Minnesota Distance-Based Fee Demonstration
Technical Advisory Committee

September 3rd, 2020
Scott Peterson, MNDOT Deputy Commissioner,
TAC Chair
1. Welcome – Scott Peterson
2. Zoom meeting guidelines – Lee Munich, HHH (5 min)
3. Agenda review and project update – Ken Buckeye, MnDOT (5 min)
4. Demonstration update – Mike Warren, WSP (15 min)
5. DBF demonstration scope – Chris Berrens, MnDOT (15 min)
6. Taxation principles – Jerry Zhao, HHH (10 min)
7. Policy considerations in developing a rate setting framework – Frank Douma, HHH (10 min)
8. Modal equity policy brief discussion – Camila Fonseca & Jerry Zhao, HHH (15 min)
9. Open discussion – TAC Members (15 min)
10. Adjourn
Welcome

Scott Peterson
MnDOT
Meeting Guidelines

Lee Munnich, munni001@umn.edu
Humphrey School of Public Affairs
University of Minnesota
Meeting Guidelines

• Mute your audio when you are not speaking. Unmute your audio when you are called on to speak.

• TAC members turn on your video. Project team members should mute your video except when speaking.

• Open the participant box. Use the hand raising icon if you would like to ask a question.

• You may also open the chat box and type in questions or comments at any time during the meeting. If you have a technical issue or comment, you may send a message to the host only.

• The meeting is not being recorded but the chat box comments will be saved.
Agenda Review & Project Update

Ken Buckeye, kened.huckey@state.mn.us
MnDOT
Charge to the DBF Technical Advisory Committee

• Provide Advise and Guidance on Technical and Policy Issues to the Project Team and MnDOT

• Be an Informed Constituency in DBF Discussions with the Public and Policy Makers

• Help Ensure that the Project Contributes to the State and National Research Efforts
Demonstration Update

Michael Warren, Michael.Warren@wsp.com
WSP
Timeline & Status

WE ARE HERE
Transitioning to Stage 2 - Providers are preparing to create their own Revenue Reports

Apr ‘20 – Jul ‘20
STAGE 1
Providers send sanitized data
Project Team creates Revenue Reports

Aug ‘20 – Nov ‘20
STAGE 2
Providers send sanitized data
Providers create Revenue Reports;
sends to Project Team for validation

Dec ‘20 – Mar ‘21
STAGE 3
Providers send sanitized data
Providers create Revenue Reports;
sends directly to State

9/2/20 mndot.gov
### By the Numbers

<table>
<thead>
<tr>
<th>Total Miles Traveled</th>
<th>Total Fuel Gallons Purchased</th>
<th>Average Fuel Economy (miles per gallon)</th>
</tr>
</thead>
<tbody>
<tr>
<td>183,124</td>
<td>6,062.411</td>
<td>30.21</td>
</tr>
</tbody>
</table>

As of data reported through July 31, 2020

- 2 Shared Mobility Providers
- 61 total vehicles have participated / collected data
- 55 active vehicles as of July 31, 2020
  - Some vehicles are not utilized every month or have been decommissioned
### Project Monthly Revenue Reports (simulated) generated for April thru July 2020

<table>
<thead>
<tr>
<th>Total Gross Distance Based Fees (DBF) (state and federal)</th>
<th>Total Gross Fuels Tax Credits (state and federal)</th>
<th>Net Total DBF Assessed (Simulated)</th>
</tr>
</thead>
<tbody>
<tr>
<td>$4,944.34</td>
<td>$2,843.16</td>
<td>$2,101.18</td>
</tr>
</tbody>
</table>

As of data reported through July 31, 2020
C/AV Testing

- **Connected/Automated Vehicle Testing:**

- **State Border Crossing:** Capture mileage both within and outside of Minnesota to determine how DBFs could vary based on multi-state travel.

- **Lane Differentiation:** Capture data in specific lanes to determine if variable DBFs could be charged for one lane use over another, such as HOV/HOT lanes.

- **Occupancy Detection:** Capture passenger counts to determine if DBF discounts could be applied for carpooling.

