

# **M-NCPPC Montgomery County Planning Department Travel Forecasting and Analysis Updates**



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M-NCPPC

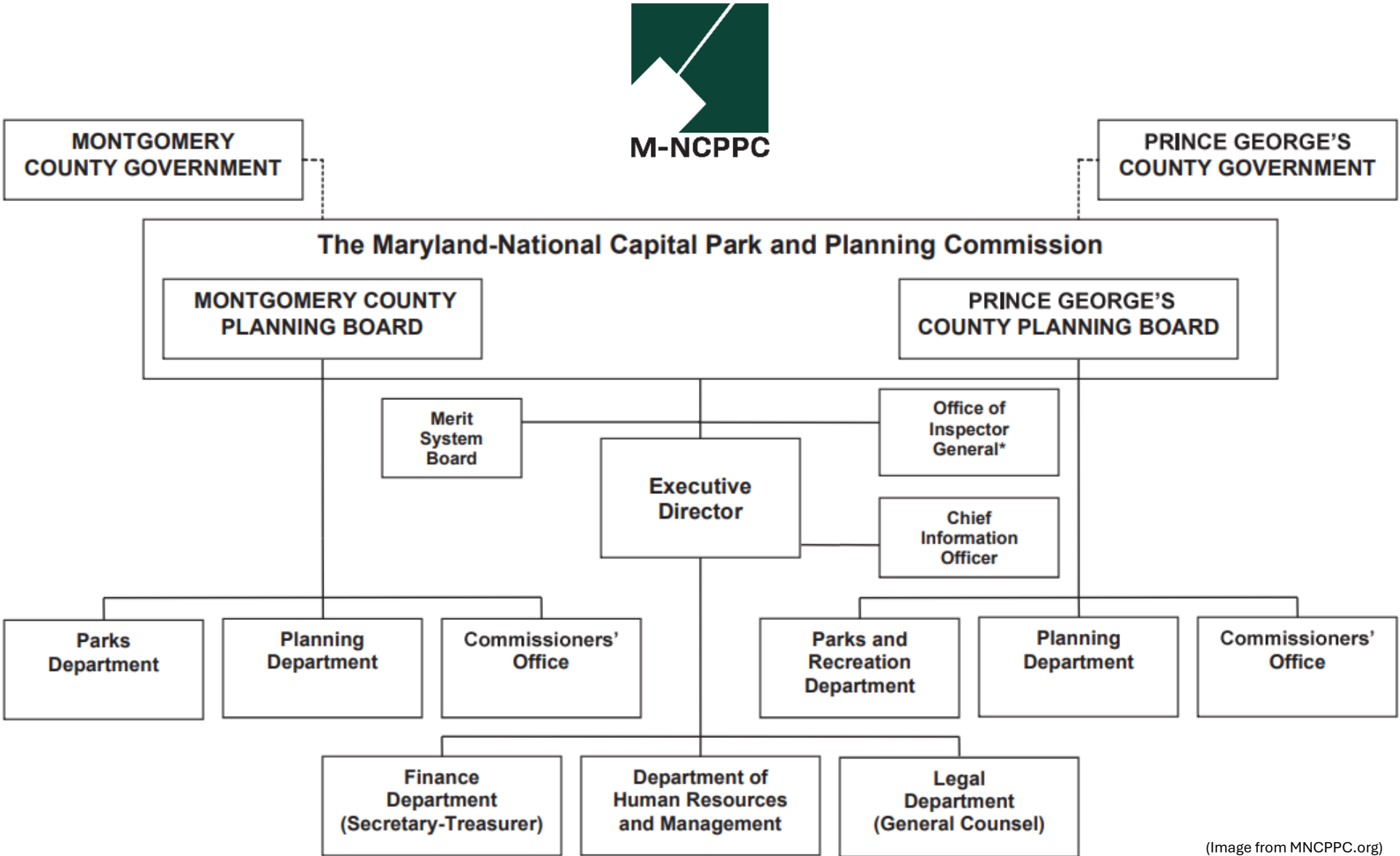


Feng Liu, Ph.D.  
Cambridge Systematics, Inc.

Presentation at MWCOG/TPB Travel Forecasting Subcommittee Meeting

September 18, 2026

# The Maryland-National Capital Park and Planning Commission (M-NCPPC)



(Image from MNCPPC.org)

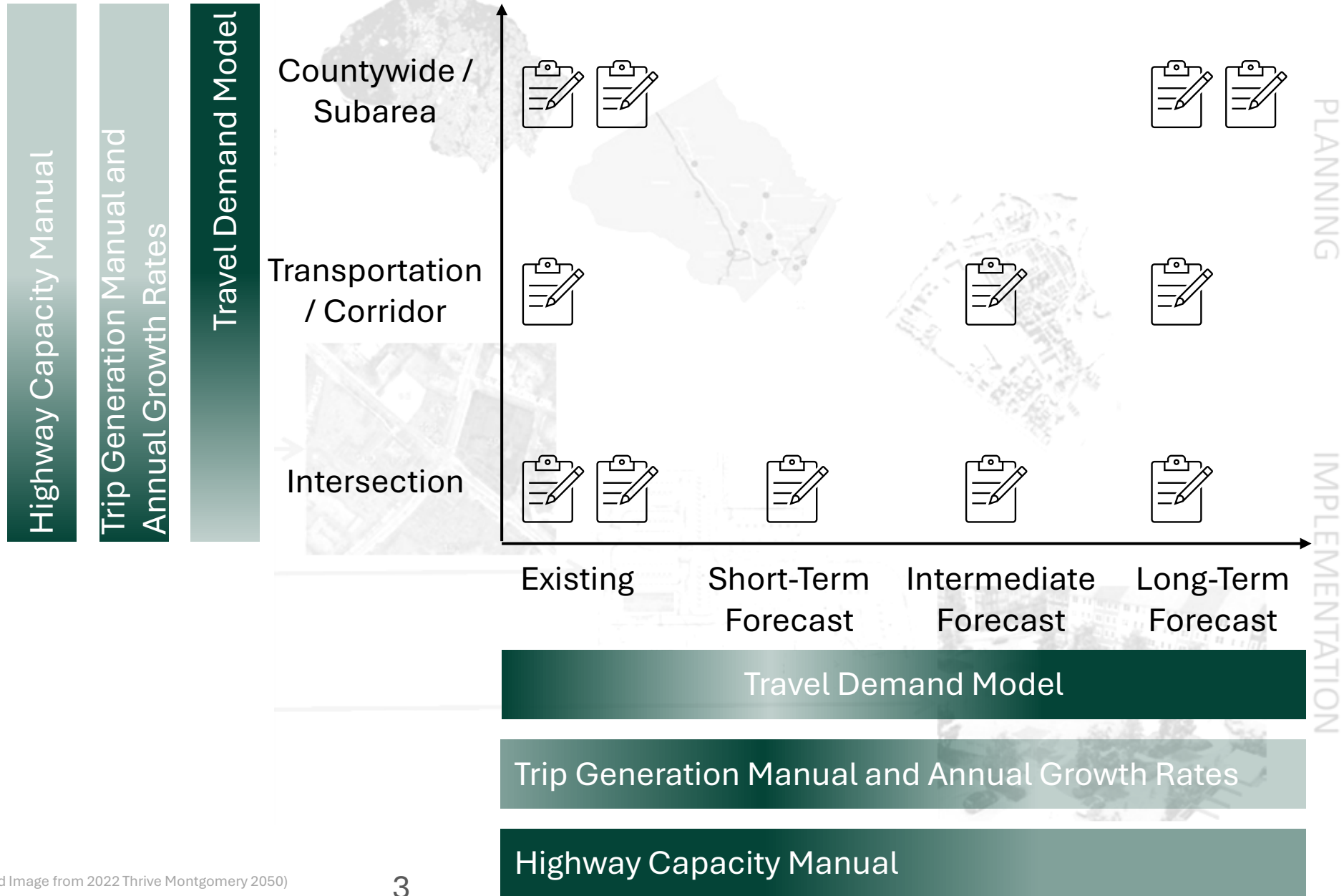
# M-NCPPC Montgomery County Planning Department (MCPD)

