City of Bellevue

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A STRATEGIC VISION FOR AUTOMATED VEHICLES

CITY OF BELLEVUE AND CITY OF SEATTLE

City of Seattle


OLD
BELLEVUE

ACKNOWLEDGMENTS

CITY OF BELLEVUE AND SEATTLE PROJECT TEAM

Daniel Lai | *City of Bellevue Project Lead*

Kelly Rula | *Seattle Department of Transportation Project Lead*

Jillian Backman | *City of Bellevue Transportation Department*

Christopher Robertson | *Seattle Department of Transportation*

Armand Shahbazian | *Seattle Department of Transportation*

SUBJECT MATTER EXPERTS

City of Bellevue Transportation Department

Seattle Department of Transportation

Washington State Department of Transportation

Washington State Transportation Commission

Puget Sound Regional Council Regional Traffic Operations Committee

Private Sector Developer Interviewees | Cruise Automation / Mobileye / Motional / Waymo / Zoox

CONSULTANT SUPPORT

David Von Stroh, Sam Van Hecke, Alice Marecek, and Gui Leao | *Cambridge Systematics, Inc.*

Jeanne Acutanza | *Acutanza STS*


417 MUKILTEO

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ACRONYMS

AASHTO ..... Association of State Highway and Transportation Officials

ADA ..... American Disability Act

ADAS ..... Advanced Driver Assistance System

ADS ..... Automated Driving System

AI ..... Artificial Intelligence

ANSI ..... American National Standards Institute

API ..... Application Programming Interface

AV ..... Automated Vehicle

AVSC ..... Automated Vehicle Safety Consortium

CAT ..... Cooperative Automated Transportation

CAV ..... Connected and Automated Vehicle

CDS ..... Curb Data Specification

DOL ..... Department of Licensing

DOT ..... Department of Transportation

EV ..... Electric Vehicle

FAA ..... Federal Aviation Administration

FMVSS ..... Federal Motor Vehicle Safety Standards

GNSS ..... Global Navigation Satellite System

HLDI ..... Highway Loss Data Institute

IAM ..... Institute for Automated Mobility

IIHS ..... Insurance Institute for Highway Safety

IOO ..... Infrastructure Owners and Operators

ISO ..... International Organization for Standardization

ITS ..... Intelligent Transportation Society

LADOT ..... Los Angeles Department of Transportation

MPO ..... Metropolitan Planning Organization

MUTCD ..... Manual on Uniform Traffic Control Devices

NACTO ..... National Association of City Transportation Officials

NHTSA ..... National Highway Traffic Safety Administration

NITC ..... National Institute for Transportation and Communities

ODD ..... Operational Design Domains

OMF ..... Open Mobility Foundation

PAVE ..... Partners for Automated Vehicle Education

PennDOT ..... Pennsylvania Department of Transportation

PLUM Catalyst ..... Passion, Learnings, Understanding, and Mobilization Catalyst

PUDO ..... Pick-up/Drop-off

ROW ..... Right-of-Way

SAE ..... Society of Automotive Engineers

SDOT ..... Seattle Department of Transportation

SFMTA ..... San Francisco Municipal Transportation Agency

TEF ..... Transportation Equity Workgroup

TEW ..... Transportation Equity Framework

TNC ..... Transportation Network Company (Private transportation technology firms that provide ridesharing services via software platforms, such as Uber, and Lyft)

U.S. ..... United States

UL ..... Underwrites Laboratories

USDOT ..... United States Department of Transportation

VMT ..... Vehicle Miles Traveled

VSSA ..... Voluntary Safety Self-Assessment

ZOV ..... Zero-Occupancy Vehicle (a vehicle that is not occupied by a human passenger or driver)

1 AUTOMATED VEHICLES ARE COMING

INTRODUCTION

With widespread worldwide testing to advance the development of automated vehicles (AVs), vehicles equipped with technology which enables them to operate themselves and perform necessary functions without any human intervention, and the majority of states in the U.S. implementing some form of AV policy, cities and local governments need to prepare for eventual AV operations on their roadways. The Cities of Bellevue and Seattle have collaborated on the co-creation of this Automated Vehicle Strategic Vision to build a framework that applies a **unified approach** to leveraging AV technology to address shared regional values and goals.

This document is intended to **help the cities and surrounding communities prepare for automated mobility,** with a focus on ensuring that programming, resources, and investments are maximizing the readiness at varying levels of AV deployment in the region.

Through local and industry outreach efforts, as well as interest from various AV companies to test their technology on roadways, the Cities of Bellevue and Seattle recognize that there is a need throughout the region to develop guidance on preparing, planning, and implementing AV technologies. This strategic document may also benefit surrounding communities as each one may experience similar challenges developing their own AV strategic vision.

This document includes a list of recommended time-phased actions as a resource for considering AV technologies for the region. This list is not comprehensive and is subject to change as AV technologies advance and new regulations are implemented; however, this document provides a shared vision for our desired future. This AV Strategic Plan begins with elemental knowledge of AV technology and policies that provide the baseline for recommended actions, followed by a menu of recommended actions to be undertaken in the near-, mid-, and long-term timeframes.

WHO SHOULD READ THIS DOCUMENT

This AV Strategic Vision has been developed as a resource for the following audiences:

(a) **CITIES OF BELLEVUE AND SEATTLE (AND THEIR NEIGHBORS):** This document outlines recommended actions validated by user needs that should be considered when considering AV technologies for this region.

(b) **THE GENERAL PUBLIC:** This document provides educational materials on the state of AV technology and policies regionally as well as nationally.

(c) **FEDERAL AND STATE TRANSPORTATION AGENCIES:** This document highlights important AV-related issues that require coordination on a larger scale in order to avoid the development of patchwork policies.

(d) **AUTOMATED VEHICLE INDUSTRY:** This document calls out opportunities for collaboration in the future to streamline testing and deployment of AV technology for both the public and private sector.

AUTOMATED VEHICLES 101

AVs are vehicles that are equipped with hardware and software systems that give them the capacity to perform specific driving functions without any intervention or supervision by a human operator. AVs have the potential to revolutionize the mobility and safety of the transportation system by expanding travel options for seniors and people with disabilities, as well as greatly reducing incidents associated with human factors.

"Automated vehicle" is a term that is frequently used interchangeably with automated driving systems (ADS), self-driving, driverless, and also autonomous vehicles, which pertains to more sophisticated levels of automation where a human driver is less – if at all – relied on for driving functions.

LEVELS OF DRIVING AUTOMATION

When AV manufacturers claim that their vehicles offer "full self-driving," it is important to begin with an understanding of vehicle automation levels, so as to avoid over-estimations of these systems' true capabilities. The most cited source in the industry is the Society of Automotive Engineers (SAE) J3016 Levels of Driving Automation.[1] SAE J3016 outlines six levels of automation, ranging from Level 0 to Level 5, as shown in Figure 1. Vehicles requiring **constant human driver supervision** fall within Level 0 through Level 2. These levels include a range of Advanced Driver Assistance System (ADAS) features. For instance, ADAS features include adaptive cruise control, blind spot warnings, and lane centering assistance. Features such as these are currently commercially available and are sometimes collectively marketed as an automated driving package.

Vehicles with Level 3 automation and above can operate in full automation mode in most roadway environments and are the focus of this document. However, in certain environments, such as those with low visibility and complex roadway geometries, Level 3 AVs may require the driver to resume control of the vehicle. This is **not** the case with Level 4 and Level 5 AVs, which are programmed to not require human drivers to take over in any situation. It is important to note that vehicles currently rated at one specific level are not guaranteed to have the ability to be upgraded to higher-level performance in the future. **The purpose of applying SAE levels is solely to define what the human driver and the automated driving system are each responsible for during operation.**

[1] https://www.sae.org/standards/content/j3016_202104/

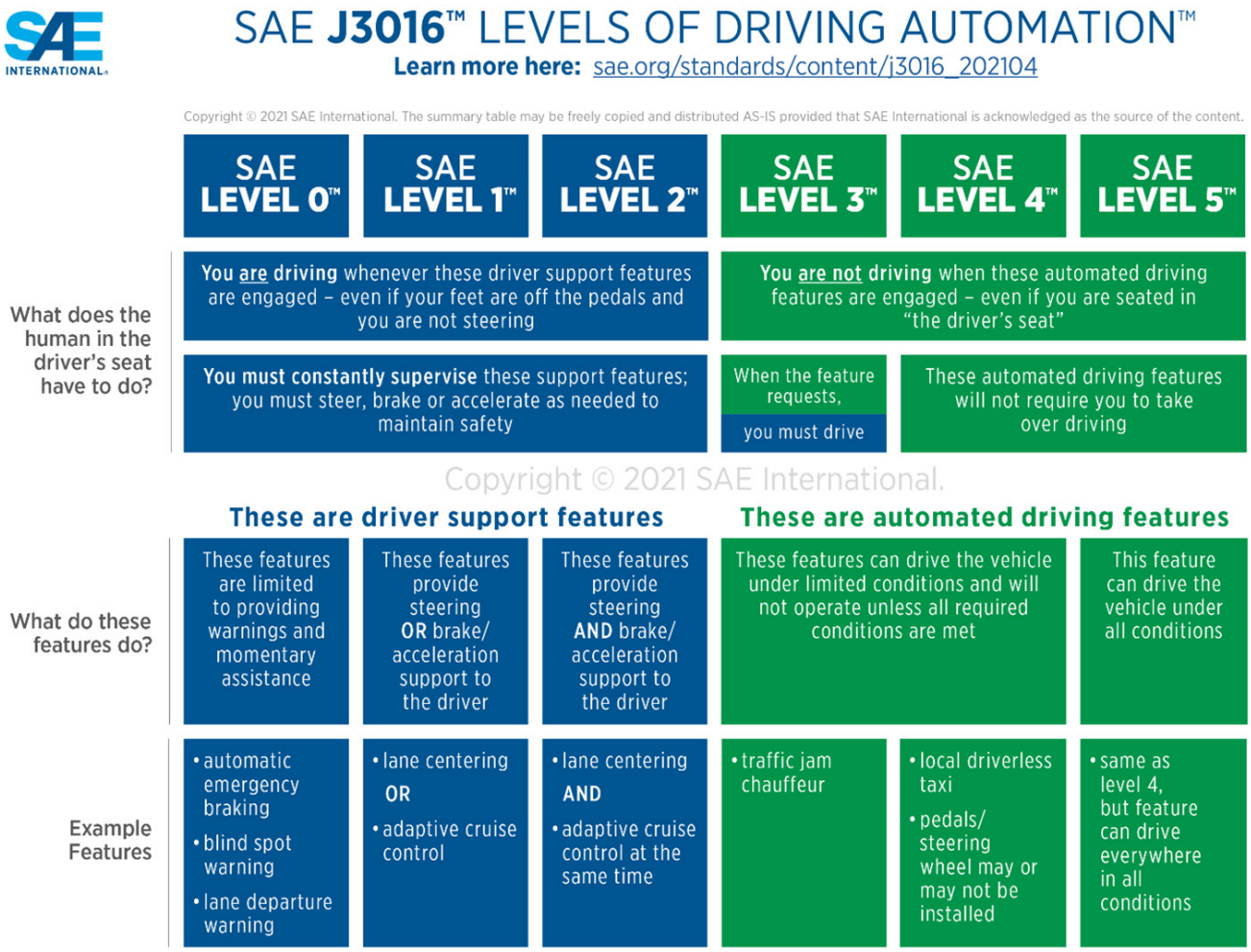
The biggest miscommunication from the AV industry lies in the definition of SAE Levels 3, 4, and 5. Many AV developers market their technology as being Level 4 when, in reality, they may only be able to achieve Level 4 in certain controlled environments, but overall, they are actually Level 3. This is problematic for a number of reasons:

1. **PUBLIC PERCEPTION –** The public has been hearing about the promises of AV technology for years and are excited to experience the anticipated benefits, so they may perceive the available technology to be more advanced than it is and are inclined to hand over more control to the vehicle than the AV is equipped to handle.

2. **SELF-CERTIFICATION PERMITTING PROCESS –** AV manufacturers are allowed by the National Highway Traffic Safety Administration (NHTSA) to self-certify their AVs using their own standards and procedures. Individual states have the ability to implement their own AV permit regulations, but many do not require the manufacturers to provide quantitative proof that their AVs have been successfully tested under every operating condition.

3. **LACK OF REGULATION –** NHTSA's Voluntary Safety Self-Assessments (VSSA) are not required by AV manufacturers and many of the ones that do file the forms fail to mention any safety-relevant industry standards, such as International Organization for Standardization (ISO) 26262 (functional safety), ISO 21448 (Safety of The Intended Functionality) and American National Standards Institute (ANSI)/ Underwrites Laboratories (UL) 4600. Most states do not implement their own due diligence to make sure that AVs are safe for testing or operations on public roadways before issuing permits.

