Preparing for Emerging Technologies
State and Local Partnerships

Colleen Turner – Assistant Director, Office of Planning and Capital Programming
Maryland Department of Transportation
December 3, 2019
Connected & Automated Vehicles in Maryland
Positioning Maryland as a Leader

Fast Facts for Connected and Automated Vehicle (CAV) Technology

Vision for CAV in Maryland
Maryland’s Vision for Connected and Automated Vehicles (CAV) is to uphold and enhance a Safe, Efficient, and Equitable transportation future by delivering collaborative and leading-edge CAV solutions. Maryland is open for business and eager to realize the life-saving and economic benefits of CAV technology, while ensuring safety for all. We are embracing CAV technology and innovation through continuing collaboration with partners interested in researching, testing, and implementing CAVs in Maryland.

http://www.mva.maryland.gov/safety/MarylandCAV/
Positioning Maryland as a Leader

Maryland Locations to Enable Testing Sites (LETS) for CAV

Maryland has designated a number of sites, owned by MDOT and its partners, that can be used for the testing of connected and automated vehicle technologies. Explore the map for information and contacts for these sites, which offer a variety of testing scenarios and conditions.

Maryland Locations to Enable Testing Sites (LETS) for CAV Interactive Map

Explore locations throughout Maryland offering unique and innovative testing opportunities for CAV technology.

Launch

Rogers Avenue Metro Station

How to get started
Please submit an Expression of Interest before testing on any of the sites shown here.

Where is this Located?
Address: 4300 Hayward Avenue, Baltimore, MD 21215

Facility Details
Test Facility Type: Parking Lot/Paved Area
General Description: Parking spaces (View from aerial)
Facility Size: 17.5 Acres
Facility Length: Usage Cost: Fee Required

Facility Restrictions
Government Agency Allowed? Yes
Private Sector Allowed? Yes
Military Allowed? Yes

Disclaimer: Safety, mobility and access of all commuters is MDOT’s primary focus. The testing locations are available for CAV testing only after a permit has been obtained, and based upon availability, all at the sole discretion of MDOT or its agents. MDOT provides no assurances that the sites will be available for the requested dates and times. MDOT assumes no liability beyond that

Mdot Maryland Department of Transportation
Electric Vehicles in Maryland
22,581 Registered EVs as of Oct 31, 2019
- Increased 56.9% during FY19
- Largest % of new EVs registered was in FY15 (71.9%)
- Growth so far in FY20 is 9.0%
EVs by ZIP Code – June 2016

- 605 Zip Codes
- 8 Zip Codes with > 100 EVs registered
- 1 Zip Code with > 210 EVs registered
- 101 Zip Codes with No EVs registered

23 Counties, 1 Independent City
EVs by ZIP Code – December 2016

605 Zip Codes
• 13 Zip Codes with > 100 EVs registered
• 2 Zip Codes with > 210 EVs registered
• 89 Zip Codes with No EVs registered

23 Counties, 1 Independent City
EVs by ZIP Code – December 2017

- 605 Zip Codes
- 18 Zip Codes with > 100 EVs registered
- 5 Zip Codes with > 210 EVs registered
- 81 Zip Codes with No EVs registered
EVs by ZIP Code – December 2018

605 Zip Codes
• 39 Zip Codes with > 100 EVs registered
• 13 Zip Codes with > 210 EVs registered
• 68 Zip Codes with No EVs registered

23 Counties, 1 Independent City
EVs by ZIP Code – October 2019

605 Zip Codes
• 68 Zip Codes with > 100 EVs registered
• 22 Zip Codes with > 210 EVs registered
• 56 Zip Codes with No EVs registered

23 Counties, 1 Independent City
EV Market Share

January 2018

- Tesla: 21%
- Chevrolet: 24%
- Toyota: 16%
- Ford: 16%
- Nissan: 8%
- BMW: 6%
- 19 Other Companies: 9%

11,906 EVs Registered
25 Companies
- 91% - 6 Companies
- 9% - 19 Other Companies

December 2018

- Tesla: 33%
- Chevrolet: 21%
- Toyota: 14%
- Ford: 12%
- Nissan: 7%
- BMW: 5%
- Chrysler: 2%
- 21 Other Companies: 6%

