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# TECHNOLOGY ACTION PLAN



An action plan to realize the visions outlined in the Urban Mobility for a Digital Age and Great Streets for Los Angeles: 2018-2020 Strategic Plan

V 1.1 – Updated March, 2019





“ THE FUTURE IS NOT SOME PLACE WE ARE GOING TO,  
BUT ONE WE ARE CREATING. THE PATHS TO IT ARE  
NOT FOUND, BUT MADE. ”  
- PETER ELLYARD

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# INTRODUCTION

Cities attract disruption in mobility and remain its centripetal force, building streets and related infrastructure, developing their operating systems and the supporting policies that today we know as the modern surface vehicle transportation system. However, the side effect of decades of highway construction and associated land use decisions has created inequities in cities, where one's zip code determines one's destiny. Enabling equal access to mobility unlocks productivity, opportunity, and community cohesion – in short, treating movement as a fundamental human right unlocks economic mobility and social wellness.

In 1886, Karl Benz patented the first internal combustion engine. Considered one of the most important inventions of the 19th century, Benz's invention ushered in the motor vehicle industry which has been at the heart of the economic development and rise of countries and economies throughout the world. Spurred by Henry Ford's 1928 "Opening roads to all mankind" campaign and his development of the assembly line, the motor vehicle industry is today considered an "industry of industries."

We reshaped our cities to serve the new technology of the 20th century – cars – instead of the other way around. Transportation is undergoing a massive transformation that will change the way we conduct business in the public and private sectors. We are at a unique point where not all technology advancements in transportation or new forms of mobility provide clear benefits to cities and their residents. Moreover, they are changing the foundational assumptions of how we build and manage transportation systems. As private companies build wealth using public streets, cities have been mostly passive. Being mindful of the mistakes of the last century will serve us as we attempt to put cities in an active role to shape and orchestrate the movement of vehicles on the ground and in the air, services and associated physical layout which will serve the 21st century and beyond.

# FRAMEWORK

## Vision

In Los Angeles, all people have access to safe and affordable transportation choices that treat everyone with dignity and support vibrant, inclusive communities.

## Mission

LADOT's mission is to lead transportation planning, project delivery, and operations in the City of Los Angeles. We work together and collaborate to deliver a safe, livable, and well-run transportation system in the city and region.

## First Principles

LADOT's approach to developing its Transportation Technology strategy is built on the following five first principles :

**Open-Source:** Allow any city or company to take product developed by Los Angeles and run it as a service within a city free from any royalties or license fees.

**Competition:** Foster a competitive market for solicited requests to run, on behalf of cities, reference products as a service differentiated by service level and customer satisfaction.

**Data and Privacy:** Cities should earn their own data through the digital services they provide while also adhering to best practices for privacy standards.

**Harmony:** Avoid a patchwork of regulation by enabling low cost, homogenous services that span municipality borders.

**Sustainability:** Build product that any city can afford with new types of business models to ensure sustainable transportation networks for generations to come.

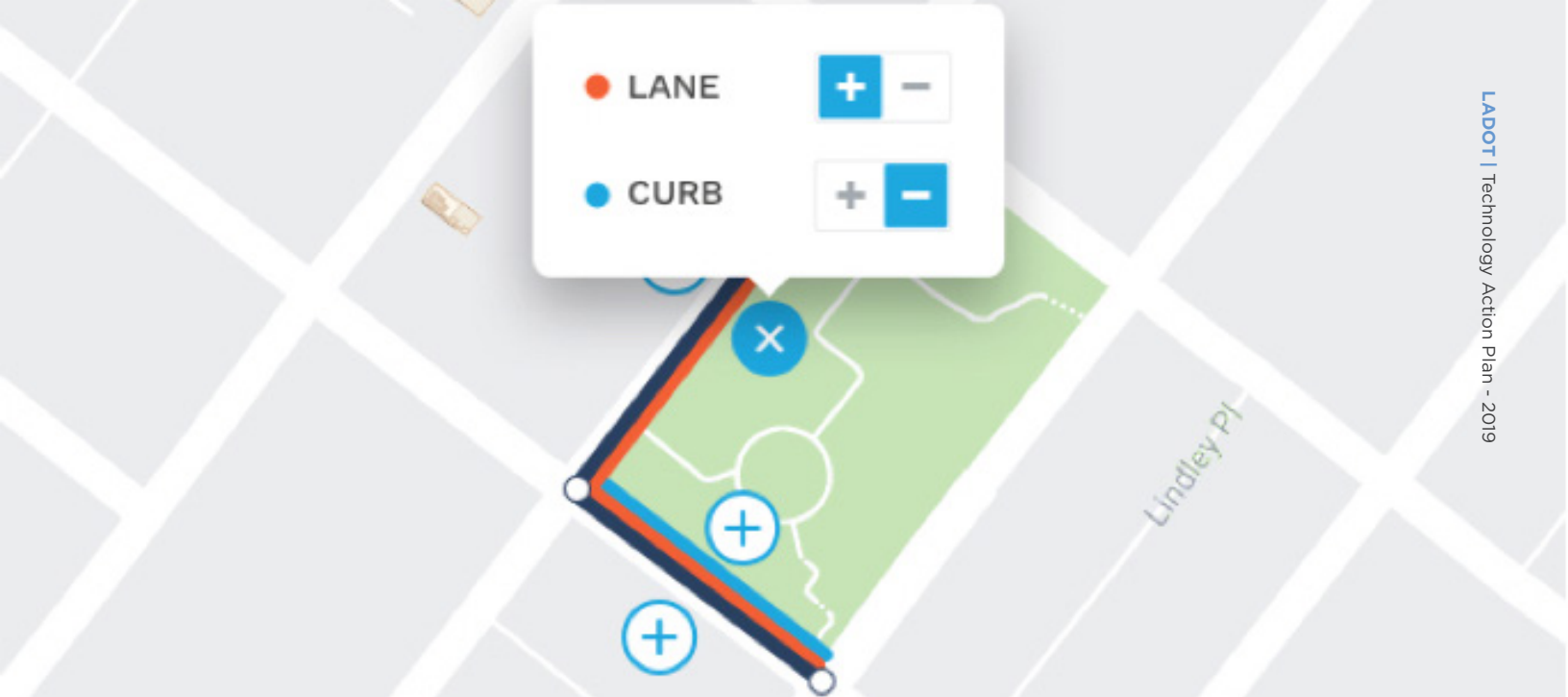
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# TWO ROLES OF A CITY

