

M-NCPPC SSP UPDATE

TRANSPORTATION IMPACT STUDY
TECHNICAL WORKING GROUP (TISTWG)
MEETING #5

January 27, 2020

FEHR  PEERS | DC

T'OOLE
DESIGN

AGENDA

1. Introductions
2. Project Scope Overview
3. Vision Zero Integration into LATR
4. Alternative Policy Area Tests
5. Discussion and TISTWG Input
6. TISTWG Schedule and Next Steps

SCOPE OVERVIEW

- LATR Test – local traffic conditions (subdivision review)
 - **Project goal:** Incorporate Vision Zero Action Plan objectives
- Policy Area Test – area-wide traffic impacts (master/sector plan review only)
 - **Project goal:** Better reflect increased travel mode alternatives (as opposed to traditional Level of Service [LOS] metrics)

TECH COMPONENT A: VISION ZERO INTEGRATION

Task 1: Stakeholder Outreach

Task 2: Literature Review

Task 3: Beta-testing of Alternative Methods in Montgomery County

Task 4: Development of Recommendations

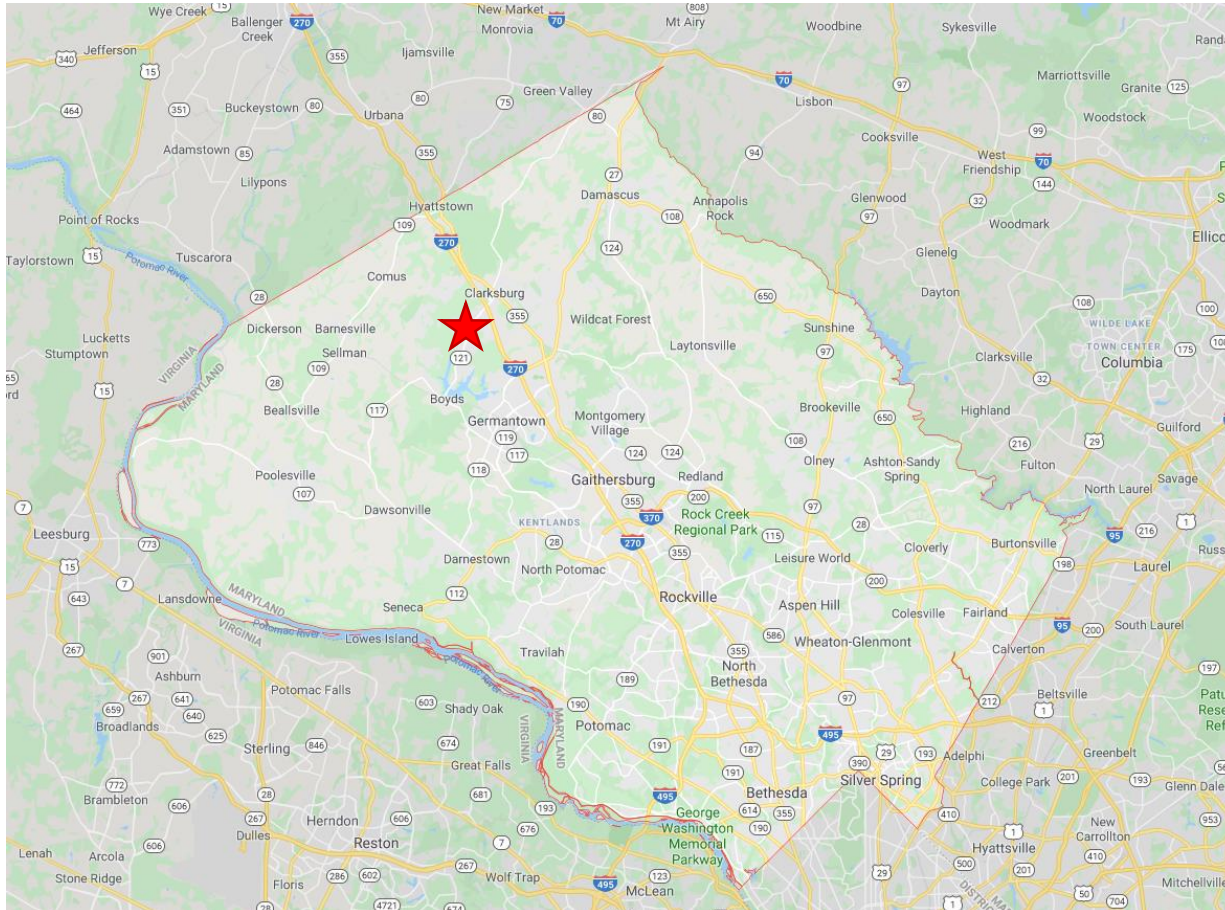
TECH COMPONENT A: VISION ZERO INTEGRATION

Task 3: Beta-testing of Alternative Methods in Montgomery County

- Review beta-test outcomes

BETA-TEST LOCATION

Creekside at Cabin Branch



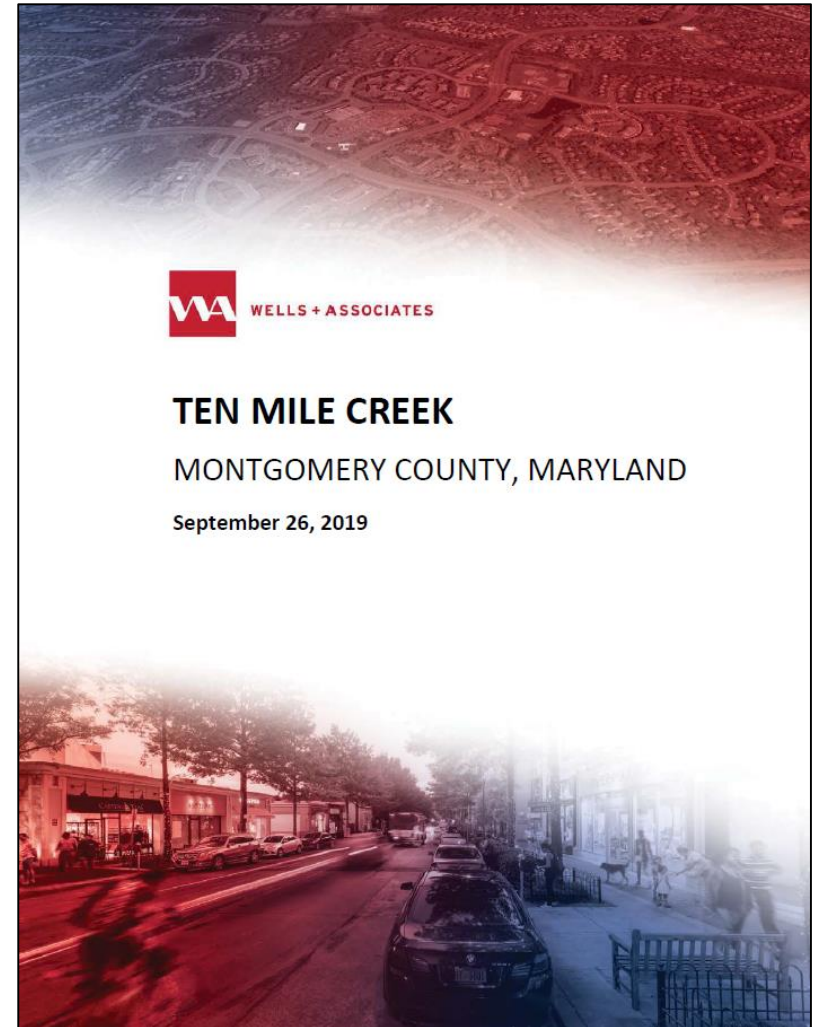
CREEKSIDE AT CABIN BRANCH

2017 LATR Guidelines

Clarksburg Policy Area – Yellow

328 Residential Dwelling Units

- 122 single family detached units
- 206 townhomes



2017 LATR GUIDELINES

- Modal Adequacy Tests
 - Motor Vehicle Adequacy
 - Mitigation to meet delay thresholds
 - Pedestrian system adequacy
 - Not required
 - Bicycle system adequacy
 - Not required
 - Transit system adequacy
 - Not required
- Pedestrian, Bicycle, and Transit Impact Statement
- Conclusions

DATA REQUIREMENTS

- Planned development
 - Land use – trip generation and trip assignment
 - Site access
- Transportation network
 - Existing road network
 - Planned and programmed improvements
 - Non-auto transportation facilities
- Traffic volumes
 - Existing traffic counts
 - Pipeline developments – trip generation and trip assignment
 - Total future traffic forecasts

CONCLUSIONS (1 OF 3)

1. All study intersections **currently operate within the acceptable congestion standard** for the Clarksburg policy area (CLV of 1,425 or 71 seconds per vehicle for the proposed roundabout at the Clarksburg Road/West Old Baltimore Road intersection), during the weekday AM and PM peak hours.
2. The three (3) **pipeline developments are expected to generate** 3,525 AM peak hour trips and 4,577 PM peak hour trips upon completion.
3. Under background conditions without the site development, all of the study area intersections and the proposed roundabout **would continue to operate at acceptable CLVs and average vehicular delays**, during both the AM and PM peak hours.

CONCLUSIONS (2 OF 3)

4. The **proposed development is expected to generate** 288 AM peak hour and 365 PM peak hour person trips, 186 AM peak hour and 235 PM peak hour auto driver vehicle trips, 8 AM peak hour and 9 PM peak hour transit trips, 17 AM peak hour and 21 PM peak hour non-motorized (bicycle) trips, and 25 AM peak hour and 30 PM peak hour pedestrian trips.
5. **Vehicular access** to the site is to be provided via a driveway connecting to Clarksburg Road at a point aligning with Dowitcher Way, and via a connection to Old Clarksburg Road that will act as an emergency vehicle access.
6. All of the study intersections and the proposed roundabout **would continue to operate with acceptable CLVs and average delays** during both the AM and PM peak hours with full buildout of the project and the proposed improvements.

CONCLUSIONS (3 OF 3)

7. The site is served by a connected network of pedestrian and bicycle facilities. Transit service is available as RideOn Route 73 has stops along Clarksburg Road and provides bus service to the Shady Grove Metrorail Station.
8. The proposed site development passes the adequate public facilities LATR tests for the required motor vehicle adequacy.
9. The pedestrian, bicycle and transit adequacy tests are not required as part of this LATR since the site will generate fewer than 50 transit, bicycle, or pedestrian trips during the peak hours.

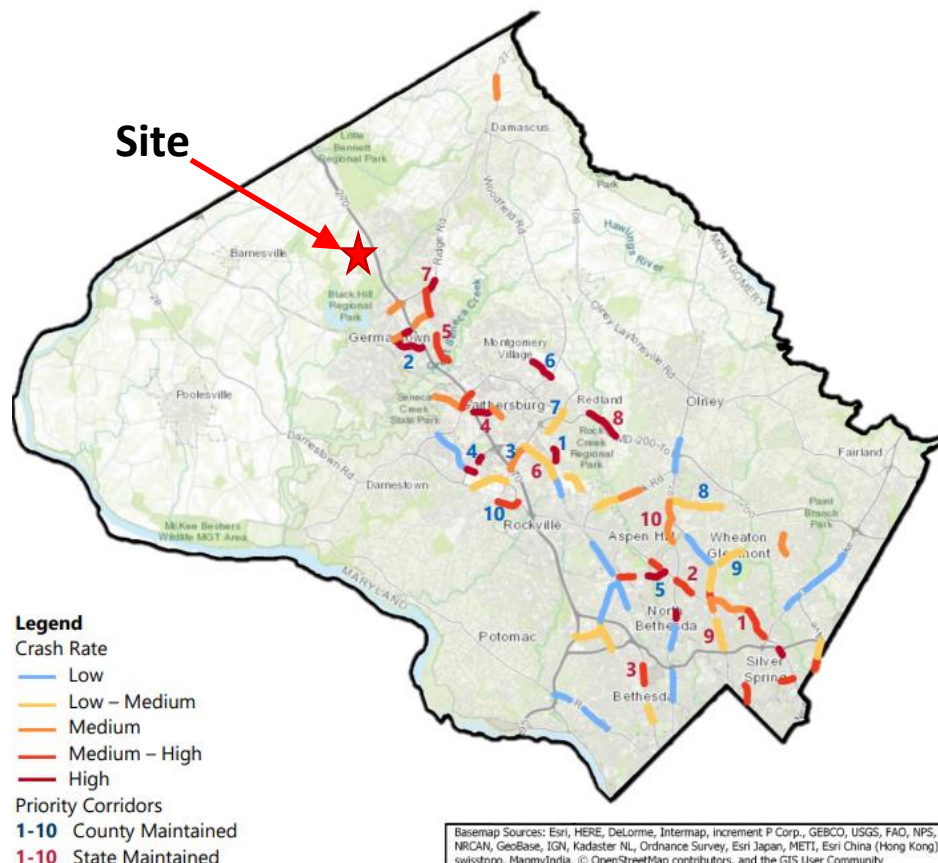
ALTERNATIVE 1

Vision Zero Impact Statement

- To ensure development is executed in a way that better aligns with Vision Zero principles, all LATR studies must include a Vision Zero Impact Statement that describes:
 - Any segment of the high injury network located on the development frontage.
 - Crash analysis for the development frontage.
 - An evaluation of the required sight distance for all access points.
 - Identification of conflict points for drivers, bicyclists, and pedestrians and a qualitative assessment of the safety of the conflict.
 - A speed study including posted, operating, design, and target speeds.
 - Any capital or operational modifications required to maximize safe access to the site and surrounding area, particularly from the Vision Zero Toolkit.
- Mitigation recommendations from the capacity-based adequacy determination must align with the Vision Zero Impact Statement and Pedestrian and Bicycle Impact Statement.
- Ensure Vision Zero resources accurately reflect conditions on the development frontage.

HIGH INJURY NETWORK

There are no segments of the high injury network in the vicinity of the development frontage.



CRASH ANALYSIS

- Opposite direction sideswipe and single vehicle crash in which the driver struck a guardrail or barrier.
- Based on this crash data, the limited number of crashes do not indicate an existing crash pattern.



