Infrastructure Owner Operators Guiding Principles for Connected Infrastructure supporting Cooperative Automated Transportation

**Lead partners: Institute of Transportation Engineers (ITE),
Intelligent Transportation Society of America (ITS America), and
American Association of State Highway Transportation Officials (AASHTO)**

**Lead Technical Resource:
AASHTO Committee on Transportation System Operations (CTSO) Working Group**

Definitions: Cooperative Automated Transportation (CAT) enables all modes of transportation to work together to improve safety, mobility, and operations efficiency through interdependent vehicle and systems automation and information exchange. CAT includes all modes (automobile, truck, plane, van, bus, rail, ferry, bicycle, scooter, pedestrian, etc.), systems (vehicles, infrastructure, information, communications, etc.), and applications (traffic management, fare collection, mobility services, trip planning, etc.). IOOs will play a fundamental role in advancing, operating and maintaining the physical and digital infrastructure and mobility services.

Connected and Automated Vehicles (CAVs) are manufactured vehicles of all classes (passenger vehicles, trucks, buses, motorcycles, scooters, etc.) and levels of automation operated and connected within a CAT environment. CAVs can be used in a CAT environment for purposes including but not limited to personal transportation, freight, transit, passenger transportation, and mobility services.

Purpose: The purpose of Infrastructure Owner Operators (IOO) Guiding Principles for Connected Infrastructure supporting Cooperative Automated Transportation (CAT) is to establish criteria for IOOs to advance connected infrastructure, data, management and operations supporting CAT solutions. Through collaboration with the AASHTO, ITE, and ITS America, these principles will encourage interoperability and consistency in CAT deployments and enable IOOs to consolidate and communicate their intentions and the value this represents in effectively managing mobility and safely operating our Transportation System.

Principles:

1. **Automation: Support increased vehicle automation to improve traveler safety, mobility, equity, and efficiency.**

   1A. Collaborate with OEMs and mobility service providers to establish national CAT frameworks (e.g. the effort currently referred to as the National Strategy for Highway Automation and others).

   1B. Support the development and implementation of regulations, training, and education efforts that are critical to support CAT.

1C. Plan and execute infrastructure, operations, and mobility readiness strategies supporting higher levels of vehicle connectivity and automation.

1D. Deploy or accommodate communications infrastructure to provide V2I data exchanges supporting all levels of vehicle automation.

1E. Collaborate with OEMs to develop an awareness of available applications to better understand priority locations where early implementations of V2I roadside infrastructure will have the most impacts

2. **Data: Achieve a connected vehicle ecosystem that enables reliable, secure V2I data exchanges in order to support cooperative automated transportation.**

    2A. Provide OEMs and mobility service providers with planned connected infrastructure deployments supporting on-board V2I applications.

    2B. Coordinate with OEMs, mobility service providers, and SDOs to come to a consensus on and interpretation of standards for V2I communications and data exchanges.

    2C. Coordinate with OEMs and mobility service providers to establish a nationwide approach for securing data exchanges between vehicles and the infrastructure.

    2D. Utilize all existing and future V2I standards in order to achieve two-way data exchanges between connected infrastructure and production OEM vehicles.

    2E. Work together to develop and communicate a national roadmap for deployment of a secure and standards-compliant connected infrastructure.

    2F. Work together with OEMs and mobility service providers to ensure seamless operations, mindful of the appropriate mobility strategies, based on two-way data exchange.

3. **Telecommunications: Protect and utilize the 5.9 Gigahertz (GHz) spectrum designated for "*operations related to the improvement of traffic flow, traffic safety and other intelligent transportation service applications*" (FCC)**

    3A. Continue to use Dedicated Short-Range Communications (DSRC) as they deploy connected infrastructure systems.

    3B. Encourage the introduction, rigorous testing, and evaluation of new 5.9 GHz communications technologies that support interoperability and that comply with performance standards.

    3C. Work with new 5.9 GHz technologies within the established FCC technical and service rules.

    3D. Continue coordination with OEMs to support long-term investment decisions regarding the deployment of communications technologies utilizing the 5.9 GHz spectrum.

    3E. Encourage technologies that enable seamless operations for vehicles traveling across state and North American borders.

4. **Operations: Develop CAT strategies that enhance existing transportation system operational capabilities.**

    4A.   Identify operational capabilities that can be leveraged to improve the effectiveness and/or cost effectiveness of existing and future operational investments.

    4B.   Adopt the outcomes of national efforts to develop new strategic operational deployment initiatives that utilize emerging connected, automated vehicle technologies, and mobility services.

    4C.   Identify any regulatory barriers to enable the safe deployment of new capabilities as a result of emerging technologies and mobility service models.

    4D.   Embrace CAT strategy interoperability and uniformity.

5. **Collaborations: Collaborate and communicate with OEMs and mobility service providers in the planning, testing, and demonstrations of CAT applications to support eventual interoperability and to achieve positive impacts on safety, mobility, and efficiency.**

    5A.   Encourage OEMs and mobility service providers to interact with established IOO associations' existing and evolving committees and working group structures when pursuing feedback and/or involvement regarding applications intended for positive impacts to the infrastructure system.

    5B.   Support activities within IOO associations' committees and working groups to collaborate on creating non-competitive input to OEMs and mobility service providers on CAT related topics.

    5C.   Be open to individual IOOs (or groups of IOOs) collaborating competitively with one or more OEMs in situations where innovation, exploration of products, or funding opportunities benefit from such collaboration.

    5D.   IOOs participating in competitive collaboration with OEMs shall seek to share outcomes of the activities, as allowed by their agreements, to encourage and support a collaborative CAT environment.