REGIONAL ELECTRIC VEHICLE INFRASTRUCTURE IMPLEMENTATION (REVII) STRATEGY PROJECT

Draft Results

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TPB Technical Committee
January 5, 2024

Agenda Item #8

National Capital Region
Transportation Planning Board

REVII Strategy

- The Regional Electric Vehicle Infrastructure Implementation (REVII) Strategy is being developed to support state and local governments as they prioritize locations for publicly accessible electric vehicle (EV) infrastructure deployment.
- The strategy will identify priority locations for a regional network of chargers to support the shift of the private light-duty vehicle fleet to EVs.
- The information provided in the strategy will inform states and local jurisdictions as they apply for funding from federal programs such as future funding opportunities from the Bipartisan Infrastructure Law's Charging and Fueling Infrastructure (CFI) Discretionary Grant Program.
- The strategy is being developed by the TPB's on-call consultant, ICF, and funded through the UPWP Technical Assistance Program.

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National Capital Region
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Regional Electric Vehicle Infrastructure Implementation (REVII) Strategy

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January 5, 2024

Agenda

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

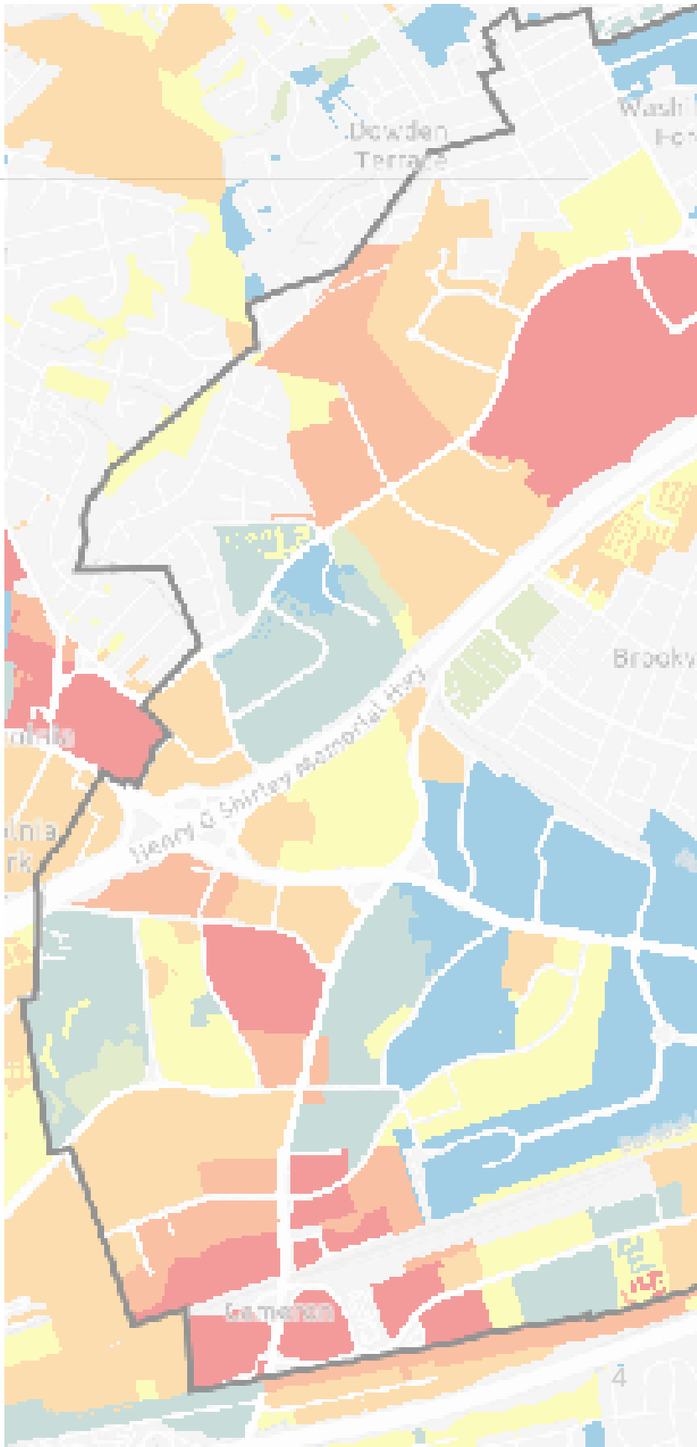
Project Overview & Introduction

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 EV charging station installations.

- Results discussed today are DRAFTS. You will be provided with a link to the map and asked to provide feedback by February 1, 2024.



Light-Duty EV Registration Forecast
Draft Results

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: Jurisdiction's proportion of state or district ZEV adoption goals; Advanced Clean Cars adoption; subsequent goal of 80% EVs by 2045. This scenario serves as the maximum potential for EV adoption.
  - **Maryland:** Electric vehicle registration goals and Advance Clean Cars II adoption
  - **Virginia:** Advanced Clean Cars II adoption
  - **District of Columbia:** Electric vehicle registration goal
  - Assumes maximum capacity the electric grid can handle is approximately 80% market saturation
- MWCOG 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.

Light-Duty EV Registration Projections: Low

Low Growth								
Year	2022		2030		2035		2045	
	# EVs	% EVs	# EVs	% EVs	# EVs	% EVs	# EVs	% EVs
Montgomery County	16,817	2.3%	123,302	15.7%	256,584	31.4%	705,937	79%
Prince George's County	4,548	0.7%	34,651	5.4%	70,079	10.6%	183,442	26%
Frederick County	2,791	1.3%	22,052	9.1%	46,237	17.9%	129,933	45%
Charles County	920	0.7%	7,580	5.0%	15,796	9.8%	44,032	24%
Arlington County	2,281	1.7%	13,456	9.5%	31,712	21.7%	97,385	63%
City of Alexandria	1,236	1.1%	11,417	9.4%	24,879	19.5%	71,907	51%
Fairfax County	12,207	1.4%	83,027	8.5%	196,374	18.9%	626,190	54%
Loudoun County	5,886	1.8%	45,310	12.5%	106,364	27.4%	339,785	76%
Prince William County	2,996	0.7%	32,386	6.9%	70,761	14.0%	209,027	36%
District of Columbia	3,132	1.1%	39,667	12.5%	82,173	24.7%	227,705	62%
Regional EV Total	52,814		412,849		900,960		2,635,344	
Regional Vehicle Total	3,886,605		4,214,678		4,435,148		4,915,102	
Share of EVs in the Region	1%		10%		20%		54%	

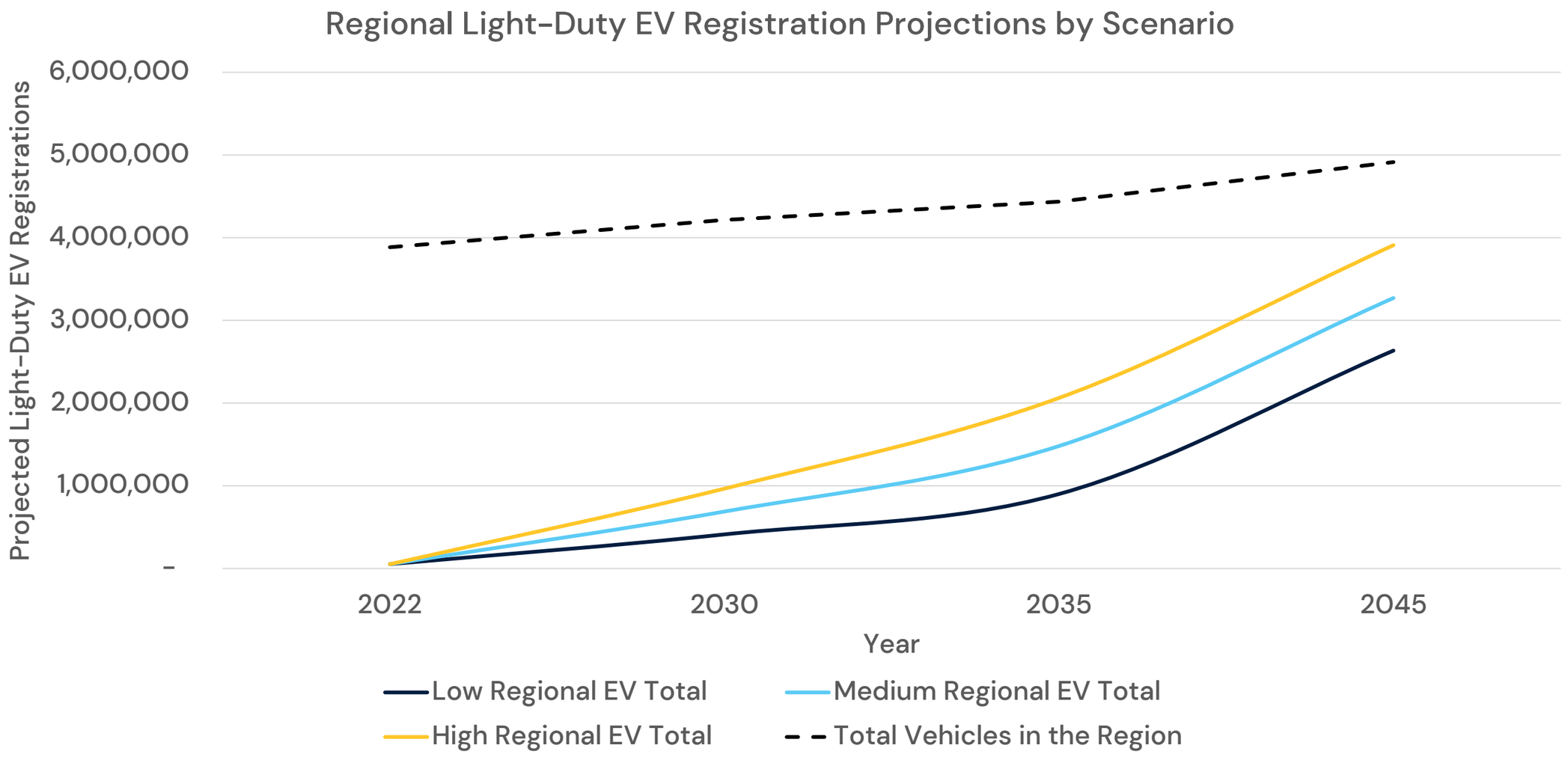
Light-Duty EV Registration Projections: Medium

