Incorporating Technology into *Complete Streets*

Complete Streets is a concept in urban planning created two decades ago which prioritizes the safety and accessibility of all users, including pedestrians, cyclists, public transportation users, and vehicles. The vision behind *Complete Streets* is to create an equitable and sustainable transportation system that promotes active transportation and enhances the quality of life for all members of the community. **Given the importance and applicability to road user safety, technology must be included and prioritized in *Complete Streets* projects. In 2024, it is time we modernize the *Complete Streets* concept to include technology as an integral part of the safety layer.**

The Infrastructure Investment and Jobs Act (IIJA), Section 11206, defines *Complete Streets* standards or policies as those which "ensure the safe and adequate accommodation of all users of the transportation system, including pedestrians, bicyclists, public transportation users, children, older individuals, individuals with disabilities, motorists, and freight vehicles."

The following are eligible elements of a *Complete Streets*-qualifying transportation plan:

(A) to create a network of active transportation facilities, including sidewalks, bikeways, or pedestrian and bicycle trails, to connect neighborhoods with destinations such as workplaces, schools, residences, businesses, recreation areas, healthcare and child care services, or other community activity centers;

(B) to integrate active transportation facilities with public transportation service or improve access to public transportation;

(C) to create multiuse active transportation infrastructure facilities, including bikeways or pedestrian and bicycle trails, that make connections within or between communities;

(D) to increase public transportation ridership; and

(E) to improve the safety of bicyclists and pedestrians

As we know, technology plays a crucial role in achieving the vision of *Complete Streets* and should be specifically called out under eligible activities, particularly to improve the safety and bicyclists and pedestrians and increase public transit ridership. Smart traffic management systems, for instance, utilize real-time data and sensors to monitor traffic flow and adjust signal timings accordingly. This reduces congestion, enhances traffic efficiency, and improves safety by minimizing interactions between vehicles and vulnerable road users. Moreover, digital tools and mapping applications allow for the integration of accurate and up-to-date information on pedestrian and cyclist infrastructure, enabling users to plan their routes with confidence.

In addition, technology supports the implementation of multimodal transportation options. Mobile applications provide users with real-time information on public transportation schedules, bike-sharing stations, and walking routes, promoting the use of alternative modes of transportation. Ride-sharing platforms encourage carpooling, reducing the number of single-occupancy vehicles on the road and freeing up space for pedestrians and cyclists

Furthermore, emerging technologies such as automated vehicles (AVs) hold immense potential in creating safer and more efficient complete streets. With their ability to communicate with each other and infrastructure, AVs can maximize traffic flow, reduce congestion, and enhance safety by eliminating or minimizing human errors.

The concept of *Complete Streets* is centered around prioritizing the safety and accessibility of all road users. Technology plays a pivotal role in realizing this vision by integrating real-time data, digital tools, and emerging technologies, ultimately creating a transportation system that is more efficient, equitable, and sustains the well-being of all community members.

Recommended Amendments to *Complete Streets*

☐ **Integration of smart/digital infrastructure:** *Complete Streets* should consider the incorporation of smart/digital infrastructure elements such as sensors, connected vehicles, leading pedestrian intervals, and intelligent traffic management systems. This could involve provisions for the installation and maintenance of these technologies in street design guidelines. This would help improve safety for vulnerable road users by making them more visible to vehicles, providing them ample time to cross intersections, and by collecting data on pedestrian and cyclist safety hotspots.

☐ **Access to charging stations and electric vehicle (EV) infrastructure:** As EV adoption grows, *Complete Streets* should include provisions for the installation and availability of charging stations along road networks. This would accommodate the growing demand and encourage the adoption of EVs with the intent of reducing range anxiety and promoting ease of ownership. Technologies related to charging infrastructure will give consumers information on where and what types of chargers are available as well as estimated station wait times.

☐ **Consideration of shared mobility options:** With the rise of shared mobility services such as ride-hailing, car-sharing, and bike-sharing, *Complete Streets* should dynamically manage infrastructure and curb space in real-time with technological tools. This might include dedicated pick-up and drop-off zones, digital curb management, designated parking spots for shared vehicles, or bike-sharing stations.

☐ **Data-driven decision-making:** *Complete Streets* should emphasize the use of data in transportation planning and design. This would involve incorporating tools, including artificial intelligence (AI) solutions, for data collection, analysis, and monitoring to inform future improvements and adaptations to street design based on real-time information. AI-powered decision support tools for state, local, and tribal transportation agencies can help assist in the siting and deployment of *Complete Streets*.

☐ **Emphasizing multimodal connectivity:** *Complete Streets* should emphasize the seamless integration of all transportation modes, including walking, cycling, public transit, and emerging forms of micro-mobility. Amendments could include guidelines for infrastructure design that prioritize pedestrian safety, bicycle lanes, transit stops, and seamless connections between different modes of transportation.