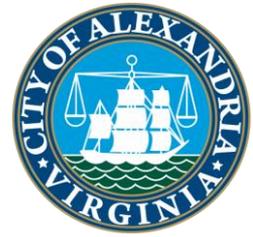


CADMUS



Electric Vehicle Charging Infrastructure Readiness Strategy

April 17, 2020

Agenda

Welcome & Introductions

Project Overview

Electric Vehicle Trends and Statistics

Preliminary Charging Location Analysis

Vision & Goals

Next Steps



Welcome & Introduction

Welcome & Introductions

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Project Overview

Related Plans & Initiatives

Environmental Action Plan

Adopted in July 2019

City Fleet
Electrification

DASH Fleet
Electrification

School Bus
Electrification

Alexandria Mobility Plan

Anticipated completion in late 2020/early 2021

Parking
Technology

Mobility Hubs

Curbspace
Management

Project Description

Purpose

Create roadmap that establishes vision, goals, and strategies for deploying EV infrastructure for residents, workforce members, and visitors in Alexandria.

Development Timeline

February 2020 to July 2020

Release of Report

Summer-Fall 2020

Public Input Opportunities

Meeting	Objective	Timeline
Virtual Meeting: <i>Charging Needs Assessment</i>	<ul style="list-style-type: none">• Introduce project• Level-set electric vehicle knowledge• Describe goals and vision	April 17th
Public Feedback: <i>Charging Needs Assessment</i>	<ul style="list-style-type: none">• Receive public input on charging needs in City of Alexandria	May
Public Engagement: <i>Draft Report</i>	<ul style="list-style-type: none">• Receive public input on draft <i>Electric Vehicle Infrastructure Readiness Strategy</i>	July

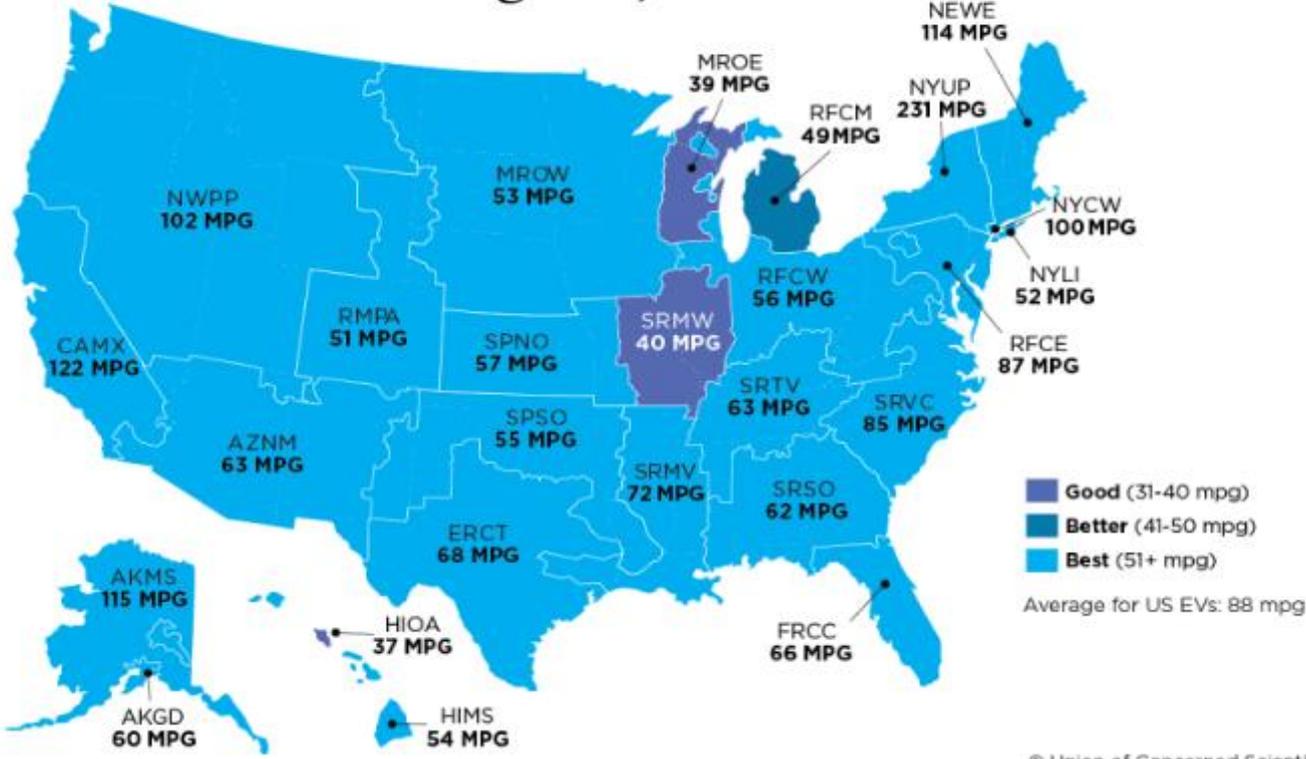


Electric Vehicle Trends and Stats

Emissions Equivalency in MPG

Driving an EV in Alexandria produces the equivalent greenhouse gas emissions as driving a **85 MPG car**. This will continue to improve into as the grid moves towards renewables