FIGURE 1. SOCIETY OF AUTOMOTIVE ENGINEERS LEVELS OF DRIVING AUTOMATION



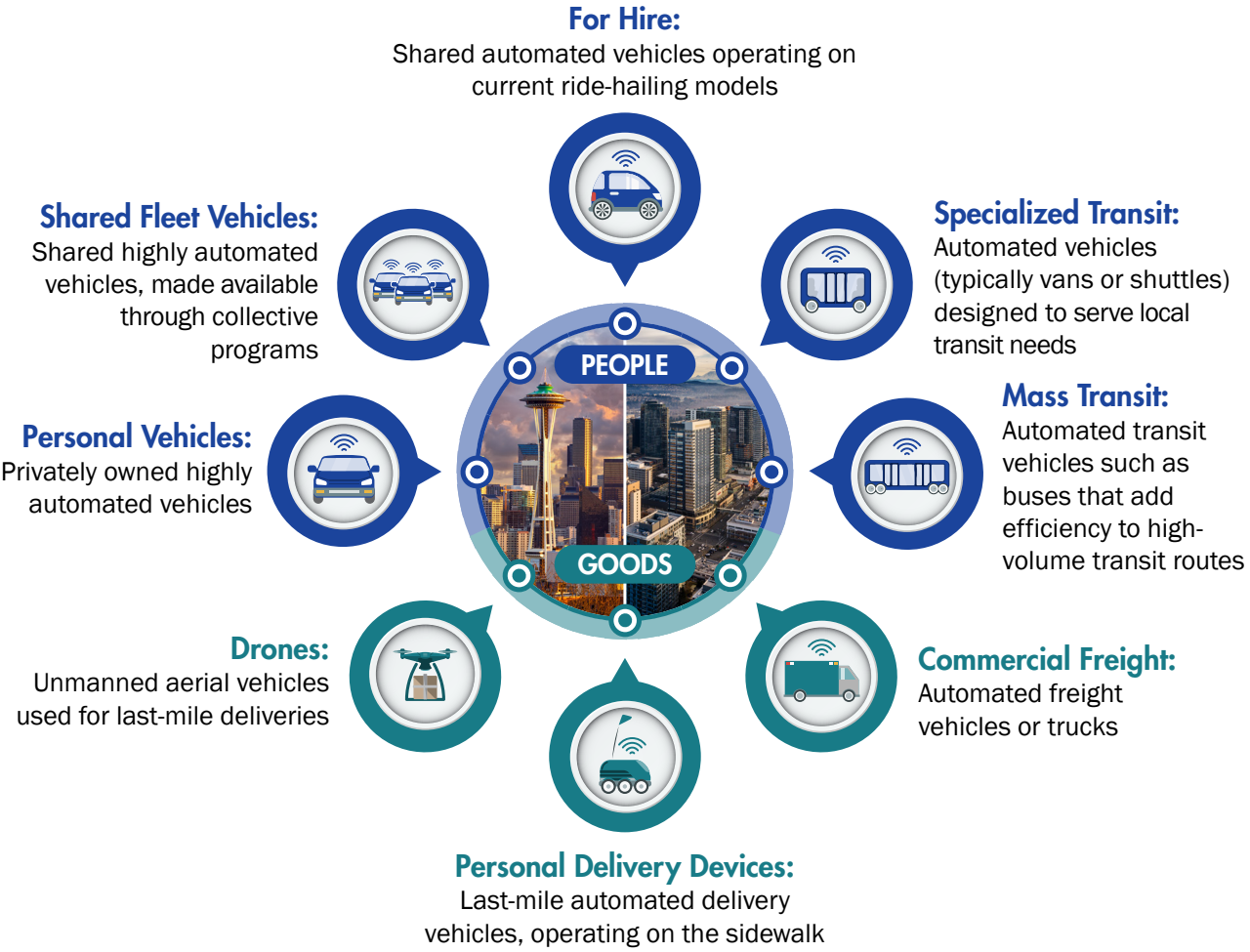
Source: 2021 SAE International, https://www.sae.org/blog/sae-j3016-update.

AUTOMATED VEHICLE APPLICATION TYPES

While the general public may be most familiar with the AV industry's development of automated driving systems for personal vehicles, there are actually a multitude of AV application types emerging on the market. Figure 2 categorizes the seven main AV applications that could be tested and/or broadly deployed in the region. These application categories fall under two broader categories of moving **people** or **goods** and are likely to evolve over time.

Stakeholder Input[2] – AV manufacturers anticipate the rollout of For Hire, Commercial Freight, and Personal Delivery Devices before the other application types.

FIGURE 2. MAJOR AUTOMATED VEHICLE APPLICATIONS



[2] Mobileye and Waymo.

TECHNOLOGY READINESS CATEGORIES

Technology readiness categories emphasize the intermediary steps required to reach the AV industry's vision of ubiquity. While it is anticipated that all seven of the AV application types introduced previously will eventually traverse through the AV technology readiness categories outlined in Table 1, the technology powering each of the AV application types will evolve according to their own timeline. It is critical that transportation agencies treat the technological maturity level of each application type separately from the others when considering the readiness of AV deployments. Readiness from the perspective of the private sector may also differ from the public sector perspective. Technology maturity from the private sector side may involve the evaluation of the number of Operational Design Domains (ODDs)[3] programmed, the depth of development and testing for each ODD, disengagement rates, failure rates, crash rates, etc., while public sector readiness may be evaluated in terms of physical and data infrastructure readiness, policy and legislation enacted, enforcement requirements, etc. If low-speed Specialized Transit AVs have demonstrated readiness for sustained deployment after a two-year commercial pilot, a Mass Transit AV bus may not necessarily be ready to make the same leap. The spotlight on Minnesota's goMARTI Pilot Program highlights an aspirational real-world example of a Specialized Transit AV Commercial Pilot.

TABLE 1. AUTOMATED VEHICLE TECHNOLOGY READINESS CATEGORIES

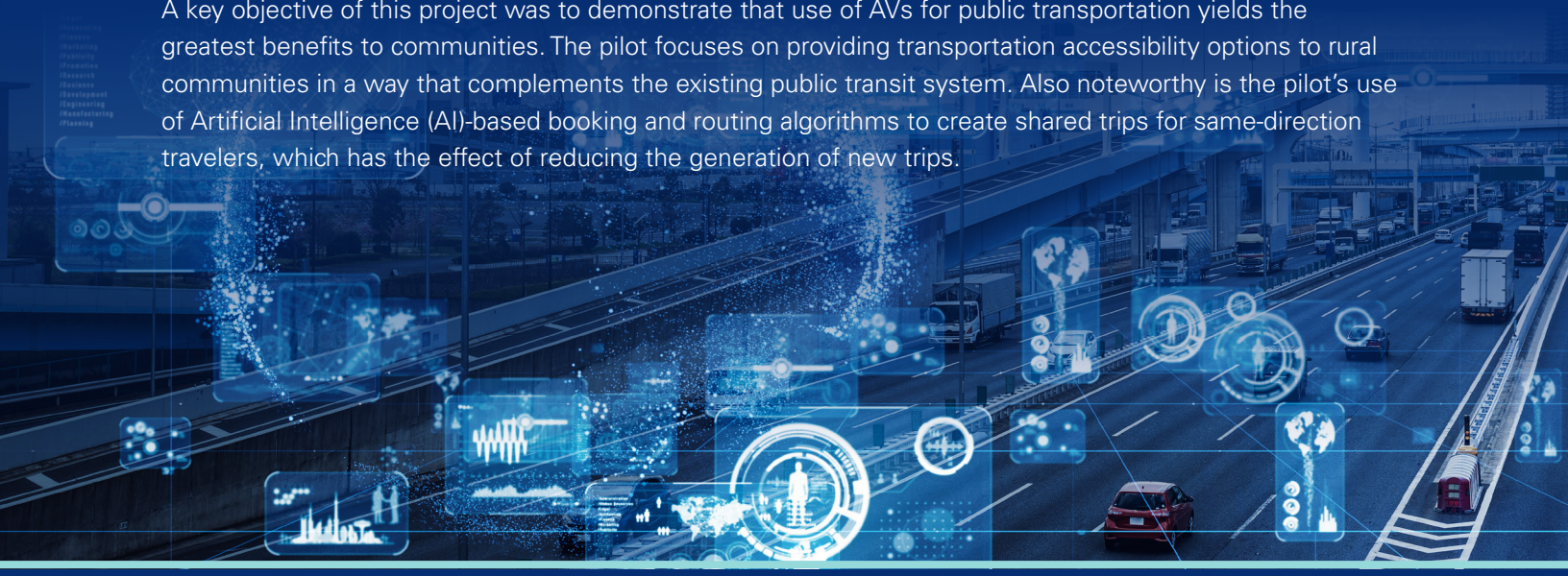
Category	Readiness Indicator	Impacts
Conceptual	Conceptual readiness is ineligible for even limited testing or deployment in a public setting.	Many of the most common AV application types have advanced beyond the Conceptual readiness category. One AV application that could be considered Conceptual is autonomous passenger air vehicles, which cannot yet be tested in public environments. To advance to the Testing category, an AV application must demonstrate that it can be safely deployed under a supervised, public setting environment.
Testing	Testing readiness may allow for a single operator with a small fleet to test and evaluate a specific use case, either initiated in partnership with the cities or unsolicited.	Currently, most AV application types fall within this category and examples of For Hire, Specialized Transit, and Commercial Freight testing abound. While many AV manufacturers anticipate rapid evolution to these categories, they have yet to prove long-term commercial viability to the market and consistent safe response under all operating environments.
Commercial Pilot	Commercial Pilot readiness may allow for sustained commercial operation on a small scale.	Some of the more advanced AV pilots have reached this category with arguably the greatest maturity in For Hire services and low-speed shuttles. AV manufacturers and regulators alike will look for "better than human" safety performance for services in this category, which may also include less human supervision.
Sustained Deployment	Sustained Deployment readiness may support multiple AV operators providing sustainable business models under several different use cases.	To reach this category, AV fleets will have demonstrated mastery of all necessary ODDs as well as consumer demand and profitability.
Mixed Fleet	Mixed Fleet readiness supports a significant penetration rate of AVs such that AVs satisfy a large portion of mobility demand.	Once AVs reach this category, transportation agencies will have the burden of balancing the liability of AV owners/operators against human drivers. Transportation system performance will need to be closely monitored and potential conflicts and issues resolved – for example potentially requiring changes to traffic laws, parking and loading zone regulations, and zoning requirements.
Ubiquity	Ubiquity readiness occurs when AVs become the dominant vehicle or mobility service type, transitioning human-operated automobiles and services into a limited role.	At Ubiquity, the role of transportation agencies will further evolve and ongoing efforts to improve system performance will change drastically – for example designing and operating infrastructure specifically to optimize AV mobility and safety.

[3] See page 8 for detailed definition and description of ODDs as they relate to AVs.

SPOTLIGHT: *MINNESOTA'S goMARTI PILOT PROGRAM*

This pilot project, which was conducted via a partnership between the City of Grand Rapids, Department of Iron Range Resources & Rehabilitation, Itasca County, May Mobility, the Passion, Learnings, Understanding, and Mobilization (PLUM) Catalyst, Via, University of Minnesota, Arrowhead Transit and Mobility Mania, was launched in September of 2022.[4] This pilot project, which was called the "first public transit project using American Disability Act (ADA) – compliant autonomous vehicles", offers free, on-demand rides to Grand Rapids residents via vehicles that are considered to be self-driving but will always be staffed by an on-board operator. This pilot was developed with local involvement as a top priority in shaping shuttle routes, hours of operation, and equitable access opportunities.

A key objective of this project was to demonstrate that use of AVs for public transportation yields the greatest benefits to communities. The pilot focuses on providing transportation accessibility options to rural communities in a way that complements the existing public transit system. Also noteworthy is the pilot's use of Artificial Intelligence (AI)-based booking and routing algorithms to create shared trips for same-direction travelers, which has the effect of reducing the generation of new trips.



WHAT ARE OPERATIONAL DESIGN DOMAINS?

