

Regional Electric Vehicle Infrastructure Implementation (REVII) Strategy



Draft Strategy Document

July 18, 2024

Agenda

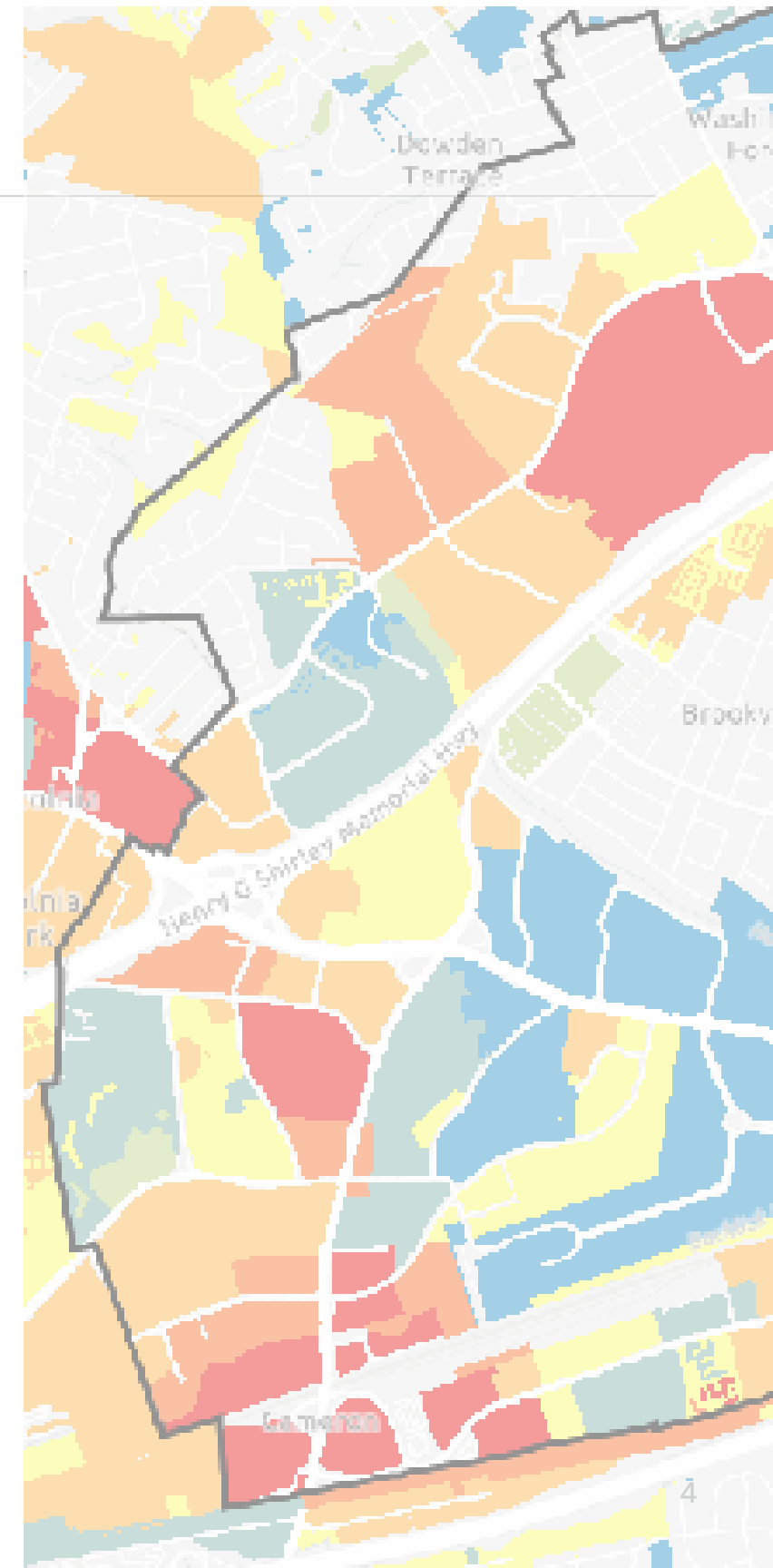
- Project Overview
- Light-Duty Electric Vehicle Registration & Charging Needs Forecast
- Light-Duty Electric Vehicle Charger Deployment Planning Analysis and Mapped
Connecting the Dots
- Draft REVII Strategy Document
- How to Navigate the Map
- Questions and Next Steps



Project Overview

Project Overview & Introduction

- **Light-duty electric vehicle registration projections for 2030, 2035, and 2045 by county and region.**
 - Three scenarios: low, medium, and high scenarios
 - Goal: plan for light-duty electric vehicle charging station demand
- **Develop light-duty electric vehicle charging station deployment location recommendations map**
 - Three scenarios for different priorities.
 - Goal: Help jurisdictions identify and prioritize parcels for light-duty electric vehicle charging station installations.
- **The analysis discussed today is final, but the strategy document is a DRAFT.**





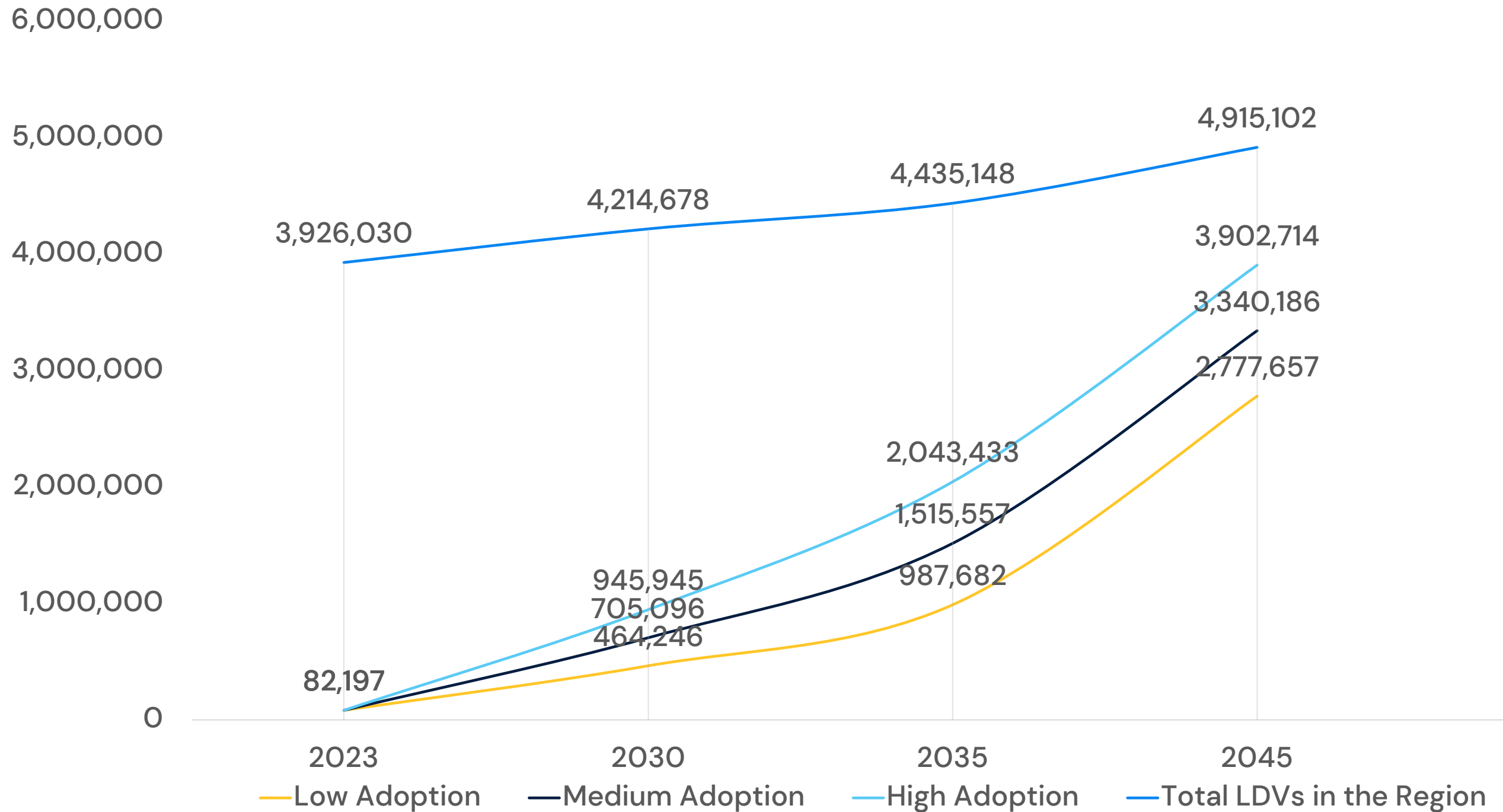
Light-Duty EV Registration Forecast

Projection Scenarios

- **Low:** Growth rate informed by historical vehicle registration data and knowledge of the jurisdiction, serves as a conservative estimate.
- **Medium:** Average of low and high scenarios.
- **High:** Advanced Clean Cars adoption; subsequent goal of approximately 80% EVs by 2045. This scenario serves as the maximum potential for EV adoption.
- MWCOCG historic vehicle registration data is used for years 2010–2020. Growth rates for observed electric vehicle registrations from MDOT and Atlas are used for 2021 and 2022.