Cities around the world operate as both a product company and a services agency. On the product side, Cities build and manage the public realm which consists of rights of way, roads, walkways, bikeways, bridges, and airspace, as well as accompanying signs, signals, and paint enabling travel from place to place. To deliver this product, Cities plan both infrastructure and operational investments, coordinated with land use planning and development. As a services agency, cities offer parking, enforcement, public space use and various types of transit among many other business lines. Cities are called upon daily for a host of operational services which include helping move people to safety during emergencies and sometimes shutting down streets, providing safe passage to those wishing to gather and demonstrate, as well as pricing the curb to regulate parking and deliveries.

LADOT aims to leverage these roles and invite innovation with an intersectional aim: economic mobility, emissions reductions, harm reduction, and community happiness. The Sustainable City pLAN, Mobility Plan, and Vision Zero plan envision mobility as a means to address some of the steepest challenges the city faces: preventing the devastation of climate change, saving lives, improving socio-economic equality, easing congestion, and improving public health outcomes, all of which are interconnected.

The system we manage and operate could grow to encompass products (both hardware- and software-based) and services open to new, advanced models for delivery and partnership between public, private, and non-profit. To achieve these outcomes requires an open discussion framework; public/private consensus; a realignment of the government-to-business relationship; and community-led interventions to solve real problems.



Cities have always actively managed transportation within their borders. Signals, painted curbs, signs, and enforcement officers all seek to organize the movement and parking of vehicles to maximize traffic flow, safety and other priorities. For the most part, these analog management tools have remained static for many decades. The transportation ecosystem, meanwhile, is surging ahead digitally, with new modes moving more people every day. Moreover, the private sector develops, deploys, and manages these new modes, with the public sector lagging and playing catch up. More study and experimentation are needed as to what Cities must do to manage disruption to traffic control systems operation, hardscape design, curb management, and system finance.

These new, digital modes pose new challenges and opportunities at once for transportation managers. Digital active management of transportation offers a testing ground to build a system that could be exponentially more effective than existing methods. To seize this opportunity, LADOT is working to build digital infrastructure that allows us to fulfill our role as planners, operators, investors, regulators, and enforcers in the most elegant and effective way possible. We must participate in the digital transportation marketplace as a peer and partner with the private sector or ultimately risk the ability of digital private companies to scale within an analog cityscape and to collectively serve the citizenry with cutting edge solutions.

#### SPOTLIGHT:

## CODE THE CURB Bringing technological solutions to Los Angeles.

Code the Curb is an undertaking to inventory more than 1 million signs, 37,000 parking meters, curb paint, and regulatory tools along 7,500 centerline miles of streets in Los Angeles. When complete, the digital inventory will allow for citywide dynamic pricing and regulations.

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# CODE IS THE NEW CONCRETE

What is needed then, is a digital infrastructure that mirrors the current hardscape and that gives transportation assets like curbs, streets, sidewalks, airspace, and subterranean space a digital identity. Using code as concrete opens up dynamic and granular opportunities to coordinate and manage the public realm on behalf of citizens.

With this digital infrastructure, what was once a fixed sign, or fixed paint scheme on a curb, can become a dynamic, digital service that the City programs to react to transportation demands on a minute-by-minute basis. The City can begin to guarantee curb space and dwell time; react immediately to public safety issues and update a variety of government-to-business pricing models. Navigation systems, apps, and connected transit shuttles can read a digital parking sign in addition to the human-readable equivalent. Road closures can be digitally communicated to vehicles, mobility service providers, and navigation products like Google Maps and Waze instantly.

Outcomes like ensuring transportation equity, safety, and security become objective functions that the city can express digitally at scale, empowering the private sector to deliver solutions at scale.

Private industry is currently building solutions to deliver one or more of these digital tools along with a new corresponding service(s). To date, all private solutions are built on a business model designed around one or more forms of “walled gardens,” usually centered around data ownership, software ownership, high per-hour development fees or a combination of these, making them a less-advantageous option for many cities.

In order to meet our mandates, Los Angeles, like other cities, needs the ability to govern the public right of way with economical and accessible tools that provide them the needed authority, the security, and the confidence they will have the ability to change solution providers as needed.