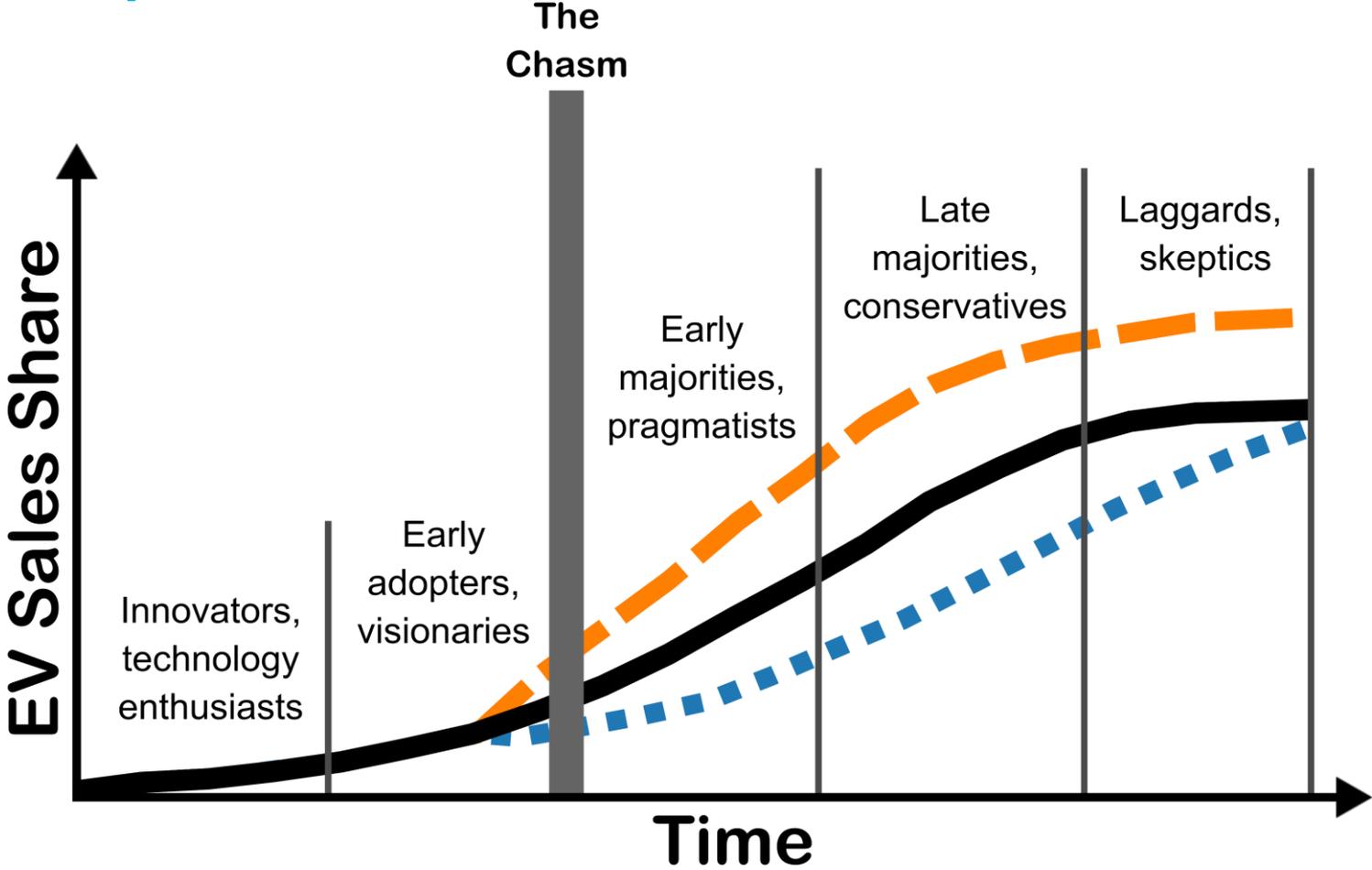
EV Emissions as Gasoline MPG Equivalent Average EV, 2018



© Union of Concerned Scientists

SOURCE: Union of Concerned Scientists, <https://blog.ucsusa.org/dave-reichmuth/are-electric-vehicles-really-better-for-the-climate-yes-heres-why>