Regional Light-Duty EV Projections by Scenario and Year



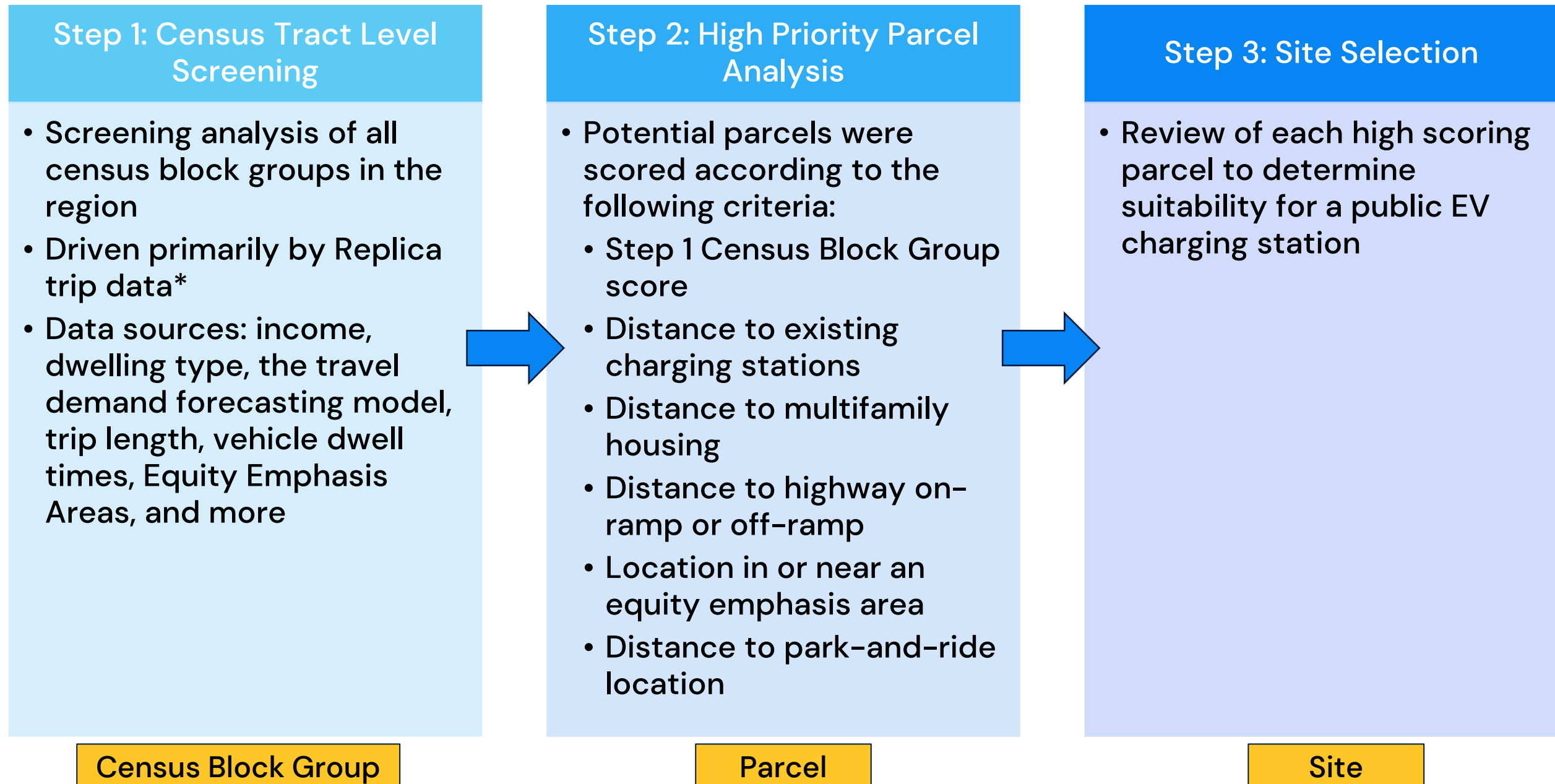
Projected Regional EV Charging Needs

Scenario		Charger Type	2030	2035	2045
Low	EV Charging Port Needs	Public Level 2	13,848	30,647	72,013
		Public DCFC	485	1,103	2,447
	<i>EVs</i>		464,246	987,682	2,777,657
Medium	EV Charging Port Needs	Public Level 2	21,840	44,333	86,936
		Public DCFC	785	1,538	2,955
	<i>EVs</i>		705,096	1,515,557	3,340,186
High	EV Charging Port Needs	Public Level 2	29,339	58,822	98,704
		Public DCFC	1,052	2,024	3,320
	<i>EVs</i>		945,945	2,043,433	3,902,714



Light-Duty EV Charging Station Deployment Priority Locations Map

Methodology Overview



Methodology Key Takeaways

Trip data is a driving force in determining site suitability

Parcel scores are heavily influenced by the CBG in which they are located

All parcels within the same CBG receive the same Step 1 score, which is then adjusted by proximity modifiers

Review high priority parcels *and* surrounding area for full context, especially if results are not intuitive

Three Analysis Scenarios

Prioritizing Direct Current Fast Chargers with High Utilization

- Serves as the reference scenario
- Focus: Building out direct current fast charging stations to serve a larger number of vehicles more quickly.

Prioritizing Level 2 Chargers with Equity Focus

- Focus: Building out Level 2 charging stations in equity emphasis areas.

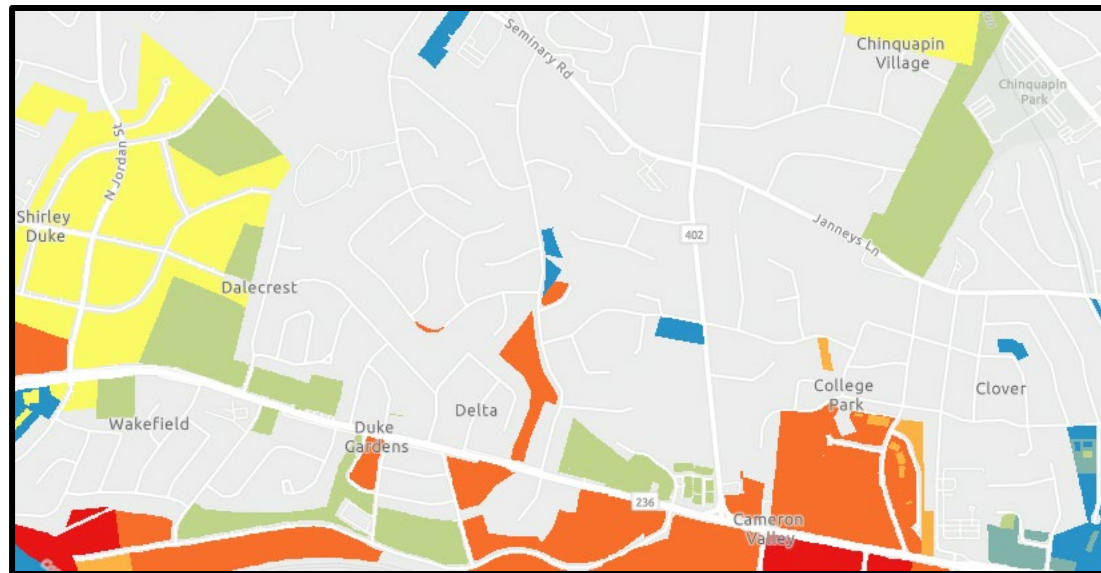
Prioritizing Direct Current Fast Chargers with Multifamily Housing Focus

- Focus: Building out direct current fast chargers in areas located near multifamily housing developments.