**SPOTLIGHT:**  
**ATSAC**

A smart network to keep Los Angeles flowing.

The Automated Traffic Surveillance and Control System (ATSAC) is the brain of the Los Angeles street network. LADOT engineers use ATSAC to optimize traffic flow and reduce congestion.

Thanks to ATSAC, LADOT improves vehicle flow, reduces travel time by more than 10%, and increases speeds during peak commute. In addition to improving traffic flows, ATSAC provides valuable information on travel speeds and traffic volumes that are used for planning and project development.

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**4 Million**  
Angelenos

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**7.4**  
**Terabytes**  
Real-Time Data  
Processing Per Day

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**4,700**  
Traffic Signals

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**23,800**  
Traffic Sensors

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**7,500**  
Miles of Streets

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**1,500**  
Transit Bus Signals

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# ACTIVE MANAGEMENT

The term Active Management describes LADOT's approach to using real-time digital communications to express mobility policies and regulation and govern the City's right of way: our streets, sidewalks, curbs, and airspaces. LADOT is using digital tools (including MDS) that allow us to communicate anonymously with fleet vehicles that operator on the public right-of-way. Active Management can provide a variety of digital infrastructure services, such as digital parking, dynamic speed limits, curb access, digital notifications for street closures, and directed public notifications. Today, LADOT is using Active Management to govern dockless shared scooters, bikes, taxis, and buses in accordance with policies and regulations set by City Council. Tomorrow, the same tools will assist in communicating with autonomous cars, drones, and whatever else the future holds.

LADOT is developing the Mobility Data Specification (MDS) and its digital infrastructure to give the City an efficient and cost-effective way of managing the right of way for transportation modes enabled by technology. In short, technology allows us to get to our goals faster, and at scale, rather than concrete and asphalt alone. Both digital and analog infrastructure matter. We will need both to succeed. We must also remember that there is one (fiscally constrained) LADOT, and hundreds of mobility providers wanting to provide services with varying degrees of benefit and ultimate viability (transportation is not a historically profitable business). Without adequate digital infrastructure on the government side, it is simply not possible to test, allow growth of many providers vs. few, or allow scale for these services. LADOT wants to be in the business of providing equal opportunity to companies of all sizes vs. picking winners and losers due to a lack of ability to manage a highly complex system.

The MDS does not set policy. That role lies squarely with elected city leaders and the associated policy experts in city agencies. MDS enables policy application through technology, using the language of product companies embedded in the DNA of the new Transportation as a Service business model. This posture and this type of infrastructure prepares us and allows us to lead the way toward the optimal universal mobility system of the future for our citizens and businesses.

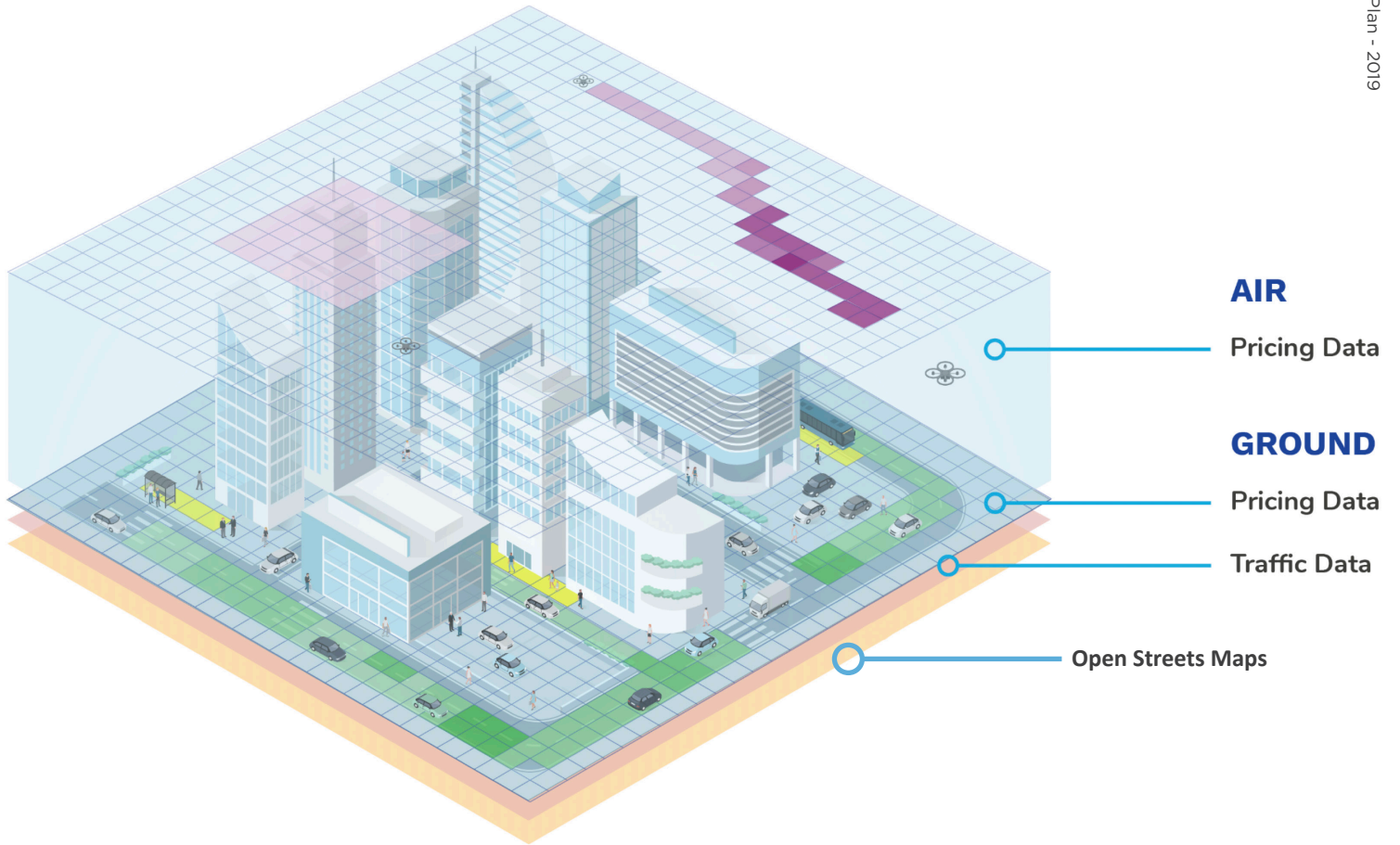
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# PUBLIC REALM

