



# 2019 INNOVATION PORTFOLIO

TRANSFORMING IDEAS INTO IMPROVEMENTS



Updated: June 2019

The Unsolicited Proposal process gives Metro a tool to receive and develop ideas, and employees permission to do things differently and to do different things.



CONTENTS

Purpose .....1

Letter from the CEO .....2

It’s Never too Early to Learn .....3

A Brief History .....4

Learning by Doing .....5

The Present Future: UP 2.0 .....6

How the UP Process Works .....7

How the UP Process is Different .....8

Relationship to Vision 2028 .....9

Relationship to P3s.....9

Overview of Innovation Pilots .....10

INNOVATION PILOTS: ADVANCED TO IMPLEMENTATION FROM PHASE I .....11

**Smart Bike Rack** .....11

**Orange Line Vehicle to Infrastructure Optimization** .....13

**Artificial Ivy** .....14

ADVANCED TO IMPLEMENTATION FROM PHASE II .....15

**Los Angeles Aerial Rapid Transit** .....15

**MicroTransit Pilot Project** .....16

**Mobile Tolling** .....18

**Facility Asset Management P3** .....19

**Vermont/Santa Monica Station Joint Development** .....21

**Mobile Charger Vending Machines** .....22

**Preventing Unplanned Outages** .....23

CURRENTLY IN PHASE II; IN DEVELOPMENT .....24

**Cash Counting Machine** .....24

**Cyber Security** .....25

PROOFS OF CONCEPT .....26

**Lane Enforcement** .....27

**Flow Modeling** .....28

**Uber + Expo** .....29

**Drones** .....30

**Improving Real-Time Arrival Information** .....32

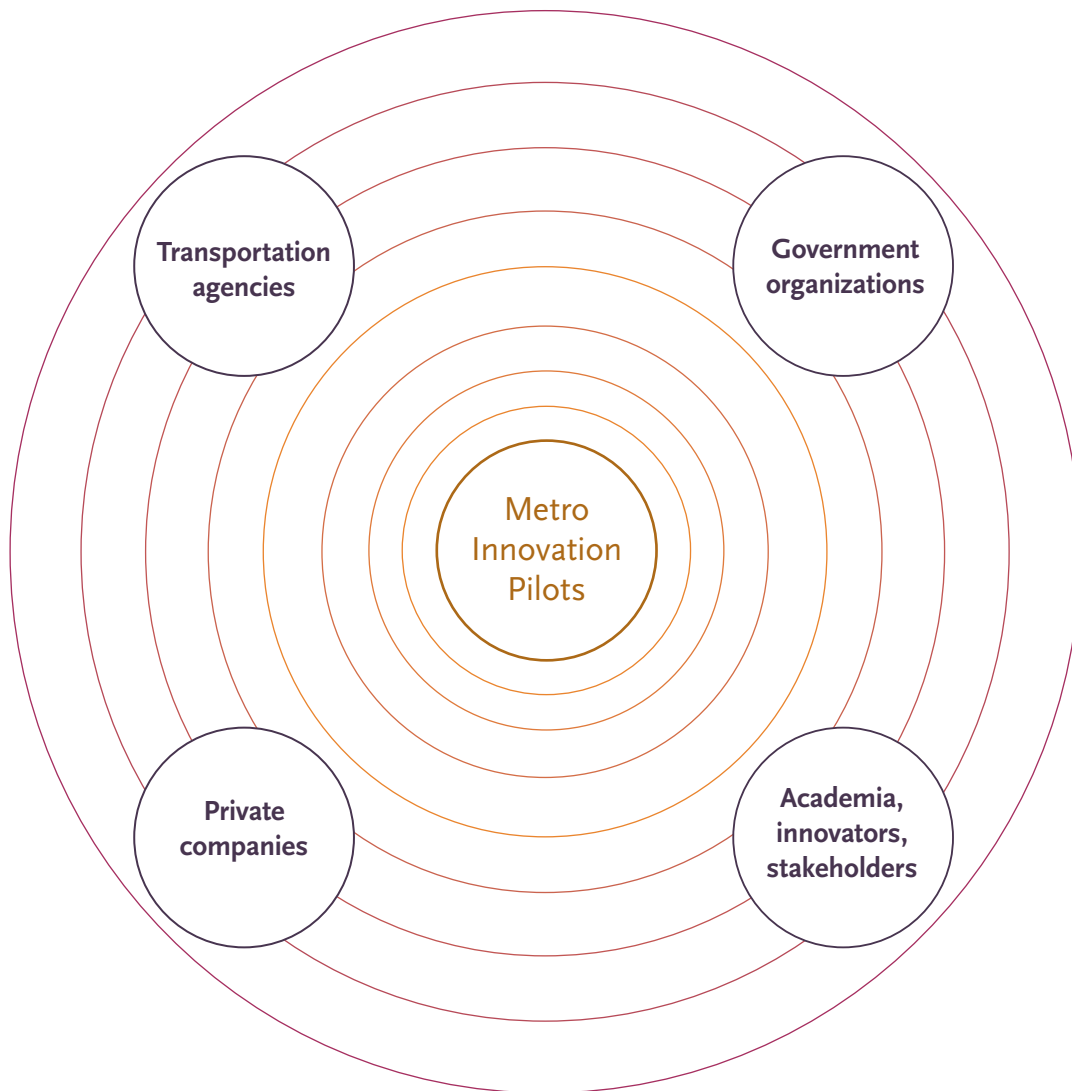
## PURPOSE

The purpose of this portfolio is:

- > To describe the broad range of innovation pilots that have been developed and implemented through Metro's Unsolicited Proposal (UP) process
- > To highlight the lessons learned and people who have made these projects possible

This portfolio profiles 17 different innovation pilots. It is intended for anyone interested in exploring this unique innovation process, how it has been used to deliver value and the projects that have come through it. This includes but is not limited to:

- > **Government organizations** looking to make use of similar processes to drive innovation;
- > **Transportation organizations** looking to find win-win partnerships and solutions to common challenges;
- > **Companies** interested in submitting unsolicited proposals or positioning products and services within the market;
- > **Students and academic institutions; innovators; and stakeholders** curious about how Metro is using the Unsolicited Proposal process to drive innovation, manage change and develop projects.





MESSAGE FROM THE CEO

Metro created the Office of Extraordinary Innovation (OEI) to search the world for the best ideas in transportation and implement them at Metro. Its Unsolicited Proposal (UP) Policy outlines a process for working with partner departments to evaluate, develop and implement the ideas that deliver the most value to Metro and its customers. The UP Policy and its associated processes and partnerships have helped Metro unlock unprecedented innovation, and move us closer to our goal of becoming the best transportation agency in the world.