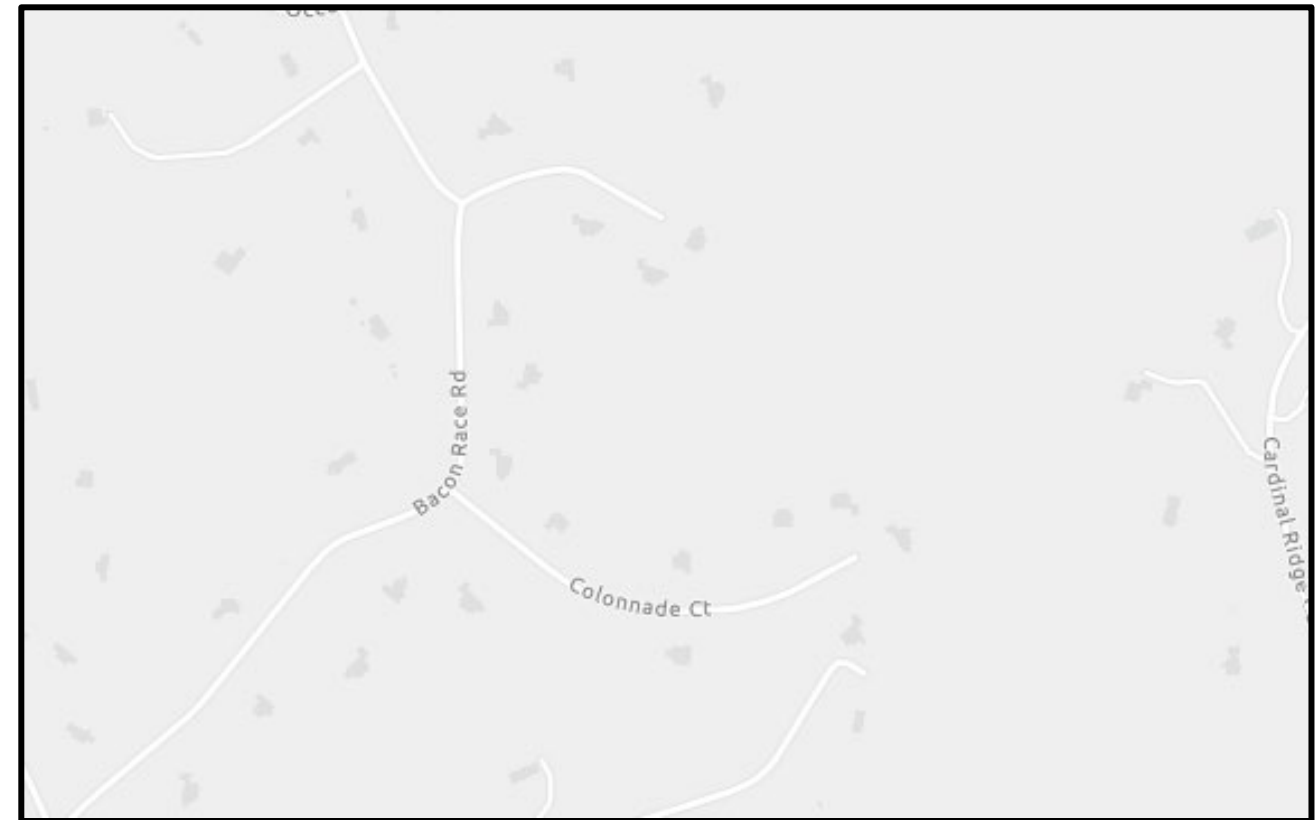
Parcels Excluded from Analysis

Not all parcel types were included in this analysis (grey areas)

- Single-family housing
- Railways
- Utility-owned parcels
- Agricultural
- Commercial/industrial



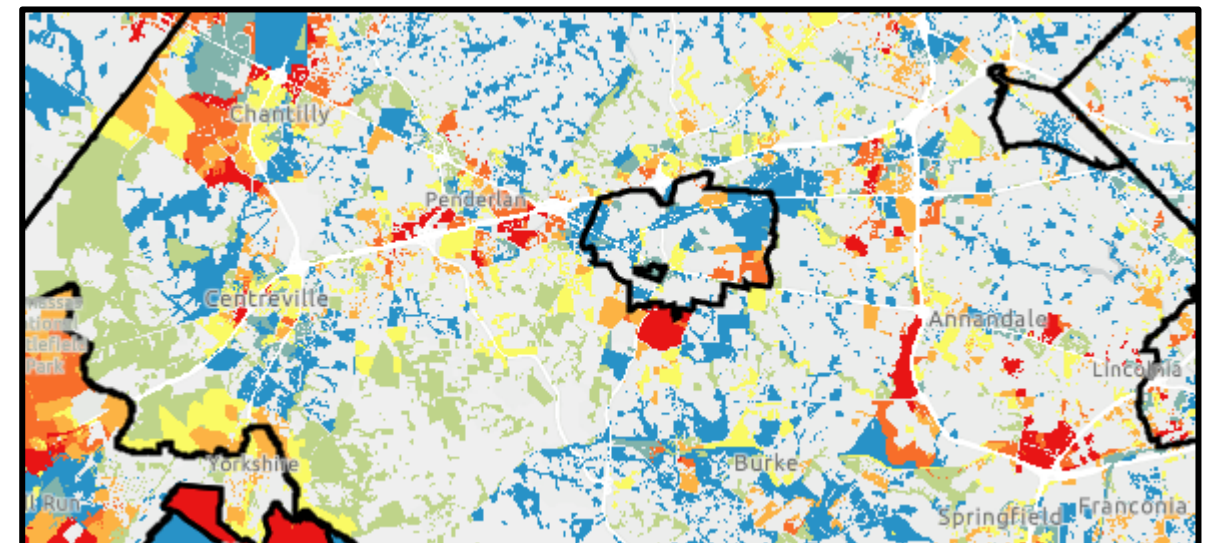
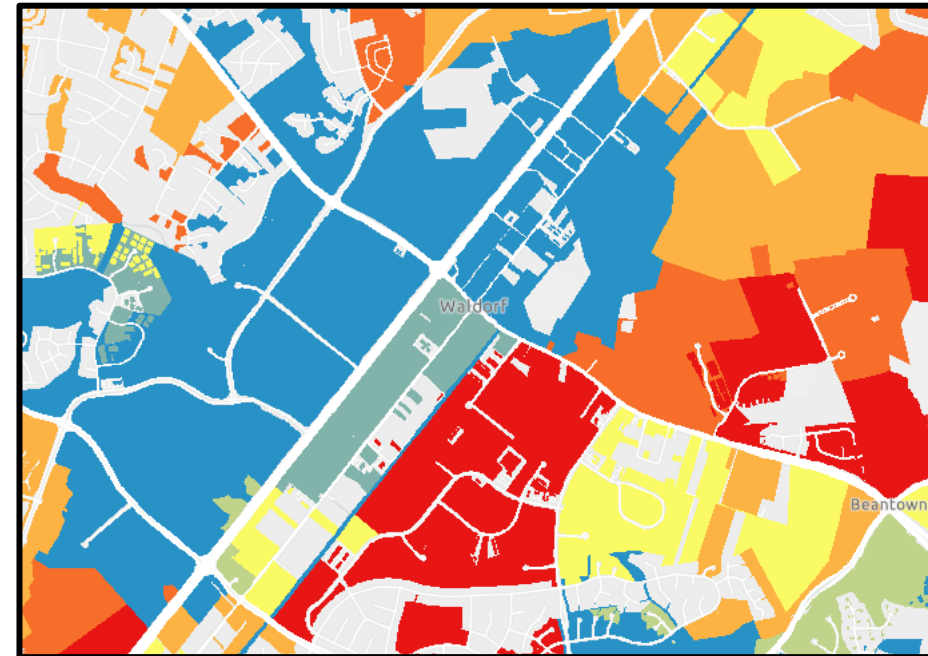
This screenshot shows parcels that were both included (color) and excluded (grey) from the analysis.



This screenshot does not contain any analyzed parcels.