Medium Growth								
Year	2022		2030		2035		2045	
	# EVs	% EVs	# EVs	% EVs	# EVs	% EVs	# EVs	% EVs
Montgomery County	16,817	2.3%	154,719	19.7%	322,120	39.4%	712,530	80%
Prince George's County	4,548	0.7%	90,152	14.0%	190,304	28.8%	377,309	54%
Frederick County	2,791	1.3%	38,504	15.8%	82,377	32.0%	178,923	62%
Charles County	920	0.7%	20,599	13.5%	44,669	27.7%	93,252	51%
Arlington County	2,281	1.7%	23,285	16.4%	50,513	34.6%	112,036	73%
City of Alexandria	1,236	1.1%	19,340	16.0%	41,840	32.8%	91,982	65%
Fairfax County	12,207	1.4%	152,126	15.5%	336,860	32.4%	772,885	66%
Loudoun County	5,886	1.8%	63,925	17.7%	142,038	36.6%	343,112	77%
Prince William County	2,996	0.7%	67,466	14.4%	148,876	29.5%	329,603	56%
District of Columbia	3,132	1.1%	59,379	18.8%	122,066	36.7%	260,949	71%
Regional EV Total	52,814		689,495		1,481,664		3,272,580	
Regional Vehicle Total	3,809,057		4,214,678		4,435,148		4,915,102	
Share of EVs in the Region	1%		16%		33%		67%	

Light-Duty EV Registration Projections: High

High Growth								
Year	2022		2030		2035		2045	
	# EVs	% EVs	# EVs	% EVs	# EVs	% EVs	# EVs	% EVs
Montgomery County	16,817	2.3%	186,135	23.7%	387,657	47.4%	719,124	81%
Prince George's County	4,548	0.7%	145,652	22.6%	310,530	46.9%	571,176	82%
Frederick County	2,791	1.3%	54,956	22.6%	118,517	46.0%	227,912	79%
Charles County	920	0.7%	33,618	22.1%	73,542	45.6%	142,472	79%
Arlington County	2,281	1.7%	33,114	23.3%	69,314	47.5%	126,686	82%
City of Alexandria	1,236	1.1%	27,262	22.5%	58,802	46.1%	112,057	80%
Fairfax County	12,207	1.4%	221,226	22.6%	477,345	46.0%	919,579	79%
Loudoun County	5,886	1.8%	82,540	22.8%	177,712	45.8%	346,438	78%
Prince William County	2,996	0.7%	102,545	21.9%	226,991	45.0%	450,179	77%
District of Columbia	3,132	6%	79,092	25.0%	161,959	48.7%	294,192	80%
Regional EV Total	52,814		966,141		2,062,369		3,909,817	
Regional Vehicle Total	3,809,057		4,214,678		4,435,148		4,915,102	
Share of EVs in the Region	1%		23%		47%		80%	

Regional Light-Duty EV Projections by Scenario and Year



Light-Duty EV Charging Station Deployment Priority Locations Map

Draft Results

Methodology Overview

Step 1: Census Tract Level Screening

- Screening analysis of all census block groups in the region
- Driven primarily by Replica trip data*
- Data sources: income, dwelling type, the travel demand forecasting model, trip length, vehicle dwell times, Equity Emphasis Areas, and more

Census Block Group

Step 2: High Priority Parcel Analysis

- Potential parcels were scored according to the following criteria:
  - Step 1 Census Block Group score
  - Distance to existing charging stations
  - Distance to multifamily housing
  - Distance to highway on-ramp or off-ramp
  - Location in or near an equity emphasis area
  - Distance to park-and-ride location

Parcel

We are here!

Step 3: Site Selection

- Review of each high scoring parcel to determine suitability for a public EV charging station
- Review will consider factors such as the following:
  - Parcel size and parking availability
  - Facility access
  - Retail chains with EV charger programs
  - Utility electric service capacity

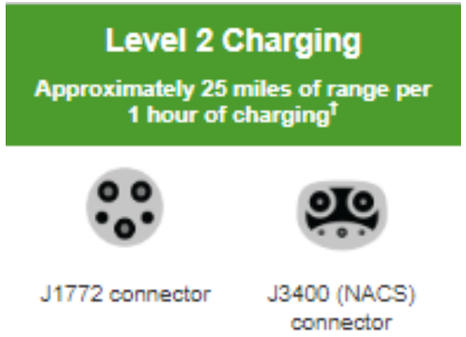
Site

**Replica data is produced by an activity-based model, calibrated locally with ground truth data (trip data derived from cell phones). Currently, travel data through Fall 2022 are available for the whole United States with detailed and disaggregated outputs down to the network link level. The trip data provided by Replica platform includes information such as origin, destination, land use, trip purpose, and socio-demographic of the trip taker. Replica has also recently developed a data set for EV ownership and vehicle miles traveled. It has become increasingly common in transportation planning studies. While the data is expansive, it is proprietary and may provide highly generalized results that require local expertise to properly interpret and apply.*

Types of Charging Stations

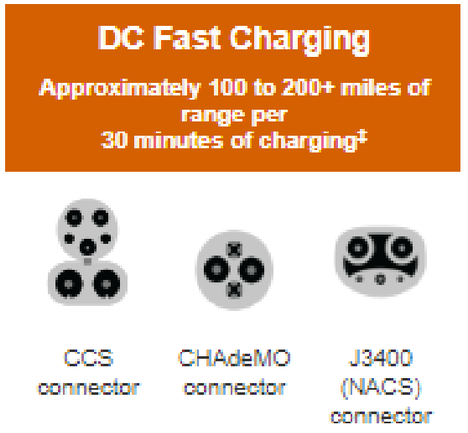
Level 2

- Commonly used for public, workplace, and home charging applications.
- Longer charging sessions
- Better for scenarios where drivers will leave their cars to charge for multiple hours



Direct Current Fast Chargers

- Typically used for public or fleet charging applications.
- Allows drivers to charge vehicles quickly
- Better for scenarios where drivers will only leave their cars for 15-30 minutes



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.

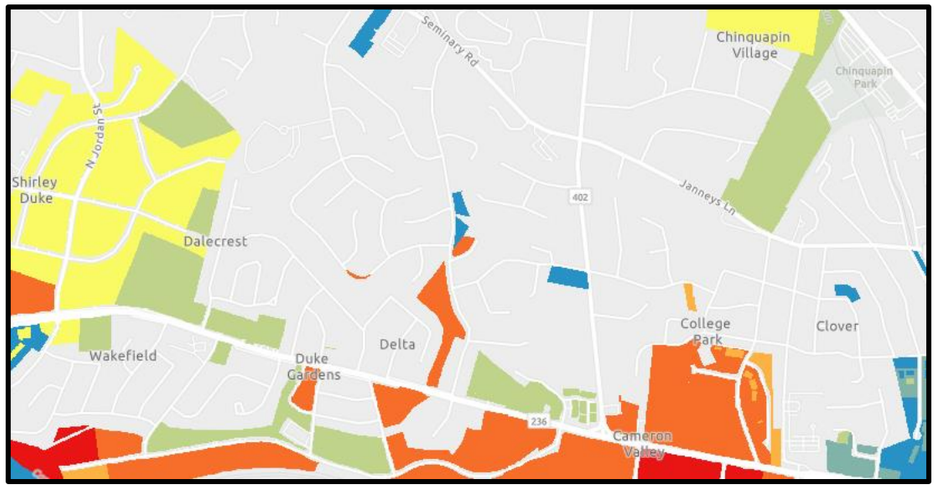
Prioritizing Direct Current Fast Chargers with Multifamily Housing Focus