16,093 EVs Registered
28 Companies
- 94% - 7 Companies
- 6% - 21 Other Companies

October 2019

- Tesla: 40%
- Chevrolet: 16%
- Toyota: 11%
- Ford: 9%
- Nissan: 5%
- BMW: 5%
- Honda: 4%
- Chrysler: 2%
- 20 Other Companies: 8%

22,581 EVs Registered
28 Companies
- 92% - 8 Companies
- 8% - 20 Other Companies
# Make of New EVs Registered

**January - December 2018**

<table>
<thead>
<tr>
<th>Make</th>
<th># EVs Registered</th>
</tr>
</thead>
<tbody>
<tr>
<td>TESLA</td>
<td>2,819</td>
</tr>
<tr>
<td>CHEVROLET</td>
<td>534</td>
</tr>
<tr>
<td>TOYOTA</td>
<td>277</td>
</tr>
<tr>
<td>CHRYSLER</td>
<td>180</td>
</tr>
<tr>
<td>BMW</td>
<td>177</td>
</tr>
<tr>
<td>NISSAN</td>
<td>118</td>
</tr>
</tbody>
</table>

- **4,187 New EVs Registered**
  - 6 Companies > 100 EVs Registered
  - Account for 98% of all new EVs
  - Tesla accounts for 67% of all new EVs Registered

**January – October 2019**

<table>
<thead>
<tr>
<th>Make</th>
<th># EVs Registered</th>
</tr>
</thead>
<tbody>
<tr>
<td>TESLA</td>
<td>3,756</td>
</tr>
<tr>
<td>CHEVROLET</td>
<td>764</td>
</tr>
<tr>
<td>TOYOTA</td>
<td>254</td>
</tr>
<tr>
<td>BMW</td>
<td>246</td>
</tr>
<tr>
<td>CHRYSLER</td>
<td>196</td>
</tr>
<tr>
<td>VOLVO</td>
<td>187</td>
</tr>
<tr>
<td>NISSAN</td>
<td>179</td>
</tr>
<tr>
<td>HYUNDAI</td>
<td>152</td>
</tr>
<tr>
<td>MERCEDES-BENZ</td>
<td>151</td>
</tr>
<tr>
<td>FORD</td>
<td>119</td>
</tr>
<tr>
<td>FORD</td>
<td>112</td>
</tr>
</tbody>
</table>

- **6,488 New EVs Registered**
  - 11 Companies > 100 EVs Registered
  - Account for 94% of all new EVs
  - Tesla accounts for 58% of all new EVs Registered
Models Registered

92 Models Registered
- 3 Models > 1,000 registered EVs
  - Model S – 1,734 (14.5%)
  - Volt – 1,310 (11%)
  - Prius Plug-in – 1,248 (10.5%)

126 Models Registered
- 6 Models > 1,000 registered EVs
  - Model 3 – 5,263 (23.3%)
  - Model S – 2,412 (10.7%)
  - Prius Prime – 1,281 (5.7%)
  - Volt – 1,199 (5.3%)
  - Prius Plug-in – 1,135 (5.0%)
  - Model X – 1,088 (4.8%)
628 Charging Stations
- 583 Stations w/in 5 Miles of AFC (92.8%)
- 99 DC Fast Charging Stations (15.7%)
  - 97 w/in 5 Miles of AFC
  - 51.7% Growth since March 30, 2015
Charging Outlets

1,785 Charging Outlets
- 326 DC Fast Outlets
  - 68.6% Growth since 2015 Q1
  - 6.2% Growth since 2019 Q2
- 1,415 Level 2 Outlets
  - 61.3% Growth since 2015 Q1
  - 8.5% Decline since 2019 Q2
- 44 Level 1 Outlets
  - 31.3% Decline since 2015 Q1
Coordinated Planning for Emerging Technologies
Purpose & Goals

To provide local jurisdictions throughout the State of Maryland with an opportunity to share planning innovations, voice needs, and gain access to educational materials relating to emerging technologies that will impact the transportation network and infrastructure. This coordination proposal will begin with collaboration on emerging technologies, such as Connected and Automated Vehicles (CAV) and Zero Emission Vehicles (ZEV).