This portfolio only scratches the surface of the game-changing innovations happening throughout Metro. Each Innovation Pilot speaks to a commitment to developing and implementing new ideas and approaches in a changing world – ideas and approaches that can, as described in Metro’s Vision 2028 Strategic Plan, provide a world-class transportation system that enhances the quality of life for all who live, work and play within LA County. These Innovation Pilots are as diverse as our workforce and the functions they perform; developing and implementing them has been a total team effort. Each one demonstrates the bold action and leadership required to address LA County’s mobility challenges.

Defining success with the UP process is complicated. In these projects we see a series of works in progress that demonstrate a willingness to test and implement new solutions and methods. Each of these projects has delivered tangible and intangible value. However, each pursuit has required additional time and effort on the part of Metro staff to learn, manage change, advance their thinking and apply it forward.

Being committed to continuous improvement, and willing to listen to alternative perspectives and ways of doing things, represents a tremendous opportunity for Metro. The Unsolicited Proposal process gives Metro a tool to understand, look ahead and take steps towards creating a better future.

Phillip A. Washington  
Chief Executive Officer

IT'S OFTEN TOO EARLY TO TELL;  
IT'S NEVER TOO EARLY TO LEARN

One of the primary roles of an innovation office is to encourage learning and exploration, which introduces the risk of failure. The UP process gives partner departments permission and cover to fail forward and fail in order to explore of better ways of doing things.

This portfolio provides the names of Metro staff who have worked on these projects. These projects didn't just happen on their own. By putting names to these projects, our hope is to encourage enterprise, learning, doing and engagement so that employees can reap what they sow. Innovation thrives in environments that reward breakthroughs and a willingness to take thoughtful risks.

In any workplace, relationships and communication are critical to getting things done, but in risk averse government agencies, the tendency is to not talk about projects until they are done because they might change or fail. While an aversion to "counting chickens before they hatch" is understandable, it is important to echo innovative efforts and build on them. Communication, early and often, not only broadcasts successes, it leads to more of them.

I will own well-intentioned  
failure. You will own the success.

– Phillip A. Washington, CEO

*What started as a mechanism to receive and implement good ideas became an incubation process and pipeline of projects with the potential to change the way we at Metro think and act in our pursuit of agency goals.*

*Here's how it happened:*

## A BRIEF HISTORY: LAUNCHING THE UNSOLICITED PROPOSALS PROCESS

Even before embarking on the development of Metro's 10-year strategic plan, Vision 2028, or establishing a Public-Private Partnership (P3) office, OEI debuted the Unsolicited Proposal (UP) Policy as its centerpiece.

Metro held its Transformation through Transportation (T3) industry forum. CEO Phil Washington declared Metro's "doors open to the private sector" and the call for innovative ideas went out.

As Metro awaited its first submission, it was early 2016, and all eyes were on November when voters would decide whether to approve Measure M, a ballot measure that would raise LA County's sales tax by one half cent and stream about \$860 million annually for highway, rail, bus and road maintenance projects for the next 40 years. The measure would more than double the size of LA County's rail network, and more.

When the UP Policy was established, its authors hoped it would catalyze ideas to accelerate Measure M projects — which were programmed decades into the future — by bringing forward financing strategies, alternative approaches and superior technical concepts, as was achieved in Denver when Phil Washington was General Manager of Denver's Regional Transportation District. In the spirit of openness, Metro left the policy intentionally broad and the bar to submit low, so that no idea with the potential to improve lives through mobility was excluded.

With the election approaching and the new office under pressure to live up to its extraordinary name, it received its first submission. But the UP wasn't a Measure M project. It was for an illuminator technology that would allow Orange Line customers identify their location on the line. Of the next 40 proposals, only one contained project financing ideas, and none were for delivery of a Measure M project. But the proposals weren't out of left field. OEI had identified its interest in a New Mobility program and were fielding calls daily to discuss what Metro "was doing about Uber and Lyft."

The fourth proposal Metro received was for MicroTransit — a service that leverages a software platform to dynamically route vehicles, much like the operations of Transportation Network Companies (TNCs). This project has become the centerpiece of the agency's New & Emerging Mobility Program and is executing Vision 2028's mission of improving the user experience on public transit for current and future customers. The fifth unsolicited proposal was from Uber, and was spun off into a first-of-its-kind TNC partnership that enabled customers to earn discounts when connecting to the newest Expo stations from within a nearby radius. This partnership has provided best practices towards the development of the agency's New & Emerging Mobility Program as well.

It wasn't until September 2016 that Metro received its first major capital UP, and then its second through seventh immediately thereafter. These proposals not only laid the groundwork for the P3 projects currently planned on Sepulveda and West Santa Ana Branch, they were valuable in creating political support for the ballot measure that made them possible. The latter UP coincided with the Gateway Cities Council of Governments, moving their position on Measure M from "oppose" to "neutral" — a critical victory on the path to a two-thirds vote.

But this portfolio isn't about the major capital P3s. It is about the Innovation Pilots that came through the process; the lessons learned through them and by getting them off the ground; and most importantly, the people who moved them from a rough concept to implementation. People inside and outside of Metro worked together to create and capture more value out of the UP process than was originally understood. This portfolio examines these low-cost, high impact projects in greater detail, including how they fit within the bigger picture and how they are helping build an innovation culture at Metro.

## LEARNING BY DOING: CHANGE INITIATIVES HAVE TO CHANGE, TOO

Of course, getting to this point wasn't nearly as linear as described in "A Brief History." As a new office, delivering projects through the UP process was a greater priority for OEI than Metro at large, meaning OEI had to change its approach to see results.

While some early proposals were moving forward, they were likely due to factors other than an effective project development and implementation process—factors like institutional energy around topics such as New Mobility and P3s, CEO support, latent industry aces-in-the-hole, and OEI's pushy manner and not-yet-full plates.

For the UP process to work long-term, departments have to see the benefit, so OEI could not sustain multiple long reviews of low-priority projects nor multi-round battles over whether an idea was worth advancing. The early disposition to try any project with potential quickly gave way to a more contextual approach of identifying areas where strategic intervention could have an impact. In the best instances, departmental champions were aware of the process and either submitted their own internal proposals (i.e. "Vehicle to Infrastructure Optimization") or referred prospective

proposers to the process with enthusiasm (i.e. "Smart Bike Rack"). This being rare, saving its pushes for the truly great ideas involved OEI conducting rapid assessments of whether a project was positioned for impact and success. Key questions asked included: Does the proposal solve a problem we actually have? Does it have a departmental champion? What are the departmental pain points? Is this something OEI would lead? Does Metro have jurisdictional authority? Is there an existing contract in place? How much social capital would be gained or lost? Would additional information help us advance our thinking? Is there an opportunity here? If we should do this, how?

This reframe was critical because it made OEI a more effective matchmaker, and made departments true partners in deciding what to prioritize. Departments could get more value and less pain from the process, so they gave more to the process. And OEI, rather than forcing projects or going it alone with limited capacity and expertise, could focus on identifying problems and potential solutions; bringing departments together; and developing tools for project evaluation, development, implementation and cross-sector partnership.