- 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

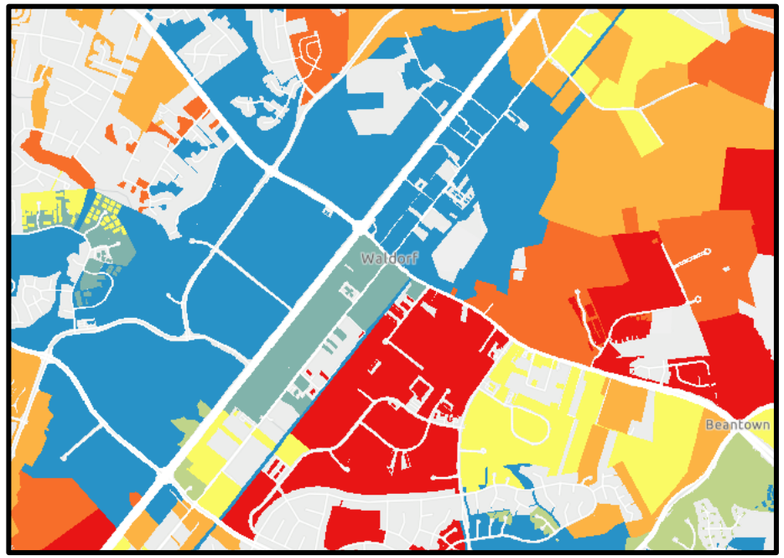


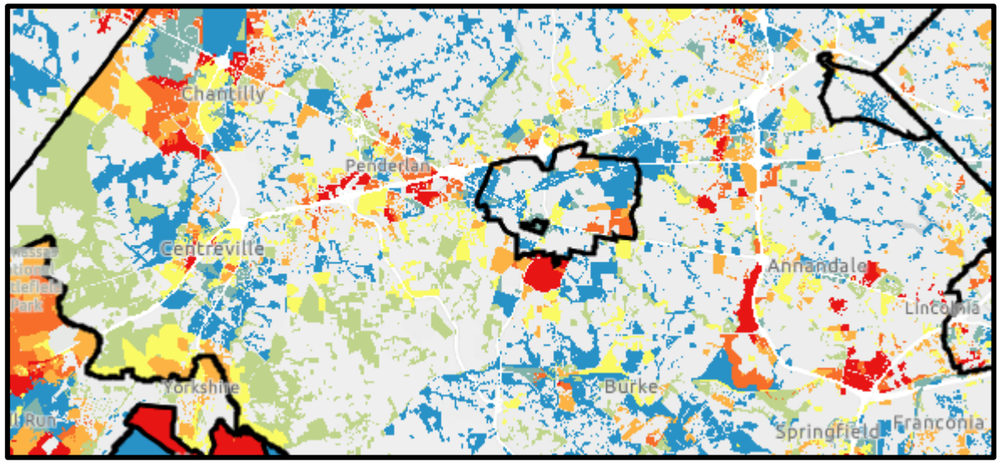
This screenshot shows parcels that were both included (color) and excluded (grey) from the analysis.

This screenshot does not contain any analyzed parcels.

Three Parcel-Level Map Scores and Results

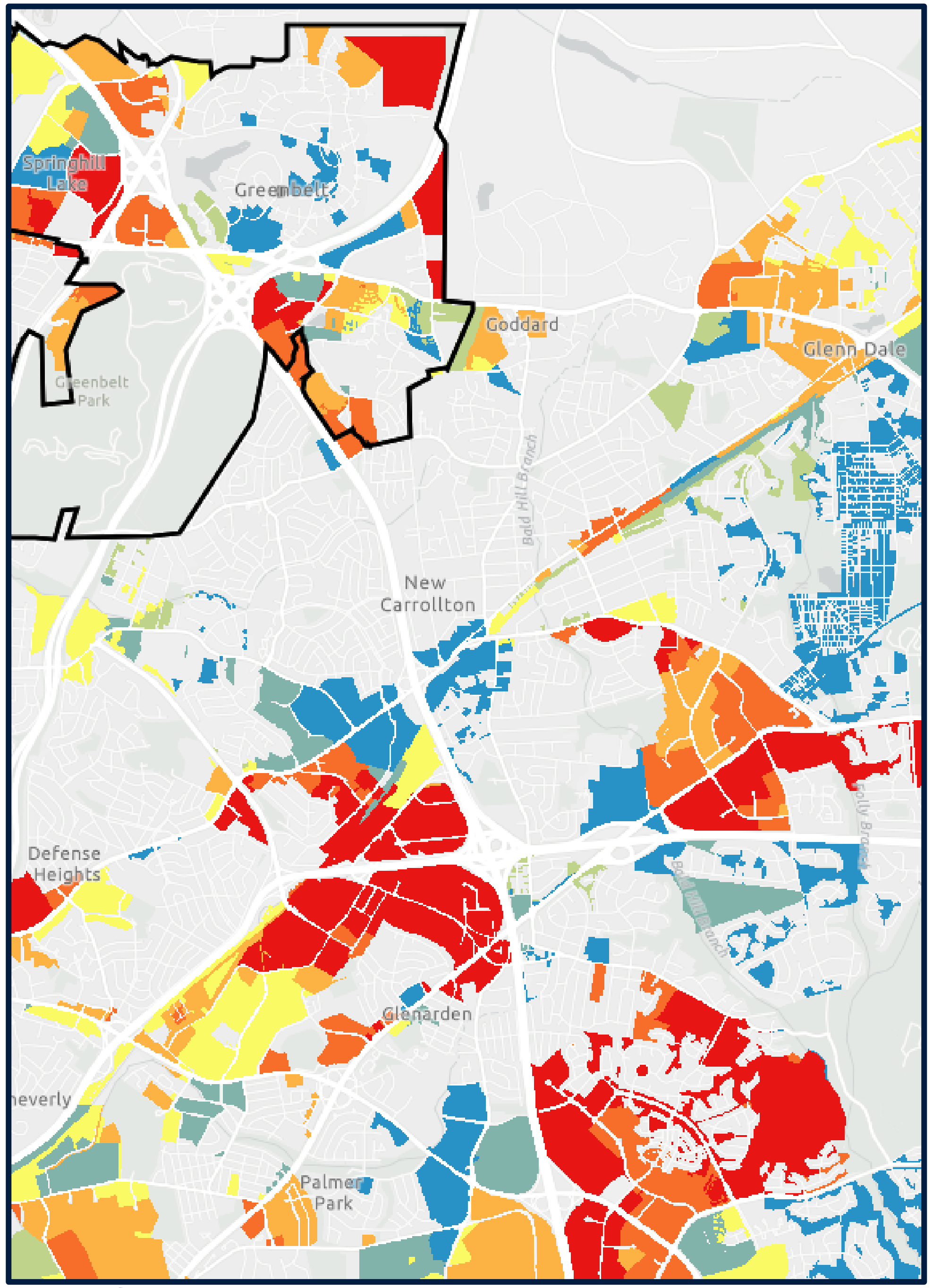
- Parcels are scored based on Step 1 scores and proximity score modifiers:
  - Score Increases: park-and-ride, MFH, EEA, highway ramps
  - Score Decreases: existing charging stations
- Results for all three maps are displayed by priority.
  - Results are displayed in percentile scores
  - Highest ranking/priority: 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.