- **Congestion (Area and Time of Day):** Capture vehicle congestion, time of day of travel, and specific cordons to determine if DBFs could vary based on when and where a vehicle travels.
### COMPANY INFORMATION

**Company Name**
Shared Mobility Provider

**Tax Report Period**
April 1, 2020 - April 30, 2020

<table>
<thead>
<tr>
<th>Fuel Type</th>
<th>Total Miles Driven</th>
<th>Total Fuel Purchased*</th>
<th>Average MPG**</th>
<th>Federal DBF Rate/Mile</th>
<th>Total Federal DBF</th>
<th>State DBF Rate/Mile</th>
<th>Total State DBF</th>
<th>Federal Fuel Tax Rate/Gallon</th>
<th>Total Federal Fuel Tax Credit</th>
<th>State Fuel Tax Rate/Gallon</th>
<th>Total State Fuel Tax Credit</th>
<th>DBF Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gas</td>
<td>12,521</td>
<td>633,000</td>
<td>19.78</td>
<td>$0.011</td>
<td>$137.73</td>
<td>$0.016</td>
<td>$200.34</td>
<td>$0.184</td>
<td>$(116.47)</td>
<td>$0.285</td>
<td>$(180.41)</td>
<td>41.19</td>
</tr>
<tr>
<td>Alcohol</td>
<td>1,000</td>
<td>100</td>
<td>10.00</td>
<td>$0</td>
<td>$0</td>
<td>$0.016</td>
<td>$16.00</td>
<td>$0</td>
<td>$0.000</td>
<td>$0.000</td>
<td>$0.000</td>
<td></td>
</tr>
<tr>
<td>E-85</td>
<td>1,000</td>
<td>100</td>
<td>10.00</td>
<td>$0</td>
<td>$0</td>
<td>$0.016</td>
<td>$16.00</td>
<td>$0</td>
<td>$0.000</td>
<td>$0.000</td>
<td>$0.000</td>
<td></td>
</tr>
<tr>
<td>Diesel (1 &amp; 2)</td>
<td>1,000</td>
<td>100</td>
<td>10.00</td>
<td>$0.011</td>
<td>$11.00</td>
<td>$0.016</td>
<td>$16.00</td>
<td>$0.244</td>
<td>$(24.40)</td>
<td>$0.285</td>
<td>$(28.50)</td>
<td>12.50</td>
</tr>
<tr>
<td>Biodiesel</td>
<td>1,000</td>
<td>100</td>
<td>10.00</td>
<td>$0</td>
<td>$0</td>
<td>$0.016</td>
<td>$16.00</td>
<td>$0</td>
<td>$0.000</td>
<td>$0.000</td>
<td>$0.000</td>
<td></td>
</tr>
<tr>
<td>LPG</td>
<td>1,000</td>
<td>100</td>
<td>10.00</td>
<td>$0</td>
<td>$0</td>
<td>$0.016</td>
<td>$16.00</td>
<td>$0</td>
<td>$0.000</td>
<td>$0.000</td>
<td>$0.000</td>
<td></td>
</tr>
<tr>
<td>CNG (cubic ft)</td>
<td>1,000</td>
<td>100</td>
<td>10.00</td>
<td>$0</td>
<td>$0</td>
<td>$0.016</td>
<td>$16.00</td>
<td>$0</td>
<td>$0.000</td>
<td>$0.000</td>
<td>$0.000</td>
<td></td>
</tr>
<tr>
<td>LNG</td>
<td>1,000</td>
<td>100</td>
<td>10.00</td>
<td>$0</td>
<td>$0</td>
<td>$0.016</td>
<td>$16.00</td>
<td>$0</td>
<td>$0.000</td>
<td>$0.000</td>
<td>$0.000</td>
<td></td>
</tr>
<tr>
<td>HEV</td>
<td>10,668</td>
<td>142</td>
<td>75.13</td>
<td>$0.011</td>
<td>$117.35</td>
<td>$0.016</td>
<td>$170.69</td>
<td>$0.184</td>
<td>$(26.13)</td>
<td>$0.285</td>
<td>$(40.47)</td>
<td>221.44</td>
</tr>
<tr>
<td>EV</td>
<td>9,999</td>
<td>N/A</td>
<td></td>
<td>$0.011</td>
<td>$109.99</td>
<td>$0.016</td>
<td>$159.98</td>
<td>$0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Unit of measure gallons unless noted
**Average MPG calculated based on total miles divided by fuel purchased

Disclaimer: The per-mile rates and calculated revenues reflected in this report are for demonstration purposes only and do not reflect any intent of a proposed rate structure by the Minnesota Department of Transportation.
Next Steps

