quality of services on their streets. Plus, it provides a consistent playbook for mobility providers.



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# MOBILITY DATA SPECIFICATION



VERSION 2.0

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# MOBILITY DATA SPECIFICATION

## AN API CONNECTING MOBILITY COMPANIES WITH LOCAL GOVERNMENTS

- 180+ cities in 35+ countries
- Ecosystem of tools for cities built on MDS
- Manages shared vehicles in the public right of way
- Scooter, bike, (robo)taxi, TNC, CTA, PHV, ride hail, delivery robot, car share

The screenshot shows the GitHub repository for the Mobility Data Specification (MDS). The repository has 56 issues, 8 pull requests, and 1 insight. The README.md file contains the MDS specification, which includes a table of contents, an 'About' section, and a 'Endpoints' section. The GitHub interface also shows 20 contributors and a file size of 23.3 KB.

**Mobility Data Specification**

**Table of Contents**

- About
- Endpoints
  - Modularity
  - GBFS Requirement
- Modes
- Versions
  - Technical Information
- Get Involved
  - Membership
- Cities Using MDS
- Providers Using MDS
- Software Companies Using MDS
- Data Privacy
- Use Cases
- Related Projects

**About**

The Mobility Data Specification (MDS), a project of the Open Mobility Foundation (OMF), is a set of Application Programming Interfaces (APIs) that helps cities better manage transportation in the public right of way, standardizing communication and data-sharing between cities and mobility providers, allowing cities to share and validate policy digitally, and enabling vehicle management and better outcomes for residents. Inspired in part by projects like GTFS and GBFS, MDS is focused on managing mobility services such as dockless scooters, bicycles, mopeds, car share, delivery robots, and passenger services.

MDS is a key piece of digital infrastructure that supports the effective implementation of mobility policies in cities around the world. For a high level overview and visuals, see the [About MDS](#) page on the OMF website.

**M D S** MOBILITY DATA SPECIFICATION

OMF OPEN MOBILITY FOUNDATION

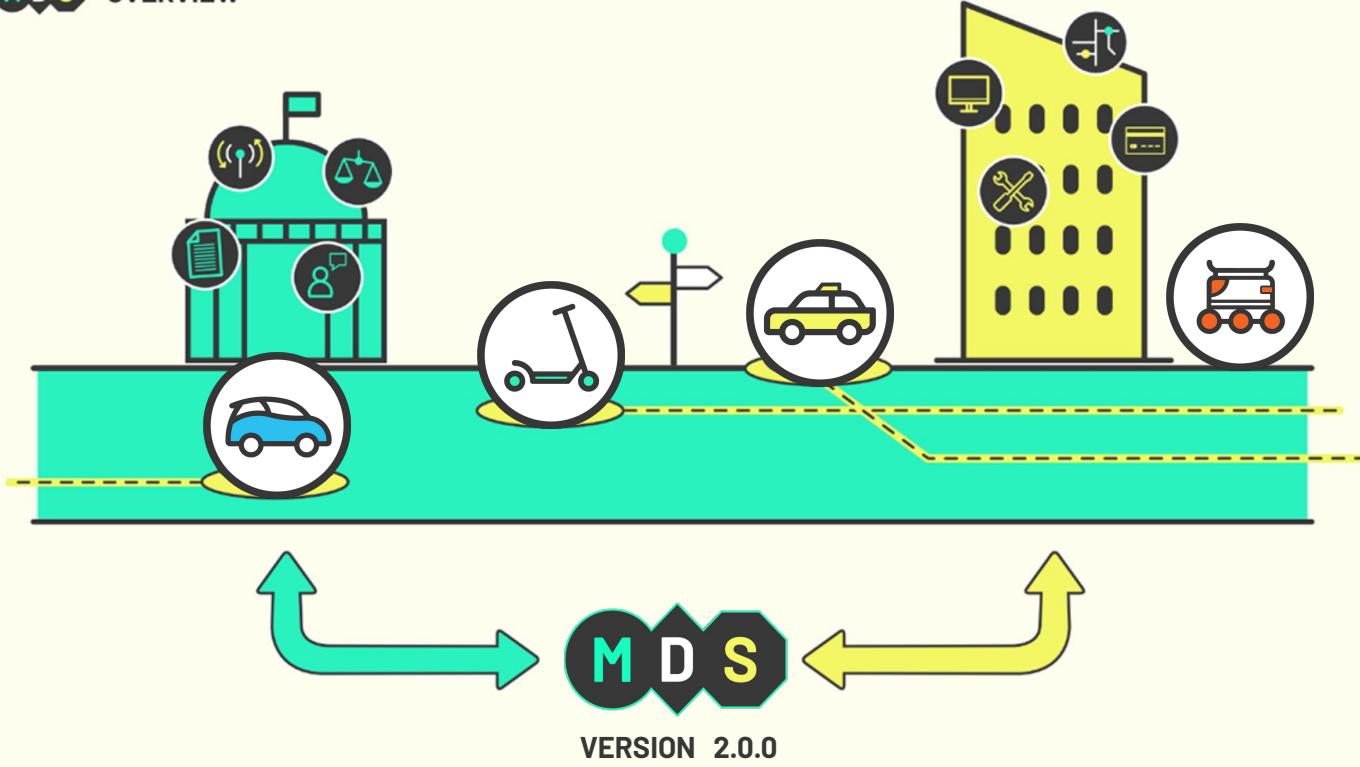
MDS is an open-source project originally created by the Los Angeles Department of Transportation (LADOT). In November 2019, stewardship of MDS and the ownership of this repository were transferred to the Open Mobility Foundation. GitHub automatically redirects any links to this repository from the [CityofLosAngeles](#) organization to the [openmobilityfoundation](#) instead. MDS continues to be used by LADOT and many other municipalities and companies.