This portfolio examines these low-cost, high-impact projects in greater detail, including how they fit within the bigger picture and are helping build an innovation culture at Metro.



## THE PRESENT FUTURE: UP 2.0

*The pipeline of ideas introduced to Metro through the Unsolicited Proposal (UP) process has brought adaptability, teamwork and implementation tools along with it. What can better, more focused ideas bring?*

Over the last three years, Metro learned that to be successful in developing and implementing UPs, the pursuits must be focused on high impact, mission critical issues that a UP can help solve. Not every initiative requires or benefits from a UP.

During this same stretch of time, through a combination of UP reviews, strategic plan development, capacity constraints brought about by Measure M and P3 project development, Metro became more results-oriented and strategic about problem-solving. To get to this place, Metro needed to be willing to confront its problems, and be committed to developing tools to collaborate across sectors to solve them.

After three years of running the UP process, through taking hundreds of meetings with potential proposers, Metro felt that too many of the 180+ proposers developed their proposals in the dark, meaning that staff was spending too much time on proposals that missed the mark. This is not an ideal outcome for either side.

With changes recently made to the UP policy and process, Metro aims to make the process more focused and the tool even more effective. To this end, Metro is shining a light on its current context and potential focus areas to better align solutions to existing challenges. Changes include:

- > Creating challenge statements that will enable Metro to point industry toward specific pain points where innovative solutions are needed
- > Mobilizing industries and stakeholders around these issues through Unsolicited Proposal Forums, also known as the Metro Accelerator Series
- > Creating the Proof of Concept (POC) Policy
- > Explicitly allowing for Employee Unsolicited Proposal submissions
- > Holding pre-proposal briefings to assess and shape ideas for impact and fit

These improvements to the Unsolicited Proposal Policy are intended to make the process more focused and help Metro use the tool more effectively to accomplish its mission. In addition, each project presents an opportunity to test new tools. Alongside UP 2.0 and through these innovation pilots, Metro has developed an expanded toolkit for getting the private sector involved earlier in projects, risk- and reward-sharing, performance- and challenge-based contracting and more.

The hope is that UPs continue to give outside perspectives a voice and opportunity to win business, but with greater focus on:

- > Moving the needle on the most difficult initiatives and key trends identified in Vision 2028;
- > Informing Metro's agenda as it evolves; and
- > Identifying actionable, win-win situations.

While this report seeks to highlight that the process is working on many levels, the UP process and associated tools and processes must continue to improve to stay relevant and deliver innovative, low cost, high impact projects that help Metro manage change, solve problems and fulfill its mission.

## HOW THE UP PROCESS WORKS

The UP policy allows any entity or Metro employee to submit concepts to Metro for formal evaluation. Once a proposal is submitted, Metro can either decide to implement the proposal through a competitive solicitation or sole source; advance the proposal to the second phase of evaluation by giving and requesting information needed to further develop the project; or decline the proposal. The projects highlighted in this portfolio have advanced in some manner through this process and are organized as such.

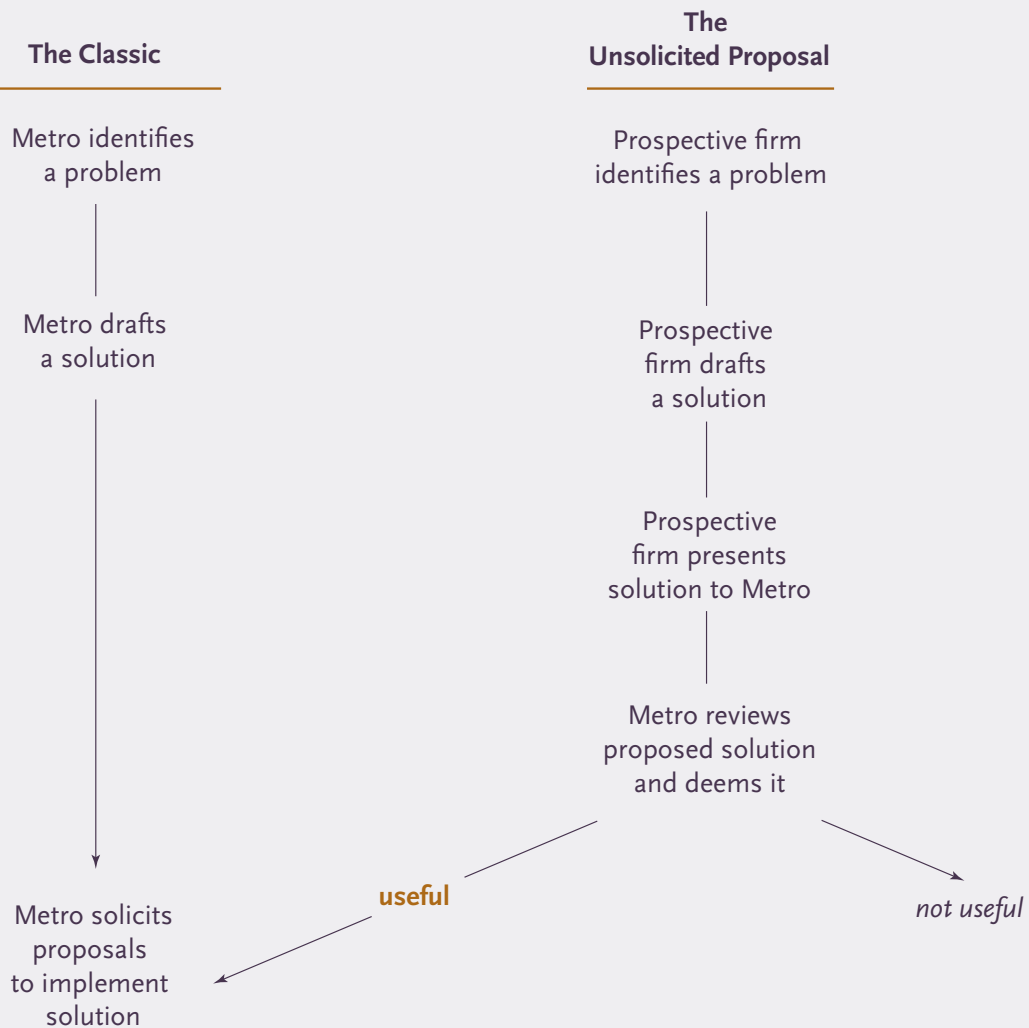
### The Journey of an Unsolicited Proposal (UP)



## HOW THE UP PROCESS IS DIFFERENT

Metro does not need a UP to advance a project or develop and implement an innovative idea; Vendor/Contract Management helps Metro staff procure thousands of mission critical and innovative products and services each year. What makes the UP process notable is where the idea originates and the way in which the project is co-developed by internal and external parties.