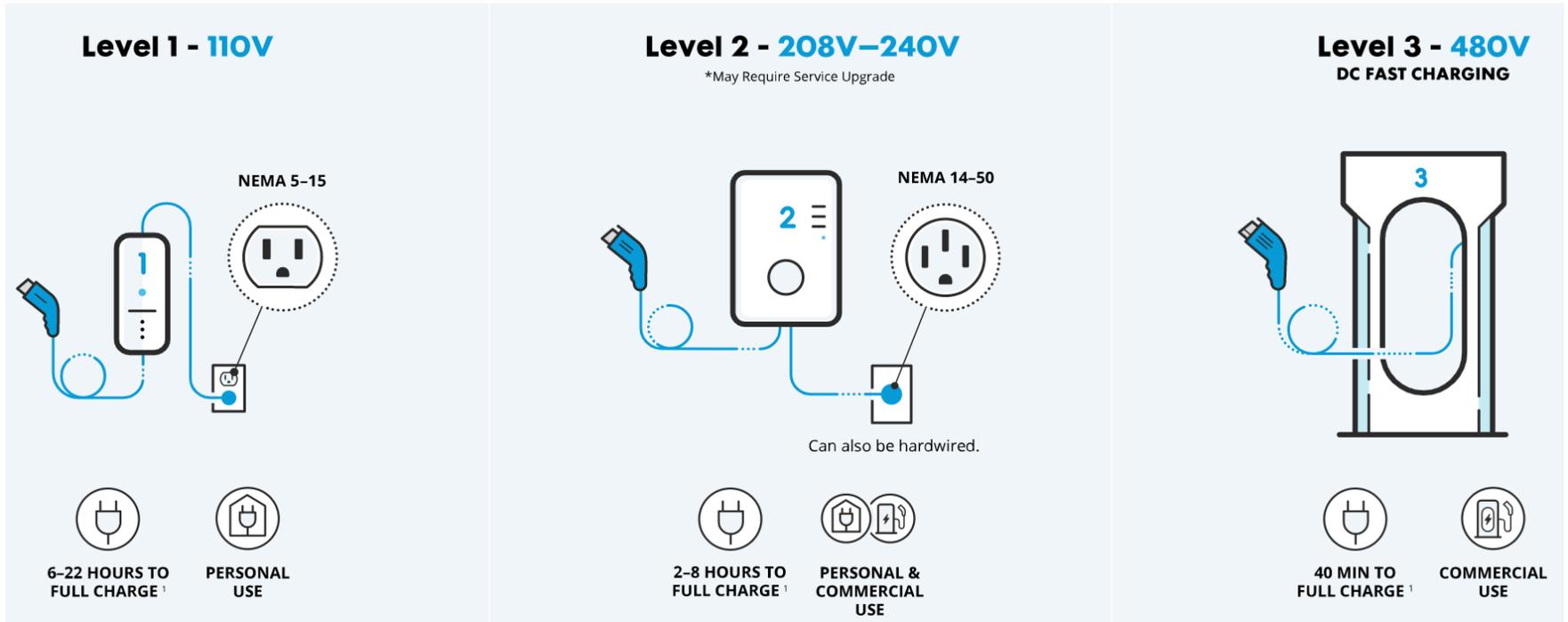
EV Adoption Curve



Through smart deployment of chargers, the City of Alexandria will shift adoption from the blue dotted line to the orange dashed line.

Types of Chargers

Three main types of chargers used in most municipalities.

