Transportation Impact Study Technical Working Group (TISTWG)
October 7, 2015 Meeting #11
MRO Auditorium
1:30-3:00 PM Agenda

1) Introductions (5 min)
2) Review of July 9 Planning Board roundtable discussion (15 min)
   a) Process for Pro-Rata Share expansion beyond White Oak
   b) Very Low VMT proposal
   c) Opportunities to collapse LATR and TPAR into a single test
3) Proposed TISTWG schedule (5 min)
4) Updates on parallel efforts (15 min)
   a) MCDOT White Oak transportation analysis
   b) M-NCPPC TPAR and trip generation studies
   c) SHA Transportation Study Guidelines
   d) M-NCPPC Assessment of Modeling Tools/Measures/Metrics study
5) Summary and status of LATR Concepts moving forward (10 minutes)
   a) April LATR Concepts Memo: http://www.montgomeryplanning.org/transportation/latr_guidelines/documents/TISTWG_LATRConceptsMemo_040115.pdf
   b) Noted subsequent amendments:
      i) Retail addendum to Very Low VMT approach (ground floor retail OK if no parking provided)
      ii) Protected intersections (requires TMD with per-trip payment; offsets TPAR/impact taxes)
6) October 7 focus on (35 minutes):
   a) SR-3: Protected Intersections (attached)
   b) AM-5: Intersection operations guidance (attached)
   c) AS-1, AS-2: Ped/bike value establishment (shift from subdivision staging policy to countywide bicycle functional plan effort)
7) Next steps and tentative meetings schedule (5 min)
   a) December 2 TISTWG meeting: second draft of Subdivision Staging Policy; first draft of full LATR Guidelines
   b) December 3 Planning Board Roundtable (focus on parallel studies cited above)
   c) December 18: TISTWG comments to M-NCPPC on December 2 materials
   d) January 8: Response to TISTWG comments
   e) February 3 TISTWG meeting
   f) Planning Board SSP worksessions: February 11, March 3, March 24 (if necessary)

Prepared by Renaissance Planning Group
October 4, 2015

Subdivision Staging Policy
Status of New Concepts for LATR/TPAR Guidelines
October 1, 2015

Certain elements (in green boxes) ready for discussion at October meeting. Work in progress on elements in orange boxes, and feedback appreciated on other elements (in blue boxes) as noted in the table below.

Concept	Description	LATR/TPAR Guidelines elements
SA-3	Alternative Review Procedures for Very Low VMT	Completed proposal for review/comment
ST-1	Trip Generation Thresholds	Moving forward with 11/30 thresholds (page 26 of April LATR Concepts handout)
ST-4	Modal analysis triggers	Moving forward with on 11/30 thresholds (page 26 of April LATR Concepts handout)
SR-3	Protected intersections	Select Major/Major and Major/Arterial locations in Bethesda CBD, Silver Spring CBD, R&D Village, and Wheaton would be logical candidates. $12,000/CLV increase fee in lieu of improvement dedicated to TMD with credit against TPAR/impact tax. See attachment.
AM-1 through AM-3	Modal analyses	Retain current LATR value of linear feet of sidewalk/bike path and $12,000/vehicle trip fee for other improvements with credit against TPAR/impact tax
AM-5	CLV/Synchro	Scoping and analysis parameters proposed. See attachment
AS-3	Pedestrian-bicycle gap contribution	Work in progress to define gaps and responsibility for filling them (presumably construction if in ROW, payment in lieu if private property required)
Other	Value of peak hour vehicle trip	Escalate $12,000 / vehicle trip value
Other	Miscellany clarifications	Considering comments developed by M-NCPPC staff in past two years

LATR CONCEPT EXPLORATION
AM-5: CLV/HCM Thresholds

October 7 TISTWG Meeting Discussion Memo

This brief memo provides a status report on the proposed guidance for conducting operational analyses using simulation models. The table below builds on the April 1 LATR Concepts Memo to provide additional detail for scoping and analysis using simulation models. The primary changes suggested to the LATR are:

- Replacement of queue lengths as a measure of effectiveness with total vehicle delay as it is more meaningful to constituents and easier to document
- Elimination of single-site analyses except for isolated locations. Use of stochastic models with execution of five runs averaged for other sites (non-isolated sites and locations along severely congested arterials)
- Requirement that improvements to address vehicular congestion not increase average pedestrian delay for locations in road code urban areas

The following terms are used in the table below:

- **Operational analysis** describes roadway network simulation software mostly commonly including Synchro/SimTraffic and VISSIM
- **LATR study scenarios** described below as:
    - Existing
    - Background (with approved development and any CIP/CTP improvements)
    - Baseline (with site generated traffic and no mitigation)
    - Proposed (with site generated traffic and proposed mitigation)
- **Severely congested arterials** defined as locations with travel time indices > 2.5 as included in the most recent MWCOG Congestion Management Process (CMP) Technical Report.

Prepared by Renaissance Planning Group
October 4, 2015

Analysis Element	In Current LATR/TPAR Guidelines?	Proposal	Rationale/comments
Scoping: Operational analysis needed if:			
CLV > 1600 in MSPA / CBD	Yes	Retain	Consider upstream/downstream traffic impacts, consider multimodal performance measures noted below
CLV > 1450 if: - within 600' of another signalized intersection, **or** - on a roadway segment explicitly identified in the LATR/TPAR Guidelines as a severely congested arterial warranting operational analysis (see list below table)	No	Add	Consider upstream/downstream traffic impacts where travel times suggest traffic counts may be significantly lower than current demand due to spillback. Consider multimodal performance measures noted below
Scoping: Analysis tools:			
Independent intersection analysis using HCM or deterministic models like Synchro only acceptable where CLV > 1600, no adjacent signalized intersection within 600', and not on a severely congested arterial. In all other cases warranting operational analysis, importance of upstream/downstream effects requires stochastic modeling, with averaging of vehicle delay results from five independent runs. Acceptance of either VISSIM or SimTraffic. Other tools may be allowed with written concurrence of M-NCPPC staff.	Generally; p. 18 identifies "simulation software such as SYNCHRO or CORSIM"	Refine	Retain flexibility but clarify when deterministic models like HCM and Synchro are allowed and when stochastic that results from VISSIM or SimTraffic are required.
Scoping: Analysis Parameters			