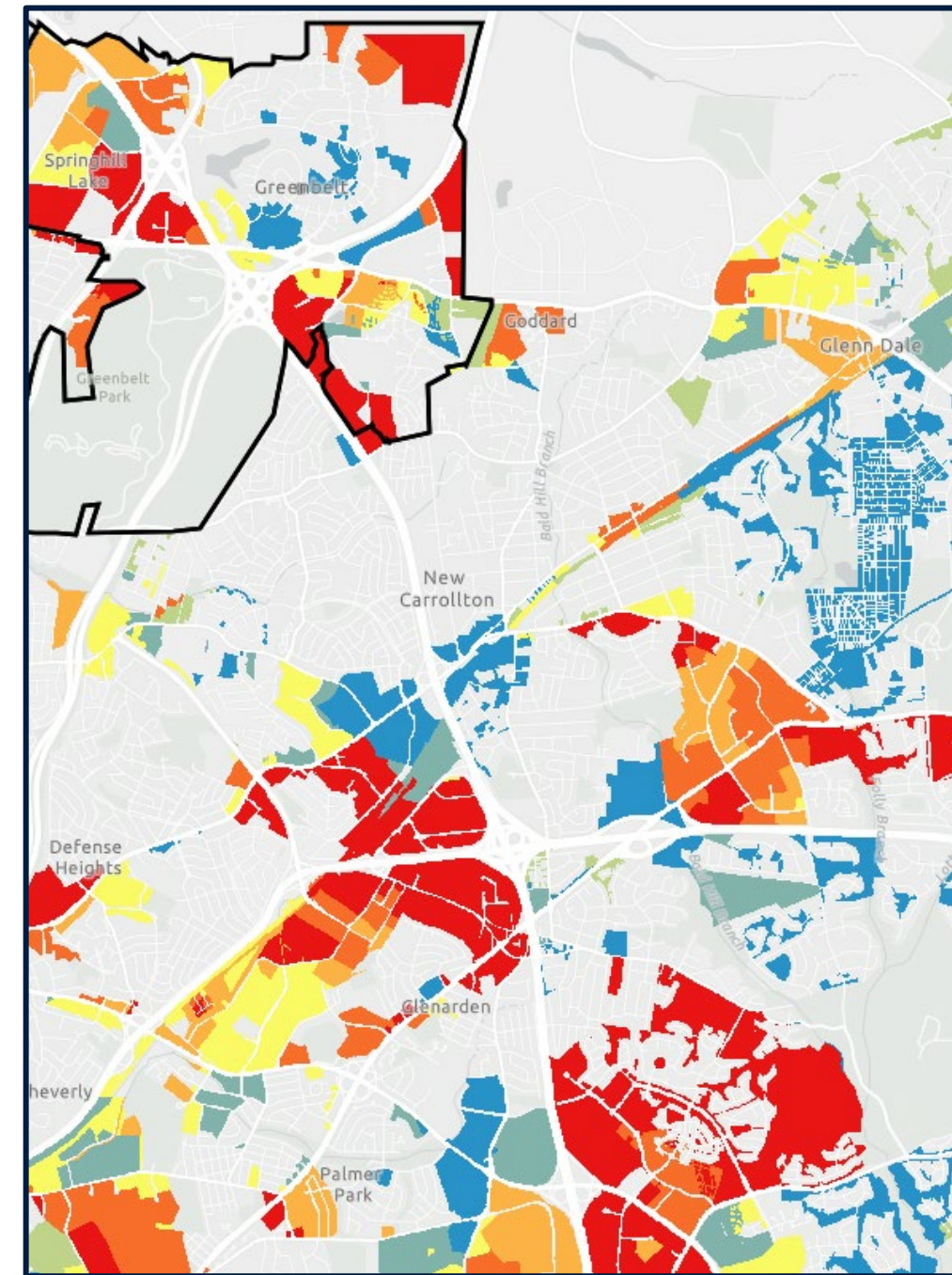
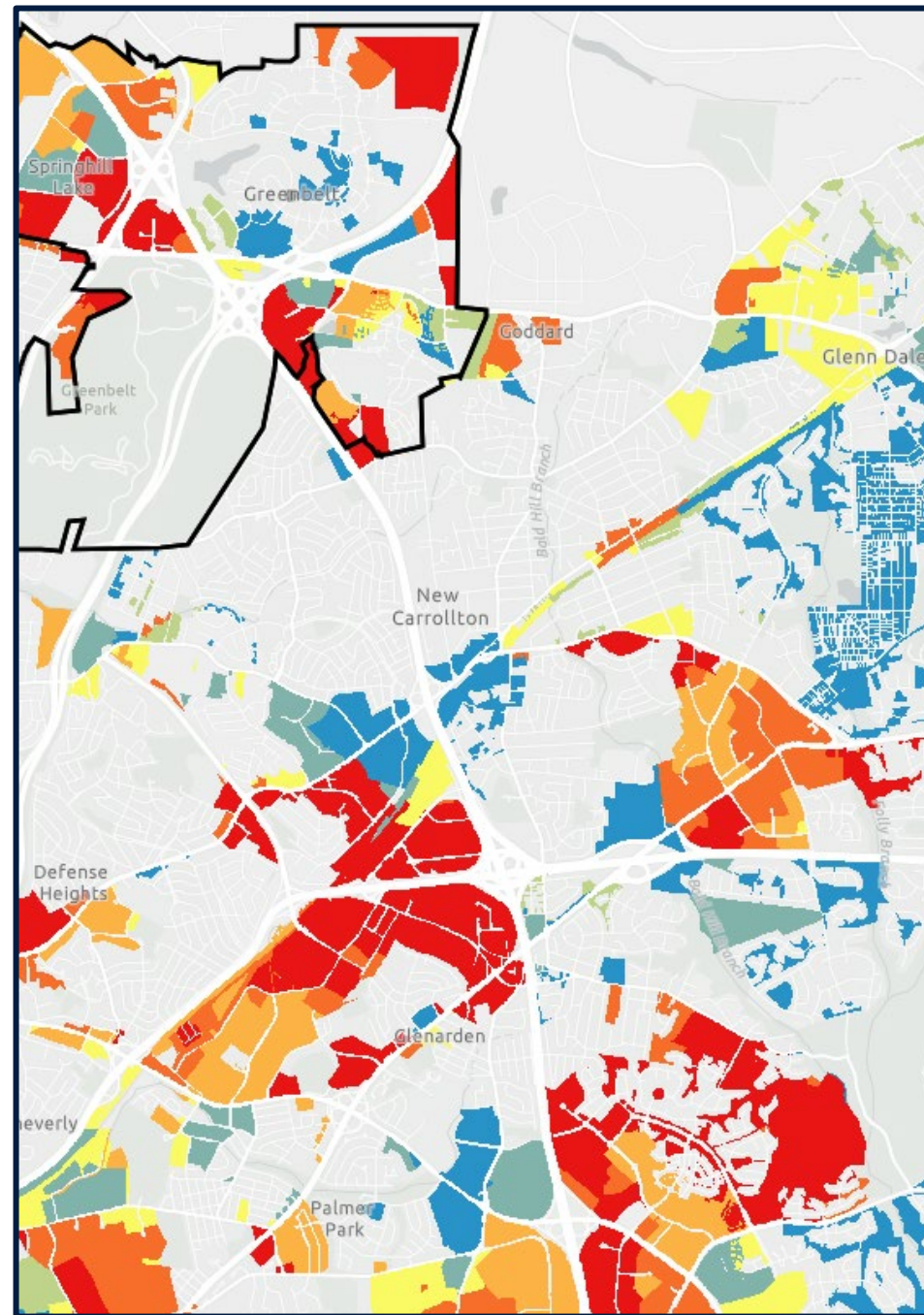
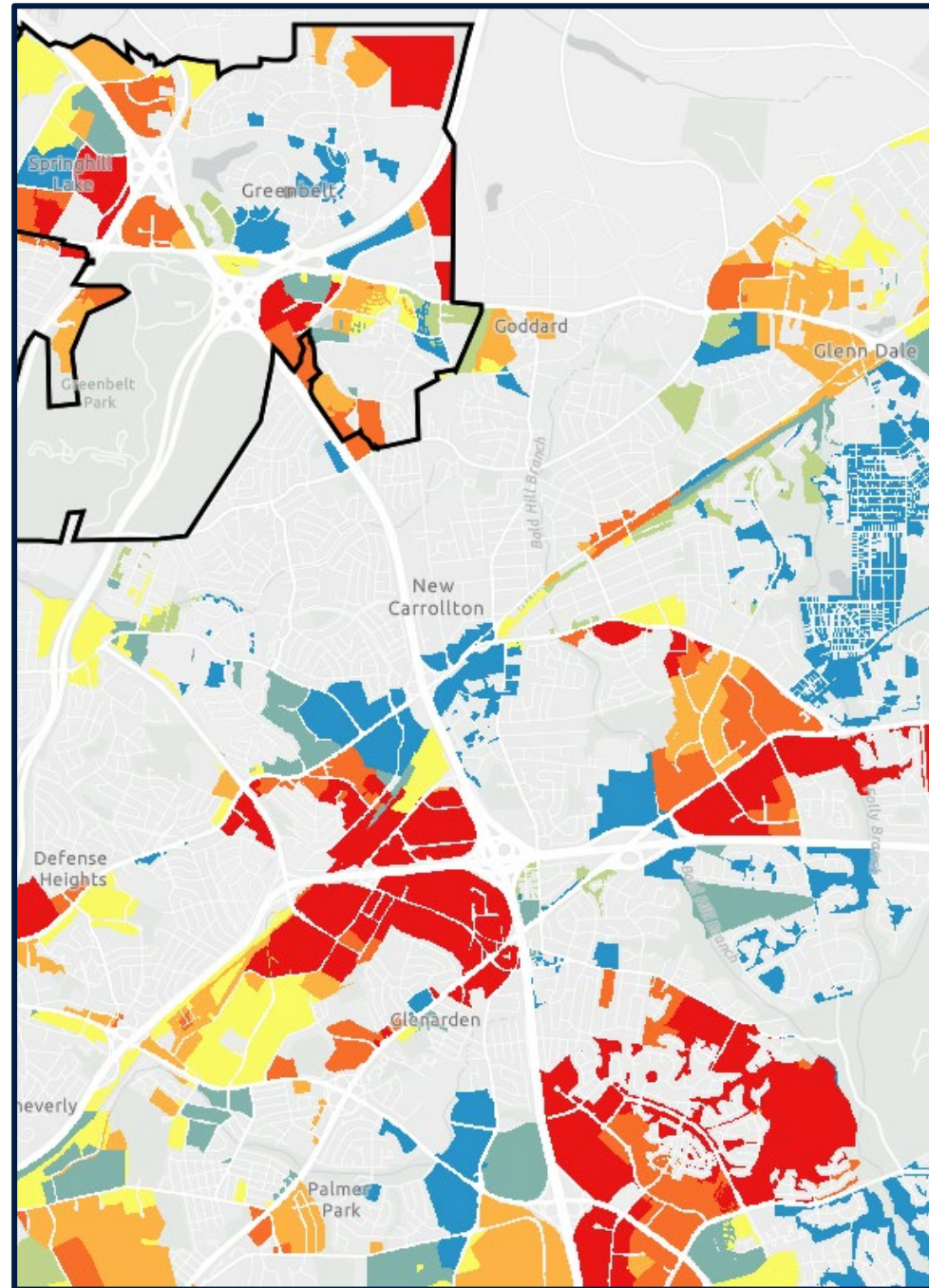
Three Parcel-Level Map Scores and Results

- Parcels are scored based on Step 1 scores and proximity score modifiers:
 - Score Increases: park-and-ride, multifamily housing, equity emphasis area, highway ramps
 - Score Decreases: existing charging stations
- Results for all three maps are displayed by priority.
 - Results are displayed in percentile scores
 - Highest ranking/priority: **Red**
 - Lowest ranking/priority: **Blue**
- Each set of scenario results may be viewed on the same online mapping platform.
- 27–33% of parcels score differently between each scenario.