Goals

- Develop a broad communication strategy would allow all local jurisdictions in Maryland wishing to collaborate to engage with MDOT and MDP to advance emerging technologies.
- Identify and document needs, challenges, and opportunities with the integration of emerging technologies.
- Ensure that local jurisdictions are provided with educational tools to understand and meet the needs of emerging technologies.
- Provide a wholistic picture of ‘Maryland’s Readiness’ for emerging technology.
Workplan

1. Develop & Administer Pre-Survey to Local Jurisdictions

2. Analyze Pre-Survey Data and Develop Content for Emerging Technologies Webinar

3. Administer Emerging Technologies Webinar

4. Post-Survey Following Emerging Technologies Webinar

5. On-Going Communication
Pre-Survey

Emerging Technologies Survey

The Maryland department of Transportation would like to provide local jurisdictions throughout the State of Maryland with an opportunity to share planning innovations, voice needs, and gain access to educational materials relating to emerging technologies that will impact the transportation network and infrastructure. This coordination will begin with collaboration on emerging technologies, such as Connected and Automated Vehicles (CAV) and Zero Emission Vehicles (ZEV).

This survey will serve as an initial step in supporting the following Planning for Emerging Technologies goals:

- Develop a broad communication strategy would allow all local jurisdictions in Maryland wishing to collaborate to engage with MDOT and MDP to advance emerging technologies.

- Identify and document needs, challenges, and opportunities with the integration of emerging technologies.

- Ensure that local jurisdictions are provided with educational tools to understand and meet the needs of emerging technologies.

- Provide a wholistic picture of ‘Maryland’s Readiness’ for emerging technology.

Thank you for your participation in this short survey.
Maryland Local Government Zero Emission Electric Vehicle Infrastructure Survey

The Maryland Department of Transportation (MDOT), in coordination with the Maryland Zero Emission Electric Vehicle Infrastructure Council (ZEEVIC), is gathering input from counties and municipalities on their experiences with Electric Vehicles (EVs), Electric Vehicle Supply Equipment (EVSE), and EV Chargers. Please provide us your insights on EVSE within your region, including known locations of future EVSE and potential locations of EVSE, so that we can better coordinate EV efforts within the State.

ZEEVIC, formerly known as the Electric Vehicle Infrastructure Council (EVIC), was established through legislation introduced in 2011 as part of a package of bills to promote EVs.
MetroQuest

46 Participants
- 30 Government Agencies
- 1 Non-Government (Greenbelt Homes, Inc.)

- Installation Cost
  - 21 (64%) 1
  - 2 (6%) 2
  - 1 (3%) 3
  - 4 (12%) 4
  - 5 (15%) 5
  - Times ranked: 33
  - Average rank: 2.031

- Maintenance
  - 2 (8%) 1
  - 10 (40%) 2
  - 6 (24%) 3
  - 4 (16%) 4
  - 3 (12%) 5
  - Times ranked: 25
  - Average rank: 2.640

- Few EVs
  - 4 (15%) 1
  - 10 (30%) 2
  - 2 (8%) 3
  - 5 (19%) 4
  - 5 (19%) 5
  - Times ranked: 26
  - Average rank: 2.865

- Permitting or Zoning
  - 3 (17%) 1
  - 5 (20%) 2
  - 4 (22%) 3
  - 3 (17%) 4
  - 3 (17%) 5
  - Times ranked: 18
  - Average rank: 2.869

- Uninformed about EVs
  - 4 (21%) 1
  - 3 (16%) 2
  - 4 (21%) 3
  - 6 (32%) 4
  - 2 (11%) 5
  - Times ranked: 19
  - Average rank: 2.947

- Electricity Pricing
  - 1 (5%) 1
  - 4 (19%) 2
  - 10 (46%) 3
  - 5 (24%) 4
  - 1 (5%) 5
  - Times ranked: 21
  - Average rank: 3.048