2425 Reddie Drive, Wheaton, MD 20902

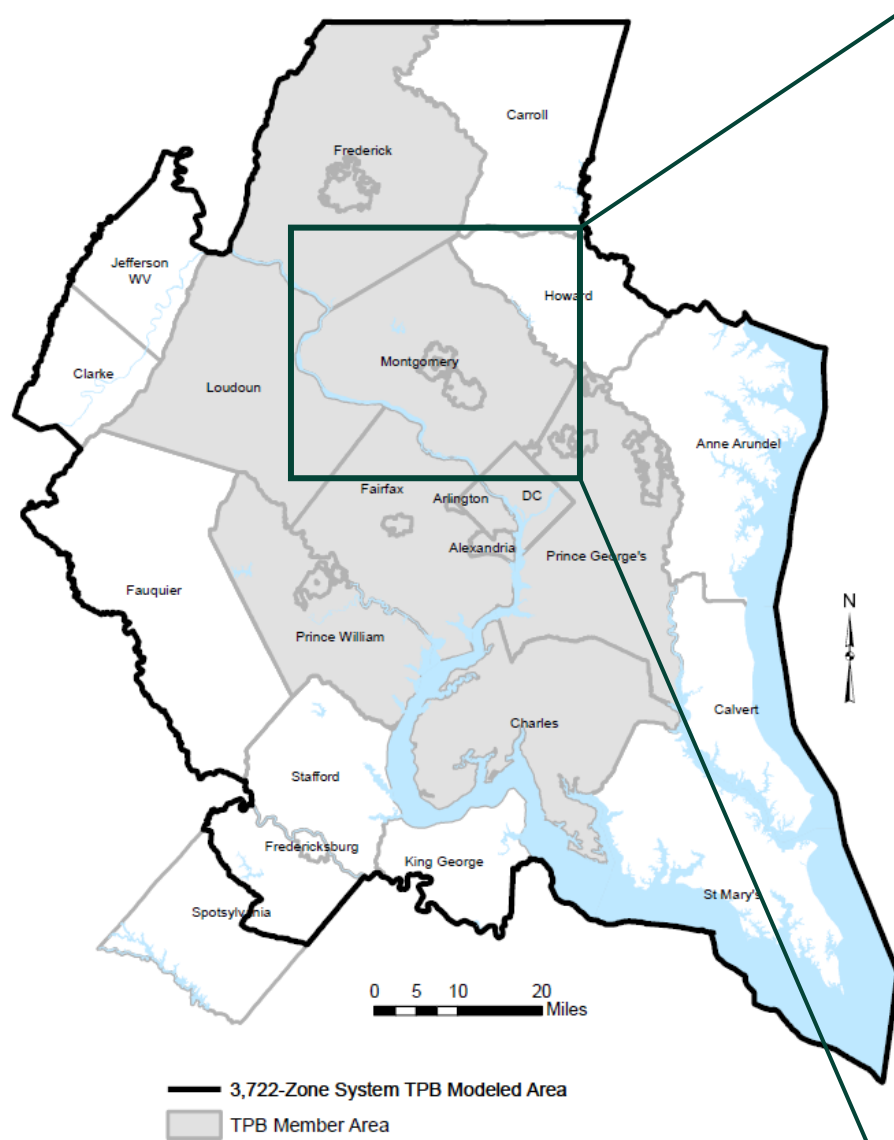


(Image from MontgomeryPlanning.org)

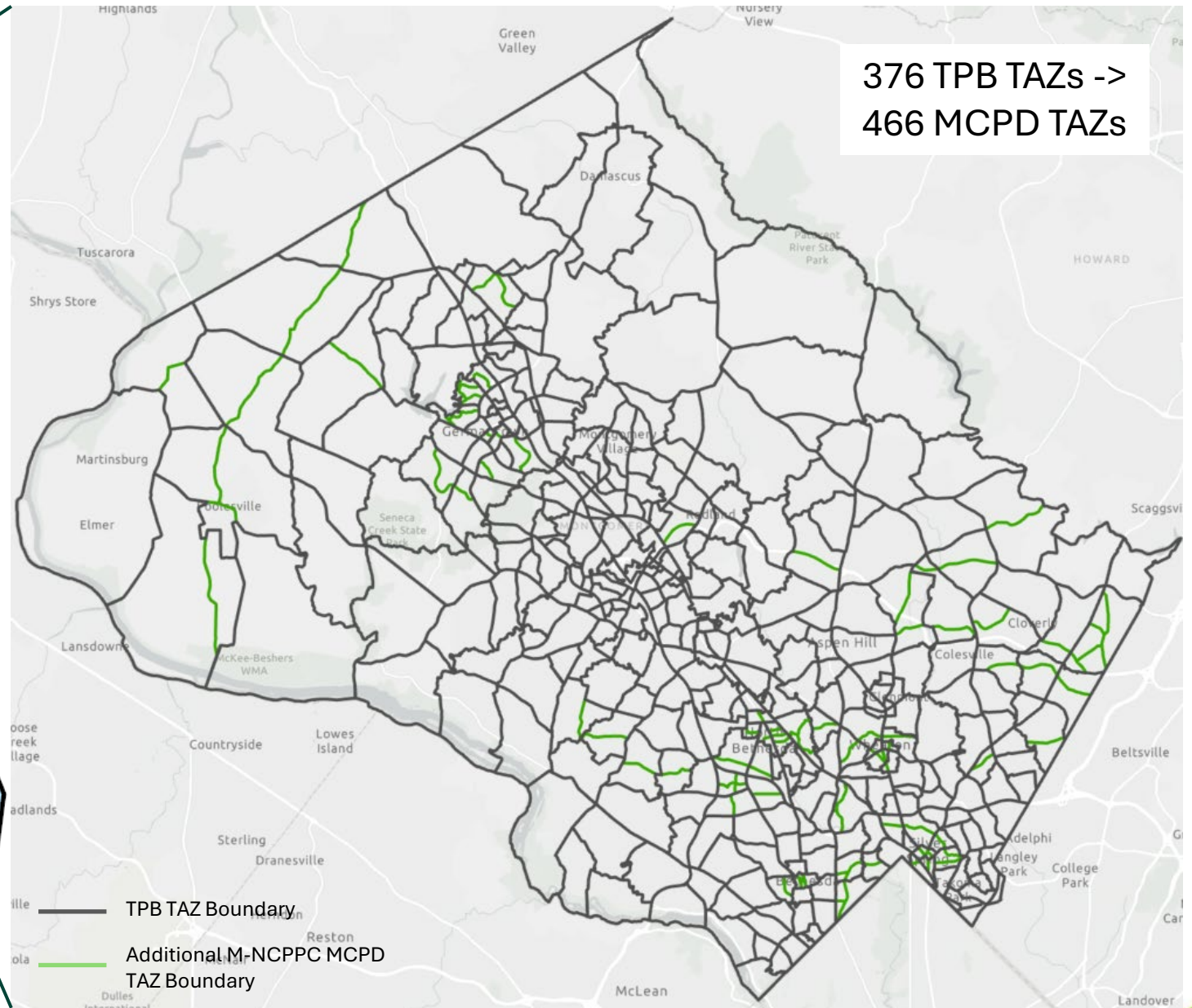
# Recent Traffic Forecasting and Analysis Applications



