



# Report Summary: Electric Vehicle Readiness Among Maryland Local Governments

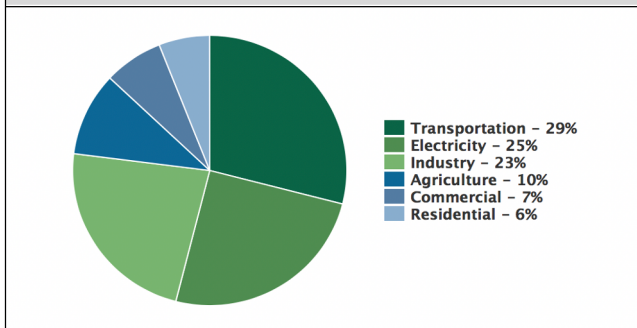
## I. INTRODUCTION

According to the US Environmental Protection Agency (EPA), the transportation sector is the leading contributor to greenhouse gas (GHG) emissions in the US due to the reliance on fossil fuel-powered vehicles (EPA, 2021). It accounted for the largest portion (29%) of total US GHG emissions in 2019 (Figure 1). Cars, trucks, commercial aircraft, and railroads, among other sources, all contribute to transportation end-use sector emissions (Figure 2).

There are three routes to reducing GHGs from transportation: (1) increasing the efficiency of vehicle technology, (2) changing how we travel and transport goods, and (3) using lower-carbon fuels (EPA, 2019). In particular, electric vehicles (EVs) offer the benefits of reduced GHG emissions and reduced reliance on fossil fuels. However, for much of the US, electric vehicle infrastructure is significantly underdeveloped and not yet built out to an adequate degree. As EVs become more prevalent, the infrastructure of charging systems will become essential to accommodate the needs of the EV drivers on roads. EVs are charged at home, at work, or at publicly accessible charging stations. Throughout the country, particularly in Maryland, steps should be taken to promote the widespread shift to EVs through an appropriate provision of EV infrastructure and support systems.

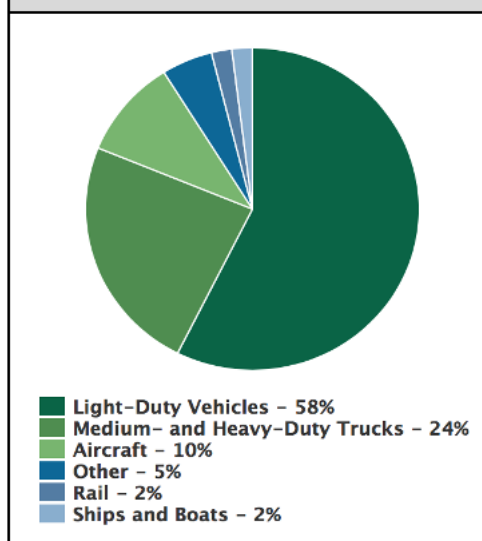
According to the Metropolitan Mayors Caucus and Green Ways 2Go (2020), EV readiness can be understood as “a condition of a local government and/or region to support strategic and safe investment by both the public and private sectors in electrification of transportation (p. 5).” In this sense, the term “EV Readiness” defines the broader set of ideas that covers the full gamut of considerations required to plan for, set policies, standardize processes and best practices, and more. Efforts to accommodate and encourage the adoption of EV technology are a sign of EV readiness. With adequate attention and sufficient understanding of challenges and hurdles in planning and implementation, combined with the preparation of resources, municipalities will be better positioned to implement projects more seamlessly. The creation of EV readiness plans, filled with strategies for adaptation, will allow for ease of transition to an EV-dominant transportation sector.

Figure 1. 2019 U.S. GHG Emissions by Sector



Source: U.S. Environmental Protection Agency (EPA) (2021).

Figure 2. 2019 U.S. Transportation Sector GHG Emissions by Source



*Note: Totals may not add to 100% due to rounding. Transportation emissions do not include emissions from non-transportation mobile sources such as agriculture and construction equipment. "Other" sources include buses, motorcycles, pipelines and lubricants.*  
 Source: U.S. Environmental Protection Agency (EPA) (2021).