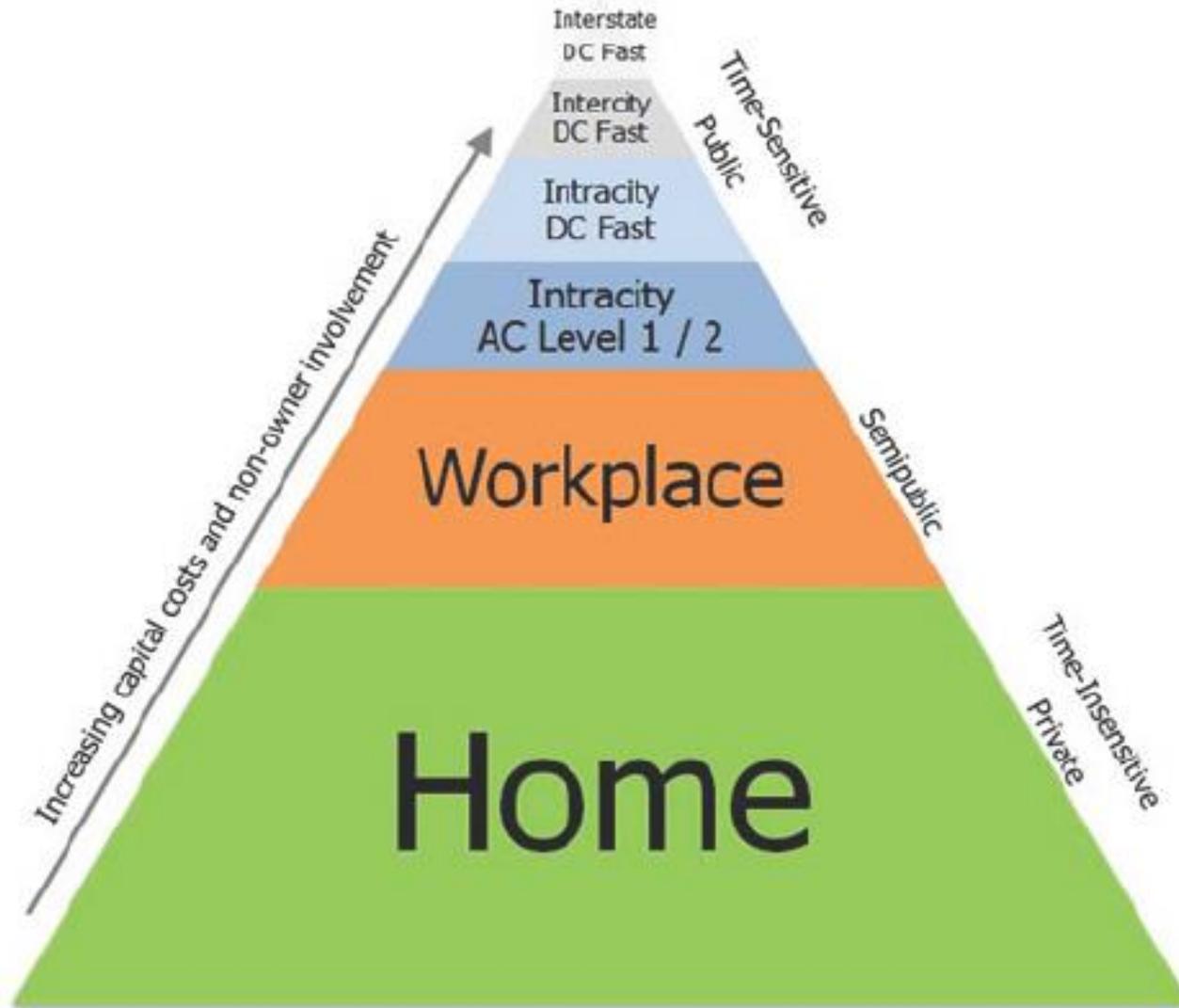


Source: <https://www.coned.com/en/our-energy-future/technology-innovation/electric-vehicles/how-to-charge-your-electric-car>

Three main categories of chargers. Level 1 are least expensive. Level 2 tend to cost \$1,000-\$5,000. Level 3 (or fast chargers) are \$45-\$150K.

Where to Install Chargers

Most people think in terms of the “charging pyramid” (i.e., priority should be home, work, public, fast charge)



Considerations when Installing Chargers

Topic	Key Question	Possible Answers
Station user	Who is the targeted user of the station?	<i>Employee, resident of multi-family dwelling, tourist, commuter</i>
Dwell time	How long will users stay at the charging location?	<i>15 min to many hours</i>
Site host for station	Who will be the site host?	<i>City property, business park, private garage, commercial property</i>
Owner-operator	Who will own the station?	<i>City property, business park, private garage, commercial property</i>
Charger type	What type of charger?	<i>Level 1, 2, or 3</i>
Plugs per site	How many plugs per site?	<i>1-4 is common in public and workplaces</i>
Parking enforcement	How to ensure turnover of parking spot? How to ensure gasoline vehicles do not use spot?	<i>Pricing or penalties, signage, law enforcement</i>

Snapshot of Alexandria

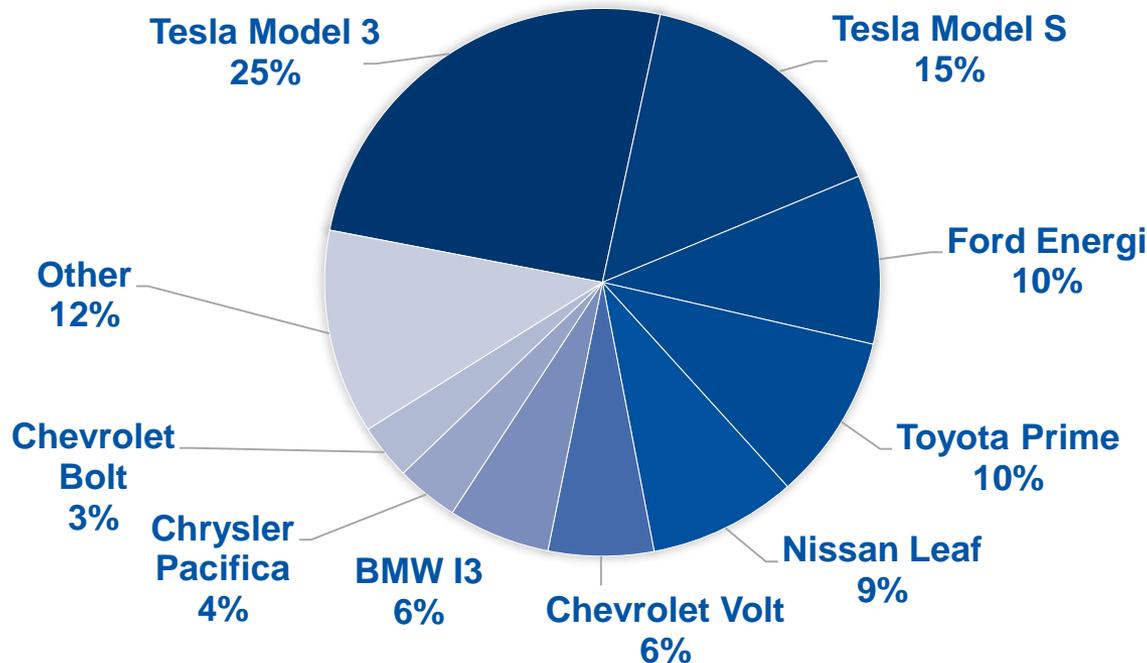
Alexandria leads other parts of the country in EV deployment. Teslas account for 40% of vehicles.