[Top](#)

**Endpoints**



## OVERVIEW



MDS enables two-way communication between public agencies and shared mobility services operating in the right of way



MICROMOBILITY



PASSENGER  
SERVICES



CAR SHARE



DELIVERY  
ROBOTS

# MDS IN ACTION: USE CASES

Cities and public agencies around the world have been successfully using MDS to manage shared mobility programs and improve transportation systems for the public's benefit:

- Increasing equity and access
- Ensuring safety and compliance
- Infrastructure planning
- Supporting public transit

Learn more in [OMF's use case database](#)

The screenshot shows an Airtable database titled "MDS City Use Cases". The database is organized into a grid of cards, each representing a different use case. The columns represent different categories or details of the use cases.

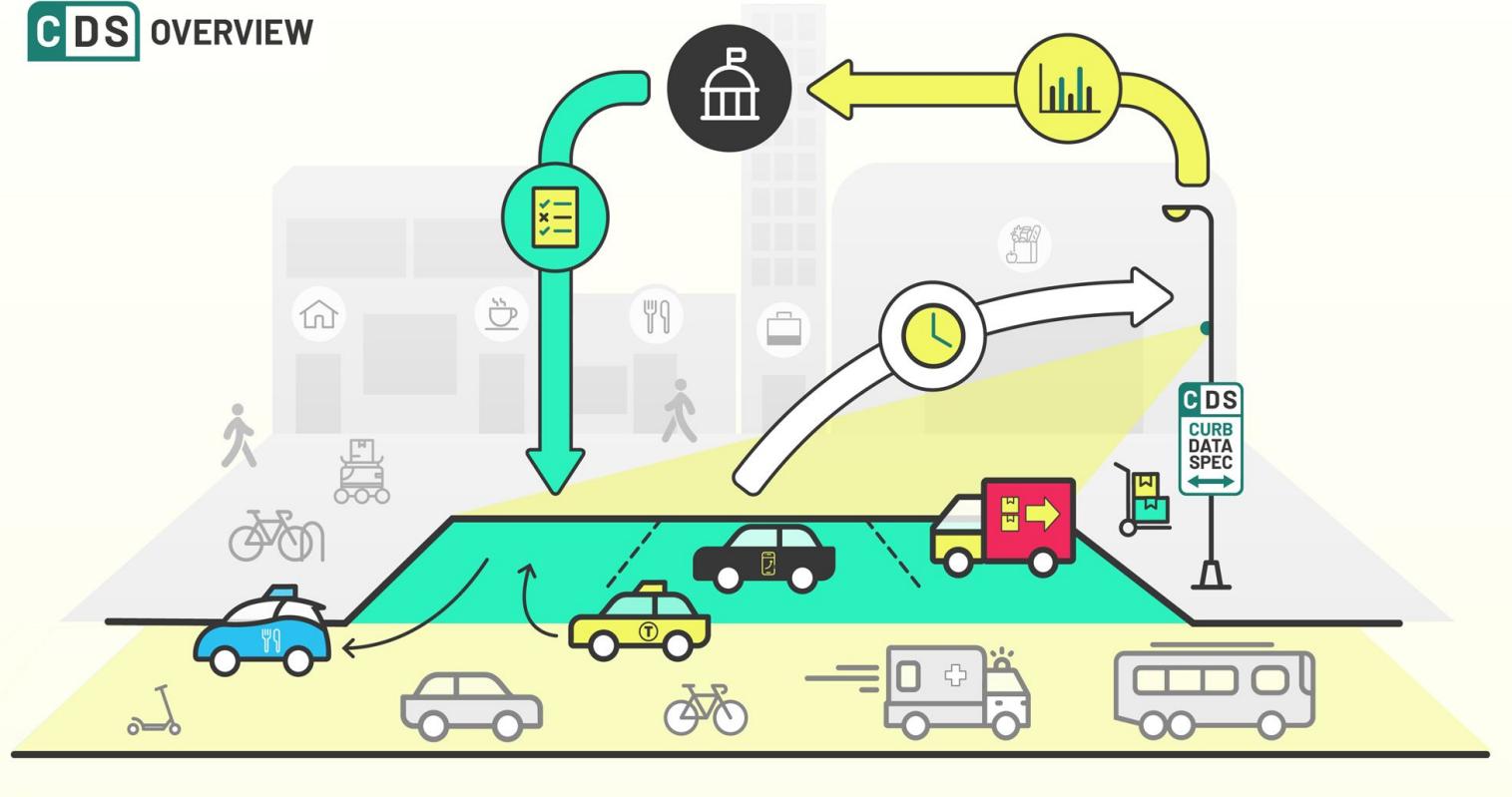
Category	Description	APIs	Provider	API PARTS	Time	CITIES
Vehicle Caps	Determine total number of devices per operator in the right of way.	Vehicle Caps	Provider: GBFS	API PARTS: Time: Historic	CITIES: Louisville, Los Angeles, Washington D	
Distribution Requirements	Ensure devices are distributed according to equity requirements.	Distribution Requirements	Provider: GBFS	API PARTS: Status Changes	CITIES: Louisville, Santa Monica, Los Angeles	
Daily Permit Fees	Calculate fees per scooter deployed/ridden per day.	Daily Permit Fees	Provider: GBFS	API PARTS: Time: Historic	CITIES: Louisville, Portland, Miami, Bogotá	
Restricted Area Rides	Find locations where devices are operating or passing through restricted areas.	Restricted Area Rides	Provider: Trip Lines	API PARTS: Trips	CITIES: Louisville, Los Angeles, Washington D	
Top Speed Calculations	Determine the average speed of a trip and ensure it meets requirements of top speed and slow area requirements.	Top Speed Calculations	Provider: GBFS	API PARTS: Trips, Location: Start/End, Location: T	CITIES: Louisville, Portland, Miami, Miami-Da	