During the Spring 2021 semester, a team of four students of the Urban Studies and Planning Program (URSP) in the School of Architecture, Planning and Preservation (MAPP) at the University of Maryland conducted a project to assess the readiness of Maryland municipalities and provide policy and planning recommendations to increase their EV readiness. This project examines EV readiness across several municipalities and identifies challenges and opportunities, using a three-pronged strategy described in the next section.

The overarching questions answered in this project are:

1. To what extent have local governments in Maryland planned and implemented EV readiness?
2. In what ways can they increase their EV readiness using Best Practices from other jurisdictions facing similar challenges?

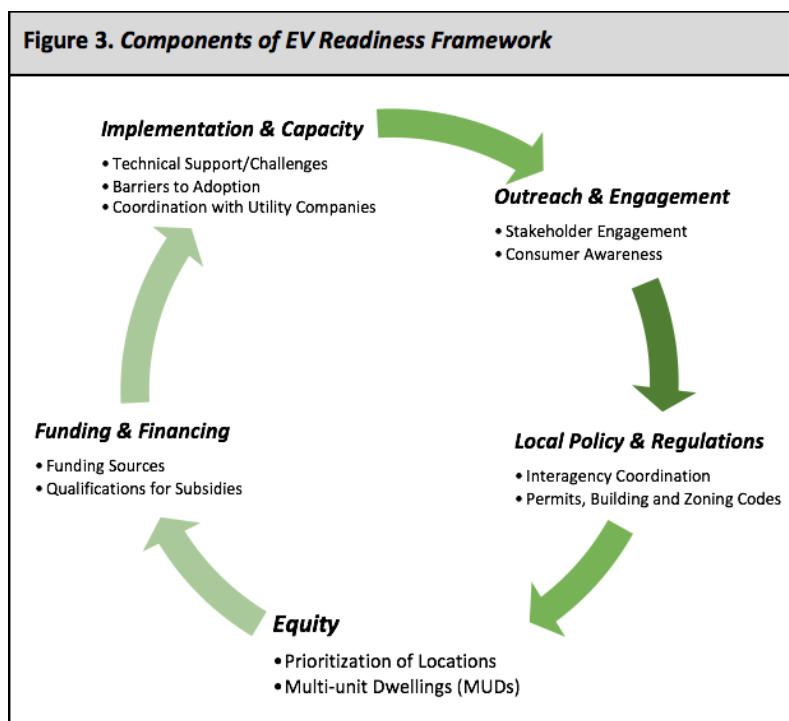
This document summarizes the project and its findings with a focus on highlighting the Best Practices from other jurisdictions across the country to provide practical policy and planning recommendations for municipalities in Maryland to consider. It includes a brief overview of the research methodology, followed by the major findings and recommendations.

## II. METHODOLOGY

A three-pronged research strategy was employed to answer the research questions, involving: (1) stakeholder interviews, (2) a systematic content analysis of existing EV readiness plans to examine EV readiness across several selected jurisdictions, and (3) a cross-comparison of findings from the interviews and the content analysis of plans to identify opportunities for Maryland municipalities in addressing and increasing their EV readiness.

### Stakeholder Interviews

To gauge the state of EV readiness, the project team conducted interviews with officials from the six municipalities in Maryland. These six municipalities were initially on the list of local contacts provided by the UMD Environmental Finance Center (EFC) and kindly responded to the interview request. In terms of geographic distribution, two municipalities are from each of the following three regions of Maryland: the Capital Region, Central Region, and the Eastern Shore Region.



Topics discussed include the current context of EV readiness across the municipalities in terms of existing practices and policy, barriers to adoption and implementation (funding, stakeholder reception, and support), equity in the EV infrastructure planning process, and stakeholder engagement and partnerships. The interviews were not only vital in identifying common issues in the process of EV adoption, but also provided supplementary information and a framework for reviewing the EV readiness plans. The framework consists of five common themes or components identified among the interview responses regarding EV readiness.