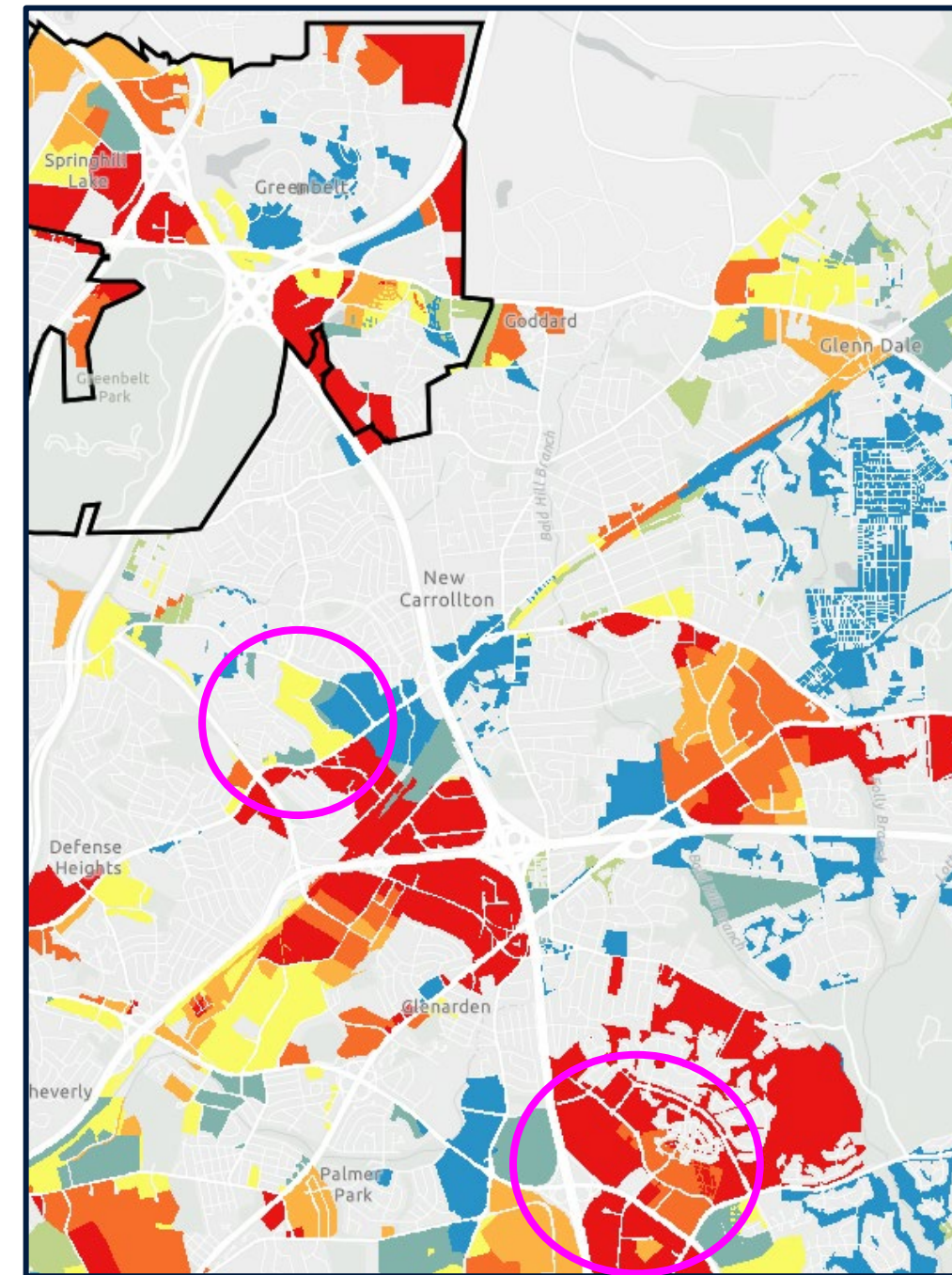
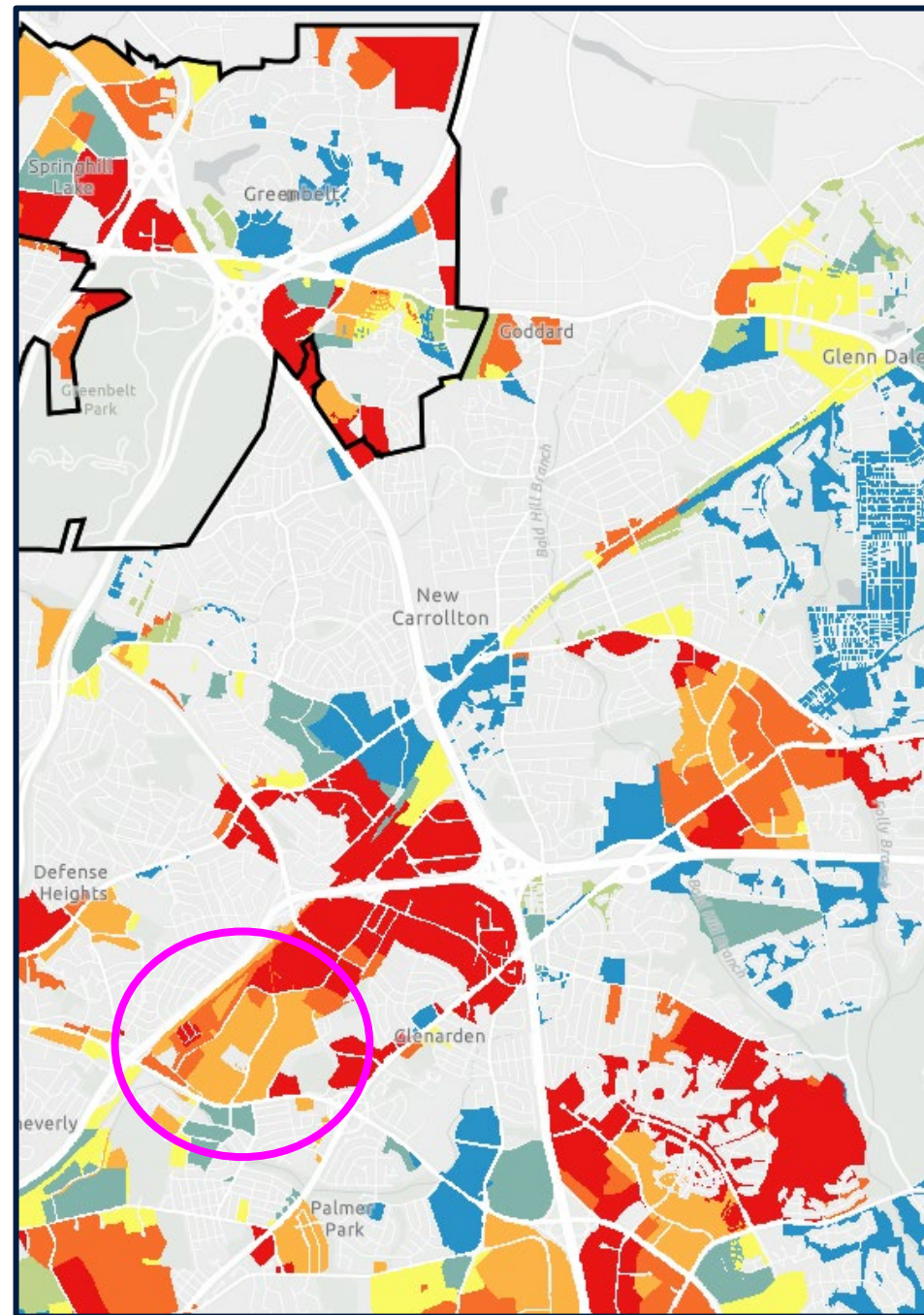
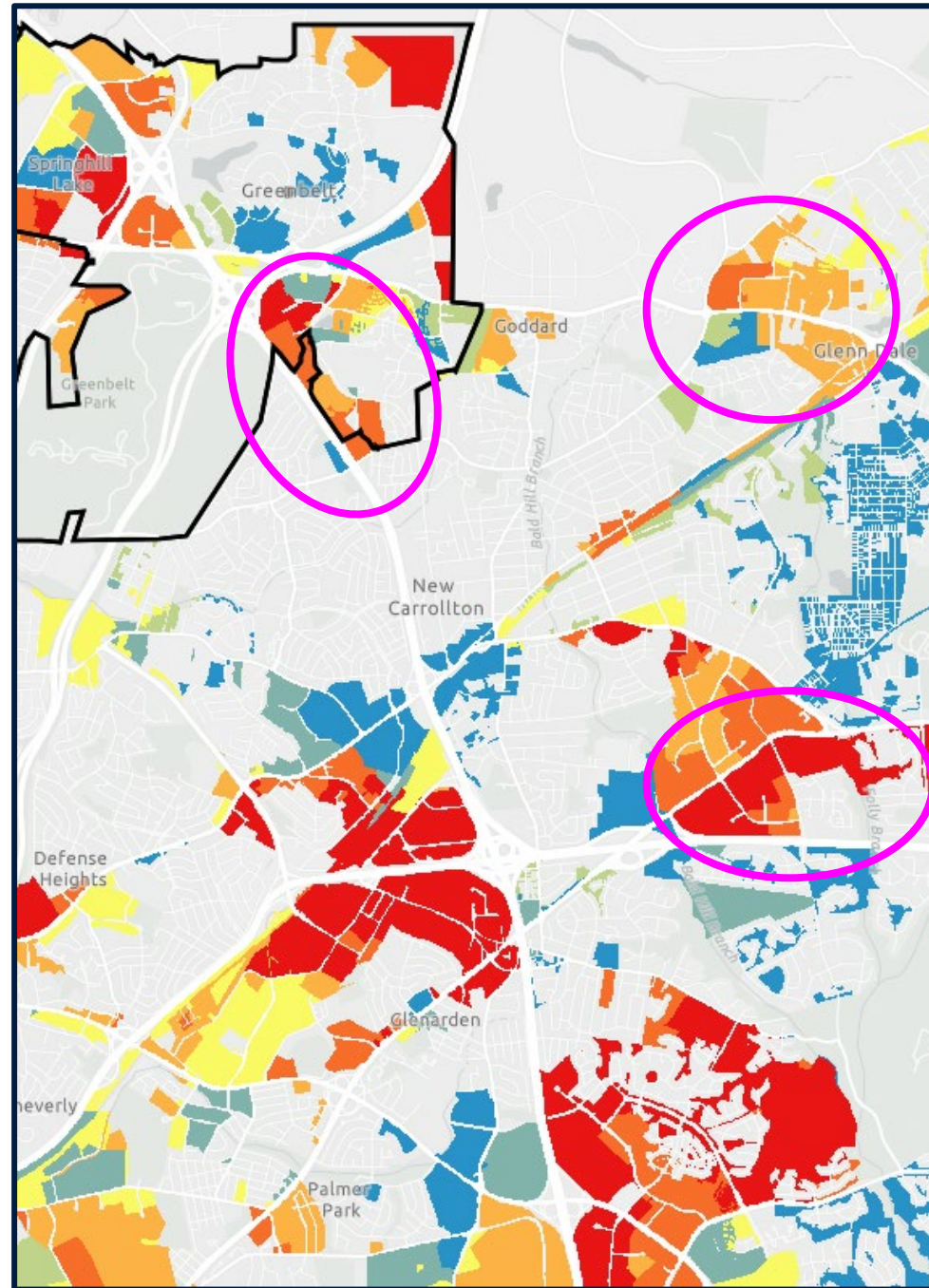
These screenshots show the results at different scales. The top image is zoomed in. The bottom image is zoomed out. Results will display in more granularity the closer you zoom in on the map.