522 EVs

Plug-in electric vehicles in Alexandria as of 2020 (57% are BEVs)

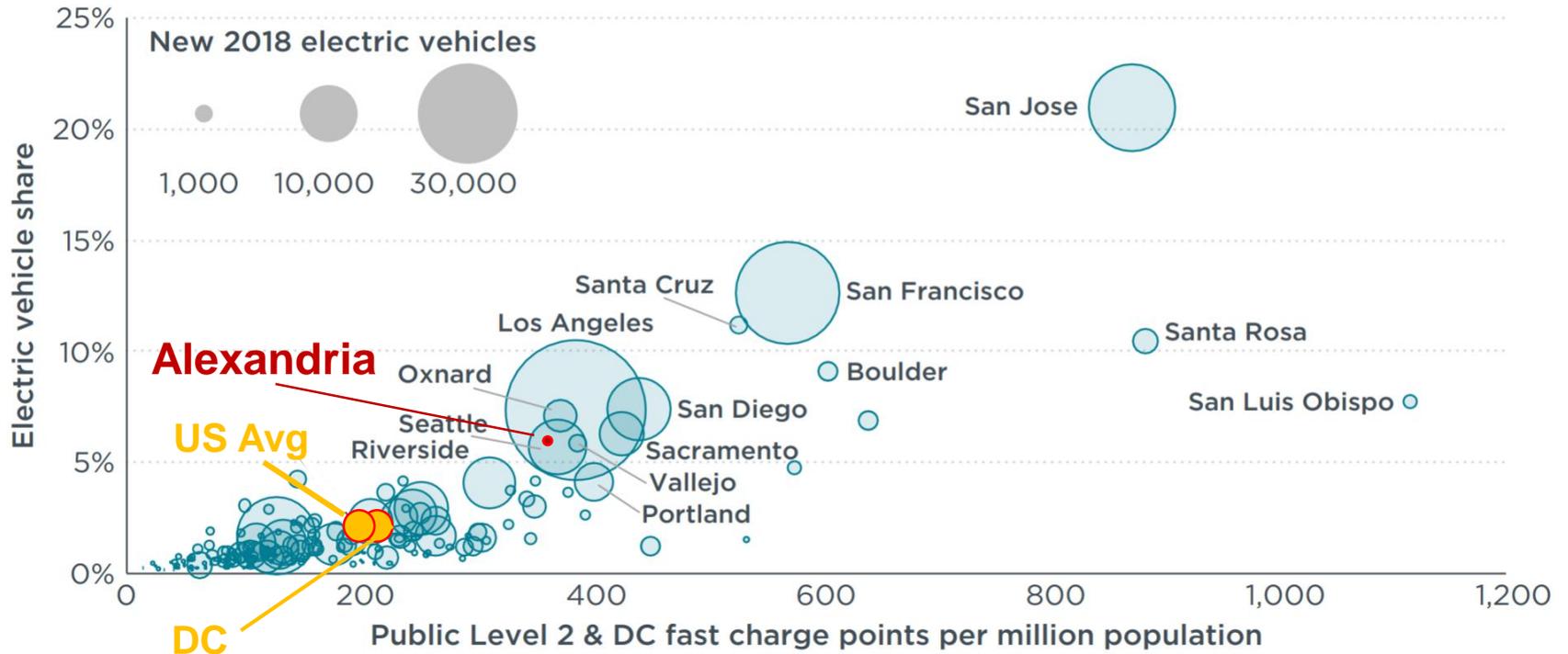
6%

New cars in 2019 in Alexandria are electric vehicles, compared to ~1% nationally



Charging Stations in Alexandria

Alexandria has higher EV and charger deployment than DC and US average



Fast Chargers

1 public station (1 plug)