### Classic Request for Proposal (RFP) Process vs. UP Process



## UNSOLICITED PROPOSALS: RELATIONSHIP TO VISION 2028

The Metro Vision 2028 Plan (accessible at [metro.net/vision2028](http://metro.net/vision2028)) is the agency-wide strategic plan that will align all of Metro's services, programs and projects toward a unified vision. The plan sets the mission, vision and goals for Metro, and puts in motion specific initiatives and performance outcomes towards which Metro and its partners will strive in pursuit of a better transportation future. The plan emphasizes putting the user experience at the core of transportation and at the forefront of how we do business.

Metro's mission is to provide a world-class transportation system that enhances quality of life for all who live, work and play within LA County. **Metro's vision is composed of three elements:**

- > Increased prosperity for all by removing mobility barriers;
- > Swift and easy mobility throughout LA County, anytime; and
- > Accommodating more trips through a variety of high-quality mobility options.

**Vision 2028 outlines the following five goals:**

1. Provide high-quality mobility options that enable people to spend less time traveling;
2. Deliver outstanding trip experiences for all users of the transportation system;
3. Enhance communities and lives through mobility and access to opportunity;
4. Transform LA County through regional collaboration and national leadership; and
5. Provide responsive, accountable and trustworthy governance within the Metro organization.

The Unsolicited Proposal process is one key tool to help operationalize Vision 2028. The process enables Metro to be nimble and to quickly realize the benefits of new opportunities that arise in the ever-changing transportation landscape. It's one way to explore new business models, technologies and tools for delivering services better, faster and more effectively as part of our continuous improvement practices.

## INNOVATION PILOTS: RELATIONSHIP TO P3S

As mentioned earlier, though not the focus of this Portfolio, Public-Private Partnerships (P3s) for major capital projects are an integral part of the Unsolicited Proposal program. They even play an important role in many of our Innovation Pilots that are not classic P3s.

Here are some of the **ways Metro is incorporating best practices from P3s into its Innovation Pilots:**

- > Recognizing the strengths of the private sector, such as innovation, research and development, and lifecycle management
- > Getting partners involved earlier in the process
- > Managing risk proactively and with an understanding of which party is best positioned to manage each risk and how much risk costs
- > Building win-win solutions that incentivize each party to perform
- > Building contracts around performance-based outcomes rather than prescriptive rules and procedures

**While keeping many of the things that traditional government procurements afford, including:**

- > Using the RFP process to develop a thoughtful schedule, scope and budget
- > Leveraging competition to get the best price and product
- > Ensuring an ethical and fair process
- > Ensuring that government contracts work towards social aims, such as equity and economic development

## OVERVIEW OF INNOVATION PILOTS

The Innovation Pilots in the pages that follow are organized by how they moved through the Unsolicited Proposal process. Some proposals have advanced directly from their initial conceptual *Phase I* submission to implementation, some proposals have been developed through the *Phase II* process of collecting additional detailed information, some proposals have been spun off into *Proofs of Concept*, and some proposals are in the advanced stages of development.

### **Advanced from Phase I to Implementation**

- > Smart Bike Rack
- > Orange Line Vehicle to Infrastructure Optimization
- > Artificial Ivy

### **Advanced from Phase II to Implementation**

- > Los Angeles Aerial Rapid Transit
- > MicroTransit Pilot Project
- > Mobile Tolling
- > Facility Asset Management P3
- > Vermont/Santa Monica Station Joint Development
- > Mobile Charger Vending Machines
- > Preventing Unplanned Outages

### **In Development**

- > Cash Counting Machine
- > Cyber Security

### **Proof of Concept**

- > Lane Enforcement
- > Flow Modeling
- > Uber + Expo
- > Drones
- > Improving Real-Time Arrival Information

## SMART BIKE RACK

Bike Hub, Bikeep, Metro Bicycle Planning and Parking Departments



Photo Credit: Bikeep

**Can a better bike rack increase bike access to stations, while reducing bike thefts and bikes on board Metro trains?**

- > A strong lock attached to the rack and camera surveillance increase security
- > Accessible with a TAP card, driver’s license or phone call so cyclists can use it when they need it
- > Smaller footprint and lower costs than a bike hub
- > Customers can leave the lock at home
- > Explore fit within Metro's Bike Parking plans

<i>Feature</i>	Bike Rack	Bike Locker	Bike Hub	Smart Rack
Free to use	Yes	No	No	Optional
Secures bike without user lock	No	Yes	No	Yes
Protection from elements	No	Yes	Yes	No
Protection from tampering	No	Yes	Yes	No
Requires minimal Metro property	Yes	No	No	Yes
Customer support	No	Yes	Yes	Yes
Requires minimal maintenance	Yes	No	No	Yes
Accommodates many users	Yes	No	Yes	Yes
Able to integrate with fare media	No	No	Yes	Yes
Requires minimal effort to implement	Yes	No	No	No

**Goals:**

- > Increase bicycle access to stations
- > Reduce bicycle thefts
- > Reduce bicycles on board
- > Improve customer experience for cyclists and passengers on crowded trains

**Best Practices:**

- > Addresses areas of customer friction on multiple fronts
- > Two-phased pilot for scalability, if successful
- > Leasing equipment instead of purchasing gives Metro flexibility as equipment ages, if improved products become available, or if the pilot is unsuccessful
- > Complements existing bike parking initiatives and extends the Metro Bike brand
- > Adds new utility to TAP card without complex integration
- > Piloted at stations based on factors of equity, bike thefts and demand for bike lockers

**Contact:**

Anthony Jusay – Manager, Transportation Planning  
213.922.7675  
[JusayA@metro.net](mailto:JusayA@metro.net)

Shannon Joseph Hamelin – Senior Director, Parking Management  
213.418.3076  
[HamelinS@metro.net](mailto:HamelinS@metro.net)

## ORANGE LINE VEHICLE TO INFRASTRUCTURE OPTIMIZATION

Internal proposal from Gary Spivack (Service Planning), Leonid Bukhin and Tony Tiritilli (Corporate Safety)



### Can better information help Bus Operators catch more green lights on the Orange Line?

Corporate Safety is leading the development of a speed advisory software that analyzes LADOT street signals against bus movements to broadcast a suggested speed to Operators. Vehicles maintaining a constant speed and staying within the green band could create a smoother operation with many benefits to Metro and its customers.