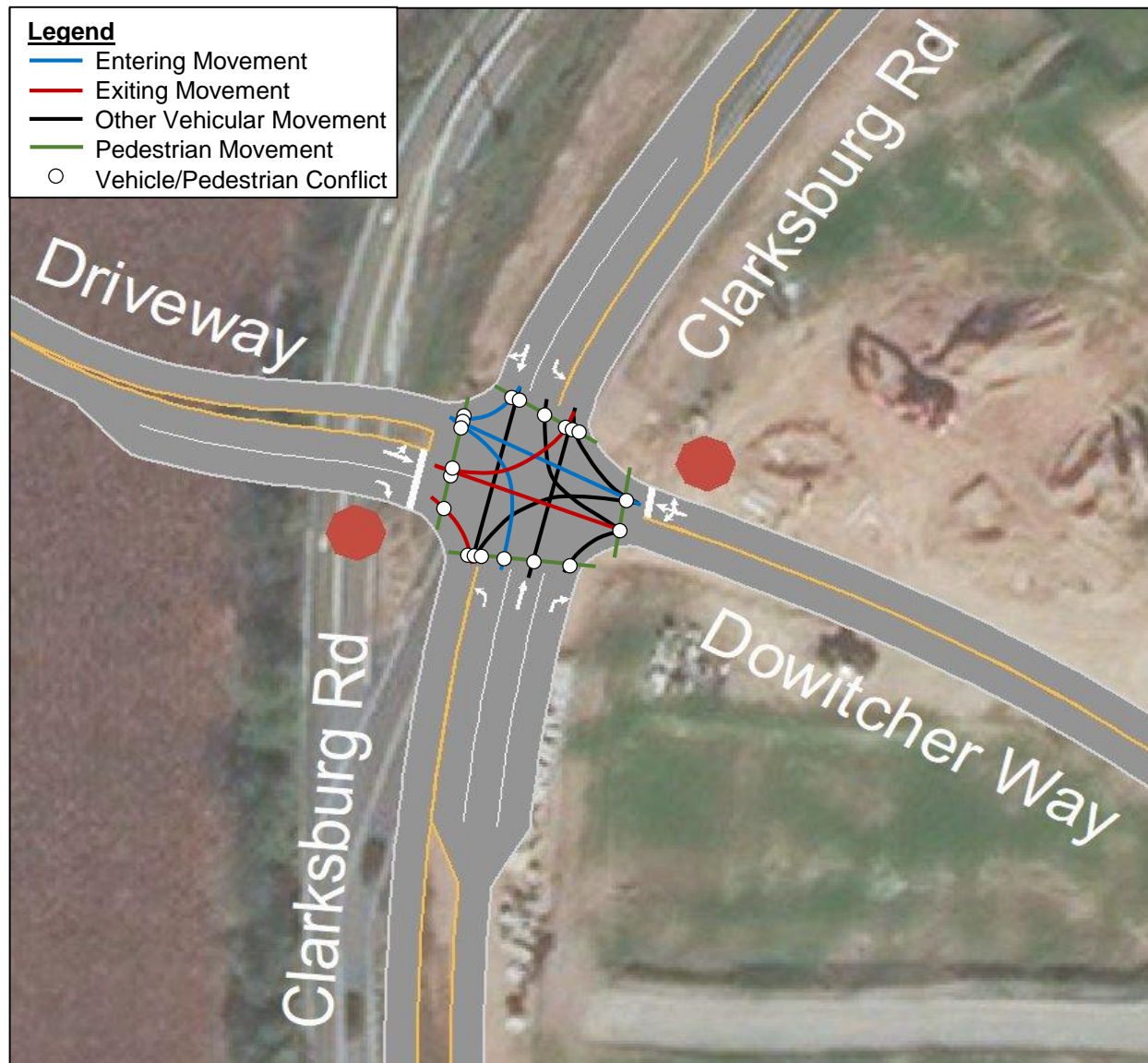
SIGHT DISTANCE

- Per the Montgomery County Sight Distance Evaluation Form, the required sight distance in each direction is 325'.
- The sight distance was evaluated for drivers turning left or right out of the Site Access Driveway onto Clarksburg Road.
 - Curvature of the roadway
 - Street trees, signs, or other roadside objects
- Ensuring there is adequate sight distance will allow drivers to exit the driveway and get up to speed on Clarksburg Road and do not interfere with drivers on Clarksburg Road.
- The sight distance is met in both directions at this location.

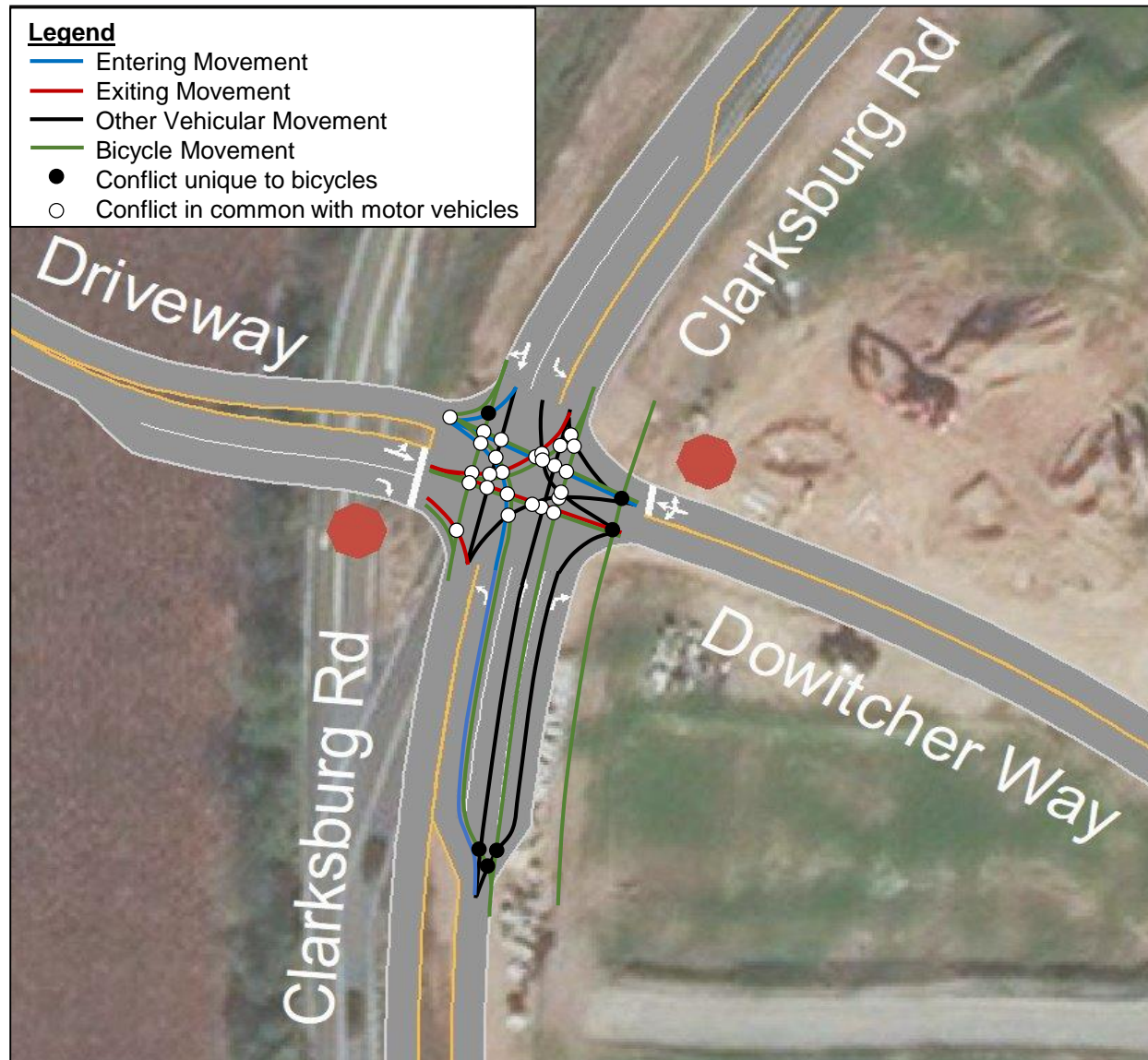
VEHICLE-VEHICLE CONFLICTS



VEHICLE-PEDESTRIAN CONFLICTS



VEHICLE-BICYCLE CONFLICTS



SPEEDS

Clarksburg Road

- Posted speed limit: 40mph
- Operating speed (hypothetical)
 - Average: 38mph
 - 85th percentile: 44mph
- Design speed: 45mph
- Target speed: Not identified

VISION ZERO TOOLKIT

Based on the information presented in this Vision Zero Impact Statement the following treatments were identified that may be applied in the Creekside at Cabin Branch study area.

- Advance Stop / Yield Markings
- Curb Extensions
- Crossing Islands
- High-Visibility Crosswalks
- Pedestrian Hybrid Beacons
- Posted Speed Limit (Target Speeds/School Speed Zones)
- Raised Crossings
- Rectangular Rapid Flashing Beacons
- Street Trees for Traffic Calming

CONCLUSIONS

Add to the list of conclusions

9. Based on data collected in the Vision Zero Impact Statement, **additional treatments from the Vision Zero Toolkit should be installed** to address the conflicts for pedestrians crossing Clarksburg Road and bicyclists continuing on Clarksburg Road. Treatments that should be considered are listed in the Vision Zero Impact Statement.

ALTERNATIVE 2

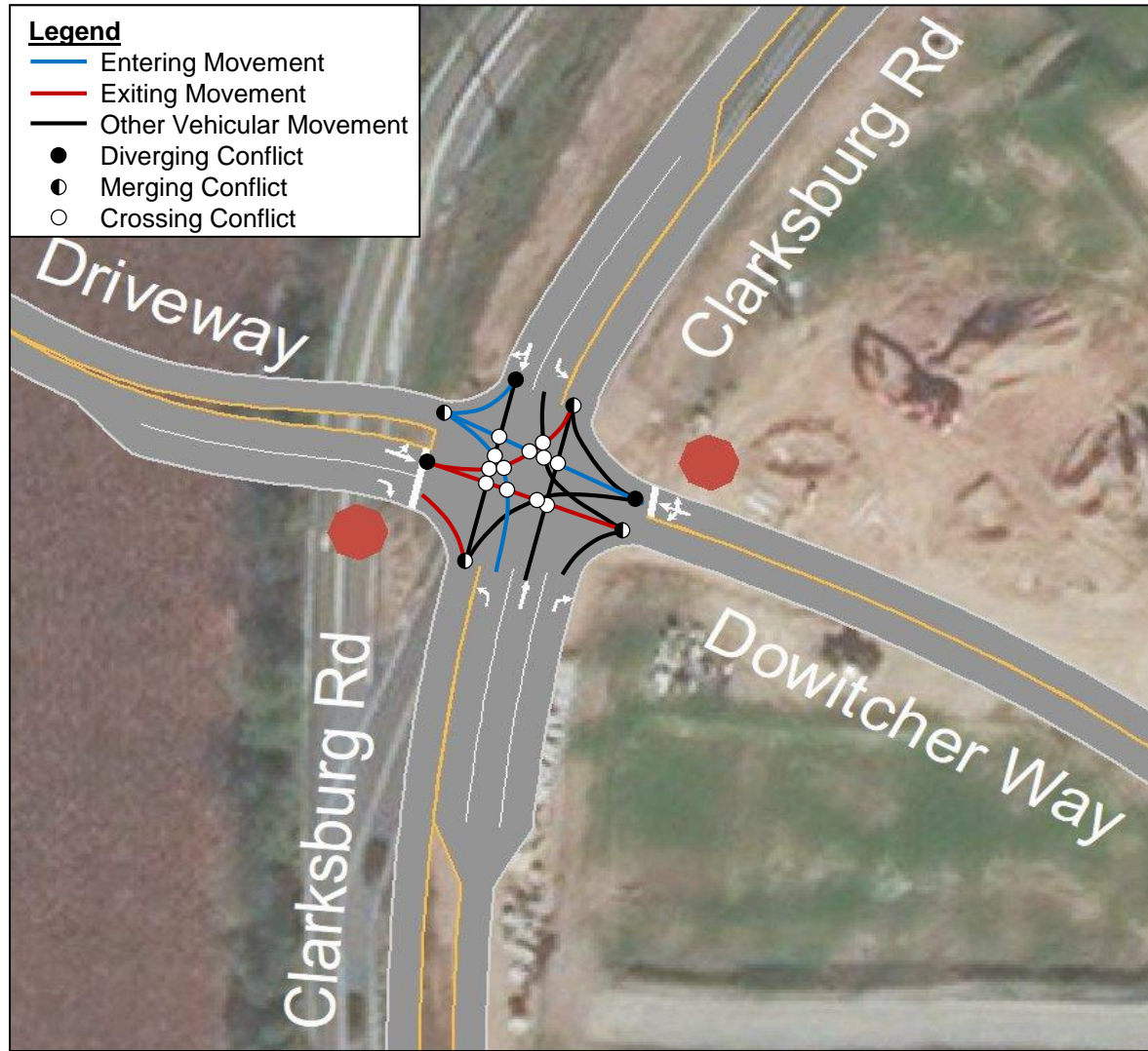
- Includes options that can be implemented in the short term and options for future implementation that use tools that are still in development
- All tests are required if the development produces > 50 peak-hour weekday person trips
- Motor Vehicle System
 - Reduce the estimated number of crashes based on predictive safety performance functions or number of conflict points
 - Existing capacity test
- Pedestrian System
 - Existing – ADA compliance
 - Acceptable pedestrian level of comfort or no gaps in pedestrian access routes within 500 feet of the site, or to transit stops within 1,000 feet
- Bicycle System
 - Existing test – low levels of traffic stress within 750 feet of the site
- Transit System
 - Existing capacity test – peak load level of service