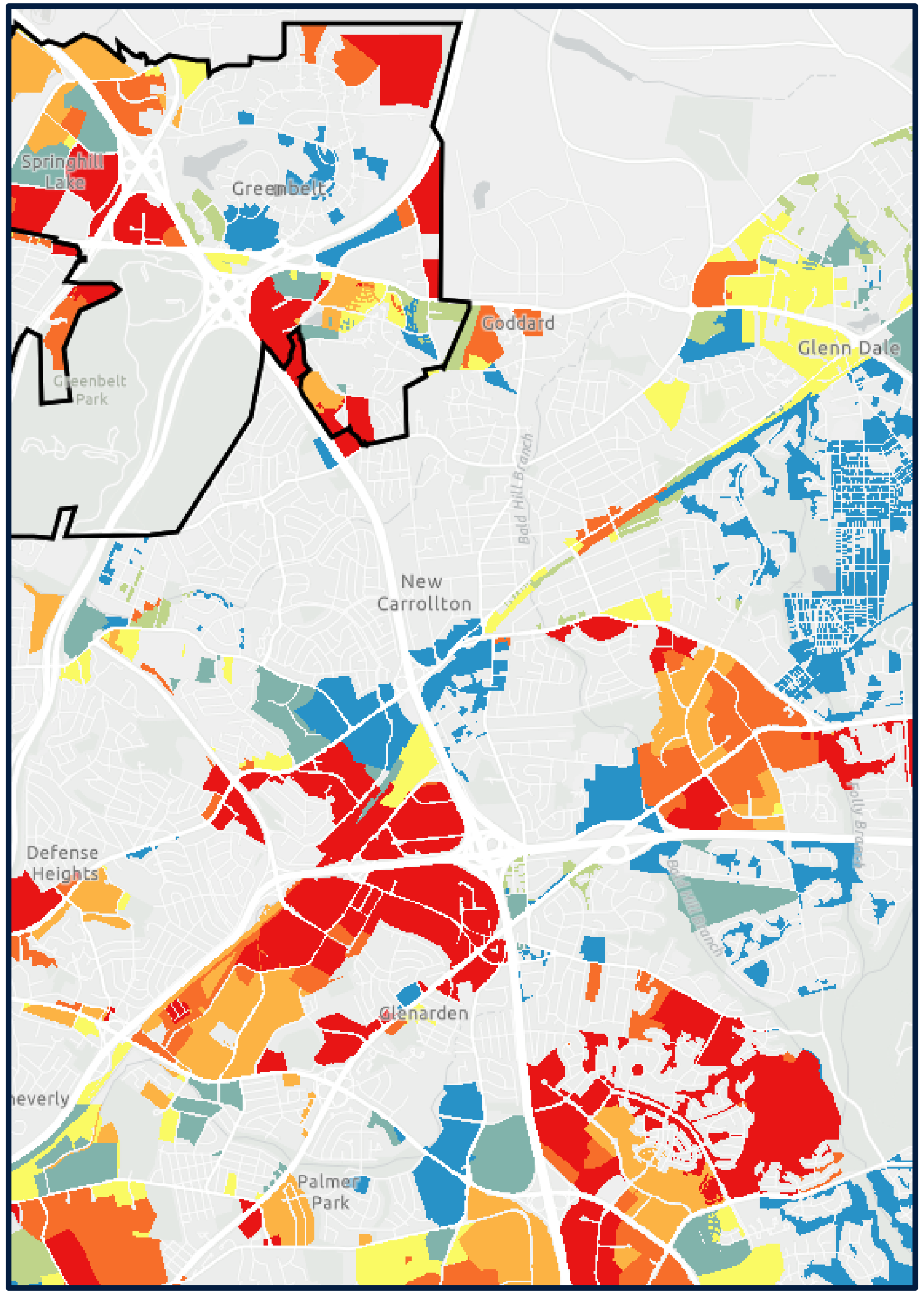


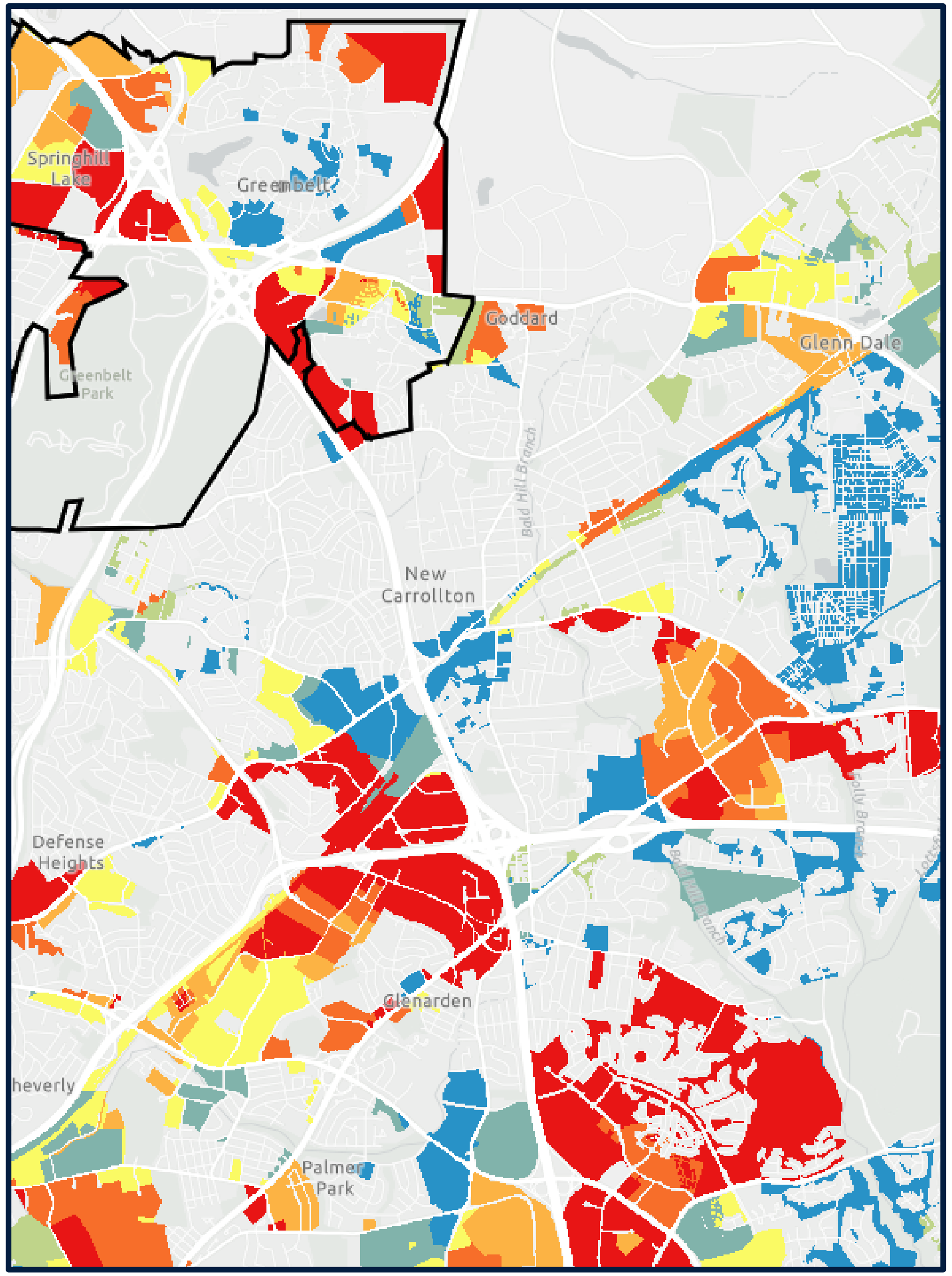


These screenshots show the results at different scales. The top image is zoomed in. The bottom image is zoomed out. Results will display in more granularity the closer you zoom in on the map.