Operational Design Domains (ODDs) involve the definition of specific domain(s) in which an automated driving system is **designed to properly operate,** including types of roadways, ranges of speed, weather, time of day, and environmental conditions. Understanding ODDs is critical for cities and local transportation agencies anticipating AV operation on their local streets because **AV technology does not currently support self-driving under every condition,** so AV developers need to specify which conditions the AV **is** capable of operating safely. For example, the ODD of a low-speed shuttle may include the urban core or a business park, but not roadways with operating speeds above 25 miles per hour. The ODD framework proposed by the Automated Vehicle Safety Consortium (AVSC)[5] outlines the multitude of complex elements an AV must be capable of safely navigating:

[4] https://www.masstransitmag.com/alt-mobility/autonomous-vehicles/article/21282377/av-news-gomarti-in-minnesota-launches-and-wrta-selects-partners-for-av-pilot

[5] https://avsc.sae-itc.org/#members

- **Weather-Related Environmental Conditions** are any weather conditions that may impact an ADS' performance in a physical domain. These include, among others, temperature, precipitation types, haze, sky condition, and wind.
- **Roadway Surface Types** refers to the material used to sustain vehicular or foot traffic which may impact driving speeds and responsiveness of different AV types. These include, among others, asphalt, concrete, dirt, and gravel.
- **Road Surface Conditions** refers to several elements, including the road surface's state of repair, the visibility of road markings, and the level to which the road surface is obscured. Visible road markings and road surfaces are critical to AV operations.
- **Roadway Infrastructure** includes any physical infrastructure present on the roadway. For instance, this can include curbs, shoulders, berms, guard rails, gutters, ditches, bridges, tunnels, and traffic control devices. This category also encompasses unique roadway configurations, such as ramps, intersections, and lanes. Two types of road structures are fixed (e.g., buildings, streetlights, street furniture, vegetation) and temporary (e.g., construction site detours, refuse collection, road works, road signage).
- **Operational Constraints** are elements not related to weather or atmospheric conditions that affect the AV operating environment. For example, they can include specific hours of the day or pre-defined geographical zones.
- **Road Users** define the unique characteristics of each road user group. The document includes American Association of State Highway and Transportation Officials' (AASHTO) five categories of road users – automobile, bicyclist, pedestrian, transit, and trucks – as well as five other groups – motorcycles and scooters, micromobility vehicles, wheelchairs/wheeled mobility assistance devices, emergency vehicles, and other vehicles including golf carts, garbage trucks, postal vehicles, etc.
- **Non-Static Roadside Objects** are objects that are not permanently fixed in place, such as trashcans or traffic cones.
- **Connectivity** is the ADS' ability to communicate with other vehicles, road users, or infrastructure. This category defines how data is communicated to or between AV fleets, including the types of communication, whether global navigation satellite system (GNSS) or cellular.

Currently under development by the Association for Standardization of Automation and Measuring Systems is a concept project[6] to create a standardized machine-interpretable format to represent ODD specifications, allowing cities to define ODDs for their communities and AV developers to use ODDs to define test cases that are necessary to validate the vehicle.

[6] https://www.asam.net/standards/detail/openodd/#:~:text=ASAM%20OpenODD%20(Operational%20Design%20Domain,connected%20automated%20vehicles%20(CAV).

OPPORTUNITIES AND RISKS

Despite the nationwide Vision Zero movement to reduce the number and severity of traffic collisions, there was a 10.5 percent increase in motor vehicle traffic fatalities in the United States (U.S.) in 2021 compared to the year before.[7] Cities are anxious to find a solution that will move the needle on Vision Zero goals in an impactful way and wonder whether AVs can deliver on the promise of increased motor vehicle safety. However, with the introduction of any new technology, there may be steep learning curves for all parties involved. In this case, the AV developers who develop the automated driving system, the cities who pilot AVs on their streets, as well as the general public that are transported by these vehicles or interact with them in urban environments. This section highlights the main opportunities and risks that come with AV technology. It is critical that cities understand both sides as they develop policies for the piloting and deployment of these vehicles.

[7] https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/813298

OPPORTUNITIES

The AV automotive industry has invested billions of dollars into AV technology on the promise that AVs will provide a range of potential benefits. Proponents and developers of AVs hope they will:

» **Save lives and reduce the number of crashes on roadways.** Human factors are a known contributor of U.S. motor vehicle crashes, and the Insurance Institute for Highway Safety (IIHS) anticipates AVs to be able to prevent one-third of those crashes. The IIHS and Highway Loss Data Institute (HLDI) have already recorded real-world crash savings anywhere from 7 percent to 78 percent through existing passenger vehicle automation such as forward collision warning.[8]

» **Improve traffic flow, potentially reducing traffic congestion.** AVs have the ability to minimize headway needed to maintain a safe following distance and facilitate a consistent distance between vehicles, which may help to reduce traffic congestion caused by stop-and-go activities. Additionally, with the resultant reduction in certain types of motor vehicle crashes, less time would be spent clearing incidents, another major cause of traffic congestion.

» **Reduce greenhouse gas emissions and save fuel costs.** AVs are anticipated to reduce congestion and, as a result, emissions by facilitating more efficient driving patterns which avoid sudden stops and starts and averting crashes that result in traffic jams. Less traffic congestion and fewer roadway incidents would result in less greenhouse gases emitted from idling. AV applications such as Shared Fleet Vehicles and For Hire would encourage people to participate in the sharing economy where the cost of vehicle ownership would be spread across more people. When goods are moved more efficiently using AVs, cost savings may be passed down to consumers. Additionally, many AVs are utilizing electric vehicle (EV) platforms, potentially driving EV adoption.

» **Offer greater independence for people with disabilities, seniors, those under driving age, and other non-drivers.** AVs may enable a wide range of new mobility solutions that can enhance the lives of people who could not take advantage of driving or transit services before. For Hire and Specialized Transit AV applications have the potential to improve quality of life for traditionally underserved communities, providing better access to employment, medical services, health care, shopping, entertainment, etc.

» **Increase personal productivity by recapturing time previously dedicated to driving.** In fully automated vehicles, occupants can take a passenger role with a similar riding experience as taking transit, offering opportunities to work on other activities aside from driving.

[8] Insurance Institute for Highway Safety, Highway Loss Data Institute. Real-world benefits of crash avoidance technologies, December 2020.

RISKS

However, a major risk lies in the fact that many of these benefits may not be realized until AVs outnumber non-AVs. Overarching challenges experienced by AV developers and public transportation agencies in their effort to achieve widespread AV deployment include:

» **Testing Limitations.** To date, AV manufacturers have been testing their ADS in relatively controlled environments – defined geographic boundaries, cities without inclement weather, limited roadway user interactions – which is not a true representation of all situations that AVs may encounter in the real-world. The potential for AVs to remedy existing problems in the commercial vehicle industry, such as truck driver shortages, as well as promote use of commercial vehicles for delivery and other purposes drives the effort to increase testing efforts for commercial AVs. With increased safety risks associated with AVs operating in mixed fleet environments, and concerns about cybersecurity and data privacy, public agencies have been keeping a watchful eye on the evolution of AV commercial operations.

» **Difficulty monetizing high-priority use cases.** Public agencies want to leverage AVs to solve known transportation challenges (e.g., replacing low-demand transit routes with Specialized Transit AV applications). These use cases may not align with the business models for AV manufacturers who are looking for ways to recoup their investments made in research and development, or result in AVs that are accessible by all passenger types (e.g., people who use wheelchairs). Use cases of interest to AV manufacturers have the potential to create an inequitable distribution of AV technology benefits catering to people who can afford it.

» **Dissenting approaches on regulatory frameworks to ensure safe AV operations.** Government Transportation Departments are responsible for the safety of vehicle occupants and other roadway users on roadways within their jurisdiction, but most jurisdictions at federal, state, and local levels have differing opinions and jurisdictional authority or expertise regarding what AV-specific regulations are necessary to ensure safety. In light of these difference of opinions, oftentimes this can lead to instances where there are no clear regulations and safety standards to adhere to.

» **Potential unintended consequences stemming from widespread AV adoption.** The general public is looking forward to AVs dropping them off at their destination and then leaving independently. This potential future may result in the introduction of zero-occupancy vehicles (ZOVs) where empty AVs circle the streets waiting for new passengers. Without regulations, AVs may increase vehicle miles traveled (VMT) performance metrics, moving cities farther away from reaching their transportation goals. Another concern is that the initial increase in AVs on the road, before traditional vehicles are largely displaced, will result in a short-term increase in gas emissions due to congestion at a time when the U.S. is committed to reduction of carbon emissions. Many are also concerned about the loss of jobs which have the potential be made obsolete once AVs become more widespread as well as the need for additional workforce retraining in order to avoid the displacement of jobs. Insurance liability concerns is another facet of uncertainty brought on by AVs – would crashes now be the fault of the vehicle manufacturer, vehicle owner, or public agency? In addition, the introduction of AVs may result in changes to current zoning restrictions, such as parking, which could eliminate a significant revenue stream from public agencies.

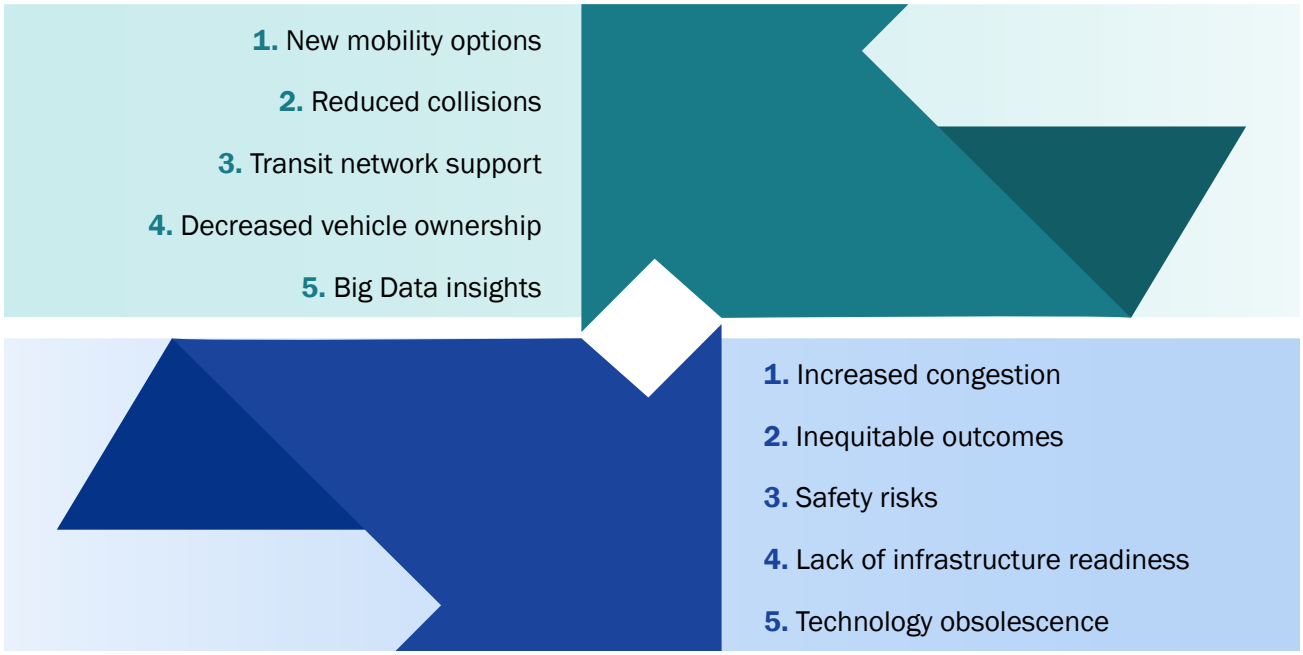
While there are up sides to every AV application type, there are also associated risks that cities need to take into consideration. Table 2 outlines application-specific opportunities and risks. It is important to note that some of the opportunities listed would not be realized until the AV application reaches a certain level of technology readiness or level of ubiquity.

TABLE 2. OPPORTUNITIES AND RISKS OF MAJOR AUTOMATED VEHICLE APPLICATIONS

Application	Opportunities	Risks
Personal Vehicles 	• Reduce the number of collisions caused by human driver error. • Travel time and reliability benefits through decreased headway requirements and congestion caused by stop-and-go movements. • Increase mobility and productivity for user groups previously unable to drive (e.g., people with vision disabilities, elderly) or choosing not to drive.	• Inability to navigate all potential ODDs safely. • Cybersecurity including potential for breach of personal data. • Difficulty educating the public of appropriate usage of the technology. • Inequitable distribution of AV technology benefits due to unaffordability of personal AVs.
Shared Fleet Vehicles 	• Reduce single-occupancy trips. • Potential first-and-last-mile transit solution. • Reduce infrastructure and parking needs.	• Potential to introduce zero-occupancy trips. • Inequitable distribution of AV technology benefits due to unaffordability of shared fleet services. • Inability to require vehicle design to be accessible to all user types (e.g., people with mobility disabilities).
For Hire 	• Reduce single-occupancy trips. • Reduce operating costs due to driver displacement.	• Potential to introduce zero-occupancy trips. • Potential to reduce share of trips made by walking, bicycling, taking transit, or micromobility services. • May require workforce retraining in order to avoid displacement of drivers. • Increase curbside congestion requiring a new curbside management framework. • Inability to require vehicle design to be accessible to all user types (e.g., people with mobility disabilities).
Specialized Transit 	• Offer additional mobility options for underserved communities. • Alternative to low-demand transit routes. • Increase first-and-last-mile mobility options.	• Potential to compete with existing transit options. • Increase safety risk operating in mixed fleet environment.
Mass Transit 	• Increase capacity on transit network. • Reduce operating costs by eliminating driver expenses.	• Safety concerns when vehicles operate in mixed fleet environment unless there is dedicated right-of-way. • May require workforce retraining in order to avoid displacement of drivers.

Application	Opportunities	Risks
Commercial Freight 	• Reduce limitations due to drivers' hours-of-service requirements. • Reduce operating costs, which can translate to consumer cost savings. • Introduction of different vehicle forms.	• Safety concerns due to size of vehicle. • May require workforce retraining in order to avoid displacement of drivers.
Personal Delivery Devices 	• Reduce person-vehicle trips. • Reduce operating costs, which may translate to consumer cost savings. • Smaller vehicle sizes may be more suitable for urban environments. • Data collection on right-of-way (ROW) conditions	• Security and liability concerns due to misplaced or dangerous packages as well as personal data storage. • Inequitable distribution of services based on accessibility of delivery locations. • Potential safety concerns with regards to interactions with other sidewalk users.
Drones 	• Reduce travel times for freight and construction industries. • Increase efficiency in data collection methods from unhindered vantage points. • Reduce congestion on roadways.	• Safety concerns due to lack of airspace regulations. • Security, nuisance, and privacy concerns related to drone right-of-way. • May require workforce retraining in order to avoid displacement of drivers.