MOTOR VEHICLE SYSTEM

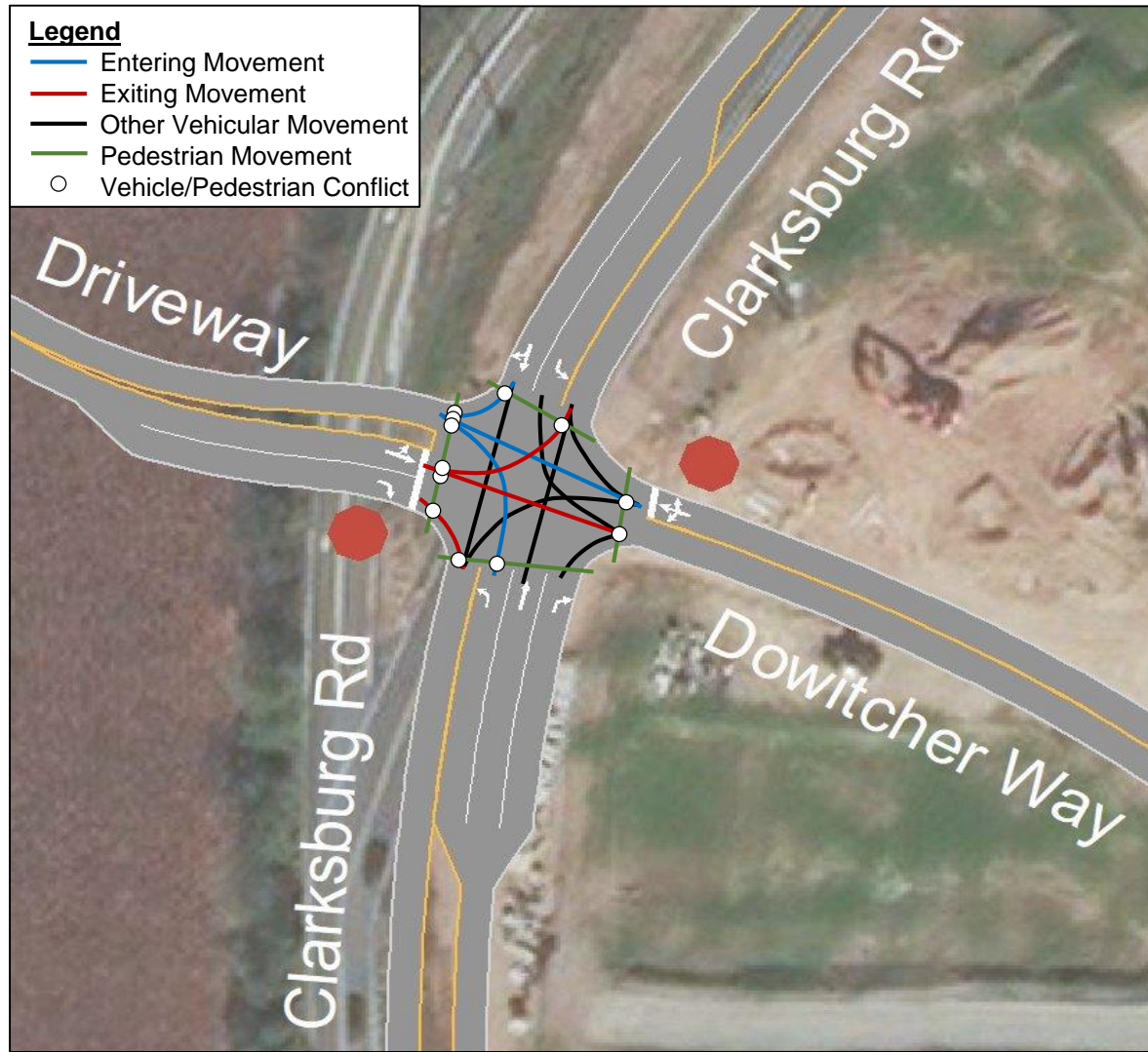
Reduce the estimated number of crashes based on predictive safety performance functions or reduce the number of conflict points

- Future traffic forecasts using 2017 LATR Guidelines process
- Safety performance function methodology: under development
- Number of conflict points
 - Conflict points identified for drivers, bicyclists, and pedestrians
 - Sum of the volumes at each of the conflict points involving a trip to or from the development site

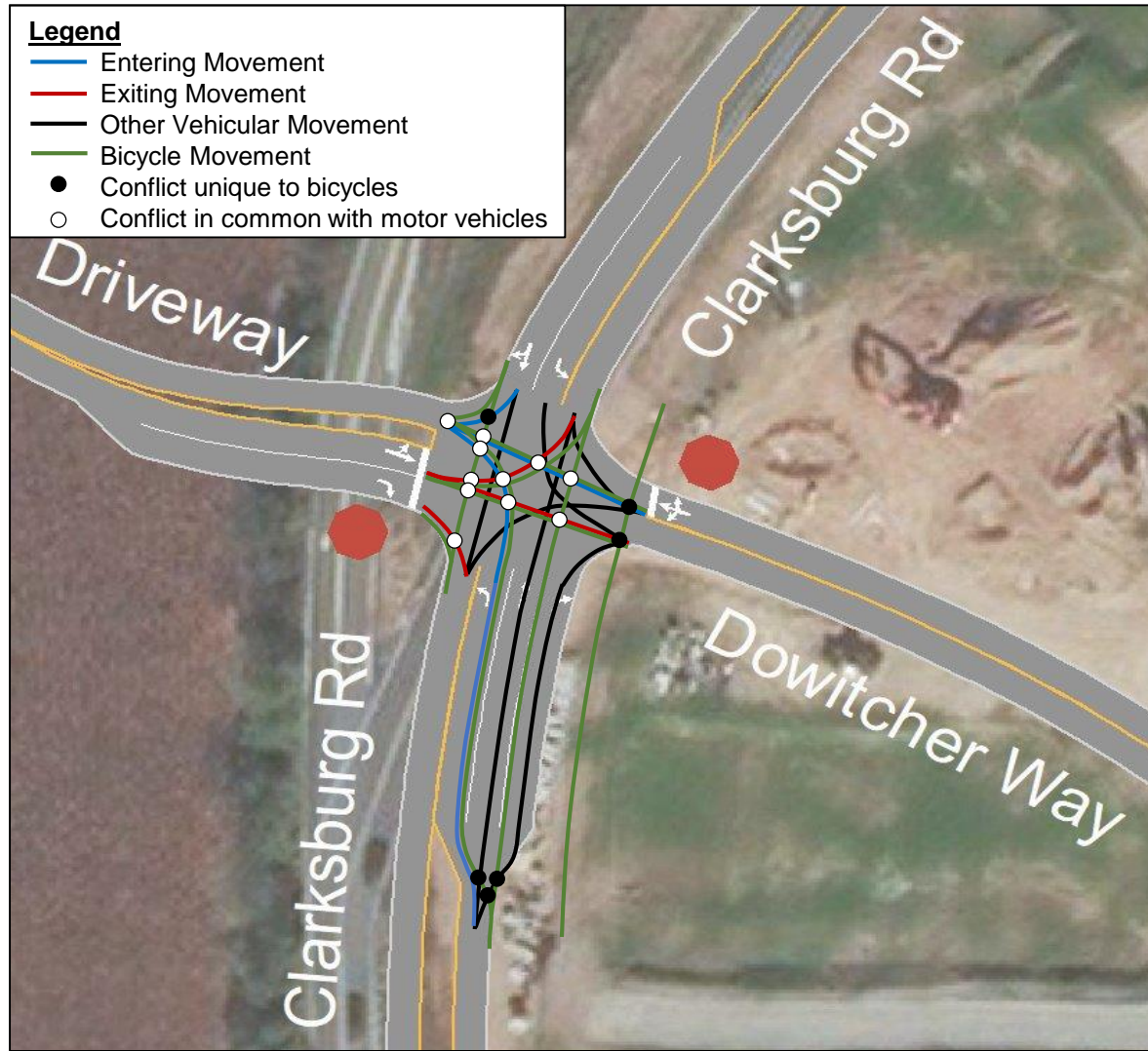
SITE ACCESS DRIVEWAY VEHICLE/VEHICLE CONFLICTS



SITE ACCESS DRIVEWAY VEHICLE/PEDESTRIAN CONFLICTS



SITE ACCESS DRIVEWAY VEHICLE/BICYCLE CONFLICTS



CONFLICT CALCULATION VEHICLE/VEHICLE

Intersection		With Development - AM Peak						
Clarksburg Rd at Site Access Driveway	Movements	EBL	EBT	EBR	NBL	WBT	SBR	Total
	EBL		104		116	104		6,663
	EBT	104			12			
	EBR							
	NBL	116	12			12	45	
	NBT	498	394			394		
	NBR		0					
	WBL		1	38	13	1		
	WBT	104			12		33	
	WBR	145				41		
	SBL	116	12			12		
	SBT	764	660	697	672	660	693	
	SBR				45	33		

CONFLICT CALCULATION VEHICLE/PEDESTRIAN, VEHICLE/BICYCLE

Intersection		With Development - AM Peak						
Clarksburg Rd at Site Access Driveway	Movements	EBL	EBT	EBR	NBL	WBT	SBR	Total
	South x-walk			46	21			485
	East x-walk		9			9		
	North x-walk	113					42	
	West x-walk	113	9	46	21	9	42	
	EBL bikes		10		22	10		755
	EBT bikes	104			12			
	EBR bikes							
	NBL bikes	105	1			1	34	
	NBT bikes	104	0			0		
	WBT bikes	104			12		33	
	SBT bikes	104	0	37	12	0	33	
	SBR bikes				15	3		

CONFLICT COMPARISON

Intersection	Conflict Type	Background AM & PM Peak Hour Conflicts	With Development AM & PM Peak Hour Conflicts
Clarksburg Rd at West Old Baltimore Rd	Vehicle-Vehicle	9,162	9,620
	Vehicle-Pedestrian	3,866	4,084
	Vehicle-Bicyclist	5,384	5,678
	Total	18,412	19,382
Clarksburg Rd at Driveway Access	Vehicle-Vehicle	9,996	13,011
	Vehicle-Pedestrian	0	1,090
	Vehicle-Bicyclist	0	1,659
	Total	9,996	15,759
Clarksburg Rd at Broadway Ave	Vehicle-Vehicle	6,596	7,411
	Vehicle-Pedestrian	4,650	5,272
	Vehicle-Bicyclist	5,640	6,455
	Total	16,886	19,138
Total		45,294	54,279

PEDESTRIAN SYSTEM

- ADA compliance
- Acceptable pedestrian level of comfort or no gaps in pedestrian access routes within 500 feet of the site, or to transit stops within 1,000 feet



BICYCLE SYSTEM

- Low levels of traffic stress within 750 feet of the site



TRANSIT SYSTEM

No stops exist within 1,000 feet of the site

- Discuss the feasibility of adding a bus stop at the Site Access Driveway

CONCLUSIONS (1 OF 2)

From Existing Study:

1. The three (3) **pipeline developments are expected to generate** 3,525 AM peak hour trips and 4,577 PM peak hour trips upon completion.
2. The **proposed development is expected to generate** 288 AM peak hour and 365 PM peak hour person trips, 186 AM peak hour and 235 PM peak hour auto driver vehicle trips, 8 AM peak hour and 9 PM peak hour transit trips, 17 AM peak hour and 21 PM peak hour non-motorized (bicycle) trips, and 25 AM peak hour and 30 PM peak hour pedestrian trips.
3. **Vehicular access** to the site is to be provided via a driveway connecting to Clarksburg Road at a point aligning with Dowitcher Way, and via a connection to Old Clarksburg Road that will act as an emergency vehicle access.
4. All the study intersections and the proposed roundabout **would continue to operate with acceptable CLVs and average delays** during both the AM and PM peak hours with full buildout of the project and the proposed improvements.

CONCLUSIONS (2 OF 2)

New Conclusions:

5. The proposed development is expected to **increase the number of conflicts** that occur at the Site Access Driveway, Old Baltimore Road, and Broadway Avenue. Treatments have been identified to **mitigate the additional conflicts**.
6. **Pedestrian access** to the site is to be provided via a sidewalk on the northwest side of Clarksburg Road and a sidepath on the southeast side of Clarksburg Road which also provides access for bicyclists.
7. **Bicycle access** is also to be provided through conventional bike lanes and a sidepath on Clarksburg Road. Upon completion of these facilities, the proposed development site passes the adequate public facilities LATR test for the required pedestrian and bicycle system adequacy.
8. Transit service is available as RideOn Route 73 has stops along Clarksburg Road and provides bus service to the Shady Grove Metrorail Station. There are **currently no transit stops within 1,000 feet of the development site**.

POLICY AREA TESTS

Metric	Modes Addressed				Analysis Scale	
	Auto	Transit	Bike	Walk	Policy Area	Corridor
1. Accessibility						
Accessibility	✓	✓	✓	(✓)	✓	
2. Mobility & Environment						
Person Throughput	✓	✓				✓
Travel Times	✓	✓			✓	
VMT per Capita	✓				✓	
Non-Auto Driver Mode Share	✓	✓	✓		✓	

POLICY AREA TESTS

BETA TEST APPLICATION

- Test application of metrics in a Policy Area context to understand process
- Present illustrative results (County, Policy Area; 2010 & 2040)
 - Will consider updating for 2015 values if time allows
- Threshold approaches:
 - No worse than existing
 - Bring up “lagging” areas to “exemplary” areas
 - Set aspirational goals, e.g.,
 - Full buildout of bike master plan
 - Some fraction of 100% low-stress connectivity

AUTO/TRANSIT ACCESSIBILITY

What? Number of jobs accessible within 45 minutes by auto (or transit)

How? Travel/4 Model

Where? TAZ level

Population-weighted average to County or Policy Area

Why? Indicates accessibility to destinations

Can demonstrate accessibility tradeoff of increased density of development, increased congestion, and transportation network changes

AUTO/TRANSIT ACCESSIBILITY COUNTYWIDE RESULTS

County Jobs Accessible by:

	Total County Jobs	Auto	Transit
2010	506,596	453,772	62,606
2040	724,652	579,181	134,637
Delta	218,055	125,408	72,032
% Delta	43%	28%	115%

Regional Jobs Accessible by:

	Total Regional Jobs	Auto	Transit
	3,886,899	1,159,950	134,155
	5,542,347	1,230,164	250,179
	1,655,448	70,214	116,024
	43%	6%	86%

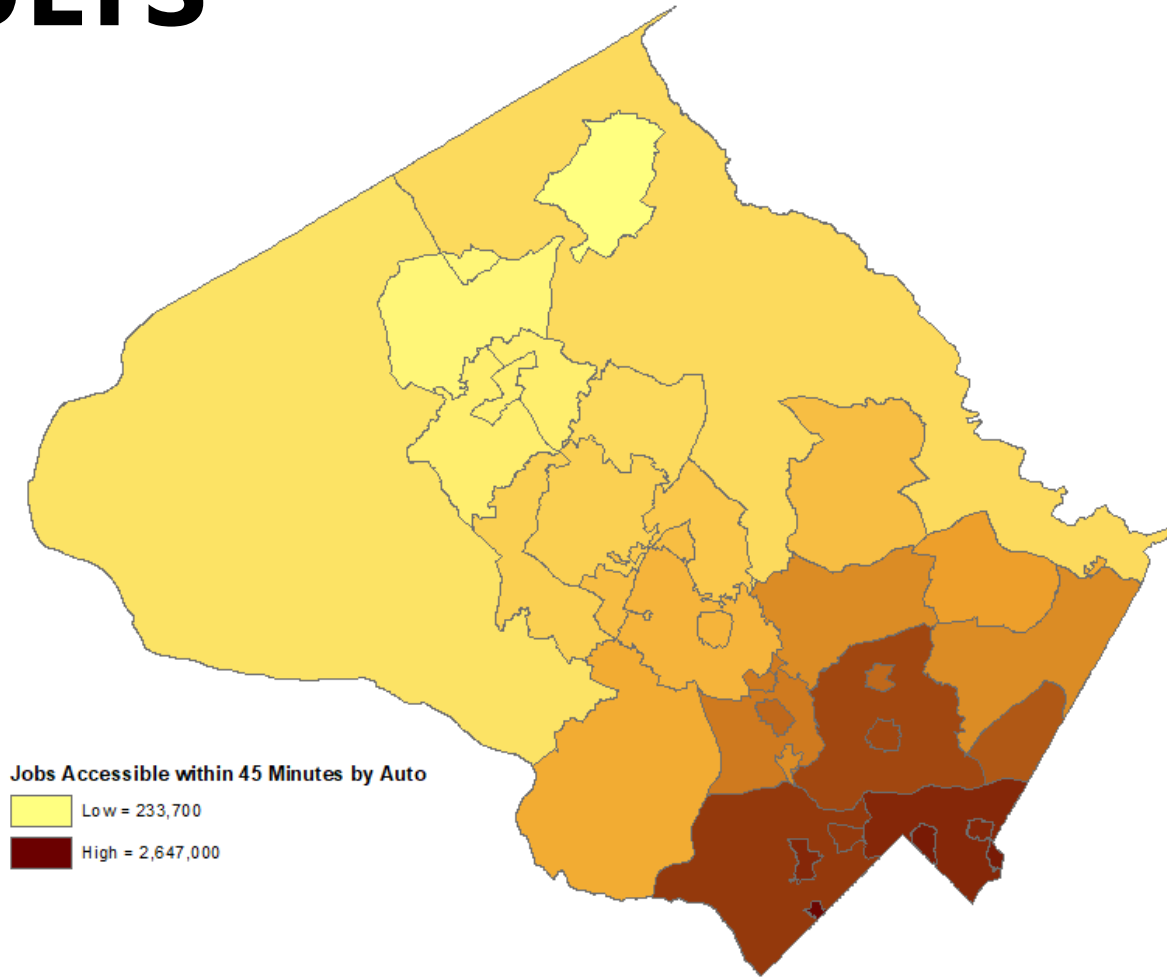
Percent of County Jobs Accessible by:

