



Land Use/Transportation Evaluation for the Forest Drive Corridor

Presented by

Derek Lombardi, Master of Community Planning Candidate

Under the supervision of Dr. Chao Liu and Uri Avin, FAICP

December 2016

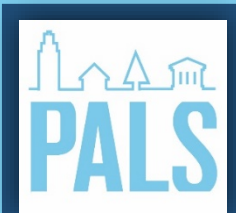




Objectives

- Assess potential and need for expansion of Forest Drive as a result of assumed land use changes on adjacent parcels
- Identify parcels most suitable for new development or redevelopment and generate alternatives using CommunityViz sketch software
- Develop an analysis tool that is applied to parcels in this corridor but is also applicable to other city corridors

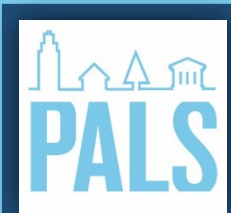




Alternatives

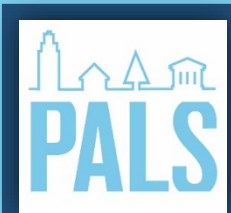
- Baseline scenario
- Zoning build-out
- Mixed use rezoning





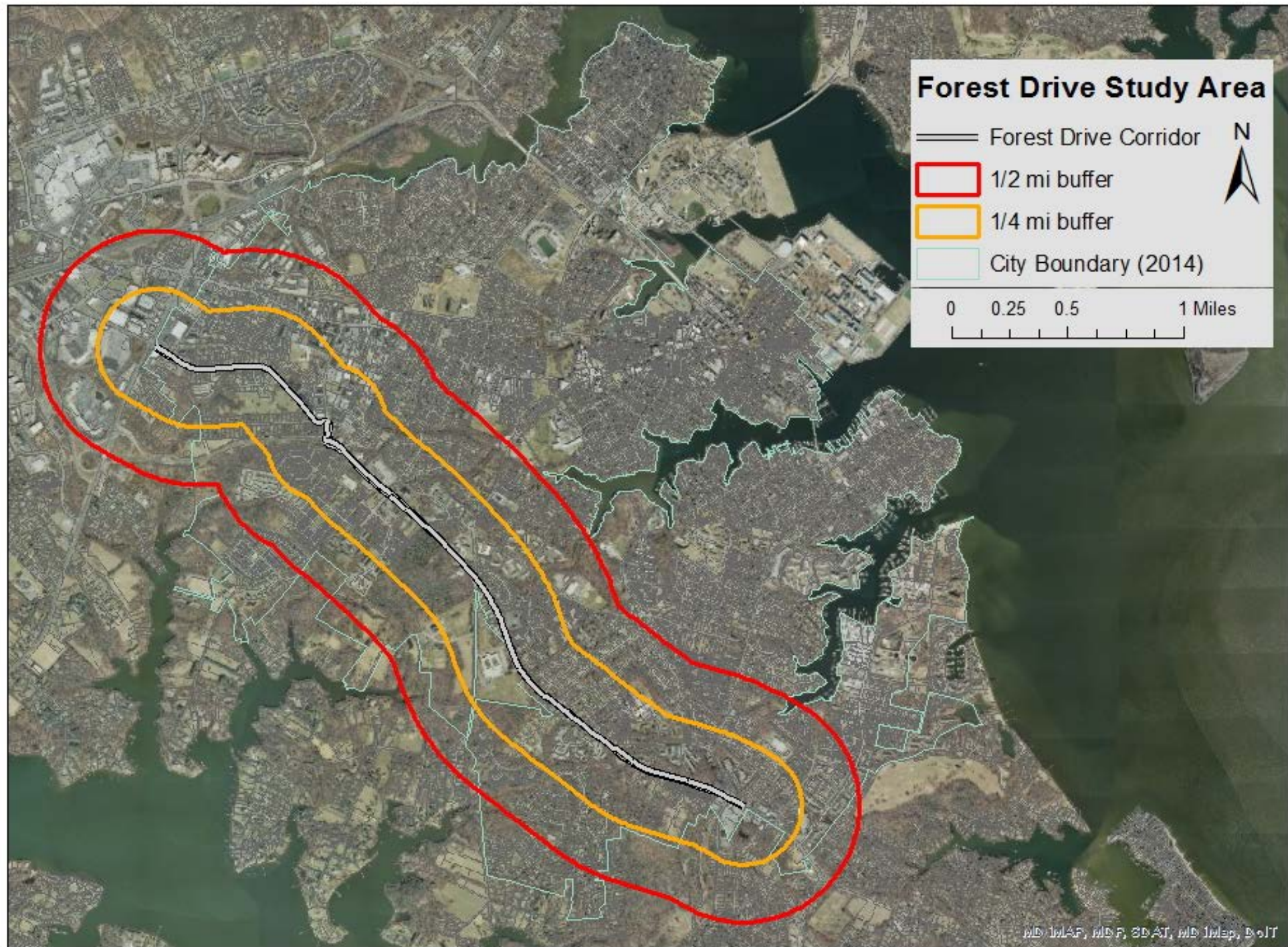
Data Sources