Analysis Element	In Current LATR/TPAR Guidelines?	Proposal	Rationale/comments
Simulation network geographic extent: Include primary subject intersection(s); those triggering operational analysis (1600 CLV or 1450 CLV+adjacent signal within 600'); continue test of 1450 CLV+600' proximity to expand network until at least 600' exists in each direction to next intersection with 1450 CLV. Include upstream approach links sufficient to accommodate forecast vehicular demand.	No	Add	Specify geographic extent of modeling to incorporate both adjacent intersections and sufficient input link storage.
Simulation network temporal extent: Peak hour, plus sufficient initialization time so that network output equals network input within 5% or output stabilizes if demand significantly exceeds capacity.	No	Add	Specify initialization time
Signal phasing and timing: Existing signal timing parameters used for existing conditions and background/baseline conditions (unless changes explicitly provided by MCDOT at time of study scoping). Adjustments to signal phasing (including adjustment to cycle lengths) for proposed conditions are encouraged to seek operational improvements in lieu of vehicular capacity additions, but are subject to review and concurrence from SHA (phasing, for intersections with State highways) and MCDOT (phasing and timing)	No	Add	Facilitate operational improvements. Minimize study effort needed to ensure multimodal performance (vehicles and pedestrians) as part of baseline conditions.
Validation: Total peak hour vehicular throughput matches existing conditions counts within 1% at network entry/exit points; within 10% at individual intersection approaches. Network sink/source nodes allowed to address balance between intersections	No	Add	Provide reasonable guidance regarding validation of existing conditions with readily available data

Analysis Element	In Current LATR/TPAR Guidelines?	Proposal	Rationale/comments
Pedestrian crossing time: All intersection approaches for proposed conditions require 3.5 ft/sec pedestrian crossing time from curb to edge of far travel lane unless crossing of approach is explicitly prohibited.	Yes, p. 18 references CLV assumptions on p. 10.	Retain	Ensure mitigation for vehicular operational concerns retains minimum crossing time standards
Transit vehicle characteristics: To be modeled explicitly only in MSPAs and CBDs, using existing transit route frequencies and assuming 10 second dwell times unless otherwise directed by M-NCPPC staff at time of scoping or if development triggers transit quantitative analysis.	No	Add	Incorporate bus operations in areas of greatest concern
Other vehicular operating conditions (i.e., truck percentages, start up lost time, car-following) use software defaults unless changes needed to achieve validation	No	Add	Simplify analysis unless needed for validation.
Analysis: Measures of Effectiveness			
Vehicular delays: Network average delay per vehicle not to exceed HCM equivalent per site Policy Area LOS/CLV standard, or less than existing conditions.	No	Add	Network average delay per vehicle facilitates use of coordinated signal timing to distribute delays throughout network rather than constructing improvements at one location.
Queue Lengths	Yes; p. defines as 80% or 90% to upstream intersection	Delete	Spillback adversely affects stochastic model performance from a vehicular delay perspective; proposed conditions would generally use signal timing to limit spillback. Documentation of queue lengths more arduous to check, report, and confirm than are network-wide delay measures.
Vehicle throughput: Ensure that simulation results include peak hour entering vehicles matching forecast demand volume network wide (within 1% of total entering vehicles)	No	Add	Ensure that forecast volumes are reflected in simulation

Analysis Element	In Current LATR/TPAR Guidelines?	Proposal	Rationale/comments
Pedestrian delays (For Road Code Urban Areas only): Ensure that average pedestrian delay for proposed condition is not greater than average pedestrian delay for baseline condition and that average pedestrian crossing distance for proposed condition is not greater than average pedestrian crossing distance for baseline condition.	No	Add	In urban areas, a primary objective is to not degrade pedestrian conditions. Pedestrian delay may be calculated in an offline spreadsheet assuming random arrivals (delay equals 50% of signal wait time at any curb-to-curb crosswalk, with consideration of two-phased crossing using medians/islands, if proposed). Pedestrian volume crossing each approach may use existing counts, unless the application triggers a pedestrian quantitative analysis, in which case the site-generated pedestrians need to be added to existing counts.

Severely Congested Arterials

The definition of severely congested arterials is, for the 2016 edition of the LATR/TPAR Guidelines, proposed to be derived from the MWCOG 2014 Congestion Management Process Technical Report assessment of arterial congestion from the two sources of data presented (floating car studies compiled by MWCOG in Figures 30 and 31 and 2013 probe vehicle data assembled by the University of Maryland in Appendix A):