Three Parcel-Level Map Results

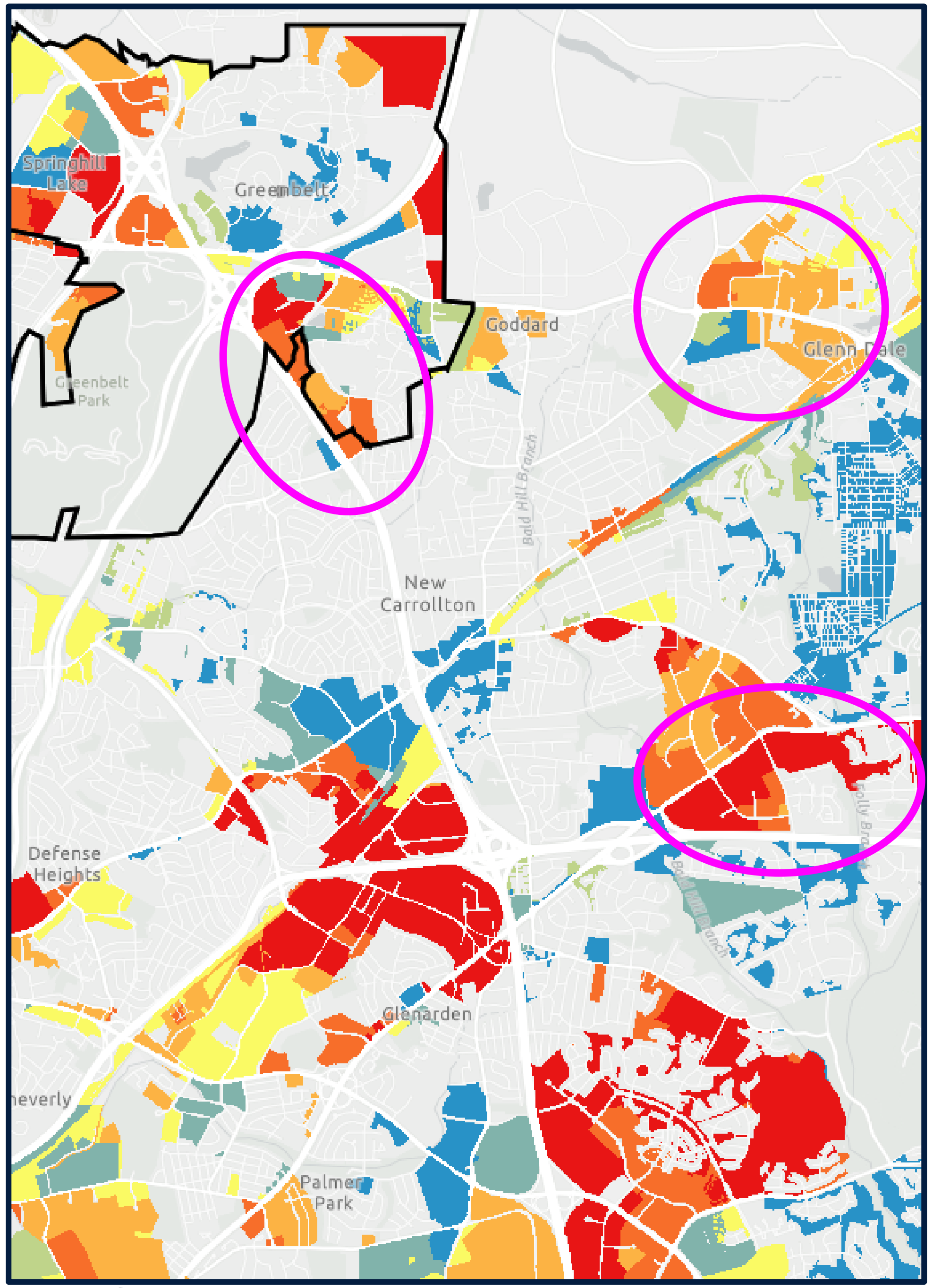


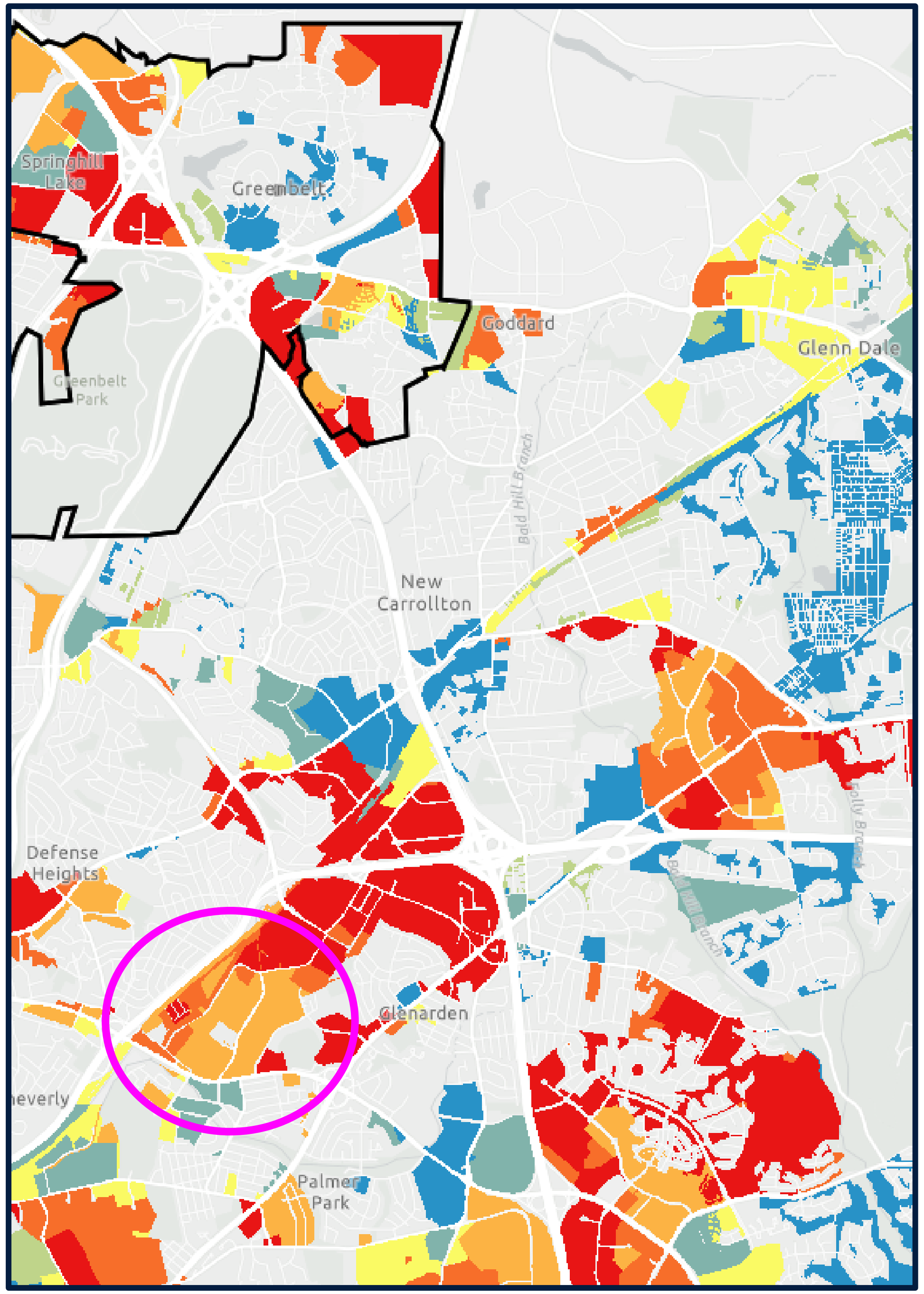


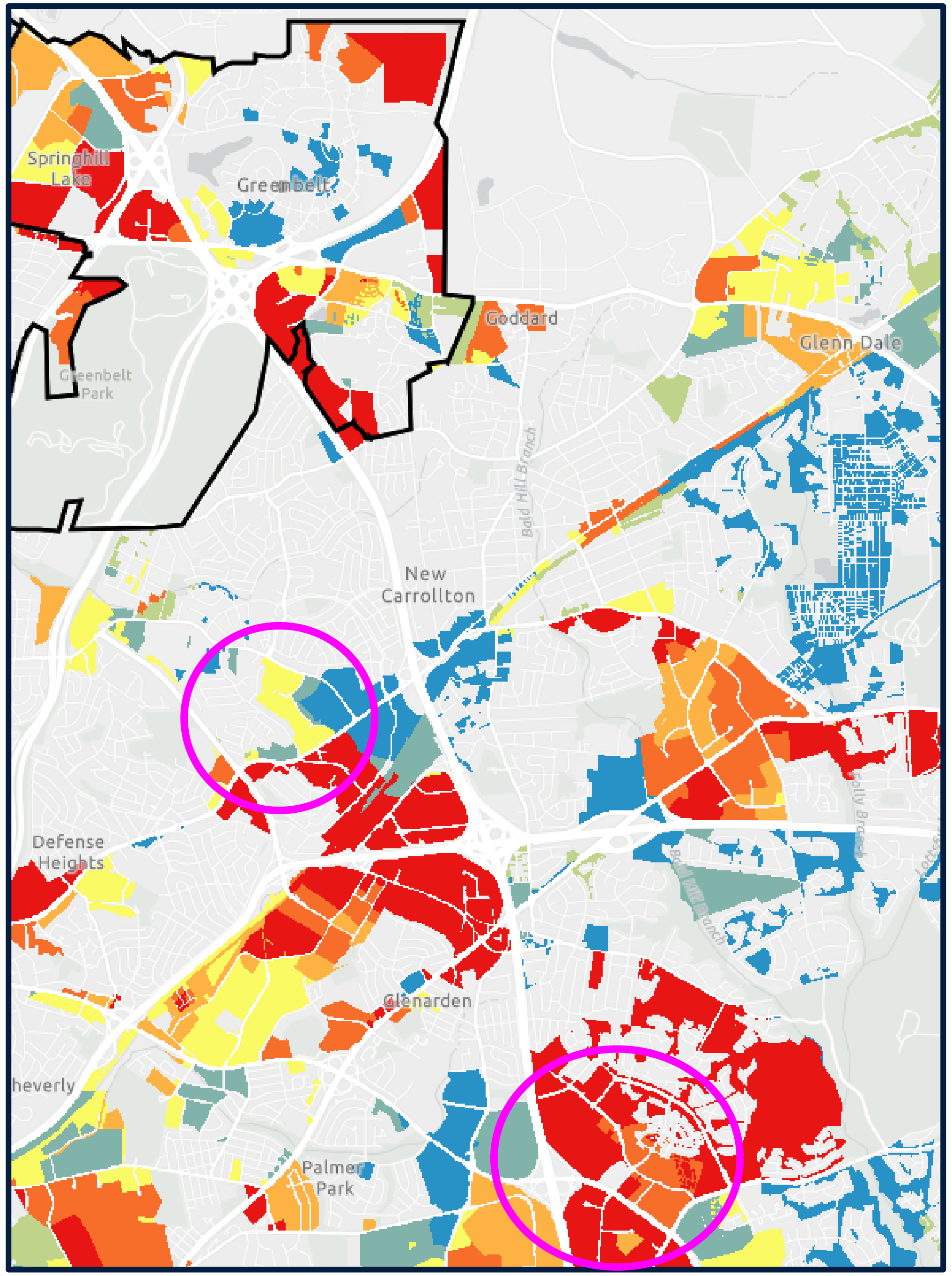


These three images are screenshots of the same area but display different scenario results.

Three Parcel-Level Map Results







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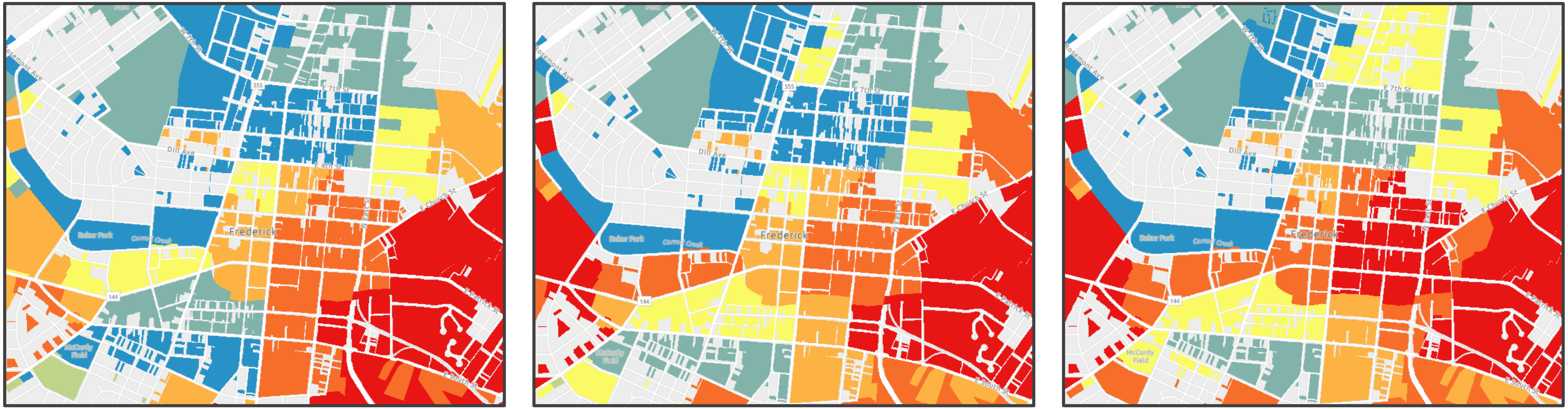
Three Parcel-Level Map Results