Three Parcel-Level Map Results



These three images are screenshots of the same area but display different scenario results.

Three Parcel-Level Map Results





Connecting the Dots

Light-Duty EV Projections and Charging Station Priority Map

- Light-duty EV projections are used to calculate the approximate number of EV charging stations needed to support future EV adoption in the region
- The charging station priority map helps identify locations to deploy the estimated number of needed charging ports
 - The number of charging ports deployed and at which locations is up to the jurisdiction, these products serve as guidelines for deployment planning.
- You can use the map for any stage of your planning process:
 - Start your planning process by using the map to identify priority locations generally to help focus your planning efforts
 - Crosscheck against locations you have already flagged as high interest areas for charging station deployments
 - Select high priority parcels for in-depth charging station siting assessments (i.e., checking electrical conduit/infrastructure that exists or needs installed)

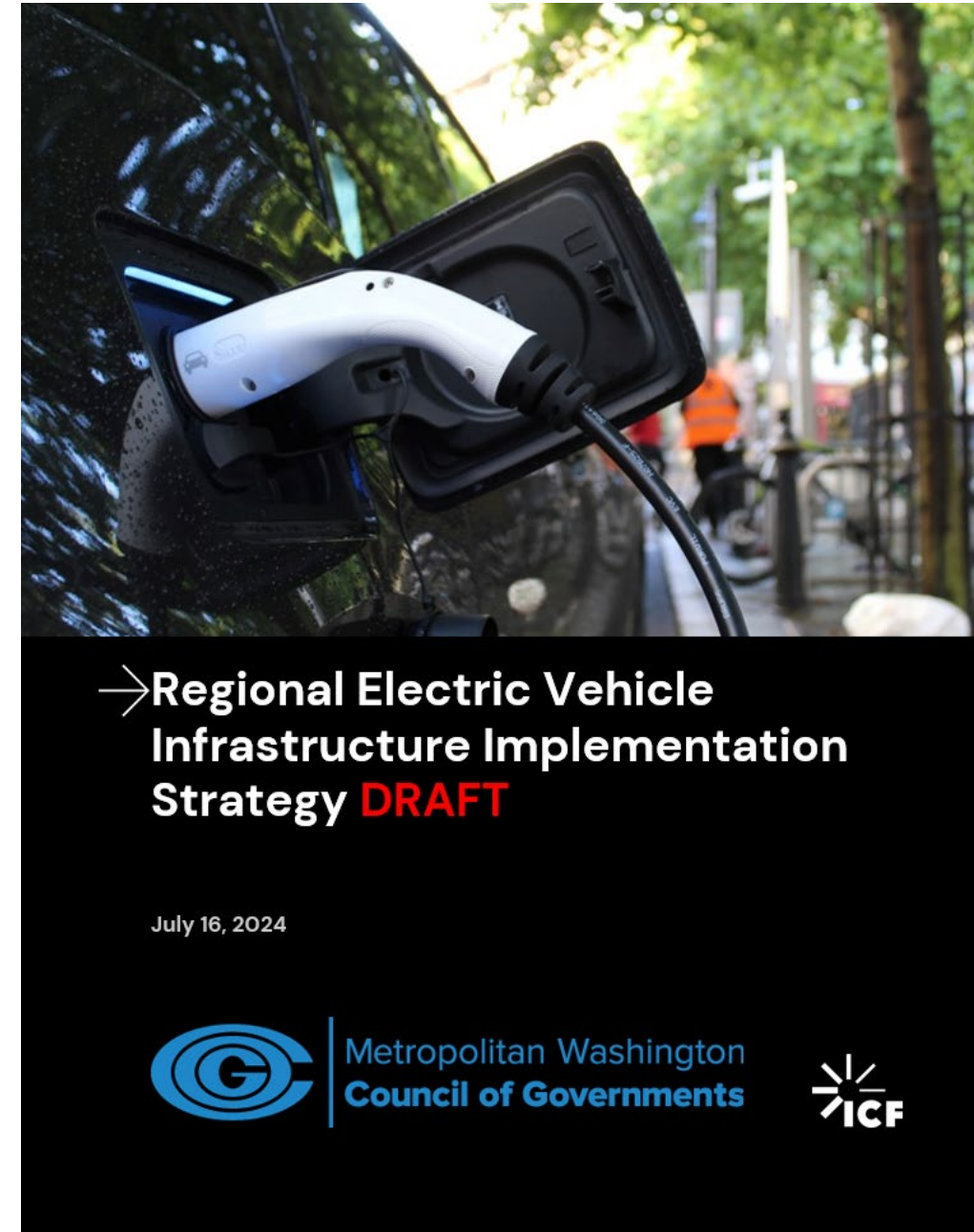
The analysis is regional. Jurisdictions should use this study in conjunction with local knowledge to determine the best path forward for deploying EV charging stations.



Draft Strategy Document

Strategy Components

- Executive Summary
- Background and Context
 - State of the Market
 - State of the Region
- Using the EV Charger Siting Analysis
 - How to use the REVII Strategy
 - Technical Approach
 - Limitations and Considerations
- Regional Results
- Jurisdictional Profiles
- Appendices



Jurisdictional Profiles

- Quick EV registration and EV charging port statistics
- Deployment progress
- EV registration projections
- Trends in EV adoption
- Projected EV infrastructure needs
- High-level image of the siting analysis results
- Site recommendations



Example Jurisdictional Profile: Charles County



Total EV Registrations*

1,812



EV % of Total LDVs

1%



Current EV Charging Ports

31 Level 2

5 DCFC



County Progress

Charles County developed a Climate Resilience Plan in 2020

*As of April 2024

Charles County

Maryland

EV and Charging Infrastructure Deployment Progress

Over the past few years, Charles County has taken the following actions to reduce GHG emissions and support EV adoption:

- In 2020, the county has created a Climate Resilience Action Strategy which is aimed to help them prepare for, adapt to, and recover from the impacts of climate change.
- Established the Climate Resilience Authority to administer the implementation of the Climate Resilience Action Strategy.
- Opened their first EV charger in 2021 in Lauren Spring Regional Park as part of the county's climate change initiative.
- Partnered with SMECO to install EV chargers at various locations across the county.