FIGURE 3. TOP OPPORTUNITIES AND CONCERNS REGARDING AUTOMATED VEHICLES IN THE REGION



PUBLIC PERCEPTION

As AV testing expands in the U.S., supportive public perception of the technology will be crucial for widespread adoption. In 2020, Partners for Automated Vehicle Education (PAVE) sponsored an extensive survey[9] of over 1,200 adults across the U.S. to gain insight on their perception and attitude toward current AV technology. More than half of the survey respondents reported already owning cars with ADAS features. Nevertheless, **nearly three out of four survey respondents reported that they are not ready for full deployment of autonomous vehicles** with another **20 percent believing that AVs will never be safe.** However, results of the study show that this hesitation does not seem to be related to isolated incidents involving AVs or ADAS systems, such as publicized fatal car crashes involving vehicles with self-driving technology.[10] When asked about these incidents, approximately half of respondents knew "nothing at all" about them.

On the other hand, the survey also reinforced the importance of continuing to educate the public on how AV technology functions and providing pilot or deployment programs that offer firsthand experiences. Respondents were presented with two questions related to how to increase their trust in AVs. When asked whether they would trust AVs if they better understood how the technology worked, 60 percent agreed. **58 percent of respondents believe that they would have greater trust in AVs if they had a chance to experience an AV ride firsthand.**

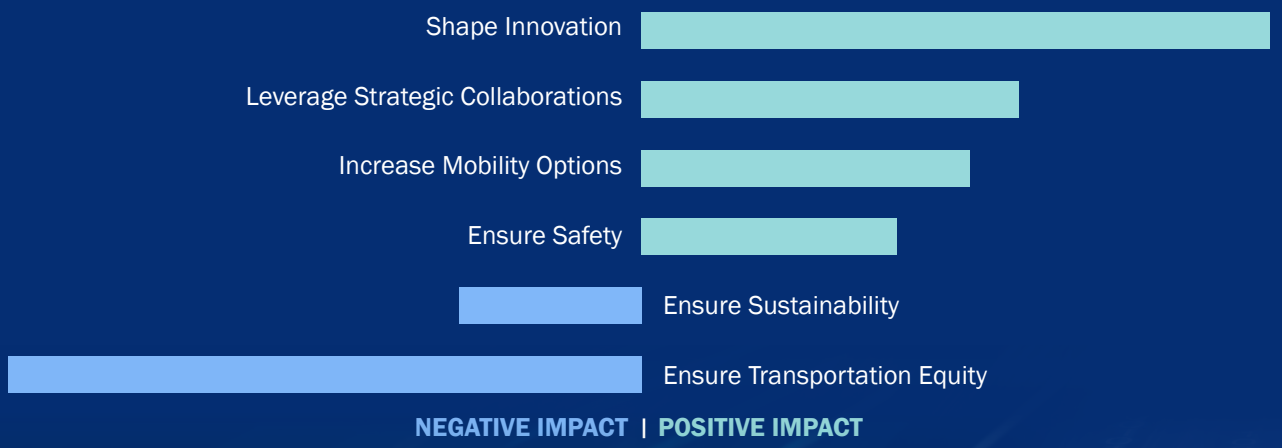
[9] PAVE Campaign. PAVE Poll: Americans Wary Of AVs But Say Education And Experience With Technology Can Build Trust. https://pavecampaign.org/pave-poll-americans-wary-of-avs-but-say-education-and-experience-with-technology-can-build-trust/

[10] https://money.cnn.com/2018/03/19/technology/uber-autonomous-car-fatal-crash/index.html

PERCEPTION IN THE PUGET SOUND REGION

Outreach sessions and polling were conducted with City of Bellevue and City of Seattle transportation leaders as part of this effort. When asked how they think AVs might impact regional goal areas (refer to Section 2 for more information regarding regional goals), not all feedback trended in the positive direction. As shown in Figure 4, city staff perceived the greatest positive impacts to the shaping of innovation in the region. However, significant negative impacts to transportation equity and sustainability were perceived.

FIGURE 4. SENTIMENT REGARDING AUTOMATED VEHICLE IMPACTS ON REGIONAL GOALS



SPOTLIGHT: *VEHICLE MANUFACTURER'S DRIVER ASSISTANCE TECHNOLOGY*

Recently, crashes involving vehicles with driver assistance technology have made headlines with reports of drivers asleep at the wheel, and most sobering – fatal crashes.[11] Drivers misuse of these assistance technologies, which can control steering, speed and braking – but is not a fully automated driving system and still requires drivers to pay attention to the road with both hands on the wheel – has been reported on numerous occasions and is currently the subject of investigations by two federal agencies. One of the main issues contributing to these incidents is that the public perceives the available driver assistance technology package to be closer to SAE Level 5, when in reality, it is SAE Level 2.

While incidents involving vehicles with driver assistance technology[12] do not make up the majority of vehicle crashes, these incidents capture media attention because they highlight how crucial it is for users to understand the functional extents and limitations of each AV, and the danger behind users relying on a vehicle to function at a higher SAE level than it is designed to perform. The public's perception of an AV's self-driving capabilities is a common concern across all automated driving systems in development and on the market. Much more education is needed for the public to understand the nuances of the AV technology being marketed to them as fully autonomous.

[11] https://www.npr.org/2022/01/18/1073857310/tesla-autopilot-crash-charges#:~:text=In%20one%20crash%20report%2C%20the,was%20hurt%20in%20that%20crash.

[12] https://www.reuters.com/business/autos-transportation/tesla-reports-two-new-fatal-crashes-involving-driver-assistance-systems-2022-11-16/.

POLICY ENVIRONMENT FOR AUTOMATED VEHICLES IN BELLEVUE AND SEATTLE

At a federal level, NHTSA is responsible for regulating motor vehicles and motor vehicle equipment through the development and enforcement of the Federal Motor Vehicle Safety Standards (FMVSS) in addition to planning and maintenance of the Nation's infrastructure. With the onset of AV technology, NHTSA and AASHTO (an independent transportation organization that advocates for transportation-related policies and provides technical support services for States) initially took a permissive stance in facilitating the deployment of connected and automated vehicles (CAVs), placing much trust in the technology developers themselves and giving them the valuable opportunity to test the technology in real-world scenarios. Now with vehicle automation evolving and becoming more widespread, NHTSA has been issuing rules to ensure that safety standards keep pace with technological developments. NHTSA's rulemaking includes requirements for manufacturers of ADAS and ADS-equipped vehicles to report crashes, providing NHTSA with critical data for analyzing safety issues that could emerge from these types of systems[13] as well as setting safety standards for automatic emergency braking to help avoid crashes with other road users. In 2022, NHTSA issued a first-of-its-kind final rule to ensure safety of occupants in automated vehicles by clarifying what is required of manufacturers when applying occupant protection standards to ADS-equipped vehicles without traditional manual controls.[14]

AUTOMATED VEHICLE PERMIT ACTIVITY IN THE REGION

Across the nation, states such as Arizona, California, Maine, New York, and Virginia have implemented AV permits with varying degrees of requirements for companies with the desire to test or commercially operate their AV technology on public roads. We have also seen cities employ additional permits that supplement state requirements, such as New York City. Permits have been shown to be an effective tool for managing the risks associated with emerging technology solutions by establishing safety, reporting, and insurance requirements that hold companies accountable for the safety of roadway users. The Cities of Bellevue and Seattle are coordinating at the regional and statewide level to ensure that automated driving technologies align with the regional goals established in the AV Strategic Vision.

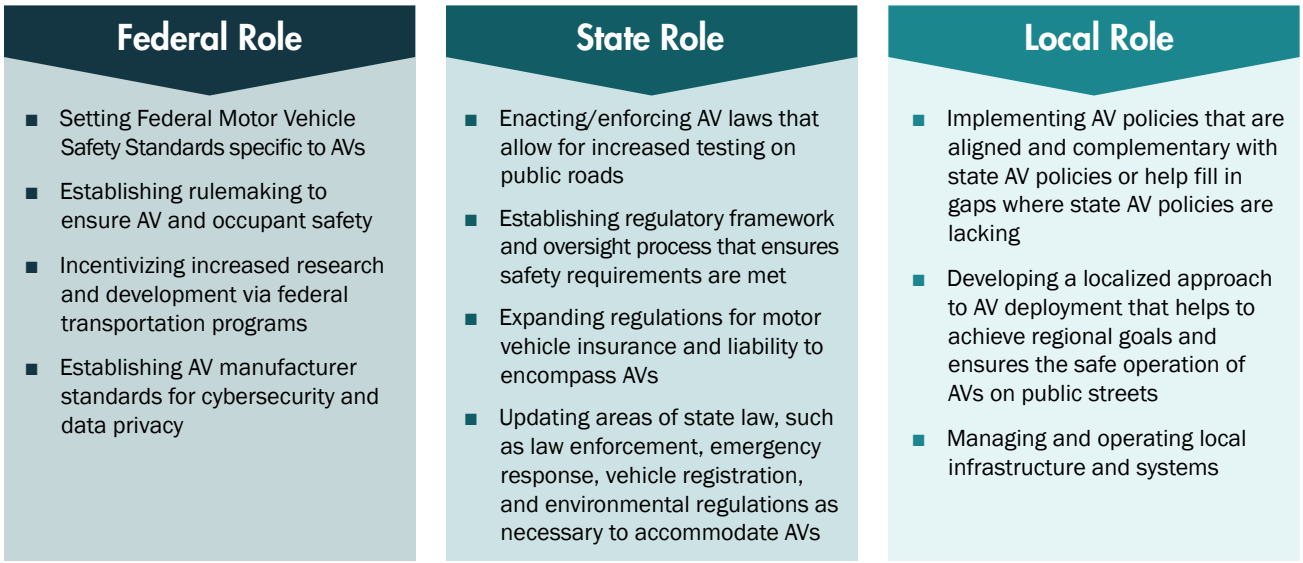
[13] https://www.nhtsa.gov/laws-regulations/standing-general-order-crash-reporting

[14] https://www.nhtsa.gov/press-releases/nhtsa-finalizes-first-occupant-protection-safety-standards-vehicles-without-driving

To further support the advancement of CAVs, AASHTO recently released AASHTO Connected and Automated Vehicle Policy Principles[15] which was developed to articulate AASHTO's position on CAV policy and communicate their priorities for the new administration. Among these policy principles is the recommendation that national policy should preserve: (1) traditional federal roles in vehicle safety and consumer protection, and (2) state policy in regulating driver licensing, vehicle registration, insurance, and training. AASHTO states that this distinction will become less clear as the operator role and vehicle technology evolves so Congressional efforts must include input from Infrastructure Owners and Operators' (IOO) when developing federal policy. IOOs manage the roadways on which people, goods, and services move and are generally comprised of public agencies working for a state, local, or tribal government.

Figure 5 highlights the different regulatory roles played by federal and state transportation authorities[16] and illustrates how local agencies may influence how they want to see AV technology deployed. The federal government is responsible for the safety standards of motor vehicles as well as the safety of vehicle occupants. However, if so desired, the federal government has the ability to pass bills that would significantly restrict states' abilities to regulate AV presence on public streets. At a state level, departments of transportation (DOTs) act as regulators to ensure the safety of road users in their jurisdictions through vehicle licensing and registration to promote safe motor vehicle operation, as well as enacting and enforcing traffic laws and regulations to promote safe drivers. Over 40 states have considered legislation related to AVs to manage the impacts of these vehicles on the road. States that want to encourage AV adoption have the authority to pass legislation that directly forbids local governments from prohibiting AV operations.[17] Local agencies are also responsible for the safety of all road users in their jurisdiction. In the absence of guidance from federal and state authorities, local agencies may implement their own policies regarding AVs that helps them to achieve regional goals and ensure safe operations of AVs on public streets. In order to achieve a nation-wide unified approach to AVs, all three levels of transportation authority can benefit from increased collaboration efforts.

FIGURE 5. POTENTIAL FEDERAL, STATE, AND LOCAL REGULATORY ROLES



[15] https://mobility.transportation.org/wp-content/uploads/sites/65/2021/10/CAV-Policy-Principles-v4-press.pdf

[16] https://www.nhtsa.gov/sites/nhtsa.dot.gov/files/documents/13069a-ads2.0_090617_v9a_tag.pdf

[17] https://www.nlc.org/wp-content/uploads/2018/10/AV-MAG-Web.pdf

In 2017, the Washington State Governor issued an Executive Order[18] which officially enabled pilot programs throughout Washington and aims to attract entities that are developing AV technology equipment. The Executive Order also establishes an AV Work Group to assist with the safe development of automated technology in vehicles on public roads. In past efforts, the State has worked towards implementing more AV-related regulations and passed the following requirements in 2020 in House Bill 2676,[19] which are in effect starting October 1, 2022:

- Companies looking to test on public roadways in Washington must supply the Department of Licensing (DOL) with contact information, planned testing locations, vehicle identification numbers, and proof of insurance (effective June 2020).
- Testing entities to annually report to the DOL any AV-related vehicle collisions or moving violations that occur during testing on a public roadway by February of the following year (first annual reports will be due February 2023).
- Testing entities must provide 14 to 60 days' notice to applicable law enforcement agencies prior to testing on public roadways.
- DOL must provide public access to materials received from AV Program self-certified companies.
- DOL must summarize and report information received from testing entities to the Legislature on an annual basis.