The public realm broadly refers to those areas of a city to which the public has access. It includes streets, curbside, footpaths, parks, squares, bridges, and public buildings and facilities. These public spaces give a city its character and also determine how inhabitants and visitors circulate, travel and interact within the city's environment. The public realm therefore has a significant impact on how a city functions and on its attractiveness as a place in which to live and work, or as a destination for tourism and investment. It is easy to forget the complexity of this system and that decisions should not be made in silos, either by government or private sector. How it is planned, designed, and managed is therefore very important and one of the principal roles of the City government. And in this role, there are four key considerations:

- Correct historic racial and socio-economic inequities and connect people to economic opportunity
- Increase the use of public space and support businesses
- Encourage participation in community and cultural activities
- Enhance personal safety

In order to fulfill these key considerations, LADOT has developed a conceptual digital vision of the public realm, as shown in the figure to the right, which will allow us to manage the realm in a more dynamic and equitable way.



“ NEVER INTERRUPT SOMEONE DOING WHAT YOU SAID  
COULDN'T BE DONE. ”

- AMELIA EARHART



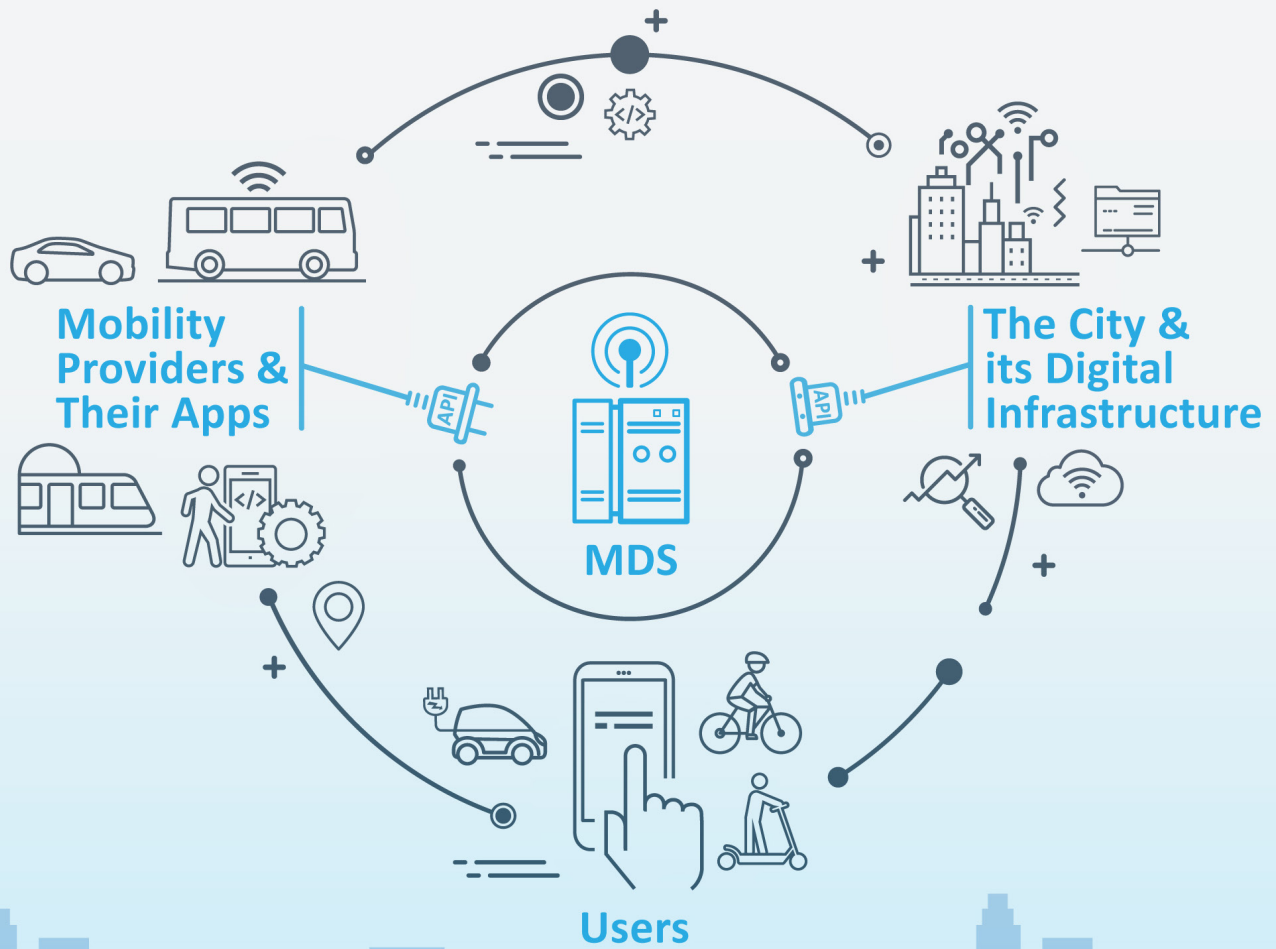
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# MOBILITY DATA SPECIFICATION

