Maryland Electric Vehicle Initiatives

Mitigation Working Group of the Maryland Commission on Climate Change

Sept. 26th, 2016
Maryland State Agency Roles

- ZEV MOU
- EVIP & AFIP
- Install EVSE
- Maryland Clean Cars Program
- EV / EVSE (Incentives / Rebates)
- Chair / Staff EVIC
- Track EV Registrations
Maryland Clean Car Program

- Adopted in 2007; Implemented in 2011
- Incorporates CALEV Program in MD
- ZEV mandate
  - requires all automobile manufacturers to make an increasing percentage of their new vehicles zero emission vehicles
  - Mandate began in 2011 and steadily increases to 22% in 2025
ZEV Memorandum of Understanding

• Signed October 2013 (CA, CT, MD, MA, NY, OR, RI and VT)
• Develop a ZEV environment/infrastructure to support ZEV requirements under the CALEV Program
• Highlights key commitments (Lead by Example, Harmonize Building Codes, Evaluate and Establish Incentives, etc...)
• Multi-State Action Plan Released May 2014
  – 11 specific recommendations to:
    • Support MOU goals
    • Guide interstate coordination
    • Advise state-specific action
EVIP [Electric Vehicle Infrastructure Program]

- DC Fast Charging
- $1M; 50% match
AFIP [Alternative Fuel Infrastructure Program]

- DC Fast Charging
- Min. 50% match
- Max. EV Award $45K
- FY 2017 up to $2M
Additional Incentives

• EV Excise Tax Credit up to $1.8M (FY 14-17)

• EVSE Rebate up to $600K (FY 14-17)

• HOV Lane Exemption Permits for PEVs

• MD Freedom Fleet Voucher (FFV) Program
MDOT EVSE Installations

- TSO
- MTA
- MAA
- SHA
- MdTA
- MPA
EVIC [Electric Vehicle Infrastructure Council]

- Formed 2011; Extended through June 2020
- Council Members Defined in Statute & Appointed
- Chaired / Staffed by MDOT
- 2012 Action Plan
  - 32 Recommendations
- Starting in Feb. meet every other month
- Priorities Identified at 1st meeting in 2016
• Priorities Identified during 1st Meeting in 2016
  – Identify legislative needs in advance of 2017 Session
  – Identify and address infrastructure limitations
  – Coalesce around central marketing theme
  – Identify technical and policy issues associated with workplace and urban charging, including
    • Interoperability
    • Paid vs. unpaid
  – Identify Economic Development Opportunities

• 4 Workgroups
2017 Legislation

• MD EV Tax Credit and EVSE Rebates [Expires FY 17]

• Installation of EVSE
  – Address barriers related to rented housing, multi-unit dwellings, homeowners’ associations, etc.

• Reserved EV Parking Spaces
  – Anti-Icing
  – Signage / Fines
FAST Act Alt. Fuel Corridors

- MDOT Submitted Nominations August 2016
- Expect FHWA to Announce Selections this Fall
- Support from Multiple Partners / Stakeholders
# Maryland’s Existing EVSE

## Existing EV Charging Stations by Corridor

<table>
<thead>
<tr>
<th>Corridor</th>
<th>Level 1</th>
<th>Level 2</th>
<th>DC Fast</th>
<th>Total*</th>
</tr>
</thead>
<tbody>
<tr>
<td>I-95</td>
<td>41</td>
<td>421</td>
<td>23</td>
<td>485</td>
</tr>
<tr>
<td>US 50</td>
<td>15</td>
<td>84</td>
<td>13</td>
<td>112</td>
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<tr>
<td>I-270</td>
<td>8</td>
<td>145</td>
<td>11</td>
<td>164</td>
</tr>
<tr>
<td>I-70 / I-68</td>
<td>14</td>
<td>168</td>
<td>17</td>
<td>199</td>
</tr>
<tr>
<td>Total</td>
<td>78</td>
<td>818</td>
<td>64</td>
<td>960</td>
</tr>
<tr>
<td>% of Total</td>
<td>8%</td>
<td>85%</td>
<td>7%</td>
<td></td>
</tr>
</tbody>
</table>

*Total includes Level 1, Level 2, and DC Fast stations.

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**Legend:**
- EV Stations within 1 Mile
- EV Stations within 5 Miles
- EV Stations outside of 5 Miles
- Ozone Nonattainment Areas
- PM-2.5 Maintenance Areas

**Map:**
- EV Charging Stations
- Ozone Nonattainment Areas
- PM-2.5 Maintenance Areas

**Pie Chart:**
- ChargePoint: 46%
- SemaCharge: 22%
- eVgo: 5%
- GE WattStation: 0%
- Greenlots: 0%
- Other: 18%
- Tesla: 6%
- Blink: 3%

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Maryland Department of Transportation
Maryland’s Existing EV Registrations

Maryland Electric Vehicle Owners: Per Zip Code

- Interstate Highways
- Existing EV Stations
- Zip Code Boundaries

Legend:
- 1 - 5
- 6 - 10
- 11 - 20
- 21 - 40
- 41 - 100
- 100+

Miles

0 5 10 20
Forecast EVs and EVSE

- 100,000 EVs and 2,227 Chargers in 2020
- 1.4 Million EVs and 32,713 Chargers in 2040

