TASK FORCE MEETING

Objectives:
1) Understand the future of electric vehicle (EV) expansion in Texas, including future technologies like inductive charging corridors.
2) Recognize the emerging role that hydrogen fuel cell vehicles can play in the growing alternative fuel sector, and what planning and infrastructure is necessary for further expansion.
3) Prioritize white paper topics for future research.

Key Takeaways:
- Hydrogen fuel cell vehicles could reach cost parity with battery electric vehicles (BEVs) as soon as 2025.
- Texas is particularly well suited for use of hydrogen fuel cell vehicles given the large availability of hydrogen within the state.
- The Bipartisan Infrastructure Law (BIL) allocates $407.8 million in Texas over a five-year period for the deployment and comprehensive expansion of EV infrastructure.
- While expansion of fast charging capabilities is often prioritized, Texas should also consider investing in Level 1 in-home charging which is sufficient for a customer’s daily commute.
- The public adoption rate of EVs continues to surpass sales expectations, a figure that is likely to accelerate via expansion of EV market into light-duty trucks.
- One method to promote equitable expansion of EV infrastructure is to prioritize federal funding based on transportation cost burden analysis and focus on highly burdened communities.
- For the 2022 round of white papers, Task Force members focused attention on energy and sustainability, followed by topics of freight, broadband, and active transportation.

12:30 PM | Call-in Period to Do Sound and Technology Check

1:00 PM | Introductions & Updates – Darran Anderson, TxDOT, and UT Austin Research Team
- Yvette Flores, of TxDOT, kicked off the meeting by welcoming participants.
- Kristie Chin, of the University of Texas at Austin (UT Austin), provided a high-level overview of the upcoming meeting.
- Darran Anderson, of TxDOT, welcomed guests and offered opening remarks including updates on mobility efforts around Texas in freight, urban air mobility, and funding allocation of the BIL.
- Kristie Chin and Mark Werner, of UT Austin, reiterated the mission of the Task Force and provided an update on the Emerging Technology Portfolio.

1:15 PM | Tech Update: Growth of the Hydrogen Fuel Cell – Mark Chung, NREL
- Fuel Cell Electric Vehicles (FCEVs) are a promising technology. Adoption, however, has underperformed due to several factors, including production costs, challenges of hydrogen storage, and an insufficient network coverage of hydrogen refueling stations.
Advantages of FCEVs are primarily evident in long-range travel applications due to shorter charging time and higher mileage; the record-setting Toyota Mirai drove 841 miles on a single tank of hydrogen fuel.

By 2025, FCEVs could be cost competitive with BEVs, particularly for heavy-duty vehicles, contingent on supportive policies, and price level of electricity in relation to gas/diesel.

1:40 PM | Legislative Primer – Melanie Alvord, TxDOT Legislative Affairs Team

- Passed November 15, 2021, the Infrastructure Investment and Jobs Act is officially referred to as the Bipartisan Infrastructure Law (BIL).
- Transportation receives the largest amount of funding, at $274 billion, for several efforts, including roads and bridges, passenger and freight rail, broadband, transit, and highway safety.
- As part of a five-year funding plan, BIL Title I will grant funding to deploy alternative fuel charging infrastructure along designated corridors.
- BIL Title V establishes a 25-member EV Working Group to make recommendations on incorporating EVs into the national transportation and energy systems.
- Texas will be apportioned $407.8 million, over five years, to strategically deploy EV charging infrastructure and to establish an interconnected network to facilitate data collection, access, and reliability.
- BIL requires USDOT to demonstrate second life applications of EV batteries, such as aggregate energy storage installations.
- By November 15, 2022, USDOE must develop and implement measures to expand data collection with respect to EV integration with the electricity grids.

2:00 PM | Break

2:05 PM | The Present and Future of Electrification in Transportation

Moderator: Scott Hinson, Pecan Street

Scott opened the conversation by handing the floor to panelists to express their backgrounds, perspectives, and expertise surrounding EV and mobility topics. Scott then began an engaging conversation by focusing on how transportation stakeholders can begin to build and prepare for a sustainable, commuter-convenient, and low-cost EV transportation future. The conversation continued with considerations for the importance of consumer education in the shift to expanding EV adoption, how proper planning may advance equity, and the proliferation of comprehensive infrastructure – especially as consumer preferences and market conditions continue to evolve.