Public Level 2

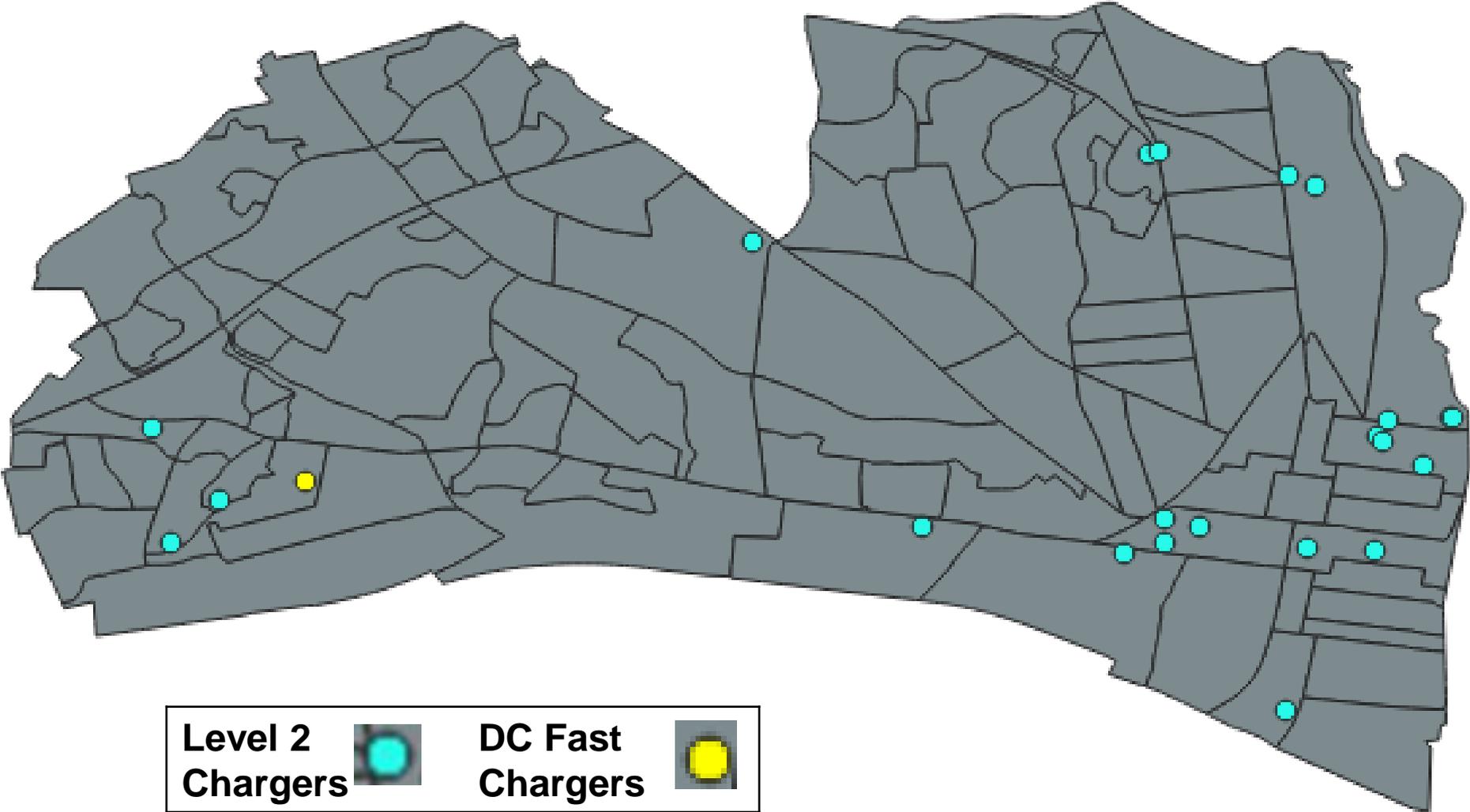
22 public station plazas (54 plugs), primarily in Eisenhower East and Old Town.

Source for # chargers: PlugShare, plugshare.com // Source for graphic: theicct.org/sites/default/files/publications/ICCT_EV_surge_US_cities_20190610.pdf

*According to NREL's EVI-Pro tool, <https://afdc.energy.gov/evi-pro-lite>

Existing Charging Infrastructure

Map of existing EV charging infrastructure with block groups in Alexandria



Summary Statistics

Alexandria-Arlington-DC Statistical Area

**2 adults
with kids**

Most common
household
composition of EV
owners in region.