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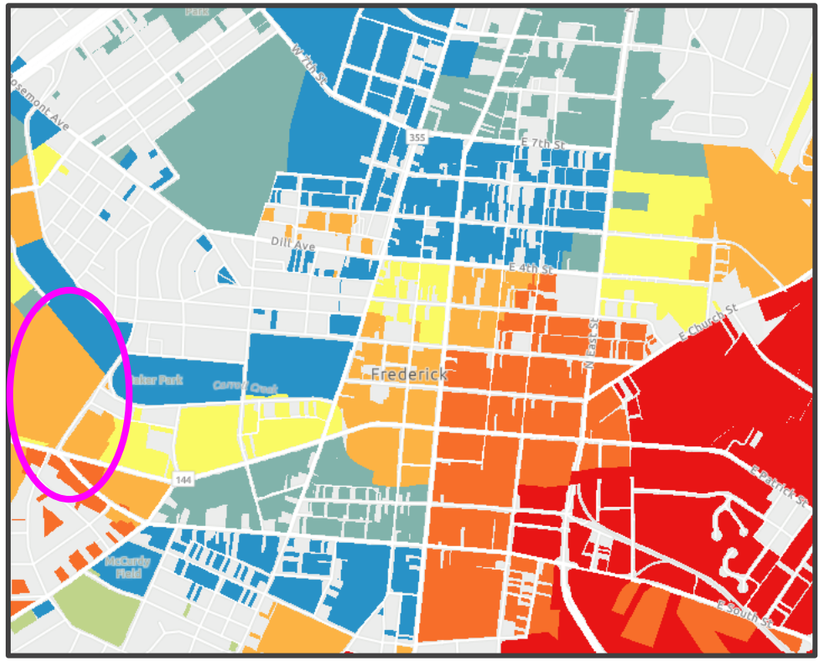
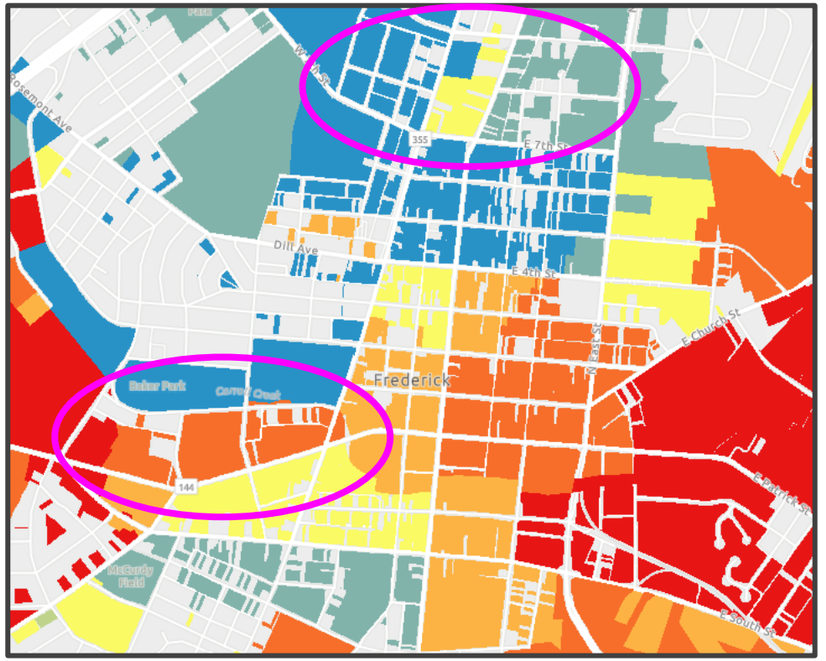
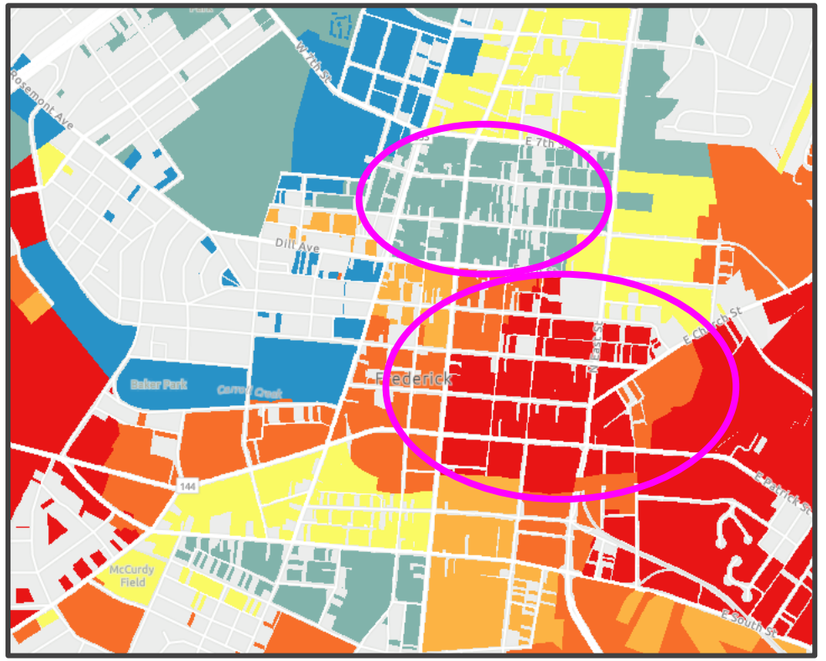
Three Parcel-Level Map Results







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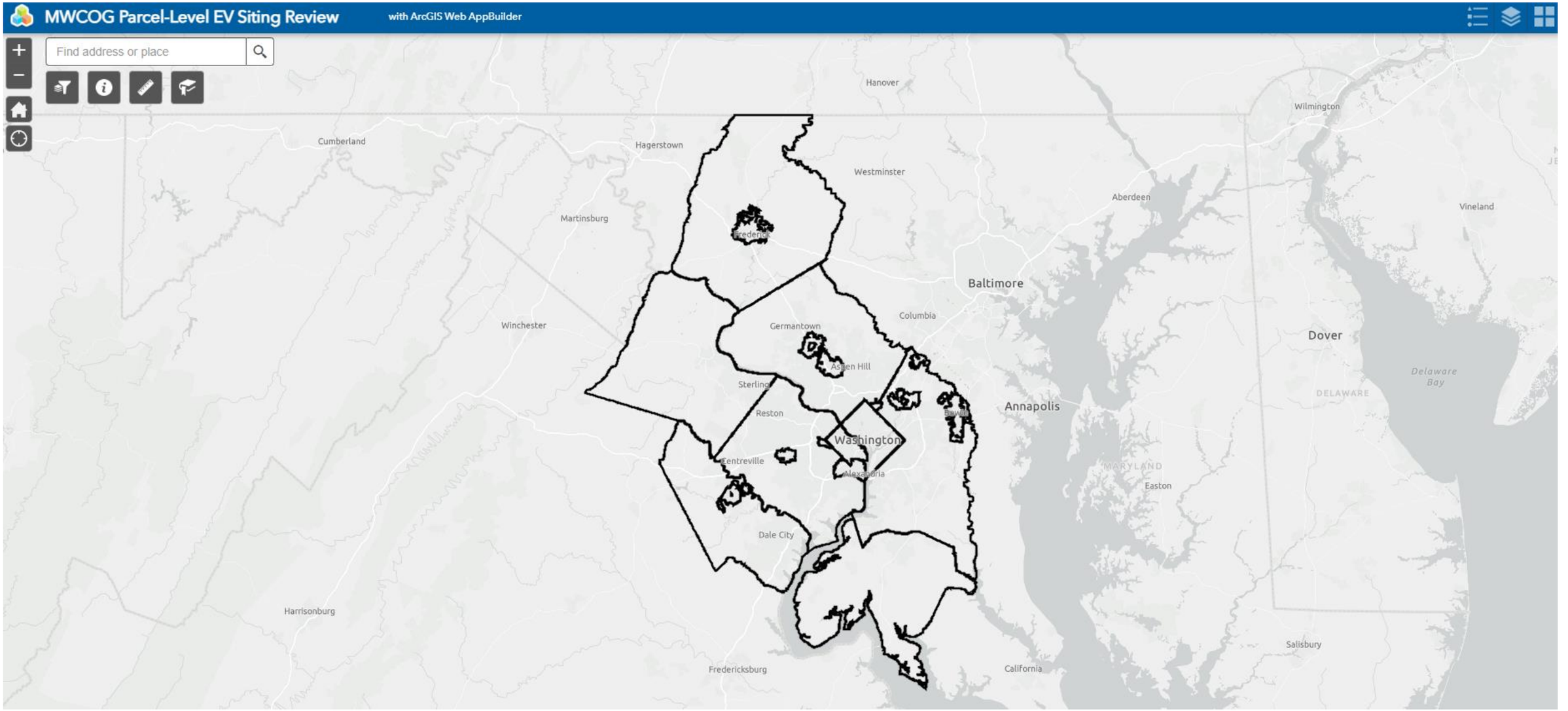
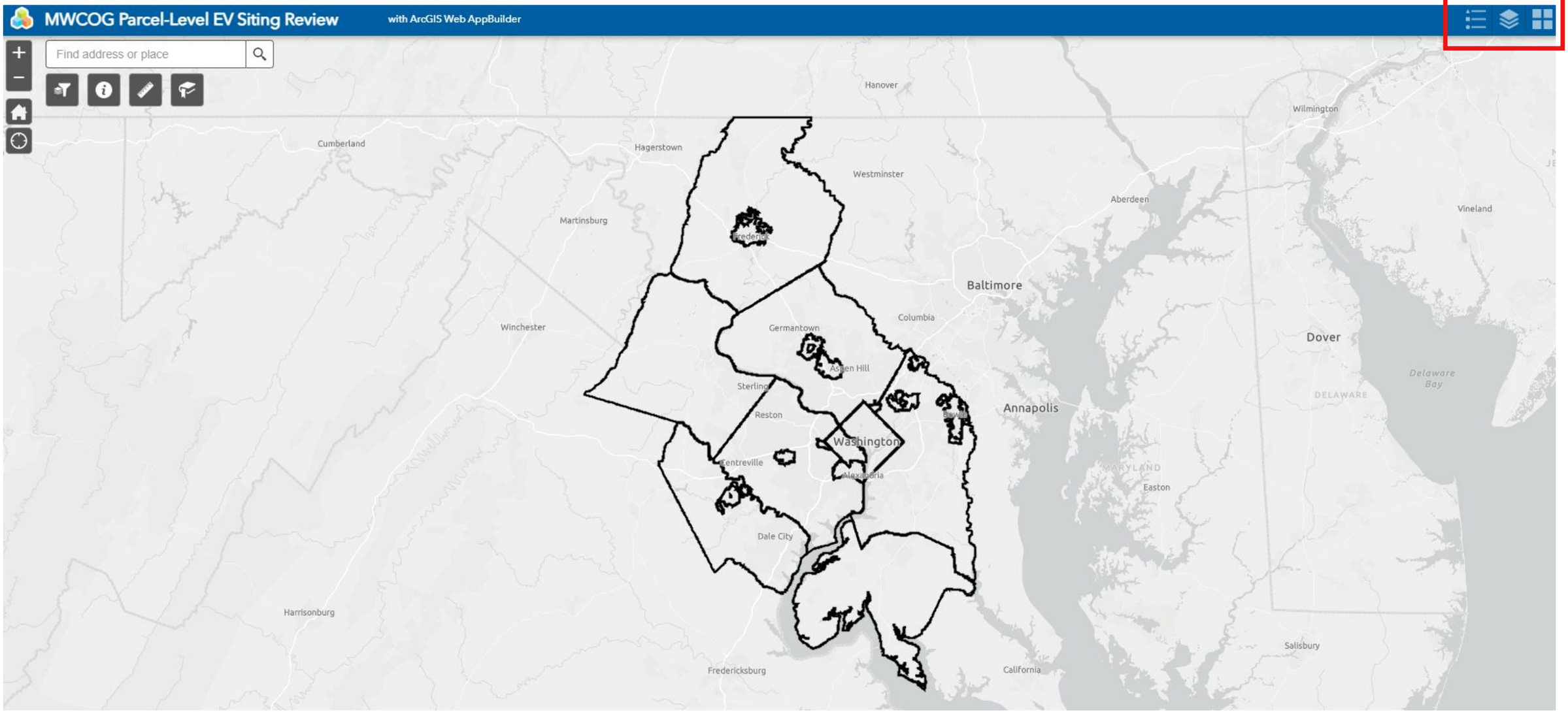
How to Interact with the Results