http://www.mwcog.org/uploads/committee-documents/bF1YXlld20140530134434.pdf

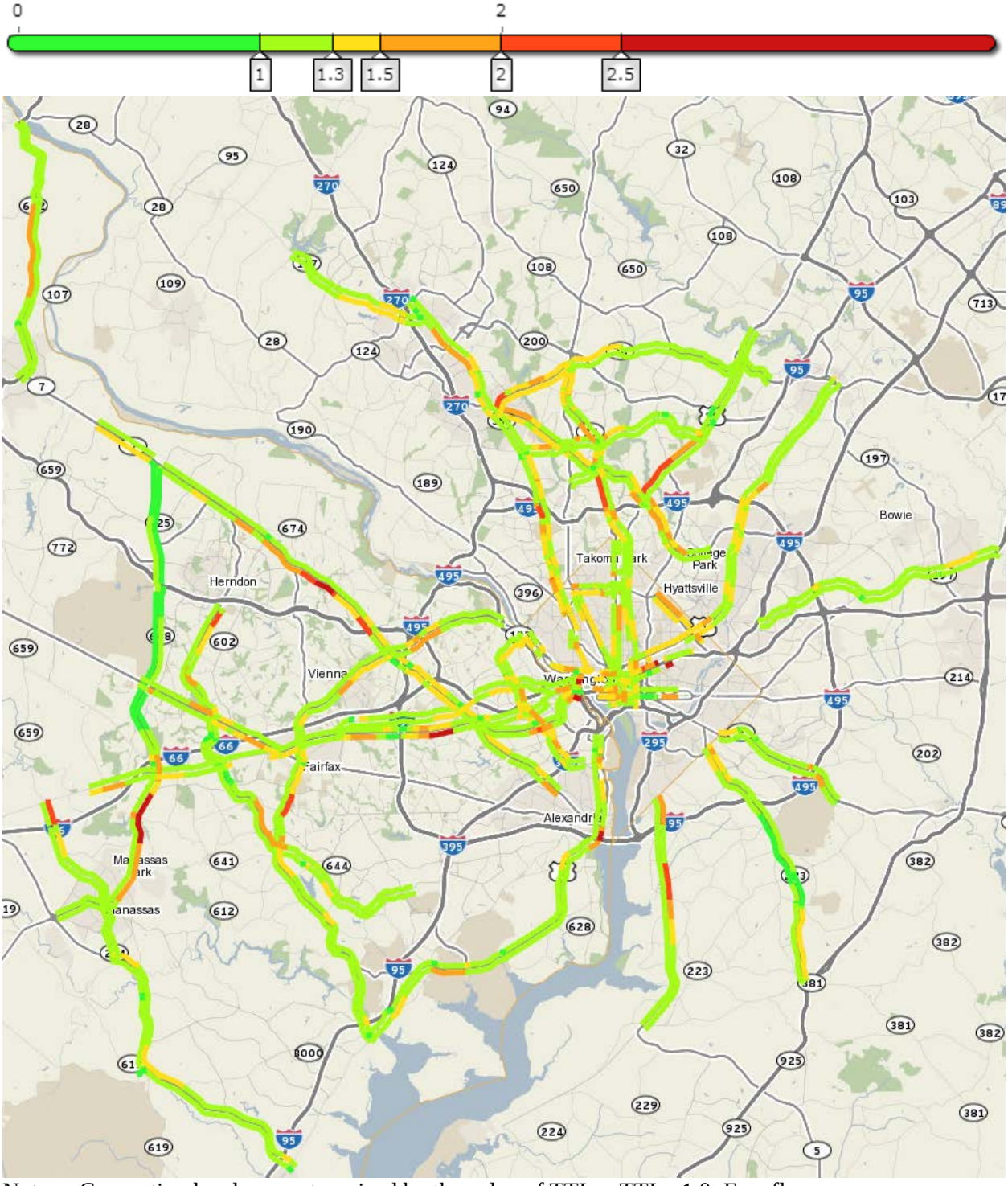
The severely congested arterials are those identified with a Travel Time Index (typical peak period travel time divided by free flow travel time) of > 2.5 in either the morning or evening peak hours. They would be identified explicitly in the LATR/TPAR Guidelines as follows:

- US 29 (Colesville Road) between New Hampshire Avenue (MD 650) and the Capital Beltway
- MD 185 (Connecticut Avenue) between Knowles Avenue (MD 547) and East West Highway (MD 410)
- MD 355 (Wisconsin Avenue) between Jones Bridge Road and the Capital Beltway

Next Steps

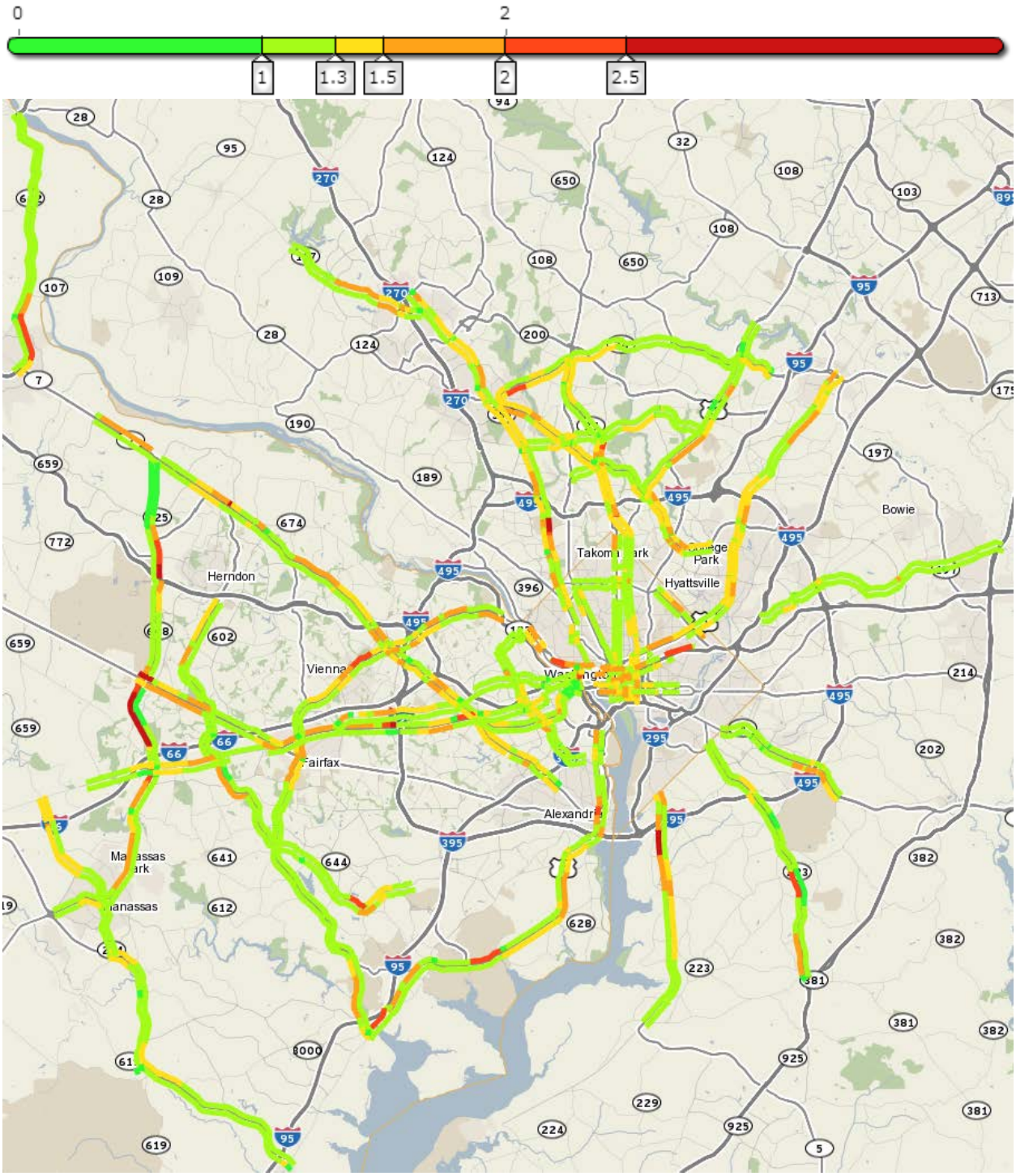
- Respond to TISTWG comments
- Develop flowchart approach to help communicate thresholds and analyses
    - Intersection location, CLV, and proximity to adjacent intersections
    - Simulation tool type (deterministic or stochastic)
    - Requirements for explicit assumptions for transit vehicles and pedestrians