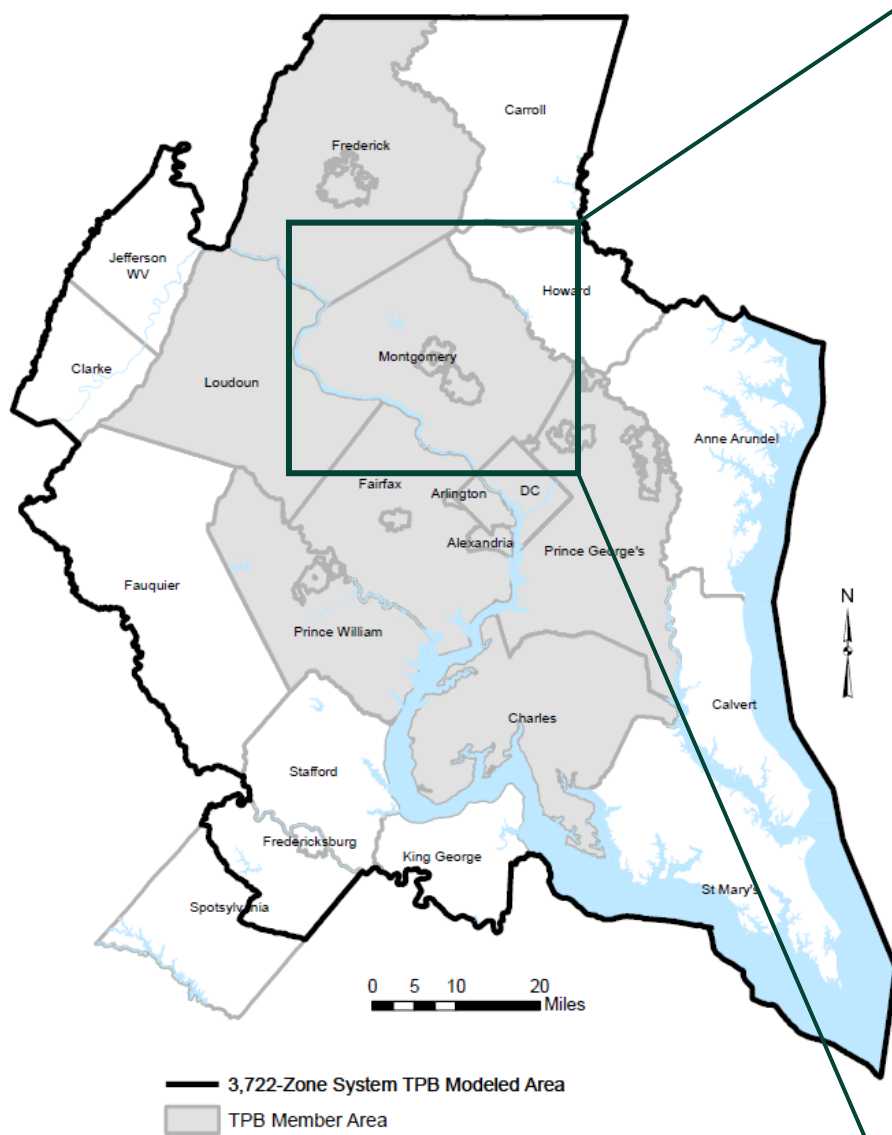
# TAZ Structure



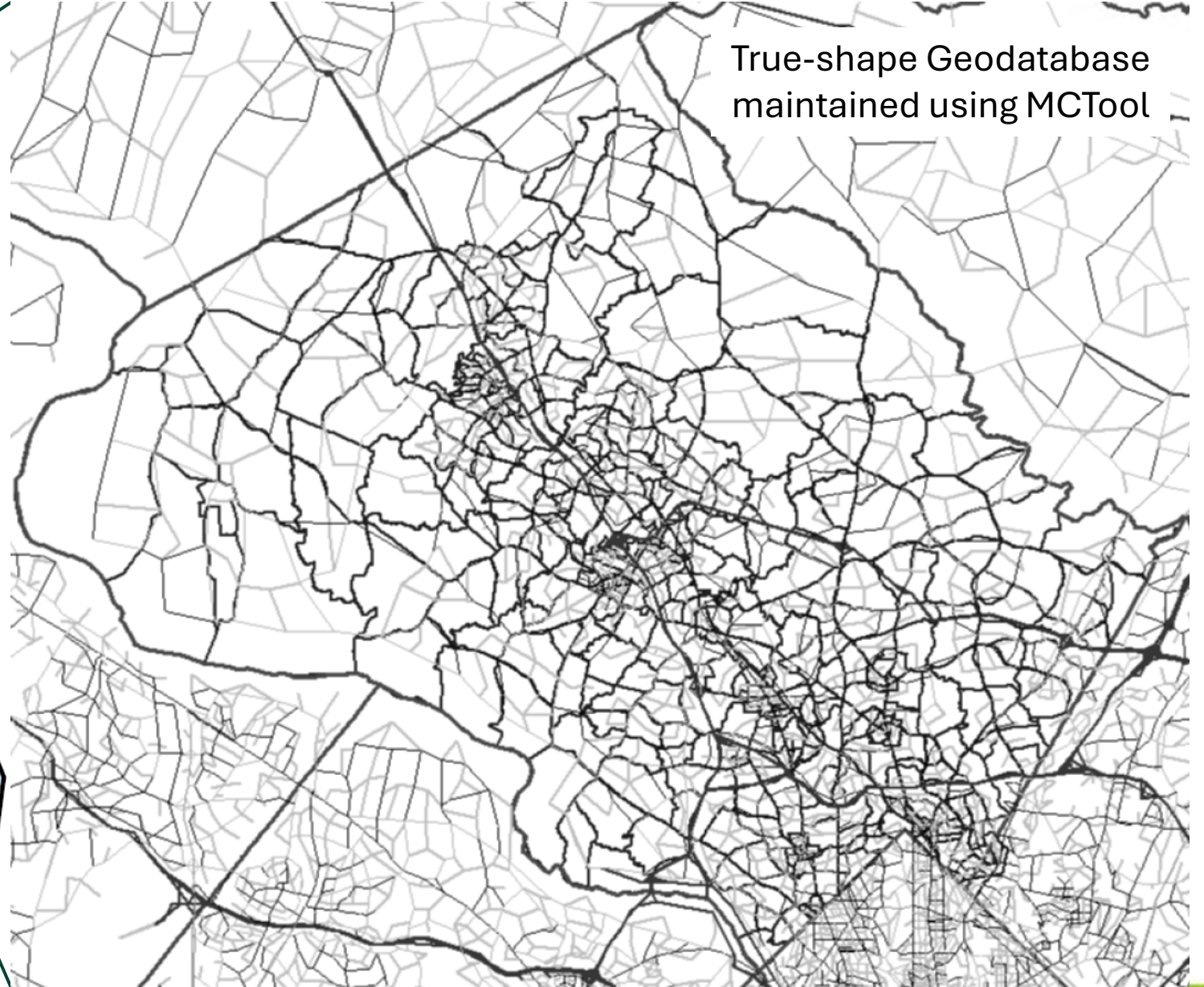
(Image from 2026 MWCOG/TPB Highway and Transit Networks  
Used in the Air Quality Conformity Analysis of the Visualize 2050  
and the FY 2026-2029 TIP)