EV Registration Projections

At the end of April 2024, Charles County had approximately 1,800 registered EVs, accounting for 1% of total LDVs in the county. Table 7, below, shows the number of EVs and percentage of EVs in the LDV population for low-, medium-, and high-adoption scenarios at benchmark years 2030, 2035, and 2045. See Appendix 1.A for technical methodology of EV market growth projections.

Table 7. Charles County EV Registration Projections

Projection Scenario	2030		2035		2045	
	# EVs	% EVs	# EVs	% EVs	# EVs	% EVs
Low	7,850	5%	16,261	10%	44,958	25%
Medium	20,735	14%	44,903	28%	93,716	52%
High	33,620	22%	73,544	46%	142,473	79%

Trends in EV Adoption

Over the last five years, Charles County has made marked progress in launching GHG and EV initiatives. From 2020 to 2024 alone, the number of EVs on the road grew by almost 1,200 vehicles, a 298% increase in EV registrations. Similarly, after deploying their first charger in 2021, the county now has 36 charging ports available. Despite Charles County being a predominately rural area, this growth is expected to continue in the county as barriers to adoption are lowered, even in the low adoption scenario. In terms of infrastructure, EV chargers are currently concentrated in more densely populated areas along the US-301 corridor, with few chargers located within EEAs or in rural portions of the county. To ensure equitable access to EV charging infrastructure for anticipated EV adoption and to support higher EV adoption rates,

Example Jurisdictional Profile: Charles County

continued efforts are needed to deploy chargers in high-traffic populous areas, including considerations for EEAs and rural portions of the county.

Projected EV Infrastructure Needs

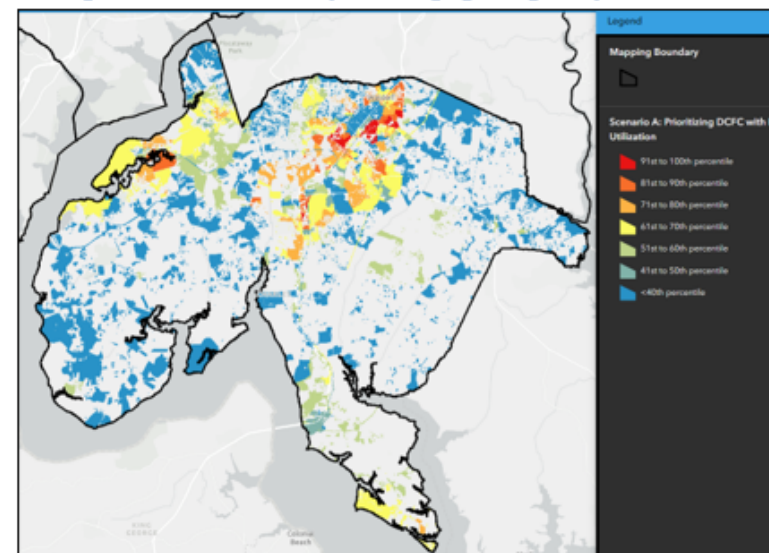
To support the projected EV registrations above, Charles County would need to deploy the following estimated numbers of EV chargers for each scenario and planning year. See Appendix 1.B for technical methodology on calculating EV charging port needs.

Table 8. Charles County Estimated EV Charging Port Needs

Scenario	Charger Type	2030	2035	2045
Low	EV Charging Port Needs			
	Public Level 2	258	490	1,181
	Public DCFC	10	17	39
	EVs	7,850	16,261	44,958
Medium	EV Charging Port Needs			
	Public Level 2	625	1,180	3,079
	Public DCFC	22	39	119
	EVs	20,735	44,903	93,716
High	EV Charging Port Needs			
	Public Level 2	1,014	2,413	4,294
	Public DCFC	35	91	150
	EVs to Support	33,620	73,544	142,473

Figure 16 summarizes the charger siting analysis results for Charles County. The charger [siting](#) analysis identifies and ranks parcels of land based on their suitability for deploying public EV chargers. Three scenarios were tested. This map shows Scenario A, Prioritizing DCFC with High Utilization. The online map can be used to display all three scenarios. Red parcels are high priority, and blue parcels are low priority. Charles County may

Figure 15. Charles County EV Charging Siting Analysis Results



Example Jurisdictional Profile: Charles County

EV Charger Deployment Site Recommendations

The sites identified below are examples of locations where Charles County may choose to deploy or engage and support the private sector in deploying EV chargers. The images of each site are provided at the CBG level, which includes the recommended site and the surrounding area. These sites are recommendations, not requirements, and are highlighted due to their high scores in EV charger GIS siting analysis. However, Charles County may have different priorities or location preferences than the ones highlighted below. As such, additional priority options are available for use and consideration in the online interactive map. Charles County may consider and move forward with these locations for deployments but should rely on local knowledge, expertise, and priorities when siting EV chargers. See the [interactive map](#) in Appendix 2.C to view all priority locations, EEAs, and transportation infrastructure within the county.

Waldorf Senior Center and Recreational Center

The Waldorf Senior Center and Recreation Center in Waldorf is close to a large residential area, government facilities and local businesses. The recreational center is less than a mile from a major road, MD-5, and within two miles of US- 301 making it an attractive location for residential and community traffic. This area is also within [an](#) EEA and includes multifamily housing. Level 2 chargers are ideal for community residents and DCFC may be useful for a wider range of users visiting the various social and governmental services close by.

Figure 16. Waldorf Senior Center and Recreational Center



Additional Considerations

Site recommendation images are at the CBG level

Consider the area surrounding the recommended site

Keep parcel and CBG scoring in mind

This strategy offers a regional perspective

Remember to review all three scenario results when using the GIS map



How to Interact with the Results

Landing Page

The screenshot displays the landing page of the 'REVII Strategy EV Siting Parcel Review' web application. The interface features a blue header with the title 'REVII Strategy EV Siting Parcel Review' and the 'Metropolitan Washington Council of Governments' logo. A yellow button labeled 'Download parcel results here' is positioned in the top right of the header. Below the header, a search bar with the placeholder text 'Find address or place' is located on the left. The main area is a map of the Washington, D.C. region, showing various municipalities and their boundaries. A blue sidebar on the left contains a 'How to use this map' section with five instructions: 'Map Layers', 'Filter', 'Legend', 'Print', and 'Add Data'. The footer of the map area includes a scale bar (20 mi) and a list of data sources: 'DCGIS, Fairfax County, VA, MNCPPC, VGIN, Esri, TomTom, Garmin, SafeGraph, FAO, METI/NASA, USGS, EPA, NPS, USFWS | U.S. Census Bureau National Capital Region T... Powered by Esri'.

Regional Electric Vehicle Infrastructure Implementation Strategy

Metropolitan Washington Council of Governments

Download parcel results here

Map Layers Filter Legend Print Add Data

Find address or place

How to use this map

- Map Layers: Click the "Map Layers" button at the top left, to turn on and off map layers.
- Filter: Click the "Filter" button at the top left to filter Scenario results by Municipality, as well as to isolate the top 10% scoring parcels. Scenarios map layer must be turned on.
- Legend: Click the "Legend" button at the top left to see the symbology for all active map layers
- Print: Click the "Print" button at the top left to print an image of the map.
- Add Data: Click the "Add Data" button at the top left to add existing datasets to the map by URL, uploading a dataset, or by your ArcGIS Online account.

20 mi

DCGIS, Fairfax County, VA, MNCPPC, VGIN, Esri, TomTom, Garmin, SafeGraph, FAO, METI/NASA, USGS, EPA, NPS, USFWS | U.S. Census Bureau National Capital Region T... Powered by Esri

Adding Layers, Changing Basemaps, Viewing the Legend

Regional Electric Vehicle Infrastructure Implementation Strategy

Metropolitan Washington Council of Governments

Download parcel results here

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20 mi

DCGIS, Fairfax County, VA, MNCPPC, VGIN, Esri, TomTom, Garmin, SafeGraph, FAO, METI/NASA, USGS, EPA, NPS, USFWS | U.S. Census Bureau National Capital Region T... Powered by Esri

Viewing Different Scenario Results

Regional Electric Vehicle Infrastructure Implementation Strategy

Metropolitan Washington Council of Governments

Download parcel results here

Map Layers Filter Legend Print Add Data

Find address or place

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Map Layers

- Mapping Boundary
- Census Block Group
- Existing EV Chargers
- Highway Ramps
- Multifamily Housing
- Park and Ride
- Equity Emphasis Areas
- Scenario A: Prioritizing DCFC with High Utilization
- Scenario B: Prioritizing Level 2 Chargers with Equity Focus
- Scenario C: Prioritizing DCFC with Multifamily Housing Focus

10 mi

Fairfax County VA, MNCRC, Esri, TomTom, Garmin, SafeGraph, FAO, MET/NASA, USGS, EPA, NPS, USEWS/ICF 2024 | U.S. Census Bureau National Capital Region Transport | Powered by Esri