Figure 30: Travel Time Index on Selected Arterials during 8:00-9:00 am on Middle Weekdays in 2013



Note: Congestion levels are categorized by the value of TTI:
TTI = 1.0: Free flow
1.0<TTI<=1.3: Minimal
1.3<TTI<=1.5: Minor
1.5<TTI<=2.0: Moderate
2.0<TTI<=2.5: Heavy
2.5<TTI: Severe

Figure 31: Travel Time Index on Selected Arterials during 5:00-6:00 pm on Middle Weekdays in 2013



Note: Congestion levels are categorized by the value of TTI:
TTI = 1.0: Free flow
1.0<TTI<=1.3: Minimal
1.3<TTI<=1.5: Minor
1.5<TTI<=2.0: Moderate
2.0<TTI<=2.5: Heavy
2.5<TTI: Severe

Figure A7: Travel Time Index on the Non-Interstate NHS in Montgomery County, MD during Weekday 8:00-9:00 am, 2013

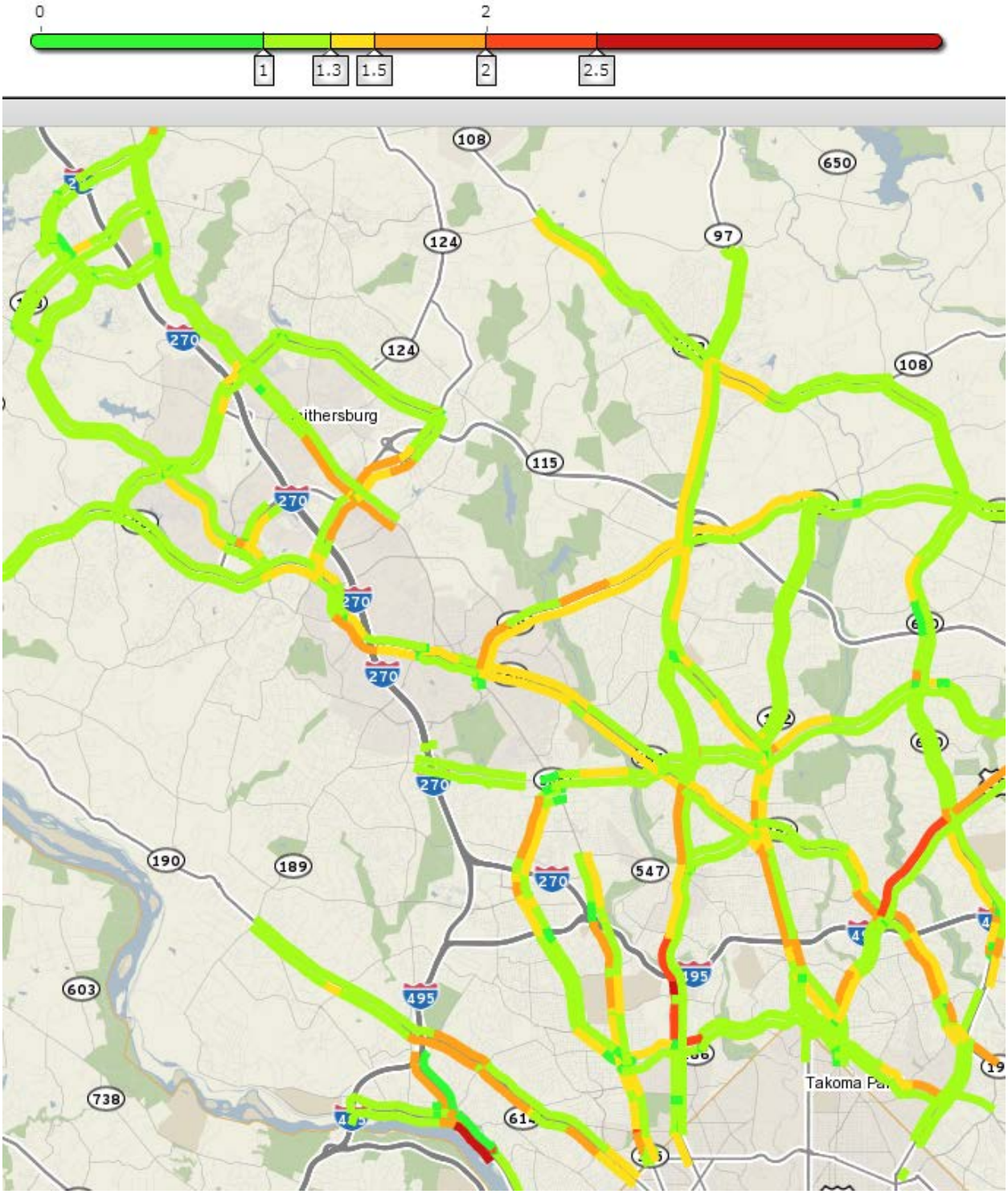
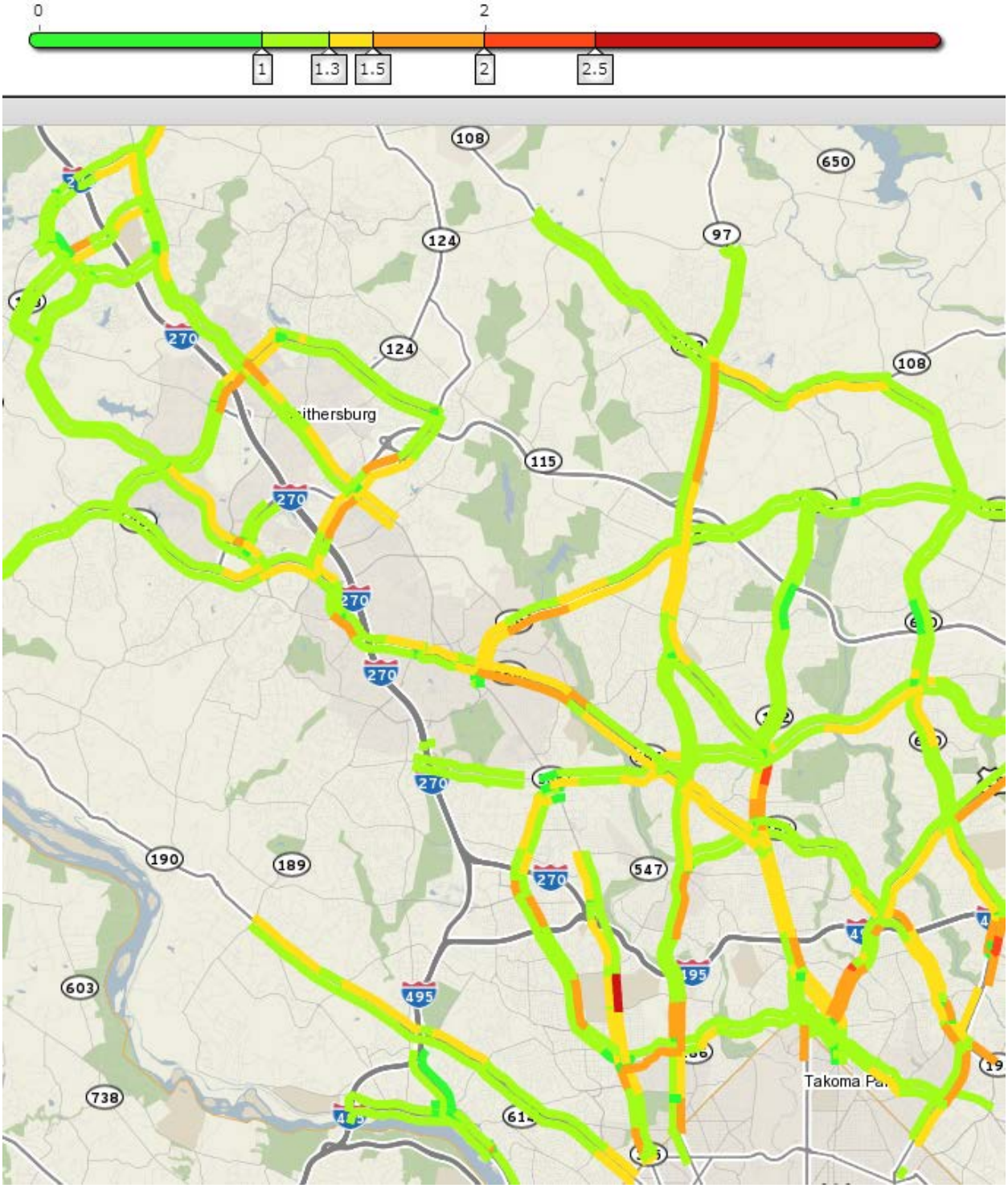


Figure A8: Travel Time Index on the Non-Interstate NHS in Montgomery County, MD during Weekday 5:00-6:00 pm, 2013



LATR CONCEPT SUMMARY

SR-3: Protected Intersections Status Report – 4/27/15

This brief memo provides a status report on the identification of potential Protected Intersections. There seems to be a general consensus that the Protected Intersection concept is appropriate but that it should not be associated with a statement of "no impact" or "no responsibility", but rather directed towards a Pay-and-Go mechanism that would:

- Allow applicants the option to reassign even existing and background traffic around the intersection if desired as part of the traffic study
- Require a payment for remaining impacts (the $12K / vehicle trip associated with peak hour trips assigned through the intersection may be a reasonable starting point), and
- Such payment to be associated with an area-specific improvement or TDM program (for instance, the existing TMDs or a current CIP project including the intersection)

The attached maps show some of the initial analysis that we conducted, examining the countywide dataset of 238 Major-Highway-to-Major-Highway and Major-Highway-to-Arterial intersections. We started with a simple organizing schema: "how many miles of designated master plan roadways of Business Street or Primary Residential roadway – appropriate for some diverted traffic as a matter of policy – are within a ½ mile radius?"