	Auto	Transit
2010	90%	12%
2040	80%	19%
Delta	-10%	6%

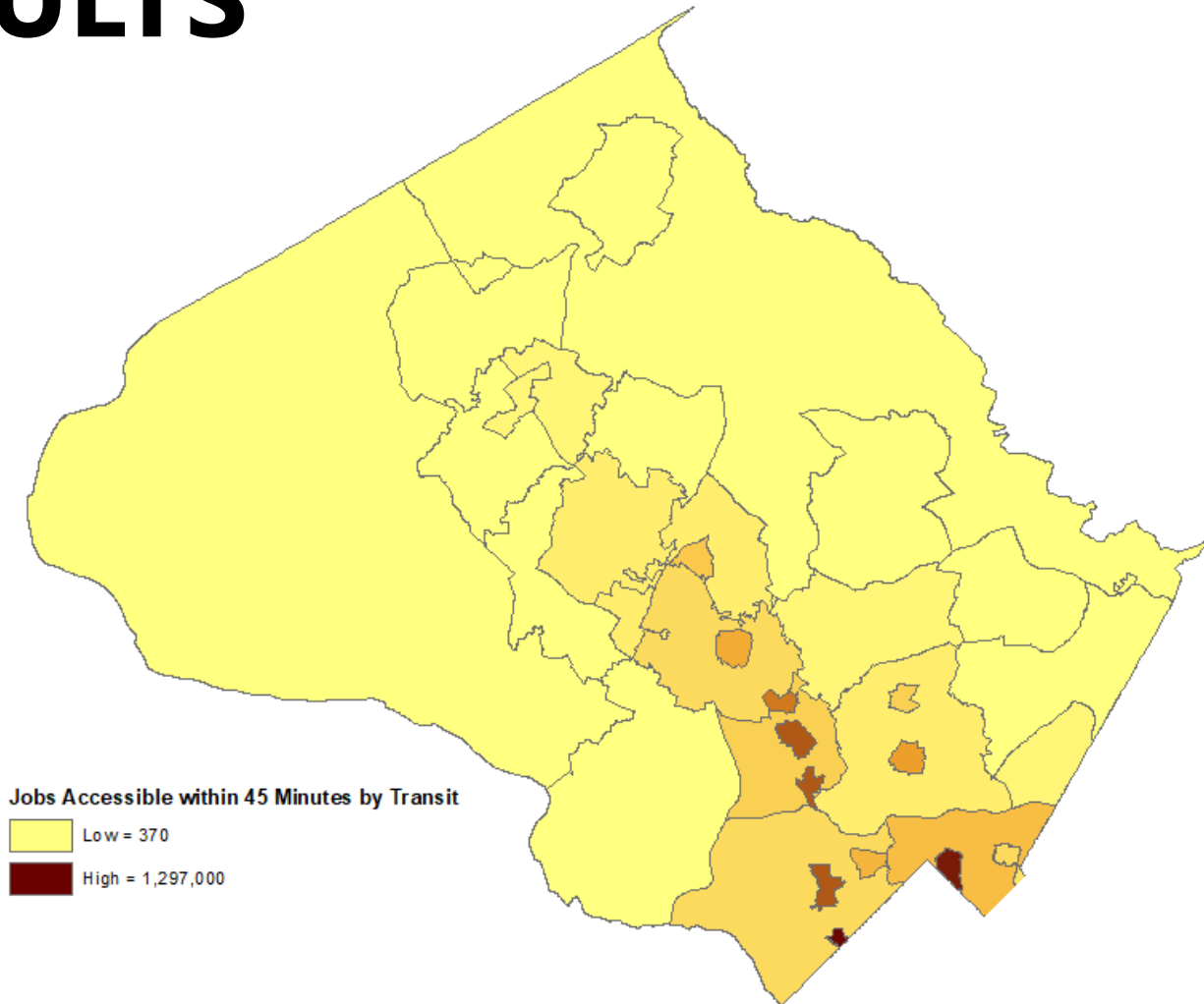
Regional Jobs Accessible (as a % of County Jobs) by:

	Auto	Transit
	229%	26.5%
	170%	34.5%
	-59%	8.0%

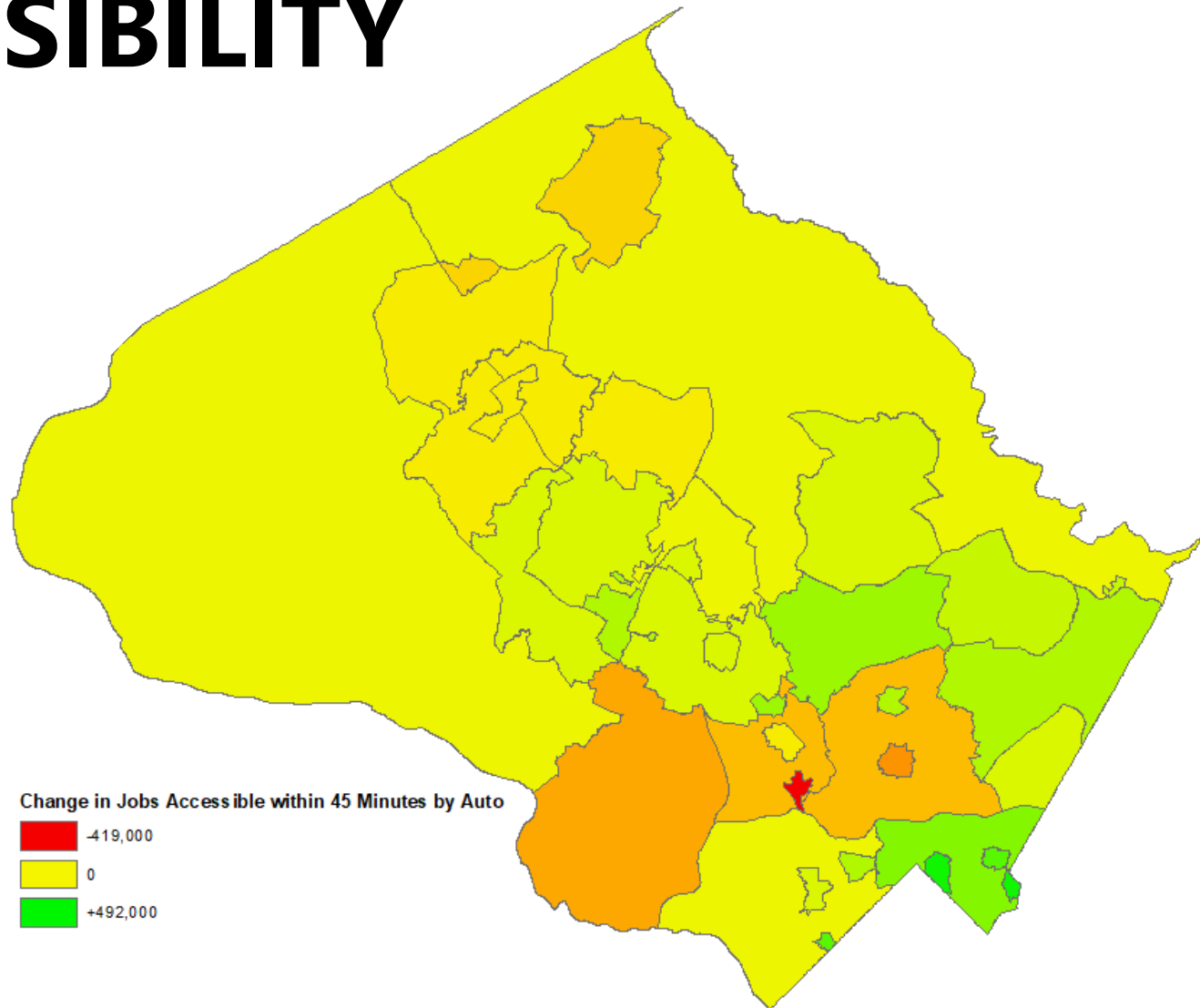
2040 AUTO ACCESSIBILITY RESULTS



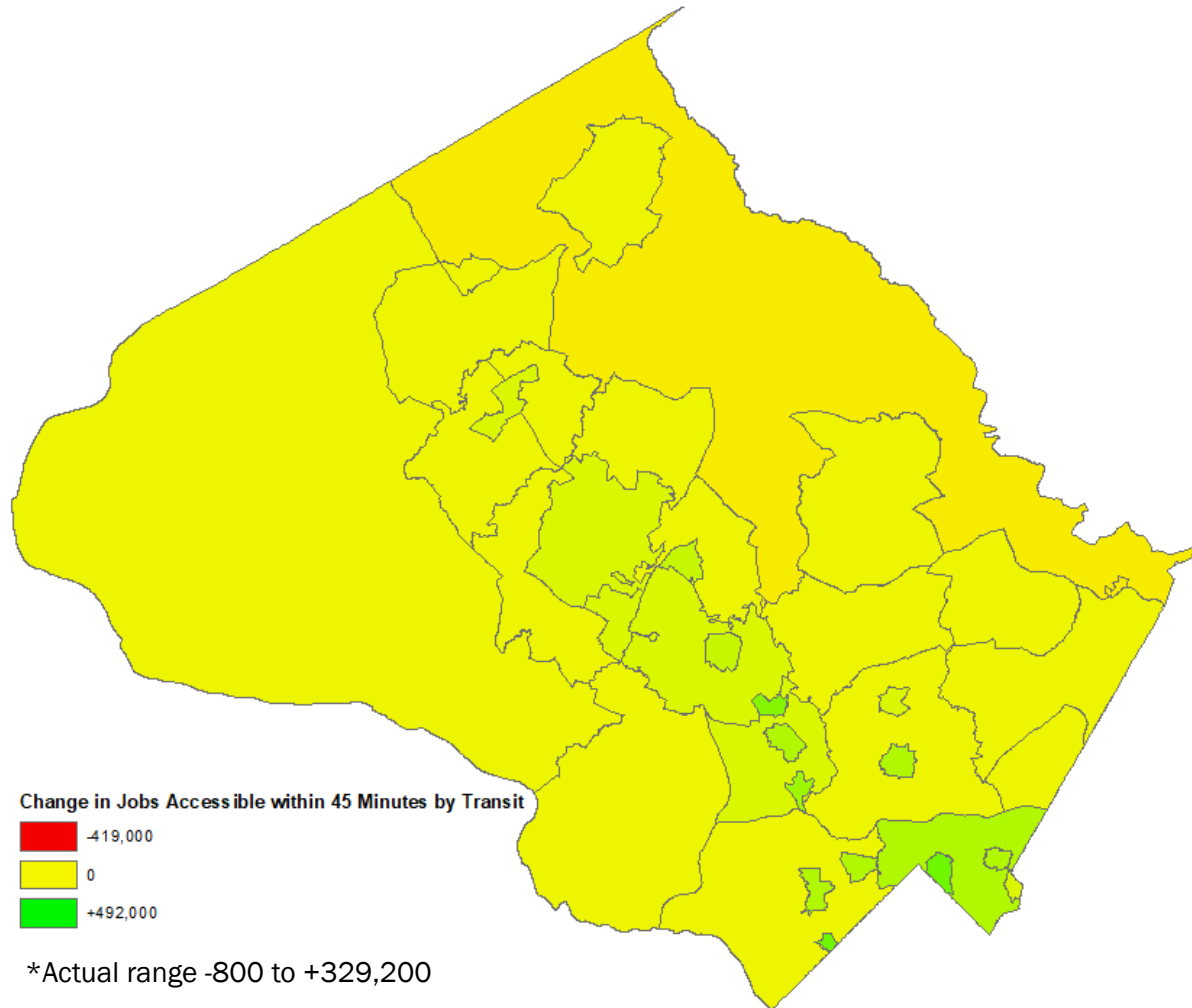
2040 TRANSIT ACCESSIBILITY RESULTS



2010 - 2040 CHANGE IN AUTO ACCESSIBILITY



2010 - 2040 CHANGE IN TRANSIT ACCESSIBILITY



LOW-STRESS BIKE ACCESSIBILITY

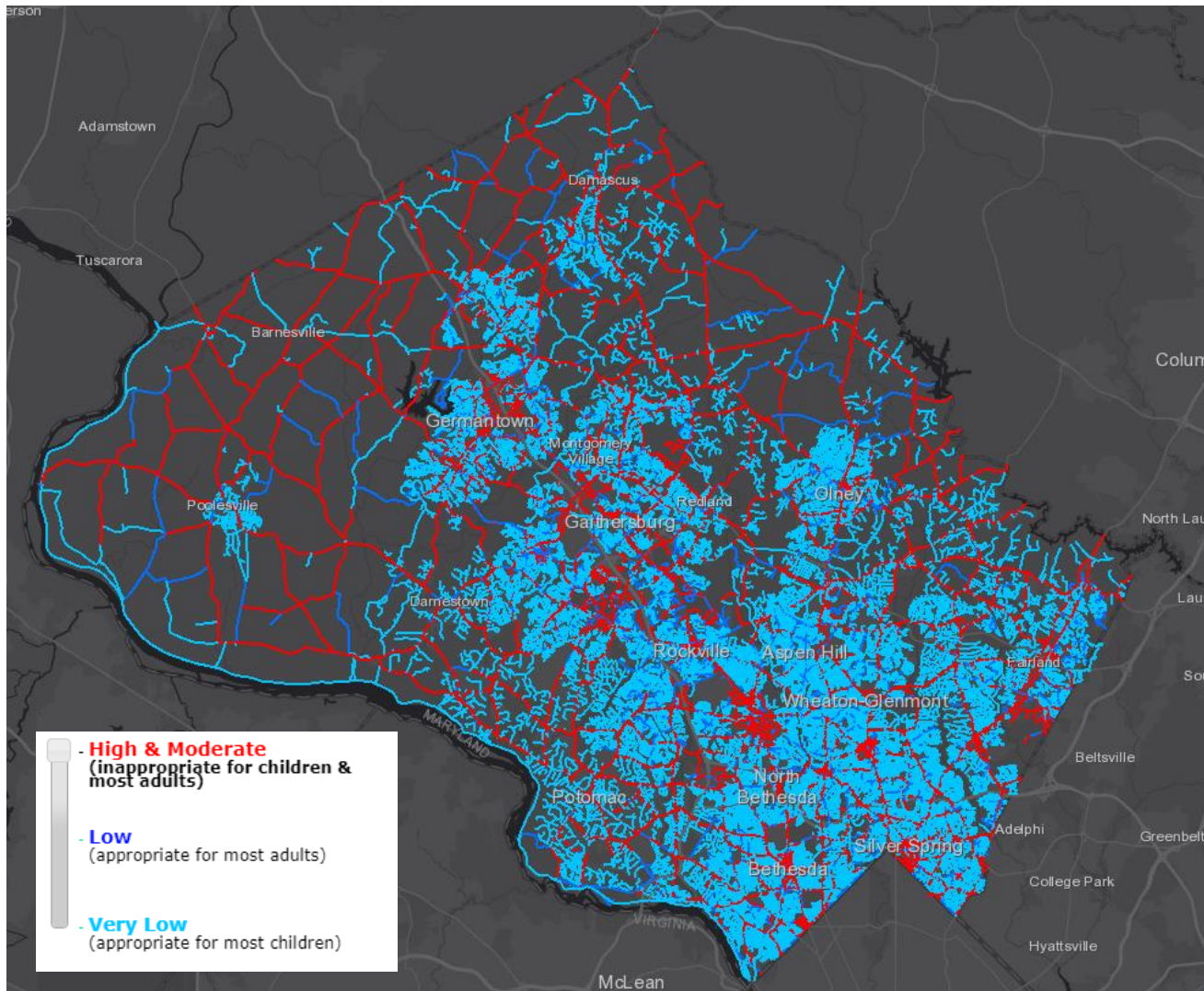
What? Number of jobs accessible within 30 minutes by low-stress bike trip (“appropriate for most adults” or “appropriate for most children”)

How? ArcMap GIS script network analysis
Bicycle Master Plan Bike Stress Map (County Only)
Hard barrier at higher-stress facilities (consider adjusting?)

Where? Census Block level
Population-weighted average to County or Policy Area

Why? Indicates bike accessibility to destinations in Montgomery County
Proxy for safe segment and crossing connectivity

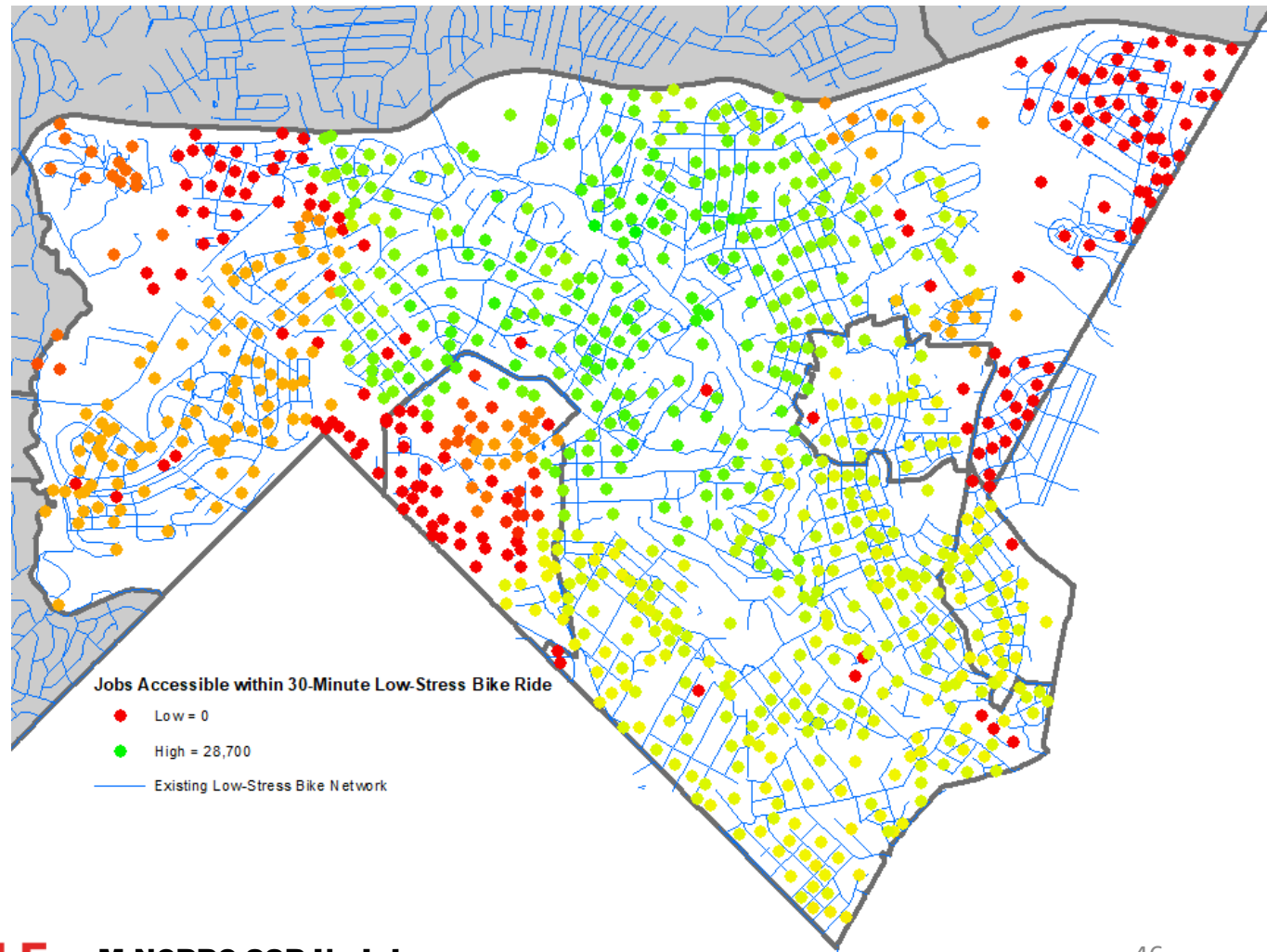
LOW-STRESS BIKE NETWORK



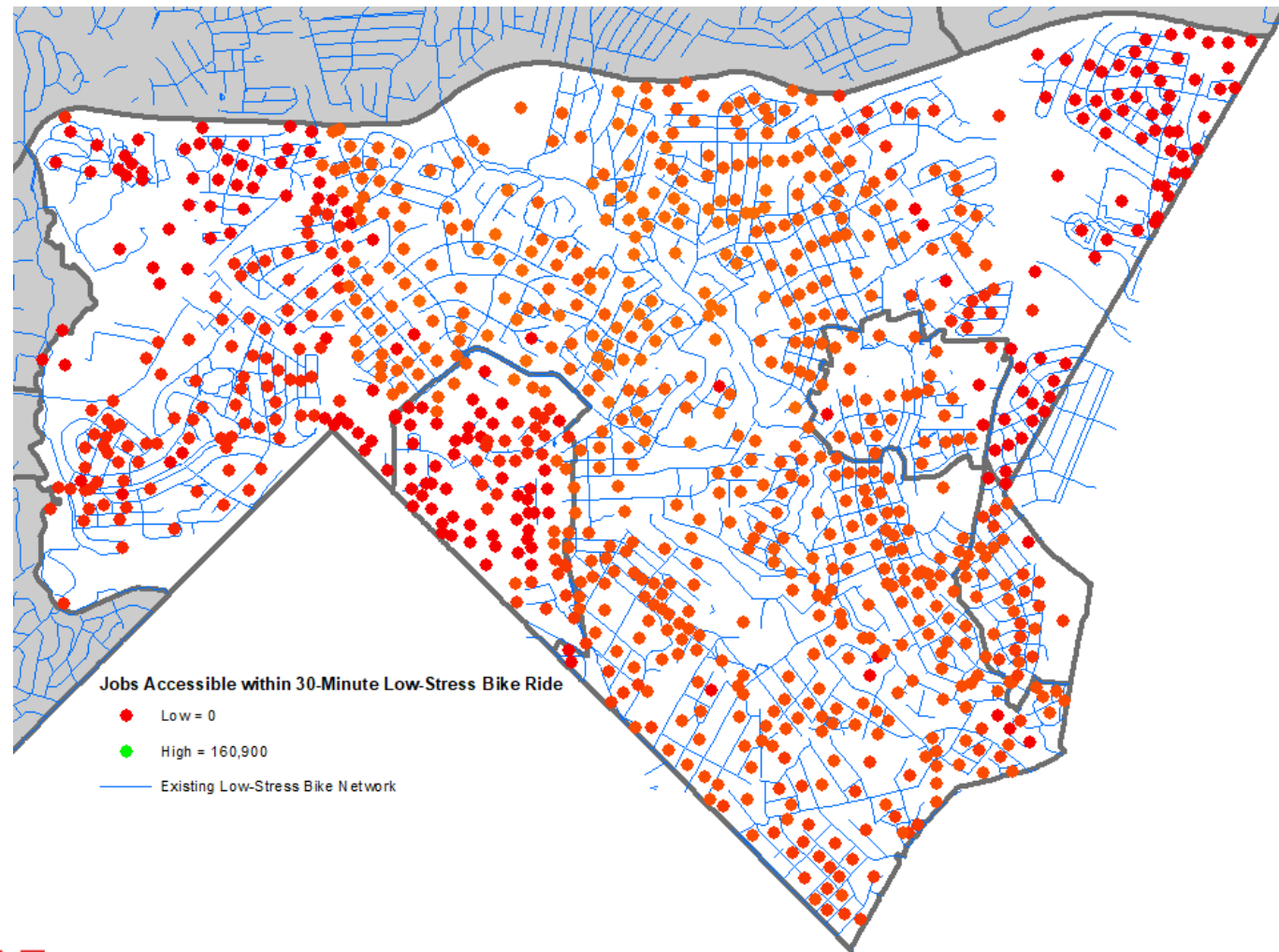
LOW-STRESS BIKE ACCESSIBILITY EXISTING

Silver Spring /
Takoma Park
Silver Spring CBD
Long Branch
Sector Plan
Takoma/Langley

Average Job
Access:
12,800



LOW-STRESS BIKE ACCESSIBILITY EXISTING



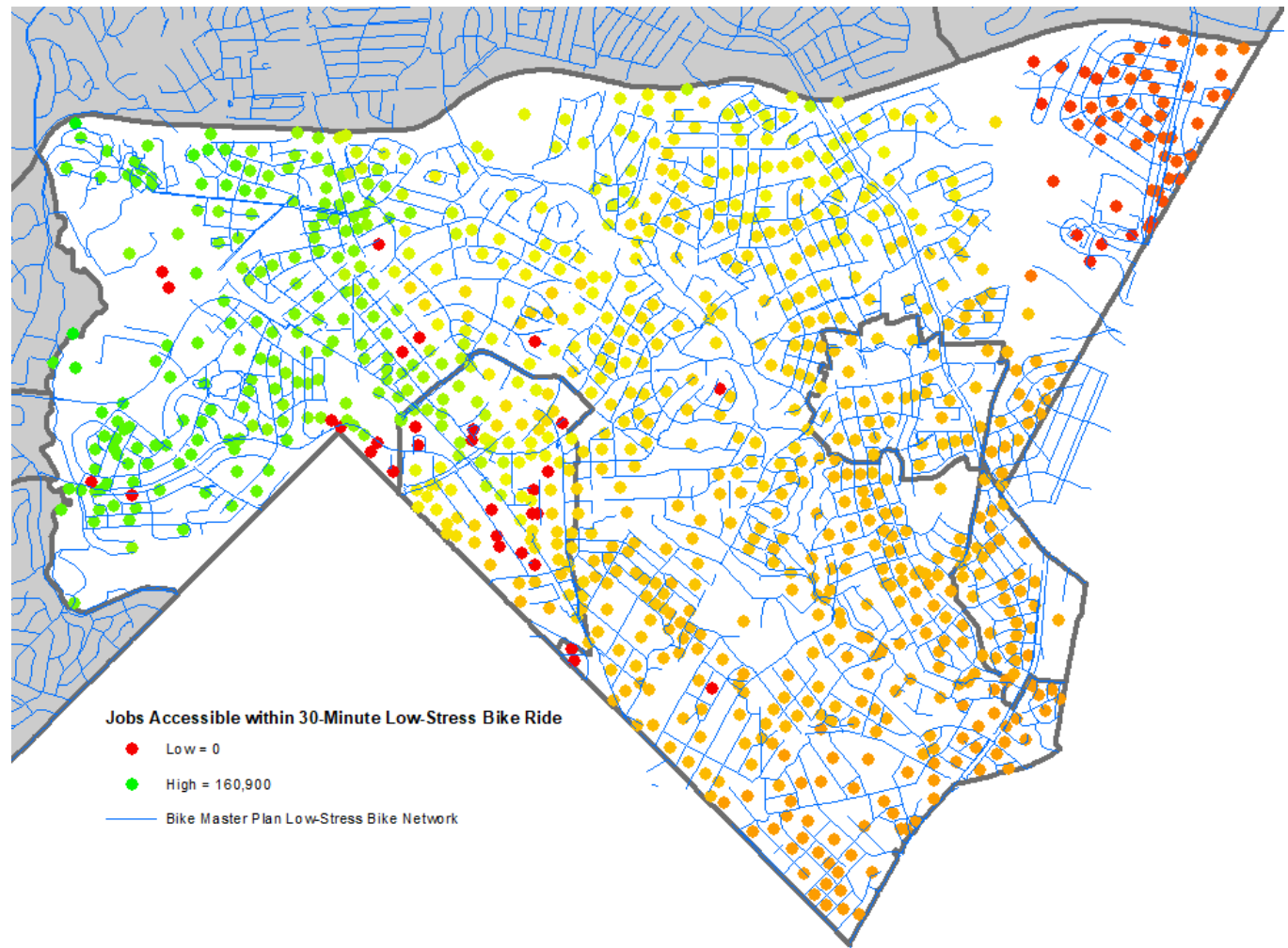
*Scale
Relative to
Bike Master Plan

LOW-STRESS BIKE ACCESSIBILITY

BIKE MASTER PLAN BUILD-OUT

Silver Spring /
Takoma Park
Silver Spring CBD
Long Branch
Sector Plan
Takoma/Langley

