

**AASHTO CAV Planning Group &
Cooperative Automate Transportation (CAT) Coalition
Planning Working Group
July 7, 2021 12:00 – 1:30 ET
Meeting Notes**

Welcome

Matt Hardy welcomed members and noted that Phillip Schaffner and Justine Sydello (chairs of this working group) were not able to attend today's webinar.

Washington State Transportation Commission (WSTC), Scenario Planning for Emerging Technologies and Revenue

WSTC's executive director Reema Griffith and CDM Smith's Zubair Ghafoor presented the current scenario planning development process underway in Washington State to help understand the impacts of CAVs and other emerging technology trends on potential road usage charge (RUC) data collection.

Reema provided background on the WSTC. The commission is appointed by the Governor to provide independent and objective guidance on transportation policy and finance to the Governor and Legislature. They also serve as the State Tolling Authority and conduct special studies, as needed.

Reema described the AV Working Group's activities to explore approaches to prepare for AVs in the future. She noted that there is an expected increase in average mile per gallon (mpg) by 2035 to 35 mpg. With this increase, taxing fuel at the same rate is not a sustainable long-term revenue. She also noted that taxing by the gallon of fuel used has some fairness and equity challenges. A year-long pilot was conducted in 2018-2019 that involved 2,000 test drivers and included both state and international border crossings. Five reporting methods were tested during the pilot:

- Odometer reading;
- Mileage Permit; and
- Milemapper smart phone app – not tethered to vehicle but wherever the user drives; and
- Plug-in devices with or without GPS.

All the testing was conducted as a simulation; participants were not actually billed for the RUCs. A variety of surveys and focus groups captured input and reactions from participants. The findings recommended a gradual transition to RUCs, allowing owners of electric vehicles and hybrids to opt-in to avoid paying a \$225.00 flat fee.

Zubair Ghafoor presented on the scenario planning model used. The process started with an overall financial model with an established base vehicle miles traveled (VMT). They adjusted the VMT to remove heavy vehicles, adjusted for Covid impacted trips, applied technology effects to arrive at gross revenue estimates. They then adjusted for the costs of collections to arrive at net revenue estimates.

Zubair noted that one key question was how to quantify the potential impacts of telecommuting, noting that they addressed this by following a process to estimate the percentage of the workforce expected to continue working from home, post pandemic.

Zubair addressed the scenario planning findings related to electrification and AVs. He noted that electric costs are declining as there is a rapid shift to electrification. They averaged two nationally recognized projections to arrive at the projection used in their modeling.

Regarding AV, the question is not “if”, but “when”. Zubair reviewed three scenarios and discussed the estimated impacts on VMT:

- Option A: Privately owned traditional vehicle – current situation with no change in VMT.
- Option B: Private AV ownership with an estimated 50% increase in VMT.
- Option C: Shared Mobility with an estimated 75% increase in VMT.

Zubair cautioned that the emergence of shared mobility is still evolving and challenging to predict.

These three scenarios were applied to the model to determine the financial projections. Zubair explained the process, explaining that scenario planning is trying to capture all plausible options for the future.

Related Links:

- <https://waroadusagecharge.org/>
- <https://www.wtp2040andbeyond.com/>

Oregon DOT, RUC West, Piloting Road Usage Charge Collection for Autonomous Vehicles

Oregon DOT’s Maureen Bock and CDM Smith’s Roshini Durand presented current efforts underway with [RUC West](#) to explore collection of a road usage charge (RUC) with AVs via a pilot. Maureen noted that the premise of the project was to understand any potential impacts that AVs may have on RUC.

Roshini noted that Udelv is a last mile delivery fleet operator that operates AVs and agreed to join the team, together with additional team members that included Perrone Robotics, CAVNUE, and two original equipment manufacturers (OEMs) – one light-duty OEM and one heavy-duty OEM.

After sharing an overview of the proposal process, Roshini shared key findings:

- Industry outreach
 - Started in proposal phase, had to sell project approach to AV providers.
 - OEMs very curious and interested in the project.
 - Tech stack providers interested as it would help inform their digital roadmaps.
 - Hard part was engaging in research (the AV providers were busy with other activities, and this competed with them).
 - Participant recruitment happened in May and project started in September – it was challenging to keep the team engaged during the months before kickoff.
- Discovery Phase & Concept Generation
 - One key outcome was that convenience must be maintained for RUC fee collection.
 - Data privacy remains a concern – feedback suggests there is reluctance to share miles traveled by AVs (this represents progress on machine learning).
- Solution Design
 - More than just technical feasibility, also institutional feasibility.
 - Tested two models: Granular data exchange (every second), and Monthly aggregate data exchange.