The first map shows the Countywide results in quantile form. The next three maps provide a zoom-in on different areas of the County for a little better resolution (although there is an issue with overlaps on the zoom-ins also). Generally, every intersection might be expected to have at least 1.5 miles of designated roadway in the case of a Major Highway transecting the 0.5 mile radius intersecting another Major Highway or Arterial at a T-intersection. There are exceptions to this rule; the lowest intersection on the list (Veirs Mill at Aspen Hill) scores at 1.24 because the designations aren't carried into the City of Rockville.

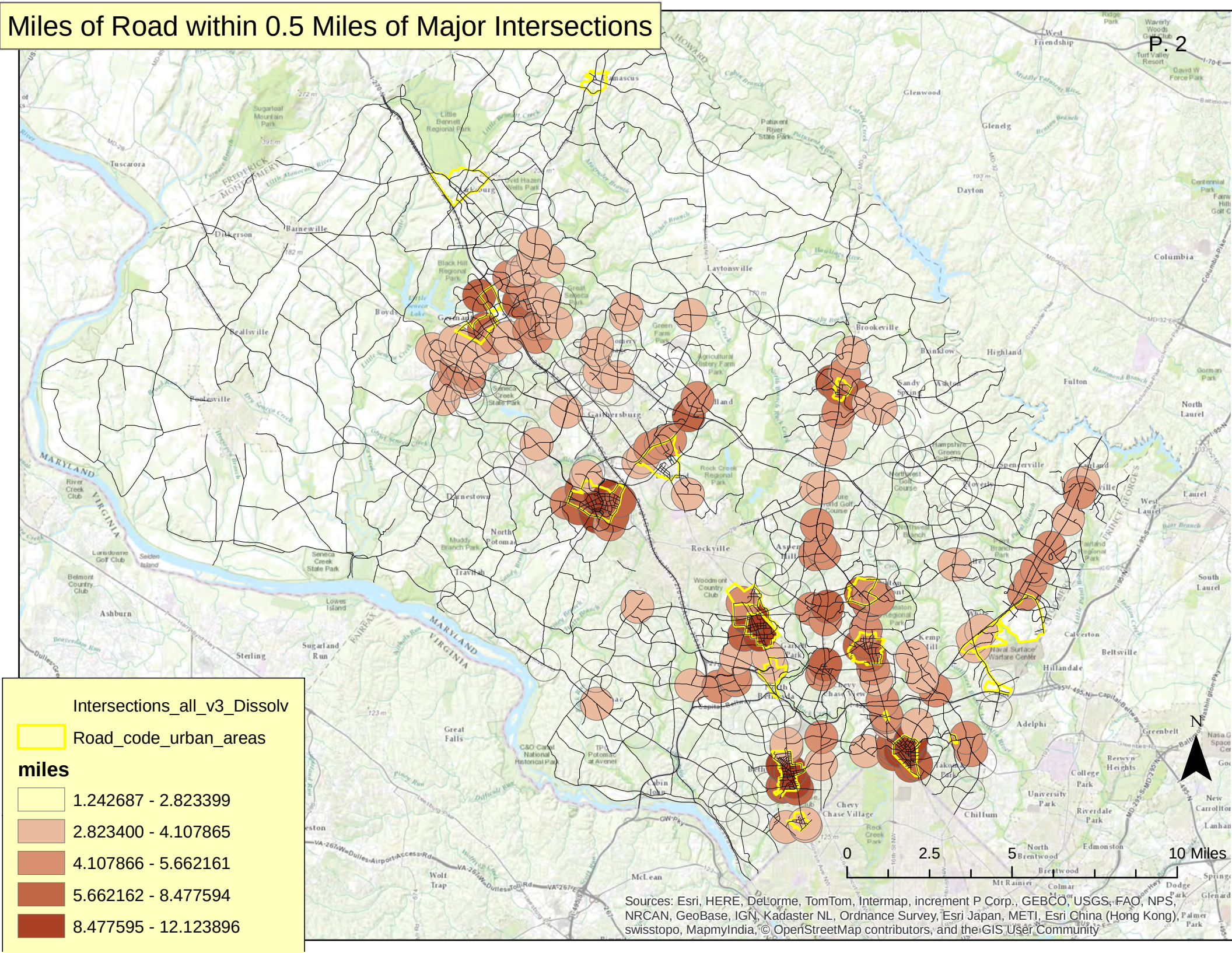
As we reviewed this info, we noted a couple of patterns:

- There is some logical overlap between many of the Road Code Urban Areas, denser designated roadway networks, and the extent to which the pedestrian quality of service should be prioritized over the motor vehicle level of service.
- The top quantile of intersections have a robust network with roughly 8 miles or greater, and they are all located in four TMDs (Bethesda, Greater Shady Grove, Silver Spring, and White Flint). While we anticipate some assessment (maybe more qualitative than GIS-based) of connectivity around all quadrants of each candidate intersection, review of these maps suggest a potential logical assessment of protected intersections organized into TMD areas. The next wave of highest-scoring intersections include some in and around Wheaton, Olney, and Germantown (as evident from the countywide maps).