# Transportation Network



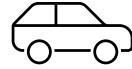
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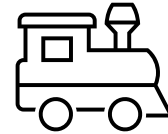
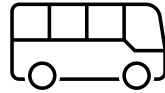
# Performance Metrics

## Performance Metrics:

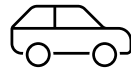
Auto Accessibility



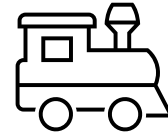
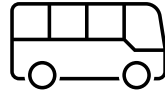
Transit Accessibility



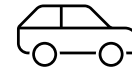
Auto Travel Time



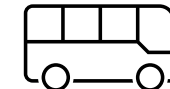
Transit Travel Time



Vehicle Miles of Travel per Capita



Non-Auto-Driver Mode Share (NADMS)

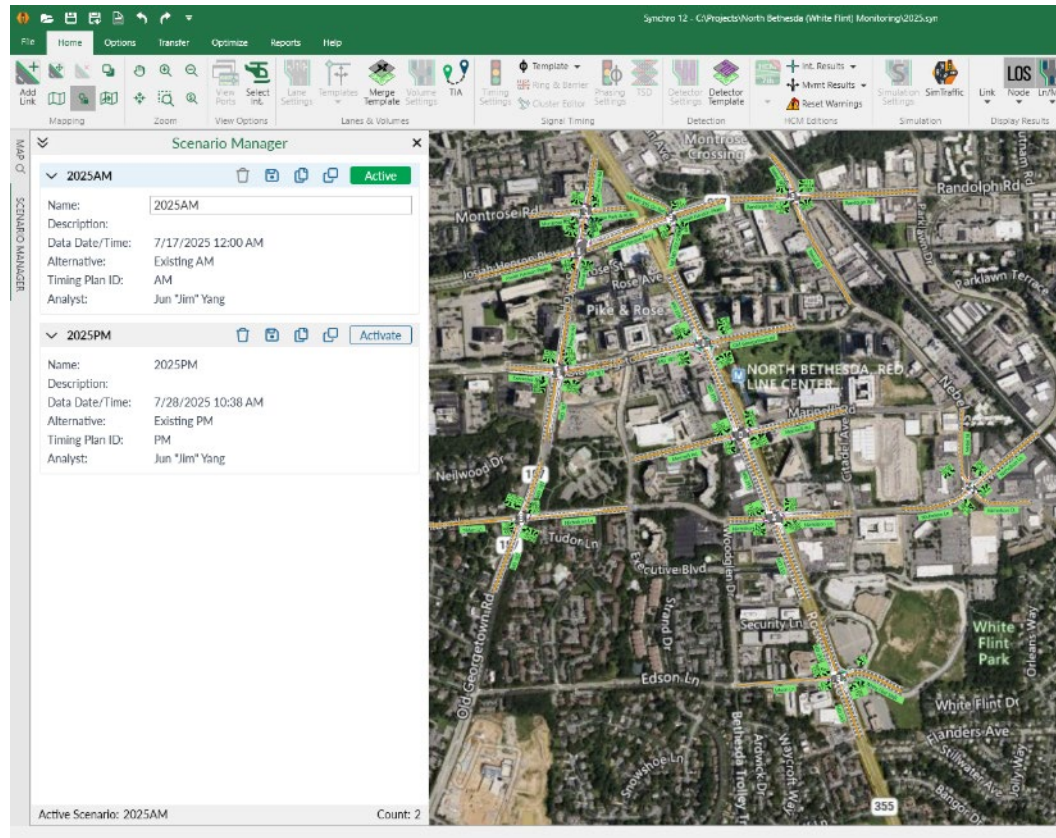


Low-Stress Bicycle Accessibility

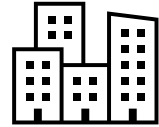


Updating performance measures in progress

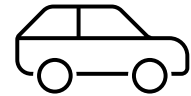
# Major Traffic Capacity Analysis



Countywide/Subarea Plans



Transportation Plans/Studies



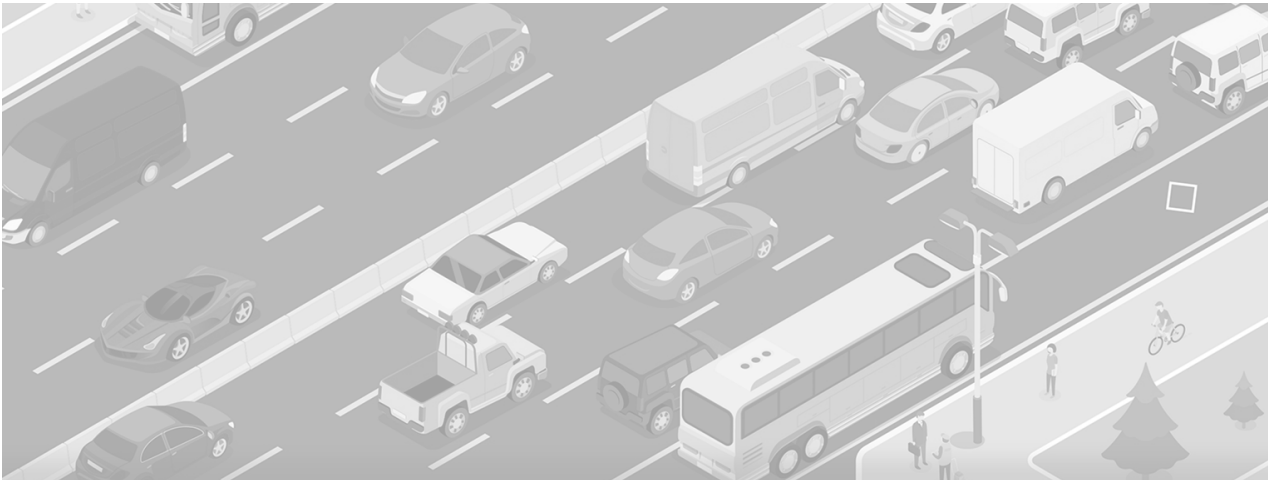
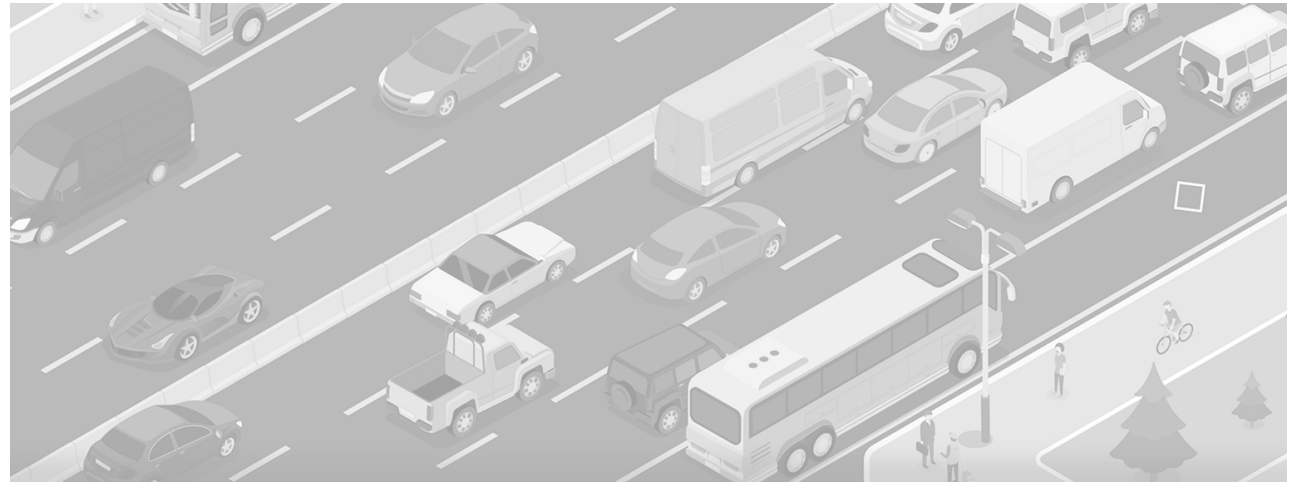
Implementation Monitoring