- Other
  - 2 (14%) 1
  - 3 (21%) 2
  - 2 (14%) 3
  - 4 (22%) 4
  - 3 (21%) 5
  - Times ranked: 14
  - Average rank: 3.214

- Lack of Interest
  - 1 (7%) 1
  - 1 (7%) 2
  - 8 (33%) 3
  - 2 (13%) 4
  - 3 (20%) 5
  - Times ranked: 15
  - Average rank: 3.393

How many EVSEs has your jurisdiction installed?
- 12 More than 5
- 12 None
- 11 2-5
- 5 1
- Total 40

Are you planning on installing an EV charger with?
- 11 No
- 10 Yes, Level 2
- 8 Maybe
- 4 Yes, DC Fast
- 4 Yes, unsure of charging level
- Total 37
MetroQuest

25 Planned Stations
- 20 Govt-Owned Open to Public
- 1 Govt-Owned Closed to Public
- 1 Privately-Owned Open to Public
- 3 No Info Provided

74 Optimal Sites
- 45 Govt-Owned Open to Public
- 14 Privately-Owned Open to Public
- 2 Govt-Owned Closed to Public
- 2 Unsure
- 11 No Info Provided
QUESTIONS?

Colleen Turner, Assistant Director, OPCP
Maryland Department of Transportation
ctturner@mdot.state.md.us
410-865-2773
Public Outreach
Communication - Public

- 2 Languages
  - Korean
  - Spanish

- 8 Events
  - 7 Completed
  - 1 Upcoming

- 3,100 Touchpoints

- Since 2017
  - 24 Events
  - 6,700 Touchpoints
### Maryland EV Events

<table>
<thead>
<tr>
<th>Maryland EV Events</th>
<th>Location</th>
<th>Estimated Attendance</th>
<th>Touch Points</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>World Heritage Festival</td>
<td>West Shore Park&lt;br&gt;Baltimore, MD</td>
<td>1,000</td>
<td>141</td>
<td>7/20/19</td>
</tr>
<tr>
<td>Festival Latino de Maryland</td>
<td>Timonium Fairgrounds&lt;br&gt;Timonium, MD</td>
<td>1,500</td>
<td>251</td>
<td>8/4/19</td>
</tr>
<tr>
<td>Latin Heritage Festival</td>
<td>Veterans Plaza&lt;br&gt;Silver Spring, MD</td>
<td>2,500</td>
<td>754</td>
<td>8/11/19</td>
</tr>
<tr>
<td>Caribbean Food and Wine Festival</td>
<td>Howard County Fairgrounds&lt;br&gt;West Friendship, MD</td>
<td>12,000</td>
<td>351</td>
<td>9/7/19</td>
</tr>
<tr>
<td>Hagerstown Hispanic 13th Annual Festival</td>
<td>Hagerstown Fairgrounds&lt;br&gt;Hagerstown, MD</td>
<td>375</td>
<td></td>
<td>9/15/19</td>
</tr>
<tr>
<td>42nd Annual Korean Festival</td>
<td>Howard County Fairgrounds&lt;br&gt;West Friendship, MD</td>
<td>50,000</td>
<td>1,027</td>
<td>9/21/19</td>
</tr>
<tr>
<td>Howard County Diwali Festival (IONHoCo Diwali Mela 2019)</td>
<td>Meadowbrook Athletic Club&lt;br&gt;Ellicott City, MD 21043</td>
<td>5,000</td>
<td>201</td>
<td>10/20/19</td>
</tr>
<tr>
<td>Chinese Lunar New Year Celebration</td>
<td>Richard Montgomery High School&lt;br&gt;Rockville, MD</td>
<td>800</td>
<td></td>
<td>2/16/20</td>
</tr>
</tbody>
</table>

3,100 Total Touchpoints
Website Analytics

**Audience Overview**

- **All Users**: 100.00% Users
- **Direct Traffic**: 27.97% Users
- **Referral Traffic**: 27.76% Users
- **Search Traffic**: 45.04% Users