Policies are subject to change with changes in administration, which can add further complications to the ever-evolving world of AV technology development.

The absence of Washington State policies restricting cities' authority to regulate AV operations on public streets poses an opportunity for cities, specifically Bellevue and Seattle, to serve as facilitators of AV technology by developing a localized approach to deployment that helps to achieve regional goals.

The coordination between state and local governments, such that policies enacted by either body are aligned and complementary, is critical to the advancement of AV technology in a region. With Washington State following the United States Department of Transportation's (USDOT) permissive stance on AV technology testing and piloting, a number of AV companies (e.g., NVIDIA, Waymo, Zoox, etc.) have already completed the State's self-certification process.

[18] https://www.governor.wa.gov/sites/default/files/exe_order/17-02AutonomouVehicles.pdf

[19] https://lawfilesext.leg.wa.gov/biennium/2019-20/Pdf/Bills/House%20Passed%20Legislature/2676-S.PL.pdf?q=20221223140806

SPOTLIGHT: *PHOENIX'S HOLISTIC SUPPORT OF AUTOMATED VEHICLE DEVELOPMENT*

Phoenix, Arizona is one of the cities that draws the most AV developers, which is a direct result of the collaborative policy framework set in motion by state and local agencies to encourage AV development in their region. Local governments in Arizona are bound by a broader preemption statute than exists in Washington, which creates a limitation to the local AV policies that can be enacted. Phoenix's four-pronged approach[20] fosters an environment that encourages AV developers to scale their technology:

1. **Supportive State and Local Policy with Forward-Thinking Leadership –** In 2015, Arizona Governor Doug Ducey signed an executive order allowing for the testing and piloting of driverless vehicles on certain public roads.

2. **An Education Pipeline Developing Workers with Vital Skills –** There are university alignments and partnerships within the region's higher education institutes, including Arizona State University, that are producing a job-ready workforce.

3. **Supportive Infrastructure and Mild Weather for Testing Vehicles –** Minimally disruptive weather events and reliable power coverage create the ideal climate for testing AVs in non-inclement weather conditions.

4. **Available AV Testing and Research Space –** In 2018, Governor Doug Ducey signed an executive order creating the Institute for Automated Mobility (IAM), a research collaboration between public and private organizations to advance all aspects of AVs from technology to safety to policy.

[20] https://www.gpec.org/blog/4-reasons-why-driverless-vehicle-companies-scale-in-greater-phoenix/

NEXT STEPS

Equipped with a better understanding of the potential benefits and risks of AV technology, the Cities of Bellevue and Seattle set out to develop a joint AV roadmap of actions that can be taken to achieve the future that they envision for this region. The timing could not be more opportune, as many AV developers, notably Zoox (purchased by Amazon in 2020) began testing on Seattle streets in Fall 2021 and Waymo began testing on Bellevue Streets in Fall 2022. It is important to note that coordination across local jurisdictions, metropolitan planning organizations (MPOs), and state agencies is highly encouraged, as AV legislation, testing and deployments will cross jurisdictional boundaries – collaboration will be a key factor to the success and scalability of AVs in the Puget Sound Region.

SPOTLIGHT: *TESTING IN THE PUGET SOUND AREA*

Starting in September 2021 and October 2022, respectively, Zoox and Waymo began testing autonomous driving in the Puget Sound region. Zoox's testing, which utilizes a fleet of 2016 Toyota Highlanders, retrofitted with sensors, is operational in select neighborhoods near the downtown area of Seattle. Waymo's five-vehicle test fleet is all-electric Jaguar I-PACE retrofitted with Lidar, Radar, and Vision perception systems and operational citywide in Bellevue. The Zoox vehicles are designated by Zoox as SAE Level 3 and currently have a human driver in the driver's seat at all times, while Waymo vehicles are designated by Waymo as SAE Level 4.

Safety: Zoox and Waymo assert that safety is foundational to their operations. Before one of their vehicles hits the road, they use computer simulation, lab work and extensive private track testing to make sure their software and hardware meet internal safety operation benchmarks. Their autonomous driving system has built-in redundancies that enhance roadway safety and help prevent crashes. For the SAE Level 3 Zoox vehicles, there is a trained safety driver and software operator on board at all times to monitor progress and take over driving, if needed.

Policy and Regulatory Compliance: Both Zoox and Waymo filed all relevant documents with the Washington Department of Licensing and are self-certified for testing in the State. Their test vehicles are road-ready and meet all applicable Federal Motor Vehicle Safety Standards.

2 ROADMAP TO OUR DESIRED FUTURE

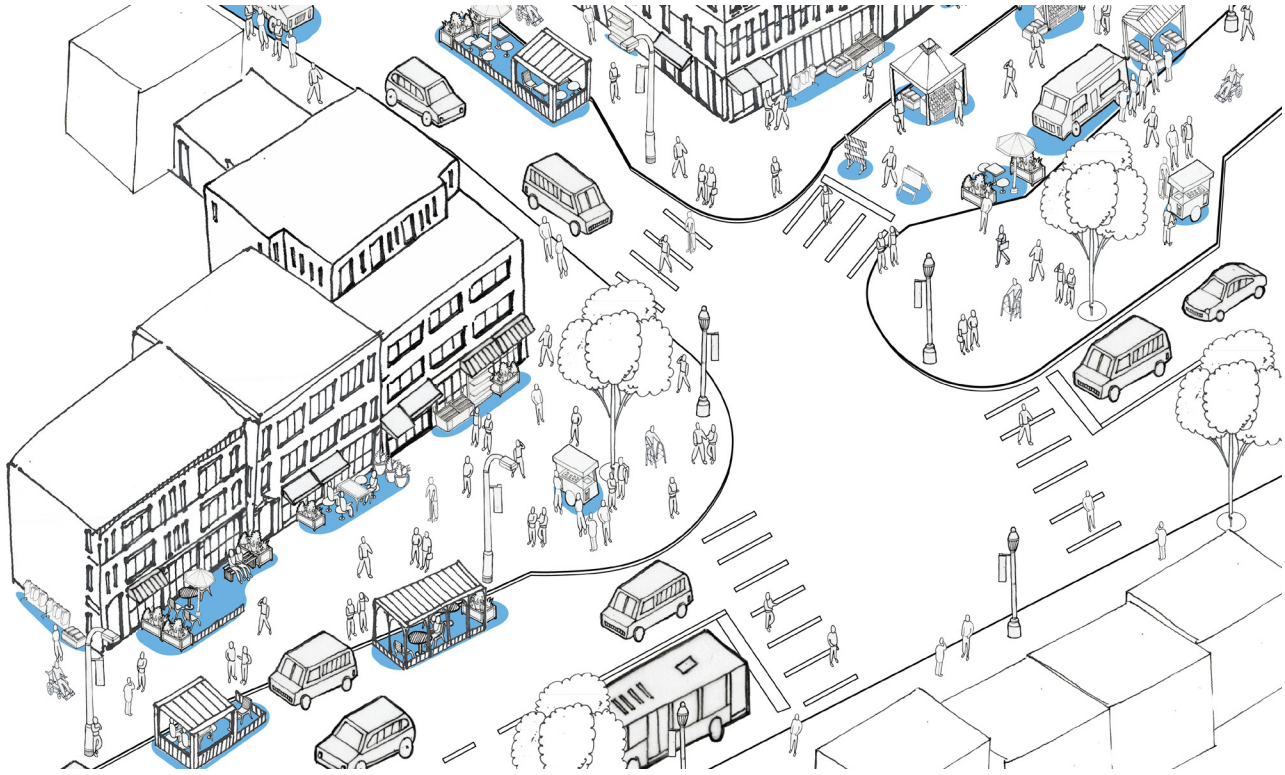

ONLY
GENE JOHNSON

PUGET SOUND REGIONAL GOALS

Managing the advancement and utilization of technologies such as AVs to the benefit of the Puget Sound Region requires a cohesive vision, collaborative partnerships, and conscientious decision-making about what regional priorities are supported by policy. This visioning effort benefits from engagement with parties such as the Washington State Autonomous Vehicle Work Group,[21] which includes a diverse Work Group Executive Committee and seven Subcommittees to develop AV-related recommendations. The Work Group's 2020 Cooperative Automated Transportation (CAT) Policy Framework[22] joins the City of Bellevue's 2018 Smart Mobility Plan[23] and Seattle Department of Transportation's (SDOT) 2017 New Mobility Playbook[24] to support a vision that outlines regional values and goals and key initiatives to advance their transportation system. Figure 6 demonstrates the alignment of the three planning documents into a set of shared goals.

Why do we need this roadmap?

To prepare for automated mobility, with a focus on ensuring that programming, resources, and investments are maximizing the readiness at varying levels of AV deployment in the region.



Source: Constantine Chrisafis, Seattle Department of Transportation.

[21] https://avworkgroupwa.org/

[22] https://oohwstcavworkgroup.blob.core.windows.net/media/Default/documents/infrastructure-systems/Meeting_11/WSTC_AVWG_Infrastructure_Subcommittee_Meeting_11_CATPolicyFramework.pdf

[23] https://bellevuewa.gov/city-government/departments/transportation/safety-and-maintenance/traffic-and-street-lighting-operations/smart-mobility

[24] https://www.seattle.gov/Documents/Departments/SDOT/NewMobilityProgram/NewMobility_Playbook_9.2017.pdf

FIGURE 6. PUGET SOUND REGIONAL GOALS

AUTOMATED VEHICLE TOOLBOX

Several AV guidance documents have recently emerged from both the USDOT and national transportation coalitions. In January of 2020, USDOT developed Ensuring American Leadership in Automated Vehicle Technologies: Automated Vehicles (AV 4.0).[25] AV 4.0 expanded upon the previous document, AV 3.0, by extending the scope to relevant components related to the integration of AV technologies. Aside from investment in the various technologies that support AVs, such as advanced manufacturing and artificial intelligence, USDOT defined various AV areas where it plans on providing investments, enabling activities, and resources. Investment areas include safety, mobility, research, security, infrastructure, spectrum and connectivity, and economic and workforce research. Other USDOT priorities include fostering collaboration with government, competition and market transparency, and federal laboratory testbeds.

Another valuable guidance document is the Blueprint For Autonomous Urbanism,[26] updated by the National Association of City Transportation Officials (NACTO) in 2019. The document focuses on laying the foundation for developing a human-focused autonomous future. Guidance from the report is found in the form of both policy and design recommendations for advancing the future of AVs. For instance, some of the principles are focused on designing for safety, movement of people versus cars, distributing benefits of AVs equitably, data-driven decision making, technology as a tool, and the importance of early action.

These resources were used to develop an AV toolbox of policy and regulatory levers that can be used in any tailored combination by cities to complement existing transportation modes (e.g., driving, transit, bicycling, walking) to achieve their specific goals. Below is a sample listing of candidate AV policy and regulatory levers, drawing from the practices of other cities and regions as well as guidance from USDOT, NACTO, the National Institute for Transportation and Communities (NITC) and the Urbanism Next Center at the University of Oregon. These examples are recommended for consideration on a context-sensitive basis by agencies working to advance their AV vision.

- Require AV operational permits
- Identify suitable routes and/or areas for AV testing and/or commercial operations
- Educate stakeholders and the public of AV capabilities and limitations
- Invest in AV-friendly infrastructure
- Integrate AV operations and connectivity with other network modes
- Issue informational requests for proposals/ information regarding AVs
- Establish AV-only facilities
- Modify curb management regulations
- Gain input from stakeholders
- Establish data sharing requirements
- Provide grant funding for AV pilots
- Leverage emerging technologies to address equity goals

[25] USDOT. Ensuring American Leadership in Automated Vehicle Technologies. https://www.transportation.gov/sites/dot.gov/files/2020-02/EnsuringAmericanLeadershipAVTech4.pdf

[26] NACTO. Blueprint for Autonomous Urbanism: Second Edition. https://nacto.org/publication/bau2/

- Invest in electric AV city fleets
- Invest in workforce training
- Designate AV testing facilities
- Designate AV parking and staging locations
- Use congestion pricing to mitigate zero-occupant vehicles
- Advance communications backbone infrastructure
- Adapt land use policies to prevent urban sprawl

ROADMAP TIMEFRAMES

The recommendations presented in the next section were developed based on a combination of national AV guidance documents and feedback collected during stakeholder engagement efforts conducted during the development of this AV Strategic Vision and are considered time-phased next steps. Each recommended action is assigned to a timeframe based on the following definitions:

NEAR-TERM ACTIONS – This presents the activities that can be conducted within **0-5 years**. These actions generally involve activities related to scoping requirements for eventual AV policy or regulatory changes or low-hanging fruit that already have political and/or financial support.