# Recent Travel Demand Modeling Related Activities

Updating Performance Metrics

Activity Based Model Preparation



(Images from montgomeryplanning.org)

Travel/4 Model Update

Transportation Network Updates

# Travel/4 Model Update

- Travel/4 is a focused area model based on the COG/TPB's Gen2 model
- Update Travel/4 based on the COG/TPB's Gen2/Version 2.4.6 model
- Validate the updated Travel/4 model for the base year 2018 with performance measures
- Conduct sensitivity testing

# Validation Performance Measures

- Validation performance measures
  - » VMT
  - » Volumes by facility types
  - » Volumes by volume groups
  - » Screenline/cutline
  - » Transit ridership
- Total VMT by jurisdictions matches well with the observed VMT, consistent with the COG/TPB model Version 2.4

# Link Volumes by Facility Types

Performance metrics (% RMSE) are better for Montgomery County than for the COG/TPB model domain, slightly better than the COG/TPB model Version 2.4 validation for 2018.

|                | Travel/4<br>% RMSE<br>(Montgomery) | Travel/4<br>% RMSE (COG/TPB<br>Model Domain) | COG/TPB V2.4<br>2018 %RMSE <sup>a</sup> |
|----------------|------------------------------------|----------------------------------------------|-----------------------------------------|
| Freeway        | 12.2%                              | 22.0%                                        | 24.4%                                   |
| Major Arterial | 30.5%                              | 40.2%                                        | 39.0%                                   |
| Minor Arterial | 42.0%                              | 49.4%                                        | 48.5%                                   |
| Collector      | 51.8%                              | 76.9%                                        | 76.7%                                   |
| <b>Total</b>   | 28.0%                              | 43.0%                                        | 44.2%                                   |

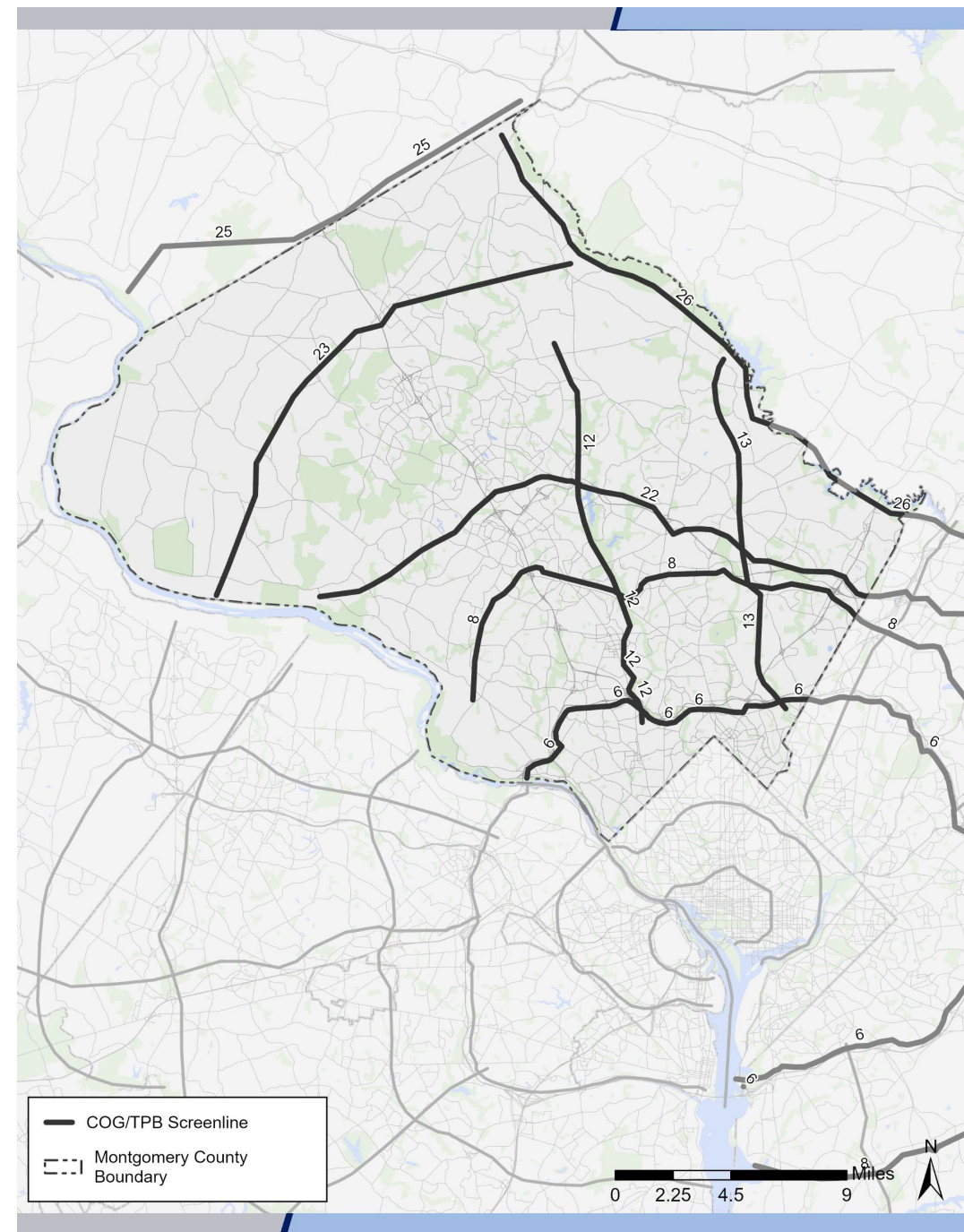
# Link Volume Group Summary

- Travel/4 Model %RMSE performs better in the County than in the COG/TPB model domain as a whole
- Travel/4 Model performs reasonably well overall, especially high-volume facilities.

| Volume Range  | Travel/4 % Deviation (Montgomery) | Travel/4 % Deviation (COG/TPB Model Domain) | Travel/4 % RMSE (Montgomery) | Travel/4 % RMSE (COG/TPB Model Domain) | COG/TPB V2.4 2018 %RMSE <sup>a</sup> |
|---------------|-----------------------------------|---------------------------------------------|------------------------------|----------------------------------------|--------------------------------------|
| <5,000        | 5%                                | 32%                                         | 64.0%                        | 112.2%                                 | 112.7%                               |
| 5,000-9,999   | 4%                                | 8%                                          | 40.5%                        | 58.7%                                  | 58.3%                                |
| 10,000-14,999 | 1%                                | 6%                                          | 36.3%                        | 42.8%                                  | 42.3%                                |
| 15,000-19,999 | 10%                               | 0%                                          | 32.5%                        | 33.8%                                  | 33.5%                                |
| 20,000-29,999 | 9%                                | -6%                                         | 28.9%                        | 31.1%                                  | 31.1%                                |
| 30,000-49,999 | -1%                               | -1%                                         | 21.9%                        | 25.5%                                  | 27.9%                                |
| 50,000-59,999 | -8%                               | -9%                                         | 20.3%                        | 23.5%                                  | 22.7%                                |
| 60,000-69,999 | 7%                                | -7%                                         | 16.6%                        | 22.7%                                  | 21.3%                                |
| >70,000       | -1%                               | -8%                                         | 6.5%                         | 18.3%                                  |                                      |
| <b>Total</b>  | <b>3%</b>                         | <b>0%</b>                                   | <b>28.0%</b>                 | <b>43.0%</b>                           | <b>44.2%</b>                         |