#### Goals:

- > Increase Operator satisfaction
- > Improve run times
- > Reduce fuel consumption, wear and tear, and possibly the number of buses needed
- > A smoother, faster ride for customers
- > An important step towards future connected-vehicle applications

#### Best Practices:

- > Idea developed and supported internally
- > Unsolicited proposal helped project “get over the hump”
- > Partnership with LADOT
- > Utilized bench contractor, Turner Engineering, to expedite implementation
- > Thanks to flexibility from ITS department and the efforts of the Digital Strategy and Innovation team alongside Equipment Maintenance, project team was able to leverage existing “Connected Bus” cellular network and expedite the prototyping of a router-equipped articulated bus
- > Test ground for recurring policy questions related to allowing Operators to use a device while driving
- > Use of platform for bus platooning and headway management being developed and tested
- > If successful, can be adapted for other uses

#### Contact:

Tony Tiritilli – Manager, System Safety  
213.922.7233  
[TiritilliT@metro.net](mailto:TiritilliT@metro.net)



## ARTIFICIAL IVY

### Intuitive Real Estate Solutions and Facilities Maintenance



Photo Credit: hooksandlattice.com

#### **Can artificial ivy placed at tagging hotspots deter graffiti on Metro property?**

To support Metro's long standing zero-tolerance policy for graffiti system-wide, Facilities Maintenance will be testing artificial ivy at seven locations.

The material is 100% recycled, UV resistant and fire retardant. The proposer, Intuitive Real Estate Solutions, was selected through a competitive process and is a Small Business Enterprise.

#### Goals:

- > Reduce tagging at hot spots throughout the system
- > Combat blight to increase perception of safety
- > Prove that a lower cost, low maintenance, waterless solution can help prevent graffiti at certain locations on the system

#### Best Practices:

- > Unsolicited Proposal process helped move the project from proof of concept to pilot implementation
- > Worked with small business to understand process for submittals
- > Potential capital solution to an ongoing operational problem

#### Contact:

Shaunt Avanesian – Facilities Maintenance Supervisor  
213.922.5931  
[AvanesianS@metro.net](mailto:AvanesianS@metro.net)

Carlos Martinez – Senior Manager, Facilities Maintenance  
213.922.6761  
[MartinezCarl@metro.net](mailto:MartinezCarl@metro.net)

Lena Babayan – Senior Director, Facilities Maintenance  
213.922.6765  
[BabayanL@metro.net](mailto:BabayanL@metro.net)

## LOS ANGELES AERIAL RAPID TRANSIT

### Aerial Rapid Transit Technologies and Multiple Departments



Photo Credit: Aerial Rapid Transit Technologies, LLC

#### **Could an aerial tram to Dodger Stadium alleviate traffic congestion, clean the air and spark joy?**

Aerial Rapid Transit Technologies proposes to design, build, finance, fund, operate and maintain an aerial tram between Los Angeles Union Station and Dodger Stadium.

Los Angeles Aerial Rapid Transit connects one of Los Angeles' most iconic, popular and congested destinations to Union Station and the broader transit network.

#### Goals:

- > Spurring economic vitality by pioneering new privately-funded infrastructure and delivery model
- > Leading in environmental stewardship by alleviating congestion through a zero-emission mode
- > Enhancing social equity by increasing available mobility options and reducing environmental impacts in communities that are currently impacted

#### Best Practices:

- > Private funding and financing
- > Roles and responsibilities based on sound interpretation of Metro's broad authority
- > Captures the imagination of the public
- > Unique partnership model

#### Contact:

Holly Rockwell – Senior Executive Officer, Countywide Planning  
213.922.5585

[RockwellH@metro.net](mailto:RockwellH@metro.net)

Dolores Roybal Saltarelli – Senior Director, Countywide Planning  
213.922.3024

[RoybalD@metro.net](mailto:RoybalD@metro.net)

## MICROTRANSIT PILOT PROJECT

### Via and Agency-wide



Photo Credit: Getty Images

#### **Can Metro partner with the private sector to design and deliver a service that provides current and future users a better experience than the Agency's traditional transit offerings?**

- > Can Metro leverage and harness new and emerging technology to provide a more customized experience?
- > Can Metro deliver a similar level of service to that of the Transportation Network Companies (TNCs)?
- > Can Metro develop a financially sustainable business model for on-demand products and services?

Private “new mobility” services are rapidly changing the transportation landscape by expanding travel options using an internet-enabled smartphone. The MicroTransit Pilot Project by design seeks to apply the best aspects of TNCs (on-demand, easy to use, reliable, fast) and the best aspects of the bus (affordable, accessible, shared) to create a new product and service that meets and exceeds customer, agency and public policy goals.

MicroTransit is anticipated to launch in 2020.

#### Goals:

- > Define and deliver a better user experience
- > Design a service that invests in our workforce and our technology skill sets
- > Design a multi-modal tool for trip planning, booking and payment
- > Reduce the number of transfers in line with our Transfer Design Guidelines
- > Develop a sustainable financial model

#### Best Practices:

- > Developed the agency's first Public-Private Partnership Pre-Development Agreement (PDA P3) model for technology contracts
- > The two-part procurement, which is operated similar to a design-build, allowed for planning and design (Part A) and implementation and evaluation (Part B)
- > Metro awarded to multiple contractor teams to plan the service concurrently, allowing for competition throughout Part A
- > Metro owns all data, intellectual property and software developed for this project; this is the Agency's most assertive approach to intellectual property ownership to date
- > Metro engaged the private sector early and often, including: posting a draft scope of work online for industry comment and holding one-on-one meetings with technology companies, as well as hosting a 300+ person industry forum with speed networking for participants to identify partners

- > Metro tested the technology on-street prior to award, the first time in the industry for on-demand technology offerings; the teams had two weeks to make software street ready in Los Angeles, as none of the teams were operational within LA County
- > Subject matter experts engaged in the design of the service throughout the process, including Part A submissions and Part A design briefings
- > OEI conducted extensive research leading up to the project, *publishing UpRouted: Exploring MicroTransit in the United States* through the Eno Center for Transportation

Contact:

Rani Narula-Woods, Senior Director, Special Projects, Office of Extraordinary Innovation  
(818) 489-8651  
[NarulaWoodsR@metro.net](mailto:NarulaWoodsR@metro.net)

## MOBILE TOLLING

### Accenture and Congestion Reduction



Photo Credit: Ptolemus

#### Can smartphones replace ExpressLanes infrastructure and improve system performance and the customer experience?

Metro's current tolling system uses industry-standard hardware (physical gantries and transponders) that require a significant investment to build and maintain, and require users to request and obtain a transponder prior to use of the lanes.

The Mobile Tolling pilot will evaluate whether a location-aware smartphone application can reliably substitute for the conventional transponder/gantry approach to toll collection. If successful, it would represent a convenient alternative for users to access the ExpressLanes, and could eventually be used to replace the current transponder/gantry toll collection approach across the ExpressLanes system for a significant cost savings.