Average Job
Access:
69,500 (5x)



COMFORTABLE WALK ACCESSIBILITY

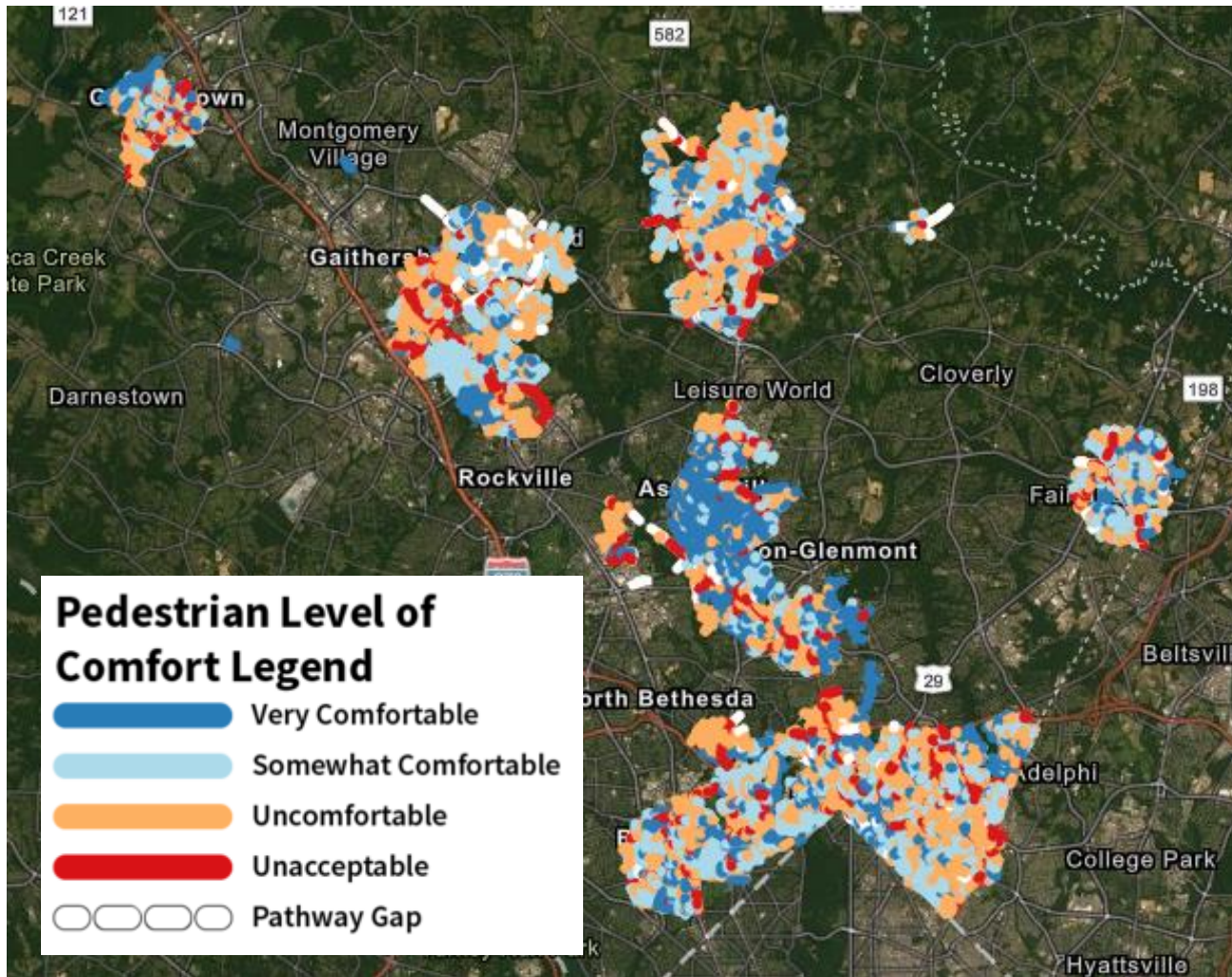
What? Number of jobs accessible within 30 minutes by comfortable walk (“very comfortable” or “somewhat comfortable”)

How? ArcMap GIS script network analysis
Pedestrian Level of Comfort Map (under development)
Hard barrier at uncomfortable facilities (consider adjusting?)

Where? Census Block level (limited coverage)
Population-weighted average to Policy Area (or County when complete)

Why? Indicates walk accessibility to destinations in MCounty
Proxy for safe segment and crossing connectivity

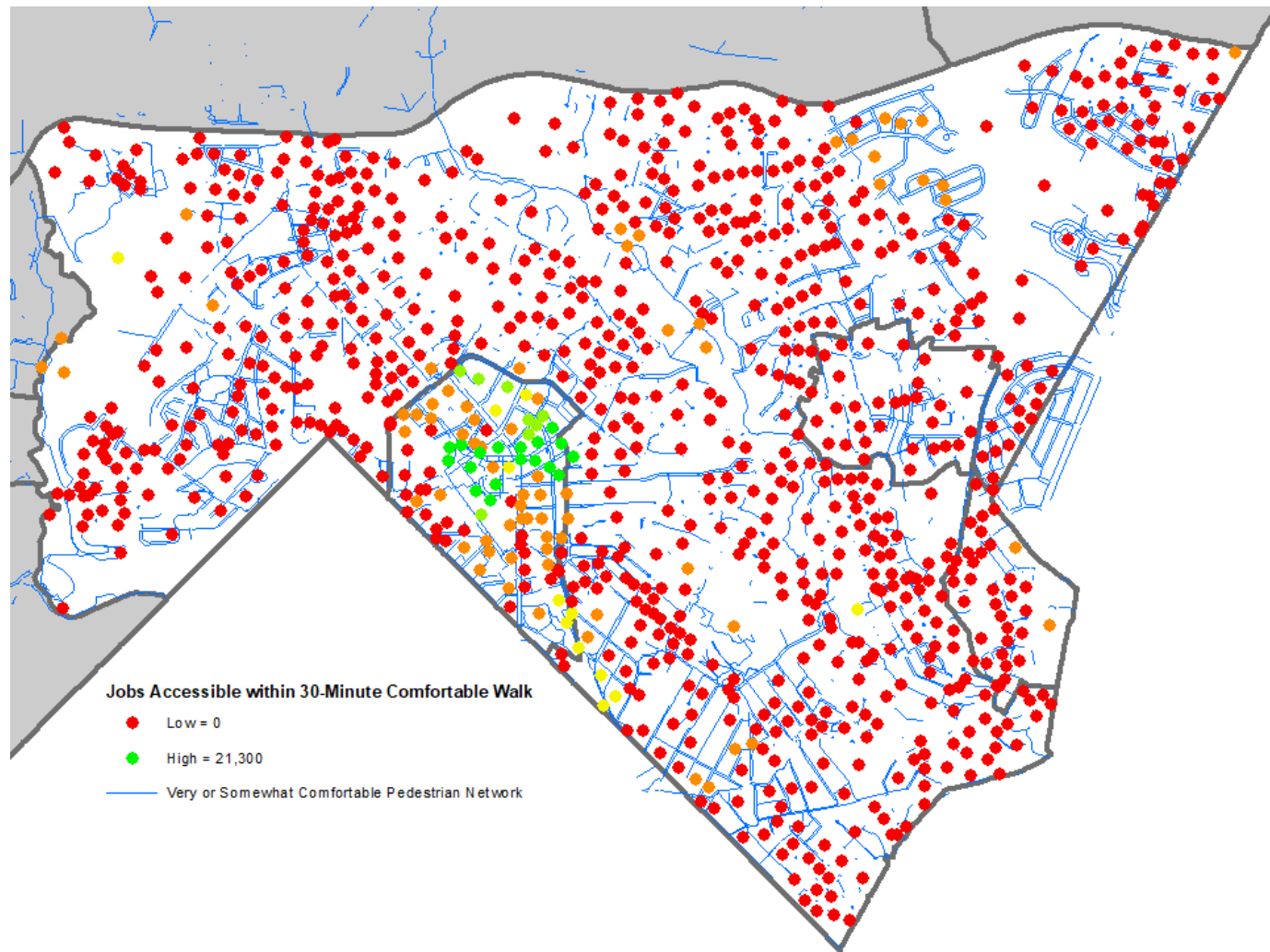
COMFORTABLE WALK ACCESSIBILITY



COMFORTABLE WALK ACCESSIBILITY EXISTING

Silver Spring /
Takoma Park
Silver Spring CBD
Long Branch
Sector Plan
Takoma/Langley

Average Job
Access:
480



PERSON THROUGHPUT

What? Number of people passing through the corridor by auto and transit

How? Travel/4 model results

*Consider updating with detailed ops/capacity analysis for key projects

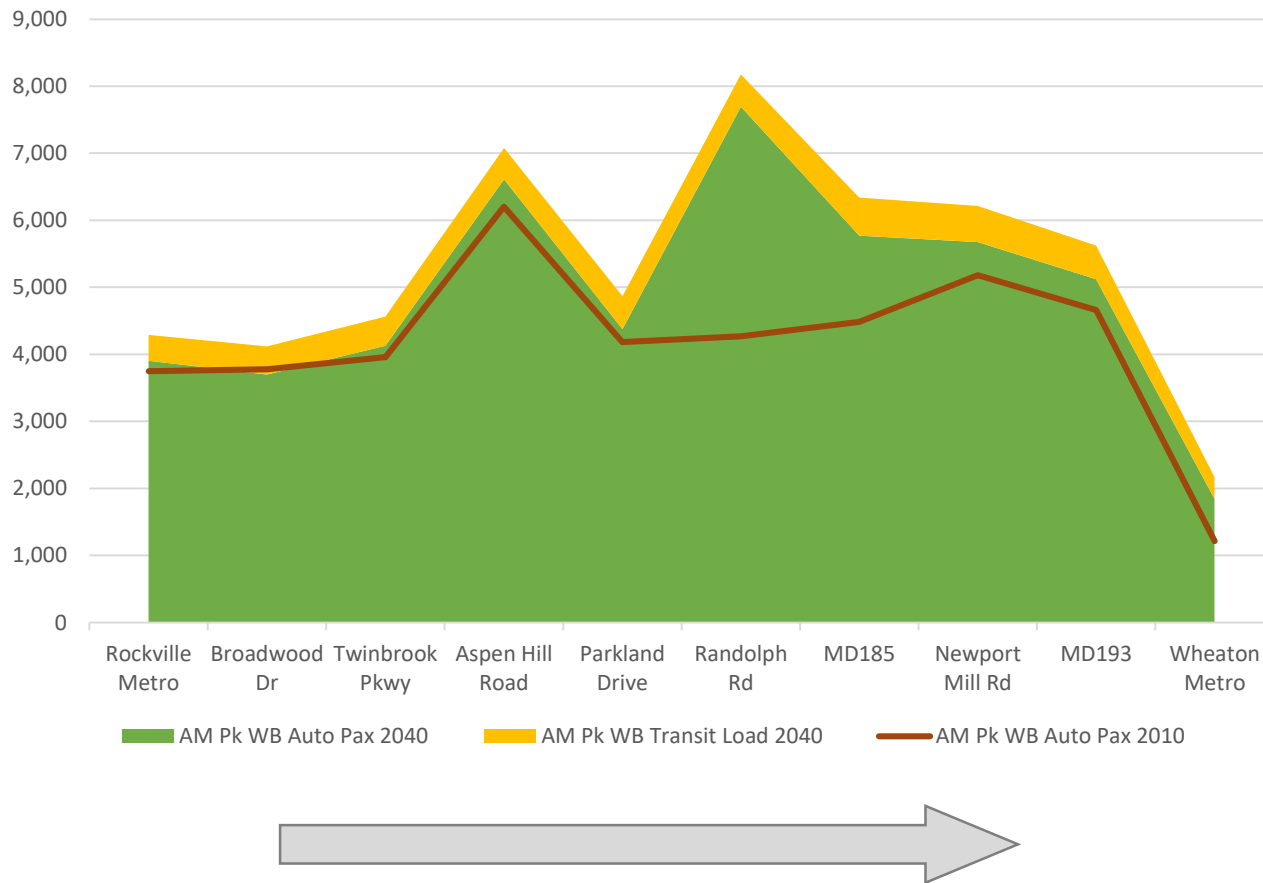
Where? Corridor level (segments along corridor)