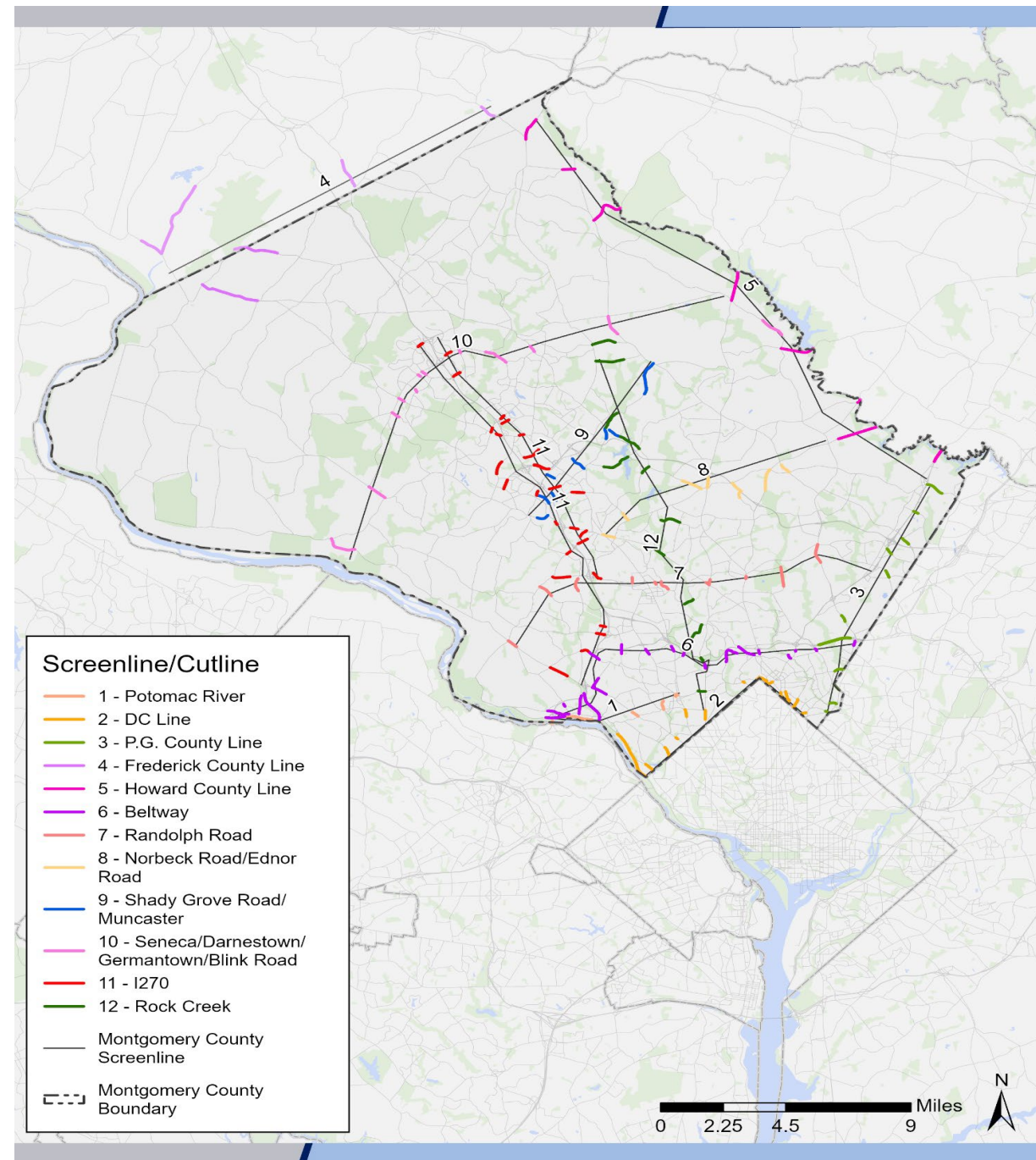
# Screenline/Cutline

- COG/TPB Screenline/Cutline, especially related to Montgomery County
- Travel/4 performs better than or comparable with the COG/TPB model Version 2.4



# Screenline/Cutline

- Montgomery County Screenline/Cutline
- Screenline/Cutline for measuring flows in and around Montgomery County



# Screenline/Cutline (MNCPPC) Performance

- Travel/4 Model volumes are compared reasonably with traffic counts overall, in terms of screen/cutline locations in the County.

| Screenline/Cutline | Location                                | Model Volume/Counts |
|--------------------|-----------------------------------------|---------------------|
| 1                  | Potomac River                           | 1.08                |
| 2                  | DC Line                                 | 1.14                |
| 3                  | P.G. County Line                        | 1.01                |
| 4                  | Frederick County Line                   | 1.07                |
| 5                  | Howard County Line                      | 1.32                |
| 6                  | Beltway South and North Sides           | 1.06                |
| 7                  | Randolph Road                           | 1.08                |
| 8                  | Norbeck Road/Ednor Road                 | 1.24                |
| 9                  | Shady Grove Road/Muncaster              | 0.95                |
| 10                 | Seneca/Darnestown/Germantown/Blink Road | 0.97                |
| 11                 | I270 East and West Sides                | 0.81                |
| 12                 | Rock Creek                              | 1.10                |
| All                |                                         | 1.02                |