• SM Providers generate Revenue Reports August 2020 through March 2021

• Project Team conduct mock audits with both SM Providers late 2020
  • Validate data accuracy and integrity
  • Simulate real-world revenue audit processes
  • Identify areas of alignment with current fuels tax audit processes; areas for improvement

• Complete Demonstration on March 31, 2021

• Final Report developed following Demonstration completion
  • Demonstration Observations and Results
  • Alignment with STSFA Grant Program Objectives
  • Opportunities and Challenges
  • Policy Considerations and Recommendations
DBF Demonstration Scope

Christopher Berrens, chris.berrens@state.mn.us
MnDOT
Transportation Revenue

Fuel Tax

Sales

Other

Registration
Hypothetical: Distance Based Fees over Time
Social, environmental, & revenue objectives can be aligned

- Addressing solvency of Highway Trust Fund
- Potential fee credits for social and/or environmental factors

Revenue Neutral (Current)
Gas Tax
DBF

Revenue
Time
## EVs as a Percentage of Total Vehicle Sales (2018)

### Top 3 Markets by Total EV Sales in 2018

<table>
<thead>
<tr>
<th>Country</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Norway</td>
<td>49.1%</td>
</tr>
<tr>
<td>Iceland</td>
<td>19.1%</td>
</tr>
<tr>
<td>Sweden</td>
<td>8.0%</td>
</tr>
<tr>
<td>Netherlands</td>
<td>6.7%</td>
</tr>
<tr>
<td>Finland</td>
<td>4.7%</td>
</tr>
<tr>
<td>China</td>
<td>4.4%</td>
</tr>
<tr>
<td>Portugal</td>
<td>3.4%</td>
</tr>
<tr>
<td>Switzerland</td>
<td>3.2%</td>
</tr>
<tr>
<td>Austria</td>
<td>2.5%</td>
</tr>
<tr>
<td>U.K.</td>
<td>2.5%</td>
</tr>
<tr>
<td>Belgium</td>
<td>2.4%</td>
</tr>
<tr>
<td>Canada</td>
<td>2.2%</td>
</tr>
<tr>
<td>Denmark</td>
<td>2.1%</td>
</tr>
<tr>
<td>France</td>
<td>2.1%</td>
</tr>
<tr>
<td>U.S.</td>
<td>2.1%</td>
</tr>
<tr>
<td>South Korea</td>
<td>2.0%</td>
</tr>
<tr>
<td>Germany</td>
<td>2.0%</td>
</tr>
<tr>
<td>Ireland</td>
<td>1.6%</td>
</tr>
</tbody>
</table>

*Note: Includes plug-in hybrids and light vehicles, excludes commercial vehicles.*

**Source:** Statista
### Timeline of Norway EV Incentives Shifting

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>No purchase/Import Taxes (1990-)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>No annual road tax (1996-)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No charges on toll roads or ferries (1997-2017).</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Free municipal parking (1999-2017)</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>50% reduced company car tax (2000-2018).</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Exemption from 25% VAT on purchase (2001-)**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Access to bus lanes (2005-)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exemption from 25% VAT on leasing EVs (2015)</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>New rules allow local authorities to limit the access to only include EVs that carry one or more passengers (2016)</td>
<td></td>
<td></td>
<td></td>
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<td></td>
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</tr>
<tr>
<td><strong>Maximum 50% of the total amount on ferry fares for electric vehicles (2018)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td><strong>Exemption from 25% VAT on leasing EVs (2015)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Fiscal compensation for the scrapping of fossil vans when converting to a zero-emission van (2018)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Allowing holders of driver license class B to drive electric vans class C1 (light lorries) up to 4250 kg (2019)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Tax Principles: A Brief Introduction

Jerry Zhao, zrzhao@umn.edu
Humphrey School of Public Affairs
University of Minnesota
Many Different Aspects about Tax

• **Type**: taxes; fees, charges

• **Level of government**: federal, state, or local government

• **Base**: ownership; transaction; usage

• **Rationale**:
  • To generate revenue
  • To offset service costs
  • To regulate behaviors
## Tax Evaluation Framework