LADOT introduced the Mobility Data Specification to change the dynamic of the relationship between the public and private sector by creating a set of open source tools to create a low-cost, harmonized implementation for cities and transportation technology companies (with Los Angeles just being the first city). LADOT is accomplishing this by creating a new, more collaborative ecosystem of technology companies, transportation providers, and cities that – together- will create a competitive marketplace that produces harmonized and procurable services.

The MDS is one of the tools LADOT is using for Active Management, and defines a set of interfaces for the City to deliver digital services and information to mobility service providers whether government or privately operated. MDS is a data standard and API specification that allows the City to engage in real time with mobility service providers (i.e. bus, scooter, bikeshare, and taxi/rideshare companies) and enables LADOT to actively manage service levels and better understand the impact of new technology deployments on our citizens, helping us create a better overall mobility experience.

The initial development of MDS consists of two key elements: Provider API and Agency APIs. Provider API is a standard for LADOT and Mobility Service Providers to share mobility data on both a real-time and a historical basis. This includes information such as vehicle location, trip durations, and service areas. Agency APIs offer digital methods for LADOT to provide real-time, active management information such as digital street closures, parking restrictions, positioning of moving emergency vehicles and more.



LADOT considers protecting citizen privacy as one of our highest goals and a core principle of MDS. Our interest is to avoid using data in an opaque and confusing manner. MDS does not specify or collect any personally identifiable data, and LADOT has developed plain language for application users to understand how and why the City collects and uses data. LADOT is working with consumer privacy leaders to appropriately address GDPR and other privacy laws and to ensure an industry-leading approach.

LADOT is developing MDS in GitHub including the software products LADOT will use to actively manage dockless mobility products in the Los Angeles public realm. The work resides in open source to empower any municipal transportation agency to deliver digital services and to customize as needed based on local regulations. We are developing the high-level requirements for these two products based on priorities set forth in the five Core Principles and input from other cities.

LADOT realizes that for the MDS to work best for all providers, and for MDS to work best for all interested Cities, there needs to be a more formal relationship between cities, technology companies, and the MDS and other future standards that can ensure collaboration.

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# BUSINESS MODEL FOR THE CITY

Cities need a new mechanism for paying for transportation infrastructure considering different philosophies, technologies, and procurement methods; together these are considered business models.

While the number of possibilities is vast, they can ultimately be grouped into some general behaviors including:

- i) where usage is measured
- ii) how billing / payments are handled
- iii) how services for these products are procured by the city.

Rather than tabulating the permutations of these approaches in text, the following will cover what could be classified as the book-ends, one being a “far left” approach, and the second being a “far right approach.” We expect the actual marketplace will be somewhere in between.

Both approaches assume that the city will publish pricing to a city managed map using Open Street Maps or some other open platform product. Pricing will be derived from a demand measurement or other objective function where market behaviors model price and demand are inversely proportional.





## Transportation Tax Model

This model rests on a minimum data-collection philosophy where Cities refrain from collecting real-time trip data from mobility providers for fear that this data will eventually result in a privacy breach or enable a new type of government overreach of some kind. The primary behavior in this model is that system users measure fees, similar to how sales tax and other self-reported taxes work today.

The basis for the transportation tax model begins with a map of a city's hardscape along with an associated pricing parameter accessible by mobility service providers through an API while traversing a space. This can be done through some sort of in-vehicle polling mechanism, in-vehicle trip planning, or at a fleet manager's dispatch office. During, before, or after a trip, the mobility service provider will calculate the transportation tax owed the municipality through a self-reporting mechanism. Afterward, at some specified period, trips are batched and reported along with payment to the city, state, or federal authority. This system will also require a data retention policy to facilitate future audits of the mobility service provider.

### SPOTLIGHT:

## BLUE LA CAR SHARE

Providing sustainable options through equity.

With the Mayor's office, LADOT launched the Blue LA car share program, the largest city funded electric vehicle car share programs in the country. Blue LA brings 200 EV chargers and 100 cars to pilot locations in Westlake, Pico Union, Hollywood, and Koreatown.

Equity was at the forefront in developing this program. A steering committee made up of community-based organizations provided input on pricing, outreach, and local hiring. Discounts are available for low-income users, and the program provides equitable access to environmentally-friendly cars without the need to worry about insurance, maintenance, or gas costs.