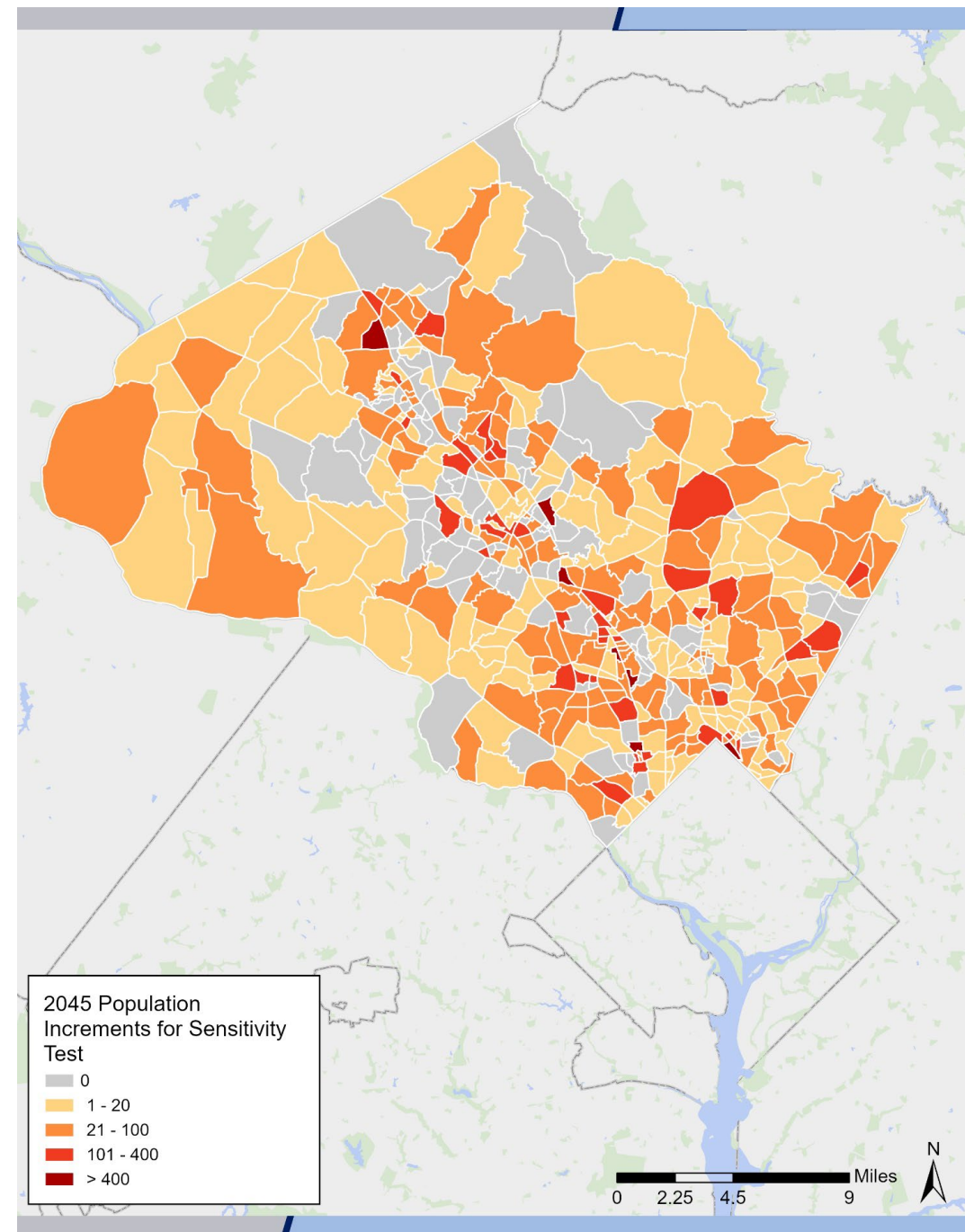
# Transit Ridership by Modes

- Travel/4 transit ridership estimates by submodes match the observed boardings well, including Ride-On.
- Travel/4 model performs better than in the COG/TPB model in ridership estimates.

|               | Travel/4 Modeled/Observed | COG V2.4 2018 Modeled/Observed <sup>a</sup> |
|---------------|---------------------------|---------------------------------------------|
| Metrobus      | 1.01                      | 1.20                                        |
| Non-Metrobus  | 0.99                      |                                             |
| Ride-On       | 1.09                      |                                             |
| Metrorail     | 1.14                      | 1.30                                        |
| Commuter Rail | 0.90                      | 0.76                                        |
| Total         | 1.068                     | 1.24                                        |

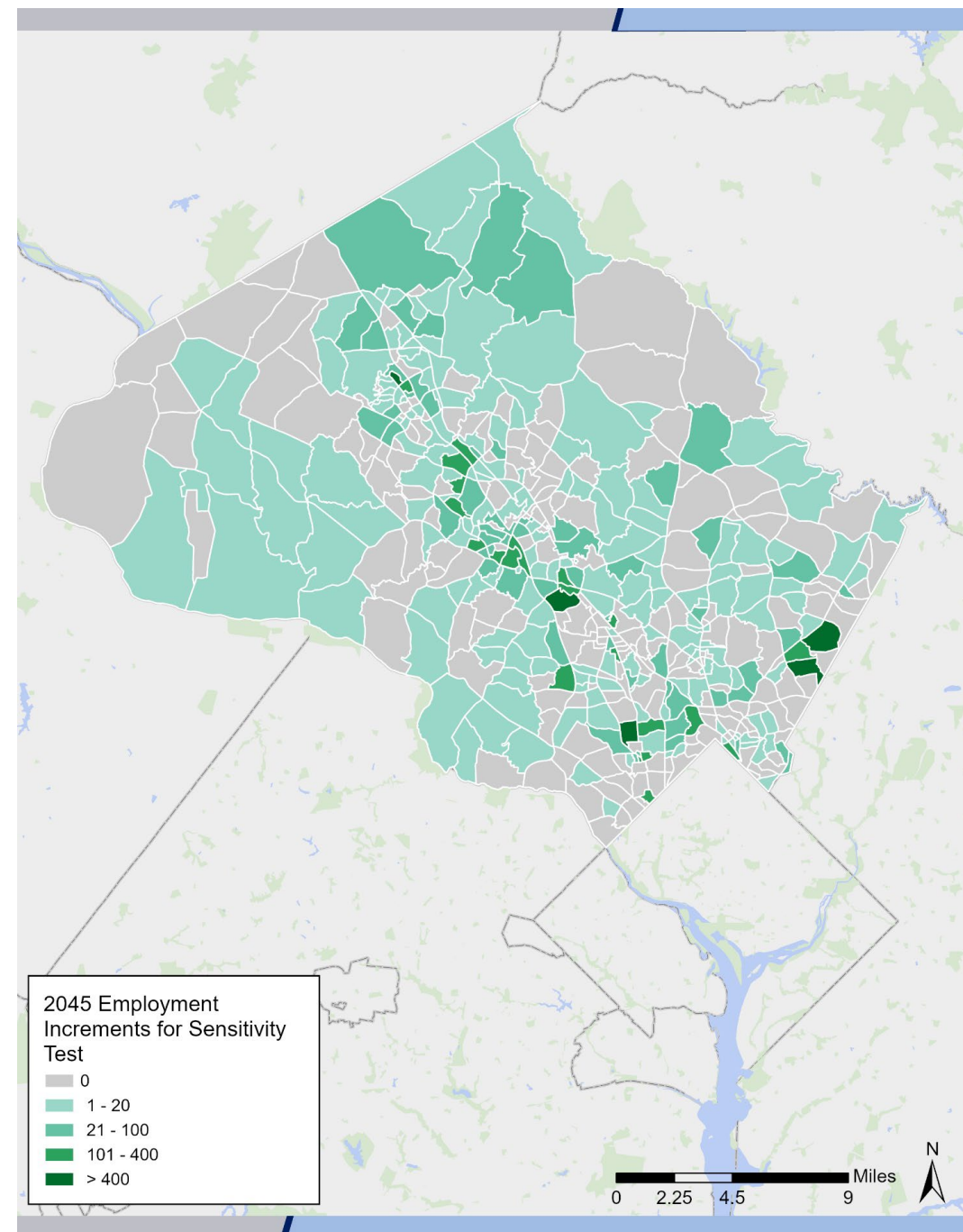
# Sensitivity Test: Land Use

- Population increments between sensitivity test and original 2045
- 10% increase in growth increments
- No change for negative growth