<table>
<thead>
<tr>
<th>Criterion</th>
<th>Sub-criterion</th>
<th>Sample Questions for a Transportation Tax</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Efficiency</strong></td>
<td>Demand-side efficiency</td>
<td>How does the tax affect the behavior of transportation users?</td>
</tr>
<tr>
<td></td>
<td>Supply-side efficiency</td>
<td>How does the tax provide incentives for investing in transportation?</td>
</tr>
<tr>
<td><strong>Equity</strong></td>
<td>Benefit-received principle</td>
<td>Does the tax payment align with benefits received?</td>
</tr>
<tr>
<td></td>
<td>Ability-to-pay principle</td>
<td>Is the tax regressive or progressive for different income groups?</td>
</tr>
<tr>
<td><strong>Adequacy</strong></td>
<td>Revenue-raising capacity</td>
<td>Does the tax raise sufficient revenue to fund transportation?</td>
</tr>
<tr>
<td></td>
<td>Revenue sustainability</td>
<td>Will the tax keep up with increasing funding needs in the future?</td>
</tr>
<tr>
<td><strong>Feasibility</strong></td>
<td>Political feasibility</td>
<td>Is the tax a sensitive issue politically?</td>
</tr>
<tr>
<td></td>
<td>Administrative feasibility</td>
<td>Is the tax easy to administer and to comply with?</td>
</tr>
</tbody>
</table>
Tax Evaluation Framework: Efficiency

• **Efficiency:**
  - In general, taxes that lead to less behavior changes are more efficient
  - However, taxes that reduce excessive behaviors are efficient

• **Tax efficiency for transportation**
  - **Demand-side:** How does the tax affect the behavior of transportation users?
  - **Supply-side:** Does the tax provide incentives for investing in transportation?
• Equity: Is the tax fair? It depends on which principle is applied.

• Equity from benefit-received principle
  • Does the tax payment align with benefits received?
  • This principle is typically applied for user fees and charges.

• Equity from ability-to-pay principle
  • Is the tax regressive or progressive for different income groups?
  • Increasingly used for all kinds of taxes, fees, and charges.
Tax Evaluation Framework: Adequacy

- **Revenue-raising capacity**
  - Does the tax raise sufficient revenue to fund transportation?
  - It is mainly affected by the tax base, tax rate, and elasticity.

- **Revenue sustainability**
  - Will the tax keep up with increasing funding needs in the future?
  - It is about whether the revenue can catch up with income growth or demand change over time.
Tax Evaluation Framework: Feasibility

• Political feasibility
  • Sensitivity to political agenda or public opinion.
  • It is often affected by visibility and the potential of tax exportation.

• Administrative feasibility
  • Admin cost: The cost of implementation, operation, and enforcement.
  • Compliance cost: Whether it is convenient for user to pay the tax?
## Tax Evaluation Framework

<table>
<thead>
<tr>
<th>Criterion</th>
<th>Sub-criterion</th>
<th>Current Fuel Tax System</th>
<th>Distance-Based Fee</th>
</tr>
</thead>
<tbody>
<tr>
<td>Efficiency</td>
<td>Demand-side efficiency</td>
<td>Moderate</td>
<td>Strong</td>
</tr>
<tr>
<td></td>
<td>Supply-side efficiency</td>
<td>Moderate</td>
<td>Strong</td>
</tr>
<tr>
<td>Equity</td>
<td>Benefit-received principle</td>
<td>Moderate</td>
<td>Strong</td>
</tr>
<tr>
<td></td>
<td>Ability-to-pay principle</td>
<td>Moderate</td>
<td>Moderate</td>
</tr>
<tr>
<td>Adequacy</td>
<td>Revenue-raising capacity</td>
<td>Moderate</td>
<td>Moderate</td>
</tr>
<tr>
<td></td>
<td>Revenue sustainability</td>
<td>Weak</td>
<td>Moderate</td>
</tr>
<tr>
<td>Feasibility</td>
<td>Political feasibility</td>
<td>Weak</td>
<td>?</td>
</tr>
<tr>
<td></td>
<td>Administrative feasibility</td>
<td>Strong</td>
<td>?</td>
</tr>
</tbody>
</table>

Policy Considerations in Developing a Rate Setting Framework

Frank Douma, douma002@umn.edu
Humphrey School of Public Affairs
University of Minnesota
Policy Considerations for Developing a Rate Setting Framework