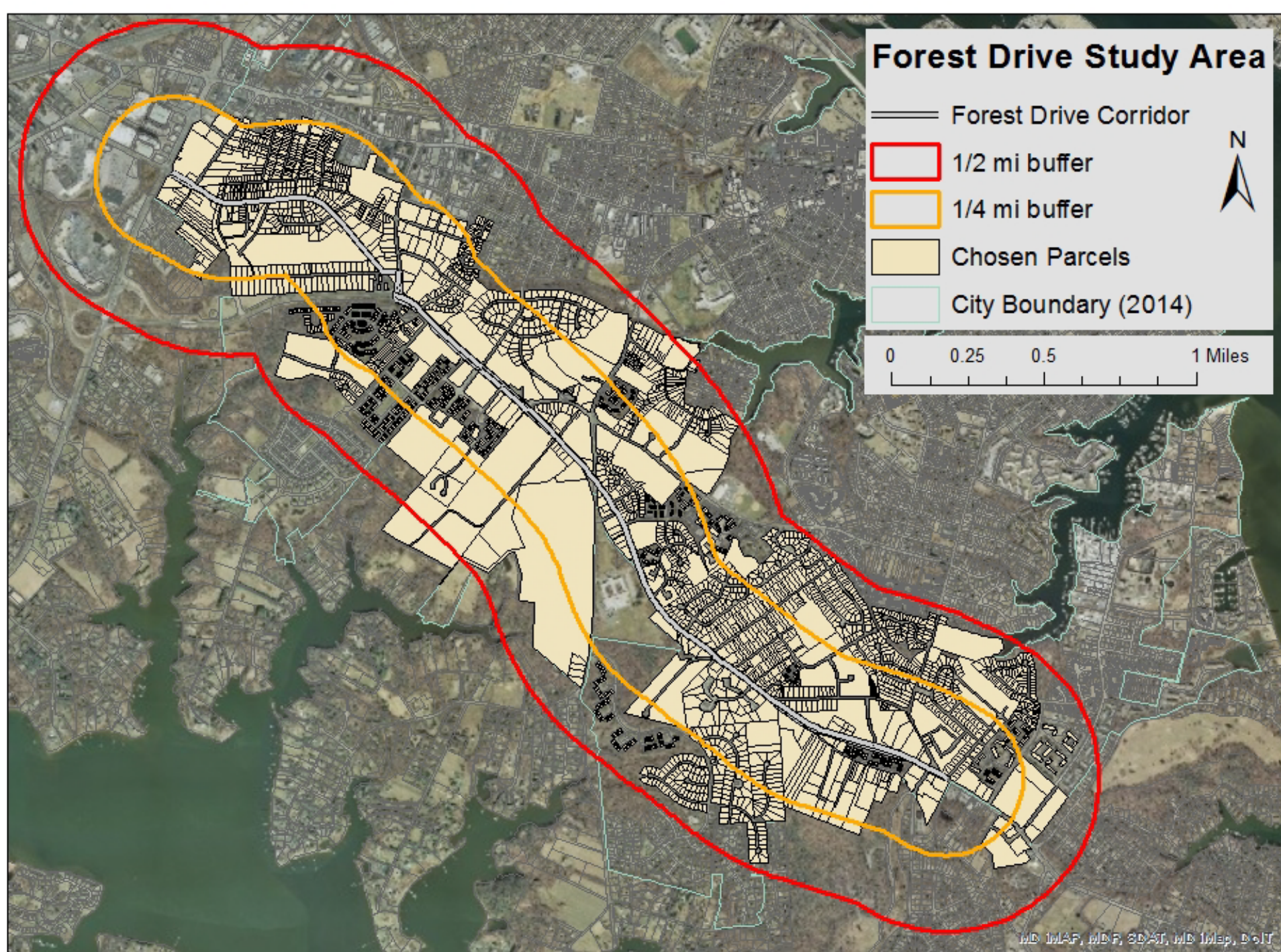
Source	Datasets
Baltimore Metropolitan Council (BMC)	Average weekday daily raw simulated traffic volume, TAZ structure
Maryland Department of Planning (MDP)	Aerial imagery shapefiles
Institute of Transportation Engineers (ITE)	Trip generation rates Trip Generation Manual, 9 th Edition Vol. 2-3
Maryland Statewide Transportation Model (MSTM)	Transportation network shapefile Transportation facility types Volume/capacity ratios; level of service data
City of Annapolis	Shapefiles for parcels, roads, city boundary
Maryland Dept of Assessments and Taxation	SDAT Real Property Data
National Center for Smart Growth (NCSG)	City land use database developed in Summer 2016
Google Maps	Street view and aerials used to confirm/update current land uses
Traffic Concepts	2015 Forest Drive Corridor Analysis Model