Resident Complaints	Investigate and validate complaints from residents about operations, parking, riding, speed, etc., usually reported through 311.	Resident Complaints	Provider: GBFS	API PARTS: Trips, Location: Start/End, Location: T	CITIES: Louisville, Washington DC, Los Angeles	
Injury Investigation	Investigate injuries and collisions with other objects and cars to determine roadway accident causes.	Injury Investigation	Provider: GBFS	API PARTS: Trips, Location: Start/End, Location: T	CITIES: Louisville, Washington DC, Miami-Dac	
Infrastructure Planning	Determine where to place new bike/center lanes and drop zones based on usage and demand, start and end points, and trips taken.	Infrastructure Planning	Provider: GBFS	API PARTS: Trips, Location: Start/End, Location: T	CITIES: Louisville, Santa Monica, Los Angeles	
City Council Reports	Use data to communicate the value, successes, and issues of a mobility policy and allow guidance on safe operations and approval.	City Council Reports	Provider: Policy	API PARTS: Location: Start/End, Location: Trip Line	CITIES: Louisville, Los Angeles, San Francisco	
Curb Management	Compare to other curb users and change policy to make better use and remove conflicts.	Curb Management	Provider: GBFS	API PARTS: Time: Real Time, Location: Start/End	CITIES: Louisville, Los Angeles, Santa Monica	
Sidewalk Management	Ensure devices are not ending or riding on sidewalks and use data to validate. Validate resident reports.	Sidewalk Management	Provider: GBFS	API PARTS: Location: Start/End, Time: Historic	CITIES: Louisville, Los Angeles, Miami, Miami	
Right of Way Management	Alerts to remove devices from public right of way where known issues occur, or creates plans to fix these issues.	Right of Way Management	Provider: GBFS	API PARTS: Location: Start/End, Location: Trip Line	CITIES: Louisville, Los Angeles, Santa Monica	
Route Usage/Demand		Route Usage/Demand				
Origin/Destination Demand		Origin/Destination Demand				
Read Diet Effects		Read Diet Effects				
Road Improvement Effects		Road Improvement Effects				