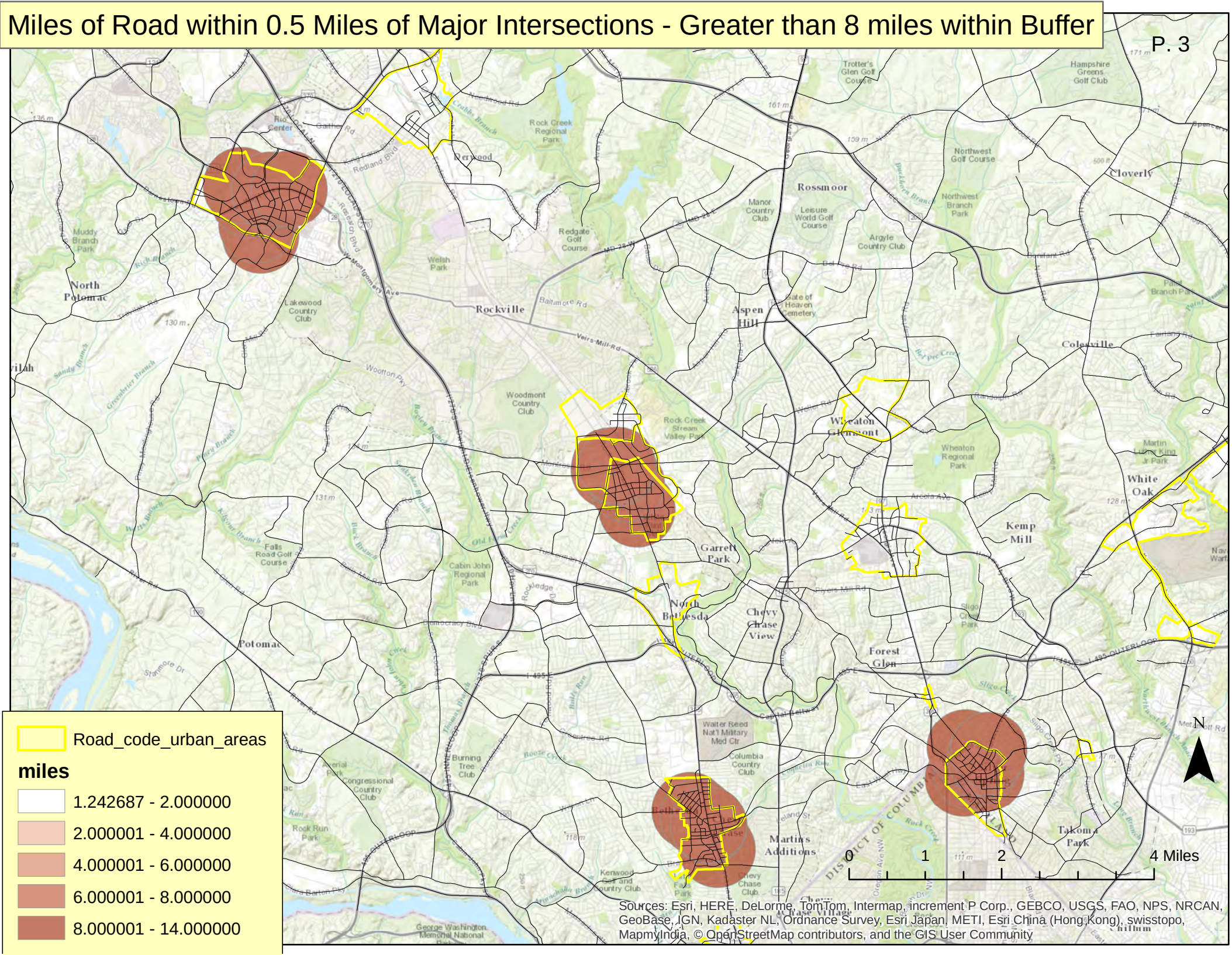
No formal review or action requested at this point, but any informal thoughts are appreciated.

Prepared by Renaissance Planning Group
April 27, 2015

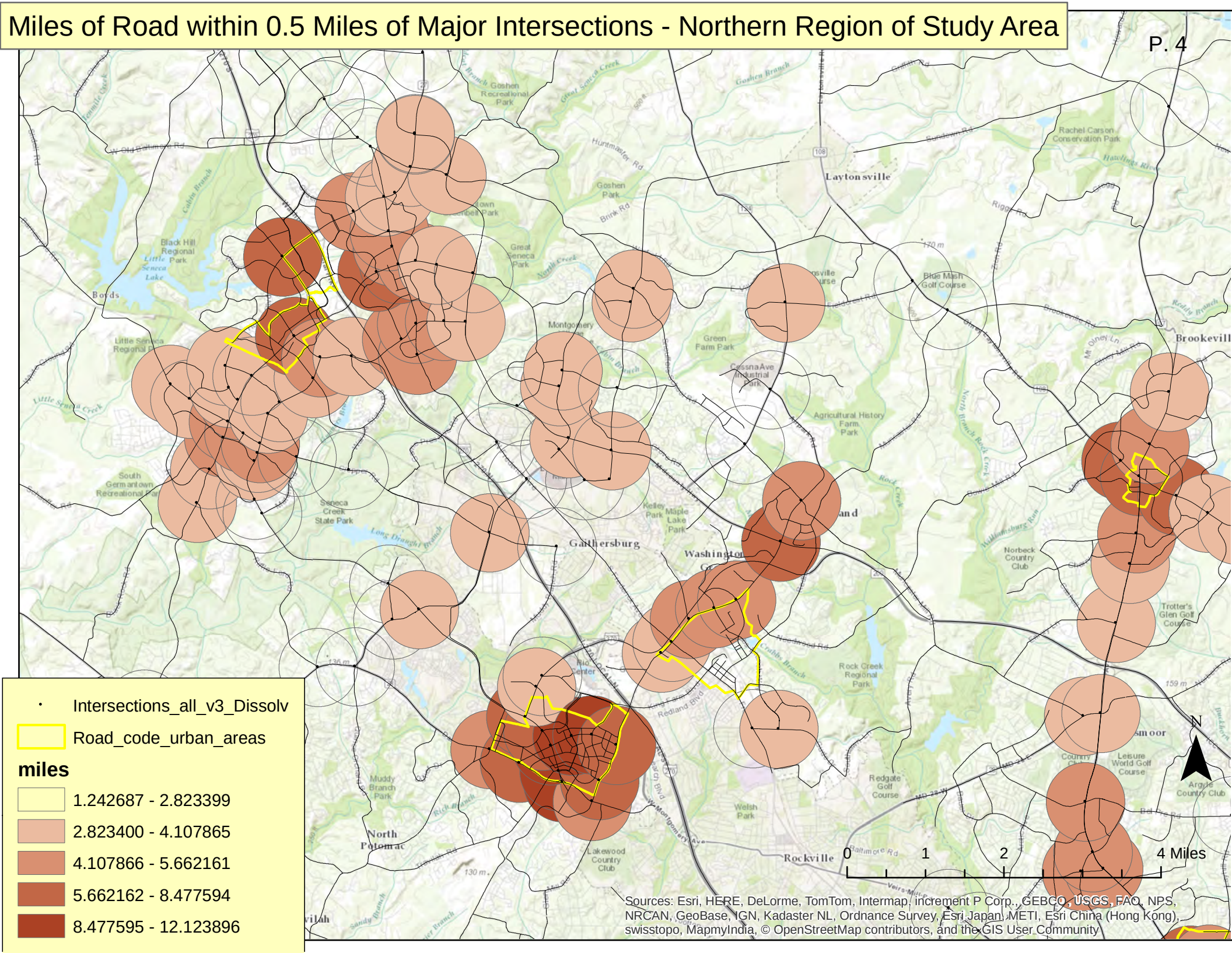
Miles of Road within 0.5 Miles of Major Intersections