8,810

Miles per Year for EV Drivers

Compared to ~10-12K for all vehicles

2.9

Vehicles per Household
for EV Drivers

Compared to 2.7 vehicles per household
for all drivers

SOURCE: 2017 National Household Travel Survey, <https://nhts.ornl.gov/>

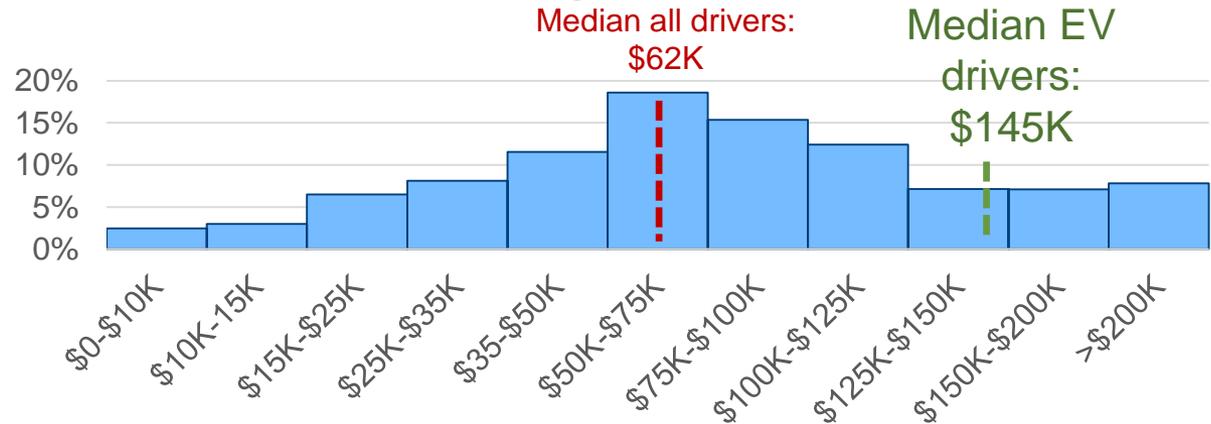
Summary Statistics

Alexandria-Arlington-DC Statistical Area

INCOME

57% of EV drivers in region have household incomes above \$200K (compared to 8% for all drivers)

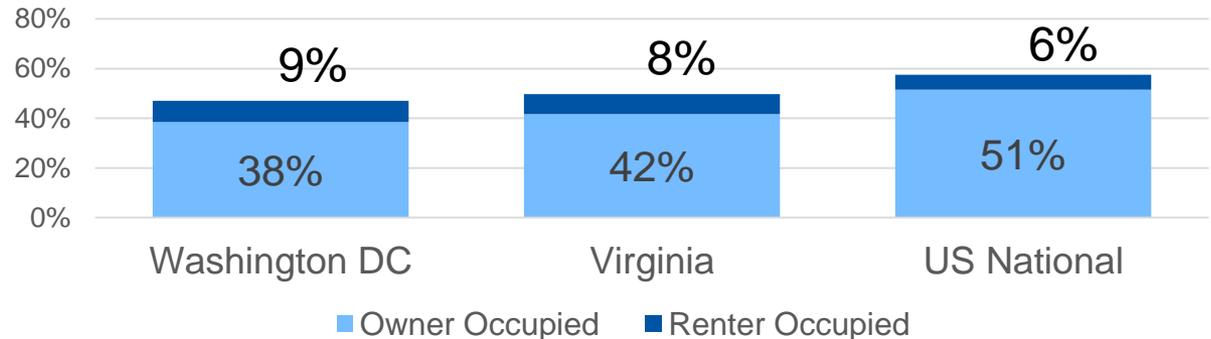
Income of All Drivers in Alexandria-DC-Arlington CBSA



HOME OWNERSHIP

86% of EV drivers in region own their homes. In Virginia, 50% of homes have a garage or carport.