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# CURB DATA SPECIFICATION



## CDS OVERVIEW



CURBS API



EVENTS API



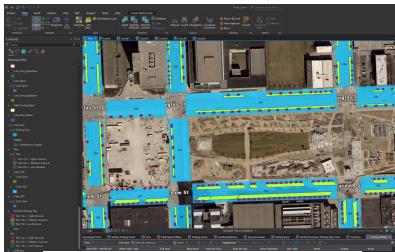
METRICS API

CDS allows cities to digitally represent their physical curb space and policies, communicate activity and events dynamically, and use metrics to improve those curbs.

# WHO IS USING CDS?

See the “[Project Showcase](#)” section in our Guide.

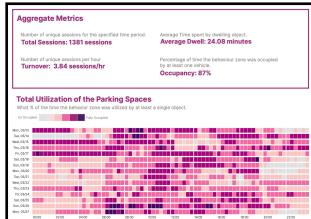
16 public agencies, 22 companies, 7 countries



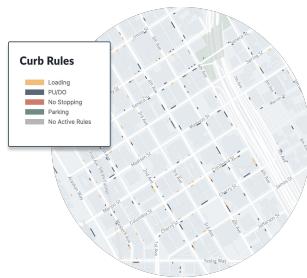
CDS in Omaha w/ ESRI



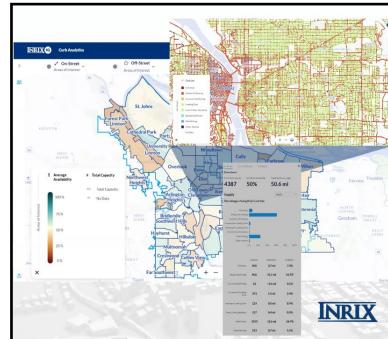
CDS in Dublin and Toronto w/ CurbIQ



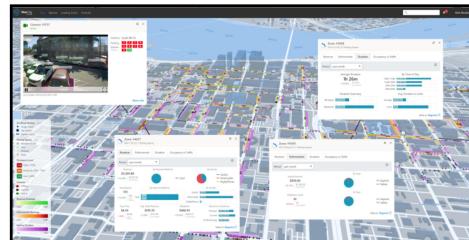
CDS Metrics in New York City w/ Numina



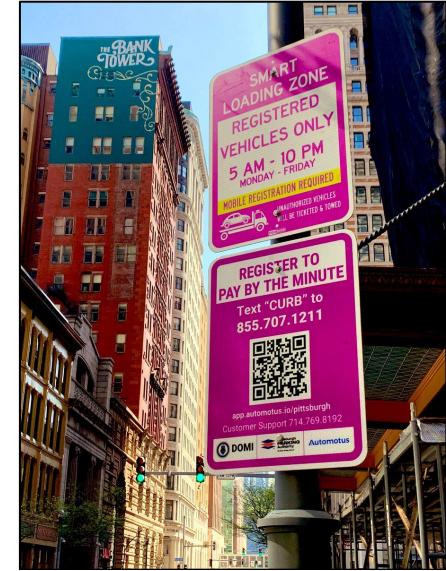
CDS in Seattle w/ Populus



CDS in Portland w/ INRIX



CDS in San Jose w/ Umojo



CDS in Pittsburgh w/ Automotus



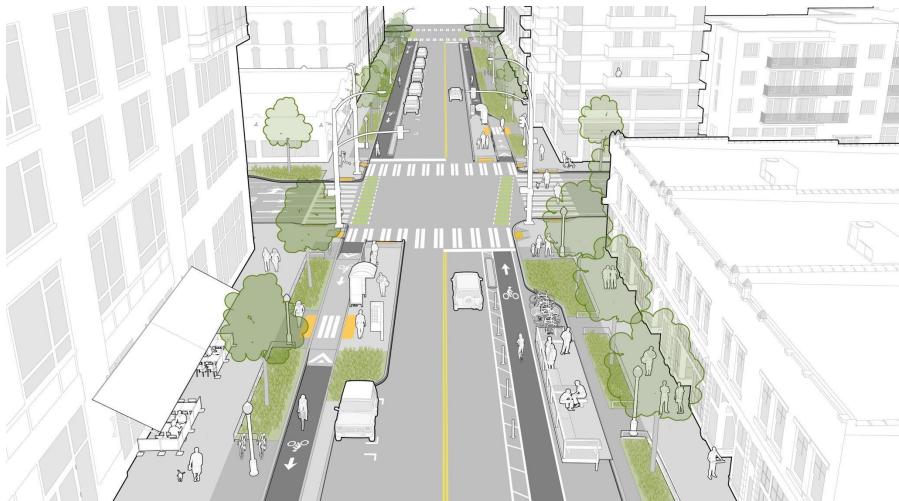
CDS in Philadelphia w/ Pebble

# BUILDING CDS IN THE OPEN

- Technology built through public and private sector collaboration, led by industry experts
- Public participation from 300+ individuals from 130+ public agencies, curb users, and technology companies before & after launch
- More competitive markets and solutions for mobility services and software tools
- Built through OMF's open model, developing free and open source tools in regular public meetings open to all



# CDS IN PRACTICE: USE CASES



CDS' flexibility means it can be used in many scenarios, including:

- Digitally sharing regulations, including loading zone rules and locations
- Determining real-time curb status
- Tracking and analyzing curb usage
- Responding to curb violations and improving curb enforcement
- Optimizing curb usage and access to meet policy goals

[See more use cases here](#)

# THANK YOU

 [openmobilityfoundation.org](http://openmobilityfoundation.org)

 [@openmobilityfnd](https://twitter.com/openmobilityfnd)

 [github.com/openmobilityfoundation](https://github.com/openmobilityfoundation)



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# RESOURCES

# MOBILITY DATA INTEROPERABILITY PRINCIPLES (MDIP)

Modernizing transit technology with open standards. The MDIP coalition is government agencies, mobility service providers, and nonprofit organizations that are dedicated to changing the relationship between transit and technology.

## Open Standard

A specific ontology, schema, or format used by the mobility industry in order to facilitate the consistent communication of information between devices which is:

- Free from cost and restrictions to use,
- Publicly documented in its entirety,
- Actively maintained by an independent organization whose business interests are not actually - and would not reasonably give the appearance of being potentially - impacted by the contents of the standard,
- Contains structured releases, versions, or changelogs, and
- Has an open community of contributors and users, and transparent, inclusive governance.