Laura Morrison, TxETRA

- One of the most significant hurdles for consumer EV adoption is unfamiliarity with the technology and infrastructure; effective public educational campaigns could enhance adoption efforts.
- Public agencies who have gone through the process of transitioning to an all-EV fleet could establish a comprehensive plan that highlights best practices, guidelines, and problem solving to be used as a framework for other agencies.
- In this shift towards EV expansion, it is important to prioritize low-income communities, who often face a higher transportation cost burden, by including community voices in the planning process or through encouraging workplace EV access or incentives.
Anne Blair, Electrification Coalition
- EVs are currently primarily available for sedan personal vehicles; infrastructure advancements must be considered for the eventual adoption and expansion of medium and heavy-duty EVs.
- With the eventual onset of advanced funding for EV expansion, it is important to ensure that infrastructure investments keep pace with vehicle adoption. Prioritizing funds towards programs that ensure a positive and easy user experience can support adoption.

Karl Popham, Austin Energy
- When preparing for EV adoption, projections often under-predict. The City of Austin has seen significant interest in EV expansion, which was evident in an Electrify Expo event hosted by the city where users could test and explore EV technology in one weekend and hosted over 21,000 visitors.
- Capital Metro has found a significant improvement in user experience when riding electric buses that eliminate the smell of exhaust, loud internal combustion engines, and heat that is emitted.
- To effectively encourage EV adoption in both urban and rural communities, supporting policies that advance charging infrastructure in multi-family dwellings and prioritize the transition within the gig-economy are pivotal.

Thomas Stout, HDR
- In-home, Level 1 charging will support most users for daily commuting purposes. To encourage more widespread adoption, educational support must be offered for users to understand viability of EVs for long distance travel.
- In addition to the convenience of inductive roadway charging, secondary benefits include infrastructural security, as embedded infrastructure cannot be tampered with or defaced.
- Utility operators must continue to prepare for adoption in both light- and heavy-duty EVs, understand electric load requirements, and identify investment priorities by including stakeholders in planning conversations.
- Beyond direct ownership of EVs by low-income communities, equity can also be advanced via reduced pollution when prioritizing EV bus routes in these low-income communities.

Nate Hickman, Texas Commission on Environmental Quality
- To ensure optimal expansion of EV technology, it is important to ensure all stakeholders are a part of this discussion, including consumers, utility providers, grant providers, and producers.
- A part of public education that must be prioritized is ensuring that consumers understand the financial assistance that is available—in particular, following advanced federal funding as a part of the BIL.

3:15 PM | Prioritization of White Paper Topics – UT Austin Research Team
- Kristie Chin provided a high-level overview of potential white paper topics for the 2022 round of white papers.
- Of polled Task Force members, significant interest was centered on the white paper topic focused on energy in relation to sustainability, resilience, and opportunities on TxDOT’s right-of-way.
• Of polled Task Force members, additional interest was noted in areas of freight and supply chain, broadband advancements and telework, and efforts in active transportation.
• Task Force members encouraged the UT Austin team to refine the topics in concert with TxDOT to ensure the information would provide the most value. UT Austin plans to downselect topics, scope them in coordination with TxDOT and the Task Force members, and begin research in spring 2022.

3:25 PM | Closing Remarks
• Darran Anderson thanked the audience, panelists, Task Force members, TxDOT staff, and UT Austin for another successful meeting.

3:30 PM | Adjourn
Alternative Fuels in the BIL – Texas Technology Task Force Meeting

Melanie Alvord
TxDOT Federal Affairs
The Bipartisan Infrastructure Law (BIL)

- On Tuesday, August 10, the U.S. Senate passed the Infrastructure Investment and Jobs (IIJA) Act by a vote of 69 – 30. On Friday, November 5, the U.S. House of Representatives passed the IIJA by a vote of 228 – 206, and the bill was signed into law by President Biden on Monday, November 15. The Biden Administration is officially referring to the bill as the “Bipartisan Infrastructure Law,” or BIL.

- The BIL includes $550 billion in new federal spending over a range of infrastructure categories, including broadband, the electric grid, drinking water, wastewater, and transportation.

