

# 66

Starting in February 2018, more than 2,000 drivers from across Washington participated in a yearlong pilot project to test how a pay-per-mile system might work.

-CITY 101 P.24 🕨

22 PREPARING FOR AUTONOMOUS VEHICLES
24 EXPLORING A ROAD USAGE CHARGE
26 SEEKING EFFICIENT SOLUTIONS FOR MAINTAINING CITY STREETS



### **Sharing Time**

Community or low-speed AVs travel at 10–35 miles per hour and include small robotaxis, pods, large shuttles, and retrofitted vehicles like golf carts and vans. See how some communities are piloting AV tech now:



### Connecting to sports and entertainment

For a year, attendees at Cowboys and Rangers games in Arlington, Texas, escaped the heat and got to see AV technology for themselves.



### **Expanding public transit**

Las Vegas trialed an on-street circulator, and Tampa will soon join, connecting transit stops. Denver, Houston, and Atlanta are on the verge of providing first/last-mile service to transit.



### **Getting around a community**

A Florida retirement community and a solar suburb are using an on-demand taxi-like service now.



Quicken Loans employees in downtown Detroit are making tens of thousands of trips from offices to parking sites.

# **JOINING THE AV CLUB**

Lessons for cities on the future with autonomous vehicles KELLEY COYNER & LISA NISENSON BOTH OF MOBILITY e3

**HE ORIGINAL REPORT** on this scenario planning exercise, held at the American Planning Association Research Symposium, appeared in Mobility Express under the pen name "Mobility Momma." A hundred planners, engineers, and researchers gathered to understand the impacts of autonomous vehicles (AVs) and crowdsource how to plan for them. This "memo," which has been updated, set the stage for the crowdsourcing strategies and resources. The "city manager's response" reflects our research and practice since the symposium.

#### TO: CITY MANAGER

**FROM:** CONCERNED CITY COUNCILMEMBER **RE:** MINI METROPOLIS — UNDER THE EIGHT BALL

No matter whom I talk to—new businesses, our financial advisers, the state DOT, concerned citizens—it seems like we are way behind! No one agrees on anything except that driverless cars, buses, shuttles, and maybe even riderless scooters are here now.

Waymo's gone into production with a factory in Detroit. Dozens of cities will soon have shuttles with cute names like Milo, Olli, and Marlon, some operating on the sidewalk, in special lanes, and even in the middle of downtown traffic. (There is a big federal grant I would love to tap into for the university). Taxi drivers are still mad about Uber and Lyft.

Some say that AVs will siphon off ridership from transit, eliminate jobs, and lead to the bankruptcy of our bus system. The GM tells me that we need to learn from these new technologies now. The real estate developers say they are saddled with expensive parking spaces that won't be needed in an AV world.

University researchers claim that the vehicles will be roaming the streets empty and people will "drive" longer and longer distances. Plus, we won't be able to support the UPS distribution center without a real digital infrastructure. We don't even have good broadband internet access.

And then these advocacy groups say we're going to convert streets and parks, widen the sidewalks, and add protected bike lanes.

We are promoting ourselves as an innovation hub, but how is it innovative if 75 percent of our citizens still say they're scared to ride in AVs?

I would sure like to know what all the infrastructure is going to cost and how we'll pay for it. Can you pull together some level-headed experts and figure out what Mini Metropolis should do?

TO: CONCERNED CITY COUNCILMEMBER FROM: CITY MANAGER & DIRECTOR OF PLANNING RE: MINI METROPOLIS — A CHANCE TO SHINE

Thank you for your patience, Concerned City Councilmember. There's lots of speculation about when and whether we will switch over to autonomous vehicles. Let's figure out how Mini Metropolis can get ready for AVs and shape this mobility revolution. Here you go:





### MONEY TALKS: Focus on economic development, job loss and creation, and revenue loss.

Start by understanding the economic impact. Expanded and improved mobility choices and innovation are drivers of economic vibrancy and the ability to attract and keep jobs. Look at the impacts of AVs (what some people call "self-driving vehicles") on revenue. And look at the impact of jobs creation and retention and increased autonomy for those who do not drive. Greater fuel efficiency and shifts to electric vehicles will accelerate the downward spiral of gas tax revenues. Changed ownership models also may undercut personal property tax. Decreased demand for parking may cut into parking revenues.

### **2. UNDERSTAND EQUITY.**

AVs can dramatically improve opportunities for blind, older, and younger riders—if we consider those travelers in the planning and design. You need only try to find your Lyft or Uber at night in a crowded row of restaurants and shops to appreciate that we need to pay attention to the last 50 feet from home or restaurant to your ride. Also, let's make sure that shared vehicles are universally designed starting with wheelchair access. You would think this would be a no-brainer, but look around to see who has a ramp and a way to fasten wheelchair riders in securely. Meanwhile nationally, job and wage losses could hit transit and taxi drivers, delivery drivers, truckers, bus operators, and Lyft/Uber drivers disproportionately; we need to connect these workers to new jobs.