# OMF ARCHITECTURAL LANDSCAPE DOCUMENT

Guides the growth and evolution of the data standards under the stewardship of the Open Mobility Foundation and helps prioritize the time and resources of its committees and working groups. Informs and shapes the direction of spec development and the processes that support it, including:

1. Product Strategy
2. Technology Architecture
3. Development Process
4. Project and Deliverable Roadmap

[Version 3 available](#), Board approved. Our Technology Council is working on Version 4 now.

The screenshot shows the first page of the "MOBILITY DATA SPECIFICATION ARCHITECTURAL LANDSCAPE" document. At the top right is the OMF logo. Below the title is a table of contents and a section titled "Technology Architecture".

**Table of Contents**

Table of Contents	2
Introduction/How to Use this Document	3
A Note about COVID-19	4
About the Open Mobility Foundation	4
Product Strategy	7
Vision for the Mobility Data Specification	7
Key Goals	8
Ecosystem	8
MDS User Personas	8
Ecosystem of MDS Resources	8
Survey of Related Organizations	8
What's Next for MDS?	8
Technology Architecture	8

**Technology Architecture**

The Technology Architecture outlines the current architecture of the MDS APIs, situates MDS within the broader mobility data and technology ecosystem, and identifies the technical considerations and design guidelines that OMF working groups and other developers contributing to the MDS codebase should follow in working on the new features necessary for the specification to evolve.

**Key Takeaways**

- Design of MDS API features should be useful and feasible for both producers and consumers of data
- Design of MDS API services and reference implementations should aim for a flexible technology stack and should not require the use of off-the-shelf proprietary services or platforms for implementation
- The API specifications shall be the primary "source of truth" for API definitions. Reference implementations can clarify correct behavior in situations where aspects of the specification are ambiguous or undefined.

**Open Questions**

- How should the OMF position the respective roles of the MDS Agency and Provider APIs, given their similar purpose?
- When and how should the OMF enable extensibility and modularization of the MDS specification and reference implementations?
- What should the scope and scale be for MDS reference implementations supported by the OMF?
- How will the work of the Privacy, Security, and Transparency Committee influence the design of MDS API services and reference

# GETTING INVOLVED IN WORKING GROUPS

- [MDS Working Group](#)
  - Sign up to get announcements from the [MDS mailing list](#)
  - Attend [monthly meetings](#) to discuss issues and hear from other contributors.
    - 9am PT/Noon ET/6pm CET on Thursdays (details on [OMF public calendar](#))
- [Curb Working Group](#)
  - Sign up to get announcements from the [Curb Management mailing list](#)
  - Attend [monthly meetings](#) to discuss issues and hear from other contributors.
    - 9am PT/Noon ET/6pm CET on Tuesdays (details on [OMF public calendar](#))

# CODE RELEASES

We use Github to manage all of our release work in the open and much of the discussion and proposals. This community development happens on each spec's respective GitHub repository

- [Mobility Data Specification repository](#)
- [Curb Data Specification repository](#)

The screenshot shows a GitHub repository page for `openmobilityfoundation / mobility-data-specification`. The README.md file is displayed, containing the following content:

## Mobility Data Specification

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[Top](#)

### Endpoints

# MOBILITY DATA SPECIFICATION



- [About MDS](#)
- [Cities & companies using MDS](#)
- [MDS version guidance](#)
- [Community projects](#)
- [Using MDS under GDPR](#)

## OUR VISION FOR MDS

The way we move around our cities is changing quickly. With dockless e-scooters, bikeshares, and ride-hailing services already well established, and new technologies like autonomous vehicles just over the horizon, cities need to be prepared to digitally manage streets, sidewalks, and other public spaces that are more complex and dynamic than ever before.

MDS is designed to enable cities to manage any shared mobility option in the public right of way. That means giving cities the data they need to understand current and historic use patterns and the tools they need to improve the safety, equity, and quality of the mobility services on their streets. MDS is a free, open-source, digital-first platform, so all cities can manage mobility in the ways that work best for them.