Why? Indicates passengers served

*With ops/capacity analysis, could also provide intersection delay info

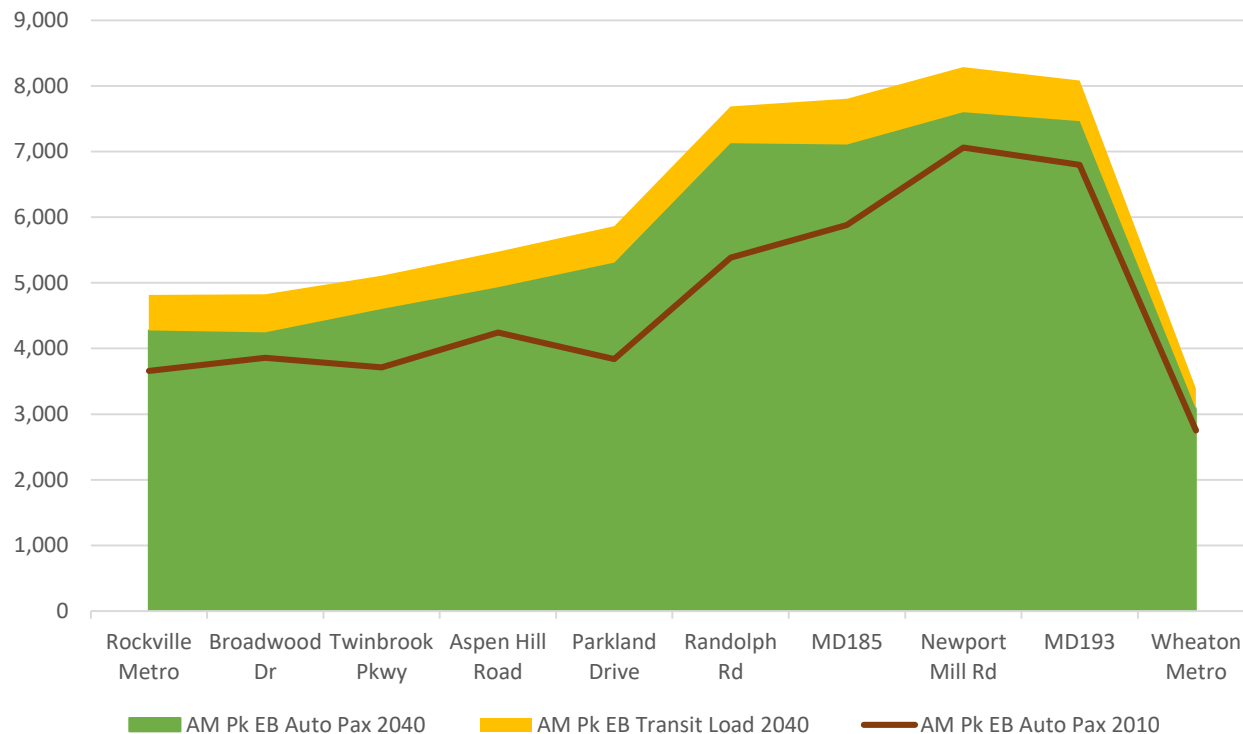
PERSON THROUGHPUT RESULTS

AM PK Period EB Veirs Mill Rd



PERSON THROUGHPUT RESULTS

AM PK Period WB Veirs Mill Rd



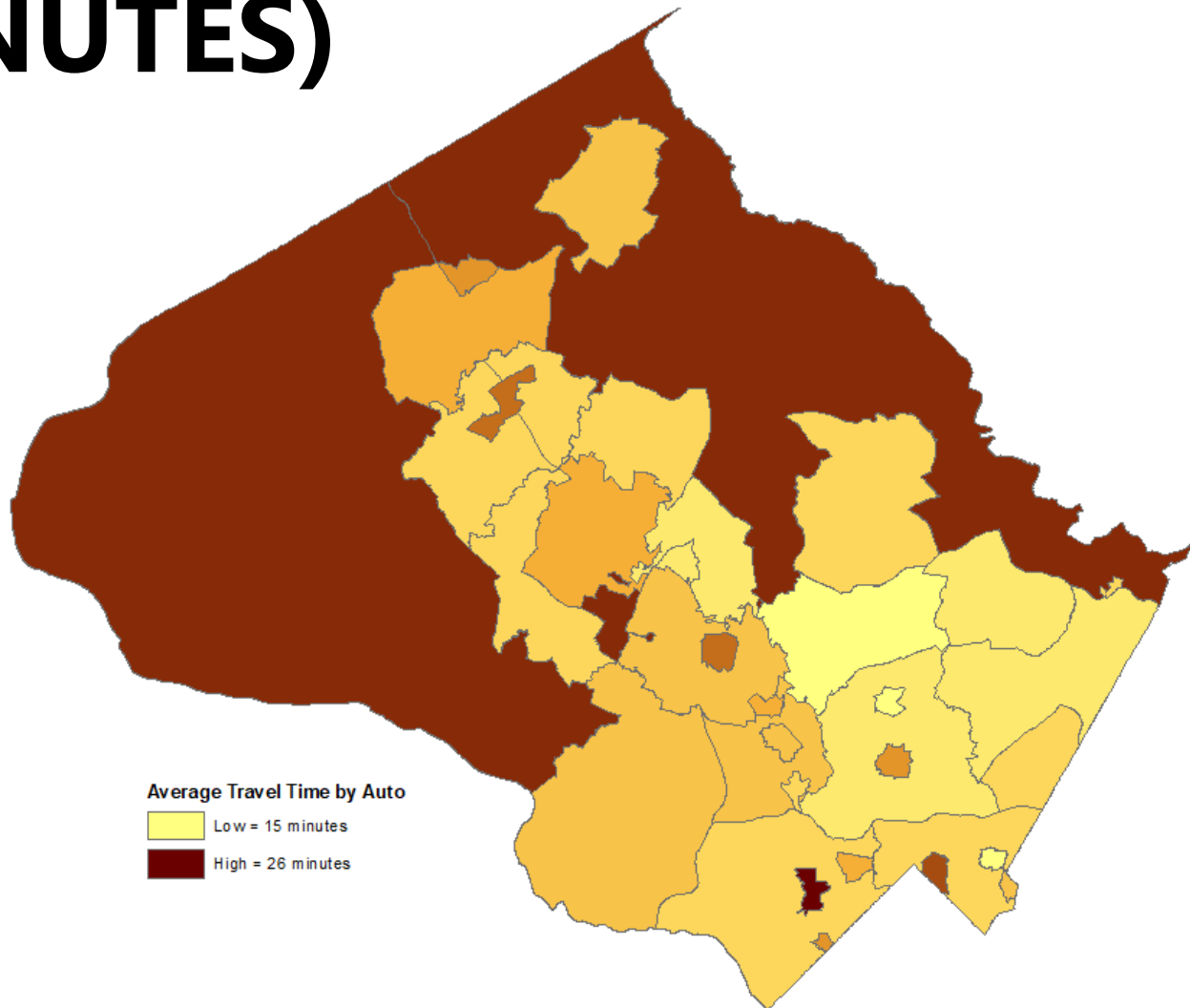
AUTO/TRANSIT TRAVEL TIMES

- What?** Average travel time per trip (all trips)
Average of trip origins and destinations
Calculated by mode (transit separate from auto)
- How?** Travel/4 Model + custom script
- Where?** TAZ level
Population-weighted average to Policy Area or County
- Why?** Indicates total amount of time spent traveling per trip
Travel time more intuitive measure of burden than intersection delay

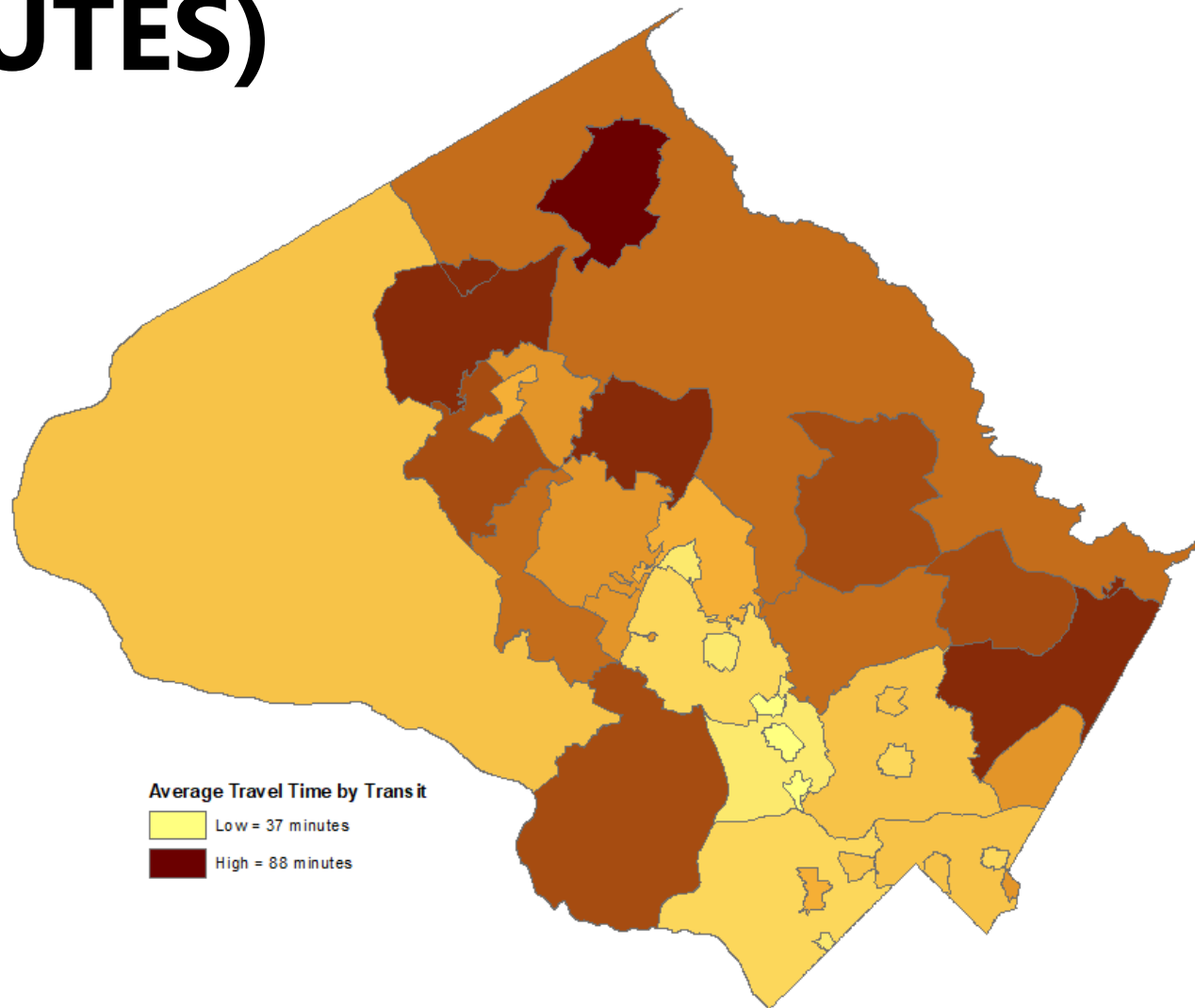
AUTO/TRANSIT TRAVEL TIMES COUNTYWIDE RESULTS (MINS)

	2010	2040	Delta	% Delta
Auto Travel Time	15.7	18.8	3.0	19%
Transit Travel Time	49.7	51.7	2.0	4%

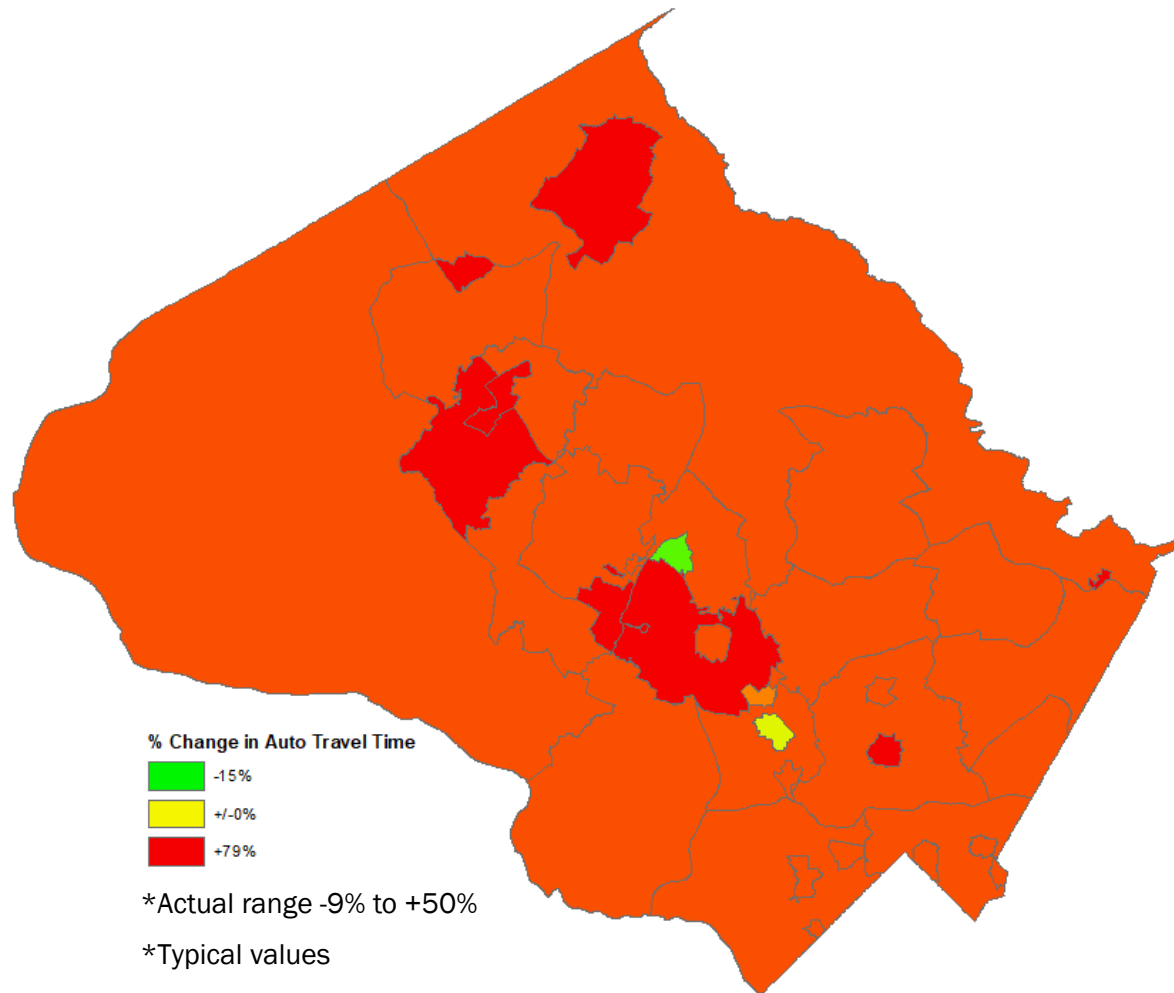
2040 AUTO TRAVEL TIMES (MINUTES)



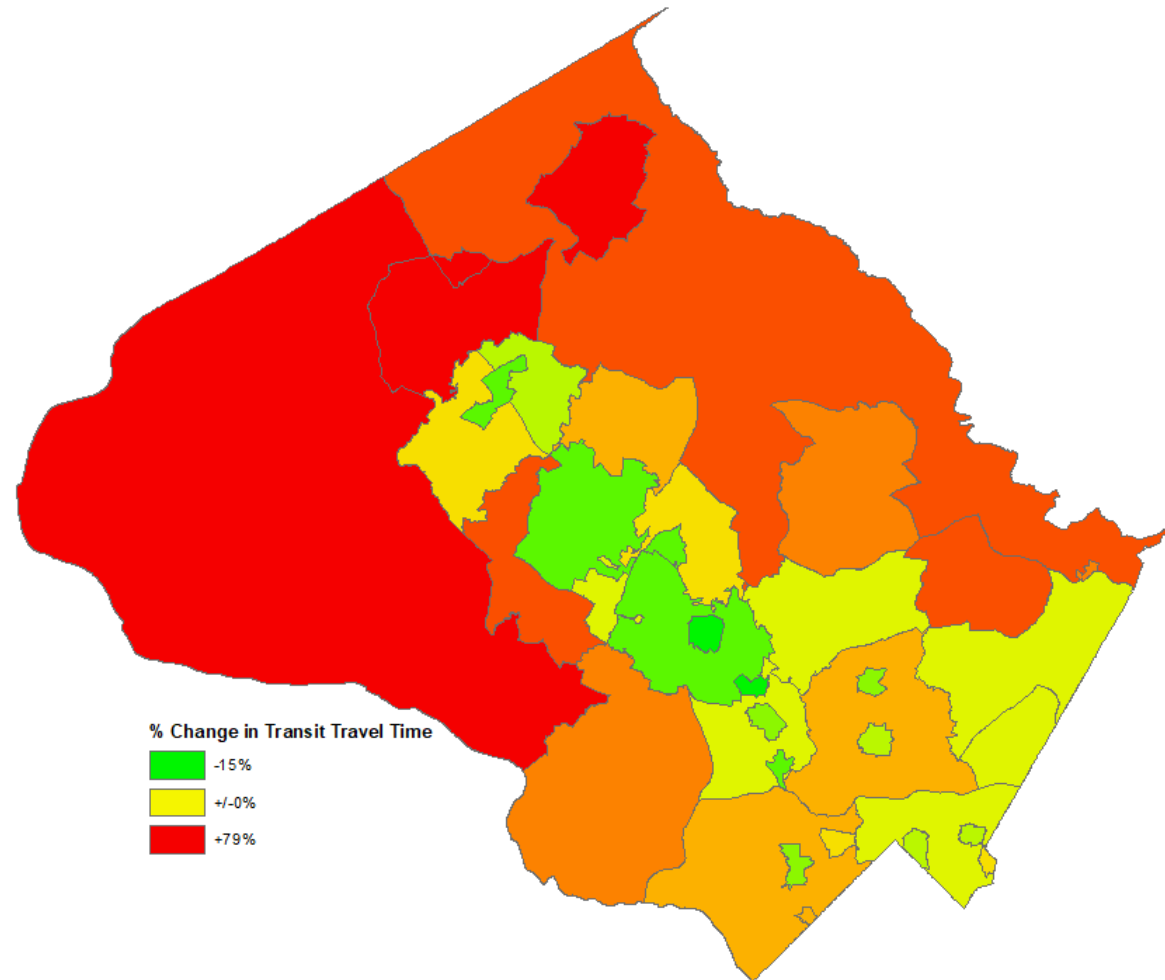
2040 TRANSIT TRAVEL TIMES (MINUTES)