**Overview**

- **Users (All Users)**
- **Users (Direct Traffic)**
- **Users (Referral Traffic)**
- **Users (Search Traffic)**

**Users**

<table>
<thead>
<tr>
<th>Category</th>
<th>October 2019</th>
<th>November 2019</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Users</td>
<td>3,346</td>
<td>3,252</td>
</tr>
<tr>
<td>Direct Traffic</td>
<td>926</td>
<td>909</td>
</tr>
<tr>
<td>Referral Traffic</td>
<td>923</td>
<td>848</td>
</tr>
</tbody>
</table>

**New Users**

<table>
<thead>
<tr>
<th>Category</th>
<th>October 2019</th>
<th>November 2019</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Users</td>
<td>3,346</td>
<td>3,252</td>
</tr>
<tr>
<td>Direct Traffic</td>
<td>909</td>
<td>1,126</td>
</tr>
<tr>
<td>Referral Traffic</td>
<td>848</td>
<td>1,040</td>
</tr>
</tbody>
</table>

**Sessions**

<table>
<thead>
<tr>
<th>Category</th>
<th>October 2019</th>
<th>November 2019</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Users</td>
<td>3,946</td>
<td>3,946</td>
</tr>
<tr>
<td>Direct Traffic</td>
<td>1,126</td>
<td>1,126</td>
</tr>
<tr>
<td>Referral Traffic</td>
<td>848</td>
<td>1,040</td>
</tr>
</tbody>
</table>
Website Analytics, Top Pages

September 1 to November 15, 2019

Page Views: 6,723

Audience Overview
Search Traffic: 46%
Referral Traffic: 27%
Direct Traffic: 27%

Top Pages Visited:

1. Homepage: 2,482 (36%)
2. Incentives: 2,417 (35%)
3. Charging: 597 (8%)
4. Ev-101: 318 (4%)
5. About-bevi: 99 (1.4%)
6. Resources/ev-calculators: 97 (1.4%)
7. Hydrogen-101: 96 (1.4%)
8. resources/useful-links/90 (1.3%)

MARYLAND DEPARTMENT OF TRANSPORTATION
Website Analytics, referral sources

September 1 to November 15, 2019
Social Media Analytics

**Page Summary**

Last 28 days

Results from Oct 21, 2019 - Nov 17, 2019

Note: Does not include today’s data. Insights activity is reported in the Pacific time zone. Ads activity is reported in the time zone of your ad account.

**Actions on Page**

October 21 - November 17

We have insufficient data to show for the selected time period.

**Page Views**

October 21 - November 17

46

Total Page Views ▲ 130%

**Page Previews**

October 21 - November 17

3

Page Previews ▲ 200%

**Page Likes**

October 21 - November 17

1

Page Likes ▲ 0%

**Post Reach**

October 21 - November 17

172

People Reached ▲ 213%

**Story Reach**

October 21 - November 17

Get Story Insights

See stats on how your Page’s recent stories have performed.

Learn More
# Social Media Analytics, continued

<table>
<thead>
<tr>
<th>Published</th>
<th>Post</th>
<th>Type</th>
<th>Targeting</th>
<th>Reach</th>
<th>Engagement</th>
<th>Promote</th>
</tr>
</thead>
<tbody>
<tr>
<td>11/14/2019 3:36 PM</td>
<td>MDOT and ZEEVIC efforts were honored with a Visionary Award for</td>
<td></td>
<td></td>
<td>92</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>11/07/2019 11:30 AM</td>
<td>Thanks to BGE, 500 additional EV charging stations will be opened in</td>
<td></td>
<td></td>
<td>125</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>11/06/2019 10:21 AM</td>
<td>Have you checked with your local utility yet to see if a rebate is</td>
<td></td>
<td></td>
<td>60</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>10/20/2019 8:59 PM</td>
<td>We are enjoying our time here at the IONHoCo Diwali Mela 2019! Happy</td>
<td></td>
<td></td>
<td>66</td>
<td>8</td>
<td></td>
</tr>
</tbody>
</table>