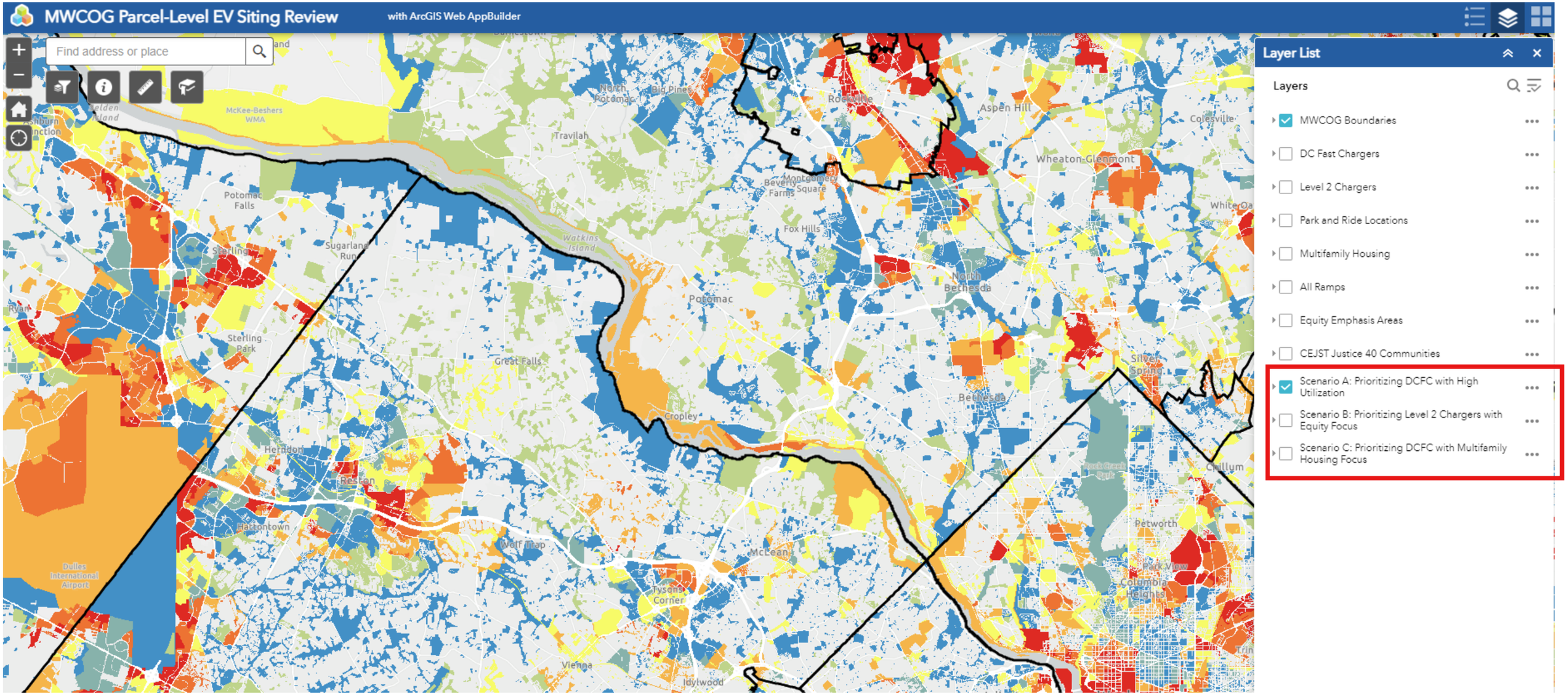
Landing Page



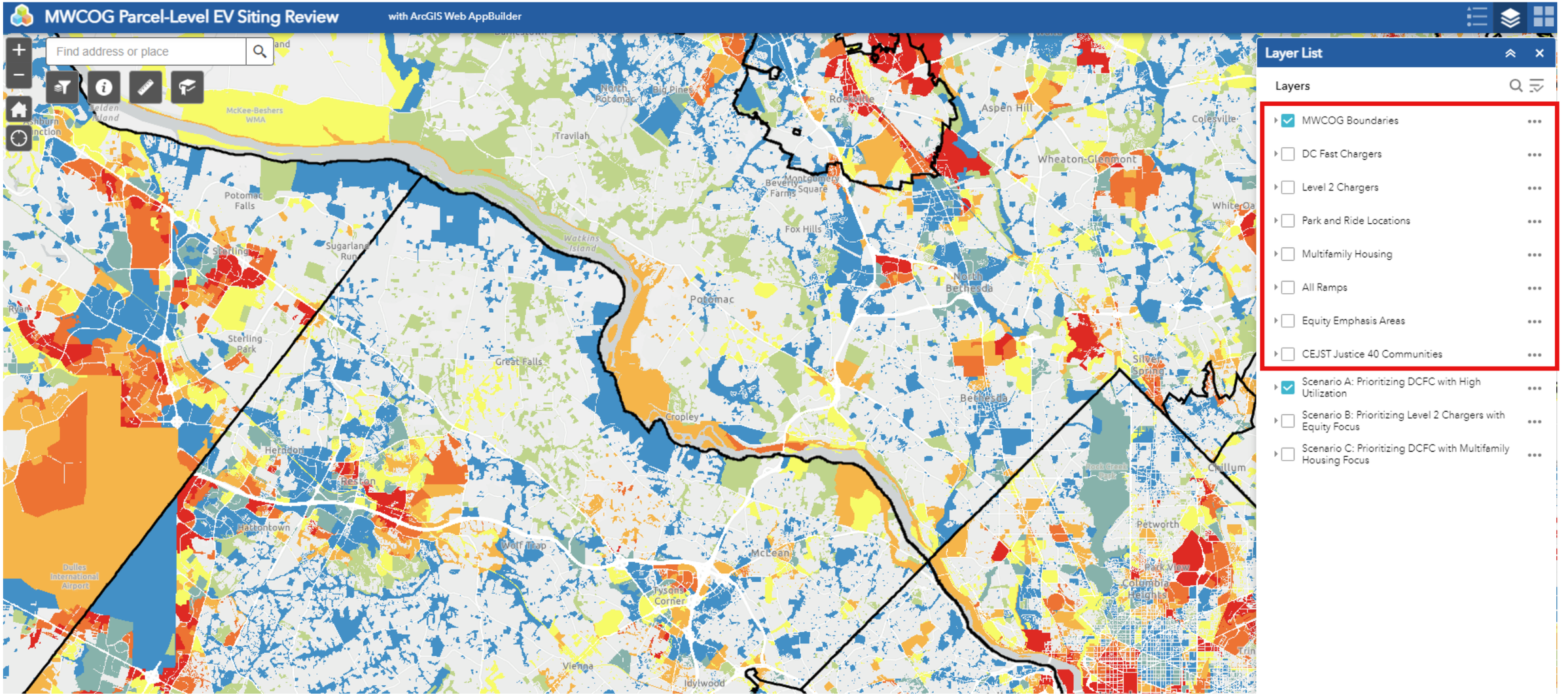
Adding Layers, Changing Basemaps, Viewing the Legend