<table>
<thead>
<tr>
<th>Year</th>
<th>Level 1</th>
<th>Level 2</th>
<th>DC Fast</th>
<th>Totals</th>
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</thead>
<tbody>
<tr>
<td>2020</td>
<td>47</td>
<td>1,009</td>
<td>64</td>
<td>1,119</td>
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<tr>
<td></td>
<td>$46,824</td>
<td>$5,043,148</td>
<td>$5,378,205</td>
<td>$10,468,177</td>
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<tr>
<td>2040</td>
<td>688</td>
<td>14,816</td>
<td>940</td>
<td>16,444</td>
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<tr>
<td></td>
<td>$687,811</td>
<td>$74,080,090</td>
<td>$79,001,833</td>
<td>$153,769,735</td>
</tr>
</tbody>
</table>

- **Existing Station**
- **Forecast Station**
Outreach Efforts

- Public
- Workplace
- Dealership
Maryland State Fair Outreach

• 505 Contacts
• 66 Completed Surveys
• General Findings:
  – Lack of Knowledge
    • Maryland Incentives
    • Charging Station Availability
  – Range Anxiety
  – Multi-Unit Dwelling Challenges
  – EV Model Diversity
2016 Survey of 1,323 EV Owners in MD

**What is your age?**

- Under 20: 2 (0.2%)
- 20 to 24 years old: 3 (0.2%)
- 25 to 29 years old: 19 (1.4%)
- 30 to 39 years old: 125 (9.5%)
- 40 to 49 years old: 284 (21.6%)
- 50 to 59 years old: 402 (30.6%)
- 60 to 69 years old: 345 (26.3%)
- 70 and older: 132 (10.1%)

**How many vehicles does your household have?**

- One: 117 (8.9%)
- Two: 600 (45.7%)
- Three or more: 595 (45.4%)

**Where does the primary driver charge the EV mostly?**

- Home: 700 (79.2%)
- Work: 49 (5.5%)
- Both: 131 (14.8%)
- Don’t know (Not sure): 4 (0.5%)
Morgan State University Survey

Would access to a charging facility influence the driver to use rail transit?

- Yes: 49 (26.3%)
- No: 137 (73.7%)

What are the reasons for not using a charging facility and taking rail transit for the rest of the commute?

- Concerned about vandalism of vehicle: 16 (11.9%)
- Concerned about other crime in the parking lot: 15 (11.1%)
- Concerned about not finding an available charging facility: 23 (17%)
- Concerned about taking too long to hook up to charging facility: 5 (3.7%)
- Concerned about cost for charging vehicle: 23 (17%)
- Concerned about EV being hooked up to charging for too long: 6 (4.4%)
- Transit service is inconvenient: 78 (57.8%)
- Driving is faster: 88 (65.2%)
- Other: 37 (27.4%)

Responses:

- Total responses: 186
- Total responses: 291
### Morgan State University Survey

**What were the top three reasons for your household purchasing or leasing an electric vehicle (EV)?**

<table>
<thead>
<tr>
<th>Reason</th>
<th>1st</th>
<th>2nd</th>
<th>3rd</th>
</tr>
</thead>
<tbody>
<tr>
<td>Env. Concerns, e.g. Air Quality</td>
<td>561</td>
<td>252</td>
<td>143</td>
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<tr>
<td>Reduce Dependence on Petroleum</td>
<td>210</td>
<td>294</td>
<td>192</td>
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<tr>
<td>Price of Electricity vs. Gasoline</td>
<td>181</td>
<td>211</td>
<td>164</td>
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<tr>
<td>Advanced Technology</td>
<td>119</td>
<td>138</td>
<td>161</td>
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<tr>
<td>Tax Breaks &amp; Net Price of Vehicle</td>
<td>101</td>
<td>190</td>
<td>193</td>
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<tr>
<td>Vehicle Performance</td>
<td>55</td>
<td>88</td>
<td>148</td>
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<tr>
<td>Make or Model of Vehicle</td>
<td>44</td>
<td>47</td>
<td>101</td>
</tr>
<tr>
<td>Single Occupant Access to HOV Lane</td>
<td>24</td>
<td>31</td>
<td>60</td>
</tr>
<tr>
<td>Safety Features of Vehicle</td>
<td>8</td>
<td>26</td>
<td>42</td>
</tr>
<tr>
<td>Status of EV Ownership</td>
<td>3</td>
<td>10</td>
<td>45</td>
</tr>
<tr>
<td>Availability of Charging Facilities</td>
<td>1</td>
<td>11</td>
<td>24</td>
</tr>
</tbody>
</table>

**Rankings**

1. Environmental concerns, e.g., air quality, pollution
2. Price of electricity vs. gasoline
3. Advanced technology
4. Reduce dependence on petroleum
5. Make or model of vehicle
Next Steps

• EVIC
  – Annual Report Due Dec. 1st
  – Legislative Session

• Transportation Climate Initiative (TCI)

• ZEV MOU

• Outreach

• Lead by Example
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