- Transportation receives the largest amount of money at $274 billion, in part because the bill includes a five-year reauthorization of highway, transit, and rail programs. The $274 billion includes:
  - $110 billion for roads, bridges and major projects.
  - $66 billion for passenger and freight rail.
  - $65 billion for broadband.
  - $39 billion for transit.
  - $11 billion for highway and rail safety programs.
Alternative Fuels in the BIL

- **Title I – Federal-Aid Highways:**
  - **Grants for Charging and Fueling Infrastructure:** The BIL establishes a grant program to deploy publicly accessible EV and alternative fuel charging infrastructure, hydrogen fueling infrastructure, propane fueling infrastructure, and natural gas fueling infrastructure along designated alternative fuel corridors or in other locations that will be accessible to all drivers of such vehicles.
  - Considerations for receiving a grant include information on protecting personal privacy and cybersecurity; and,
  - How infrastructure installation can be responsive to technology advancements, such as accommodating AVs, Vehicle-to-Grid technology, and future charging methods.
  - Funding increases each FY, starting with $300 million in FY 2022, for a total of $2.5 billion over five years.
Alternative Fuels in the BIL (cont.)

- **Title I – Federal-Aid Highways:**
  - **Report on Emerging Alternative Fuel Vehicles and Infrastructure:** The BIL directs USDOT to provide a report (within a year) that:
    - Includes an evaluation of emerging alternative fuel vehicles and projections for potential locations of emerging alternative fuel vehicle owners;
    - Identifies areas where emerging alternative fueling infrastructure will be needed to meet the current and future needs of drivers;
    - Identifies areas that may impede deployment and adoption of emerging alternative fuel vehicles;
    - Includes a map that identifies concentrations of emerging alternative fuel vehicles to meet the needs of current and future emerging alternative fueling infrastructure;
    - Estimates the future need for emerging alternative fueling infrastructure to support the adoption and use of emerging alternative fuel vehicles; and,
    - Includes a tool to allow states to compare and evaluate different adoption and use scenarios for emerging alternative fuel vehicles, that can also adjust for local factors.
Alternative Fuels in the BIL (cont.)

- **Title V – Research and Innovation:**
  - **Electric Vehicle Working Group (EV-WG):** The BIL establishes a 25-member EV-WG, led jointly by USDOT and USDOE, comprised of a variety of Federal and non-Federal stakeholders to make recommendations on incorporating electric vehicles into the nation’s transportation and energy systems.
  - The EV-WG is required to prepare a series of reports to Congress on barriers to electric vehicle adoption and possible opportunities and solutions.
Alternative Fuels in the BIL (cont.)

- Division J – National Electric Vehicle Formula Program:
  - $5 billion in supplemental (advanced) appropriations for the National EV Formula Program
  - Each state receives an amount based on its highway apportionment. Based on FY21 formula distributions Texas’ total share over 5 years would be $407.8 million, or $81.56 million over five years.
  - The Program provides funding to states to strategically deploy EV charging infrastructure and to establish an interconnected network to facilitate data collection, access, and reliability. This includes:
    - The acquisition and installation of EV charging infrastructure to serve as a catalyst for the deployment of such infrastructure and to connect it to a network to facilitate data collection, access, and reliability;
    - Proper operation and maintenance of EV charging infrastructure; and,
    - Data sharing about EV charging infrastructure to ensure the long-term success of investments made.
Demonstration of EV Battery Second-Life Application for Grid Services:

- Requires USDOT to demonstrate second life applications of electric vehicle batteries as aggregated energy storage installations to provide services to the electric grid:
  - The purposes of project is to:
    - Demonstrate power safety and the reliability of the applications under the program;
    - Demonstrate the ability of electric vehicle batteries –
      » To provide ancillary services for grid stability and management; and
      » To reduce the peak loads of homes and businesses.
  - Extend the useful life of electric vehicle batteries and the components of electric vehicle batteries prior to the collection, recycling, and reprocessing of the batteries and components; and
  - Increase acceptance of, and participation in, the use of second-life applications of electric vehicle batteries by utilities.
- Priority must be given to projects in which the applicable second-life applications is paired with one or more facilities that could particularly benefit from increased resiliency and lower energy costs, such as a multi-family affordable housing facility, a senior care facility, and a community health center.
Data Collection of EV Integration with the Electricity Grid:
- By November 15, 2022 USDOE must develop and implement measures to expand data collection with respect to electric vehicle integration with the electricity grids.
  - The sources of the data collected may include:
    - Host-owned or charging-network-owned electric vehicle charging stations;
    - Aggregators of charging-network electricity demand;
    - Electric utilities offering managed-charging programs;
    - Individual, corporate, or public owners of electric vehicles; and

Study on Impact of EVs:
- By March 15, 2022, USDOE must complete and submit to Congress a report describing the results of a study on the cradle to grave environmental impact of electric vehicles.

Study on Impact of Forced Labor in China on the EV Supply Chain:
- By March 15, 2022, USDOE must, in coordination with the Departments of State and Commerce, study the impact of forced labor in China on the electric vehicle supply chain.