

Infrastructure & Systems Subcommittee

Cooperative Automated Transportation (CAT) Draft Policy Framework

Working Document

May 11, 2020

POST-WORKSHOP
REVISED STRATEGIES AND ACTIONS

Acronyms and Terms Referenced in Strategies & Actions:

Term	Definition
5G	Fifth generation technology standard for cellular networks
AAMVA	American Association of Motor Vehicle Administrators
AASHTO	American Association of State Highway Transportation Officials
ADA	Americans with Disabilities Act
ADAS	Advanced Driver-Assistance Systems
AV	Automated Vehicle
BAT	Business and Transit
CAT	Cooperative Automated Transportation
CCTV	Closed Circuit Television
CRCS	Connected Road Classification System
GHSA	Governors Highway Safety Association
GIS	Geographic Information System
HOT	High Occupancy Tolling
HOV	High Occupancy Vehicles
ISO	International Organization for Standardization
IT	Information Technology
MaaS	Mobility-as-a-Service
MOD	Mobility on Demand
MPO	Municipal Planning Organization
MUTCD	Manual on Uniform Traffic Control Devices
NCHRP	National Cooperative Highway Research Program
OEM	Original Equipment Manufacturer
PRA	Public Records Act
RCW	Revised Code of Washington
RPO	Regional Planning Organization
SAE	Society of Automotive Engineers
SEPA	State Environmental Policy Act
TNC	Transportation Network Company
V2X	Vehicle-to-Everything
VMT	Vehicle Miles Traveled
WAC	Washington Administrative Code

1. Organize for Innovation

Enable organizational change that empowers officials to be flexible, accelerate decision-making, and adapt to changing technology.

Strategy Number	Strategy	Action	Legislative Goals Addressed*
	tion System Policy Goals RCW <u>47.04.280(†</u> C Vitality, 2) Preservation, 3) Safety, 4) Mol		
01	Share knowledge with external partners.	1-A) Maintain active participation in the American Association of State Highway Transportation Officials (AASHTO) CAT Coalition, which is a national network to address critical program and technical issues associated with the nationwide deployment of connected and automated vehicles on streets and highways. Encourage sharing of materials and updates at regular intervals through online or in-person forum(s).	Economic Vitality, Safety, Stewardship
		1-B) Maintain active participation in the Governors Highway Safety Association (GHSA) and the Association of American Motor Vehicle Administrators (AAMVA), who have autonomous vehicle working groups and are striving to develop standards for issues related to AVs. Encourage sharing of materials and updates at regular intervals through online or inperson forum(s).	
		1-C) Join the 5G Automotive Association to monitor industry activity. Encourage sharing of materials and updates at regular intervals through online or in person forum(s).	
		1-D) Identify a list of national organizations, workgroups, committees, etc. to intentionally partner with and engage in a continued meaningful way with a list of public and private organizations that should consider engaging in each opportunity. Encourage sharing of materials and updates at regular intervals through online or in-person forum(s).	
02	Adopt an organizational structure that can meet the needs of the next ten years.	2-A) Establish employee positions dedicated to innovation with authority over dedicated operating and capital funds and flexibility to engage partnerships.	Stewardship
		2-B) Provide access to training that prepares agency staff to plan, program, manage, maintain, and operate new systems and infrastructure.	