Viewing Different Scenario Results

Regional Electric Vehicle Infrastructure Implementation Strategy

Metropolitan Washington Council of Governments

Download parcel results here

Map Layers Filter Legend Print Add Data

Find address or place

Martinsburg

Winchester

Baltimore

Columbia

Annapolis

Washington

Alexandria

40 mi

Fairfax County, VA, MNCRPC, Esri, TomTom, Garmin, Safe-Graph, FAO, METU/NASA, USGS, EPA, NPS, USEWS, IICE 2024, U.S. Census Bureau, National Capital Region Transport, Powered by Esri

How to use this map

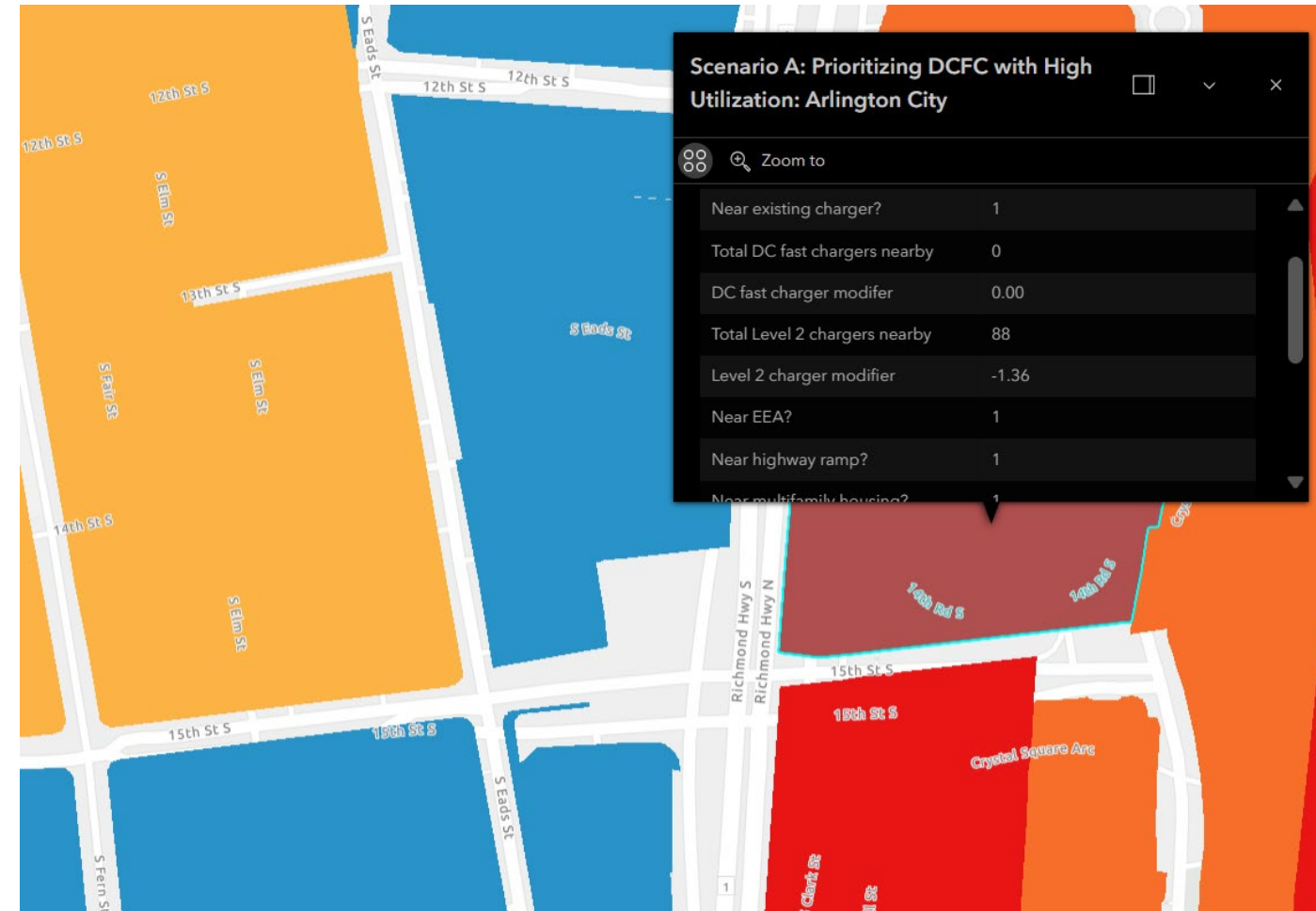
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Map Layers

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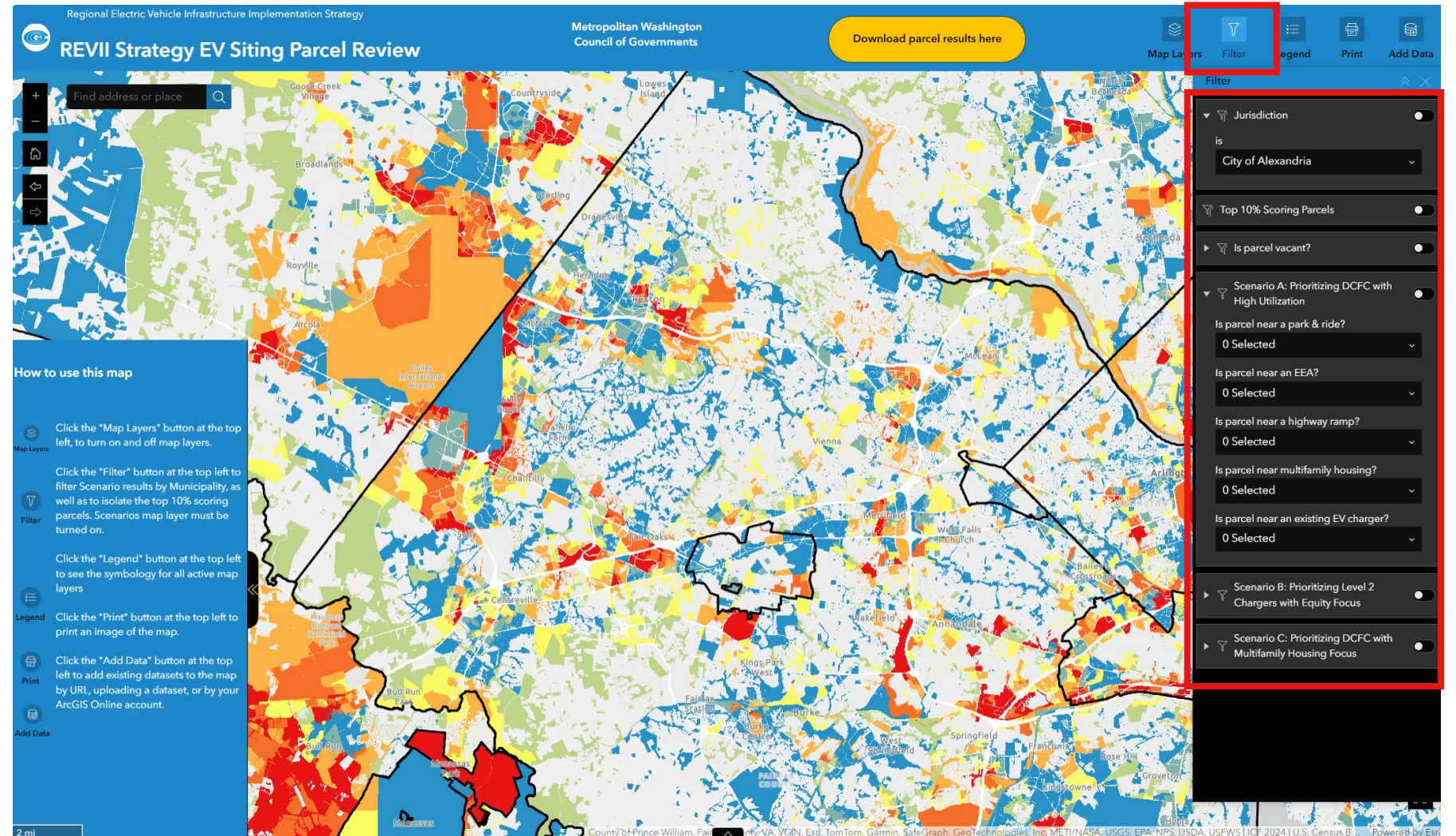
Individual Parcel Details

- Select a parcel
- View:
 - Census Block Group Number
 - Step 1 score (“rank”)
 - Step 2 score (“final score”)
 - Scores for each parcel score modifier
 - Existing Direct Current Fast Chargers
 - Existing Level 2 Chargers
 - Equity Emphasis Area
 - Multifamily Housing
 - Highway ramps
 - Park-and-Ride
 - Number of nearby chargers (within ½ mile)



Filtering for Specific Results

- Near park-and-ride locations
- Near multifamily housing
- Near highway ramps
- Near equity emphasis area
- Near existing charging stations
- Top 10% highest scoring parcels for each scenario





Questions?