

Connected and Autonomous Vehicles Policy

Discussion Draft Recommendations

May 4, 2017

Summary

Autonomous Vehicles (AVs) have the potential to benefit Portland by reducing crashes, improving first and last mile connections for transit users, and reducing the high cost of owning a private vehicle. AVs also have the potential to significantly increase traffic congestion, vehicle miles travelled, and climate pollution. Investments in AV infrastructure could increase demands on transportation budgets while use of AVs could threaten parking revenues. The protections and rules of the road adopted by state and local governments will substantially determine how much benefit and how much burden we experience.

Autonomous vehicle technology is advancing rapidly: AVs are being tested on public streets in Pittsburgh, California, and Arizona. We may have vehicles that are largely autonomous operating in Portland in 2017.

Portland does not have an autonomous vehicles policy. In order to maximize potential benefits and minimize potential threats, PBOT is proposing a policy based on AVs advancing our adopted comprehensive plan goals. The objectives below are designed to provide guidance from City Council to both implementing bureaus and private sector organizations. The policy could provide clear guidance for evaluating autonomous vehicle tests, pilots, and deployment. PBOT is also proposing to amend Comprehensive Plan Policy 9.6, the transportation strategy for people movement, to reflect a priority for AVs that are fleet, electric, and shared by multiple passengers. This combination is likely to produce the greatest benefits with the least risk.

With clear policy direction, use of autonomous vehicles in Portland could boost the likelihood of achieving our Vision Zero, economic, environmental, and equity goals.

Connected and Autonomous Vehicles Policy

Policy 9.xx Connected and Autonomous Vehicles. Ensure that connected and autonomous vehicles advance Portland's Comprehensive Plan multiple transportation goals and policies, including vision zero, climate pollution reduction and cleaner air, equity, physical activity, economic opportunity, great places, cost effectiveness, mode share, and reducing vehicle mile traveled.

Objective 9.41 Connected and Autonomous Vehicles.

Prioritize connected and autonomous vehicles that are fleet/shared ownership, electric, fully automated and, for passenger vehicles, shared by multiple passengers. Develop and implement strategies on:

9.41.a. Safety: Ensure that all levels of self-driving vehicles operate safely for all users, especially in the presence of vulnerable road users;

9.41.b. Reliability and Efficiency: Ensure that connected and autonomous vehicles improve travel time reliability and system efficiency by

1. maintaining or reducing the number of vehicle trips during peak congestion periods;
2. reducing low occupancy vehicle trips during peak congestion periods;
3. paying for use of, and impact on, Portland's transportation system including factors such as congestion level, vehicle miles traveled, vehicle occupancy, and vehicle energy efficiency;

9.41.c. Climate: cut vehicle carbon pollution by reducing "empty miles" traveled by passenger vehicles with zero or one passengers;

9.41.d. Equity: make benefits of autonomous mobility available on an equitable basis to all segments of the community;

9.41.f. Adverse Impacts: identify, prevent, identify, and mitigate potential adverse impacts from connected and autonomous vehicles.

Use a full range of tools to ensure that connected and autonomous vehicles and private data communications devices installed in the City right of way contribute to achieving Comprehensive Plan and Transportation System Plan goals and policies, including:

9.41.g. Information: Maintain City authority to identify and develop appropriate data sharing requirements to inform and support safe, efficient, and effective management of the transportation system. Ensure that when connected and autonomous vehicles use City rights-of-way or when vehicles connect with smart infrastructure within the City they share information including vehicle type, occupancy, speed, travel routes, and travel times, with appropriate privacy controls. Ensure that private data communications devices installed in the City right of way are required to share anonymized transportation data;

9.41.h. Design and Manage: design and manage the mobility zone, curb zone, and traffic control devices, e.g. to limit speeds to increase safety, to minimize cut-through traffic, evaluate future demand for pick-up and drop-off zones, and to prioritize autonomous electric vehicles carrying more passengers in congested times and locations;

9.41.i. Investments: Evaluate the public cost and benefit of investments in wayside communication systems advancing connected and autonomous vehicles goals. Develop a criteria-driven automated vehicle wayside infrastructure investment plan.

9.41.j. Funding: Develop sustainable funding mechanisms to support connected and autonomous vehicle infrastructure and service investments, transportation system maintenance, and efficient system management;

9.41.k. Pricing: Ensure that autonomous vehicles and vehicles that connect to smart City infrastructure, and private data communications devices installed in the City right of way, help pay for infrastructure and service investments, and support system

reliability and efficiency. Develop a tiered pricing structure that reflects vehicle impacts on the transportation system, including factors such as congestion level, vehicle miles traveled, vehicle occupancy, and vehicle energy efficiency;

9.41.l. Pilot Projects: Carefully evaluate potential pros and cons of pilot projects; support testing connected and autonomous vehicles in limited initial applications to explore the best methods of advancing adopted goals, policies, and objectives;

9.41.m. Analysis: Evaluate the potential impacts of connected and autonomous vehicles on traffic and travel modeling, vehicle storage (parking) demand analysis and projects, right-of-way allocation, development, and parking and vehicle capacity project evaluation, management, funding, and other evolving issues;

9.41.n. Partnerships: Collaborate with federal, state, regional, local, and private sector partners. Advocate for state creation of a jurisdictional committee on automated safety technology with Portland representation, and state recognition of city oversight of autonomous vehicles on city streets.

9.41.o. Connectivity: Support federal requirements that all new passenger vehicles are equipped with dedicated short-range communications (DSRC) radios, which include a number of traffic safety technologies that are consistent with Portland's Vision Zero goals.

Glossary

Autonomous Vehicle - The U.S. Department of Transportation recommends defining autonomous vehicle technology levels using the SAE J3016 standard:

- Level 0 – No Automation: The full-time performance by the human driver of all aspects of the dynamic driving task, even when enhanced by warning or intervention systems
- Level 1 – Driver Assistance: The driving mode-specific execution by a driver assistance system of either steering or acceleration/deceleration using information about the driving environment and with the expectation that the human driver performs all remaining aspects of the dynamic driving task
- Level 2 – Partial Automation: The driving mode-specific execution by one or more driver assistance systems of both steering and acceleration/deceleration using information about the driving environment and with the expectation that the human driver performs all remaining aspects of the dynamic driving task
- Level 3 – Conditional Automation: The driving mode-specific performance by an Automated Driving System of all aspects of the dynamic driving task with the expectation that the human driver will respond appropriately to a request to intervene
- Level 4 – High Automation: The driving mode-specific performance by an Automated Driving System of all aspects of the dynamic driving task, even if a human

driver does not respond appropriately to a request to intervene

- Level 5 – Full Automation: The full-time performance by an Automated Driving System of all aspects of the dynamic driving task under all roadway and environmental conditions that can be managed by a human driver.

Connected Vehicle -A vehicle that communicates with the Internet, other vehicles, wayside systems and/or passengers.

Policy 9.6 Transportation strategy for people movement. Implement a prioritization of modes for people movement by making transportation system decisions according the following ordered list:

1. Walking
2. Bicycling
3. Transit
4. Fleets of electric, fully automated, multiple passenger vehicles
5. Other shared vehicles
6. No or low occupancy vehicles, fossil-fueled non-transit vehicles
- ~~7. Taxi/commercial transit/shared vehicles~~
- ~~8. Zero emission vehicles~~
- ~~9. Other single occupant vehicles~~