2010 - 2040 CHANGE IN AUTO TRAVEL TIMES



2010 - 2040 CHANGE IN TRANSIT TRAVEL TIMES



VEHICLES MILES TRAVELED (VMT) PER CAPITA

What? Daily miles traveled per “service population”
“service population = population + total employment

How? Travel/4 Model + custom script
50% of origin VMT + 50% of destination VMT

Where? TAZ level
Service Population-weighted average to Policy Area or County

Why? Indicates total amount of driving per person

VEHICLES MILES TRAVELED (VMT) PER CAPITA COUNTYWIDE RESULTS

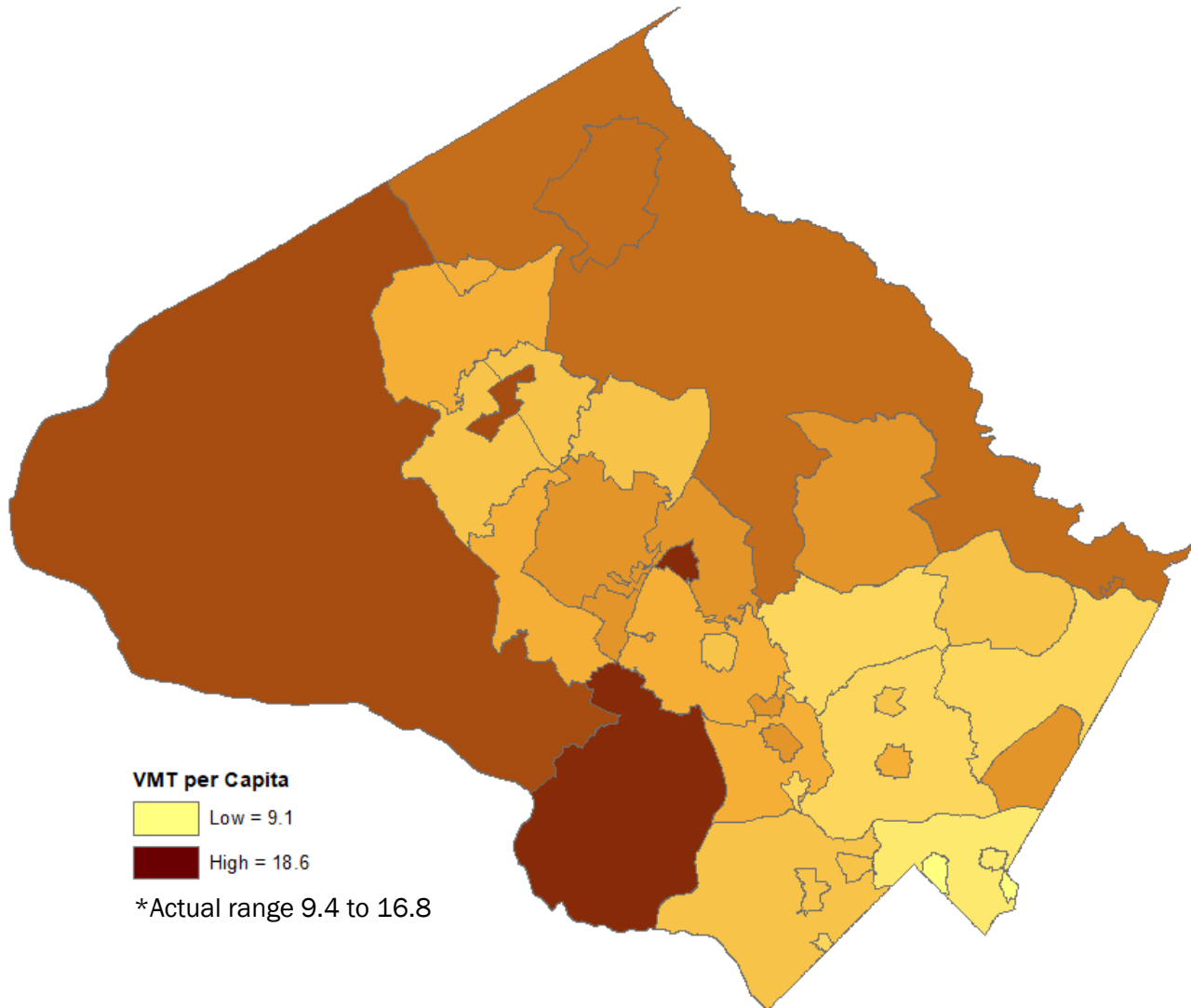
2010: 13.0 VMT per capita

2040: 12.4 VMT per capita

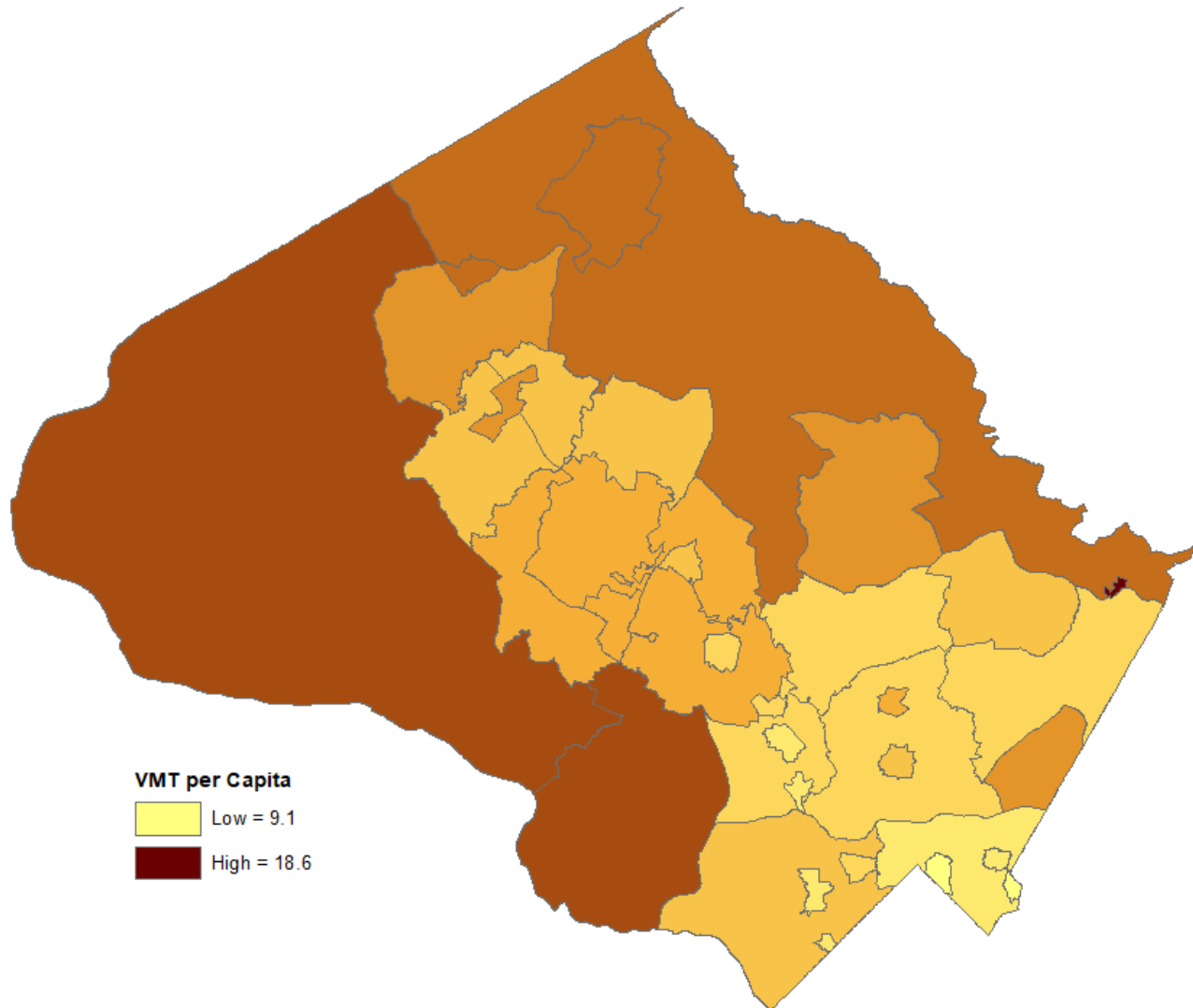
-0.6 VMT per capita

-5% countywide

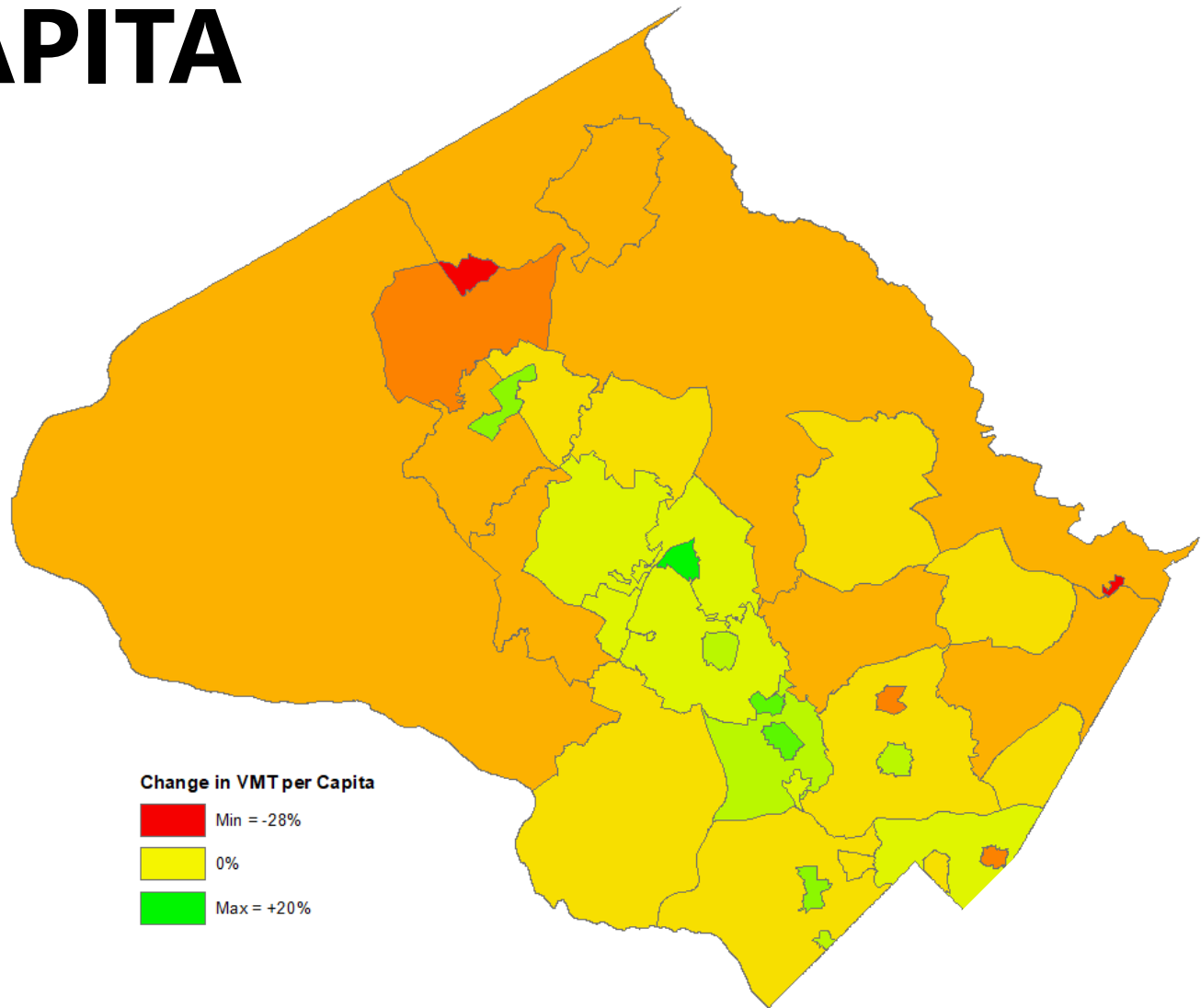
2010 VMT PER CAPITA



2040 VMT PER CAPITA



2010 – 2040 CHANGE IN VMT PER CAPITA



NON-AUTO DRIVER MODE SHARE*

What? % of non-auto driver trips (HOV + transit + nonmotorized)

How? Travel/4 Model + custom script
Includes origin and destination trip ends

Where? TAZ level
Population-weighted average to Policy Area or County

Why? Indicates use of non-auto modal options

**Results under review*

POLICY AREA METRICS – THRESHOLD SETTING

- Calculated metrics countywide and at the policy area level
- Thresholds as context-sensitive (varies by policy area)
- Approaches:
 - No worse than existing
 - Bring up “lagging” areas
 - Set aspirational goals

TISTWG SCHEDULE

Meeting Date	<u>Topic</u>
09/09/19	TISTWG Kickoff
10/07/19	Draft LATR Lit Review and Policy Area Test Options
11/04/19	Beta Test Plans for LATR and Policy Area Tests
12/09/19	LATR Data Collection Requirements
01/27/20	Draft LATR Impact Study Reports Draft Policy Area Beta Test Results
02/27/20	Planning Board Briefing