#### 3. WHAT TO WORRY ABOUT: Favor safety gains, and protect against cyber dangers.

There are indeed real reasons to be worried about the vulnerability of automated vehicles to cyberattack. Address that risk, so as not to let it hijack automated technologies that protect occupants and people in the path of AVs, such as pedestrians, bicyclists, and people at bus stops. The sooner we start adopting automated technologies, the more lives will be saved-some of the 37.000 lives that are currently lost to human-caused crashes each year. Most traffic crashes are attributable to human error; from pilots of AI-fueled technology at Sound Transit, we now can help protect pedestrians and reduce less dangerous but still costly incidents.

### 4. THE INTERSECTION OF NEW MOBILITY AND LAND USE: Mobility-Oriented Development

We've worked on making places where people can live, work, play, and prosper. How might they change our affordable and workforce housing? Is there a new paradigm for mobilityrich hubs that also include shared-AV drop-off areas, electric charging stations, and rich networks of walking and bike paths? Scenario planning with the stakeholders and the community is one way to explore how AV deployment could impact the city and what policy and planning tools we need to achieve our goals. Pilots of accessible, automated, connected, electric, and shared vehicles are another way to learn how to harness this disruptive set of technologies.

Conclusion: There are still many ways to maximize the safety and environmental benefits of AVs while guarding against increased congestion, sprawl, job loss, and the further weakening of public transit. Start by understanding AVs, and then move out with low-speed pilots that serve communities safely.

Let's start now, working with the community to define what the technology revolution will look like on the streets where we live. C

Kelley Coyner, founder of Mobility e3, has taught at George Mason University and headed transportation agencies. She now advises CityTech on mobility innovation and is Mobility Momma.

**Lisa Nisenson** *is an urban designer, smart mobility advisor, researcher, and founder of the award-winning smart city app GreaterPlaces.* 





### **Pilot Lights**

This map shows the levels of participation in the pilot project compared to that area's percentage of Washington residents. For example, 60 percent of WA RUC participants are from the Central Puget Sound compared to that area consisting of 62 percent of the state's population.

#### Participants Population



The state's road usage charge pilot project enrolled participants from all parts of the state and offered them a variety of tools for tracking mileage driven, including:

- Mileage permit
- Odometer reading
- Plug-in device with GPS
- Plug-in device without GPS
- MileMapper smartphone app

# PAY AS YOU GO

Washington explores a road usage charge in the quest for stable transportation funding

**REEMA GRIFFITH** EXECUTIVE DIRECTOR, WA STATE TRANSPORTATION COMMISSION

### ASHINGTON STATE



is exploring a potential gas tax replacement. The current state gas tax of

49.4 cents per gallon funds a large portion of the transportation budget that pays for maintenance of Washington's highways, ferries, and other infrastructure. As cars become increasingly fuel efficient and more electric vehicles travel our roads, the revenue used to support roads will decrease. To ensure stable, long-term funding for roads and bridges, the state is exploring options to change the way roads are funded.

### IN FEBRUARY 2018, MORE THAN 2,000 DRIVERS PARTICIPATED IN A YEARLONG PILOT PROJECT TO TEST HOW A PAY-PER-MILE SYSTEM MIGHT WORK.

Since 2012, the Washington State Transportation Commission (WSTC) has been exploring a road usage charge as a potential replacement to the gas tax. Starting in February 2018, more than 2,000 drivers from across Washington participated in a yearlong pilot project to test how a pay-per-mile system might work. Participants reported their miles, received mock invoices based on miles driven, and shared feedback about their experience.

Drivers were mock-charged 2.4 cents per mile, which is the equivalent per-mile cost of the current gas tax for a car that gets 20.5 miles per gallon, Washington's average. Participants had the option to choose between four mileage reporting options to record and report their miles driven, ranging from high-tech to lowtech and no-tech. Invoices shared insights about individual driving habits and compared what drivers would pay under the current gas tax with their potential road usage charge.

Throughout the test-driving phase of the pilot, participants had multiple opportunities to report observations made while participating and reviewing mock invoices sent at regular intervals. Test drivers also participated in focus groups and surveys, sharing feedback about topics like the convenience and user-friendliness of reporting options and invoices; the importance of principles such as privacy, simplicity, transparency, cost-effectiveness, and equity; and satisfaction with customer service and the pilot itself.

The test-driving phase of the 12-month pilot project ended in January 2019. Now that the pilot project is complete, all of the data and information collected will be analyzed and findings determined. The WSTC will issue a final report of findings and recommendations to the governor, the state Legislature, and the United States Department of Transportation by January 2020. At that point, the Washington State Legislature will be tasked with deciding if, how, and when a road usage charge would be enacted. **©** 

**Reema Griffith** leads the Washington State Transportation Commission's work on state finance, toll and ferry fare setting, long-range statewide planning, public outreach and education, and providing advisement to the Legislature and governor on transportation matters.



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### Building Bridges

Bridge repair and replacement projects are often out of scale with city budgets. In the City of Winlock (population 1,300), Olequa Creek splits the community in two, and bridges are essential transportation connections. The Fir Street Bridge closed in 2014 as unsafe, and the Walnut Street Bridge also needed repairs. Estimated project costs were almost \$4 million.