#### Goals:

- > Prove the Technology — Develop a smartphone application with 99.999% accuracy at detecting when a given user is in the ExpressLanes, and a 0% false-positive rate
- > Deploy — Provide users with a convenient alternative method for accessing the ExpressLanes
- > Significantly Reduce Operating Costs — If proven effective, deploy widely across the ExpressLanes user base to achieve significant savings to Metro in transponder and gantry costs

#### Best Practices:

- > Contract Flexibility — Three-phase contract allows for an initial small-scale test, an option for expanded testing if initial tests are encouraging, and an option for further development work to bring the application to a marketable state if expanded testing is successful
- > Performance-Driven Approach — The Scope of Work was strategically written to be open-ended regarding technologies used and approach taken, and clearly defined quantitative performance criteria to establish success
- > Access Industry Expertise and Insights — Use of the Unsolicited Proposal process has allowed Metro substantial insight into several relevant emerging technologies and associated potential applications

#### Contact:

Dina Saleh, Senior Transportation Planner, Congestion Reduction  
213.418.3217  
[SalehD@metro.net](mailto:SalehD@metro.net)

Robert Campbell, Manager, Congestion Reduction  
213.418.3170  
[CampbellR@metro.net](mailto:CampbellR@metro.net)

## FACILITY ASSET MANAGEMENT P3

### Bluefin, Program Management and Facilities Maintenance



Photo Credit: Roof Maintenance Design Group

#### **Could a performance-based P3 contract to manage 1.75 million square feet of roofs improve roof performance, increase efficiency and save money?**

Metro's roofs are aging faster than Metro is repairing them, causing higher costs and degraded performance. Metro's lack of roof funding is leading to a lack of roof planning and vice versa, while roofs continue to break down. The result: the roofs are leaking on our employees.

To solve this problem, the proposal recommends managing roof repair systemwide on one long-term management contract built around performance. This incentivizes the contractor to fix roofs before they fail, when they are less expensive to fix. To provide cost relief, the proposer explored introducing solar power.

#### Goals:

- > Repair roofs before they fail and at a lower cost
- > Perform repairs programmatically rather than as one-offs
- > Optimize roof assets from a financial and performance perspective
- > Contract can be flexible to Metro requirements, including small and minority business utilization
- > Relieve costs through solar development

#### Best Practices:

- > Fixing assets before they fail saves money long term
- > Payments can be made over time instead of in one large sum
- > Synergy between solar development and roof repair instead of conflict
- > Managing assets programmatically

Contact:

Denise Longley – Deputy Executive Officer, Enterprise Transit Asset Management

213.922.7294

[LongleyD@metro.net](mailto:LongleyD@metro.net)

Andi Wang – Deputy Executive Officer, Program Management

213. 922.4722

[WangA@metro.net](mailto:WangA@metro.net)

Kevin Sechler – Director, Facilities Maintenance

213.922.5950

[SechlerK@metro.net](mailto:SechlerK@metro.net)

Errol Taylor – Executive Director, Maintenance and Engineering

213.922.3227

[TaylorEr@metro.net](mailto:TaylorEr@metro.net)

Yousef Salama – Manager, Innovation, Office of Extraordinary Innovation

213.418.3323

[SalamaY@metro.net](mailto:SalamaY@metro.net)

Nolan Borgman – Senior Transportation Planner, Office of Extraordinary Innovation

213.922.4117

[BorgmanN@metro.net](mailto:BorgmanN@metro.net)

## VERMONT/SANTA MONICA STATION JOINT DEVELOPMENT

Little Tokyo Service Center Community Development Corporation and Metro Joint Development



Credit: Birba Group

### **Can privately-owned properties be combined with underutilized Metro properties to create affordable housing and community-serving uses?**

Metro has partnered with the Little Tokyo Service Center Community Development Corporation (LTSC) on a mixed-use affordable housing project at the Vermont/Santa Monica Red Line Station.

In 2016, Metro created a Joint Development (JD) Unsolicited Proposal Policy and Process. This project is the first joint development Unsolicited Proposal to lead to an

Exclusive Negotiation Agreement and Planning Document (ENA). LTSC has already secured over \$20M in financing, is currently refining the project's design and will be submitting for entitlements to the City of Los Angeles in the coming months.

#### Goals:

- > Produce over 190 units of affordable housing and 20,000 square feet of ground floor commercial space adjacent to the Vermont/Santa Monica Red Line Station
- > Activate and improve an existing Metro Station Plaza with community-serving uses such as eateries and a health center, and construct a mobility hub to facilitate multimodal connections between the station and the surrounding area

#### Best Practices:

- > Metro owns hundreds of small, irregularly shaped parcels throughout LA County; this project demonstrates that JD can be possible when difficult to develop Metro properties are assembled with privately owned land
- > Project will create 190 rental units serving low and very low-income transit-dependent individuals and families, and will contribute to Metro's JD affordable housing goals; LTSC and Metro have engaged with numerous area stakeholders to refine the project, including the East Hollywood Neighborhood Council, local Business Improvement District and City of Los Angeles staff

#### Contact:

Wells Lawson – Senior Director, Countywide Planning & Development

213.922.7217

[LawsonW@metro.net](mailto:LawsonW@metro.net)

Nicole V. Avitia – Manager, Transportation Planning, Countywide Planning & Development

213.922.7439

[AvitiaN@metro.net](mailto:AvitiaN@metro.net)



## MOBILE CHARGER VENDING MACHINES

### MobileQubes and Multiple Departments



Photo Credit: MobileQubes

#### **Will grab-and-go mobile chargers available for rent and purchase be a popular customer amenity?**

This tactical pilot is to deploy a small network of mobile charger vending machines at select Red Line stations to test their popularity and whether they present opportunities to improve station quality of life and security.

#### Goals:

- > Provide a customer amenity
- > Provide a resource for customers to keep cell phones charged for security, entertainment and quality of life purposes
- > Help address loitering and vandalism of exposed outlets

#### Best Practices:

- > Delivered as a lease
- > Revenue to Metro guaranteed
- > Scalable if popular
- > Metro not liable for vandalism, theft, etc.
- > Worked with Security, Real Estate, Traction Power, Facilities Maintenance, Electrical Engineering, Architectural Support, Systemwide Design, Metro Art and more

#### Contact:

Nolan Borgman – Senior Transportation Planner, Office of Extraordinary Innovation  
213.922.4117  
[BorgmanN@metro.net](mailto:BorgmanN@metro.net)

John Beck – Principal Real Estate Officer, Real Estate  
213.922.4435  
[BeckJ@metro.net](mailto:BeckJ@metro.net)

Amador Nafrada – Senior Engineer, Systems Engineering  
213.922.7259  
[NafradaA@metro.net](mailto:NafradaA@metro.net)

Marlon Godoy – Traction Power Inspector, Rail Maintenance of Way  
213.922.3323  
[GodoyM@metro.net](mailto:GodoyM@metro.net)

## PREVENTING UNPLANNED OUTAGES

Covington & Associates and Information Technology Services (ITS)



Photo Credit Dailymail.co.uk

**IT System outages are expensive and unproductive. Can we catch them before they occur?**

This diagnostic software prevents unplanned outages caused by misconfigured technology. It can be thought of like a computer antivirus scan, but for misconfigurations within the server/network/database environments.