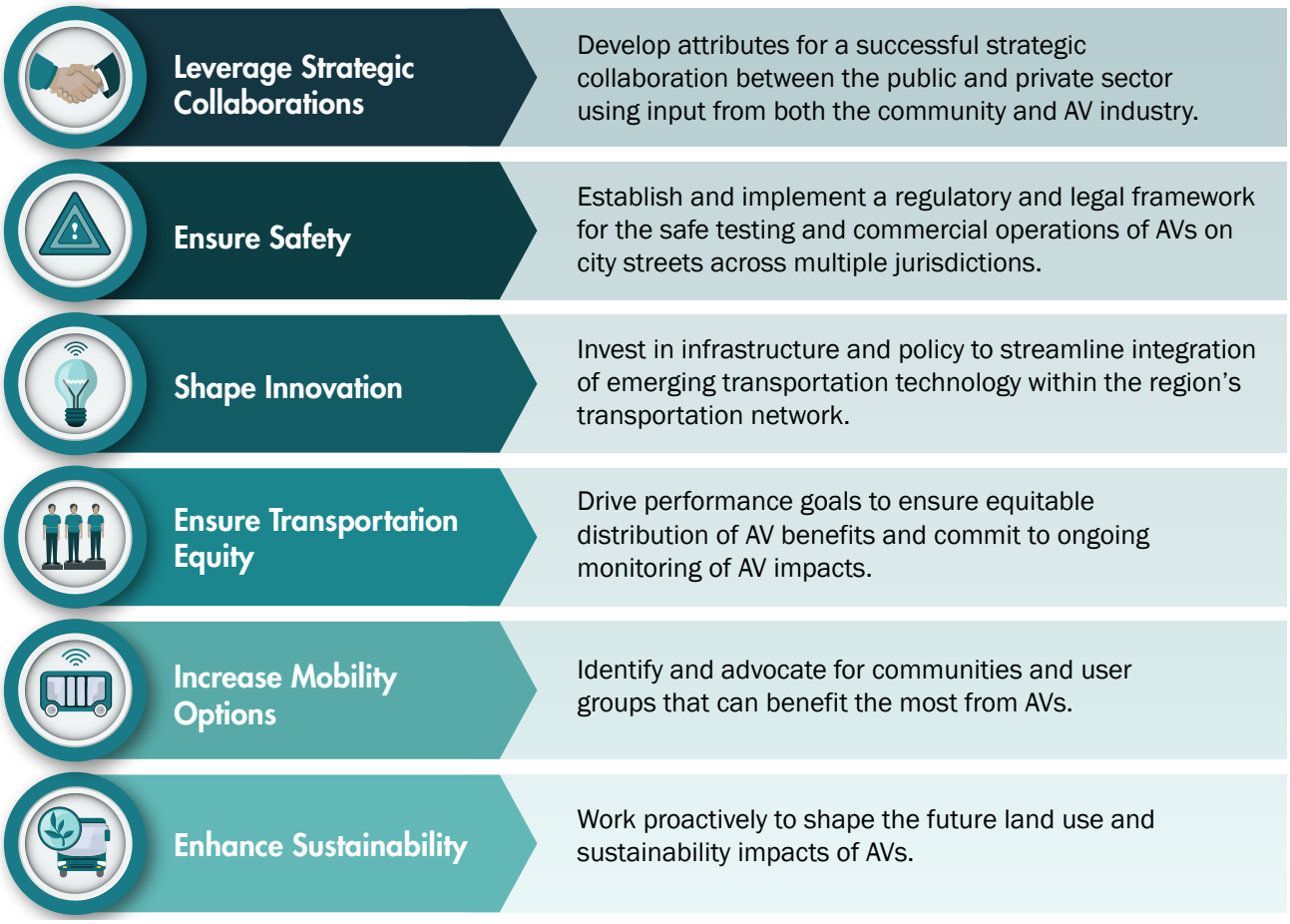
MID-TERM ACTIONS – This presents the activities that can be conducted within **5-10 years**. These include actions that result in AV policy or regulatory changes, coordination beyond the local level, and infrastructure upgrades.

LONG-TERM ACTIONS – This presents the activities associated with long-term goals that can be conducted within **10-20 years**. These include actions associated with less mature AV application types (e.g., drones), or implementing AV frameworks that require collaboration with other jurisdictions.

RECOMMENDED STRATEGIES AND ACTIONS

This section outlines a time-phased series of actions that are recommended as part of the AV Strategic Vision. Figure 7 showcases the recommended strategies presented in this section that were derived from a series of stakeholder engagement efforts with state and local agencies, AV companies, professional societies, governmental partners, academic partners, and equity and inclusion groups. Stakeholders provided illuminating insights into where the Cities of Bellevue and Seattle should focus their limited resources in the coming years, key roles that the Cities should play while preparing for and managing AVs, changes in policy and regulations needed around AVs, major AV implementation challenges in Washington, as well as ways to collaborate with AV developers to safely and effectively meet regional goals while allowing for innovation.

FIGURE 7. AUTOMATED VEHICLE STRATEGIC VISION



1. LEVERAGE STRATEGIC COLLABORATIONS:

Develop attributes for a successful strategic collaboration between the public and private sector using input from both the community and AV industry.

If we shape it…

Cities can help to identify AV service models that not only enhance the livability of our communities, but also provide crucial revenue streams for AV companies. By prioritizing the movement of people instead of vehicles, we can address inequities for communities that have been historically underserved by transportation options.

If we leave it to chance…

AV companies will rely on service models that are profitable in order to stay in business. If the most monetarily beneficial path involves providing automated personal vehicles or personal delivery devices for the more privileged communities, then the increased presence of AVs may result in certain environments becoming congested with AV robots and an uptick in drone activity. This may cause a decrease in the use of public spaces by people, thereby negatively impacting the characteristics that make Seattle, Bellevue, and the surrounding communities great. Additionally, an AV service model driven primarily by profitability would exclude disadvantaged communities altogether.

Recommended Actions

In observing other AV deployments nationwide, there are instances where strong relationships/partnerships between AV developers and public agencies are lacking and have led to perceived broken promises and frustrations on both sides, which ultimately impacted the success of the deployment.[27] AV developers can be resistant to sharing proprietary data while public agencies may be wary of the adequacy of safety measures put in place by AV companies. Such lack of mutual trust often creates roadblocks to the level of collaboration that is needed for the successful strategic deployment of AVs. We understand that relationships take time to develop and this is an area worthy of our investment because it will greatly shape what, where, and how AV technology will be deployed in our region.

In order to develop mutually beneficial relationships with the private sector, we will:

Near-Term (0-5 Years)

A. **Prioritize people's safety and comfort over vehicle throughput or the convenience of AV companies.** We believe that AV technology has the potential to improve people's lives, which serves as our north star when making any AV-related decisions.

[27] https://www.nytimes.com/2017/05/21/technology/pittsburgh-ubers-driverless-car-experiment.html

B. **Support industry in providing educational information to the public on the limitations of each SAE Level.** Support the private sector in providing public messaging and education which convey that SAE Levels 1 and 2 **do not** fall under the realm of "automated vehicles" and **do require** constant oversight by the driver. The nuances between the automated driving features supported under SAE Levels 3, 4, and 5 also need further clarification and education by industry.

C. **Engage communities in the decision-making process to offer opportunities to understand these enhancements and the potential benefits to their communities.** When changes to a community happen too quickly or without notice, even when public agencies' intentions are good, residents can feel like changes are happening **to them**, rather than **for them**.

D. **Proactively collaborate with AV industry to form beneficial alliances.** All AV companies that were engaged during this effort see the benefits in developing long-term relationships with local agencies, understanding that we are the stewards to our public roads.

E. **Establish two-way communication with communities and the AV industry.** While AV companies are generally reluctant to share detailed information as a means to maintain their competitive advantage, there is much to learn from them regarding AV technology impacts and potential safety risks to road users. AV companies can also benefit from cities' inputs regarding public values, passenger needs, vehicle design and requirements, transportation network design, and other areas. Organizations such as NACTO can facilitate the collective voices of cities.

F. **Collaborate on the development of mutually beneficial datasets and/or data standards with AV companies.** AV companies collect significant data that they may not necessarily want to share with public agencies. Public agencies also generally lack the resources to process the raw data in hopes of finding useful insights. To expedite the sharing of data that is useful to each party, we will collaborate with AV companies to identify useful data attributes and formats.

G. **Establish data exchange requirements and processes between AV companies and the city.** The Cities of Seattle and Bellevue have established Open Data Portals where Application Programming Interfaces (APIs) are available for AV developers to access the city's data catalog as well as upload AV-related data. Once data exchange requirements have been defined and standardized, we can update our APIs as necessary to ingest the relevant data elements from these new sources.

H. **Initiate the development of a public-private partnership model that includes cost sharing incentives and contributions from businesses and future users.** In order for AV deployments to be financially viable in the long-term, contributions will be necessary from parties other than public agencies and AV developers.

I. **Form a strong coalition with local and state agencies to adopt similar goals/criteria for AV policy to strengthen the regional "voice."** This collaboration between the Cities of Bellevue and Seattle is just a first step to developing a unified regional approach to AVs.

J. **Clearly outline AV regulation framework for AV companies.** AV companies are faced with jurisdiction-specific AV regulations which can have impacts on their ability to scale operations. AV scalability is critical in order to realize system-wide transportation benefits. One way we can support AV companies is to create a coalition of cities with the support of state partners, which foster continued collaboration towards a unified approach to AV regulations, to the extent feasible given the unique requirements of different jurisdictions' operating environments.

K. **Identify a small-scale pilot opportunity to allow the public to experience AV technology firsthand and help them overcome any concerns regarding this emerging technology.** The biggest change in one's perception of AVs generally occurs after they have had the chance to ride in one. We want to ensure that when AVs become commercially available in our region, that the public both ready for them and excited to incorporate them into their daily lives.

Mid-Term (5-10 Years)

L. **Selectively collaborate on commercial operations with AV companies whose goals align with the city's.** Different AV companies focus on different AV application types. Instead of greenlighting commercial operations for any AV companies that have an interest in our region, we will be selective in the ones that address gaps in our transportation system.

M. **Identify alternate options and/or training for the labor force whose jobs may be displaced due to automation and electrification.** We want to ease concerns regarding workforce displacement by offering training opportunities well in advance of any job impacts.

Long-Term (10-20 Years)

N. **Foster an environment that encourages AV development through collaboration with academics/research institutions and investors.** Much like the factors in Arizona that has allowed AV development to flourish, we aspire to foster an ecosystem that provides the policy framework, technical skillset, as well as financial support needed for AVs to become a permanent fixture in our transportation system.

2. ENSURE SAFETY:

Establish and implement a regulatory and legal framework for the safe testing and commercial operations of AVs on city streets across multiple jurisdictions.

If we shape it…

Each city is facing similar challenges when it comes to establishing the appropriate level of regulations in an effort to ensure safe operations of AVs on their streets. While vehicle safety promises to be one of the biggest benefits of AVs with the potential to reduce the number of crashes caused by human error, AV are susceptible to computer and physical defects. For example, AV sensors can be impaired by heavy rain, fog, or snow, leading to potential self-navigation issues. Different operating environments necessitate, both locally and nationally, a patchwork of regulations and deployment challenges that can deter AV companies from making investments in our cities. By proactively collaborating among governing bodies in the region, we can avoid city-specific carve-outs, as demonstrated by the collaborative development of this AV Strategic Plan by the Cities of Bellevue and Seattle.

If we leave it to chance…

Cities are responsible for the safety of public road users, whether they are operating a vehicle, walking, bicycling, or using other modes. With federal guidance slow to be issued and Washington State taking a generally permissive stance on AVs, it is inevitable that AV companies will begin testing on our city streets. If we focus solely on supporting AV technology advancements, AV companies may prioritize profits before the safety of our public road users.

Recommended Actions

Right now, our cities lack a robust regulatory and legal framework that protects public road users from AV-related incidents. We have more questions than answers, but that should not prohibit us from establishing requirements against known safety concerns. We can look to other states such as California, Pennsylvania, and Arizona who have developed more mature regulatory frameworks for guidance and lessons learned. The key is to stay ahead on the topic before public road users are put in avoidable hazardous situations.

In order to ensure the safe testing and commercial operations of AVs on our city streets, we will:

Near-Term (0-5 Years)

A. Determine local authority pathways to regulate AV testing and commercial operations. Establishing permit requirements would be the first step to regulating AV testing and commercial operations. Administration of permits may be managed at the state and/or local levels. We may also consider designated AV testing areas or modifications to curb space usage to align with changes in loading patterns.

B. **Establish permit requirements for AV testing and commercial operations.** For example, AV developers may need to meet certain safety metrics that we specify before their AV testing can move into commercial operations.

