Recommendation 6: The federal government should promote the development and adoption of policies, procedures and funding methods that can accelerate the adoption of smart, connected, and electrified transportation technologies. Many of these technologies incorporate the use of IoT.

Description:

The federal government should promote the development and adoption of policies, procedures and funding methods that can accelerate the adoption of connected and electrified transportation technologies. Many of these transportation technologies incorporate the use of IoT. Federal funding can also serve to increase private sector investment.

Justification:

Greater adoption of smart, connected, and electrified transportation technologies could help in the following examples:

- Incorporation of technologies enabled by IoT: Opportunities for IoT technologies in smart, connected transportation include sensors, cameras, and edge computing devices that can improve safety in things such as vulnerable road users (i.e., pedestrians at crosswalks), traffic intersections, school and work zones. Opportunities for IoT technologies in electrified transportation include in car systems or mobile apps that can locate charging stations, as well sensors that manage charging stations to gather data about usage and performance, to anticipate maintenance needs, and troubleshoot problems.

- Improving overall traffic safety: Vehicles that have technologies such as Cellular Vehicle to Everything (C-V2X) can communicate basic safety messages and information to corresponding infrastructure and other road users thereby reducing traffic and pedestrian fatalities.

- Reduction in greenhouse gas emissions: The transportation sector generates the largest share of greenhouse gas emissions a big contributor to climate change. Electrification of transportation away from traditional fossil fuels are a viable option for transportation. Also smart, connected transportation can improve traffic flow and reduce congestion which is also better for the environment.

Implementation considerations:

- With the Bipartisan Infrastructure Law (BIL) and the Inflation Reduction Act (IRA) the Federal Government is already taking steps to electrify the transportation sector. Funds are being directed to the states to deploy electric vehicle charging stations via the NEVI Formula Program (https://afdc.energy.gov/laws/12744). Under the IRA tax credits are available for

EVs that are primarily assembled in North America. Its important that this legislation stays in effect throughout its designated time period.

- While the BIL and the IRA are significant pieces of legislation, additional legislation is probably needed to focus on rural communities.

- The Federal Government could set aside easily and readily tappable funding pools year-round for innovation and next-generation technologies. Grants could be set aside for categories that the government deems high importance.

- The Federal Government can leverage innovative procurement technologies like outcomes-based contracting.

Potential implementation barriers:

- Time and Cost: The time and cost for this transformation could be considerable. Its important that these initial investments are focused and targeted.

- Education: There is an overarching need to educate local governments and consumers on these new types of technologies (particularly those related to Electric Vehicles) which could be hard and time consuming.

- Supply Chain: The manufacturing industry recognizes the goal from the Administration of Buy America, Build America (BABA) however, there are current constraints meeting domestic content requirements and there needs to be an appropriate ramp-up, phase in period to get to full production. There is also a lack of consistent Buy America, Build America across federal and state government agencies.

- The Electric Grid: States with the most EVs today are already struggling to accommodate large scale charging loads on congested grids, and these constraints will only become a bigger problem as the number of EVs grow. Charging for heavy-duty EVs like trucks and busses is even more challenging to accommodate on the distribution grid since they require far more power in concentrated locations.

Possible participating agencies

- DOE/DOT Joint Office, DOT, DOE,