Strategy Number	Strategy	Action	Legislative Goals Addressed*
		2-C) Delineate the responsibilities between federal, state, MPO and local agencies. Identify the responsible party for implementing the policy.	
		2-D) Identify a list of core technical competency skillsets that will be needed for planning, managing, and operating the future transportation system, and identify existing training opportunities and gaps to address those needs.	
		2-E) Identify organizational areas (such as asset management or information technology) that will be impacted and need to adapt within a CAT future.	
03	Restructure agency budgets to most effectively encourage innovative culture and adaptation to changing technology.	3-A) Identify and prioritize safety related transportation expenditures and initiatives that embrace CAT technologies to reduce societal costs of crashes.	Safety, Stewardship
04	Use agency performance measures to prioritize technology investments.	4-A) Create a framework to screen technology investments based on how they contribute to agency performance measures.	Stewardship
		4-B) Create a discretionary fund to procure technologies that meet the performance measure criteria.	
05	Develop and maintain CAT data security, privacy, and governance policies and standards.	5-A) Identify open data needs from the private and public sector and create a plan to address the gaps. 5-B) Identify and collect CAT data from private and	Stewardship
		public sector on data.wa.gov. 5-C) Identify data stewardship principles for data collected, stored, processed, or disseminated for CAT-related initiatives, programs, or sources.	
		5-D) Update/develop data standards, specifications, and policies that support connected infrastructure. This includes clarifications on who owns what data, who can access it, what it is used for, etc. Policies should enable public-private data sharing that protects trade secrets and individual privacy.	
		5-E) Implement robust administrative, technical, and physical security protocols for all public infrastructure.	
		5-F) Evaluate, plan, and provide guidance for the IT security needs and threat response plans for transportation and local agencies.	
		5-G) Dedicate IT or IT positions to cybersecurity.	
		5-H) Conduct a workshop with a comprehensive list of public and private subject matter experts to identify	

Strategy Number	Strategy	Action	Legislative Goals Addressed*
		near-term steps to address existing cybersecurity gaps for CAT-related transportation systems and services. 5-I) Produce a strategy document with recommendations for the state on shared mobility data Standards, storage, and management. This document would involve a diverse group of stakeholders from the public and private sectors in evaluating existing data standards (including the Mobility Data Specifications (MDS)), researching data management best practices, and working towards forming strong data sharing partnerships.	

2. Shared Mobility

Encourage and incentivize shared mobility, including an emphasis on high occupancy and shared modes for moving people and goods.

Strategy Number	Strategy	Action	Legislative Goals Addressed*
	ation System Policy Goals RCW <u>47.04.280(1</u> c Vitality, 2) Preservation, 3) Safety, 4) Mob		
01	Increase the proportion of homes that are within 10 minutes (walk or shared ride) of a transit service with peak hour headway of 15 minutes or less.	 1-A) Work with local transit agencies or providers and residents to identify areas where transit use is suboptimal. 1-B) Encourage transit agencies or providers to work with private partners to increase transit access. 1-C) Explore opportunities for automated shuttles to feed transit stations. 1-D) Support partnerships with ride-hailing companies that demonstrate an increase in transit or other high occupancy mode ridership. 1-E) Pilot the remote and/or autonomous repositioning of electric scooters or e-bikes to improve connections to transit. 1-F) Identify a list of existing planning tools for assessing the connection between modal options and housing. 	Economic Vitality, Mobility, Environment, Stewardship
02	Adapt and reuse public infrastructure as mobility needs evolve.	 2-A) Analyze the historical and projected usage of existing Park and Ride lots and identify underutilization issues and potential barriers to other uses, such as shared mobility hubs. 2-B) Develop a plan for transitioning consistently underutilized Park and Ride lots to other uses such as shared mobility hubs. 2-C) Provide guidance to local agencies and professionals on how to evaluate the reutilization of road space to support the use of emerging modes, such as through Road Diets or Complete Streets. 2-D) Evaluate the transit grid to work toward better access and connections in the system, and to strengthen it where it is the weakest. 2-E) Provide resources and technical assistance to local jurisdictions to implement Business Access and Transit (BAT) lanes in designated corridors. 	Economic Vitality, Preservation, Mobility, Environment, Stewardship

Strategy Number	Strategy	Action	Legislative Goals Addressed*
03	Explore methods to resource and support shared mobility initiatives. Initiatives should cover a number of use cases and communities, not only urban.	 3-A) Develop a list of methods to incentivize shared mobility. The list should include: How the method incentivizes shared mobility (e.g. use case) Supported area(s) (e.g. city, county, region) Potential public or private partners needed to implement and support the initiative Implementation timeline Estimated implementation and operations costs Potential funding sources (e.g. Grants) to support implementation and/or operations 3-B) Identify, evaluate, and communicate the list of GIS-based tools that can conduct a macro level planning analysis using publicly accessible data (e.g. Sugar Access, Census Track and Streetlight Data) to identify opportunities to increase access to and usage of shared mobility options. 3-C) Explore opportunities to expand vanpool services, including the electrification and/or automation of vanpools. 3-D) Develop vehicle occupancy detection systems to measure efficiency of all vehicles, including freight, in managed lanes. 	Mobility, Environment, Stewardship
04	Embrace mode-neutral capacity measures.	 4-A) Define "shared mobility" quantitatively in terms of moving people and goods. Establish mode-neutral capacity measures that calculate capacity for all modes, including active modes and transit. 4-B) Identify under-utilized facilities that can increase person-throughput, such as with managed lanes and road diets. 	Mobility, Environment, Stewardship
05	Encourage high adoption of shared mobility by enhancing the commuter experience and reducing costs from shared, automation, and electrification.	5-A) Measure commuter experience metrics to identify areas for enhancement. Metrics include, but are not limited to, time to destination and number of changeovers/hops to destination.	Economic Vitality, Mobility, Environment, Stewardship