C. **Collaborate with regional, state, and federal agencies on the development of a legal framework that maximizes consistency between jurisdictions (e.g., liability).** We aspire to develop a unified stance on AV policy in order to streamline AV deployments and scalability. This collaboration could include groups such as Transportation 4 America, NACTO, the Institute of Transportation Engineers, or the Intelligent Transportation Society (ITS) of America and result in the issuance of additional bills and legislature that will comprise the legal framework to achieve uniformity in AV development standards.

D. **Set safety metric guidelines for local AV testing and commercial operations to achieve Vision Zero commitments.** Up until now, AV developers have mainly dictated what constitutes "safe" vs. "unsafe" AV operations. We need to set safety performance goals to ensure that AV deployments help us reduce traffic fatalities and severe injuries, while increasing safe, healthy, equitable mobility for all.

E. **Authorize AV testing areas or opportunities for specific use cases (e.g., pick-up/drop-off curb spaces and associated permits).** Almost every AV developer that we engaged was focused on the availability of AV pick-up/drop-off (PUDO) zones. Current city infrastructure is not set up for an influx of AVs vying for curb space, but before zoning regulations are changed permanently, we need a better understanding of how curb spaces can be rezoned for the benefit of multiple types of functional uses (cars as well as other uses).

F. **Ensure transparent data sharing and reporting for AV testing and operations on public roads.** We cannot monitor the performance of AVs effectively without access to certain data from the vehicles. We will require access to critical data elements from AV companies in order to ensure that our safety metrics are met.

Mid-Term (5-10 Years)

G. **Address deficiencies in the transportation system to meet stated performance goals.** The availability of data collected by AV companies in the process of their deployments may reveal deficiencies in the current transportation system, such as high-crash intersections. This data can be used to conduct further analyses and identify potential safety issues to be addressed and prioritized as projects to improve the our transportation system for all users.

H. **Establish enforcement procedures to ensure that AVs comply with all relevant safety requirements.** Setting safety goals and permit requirements alone is not sufficient to ensure safety. Enforcement procedures are necessary to revoke permits for noncompliance.

I. **Assess different right-of-way uses to enable new AV applications.** AV-only facilities may be beneficial for certain AV application types such as Mass Transit or Commercial Freight, enabling more efficient movement of people and goods.

J. **Explore potential changes needed to Manual on Uniform Traffic Control Devices (MUTCD) signage requirements.** AVs may not be able to interpret existing roadway signage the way human drivers can, so MUTCD signage requirements may need to be revised to accommodate both.

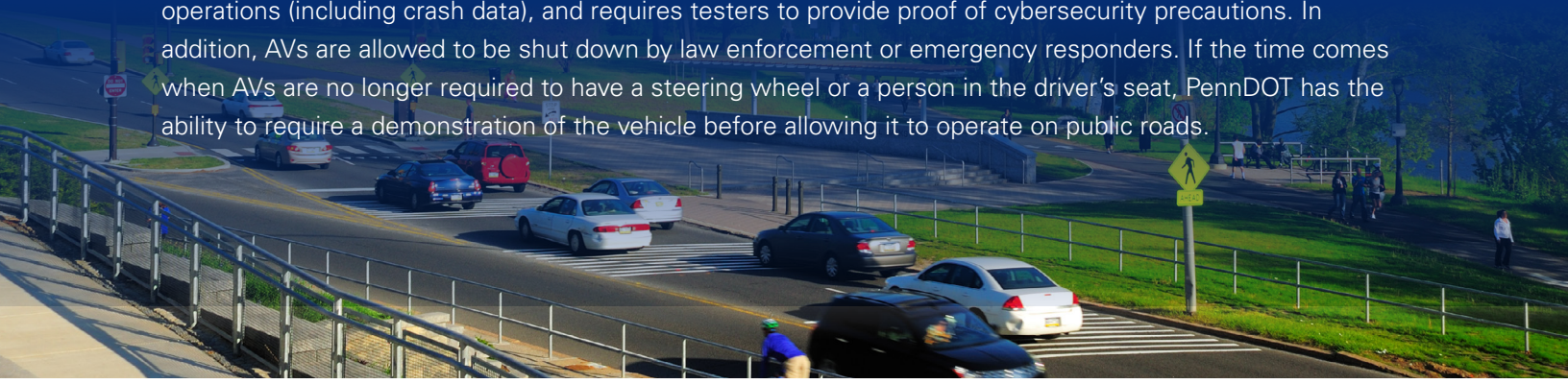
Long-Term (10-20 Years)

K. **Establish legal frameworks to ensure that AVs have, at a minimum, the same accountability as human drivers.** Traditionally, a driver has always been deemed liable for vehicular incidents. For AV incidents that are unavoidable where a driver is not present, the question of liability raises many concerns – is the manufacturer of the vehicle, the owner of the vehicle, or the owner of the road where the incident took place liable for the damages? We need to develop a framework that is fair and equitable for all.

SPOTLIGHT: *PENNSYLVANIA'S AUTOMATED VEHICLE POLICY MODEL*

Pennsylvania DOT (PennDOT) published their Autonomous Vehicle Testing Policy[28] in 2016, which was developed by the State's Autonomous Vehicle Task Force. In November of 2022, a House Bill (2398[29]), which provides a regulatory framework for the testing and deployment of AV technology, was signed into law. While PennDOT encourages the development of this emerging technology, there was a desire to ensure that the policy they put in place allows the technology to grow in an appropriate way. The policy stipulates that the department would enter into a contract that would include proof of $5 million in liability insurance with any entity that wished to test a self-driving vehicle. The contract could be suspended or canceled by the department. Entities entering into contract are required to provide a description of their testing plan (including geographic area and road types the vehicle would be using), the speed the vehicle would be traveling, and the weather in which it can operate.

PennDOT reserves the right to restrict AVs to certain routes, be able to restrict vehicle platooning (where vehicles travel as a wirelessly connected convoy), requires testers to collect and share data about the vehicles' operations (including crash data), and requires testers to provide proof of cybersecurity precautions. In addition, AVs are allowed to be shut down by law enforcement or emergency responders. If the time comes when AVs are no longer required to have a steering wheel or a person in the driver's seat, PennDOT has the ability to require a demonstration of the vehicle before allowing it to operate on public roads.



[28] Luke Bernstein: Autonomous vehicle law puts Pa. in driver's seat of opportunity, innovation | TribLIVE.com

[29] http://www.penndot.gov/ProjectAndPrograms/ResearchandTesting/Documents/AV%20Testing%20Policy%20DRAFT%20FINAL%20REPORT.pdf

3. SHAPE INNOVATION:

Invest in infrastructure and policy to streamline integration of emerging transportation technology within the region's transportation network.

If we shape it…

By thinking about how to prepare for the inevitable growth of technology in transportation (AVs or no AVs), cities can proactively look for ways to innovate and invest in infrastructure and policy that can support technology growth over time. Many local preparations would be the same whether or not there are drivers in vehicles.

If we leave it to chance…

AV companies may insist that their AV systems do not require any special infrastructure enhancements in order to function properly as long as lane striping is clearly identifiable for use in AV navigation. Cities can continue with this minimalistic approach, but the AV developers or applications that they attract may not be considering the full implications of AV commercialization. Inaction may lead to the overlooking of necessary infrastructure investments such as AV PUDO situations requiring changes to curb space zoning requirements, electric AVs requiring access to a larger network of charging infrastructure, and pedestrians and bicyclists wanting physical barriers between them and AVs in order to feel safer, to name a few.

Recommended Actions

Lack of time and resources as well as competing transportation priorities have constrained investments in infrastructure and policy and AVs may or may not become widely available in our region within this decade. However, the effort that is needed to prepare for their arrival overlaps with many of the efforts we are already embarking on to advance other transportation technology initiatives. The important thing to keep in mind when investing in infrastructure and policy is to make sure that all roadway design accounts for the most vulnerable travelers in an equitable manner, irrespective of travel mode.

In order to streamline the integration of emerging transportation technology within the region's transportation network, we will:

Near-Term (0-5 Years)

A. Establish strategies for safe interaction between AVs and those that walk, cycle, and roll. Some of the movements and actions initiated by AVs within close proximity to non-vehicular road users may create situations of discomfort or fear of harm because the vehicle's intention is not clear.

B. **Designate AV testing areas.** By identifying use cases that AV companies are focusing on, we can designate specific AV testing areas that offer the roadway geometrics necessary to conduct the tests while limiting potentially unsafe interactions with human controlled vehicles and other vulnerable road users.

C. **Monitor advancements in the AV industry in other relevant cities, at a national level.** New AV developments are emerging on an almost daily basis. Valuable lessons can be gleaned from AV deployments in other cities, which can save us costly time and resources as we adopt the optimal AV framework for our region.

Mid-Term (5-10 Years)

D. **Identify opportunities to expand charging infrastructure for the onset of electric AVs.** We believe that AVs should be required to be manufactured as low or zero-emission vehicles in order to complement the Cities' sustainability goals of reducing emissions and becoming more carbon neutral. As such, coordination among utilities, cities, and AV companies will be needed to ensure that charging infrastructure is expanded and available to support the growing share of electric vehicles.

Long-Term (10-20 Years)

E. **Ensure emerging mobility options are accessible to all.** Testing of various AV application types has revealed accessibility limitations of certain AVs. In the case of For-Hire services, there are no guarantees that AVs used can accommodate travelers who require accessible transportation such as people with wheelchairs. In the case of Personal Delivery Devices, the AVs currently cannot climb stairs to reach residents who do not live on the first floor of a multi-unit building. As a result, delivery services enabled by Personal Delivery Devices may disproportionately benefit consumers living in single-family residences, versus multi-story apartments or condominiums. In order to ensure that the benefits of AVs are distributed equitably, there may be gaps between AV service offerings that need to be addressed.

F. **Identify high-priority use cases for AV drones and determine potential implications on airspace and right-of-way restrictions.** Drones used for last-mile deliveries fall into the Conceptual technology readiness category. There are many potential infrastructure and policy impacts that need to be further explored before this AV application can be deemed feasible for testing. Although Federal Aviation Administration (FAA) involvement is key for ultimately integrating drones safely into the air space, cities will aid in the creation of legislations and regulations to guide drone usage in their jurisdiction, which notably also include beneficial non-retail uses such as emergency response.

4. ENSURE TRANSPORTATION EQUITY:

Drive performance goals to ensure equitable distribution of AV benefits and commit to ongoing monitoring of AV impacts.

If we shape it…

The City of Bellevue has taken steps to include an "equity index" in our Mobility Implementation Plan that is used to help identify places where specific types of projects would enable people to get where they need to go. SDOT's Transportation Equity Program includes the Transportation Equity Workgroup (TEW) that has co-developed a Transportation Equity Framework (TEF) which provides department-wide policy and strategic advisement. We can become moderators of AV deployments in the region. We can ensure that specific AV applications selected for deployment are those that have been determined to be most beneficial in attaining our transportation equity goals.

If we leave it to chance…

With significant investment into AV research and development, the AV industry needs to find ways to monetize AV technology as quickly as possible. In order for AV companies to recoup technology development costs and fund further advancements, consumers may need to pay a premium for access to these vehicles. Without incentives or regulations to encourage private investments in vehicles and deployment applications that are both accessible and equitable, AVs may contribute towards transportation inequities.

Recommended Actions

A history of inequitable policies and disinvestment has created imbalance in our transportation system, including inaccessibility for certain populations in the community such as the elderly, disabled, and un-banked/under-banked, limited availability of services based on gender identity or racial discrimination, and longer commutes for communities of color than their white counterparts due to displacement. As an example, while communities of color contribute less to pollution, they disproportionately experience the long-term impacts of this racism, including limited access to opportunities and wealth.[30] Ensuring transportation equity starts with quantitative benefits analysis, which can also help to improve public sentiment surrounding AV technology. By driving the performance goals and committing to ongoing monitoring of AV impacts, we empower ourselves to make data-driven decisions that serve our cities' best interest.

In order to ensure equitable distribution of AV benefits, we will:

Near-Term (0-5 Years)

A. **Provide public outreach and education opportunities to further understanding of AV capabilities and limitations.** We know that education regarding AV technology needs to be not only more widely available to all communities inclusive of historically underserved communities whose access to new mobility opportunities are otherwise limited, but also

[30] https://www.seattle.gov/transportation/projects-and-programs/programs/transportation-equity-program

communicated in a way that strips out all of the marketing ploys that can create misunderstanding with the public. It would benefit the public and community-based organizations to understand which transportation-related barriers could be addressed with this emerging technology as well as monitor new technologies to identify any barriers early on. Involving the public in pilot efforts by soliciting their input regarding community needs and creating opportunities for them to ride in and experience AVs first hand have proven to be an effective means of educating the public on AV capabilities and limitations.

B. **Map locations of AV service offerings.** By better understanding where AV services are being offered (such as PUDO locations), we can identify and work to remedy geographic inequities of AV service offerings. Equity zones can be defined, and requirements developed to ensure equitable access to AV services across all communities.

C. **Formalize key performance indicators that can be used to evaluate the effectiveness of AV deployments on their ability to meet city goals.** SDOT's Transportation Equity Program[31] and City of Bellevue's Mobility Implementation Plan[32] are important resources that formalize the region's approach to creating an equitable transportation system. Setting the appropriate performance measures using equity metrics, low-income programs, and actual program outcomes will help us determine whether AV deployments within our region bolster the city's transportation goals for all users, result in tangible benefits for all communities, and are worthy of continued investment.