Federal Bridge Replacement Advisory Committee (BRAC) funding supports most major bridge repairs and replacements across the state, and Winlock received \$3.2 million for these projects. However, to receive federal funding, the city needed \$600,000 in matching funds. With limited local resources, there was a significant funding gap even with outside funding. Support came from the Washington State Transportation Improvement Board (TIB) Small City Program, and with this funding the town coordinated a major repair of Walnut Street Bridge in 2017 and replacement of the Fir Street Bridge in 2018.

# **FUNDING DRIVE**

Seeking efficient solutions for maintaining city streets BRIAN MURPHY BERK CONSULTING & STEVAN GORCESTER PERFORMANCE PLANE LLC

**VERY DAY, WE SPEND TIME** on city streets, whether driving, riding a bike, or walking. You may have taken a county road or a state route as you traveled to work or home today, but you likely started your day on a city street or used a city street to get to your destination.

City streets are an essential and basic part of our transportation network, connecting Washington neighborhoods and communities and supporting our economy. Altogether, Washington cities are responsible for about 17,000 miles of streets and about 740 bridges, carrying some 25 percent of statewide traffic each day.

The bulk of city investment in critical transportation infrastructure comes from local sources. While there are federal and state dollars that help with a range of projects, nearly 80 percent of city transportation funding comes from local sources, with the state contributing about 13 percent and the federal government covering the remainder. Within that local share, only a small portion of city investments come from funding sources dedicated to transportation, with the majority coming from general city funds. Transportation investments thus often compete for scarce public dollars alongside safety, human services, parks, libraries, and other city functions. Smaller cities with less general fund capacity to contribute to streets, such as Winlock (see "Building Bridges," at left), become more dependent on grants for street maintenance and upgrades.

Funding raised for local transportation is spent in different ways. Public works and transportation departments have base administration and overhead costs, as well as costs for maintaining buildings, equipment, and vehicle fleets. They also have costs to maintain the existing system, including daily activities (such as filling potholes), as well as long-term preventative maintenance that extends the useful life of streets. Finally, larger capital projects that enhance or expand infrastructure are also costs in a transportation budget, including all necessary financing and debt service costs.

These are all sizable costs to cities, and they are increasing over time. Washington cities spent \$1.4 billion on construction, maintenance, and preservation projects in 2017, according to the Washington State Department of Transportation (WSDOT). Over the past five years, this has increased on average by over 5 percent per year, adjusted for inflation.

These increasing costs have led to a greater gap between available funds and local needs. The reasons for these cost trends vary from community to community. Higher costs for labor and materials have been significant short-term drivers. Regulatory requirements and legal liabilities, ranging from stricter federal and state requirements for stormwater discharges to legal liabilities for fish passage barriers, have expanded the scope of transportation projects. Growth and development in many Washington communities have led to demands for expanding local transportation capacity to maintain desirable levels of service. Many of Washington's cities and towns face maintenance and preservation backlogs and lack adequate transportation revenues to meet these needs.

Considering all of these factors, and recognizing that cities both large and small are striving to make wise investment decisions to preserve and maintain their street networks, AWC worked with the Legislature to ask the state's Joint Transportation Committee (JTC) to explore the following questions as part of a new study:

• How much are different types of cities currently investing in streets? How do they fund these investments? How can state programs and local funding tools be most effective? Why do cities choose to use or not use certain funding tools?



How do transportation revenues and expenditures vary by city? How do city experiences differ based on local conditions, including cities with unique responsibilities such as bridges, commute corridors, freight corridors, or state highways?

How can new and existing data about our streets be used to ensure that our dollars are invested effectively in maintaining our streets, whether they come from federal, state, or local sources?

■ What factors drive the costs of maintenance and capital projects, considering such factors as the age of the underlying system, environmental mitigation, and desired social outcomes, as well as the underlying costs of labor and materials?

■ How do cities finance large transportation projects? What are the challenges cities face in assembling sources of funding for major projects?

• What potential alternative sources of funding could address existing gaps and future needs?

This study, which will conclude by the end of June, is being led by BERK Consulting, supported by Steve Gorcester and Perteet. Working with JTC staff and a staff workgroup, they will seek answers to the above questions through analysis of existing data, deeper investigation into several representative case studies (contact us if you would like your city's experiences to be featured as an illustrative example), and research into challenges and solutions found elsewhere in the country. (More information is available on the project webpage at leg.wa.gov/JTC/Pages/ City-Funding-Study.aspx.) In addition to providing an overview of what local communities are facing, this study will present guidance to the Washington State Legislature on future actions that can be taken to support cities in building and maintaining their transportation networks. Recommendations will not simply direct more state and local money at funding gaps, but instead suggest how current funding and current tools can be used more efficiently. **C** 

**Brian Murphy** is a principal at BERK Consulting Inc., with more than 15 years of experience leading complex policy projects and working closely with decision-makers.

**Stevan Gorcester** is a 35-year career professional in public management, transportation, and capital finance who led the Transportation Improvement Board (TIB) for almost 15 years before entering consulting.



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