<p>(1) The <b>Outreach &amp; Engagement</b> component refers to the local government’s involvement in stakeholder engagement with both public and private entities and consumer awareness campaigns to educate residents.</p> <p>(2) The <b>Local Policy &amp; Regulations</b> component refers to existing implementation plans and policies related to interagency coordination, public and private incentives for EV adoption, as well as permits, building and zoning codes.</p> <p>(3) The <b>Equity</b> component refers to not only the prioritization of locations for EV charging infrastructure but also the inclusion of EV charging stations in multi-unit dwellings (MUDs) and disinvested areas.<sup>1</sup></p>	<p>(4) The <b>Funding &amp; Financing</b> component refers to the wide range of financing and funding options that exist for individuals, commercial fleets, and local governments to further EV readiness, including grant, rebate, and voucher programs.</p> <p>(5) The <b>Implementation &amp; Capacity</b> component refers to the operational implementation and capacity at the local level, which includes technical support and challenges, barriers to adoption, and coordination with utility companies.</p>
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### Content Analysis of EV Readiness and Infrastructure Plans

Using the EV Readiness framework described above, EV readiness and infrastructure plans from six jurisdictions across the country (Table 1) were reviewed to analyze primary practices and issues that are common for EV adoption and implementation.

Table 1. List of EV Readiness and Infrastructure Plans		
Jurisdiction	Year	Title
City of Frederick (MD)	2018	Plug-In Electric Vehicle Charging Infrastructure Implementation Plan for the City of Frederick
Metropolitan Washington Council of Governments (MWCOG) (DC)	2012	Electric Vehicles in Metropolitan Washington
Santa Monica (CA)	2017	Santa Monica Electric Vehicle Action Plan
City and County of Sacramento (CA)	2017	Electric Vehicle Readiness and Infrastructure Plan
Texas Triangle (TX)	2012	Texas Triangle Plug-in Electric Vehicle Readiness Plan
City of Aspen (CO)	2017	Aspen Community Electric Vehicle Readiness Plan

### III. MAJOR FINDINGS & RECOMMENDATIONS

This section highlights the main findings and provides recommendations for EV adoption and infrastructure development, based on the EV Readiness framework with the five components. Most of the findings and recommendations focus on elements necessary in the early stages of adoption and implementation, which is the case for many Maryland municipalities. Further, these recommendations also address the needs identified by the interviewees when asked about what additional support from

<sup>1</sup> For more information on EV infrastructure equity in Maryland, explore an interactive StoryMap that analyzes the distribution of alternative fuel stations, the locations of alternative fuel corridors, the amount of existing EV ownership, and the equitable deployment of EV infrastructure across the state (<https://arcg.is/1S0GeC>). The StoryMap was created by another team of students: Daniella C. Acosta and Luke S. Benson.

the state, regional, or other public/private sector actors would enable them to manage EV expansion efforts better in the near future.