3. Economic Vitality and Livability

Create resilient and efficient regional networks and empower local agencies to create resilient, multimodal local networks.

Strategy Number	Strategy	Action	Legislative Goals Addressed*
	tion System Policy Goals RCW <u>47.04.280()</u> Vitality, 2) Preservation, 3) Safety, 4) Mob		
01	Incorporate emerging modes in transportation planning.	1-A) Provide resources and technical assistance to cities and counties to adopt appropriate mobility data standards (such as the Mobility Data Specification) into their ordinances and/or contracts that manage private mobility providers using the public right-of-way. 1-B) Provide resources and technical assistance to	Economic Vitality, Mobility, Environment, Stewardship
		RPOs and MPOs to include emerging MaaS and MOD modes into regional travel demand models.	
		1-C) Develop a public-private partnership to support and resource a research project that examines how the Public Records Act (PRA) may be updated to:	
		 Protect trade secrets for private mobility providers Protect personally identifiable information for users Allow for data sharing between public and private entities that advances mobility, safety, equity, and other public interest outcomes; involving a diverse set of stakeholder and partners. 	
		1-D) Evaluate and assess the experience of cities and counties that have adopted mobility data standards (such as the Mobility Data Specification) into their ordinances and/or contracts that manage private mobility providers using the public right-of-way.	
02	Use public/private partnerships.	2-A) Partner with telecom companies to expand the availability of high-speed internet in rural corridors. 2-B) Research ways to partner with telecom companies to install fiber and wireless communications infrastructure within public rights of way.	Economic Vitality, Stewardship
		2-C) Support local jurisdictions to pilot MaaS and MOD strategies.	

Strategy Number	Strategy	Action	Legislative Goals Addressed*
		2-D) Partner with MaaS providers to conduct demonstration projects that illustrate how to address specific mobility needs with MaaS.	
		2-E) Partner with other agencies and private companies to ensure dark fiber is included in as much of the infrastructure as possible.	
03	Increase the person-throughput on commuter routes.	 3-A) Provide resources and technical assistance to local jurisdictions to implement transit signal prioritization in designated corridors. 3-B) Provide resources and technical assistance to local jurisdictions to implement managed lanes (e.g. BAT or HOT) in designated corridors. 	Economic Vitality, Mobility, Stewardship, Environment
04	Provide transportation funding resources for CAT initiatives.	 4-A) Assess alternatives to the state gas tax for sustainable state transportation funding. 4-B) Evaluate potential local, state, regional, and federal grant funding and resources for CAT initiatives, demonstrations, and deployments. 	Economic Vitality, Stewardship
05	Encourage coordination and communication between cities and agencies for efficient regional mobility.	5-A) Explore the inter-agency relationships which may impact and influence potential mobility policies, programs, and efforts.	Economic Vitality, Mobility
06	Coordinate with freight and local services.	6-A) Identify methods for local entities to coordinate with public agencies, and private industries to identify needs for technology strategies to support the movement of goods and services.	Economic Vitality, Mobility

4. Infrastructure and Context Sensitive Street Design

Promote durable, physical and digital networks that accommodate the movement of people and goods in ways that are appropriate for the context.