Fraction of Homes with Garage/Carport





Preliminary Charging Location Analysis

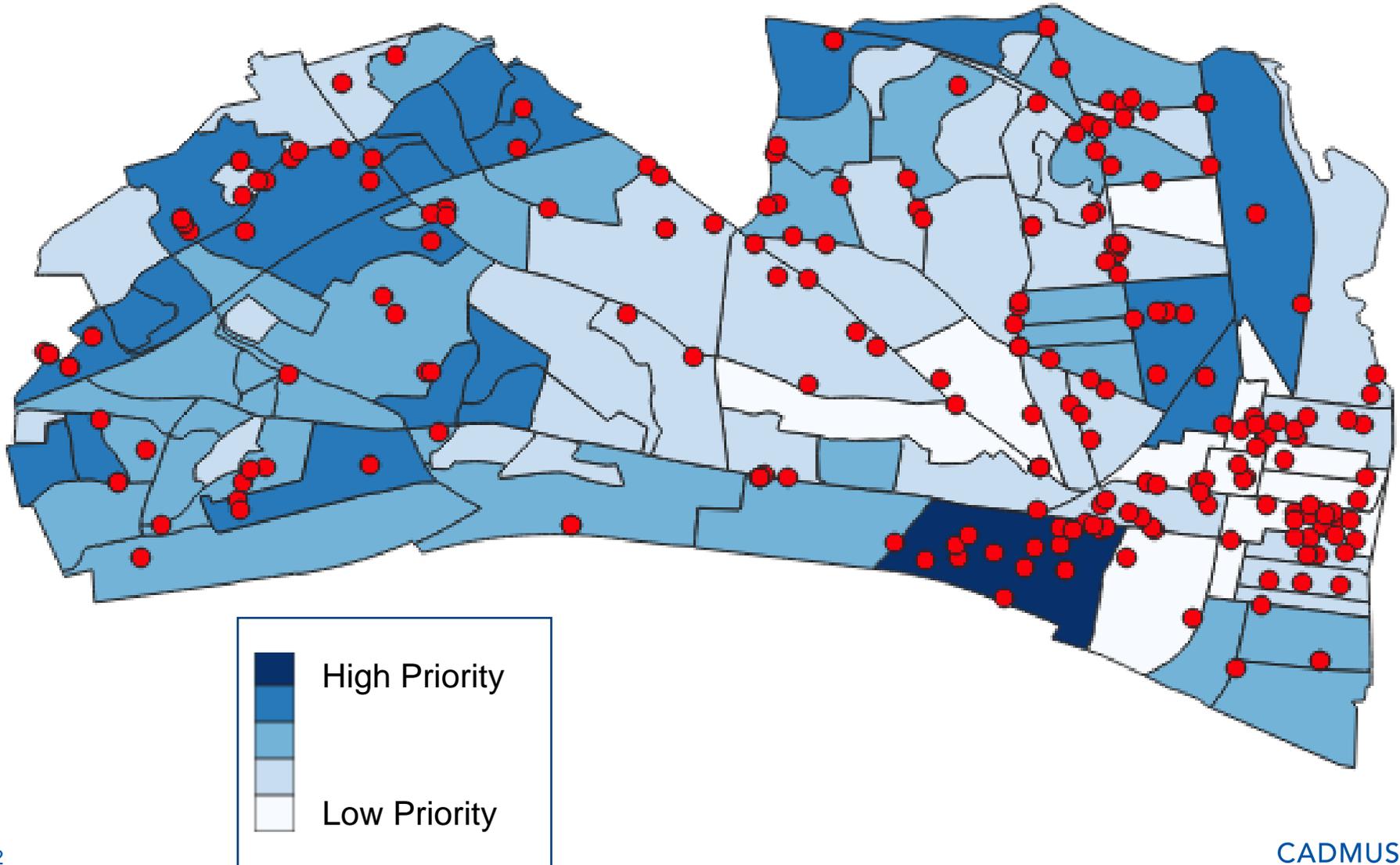
Preliminary Priority Scoring

City will develop a composite score for each block group through an iterative process

GIS Layer	Weight	Rationale for Including Layer
Number of Multi-family Buildings	50%	Residents of multi-family buildings have unmet demand for EV charging
Number of Renters	5%	Renters may have less ability to install EV chargers
Number of Car Commuters	5%	Commuters have higher need for chargers than non-commuters
Likelihood of buying an EV (based on HH income)	20%	Pairing chargers with locations with high EV adoption will ensure greater utilization of chargers.
Number of chargers within ½-mile radius	20%	Ensure chargers are adequately spaced

Preliminary Charging Location Analysis

Initial ranking of block groups based on priority score with sites of interest





Vision & Goals

How to Prioritize Sites for Chargers?

Example Criteria	How to Prioritize	Drawbacks
Equity	<ul style="list-style-type: none">• Ensure all citizens have a public charger within 5-min. walk of their home.	<ul style="list-style-type: none">• Some chargers will be very low demand
Cost Effectiveness	<ul style="list-style-type: none">• Install as many chargers as possible in City for given budget.	<ul style="list-style-type: none">• Could be a costly approach
Multi-Unit Dwellings	<ul style="list-style-type: none">• Work with developers & HOAs to prioritize chargers in condos/apts.	<ul style="list-style-type: none">• Draws potential City support away from other public sites
Business Parks	<ul style="list-style-type: none">• Work with businesses to prioritize chargers in business parks.	<ul style="list-style-type: none">• Draws potential City support away from other public sites



Next Steps

Next Steps

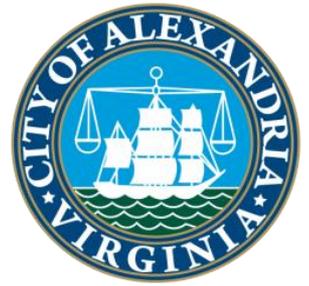
- In May, we will seek public input for charger locations and deployment strategies for EV charger deployment
- In July, we will have another public engagement opportunity around the draft EV Infrastructure Readiness Strategy
- In late summer/fall, the final EV Infrastructure Readiness Strategy will be released

Feedback and Input

We welcome your feedback and suggestions on the project. Please use the accompanying web link on the City's website to provide input on these questions:

- What are your goals and vision for this plan?
- What types of locations should be the highest priority for future EV infrastructure?
- What are unique barriers for Alexandria with regards to EV charging infrastructure?
- Who are right stakeholders to engage and provide further input on EV charging infrastructure?

Thank you



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A blue-tinted photograph of a business meeting. Several people in professional attire are silhouetted against a large window. Some are seated at a table, while others are standing and talking. A large, semi-transparent blue graphic element, consisting of overlapping curved shapes, is overlaid on the left side of the image.

Thank You