- Explored if AV could do some pre-mapping to RUC account manager (usually done by RUC account manager) – the intent was to understand if some cost savings could be achieved by this pre-mapping being done at the AV.
- Development and Testing
 - Interfaces for data exchange were found to be non-trivial.
 - RUC data was not easily available.
 - Granular data that is reported by AVs was found to shift the burden to the RUC platform (it now had to process GPS data reported every second vs. every 30 seconds in regular RUC program).
 - Pilot Operations and Research
 - There was a soft launch for 2 weeks.
 - There were two months of pilot operations with data from both data exchanges.
 - Recommendations
 - AVs do not need to collect or process the data that is generally needed to support RUC operations (e.g., odometer and fuel information) and therefore this data may be more difficult to include in AVs.
 - There is a need to consider AV business models and constraints in future RUC planning. It was a big ask for them to spend a month testing this and complying with RUC requirements will be an ask.
 - Roshini noted that a key finding was that it is not Autonomy that matters for RUC, but Connectivity that is very important.
- Maureen noted that ODOT has been looking to leverage connectivity with the existing RUC program, as they recognize that connectivity can improve safety and mobility.
- Maureen referred to ODOT’s connected vehicle eco-system, noting that:
 - Technology based RUC aligns with the “user pays” principle.
 - Connectivity and the data from vehicle could lower the administrative costs.
 - Cloud analytics – data processing analytics and storage, as well as an open ecosystem are key aspects of this.
 - Maureen noted ODOT is exploring both direct communications (5.9 GHz band) and network Communications (LTE/5G for V2N) using licensed cellular networks.
- Maureen summarized the lessons learned from ODOT’s perspective:
 - Build partnerships.
 - education matters (public and political).
 - Make it seamless for the public, if possible.
 - Leverage emerging technologies.

Questions:

Matt asked the presenters from Washington if they could comment on the model that was developed, including what tools or models were used? Zubair noted that the model is implemented in Excel.

Matt asked how accessible is the model to users (e.g., are consultants needed or are they web-based)? Zubair described it as adjusting parameters that are all drop-down options in Excel. It can be used by various levels of staff and is intended to be user friendly. The factors are applicable to other states. The

only change needed is underlying data (e.g., quantifying impacts of telecommuting) that could be different in other states.

A question to the Oregon presenters was why did they think the OEMs were curious/interested in this, and did you reach out company by company or did you work with one of their associations? Roshini noted that they learned they needed to find a partner that was an AV vendor Level 4, and those are not easy to find. Reached out to industry contacts, all partners tried very hard to recruit industry partners and that is how they came to meet Ndelv. Regarding why the OEMs are curious, the team believed they were curious about what they should build into their service packages for customers. Maureen added she contacted individual OEMs and tier 1 suppliers as well as groups like OmniAir, 5GAA, and MaaS Alliance.

Question: From planning perspective, how are you considering the work you have done and putting it into your 20-year Transportation Plan? Reema noted that the WSDOT 20-year plan is online, and they were in the middle of RUC research when it was last completed. The current 20-year plan does contemplate the long-term changes of RUC and technologies; it is a high-level plan attempting to forecast it. It has influenced WSDOT's planning and as they are getting ready to start the 20-year planning again, it will continue to influence our plan. From Maureen: It is part of the Statewide Transportation Strategy document, which is our framework for reducing GHG from transportation. It is also part of the Strategic Action Plan, which is the OTC's plan. Our Road User Fee Task Force is also keen on making RUC mandatory for efficient vehicles.

Question: How much of the RUC was based on freight and heavy vehicle use? WA: RUC experience is applicable to passenger vehicles for now, recognizing eventually it may extend to heavy vehicles. From WS standpoint it was a given since start of their work. Maureen noted that RUC focus was also on passenger vehicles.

Maureen posted the following document to chat: Highway Cost Allocation Study for Oregon; https://www.oregon.gov/das/OEA/Documents/HCAS_19-21.pdf

Update on Federal Regulation Comments

Matt provided an update on Federal Regulations, noting that initial comments on the FCC 5.9 GHz report and order were due in June. AASHTO submitted those comments that were provided by members. Comments focused on what the impact of the reduced spectrum would be on ability of IOOs to meet or address key safety issues (e.g., what applications can run). Other was what will happen with interference to the spectrum. Also, the reimbursement of costs that DOTs have incurred and potential for getting reimbursement.

Government Accountability Office (GAO) is conducting an analysis of what the impact will be. By Spring 2022, they plan to circulate some information related to spectrum issues and transportation safety spectrum. Not clear if this report will be timely.

Other Updates

Mark Norman reminded everyone that ARTS 21 Symposium takes place next week, all virtual.

Zubair noted that they are conducting research into artificial intelligence, would be willing to share it. He invited Matt to contact him or Justine.

Close

On behalf of Philip and Justine, Matt adjourned the meeting at 1:30 pm.

Attendees:

Matt Hardy
Zubair Ghafoor
Chuck Roman
Kyle Miller
Diana Palmer
Reema Griffith
Maureen Bock
Abbas Mohaddes
Amna
Anthony Buckley
Burt
Hari Sripathi
Zeke Reyna

Charles Wade
Curtis Nosal
Dave Tolman
Federico Rodriguez
Jeff Lindley
Margaret Smith
Mark Norman
Mark Wingate
Marsha Fiol
Patrick McCarthy
Robin Naitove

Roshini Durand
Shane McKenzie
Susan Howard
Thomas Hill
Tom Kern
Tom Kearny
Travis Dunn
Ali Lohman
Jeremy Raw