The challenge with this model is that it relies on delayed payments, creates opportunities for losses due to underreported taxes, and adds auditing costs to the city and the providers. Cities can fix some of these issues with the addition of trustless payment technologies like blockchain.

## Utility Model

The utility model is based on treating transportation infrastructure like any other public utility such as water, power, data, etc. where usage is measured by the entity providing services, in this case, the city. The “far left” implementation of this model is similar to the airline model, where travel options and routes are presented as products prior to use. Airlines, for example, calculate the cost of the routes based on their objective function of optimizing profitability and present these routes in a competitive marketplace. In the case of cities, pricing would be set to achieve a different objective function (taking into account externalities), based on a combination of security, resiliency, safety, transportation happiness, and racial and socioeconomic equity. The City would package these prices into optional route products and transact as such.

This option relies on anonymized trip data which accurately locates vehicles in the network. This method has the added advantage of facilitating digital enforcement of vehicle caps, parking in the right of way, and deploying ground-based resources for incident response to name just a few. This business model is not without contention as it positions the City as a real time digital system operator and regulator, and a holder of detailed trip data, both of which have implications for citizen privacy and introduce a new city posture.

Any change in technology inevitably impacts our people. The rise of new transportation business models has far reaching implications for LADOT’s people and agency culture. We intend to work to empower our teams to enable them to anticipate and benefit from change.







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# CULTURE CHANGE

Our success requires we take seriously the team transformation required to integrate our work on technology into LADOT's culture and work.

Our plan involves four main pillars for our internal approach:

1. Develop LADOT leaders for change management

Change management is a critical leadership skill in this type of transition. That means leaders will learn how to guide people through a series of transitions that allow them to integrate the change more successfully.

2. Leverage and evolve the LADOT agency culture

Agency culture can serve as a critical stabilizing force during this time of unprecedented change. Culture is often used in vague ways to describe things that are difficult to verbalize, but culture is made of four things:

- i. Shared Language: The words we use to create meaning of our experience
- ii. Shared Values: The things we decide matter most to us
- iii. Shared Behaviors: The actions we can expect of one another
- iv. Mutual Respect for all stakeholders



Using this definition, we are better able to consciously create and use our culture as a resource in navigating change.

### 3. Map the Future of Work

Part of our task is to imagine how the nature of work and skills will evolve with the Agency. This means understanding which roles will shift and what new ones will come online in the coming years. With this in place we can prepare our workforce with the right skills and education for what is ahead.

It takes time to develop a digital culture and like private sector products and services, it will be iterative vs. a grand unveiling on day one. With this approach, LADOT can more quickly and consistently deliver on the promises of this Technology Action Plan and be positioned to co-create solutions with varied stakeholders including private citizens and private companies that want to sit at the table..

The bottom line is clear: Culture is the most important enabler of digital transformation. Without people, tools will not make any difference.

“ THE CITY OF LOS ANGELES WILL USE TECHNOLOGY AND DATA AS A NEW TYPE OF INFRASTRUCTURE TO PROVIDE EQUITYABLE ACCESS TO SHARED TRANSIT AND MOBILITY SERVICES FOR THE PUBLIC. ”

- WORD CLOUD ANALYSIS FROM TAP V 1.0





**Slow  
down.  
Life  
is  
not a  
race.**

WRDSMITH



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# IDEAS IN ACTION

With the ongoing explosion of technology in transportation, LADOT is committed to ensuring that everyone in our city benefits from these new mobility choices. Los Angeles is embracing new technologies and new modes to better serve the needs of everyone. We're proud to lead the way for 21st Century mobility and are also working with other cities and government agencies to develop this innovation.

LADOT is undertaking a number of transportation technology projects to test and implement a wide range of new approaches. From introducing electric car sharing programs with BlueLA to using real-time data to power and manage large-scale e-scooter implementation with the Mobility Data Specification, we are finding ways to ensure everyone benefits from innovation.

Our near-term focus is to respond to new forms of mobility and to set the ground rules for how new types of transportation operate on our streets. These evolving demands on the right of way, on our streets, sidewalks, curbs, and airspaces are pushing us to develop new ways to manage mobility that go beyond our 20th century traditional methods: traffic signals, signs, and paint.

On the following pages, we have provided an illustrative (rather than exhaustive) list of the types of Task Order Solicitations for Transportation 2.0 services that LADOT is considering.



# APPENDIX 1

## Transportation 2.0 Service Task Orders

POSSIBLE PROJECT TITLE	EXPECTED COMPLEXITY	EXPECTED COST	DESCRIPTION
PROMISE ZONE MICRO-TRANSIT	MEDIUM	MEDIUM	IDENTIFY AND LAUNCH A MICRO-TRANSIT SERVICE IN LA’S FIRST
DTLA AUTONOMOUS TRANSIT	LOW	LOW	LAUNCH A ONE-YEAR PILOT OF AUTONOMOUS TRANSIT IN DTLA.
UNIVERSAL ACCESS TO PLAY	LOW	LOW	IDENTIFY AND LAUNCH A SERVICE TO ASSIST DEPARTMENT OF RECREATION AND PARKS WITH EFFORTS TO TRANSPORT RECREATION TEAMS TO AND FROM GAMES; GIVE KIDS IN LOW-INCOME COMMUNITIES REGULAR OPPORTUNITIES TO ACCESS MAJOR
SHARED MOBILITY PILOT EVALUATION AND EXPANSION PLANNING TECHNICAL SUPPORT	MEDIUM	MEDIUM	PROVIDE SUPPORT TO EXISTING EV CAR SHARE PILOT, INCLUDING PILOT EVALUATION, STRATEGIC PLANNING AROUND EXPANSION OPPORTUNITIES AND FUNDING MECHANISMS, AND SUPPORT ONGOING EQUITY FRAMEWORK FOR SHARED MOBILITY SERVICES. TECHNICAL SUPPORT WILL ALSO INCLUDE INTEGRATION OF EXISTING SHARED MOBILITY OPTIONS.