• The process of setting fee rates includes implicit choices

• Depending on these choices, some pay more, some pay less

• In a perfect world, these choices reflect explicit policy directives

• Our world is not perfect, but to get closer, it helps to isolate some issues
Policy Considerations for Developing a Rate Setting Framework

- We propose 5 perspectives to “isolate” certain issues, one per TAC meeting
- Purpose is to raise the potential implications
- But not to resolve potential conflicts at this time
- Once we have reviewed all 5 perspectives, we will engage in a more holistic rate setting discussion
- This demonstration project is limited to gauging the technical feasibility of DBF collection
- The amount and type of DBF will be determined by policymakers in the future, not this demonstration project
Policy Considerations for Developing a Rate Setting Framework

Proposed order of review:

1. Modal equity (today)
2. Social equity
3. Collection methods and Administrative costs
4. Privacy
5. Urban / Rural distinctions
Modal Equity

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Jerry Zhao, zrzhao@umn.edu
Meredith Benesh, bene0110@umn.edu
Humphrey School of Public Affairs
University of Minnesota
• The costs different modes of transportation impose in the transportation system
  • Direct costs & Indirect costs

• The contributions of these modes to cover these costs
  • Motor fuel taxes and Registration fees for EVs
Passenger Vehicles and Heavy Vehicles

- Heavier vehicles impose higher costs on the transportation infrastructure

- It is unclear whether they contribute correspondingly to the cost they impose

<table>
<thead>
<tr>
<th>Vehicle Type</th>
<th>Passenger Car Equivalents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cars</td>
<td>1</td>
</tr>
<tr>
<td>Vans/Pickups</td>
<td>7</td>
</tr>
<tr>
<td>Large Pickups/Delivery vans</td>
<td>15</td>
</tr>
<tr>
<td>Large Delivery Trucks</td>
<td>163</td>
</tr>
<tr>
<td>Local Delivery Trucks</td>
<td>236</td>
</tr>
<tr>
<td>Residential Recycling Trucks</td>
<td>274</td>
</tr>
<tr>
<td>Buses</td>
<td>851</td>
</tr>
<tr>
<td>Residential Trash Trucks</td>
<td>1,279</td>
</tr>
<tr>
<td>Long Haul Semi-Trailers</td>
<td>1,408</td>
</tr>
</tbody>
</table>

Source: Wilde (2014)
Individual Mobility

Electric Vehicles

- EVs and ICE vehicles generate comparable road damage
- EVs are expected to impose lower environmental costs compared to ICE
  - Depends on the method used to generate electricity
  - Cradle to grave carbon footprint
- EVs contribute relatively less than ICE vehicles in terms of the motor fuel tax

• Vehicles used for transit impose higher costs than vehicles used for individual mobility.
  • When comparing costs per passenger, however, the costs imposed per transit passenger are lower.

• Transit underpays for the transportation costs it imposes.
  • Transit services are exempt in various ways from the payment of motor fuel taxes in most of the states.
  • Transit services are heavily subsidized, in part, because of their potential to reduce congestion and pollution.
Per-Passenger Costs & Contributions

- **COSTS**
  - Diesel Bus
  - Common Sedan
  - EV
  - Van & Pickup Trucks

- **CONTRIBUTIONS**
  - Diesel Bus
  - EV
  - Common Sedan
  - Van & Pickup
  - Trucks
Shared Mobility

- Likely increase VMT
- Likely increase GHG emissions
- Unclear impact on VMT
- Decrease GHG emissions

Automation and Connectivity
- Unclear impact on road damage
- Decrease GHG emissions
Questions to Guide the Discussion

• Is the current registration fee of $75 on EVs appropriate to cover the costs they impose on the roadway system?
  • Should all vehicles pay the same for the use of our roadway system regardless of their powertrain?
  • Should EVs pay a discounted fee due to their environmental benefits?
  • Should ICE vehicles pay an additional surcharge for their environmental costs?

• How to account for different vehicle categories and the road damage they impose on the transportation system?

• How should we think about funding the roadway system considering a future with autonomous and connected vehicles?
• Please fill the online survey at: https://umn.qualtrics.com/jfe/form/SV_1Zc6T7XnCKOl74F

• The survey will take about 10-15 minutes to complete

• Please complete the survey by September 11th.

Thank you in advance for your participation! This demonstration and evaluation are a critical part of future transportation funding in Minnesota.
Adjourn

Thank you for your participation!