### Goals:

- > Identify misconfigurations within the server/network/database environments efficiently and effectively, leading to the correction of these issues before an outage occurs

### Best Practices:

- > First UP completed
- > Gave Metro reason to be confident in its system architecture and software configurations

### Contact:

Richard Bezjian – Director, Engineering, System Architecture and Tech Integration  
213.922.4180  
[BezjianA@metro.net](mailto:BezjianA@metro.net)

## CASH COUNTING MACHINE

Southern AM Engineering and Metro Finance/Revenue Department



Photo Credit: H2H2H.org

### Can Metro process cash more effectively?

Metro accepts cash on its buses, at its TAP Vending Machines (TVMs) and at Metro Customer Service Centers. All this cash is collected and counted using in-house labor and contract services.

This UP is an example of a company recognizing a problem at Metro and within the industry, and working to solve it. In order to ensure that the solution was an improvement, the company worked diligently to understand the costs and benefits of Metro's current processes against their custom solution, which they developed without the promise of a contract.

### Goals:

- > Process 600 units per minute
- > Meet uptime requirements
- > Perform without additional staffing
- > Better cost/benefit outlook than current processes

### Best Practices:

- > Shining a light on a process inspired an engineer to develop a custom solution with the hopes of selling it to Metro and beyond
- > Developing clear metrics and understanding Metro's baseline will help Metro make the decision whether to change its practices
- > Metro has brought actual cash to the facility (with Security detail) to run a realistic test of the machine
- > Counting a higher percentage of revenue in-house could save money and increase control and oversight

### Contact:

Mark Simpson – Director, Revenue Collection  
213.922.4842  
[SimpsonM@metro.net](mailto:SimpsonM@metro.net)

## CYBER SECURITY

### FireEye, Security, ITS and Operations



Photo Credit: CNet

#### **What is the return on investment of a risk-based, cybersecurity transformation program?**

This proposal seeks to evaluate risks and determine which people, processes and technology should be deployed to keep Metro secure.

#### Goals:

- > Improve Metro's cyber security
- > Protect passengers, employees, information, assets and systems
- > Keep transportation system safe and available
- > Avoid costs of a cyber breach

#### Best Practices:

- > Holistic approach blending strategies and tactics; products, services and processes; and planning and implementation
- > Use of non-disclosure agreements
- > Interdepartmental collaboration

#### Contact:

Janice Lim – Deputy Executive Officer, Enterprise Information Management  
213.922.5590  
[LimJ@metro.net](mailto:LimJ@metro.net)

Christiam Lemus – Senior Network Engineer, Information Security  
213.922.3401  
[LemusC@metro.net](mailto:LemusC@metro.net)

Joe Giba – Executive Officer, Information Technology  
213.922.3450  
[GibaJ@metro.net](mailto:GibaJ@metro.net)

## PROOFS OF CONCEPT

It would be unrealistic to expect that OEI and other Metro departments could commit to fund, project manage and run every unproven idea worth trying. Proofs of Concept (POCs) are opportunities for Metro to take a deeper look at the value proposition of a product or service, for free, with no contract. The Unsolicited Proposal Policy was revised in May 2018 to explicitly allow these demonstrations.

### *Ground Rules*

- > At the end of a POC, a contract cannot be given to the company without a competition or a sole source justification
- > If a POC project becomes the subject of a competitive solicitation, all the information given to the POC participant is provided to all bidders in the solicitation documents
- > If proprietary information is being provided, a Non-Disclosure Agreement may be signed by either party as needed
- > Indemnification often comes up, and Metro is often reluctant to indemnify outside parties
- > If equipment is being borrowed by Metro, normal wear and tear should be expected and not reimbursed

## LANE ENFORCEMENT

### CarmaCam and Vehicle Operations



Photo Credit: Los Angeles Magazine

#### Can a smartphone application help Metro keep bus-only lanes clear of other vehicles?

Metro's bus lanes run adjacent to general purpose streets, often with no separation. Normal vehicular traffic uses bus-only lanes for right turns, so some lane intrusion is allowed. But illegally parked cars and idling cars clog the lanes, create adverse operating conditions and slow down buses.

Enforcement of the lane is not a priority for law enforcement.

This project will explore whether an application can be used to capture incidences of illegal activity in the bus-only lanes and use the data to issue warnings and citations.

#### Goals:

- > Capture incidents effectively to facilitate enforcement
- > Improve on-time performance
- > Increase Operator satisfaction
- > Provide a model for future lane enforcement as bus-only lane networks expand

#### Best Practices:

- > Asked Bus Operators to weigh in on technology
- > Documented the problem
- > Technology was adapted to this application from its original use to fit Metro's needs
- > Similar program was successful in San Francisco

#### Contact:

Avital Shavit – Senior Manager, Transportation Planning, Office of Extraordinary Innovation

213.922.7518

[ShavitA@metro.net](mailto:ShavitA@metro.net)

Jorge Galvan – Director, Transportation Operations

(213) 617-6243

[GalvanJ@metro.net](mailto:GalvanJ@metro.net)

ZsaZsa Bates – Manager, Transportation Operations, Division 13

(213) 928-4604

[BatesZ@metro.net](mailto:BatesZ@metro.net)

Luis Garcia – Intern, Office of Extraordinary Innovation

(213) 418-3435

[GarciaL4@metro.net](mailto:GarciaL4@metro.net)

## FLOW MODELING

BuroHappold and Joint Development Department

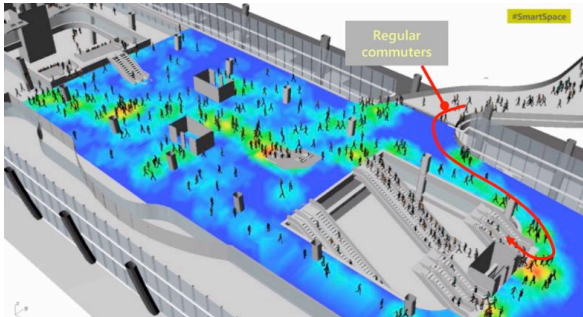


Photo Credit: BuroHappold

**Can tools that help envision how people move through space help Metro better plan, design and operate its system?**

BuroHappold modeled the way people travel around the North Hollywood Station now and in the future to understand how the path of travel for transfers between the Orange and Red Lines could be improved. The model tested multiple scenarios to predict pedestrian delay and conflict points.