EV TAXI IMPLEMENTATION, VEHICLES AND INFRASTRUCTURE	MEDIUM	MEDIUM	STUDY A FEASIBLE APPROACH TO OFFER SUBSIDY AND/OR REBATE PROGRAM FOR ELECTRIC VEHICLE PURCHASE AND DEVELOP STRATEGY FOR PROVIDING SUPPORTING
THIRD PARTY UNIVERSAL TAXI DISPATCH APP CONNECTED WITH MULTIMODAL TRIP PLANNING APP	LARGE	MEDIUM	DEVELOP A UNIVERSAL TAXI DISPATCH APP THAT INCORPORATES THE ENTIRE PERMITTED TAXI FLEET AND OFFERS USERS REAL-TIME INFORMATION FOR CONVENIENT AND SEAMLESS TRIP PLANNING, RESERVATION, AND/OR PAYMENT,
UNIVERSAL DISPATCH APP FOR WHEELCHAIR ACCESSIBLE VEHICLES	LARGE	MEDIUM	DEVELOP A DISPATCH APP THAT INCORPORATES ENTIRE WHEELCHAIR ACCESSIBLE FLEET, INCLUDING TAXIS, INSPECTED VEHICLES FROM TRANSPORTATION NETWORK COMPANIES, AND PARATRANSIT TO OFFER USERS REAL-TIME INFORMATION FOR
CONCIERGE SERVICE	LARGE	LARGE	SERVICE TO DELIVER A USER EXPERIENCE ENGAGEMENT VERSUS DESTINATION ENGAGEMENT. FOR EXAMPLE. WHAT IF, INSTEAD OF SELECTING A DESTINATION, A PERSON SELECTS A TASK: "TODAY I WANT TO MEET FRIENDS AND DISCOVER SOMEWHERE NEW
VISUAL REQUIREMENTS FOR TRAVEL IN LA	MEDIUM	LARGE	DOCUMENT ALL THE AREAS OF VISUAL INTERACTION FOR EACH TYPE OF TRAVEL MODE WITHIN LOS ANGELES. DEVELOP BEST PRACTICES FOR THE DESIGN OF AVS AND

<p>DESIGN GUIDELINES FOR DIGITAL INFRASTRUCTURE</p>	<p>MEDIUM</p>	<p>MEDIUM</p>	<p>WITH THE POTENTIAL PROLIFERATION OF NEW DIGITAL INFRASTRUCTURE, THE SENSORS AND COMMUNICATIONS TECHNOLOGY NECESSARY TO CAPTURE AND RELAY REAL-TIME TRANSPORTATION DATA, THE CITY OF LOS ANGELES WILL SET STANDARDS FOR WELL-DESIGNED EQUIPMENT THAT INTEGRATES INTO EXISTING INFRASTRUCTURE AND/ OR IS COMPLEMENTARY. MUCH IN THE EXISTING MARKETPLACE OF SENSORS AND COMMUNICATIONS INFRASTRUCTURE HAS BEEN DEVELOPED WITH LITTLE CONSIDERATION FOR AESTHETICS. HOWEVER, AS POTENTIALLY THE LARGEST MARKET, THE CITY AND REGION OF LOS ANGELES</p>
<p>DESIGN GUIDELINES FOR AUTONOMOUS RIGHTS OF WAY</p>	<p>MEDIUM</p>	<p>LARGE</p>	<p>BUILDING ON THE NATIONAL ASSOCIATION OF CITY TRANSPORTATION OFFICIALS BLUEPRINT FOR AUTONOMOUS URBANISM, THE CITY AIMS TO CREATE A SET OF INITIAL WORKING DESIGN GUIDELINES FOR AUTONOMOUS INFRASTRUCTURE AND RIGHTS OF WAY BOTH ON THE GROUND AND IN THE SKY. IN THE NEXT FIVE YEARS, AS FLEETS OF DRIVERLESS CARS AND DRONES APPEAR, THE CITY NEEDS TO GIVE CAREFUL THOUGHT TO THE IMPLICATIONS FOR SETTING</p>

# APPENDIX 2

## MDS Agency Roadmap

LADOT is developing Agency APIs by identifying the types of questions we want to answer regarding the active management of our transportation system. The question “how many dockless mobility trips per day” is an example question that helped us develop the “start\_trip()” API. This Appendix provides the list of Agency APIs currently in production (v1.0) as well as the roadmap of APIs we envision developing in the months ahead. We include the example questions we want to answer with each API.

### Version 1.0 – In production

#### High Level Description

- Replicate the Provider dataset
- Create robust reference work for 3rd party companies to build Agency-as-a-Service product.