Table 2. Summary of Findings and Recommendations
<p style="text-align: center;"><b>Outreach &amp; Engagement</b></p> <p><b>FINDING</b> Communication about readiness planning and community education is key to EV readiness planning success. Regardless of the level of public demand for EV adoption and charging infrastructure, municipalities should prioritize conducting consumer awareness campaigns to help community members understand the benefits of EVs and learn about how the region is supporting EV adoption.</p> <p><b>RECOMMENDATION</b> Promote and fund the ongoing creation of outreach materials and programs to educate the public about EVs and local EV conditions. Education materials can include brochures, websites, mobile apps, online videos, etc. Public events can consist of festivals, workshops, and technology demonstrations, like ride-and-drives. These events allow for public feedback and can help gauge the level of interest. In addition, promote and build community partnerships with local businesses and organizations for greater public outreach.</p> <p><b>BEST PRACTICE EXAMPLE</b></p> <ul style="list-style-type: none"> <li>• <u>Middletown, MD</u>: Middletown Green Expo is the annual Middletown Earth Day gathering where various events bring together many diverse organizations and businesses and inspire residents to Go Green. <a href="https://www.greenmiddletown.com">https://www.greenmiddletown.com</a></li> </ul> <p><b>FINDING</b> EV readiness efforts among local municipalities in Maryland can benefit from regional coordination and support from surrounding areas. The larger cities tend to be further ahead in EV adoption and implementation, while the smaller cities and towns are lagging.</p> <p><b>RECOMMENDATION</b> Build and strengthen regional partnership for coordination of efforts and data sharing. Several municipalities in Maryland are members of the Metropolitan Washington Council of Governments (MWCOCG), which oversees the National Capital Region Transportation Planning Board and its regional transportation priorities. Information gathered from this partnership should be disseminated to other Maryland municipalities that may also benefit.</p>
<p style="text-align: center;"><b>Local Policy &amp; Regulations</b></p> <p><b>FINDING</b> Jurisdictions need to understand the EV-charging needs of their stakeholders and how to meet those needs best. However, critical data are not being collected, and/or access to pertinent data is limited.</p> <p><b>RECOMMENDATION</b> Promote and fund conducting a self-assessment of existing EV readiness using the Department of Energy’s Plug-In Electric Vehicle Readiness Scorecard (<a href="https://www.afdc.energy.gov/pev-readiness">https://www.afdc.energy.gov/pev-readiness</a>) or other similar assessment tools. Once an initial assessment is made, municipalities can move forward to determine the types and amounts of infrastructure needed, based on existing conditions using the DOE’s Electric Vehicle Infrastructure Projection Tool (EVI-Pro) (<a href="https://afdc.energy.gov/evi-pro-lite">https://afdc.energy.gov/evi-pro-lite</a>) or other similar projection tools.</p> <p><b>FINDING</b> Jurisdictions need to ensure their ordinances and codes allow for streamlined processes to reduce the soft costs of Electric Vehicle Supply Equipment (EVSE) installation and provide convenient accommodations for EV charging.</p> <p><b>RECOMMENDATION</b> Refer to and utilize resources that provide model ordinances or code as a tool for standardizing text and simplifying the process.</p> <p><b>BEST PRACTICE EXAMPLE</b></p> <ul style="list-style-type: none"> <li>• <u>Puget Sound Regional Council (PSRC), WA</u>: <i>Electric Vehicle Infrastructure: A Guide for Local Governments in Washington State</i> <a href="https://www.psrc.org/sites/default/files/electric-vehicle-guidance.pdf">https://www.psrc.org/sites/default/files/electric-vehicle-guidance.pdf</a></li> </ul> <p><b>FINDING</b> Existing building and zoning codes are not equipped to respond to future EV infrastructure. Addressing EVs in the zoning and building code can help ensure that communities become EV ready. Zoning</p>

policies can be created for EVs that enable ease of charging throughout a jurisdiction, and building codes allow a community to incorporate EV readiness into the building process.

**RECOMMENDATION** Updating various municipal building codes to be able to respond to future installations. Municipalities can wait for a new update of the Maryland Building Performance Standards (MBPS) or amend their energy codes to include 2021 IECC guidelines. The EV-ready provisions in the 2021 IECC, when finalized, will offer officials across the country a ready-made, nationally consistent approach to ensuring new buildings are ready for vehicle charging.