### Goals:

- > Determine whether design interventions are needed at Orange Line station and Red Line mezzanine level
- > Test the utility of this data-driven, evidenced-based approach and methodology

### Best Practices:

- > UP Manager searched internally to identify a use case and project champion
- > Proof of Concept was tied to a larger, ongoing development project
- > Metro wasn't ready to commit to buying this technology, but BuroHappold was willing to perform a pared down scope pro bono to prove its utility and create future business opportunities, which created a low-risk situation for Metro and the larger project
- > BuroHappold provided a web-based version of the model that can turn design features on or off to analyze a range of different scenarios
- > Held two brown bag meetings to review the POC findings, better understand tools, and brainstorm applications to improve system designs and user experiences
- > Tool allows for people-centered, data driven decision-making early in the planning process

### Contact:

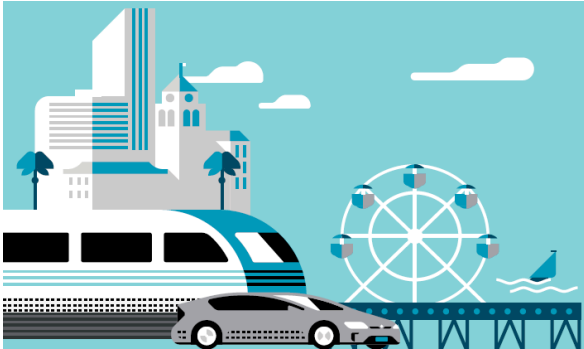
Wells Lawson – Senior Director, Countywide Planning  
213.922.7217  
[LawsonW@metro.net](mailto:LawsonW@metro.net)

Marie Sullivan – Manager, Transportation Planning  
213.922.5667  
[SullivanM@metro.net](mailto:SullivanM@metro.net)

Christina Baghdasarian – Transportation Planner, Countywide Planning  
213.922.7685  
[BaghdasarianC@metro.net](mailto:BaghdasarianC@metro.net)

## UBER + EXPO

### Uber and Office of Extraordinary Innovation



Artwork Credit: Uber

#### **Can Transportation Network Companies (TNCs) complement rail service by helping customers with the first and last mile?**

Metro and Uber partnered around the opening of the Expo Line for a two-week period to give discounts to people using Uber to connect to the new Expo stations from within a nearby area.

#### Goals:

- > Increase access to Expo Line by providing an option for first and last mile travel
- > Learn by doing a partnership with a Transportation Network Company (TNC)
- > Better understand how TNCs are used as a complement or substitute for transit

#### Best Practices:

- > Spun off from Unsolicited Proposal and completed within six weeks
- > First-of-its-kind partnership
- > Lessons learned applied to Mobility on Demand project

#### Contact:

Colin Peppard – Senior Director, Special Projects, Office of Extraordinary Innovation  
213.418.3434  
[PeppardC@metro.net](mailto:PeppardC@metro.net)



## DRONES

### Media Arts and KSI, and Program Management

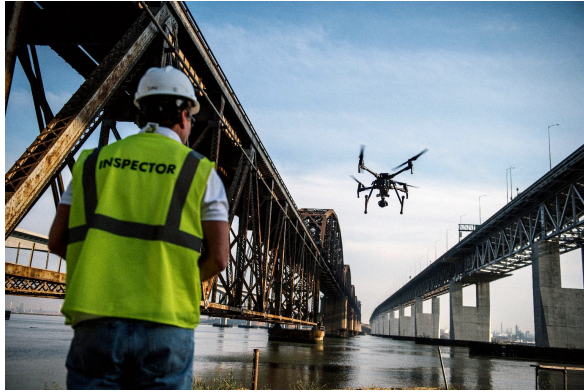


Photo Credit: Union Pacific

#### **Can the use of drones increase the efficiency, cost effectiveness, and effectiveness of facility and track inspection data collection?**

This proposal catalyzed the socialization of using drones to collect data throughout Metro, and planted the seed for the development of a drone program at Metro.

As part of this Proof of Concept, Media Arts and KSI flew over two facilities and produced a report of findings.

#### Goals:

- > Socialize the capabilities of drones amongst Metro employees
- > Collect and analyze drone data
- > Find an initial use case to prove that drones can add value to data capture throughout the organization

#### Best Practices:

- > Started with easy mission away from public domain
- > Adapted use case to “crawl before walking”
- > Continued to develop value proposition and project after Unsolicited Proposal, including a software POC using drone-based data collection on the Rail to Rail project. Presented Rail to Rail data, along with lessons learned on how to authorize, plan, fly and process mission data to Program Management, Wayside Systems, Transit Asset Management, Environmental Compliance and OEI.

#### Contact:

Shannon Hanley – Chief Admin Analyst, Program Management  
213.922.1350  
[HanleyS@metro.net](mailto:HanleyS@metro.net)

Ashley Mack – Architectural Associate, Facilities Engineering-Operations  
213.922.7386  
[MackA@metro.net](mailto:MackA@metro.net)

Tamar Fuhrer – *No longer with Metro*

Nolan Borgman – Senior Transportation Planner, Office of Extraordinary Innovation  
213.922.4117  
[BorgmanN@metro.net](mailto:BorgmanN@metro.net)

Other Unmanned Aircraft Systems (UAS) Resources:

Stephen Toms – Project Manager, Enterprise Transit Asset Management

213.922.5548

[TomsS@metro.net](mailto:TomsS@metro.net)

## IMPROVING REAL-TIME ARRIVAL INFORMATION

### Swiftly and ITS



#### **Can Metro improve its real-time arrival information by improving bus geolocation services and predictive algorithms?**

Predicting where a bus will be in the future requires an accurate understanding of where that bus is on its route presently, which Metro’s existing system only reports every three minutes. Swiftly solved this problem with low-cost GPS trackers that report the bus locations every 10 seconds.

With better data inputs, this POC then tested whether Swiftly’s “Transitime” algorithm, which determines where the bus will be based on where it is, performed against Metro’s existing algorithm.

This pilot also encouraged Metro to think about what a customer looks for in a real-time arrival prediction if, for example, one prediction was more precise within five minutes but less precise within 20 minutes.

#### Goals:

- > Improve data inputs
- > Test Swiftly’s algorithm against Nextbus
- > Review real-time arrival methodology
- > Improve real-time arrival predictions

#### Best Practices:

- > Chose two bus lines operating out of Division 3 that were well suited to testing and POC management
- > GPS trackers showed improved real-time poll rates; findings helped to justify and accelerate the fleetwide implementation of the “Connected Bus” project (putting WiFi on all buses)

#### Contact:

Doug Anderson - Senior Director, Information Technology  
213.922.7042  
[AndersonD@metro.net](mailto:AndersonD@metro.net)

Al Martinez – Senior Director, Information Technology  
213.922.2956  
[MartinezAl@metro.net](mailto:MartinezAl@metro.net)



*Written by:* Nolan Borgman

*Key Contributors:* Avital Shavit, Tamar Fuhrer, Carolina Coppolo, Pete Rodrigue, Joshua Schank, Colin Peppard, Eileen Hsu

*Edited By:* Joshua Schank, Sharyne Ng, Avital Shavit, Dennis Arnold, Metro Marketing Department

*Designed by:* Metro Design Studio

*Special Thanks:* Vendor/Contract Management, Tamar Fuhrer (formerly of OEI), Pete Rodrigue (former Coro Fellow placed with OEI) and every person and department who has been involved in building the Innovation Pilot Program