Strategy Number	Strategy	Action	Legislative Goals Addressed*
	ntion System Policy Goals RCW <u>47.04.280()</u> c Vitality, 2) Preservation, 3) Safety, 4) Mol		
		1-A) Evaluate the performance of existing recessed striping in areas with frequent snowplow activity in relation to current and near-term connected vehicle and infrastructure technologies. 1-B) Evaluate and adopt standards for machine readable signing and striping. Standards may be adopted from Manual on Uniform Traffic Control Devices (MUTCD), other industry standards, or through development of standards specific to the state. 1-C) Prioritize roadway investments that leverage or support existing or near future connected or automated technologies, based on the benefit verses cost for the implementation and maintenance, taking facility lifecycle into consideration. 1-D) Partner with telecom companies to advance standards for communications infrastructure that support CAT, e.g. 5G. 1-E) Classify roadways and corridors to identify areas for improvement to support connected and automated technologies. Classification should include levels of classification (e.g. needs upgrade, meets, or exceeds needs for connectivity and automation). Use the NCHRP 20-24(112) Connected Road Classification System (CRCS) Framework to support this initiative. 1-F) Prioritize corridors and/or roadway types for implementation of CAT technologies, based on results of Connected Road Classification System initiative (action 03-01-E). Prioritization should take facility function and service life into consideration. 1-G) Create a plan to improve roadway pavement markings in a manner consistent with current and developing ADAS technology performance, and in	Preservation, Safety, Stewardship
		compliance with MUTCD. 1-H) Assess infrastructure elements (such as signing, striping, and potential need for roadside	

Strategy Number	Strategy	Action	Legislative Goals Addressed*
		communication equipment) to identify areas for improvement or replacement to enable and support the operation of automated and connected technologies and solutions. Assessment should include the current state of the element (e.g. good, fair, poor) and maintenance and upgrade cycles.	
02	Preserve and utilize the 5.9 GHz wireless communication spectrum for public safety applications.	 2-A) Identify vehicle to everything (V2X) data sharing uses case implementations. 2-B) Evaluate both cloud and roadside infrastructure-based V2X implementations in a technology neutral manner. 2-C) Plan for a multi-agency connected vehicle data platform to collect and share connected vehicle information from infrastructure, moving vehicles, multimodal and third parties so multiple users (OEMs, private sector, and public sector) can access and turn the data into useful information. Platform should only include data feeds appropriate for sharing with the public. 2-D) Assess how V2X technologies equitably account 	Safety, Mobility, Stewardship
		for the needs of all modes (e.g. Start with Signalized Intersections and then identify other use cases such as mid block crossings, bike lanes, etc.)	
03	Ensure existing statutes do not restrict infrastructure readiness.	3-A) Audit current laws (Revised Code of Washington (RCW) and rules (Washington Administrative Code (WAC) to identify outdated, contradictory, or restrictive policy prescriptions.	Stewardship
04	Advance curb space management practices to support emerging modes.	 4-A) Participate as a panel member of the ISO standards development effort (e.g. ISO/PWI TR 4448) for use of curb space. 4-B) Work with partners, including local government, to develop clear curb management regulations that compliment connected vehicles and infrastructure. 	Preservation, Mobility
05	Use resiliency as a performance measure to prioritize projects.	5-A) Define safety and operational resiliency quantitatively. Leverage data and analytical tools to identify resilience gaps and use it as a project prioritization tool. 5-B) Leverage data and analytical tools as new construction projects are being considered to determine how they mitigate safety and operational resiliency issues.	Preservation

5. Land Use

Encourage land use development patterns that support multimodal connectivity to efficient local and regional networks.

Strategy Number	Strategy	Action	Legislative Goals Addressed*		
•	*Transportation System Policy Goals RCW <u>47.04.280(1)</u> : 1) Economic Vitality, 2) Preservation, 3) Safety, 4) Mobility, 5) Environment, 6) Stewardship				
01	Promote smart growth.	 1-A) Provide resources and technical assistance to local jurisdictions to incorporate shared mobility and transit-oriented development principles into their comprehensive plans and zoning ordinances. 1-B) Provide resources and technical assistance to cities and counties that encourage innovative parking management policies, such as reducing or eliminating parking requirements, that support desired, equitable mode shift. 1-C) Conduct land use scenario modeling to identify and evaluate the impacts connectivity, automated, shared mobility, and electrification have on smart land use development. 	Economic Vitality, Preservation, Mobility, Environment, Stewardship		

6. Equity

Work with marginalized communities to increase access to desirable mobility options.