#### **BEST PRACTICE EXAMPLE**

- Santa Monica, CA: The 2015 Zoning Update included mandates for new development, remodel, or expansion projects, which state that all new developments, including remodels, must have one charging station for every 25-49 parking spaces and two charging stations for 50-99 parking spaces. One additional charger is required for each additional 50 spaces. (9.28.160 Electric Vehicle Charging Stations, pg. 3.94)  
[https://www.smgov.net/uploadedFiles/Departments/PCD/Zoning/z%20ZO%20Updated%20Final%20Full%20Document%20\(Mar%202017\).pdf](https://www.smgov.net/uploadedFiles/Departments/PCD/Zoning/z%20ZO%20Updated%20Final%20Full%20Document%20(Mar%202017).pdf)

### **Equity**

**FINDING** Several barriers exist that prevent disadvantaged communities from partaking in the benefits of EVs, such as low home and vehicle ownership rates.

**RECOMMENDATION** More prioritization of EV charging locations with a focus on targeting low- and middle-income areas as well as MUDs. Further, EV adoption among disadvantaged and lower-income communities can be supported by financial assistance for new and used EV purchases.

#### **BEST PRACTICE EXAMPLE**

- Sacramento, CA: The Community CarShare Program is a pilot currently underway between the Sacramento Metropolitan Air Quality Management District and two affordable housing developers to locate electric car share programs (PEVs and charging infrastructure).  
<http://www.airquality.org/residents/incentive-programs/community-carshare-program>
- State of California: The Clean Vehicle Assistance Program provides grants and affordable financing to help income-qualified Californians purchase or lease a new or used hybrid or electric vehicle.  
<https://cleanvehiclegrants.org>

### **Funding & Financing**

**FINDING** Funding is a top priority for localities in the preparation and installation of electric vehicle charging infrastructure. However, funding sources are often unpredictable and can vary from availability to strict eligibility requirements.

**RECOMMENDATION** Municipalities can create a Capital Improvement Plan (CIP) for EV charging infrastructure. The CIP plan can include hiring an EV coordinator who focuses on aspects of EV implementation, which include selecting locations for charging stations, public outreach, creating EV policies, and seeking additional outside funding to promote the city's EV goal.

**RECOMMENDATION** Municipalities can look to the state of California for ideas and strategies on expanding funding and financing options. California leads the way with plenty of diverse funding sources available.

#### **BEST PRACTICE EXAMPLE**

- California Energy Commission: California Capital Access Program EV Charging Station Program provides up to \$500,000 in loans and up to 15% rebates for small businesses and landlords to install EV charging stations for employees, clients and tenants. <https://www.grants.ca.gov/grants/california-capital-access-program-calcap-electric-vehicle-charging-station-evcs-financing-program/>
- California Alternative Energy & Advanced Transportation Financing Authority: The Property Assessed Clean Energy (PACE) Reserve Program is a property tax assessment. It creates a loan that provides



upfront financing to residential, commercial, and industrial property owners for EVSE equipment and installation costs. (AB-2597 Energy: PACE Program)

[https://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill\\_id=201320140AB2597](https://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=201320140AB2597)

### Implementation & Capacity

**FINDING** There are several areas where increased collaboration with utility companies is essential for EV readiness. However, the level of collaboration in partnerships between local governments and utility companies varies.

**RECOMMENDATION** Establish and support partnerships with utility providers by collaborating to promote transportation electrification and educating EV users about utility programs. Better coordination between local governments and electric companies can be sustained with formal agreements, which should include assistance with education, funding for infrastructure, and consumer incentives.

## IV. CONCLUSION

As EVs become more prevalent, localities must adapt. EV infrastructure provision will be a necessary component of a locality's growth moving forward. This project attempts to capture the necessary policies and tasks required to meet the fast-moving changes associated with innovations in EV technologies and mobility and changes in market demand. Implementing the recommendations provided above will help Maryland municipalities adapt to an EV-centric transportation sector while enabling them to respond to the dynamic nature of the increasingly integrated world of energy, mobility, and technology.

## V. ACKNOWLEDGEMENT

This summary report has been prepared by Brittany Wong and Hiroyuki Iseki, *Associate Professor of Urban Studies*, based on the project report produced by Philip Isaiah, Catherine Skeeter, Marta Woldu, and Ronnetta Zack-Williams in *URSP 688N Urban Transportation Planning & Policy*.

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