Viewing Different Scenario Results

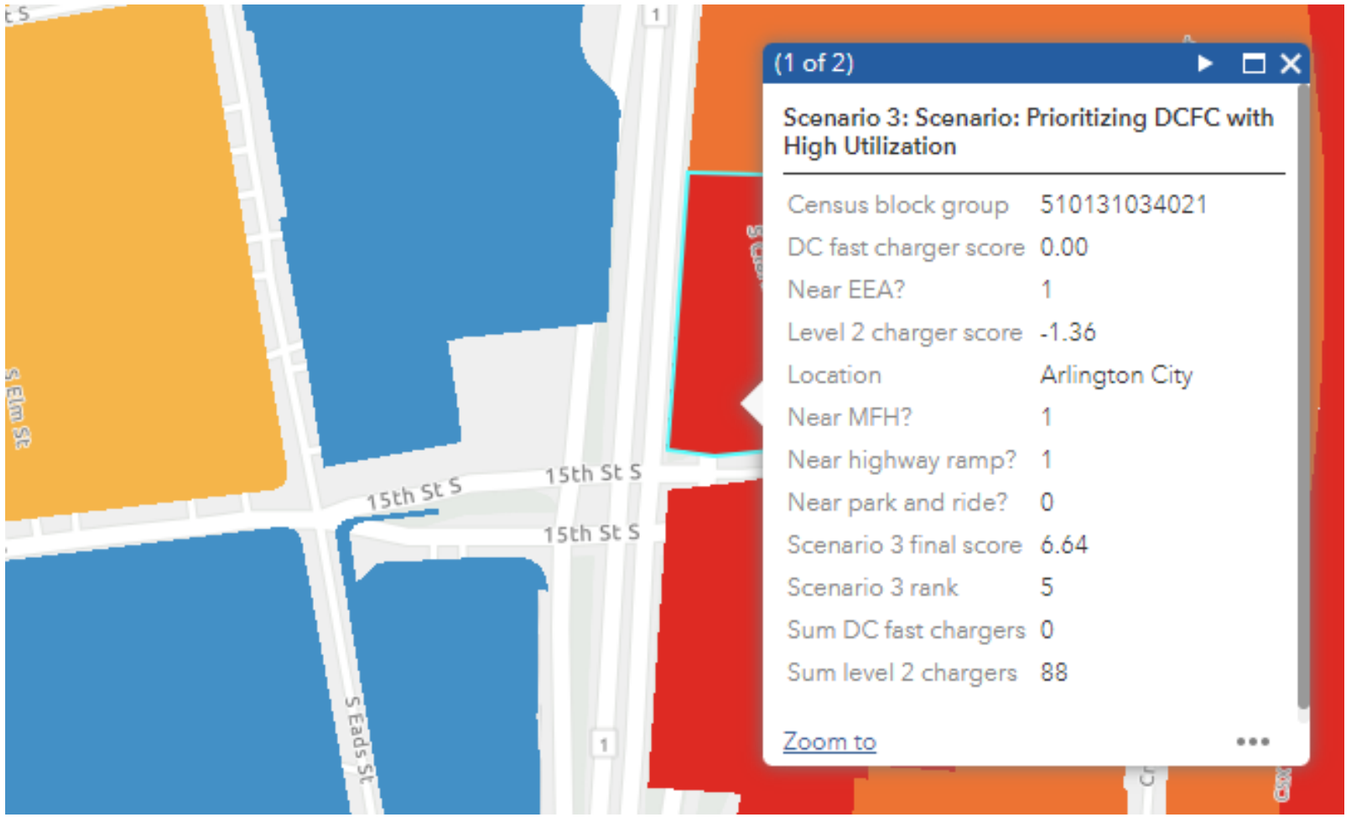


Viewing Different Scenario Results



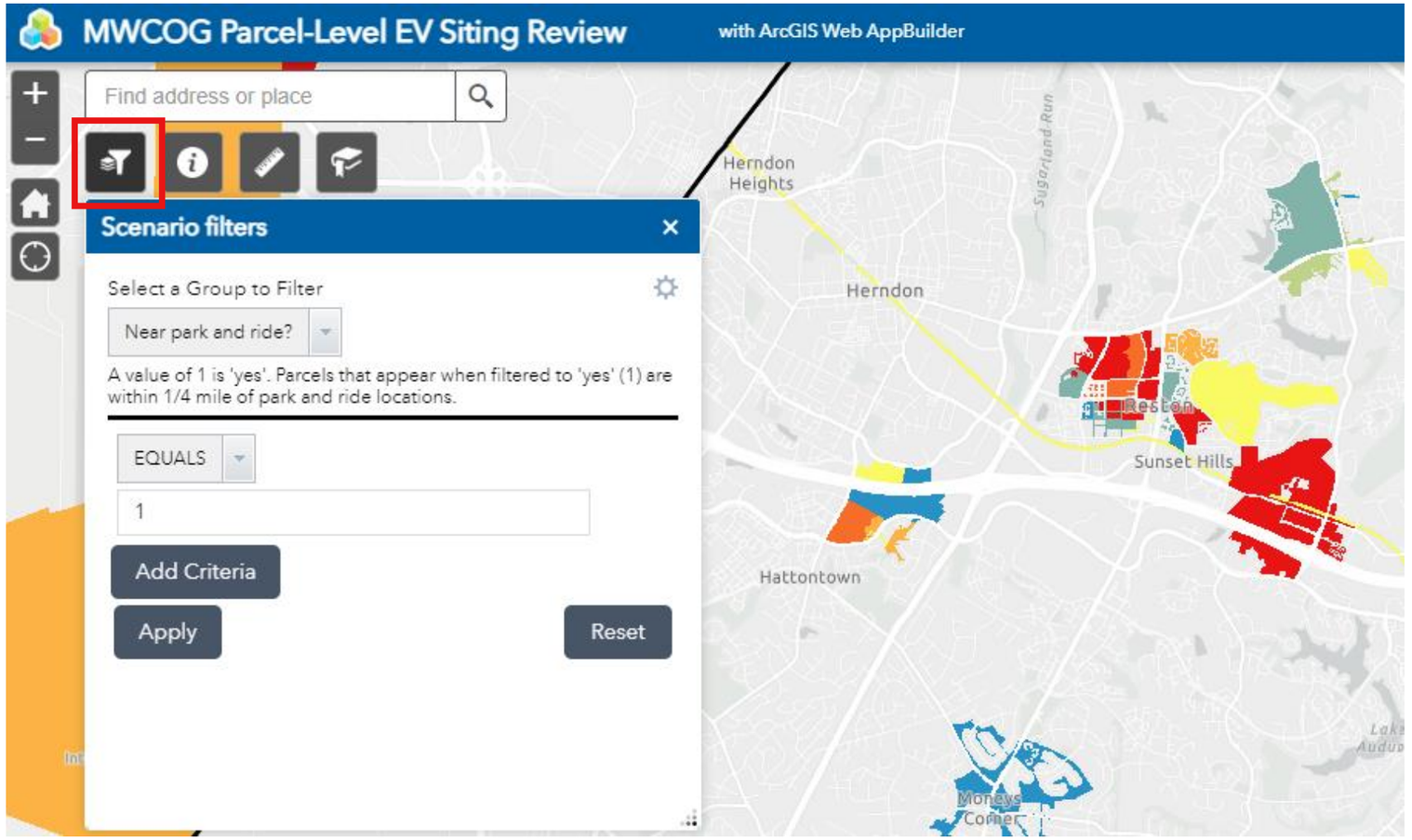
Individual Parcel Details

- Select a parcel
- View:
  - CBG 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



Connecting the Dots

Light-Duty EV Projections and Charging Station Priority Map

- Light-duty EV projections will be used to calculate the approximate number of EV charging stations needed to support future EV adoption in the region
- The charging station priority map will help identify locations to deploy the estimated number of needed charging stations
  - The number of charging stations 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.

Next Steps

The Study Team is Seeking Your Feedback on Draft Results

GIS results may be viewed here:

https://icf-eandp.maps.arcgis.com/apps/webappviewer/index.html?id=8fd11c5995bf4e71aec85e89c063a53c

Questions to consider:

- Do the high priority areas make sense given my understanding of travel patterns and parcel locations/types?
- Are there any areas that are *not* showing up as scored parcels and you're not sure why?
- Is there anything that could make the map more useful?

Feedback is requested by COB February 1, 2024.

Final report and mapping is expected in Spring 2024.

Questions and feedback may be directed to:

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and

Robert Christopher
COG Environmental Planner
rchristopher@mwcog.org

Questions?