Strategy Number	Strategy	Action	Legislative Goals Addressed*
	ntion System Policy Goals RCW <u>47.04.280(1</u> c Vitality, 2) Preservation, 3) Safety, 4) Mob		
01	Expand the number of marginalized communities involved in drafting CAT policies.	1-A) Create an Equity subcommittee of the Autonomous Vehicles Work Group.	Economic Vitality, Safety, Mobility
02	Serve diverse populations.	2-A) Establish performance measures for ADA accessibility for private mobility providers. 2-B) Evaluate private mobility provider solutions, including but not limited to transportation network companies (TNCs), as a method of supplementing Fixed Route Transit and either replacing or supplementing Dial-a-Ride services. 2-C) Ensure connected automated transportation works for vulnerable populations outside of urban areas. 2-D) Seek out and support solutions that enable the development of connected automated transportation solutions for human services transportation. 2-E) Define accessibility criteria for connected and automated transportation solutions (including but not limited to TNCs, micromobility, supplemental transit services, etc.). Accessibility criteria shall be developed in coordination with the Washington AV Work Group Health & Equity Subcommittees and its diverse membership to identify accessibility criteria for marginalized, disabled, disadvantaged, and underserved populations. 2-F) Establish a path forward to apply accessibility criteria to pilot and deployment projects and performance measures for publicly funded CAT initiatives.	Safety, Mobility
		2-G) Develop training and guidance for Transportation Network Companies (TNCs) to enable their services to comply with Americans with Disabilities Act (ADA).	

Strategy Number	Strategy	Action	Legislative Goals Addressed*
03	Meet the mobility needs of vulnerable populations.	3-A) Consult with marginalized communities on their mobility needs.	Safety, Mobility
		3-B) Prioritize and provide resources for marginalized communities' mobility needs.	
		3-C) Implement an AV shuttle pilot in an urban corridor that is targeted to serve vulnerable populations.	
		3-D) Provide resources and technical assistance to transit agencies and local governments to make desirable mobility options available to historically underserved populations. Set up measurement benchmarks to quantify the progress in providing accessibility to alternative options.	
		3-E) Identify and address barriers to using active modes, such as bike shop deserts or lack of basic mechanics and maintenance knowledge.	
		3-F Identify and address barriers to shared mobility mode use such as inadequate lighting, long headways, and other issues that make users (especially women) fear for their safety. (Example: Strategies like CCTVs are preferred by transit users.)	
04	Incorporate community health into project prioritization criteria.	4-A) Identify best practices criteria, implementation approaches and potential barriers to incorporating a health impact assessment into the SEPA process. 4-B) Identify urban and rural projects to pilot the health impact assessment. (e.g. If Federal Transit Administration Integration Mobility Innovation grant funding is secured, evaluated the SAE Level 4 AV Shuttle project in Lakewood WA with Pierce Transit).	Economic Vitality, Safety, Environment

7. Safety

Increase the safety of transportation systems and infrastructure to support the safe movement of people and goods.

Strategy Number	Strategy	Action	Legislative Goals Addressed*		
*Transportation System Policy Goals RCW <u>47.04.280(1)</u> : 1) Economic Vitality, 2) Preservation, 3) Safety, 4) Mobility, 5) Environment, 6) Stewardship					
01	Explore the use of automated enforcement to supplement and/or enhance traditional enforcement methods.	1-A) Identify a list of potential use cases with supporting implementation criteria for all areas that are candidates for automated enforcement. At a minimum, evaluate speed, red-light cameras, congestion management, tolling, and occupancy enforcement. Considerations should be given to where traditional enforcement methods are unfeasible (e.g. no shoulders) or where crash rates remain high.	Safety, Mobility, Stewardship		
02	Promote solutions that have the potential to reduce fatal and serious injury crashes.	 2-A) Support the development of safety standards for connected and automated technologies that ensure people who drive, ride, walk, bike, and roll can safely travel in the right of way, through participation in national committees and standards development initiatives. 2-B) Evaluate knowledge competency requirements and education needs for ADAS-equipped vehicles, 	Economic Vitality, Safety, Mobility, Stewardship		
		and the potential impact on current driver training, testing, and licensing regulations and rulemaking. 2-C) Develop a plan to implement the Cooperative Automated Transportation strategies identified in the 2019 Target Zero Plan/WA State Strategic Highway Safety Plan. For each strategy listed, Implementation Plan should include: • Lead entity/agency • Resources needed to implement • Anticipated implementation timeline			
03	Use gathered CAT data and Data- Driven Safety Analysis for decision- making.	3-A) Identify systematic changes to the roadway infrastructure systems and services that reduce crashes with Advanced Driver-Assistance Systems (ADAS).3-B) Test new methods for safety analysis (i.e. video	Safety, Mobility, Stewardship		
		near-miss safety-analytics, using third party moving vehicle data with hard braking/hard acceleration,			