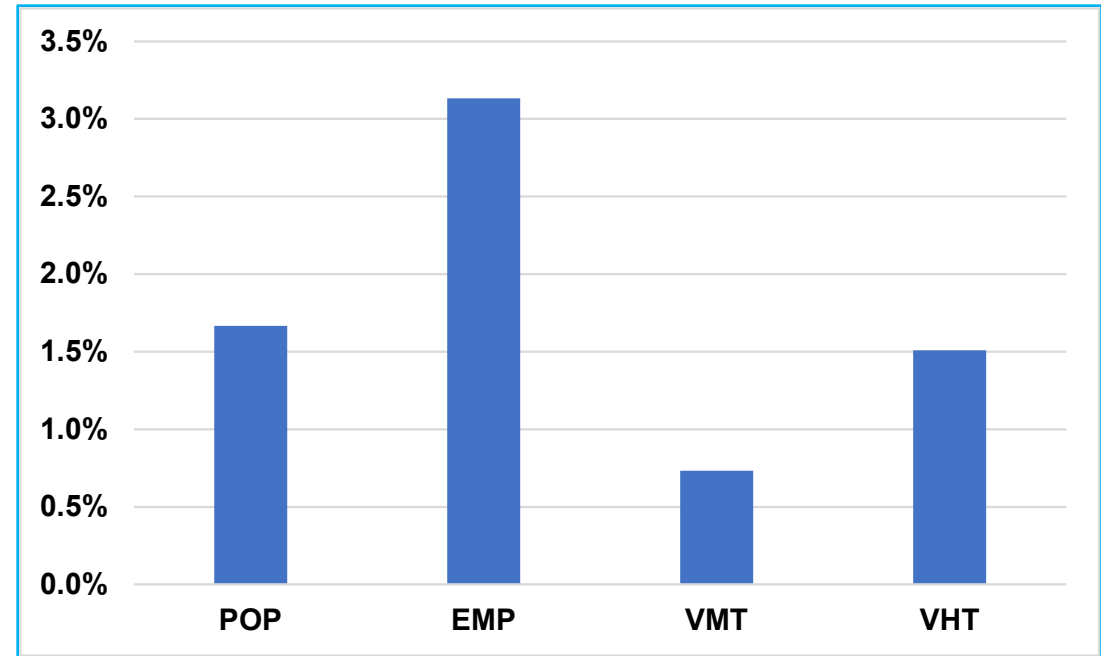
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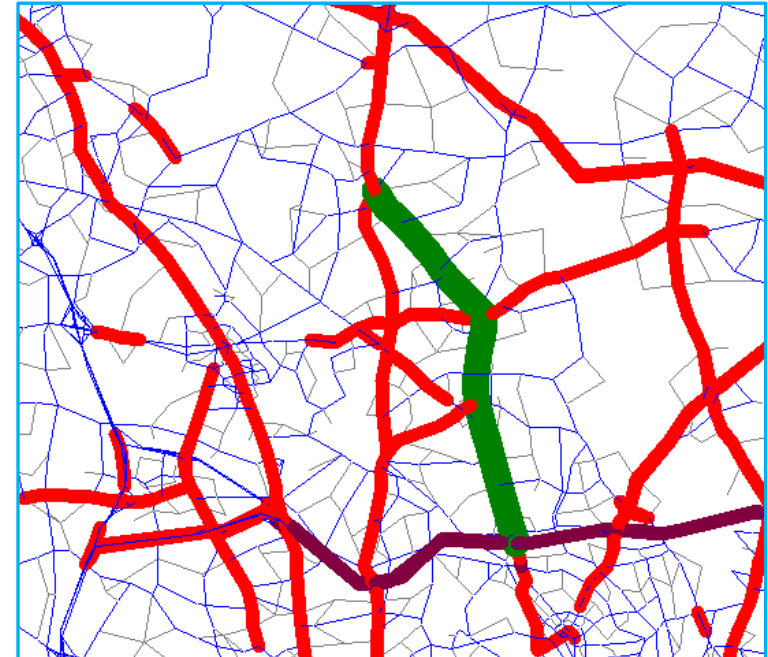
# Sensitivity Test Results: Land Use

- For Montgomery County, VMT would increase at a lower rate and VHT at a rate similar to the population change



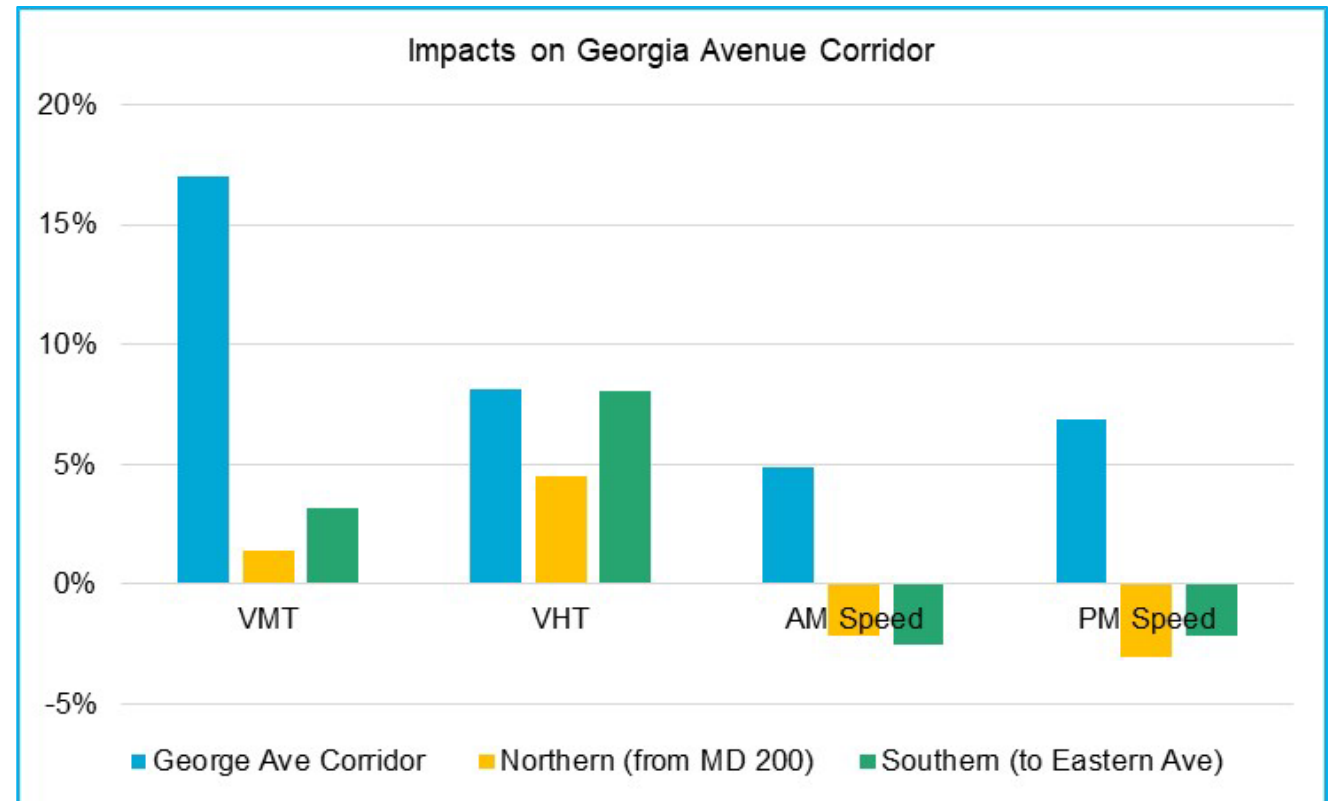
# Sensitivity Test: Roadway Capacity Expansion

- Georgia Ave from Connecticut Ave to I-495
- Widen from 3 to 4 lanes each direction



# Sensitivity Test Results: Roadway Capacity Expansion

- For Georgia Ave corridor segments, VMT would increase 17% while AM and PM congested speeds would increase 5-7%.
- For downstream and upstream segments, VMT and VHT would increase slightly, while AM and PM speeds decrease slightly (2-3%).



# Thank you

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