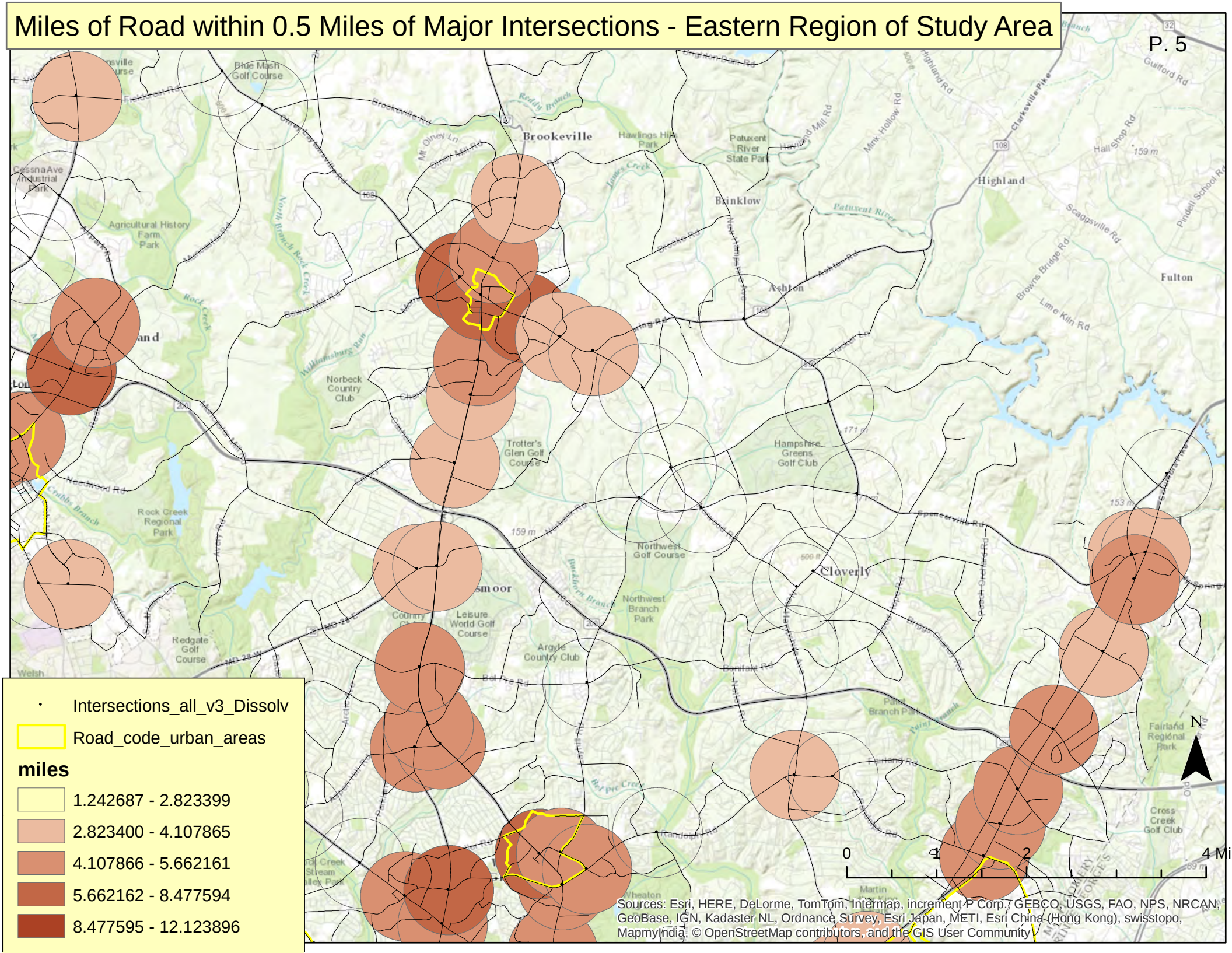
Miles of Road within 0.5 Miles of Major Intersections - Greater than 8 miles within Buffer



Miles of Road within 0.5 Miles of Major Intersections - Northern Region of Study Area



Miles of Road within 0.5 Miles of Major Intersections - Eastern Region of Study Area



Sources: Esri, HERE, DeLorme, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

Miles of Road within 0.5 Miles of Major Intersections - Southern Region of Study Area