Strategy Number	Strategy	Action	Legislative Goals Addressed*
		etc.) to understand hot spots and corridor safety needs. 3-C) Develop data gathering and integration methods in order to measure the safety impact of ADAS and automated vehicles on reducing fatalities and serious injuries.	
04	Develop systems which can provide the most positive impact to safety within transit/mobility.	 4-A) Identify and detail specific safety systems for focus. 4-B) Support the piloting and deployment of machine readable signs to initiate AV notifications, warnings, or vehicle controls (i.e. no markings, weight restrictions, surface changes, etc.). 	Safety, Mobility
05	Embrace emerging and evolving transportation technologies to support a culture of safety.	5-A) Educate the public on the benefits and safety limitations of Advanced Driver-Assistance Systems (ADAS) that may affect safe driving behaviors. 5-B) Educate the public on how and where level 3, 4, and 5 AVs will be deployed, how they operate, and what to expect from AVs, through coordination with public agencies, consumer associations, insurance companies, vehicle dealers, etc.	Safety
06	Create a regulatory environment that supports the safe testing and deployment of connected, advanced, and automated vehicles and related technologies.	6-A) Audit current laws (Revised Code of Washington; RCW) and rules (Washington Administrative Code; WAC) to identify outdated, contradictory, or restrictive policy prescriptions. 6-B) Establish a uniform minimal level of safety assessment for the testing of automated vehicles SAE Levels 3, 4 and 5 that is consistent with other states and federal regulation in a manner that avoids a patchwork of regulation.	Safety, Stewardship

8. Environment

Reduce the local and cumulative environmental impacts of mobility to improve air and water quality, energy conservation and mitigate climate change.

Strategy Number	Strategy	Action	Legislative Goals Addressed*		
*Transportation System Policy Goals RCW <u>47.04.280(1)</u> : 1) Economic Vitality, 2) Preservation, 3) Safety, 4) Mobility, 5) Environment, 6) Stewardship					
01	Make it easier for individuals to plan and execute multimodal trips.	1-A) Provide resources and technical assistance to cities, counties, RPOs, MPOs, and transit agencies to integrate their services (e.g. transit, parking, MaaS providers) into a mechanism, such as a smartphone app, that integrates planning, scheduling, and paying for trips of different modes.	Economic Vitality, Mobility, Environment, Stewardship		
02	Explore how CAT technologies can support Washington State Governor's decarbonization goals and initiatives.	 2-A) Develop a plan to identify integration points and opportunities to support decarbonization goals and initiatives. Plan should include: List of decarbonization goals and related initiatives How varied CAT technologies and tools can impact each goal/initiative Lead agencies/entities to support integration of CAT technology/tool Suggested implementation plans and timelines 2-B) Identify methods, tools, and techniques to measure VMT of internal combustion engine vehicles and electric vehicles separately. 2-C) Evaluate the potential to reduce greenhouse gas emissions by piloting fully electric AVs as a complement to transit and active transportation. 2-D) Pilot ways of measuring greenhouse gas emissions using moving vehicle data (i.e. connected vehicle) to improve accuracy of data for transportation planning & analysis projects. 	Economic Vitality, Environment, Stewardship		
03	Expand the use of technologies proven to reduce emissions.	 3-A) Provide resources and technical assistance to local jurisdictions to implement truck signal prioritization in designated corridors. 3-B) Consider the impact to all system users through a comprehensive health impact assessment as part of the SEPA process applied to transportation projects with CAT technology elements. 	Economic Vitality, Mobility, Environment		