[GET INVOLVED](#)

# CURB DATA SPECIFICATION



## MANAGING THE CURB TO DELIVER MORE

- [About CDS](#)
- [Cities & companies using CDS](#)
- [Pilot project guide](#)

We believe that public streets and sidewalks can be safer, more dynamic, and deliver more value to residents and local businesses. That's why the OMF is building digital tools to help cities effectively manage curb space.

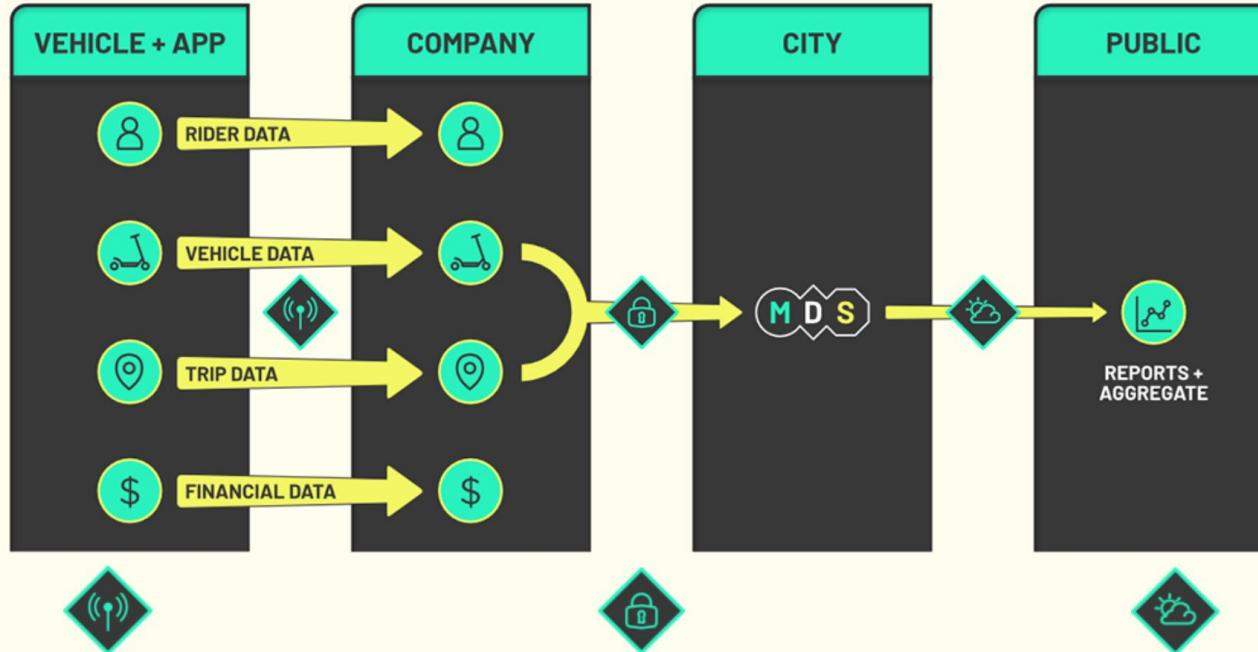
Urban curb space has long been a scarce resource. The most in-demand loading zones today are sites where double parking and congestion lead to safety risks and lost value for businesses and delivery services. Governed by complex rules communicated by signage and physical infrastructure, curb management tools have not always kept pace with changing demand driven by new mobility and on-demand services; alternative uses of the public right of way like slow streets, outdoor dining, and parklets; and increased desire for road space focused on sustainable transportation. As the demands placed on urban curb space evolve, so too must the tools we use to manage it.



[GET INVOLVED](#)



## MOBILITY DATA FLOW AND PRIVACY



Cellular broadcast of detailed data to company

Subset of vehicle and trip data securely transferred

Open data and sunshine laws through the internet

# PRIVACY RESOURCES

- [MDS Privacy Guide for Cities](#)
- [Mobility Data State of Practice](#)
- [Using MDS Under GDPR](#)