#### Example Questions

- What vehicles are operating in the City transportation product?
- How many dockless vehicles are operating in the City?
- How many dockless mobility trips are there per hour, day, week, month?
- Where are dockless mobility trips happening?
- Where are the dockless mobility vehicles located in the City transportation product?

#### Specific APIs

register\_vehicle()

deregister\_vehicle()

update\_vehicle\_status()

start\_trip()

update\_trip\_telemetry()

end\_trip()

### Version 1.1



### High Level Description

- Add scooter parking support
- Enable active management of vehicle counts
- Provide hooks to integrate agency APIs into municipal traffic management systems (e.g., Los Angeles ATISAC system)
- Incorporate Shared Streets

### Example Questions

- Where can dockless bikes/scooters park?
- What is the maximum number of dockless mobility vehicles per operator?

### Specific APIs

check\_parking()

Updates to update\_vehicle\_status() and end\_trip() APIs

## Version 1.2

### High Level Description

- Paid parking administrator
- Settlement engine
- Update interfaces for Transportation Operation Centers
- Provide ground truth via Open Street Maps/Shared Streets
- Interfaces to shut down streets

### Example Questions

- How much does a curb cost “right now” and for how long?
- What is the maximum number of dockless mobility vehicles per operator?

### Specific APIs

submit\_movement\_plan()

update\_movement\_plan()

get\_parking\_price()

start\_parking()

end\_parking()

Updates to end\_trip()API to support “not allowed” response

## Version 2.0

High Level Description

- Dynamic pricing
- Intersection management
- Street sign management
- Initial 3D autonomous reference management

Example Questions

- How should dockless mobility vehicles behave at an intersection?
- What price is the “shared space” at this moment?

Specific APIs

get\_intersection\_rules()

get\_intersection\_status()

get\_speed\_limit()

Updates to update\_movement\_plan()API to support “not allowed” response

# APPENDIX 3

## Transportation Technology Projects in Progress

LADOT is testing and implementing a wide range of technology projects to find ways to make new technologies work for all of us. LADOT will issue to the Transportation Technology bench Task Order Solicitations related to the following transportation technology projects. We also welcome suggestions to <mailto:ladot.innovation@lacity.org>.

**ATCMTD** – Through the Advanced Transportation and Congestion Management Technologies Deployment (ATCMTD) project, the City of Los Angeles will deploy advanced transportation and congestion technologies to our transit fleet, our very large automated transportation infrastructure and our web services. The goal of the project is to increase mobility in the City while keeping pedestrians, bicyclists and motorists safe and improving air quality by decreasing congestion.

**ATSAC 3.0** – The Automated Traffic Surveillance and Control (ATSAC) 3.0 project will modernize the computing infrastructure as well as integrate all the other active management digital capabilities LADOT is pursuing. The ATSAC system is the heart of the Los Angeles surface transportation system and covers the entire 7,500 miles of city roadways, 40,000 parking meters, 4,700 traffic signals, 1,500 transit signals and 23,800 traffic sensors.

**BlueLA Car Sharing** – LADOT launched a zero-emission car sharing program to provide point-to-point car access servicing low-income communities and offering subsidized rates to families in need. LADOT offers 100 all-electric vehicles and 200 charging stations in communities throughout Los Angeles including Westlake, Koreatown, Pico-Unions, Downtown, Echo Park, Boyle Heights and Chinatown.

**Code the Curb** – This digital inventory project aims to electronically inventory all of the City’s parking assets in the public right-of-way including paint color, signs and any other markings all linearly and correctly represented. The result will be an online, spatial inventory database of all signed traffic and parking regulations within the City of Los Angeles.

**Demand-Based Parking “Express Park”** – LADOT was an early adopter of technology that matches the cost of parking to demand. When demand for parking is low, rates are low. When demand is high, rates should match. LADOT will expand Express Park to LADOT-owned and managed facilities and at special events.

**Data Inventory** – LADOT created an inventory of all the data sets and data sources used by and generated by LADOT staff in the core processes of their work. Using the Data Roadmap tool, staff can explore data sets and learn about data formats, locations, access and data ownership.

Micro Transit Pilots – Micro-Transit fleets are similar to pooled ride-hailing services. In select neighborhoods across Los Angeles, users can download an app to hail a small van or bus and be dropped off within the neighborhood. The micro-transit vehicle bases its trip routes based on other customer trip requests. Micro Transit programs offer a low-cost alternative to single passenger ride-hailing services and provide connections to rail and fixed bus services.

Mobility Hubs – The Mobility Hubs project aims to provide individual travelers with mobility choices to accommodate seamless trips to and from transit centers to employment, education, and major activity centers. Mobility Hubs will provide convenient and inventive physical spaces at existing Metro Rail stations designed to integrate a suite of mobility services and real-time planning information with the regional transit system.

Transportation Happiness – As part of an effort to improve user experience through technology and data, LADOT is exploring ways to measure Transportation Happiness and integrate that metric into all LADOT transportation projects. Leveraging existing and future data resources, both quantitative and qualitative, LADOT will assess and track how the agency is upholding the Principles for Transportation Happiness (BETA). ,

Vision Zero – In 2015, Mayor Eric Garcetti launched a citywide initiative called Vision Zero to eliminate traffic fatalities in Los Angeles by 2025. With a focus on delivering safety improvements in high impact areas, LADOT uses innovate street design education and a data-driven approach to make our streets safe for everyone.