Mid-Term (5-10 Years)

D. **Measure benefits in terms of safety, but also in terms of system performance and efficiency.** Once AV commercial operations have stabilized, we want to quantify any benefits stemming from the deployments. This will help us determine which AV applications can help us achieve not only our transportation goals that include enhancing the sustainability of our transportation network through reduced emissions, but also whether this is an equitable distribution of AV benefits.

Long-Term (10-20 Years)

E. **Adjust performance goals once AVs reach ubiquity.** The AV industry anticipates the full potential of AVs to be realized once AVs outnumber vehicles with no driving automation technology as well as non-motorized road users. However, since high penetration rates of AVs are not anticipated for many years, we need to set interim performance goals while AVs go through initial deployment and mixed fleet environments. As part of our commitment to ongoing monitoring of AV impacts, when AVs do reach ubiquity, we will need to increase performance targets to account for AVs' ability to optimize system-wide performance.

[31] https://www.seattle.gov/transportation/projects-and-programs/programs/transportation-equity-program

[32] https://bellevuewa.gov/city-government/departments/transportation/planning/infrastructure-and-subareas/mobility

5. INCREASE MOBILITY OPTIONS:

Identify and advocate for communities and user groups that can benefit the most from AVs.

If we shape it…

We can guide the equitable deployment of AV pilot projects and commercial deployments so that historically disadvantaged communities are included, focusing on increasing mobility options for user groups that often have less access to high-quality transit service. We can work in collaboration with AV companies to incentivize and encourage the deployment of shared AV service models to reduce dependency on vehicle ownership and increase mobility options for all. We can reduce operating costs for existing services with low demand by increasing the available options to include on-demand AVs. Due to the importance of both personal vehicles and public transportation, efforts to increase accessibility and affordability of public transportation must be balanced with investments in road safety and infrastructure to support the needs of other road users. Reduction of operating costs can facilitate an increase in our ability to invest in transportation safety.

If we leave it to chance…

AV pilot projects will be deployed in places that have the energy, time, and resources to support them rather than places that could benefit from them the most. AV companies will follow the most profitable revenue stream, which is likely to be single-occupant AVs, resulting in cities maintaining the status quo in terms of mobility options. A pattern of unregulated AV deployment may result in some of the shortfalls experienced in the implementation of transportation network companies (TNCs), which include a lack of mobility options and inherent inequity due to bias against the elderly or disabled as a result of drivers not having access to training or accessible vehicles.

Recommended Actions

Lack of affordable, convenient, and comfortable mobility options have resulted in the popularity and prevalence of personal vehicles. AVs have the potential not only to reduce operating costs for transportation service providers and increase mobility options for travelers, but also introduce innovative forms of transportation such as shared commute pods, low-speed circulators within medical, business, or residential campuses, and PUDO services to provide access to essential destinations for people of different abilities and ages. Leveraging AVs to the benefit of communities and user groups with the largest gaps in transportation access is one way that we can work to increase transportation equity and mobility options simultaneously.

Since this strategy drives many of the recommended actions listed under the other five strategies, the following recommendations focus on the near- and mid-term timeframe. In order to advocate for more mobility options for vulnerable communities and user groups, we will:

Near-Term (0-5 Years)

A. **Identify high priority community-focused use cases for AVs (e.g., long-haul freight, paratransit, wheelchair accessible taxis) and demand for those use cases.** Before we select AV developers to collaborate with on AV pilots and deployments, we must first understand which AV application types are beneficial to our regional goals. AV promoters and cities should engage with and solicit feedback from the community and advocacy groups, ensuring that equitable opportunities are created for all transportation stakeholders, including transportation disadvantaged communities that have historically been overlooked, to understand these use cases. The spotlight in Section 1 on Minnesota's goMARTI pilot program highlights an aspirational use of AVs to provide alternative ADA-compliant public transportation options to rural communities.

B. **Identify existing services that can be more efficiently and effectively served by AVs.** These may include transit routes with low demand, last-mile shuttles, and/or places where you cannot run a large bus or build a new rail line. Transit agencies can integrate AV technologies and explore partnerships to expand their service area and hours and improve reliability. One example of this is the goMARTI pilot, which featured a strong public/private partnership and inclusion of public input with the goal of ultimately enhancing the existing transit system. Increasing the efficiency of existing services is another approach to optimizing our transportation system and reducing operating costs.

C. **Search for commonalities in goals among neighboring jurisdictions and stakeholders that inform policy decisions.** Data on areas such as electrification, curb space management, and AV-enhanced transit mapping can be shared across neighboring agencies to facilitate collaborative decision making.

D. **Champion projects that are a right fit and have both institutional and financial support.** Ensure that marginalized communities are a consideration within AV deployment/policies on an ongoing basis.

Mid-Term (5-10 Years)

E. **Work with the AV industry to demonstrate the value of AV applications to the public once the benefits are proven.** If AVs are proven to be effective at moving more people safely and comfortably, we will want to encourage the public to adopt this emerging technology.

6. ENHANCE SUSTAINABILITY:

Work proactively to shape the future land use and sustainability impacts of AVs.

If we shape it…

We can play a role in making sure overall system performance and livability **improves** with the onset of AVs through complimentary zoning and development policies to encourage transit-oriented development and reduce reliance on vehicles. Increases in VMT for currently underserved segments (e.g., communities of color) may be allowable since it signals increased economic opportunities for communities in need, but EVs and zero emission goals should be incentivized otherwise.

If we leave it to chance…

With AVs making travel safer and more comfortable, it may become more enticing to move to areas further away from the urban core, thus causing more traffic and development in suburban and less dense areas. Without government intervention, AVs may have no incentive to reduce greenhouse gas emissions.

Recommended Actions

Many of the unintended consequences that make AV technology such a high risk are tied to their impacts on sustainability. While we may see AVs as a tool to reduce vehicular trips and meet transportation environmental goals, the public may not want to sacrifice the privacy and convenience that comes with personal vehicles. AV manufacturers may not prioritize paratransit vehicles if they are not a business model that yields a high rate of return. We need to guide AV deployments in the direction that is most beneficial to the city as a whole.

Since this strategy drives many of the recommended actions listed under the other five strategies, the following recommendations focus on the near- and mid-term timeframe. In order to address the future land use and sustainability impacts of AVs, we will:

Near-Term (0-5 Years)

A. **Emphasize the need to reduce deadhead (or ZOV) miles and emissions.** The introduction of ZOVs, which has the undesirable effect of increasing both VMT and emissions, would be the biggest setback in terms of reaching our transportation goals and must be minimized. Policies to regulate AV minimum occupancy, fuel efficiency and fossil fuel consumption should be implemented to manage potentially negative emission impacts by AVs.

B. **Assess curbside assets.** The City of Seattle has modified its Comprehensive Plan to identify different curb functions and set policies for use, while the City of Bellevue is in the process of modifying their Comprehensive Plan to address the same issues. These curb space management efforts can be further enhanced through the creation and maintenance of a digital inventory of curb assets so that this data can be later used in the determination of zones to accommodate AV applications.

Mid-Term (5-10 Years)

C. **Determine changes needed to curb space usage to accommodate emerging AV applications.** Curb space usage encompasses dedicated curb zones, curb usage fees, curb zone data sharing, etc. Figure 8 shows how NACTO envisions zoning to change in the future. As changes are made to curb space usage to accommodate the changing mobility landscape, which includes AVs, Comprehensive Plans should be updated with policies that reflect these changes.

D. **Determine changes needed to parking requirements.** Assuming that AVs enable us to head towards a shared economy, this is our opportunity to reduce or eliminate off-street parking requirements or adjust parking requirements for new developments.

E. **Work with state and federal government to incentivize and implement low emission regulations for AVs.** We do not want to see a future where AV emissions are not regulated. Low emissions need to be a requirement for AV manufacturers from the very beginning and our cities will advocate with the state and federal governments for regulations that support our goals and priorities.

FIGURE 8. ZONES OF THE FUTURE STREET

Source: National Association of City Transportation Officials, Blueprint for Autonomous Urbanism: Second Edition, https://nacto.org/publication/bau2/

SPOTLIGHT: *SAN FRANCISCO AND LOS ANGELES' APPROACH TO CURB MANAGEMENT*

Los Angeles DOT (LADOT) acknowledges that curb space is a limited resource that needs to be flexible to changes in demand, as peak demand varies by time of day and days of the week in different parts of the city. In order to obtain a comprehensive understanding of how all of the city's curb space is defined, LADOT launched an initiative called Code the Curb,[33] where they are developing a digital map designed for collaboration of the City's painted curbs and other regulatory tools as a baseline to measure the impacts of reapportioning curb use given local context and real-time demand. They plan to simplify rules around curb access whenever possible and streamline signage and other information displays to make it easier to understand how and when curbs can be used. LADOT's ultimate goal is to leverage technology to make this flex space functional in real-time. With the right data, LADOT could pilot an adaptive model that allows for curb space to be reassigned (and priced) based on demand to serve all modes, including the rise of new technology-enabled transportation services and automated vehicles.[34]

The San Francisco Municipal Transportation Agency (SFMTA), which manages both the city's public transportation network and its streets, recently published their Curb Management Strategy report.[35] SFMTA defines five key curb functions: (1) Access for People, (2) Access for Goods, (3) Public Space and Services, (4) Storage for Vehicles, and (5) Movement and prioritizes curb functions by land use. Their strategy to improve access to up-to-date data includes developing a standard operating procedure for TNCs, taxis, Courier Network Services, and delivery companies to request specific pick-up and drop-off points.

Following in their footsteps, the Cities of Bellevue and Seattle are both making strides in terms of innovative curb management. SDOT is redefining their curb space as the "flex zone" and is establishing policies for the Seattle 2035 Comprehensive Plan to set priority for flex zone use by function (i.e., mobility, access for people, access for commerce, activation, greening, and storage).[36] SDOT has also been contributing to the Open Mobility Foundation's (OMF) Curb Data Specification (CDS), which aims to enable standardized data exchanges between cities, curb users, and curb data providers about how spaces are currently being used and eventually help reduce inefficient use of curb space.[37] The City of Bellevue is working to create a Curb Management Plan that will provide a new, long-range planning vision for designating, maintaining, and operating curbside areas in Bellevue's most dense neighborhoods.

[33] https://ladot.lacity.org/projects/transportation-technology#code-the-curb

[34] https://ladot.lacity.org/sites/default/files/documents/transportationtechnologystrategy_2016.pdf

[35] https://www.sfmta.com/sites/default/files/reports-and-documents/2020/02/curb_management_strategy_report.pdf

[36] https://www.seattle.gov/transportation/projects-and-programs/programs/parking-program/parking-regulations/flex-zone/curb-use-priorities-in-seattle

[37] https://gcn.com/data-analytics/2022/02/seattle-takes-double-parking-curbside-data/362023/

A CALL TO ACTION

When there is a lack of funding for even the most basic transportation investments, one might ask whether AV technology should be prioritized for near-term investments. Increased investment in AV technology and strategies will inevitably divert a portion of already limited transportation funding away from and compete for priority among other transportation improvement projects that are also key to obtaining a safe and efficient transportation network for all travel modes, such as transit, micromobility, bicycle and pedestrian improvements. However, when utilized strategically and in a complementary manner with other modes, AV investments have the potential to yield positive returns on investments due to the anticipated benefits of AV technology.

Regardless of whether we like it or not, **automated vehicles are coming,** and we need to be prepared for how we want them to shape our communities.

The Puget Sound Region is already ripe to attract AV developers, with many of the components that encourage AV developers to scale their technology already in place: access to a network of skilled workforce through our tech hub, ability to test AVs in unique ODDs such as rainy weather and tunnels, and a welcoming state regulatory environment. These factors attribute to the growing interest among companies to consider testing their AV technologies in the State. AVs that have been thoroughly vetted in fair weather conditions will be looking for environments such as the Puget Sound Region to execute their next stages of testing. In fact, Zoox and Waymo are only the two most recent companies with known testing on our streets.

If we take the approach of waiting for AVs to come rather than preparing for them now, we lose the opportunity to shape AV applications to the benefit of the region and become more susceptible to the risks of an unregulated environment.

Implementation of this AV Strategic Vision for AVs, however, represents an alternative that puts the Cities of Bellevue and Seattle in the driver's seat. It empowers the region to realize the benefits of AV while ensuring the safety, equity, and other critical transportation goals are met. We are committed to championing our AV priorities at the State level and creating a collaborative atmosphere with all stakeholders to leverage AV technology in a way that best supports our transportation goals and the desires of the community at large.

The City of Bellevue
Transportation Department
450 110th Avenue NE
(or) PO Box 90012
Bellevue, WA 98009
(425) 452-6856
https://bellevuewa.gov/city-government/departments/transportation

City of Bellevue

The Seattle Department of Transportation
700 5th Avenue, Suite 3800
PO Box 34996
Seattle, WA 98124-4996
(206) 684-ROAD (7623)
www.seattle.gov/transportation

City of Seattle