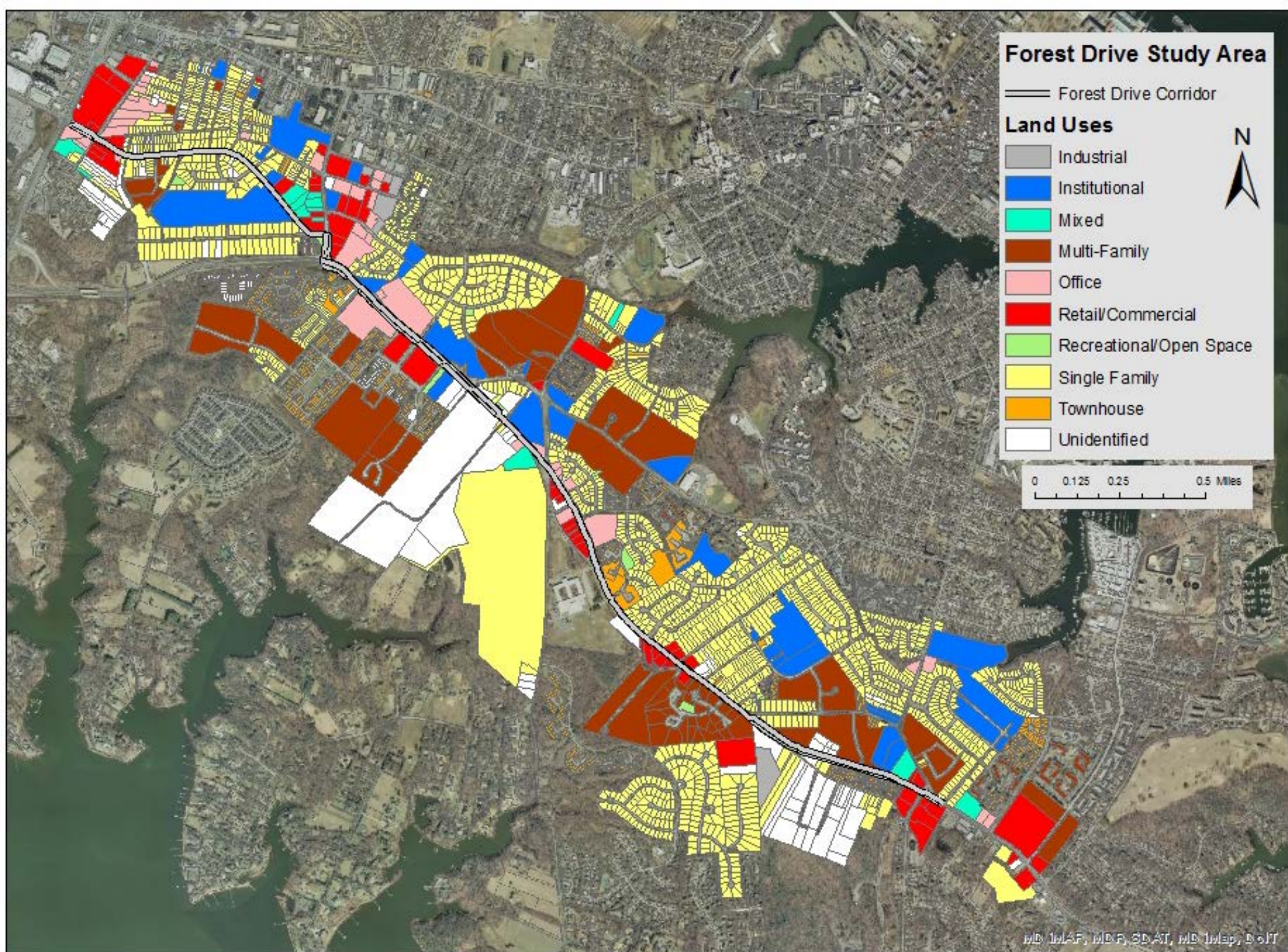


Methodology and Process

- Base mapping of land use, zoning, roads, imagery, TAZs
- Selection of buffer zone
- Cleaning and joining together different datasets
- Identifying parcels suitable for development (undeveloped or underdeveloped)
- Calculating trip generation rates by land use type
- Projecting trips and traffic for the baseline (current) scenario
- Testing future scenarios for traffic impacts







Sources:
UMD land use
database, SDAT,
Google Maps,
site visit



Identifying Underdeveloped Parcels

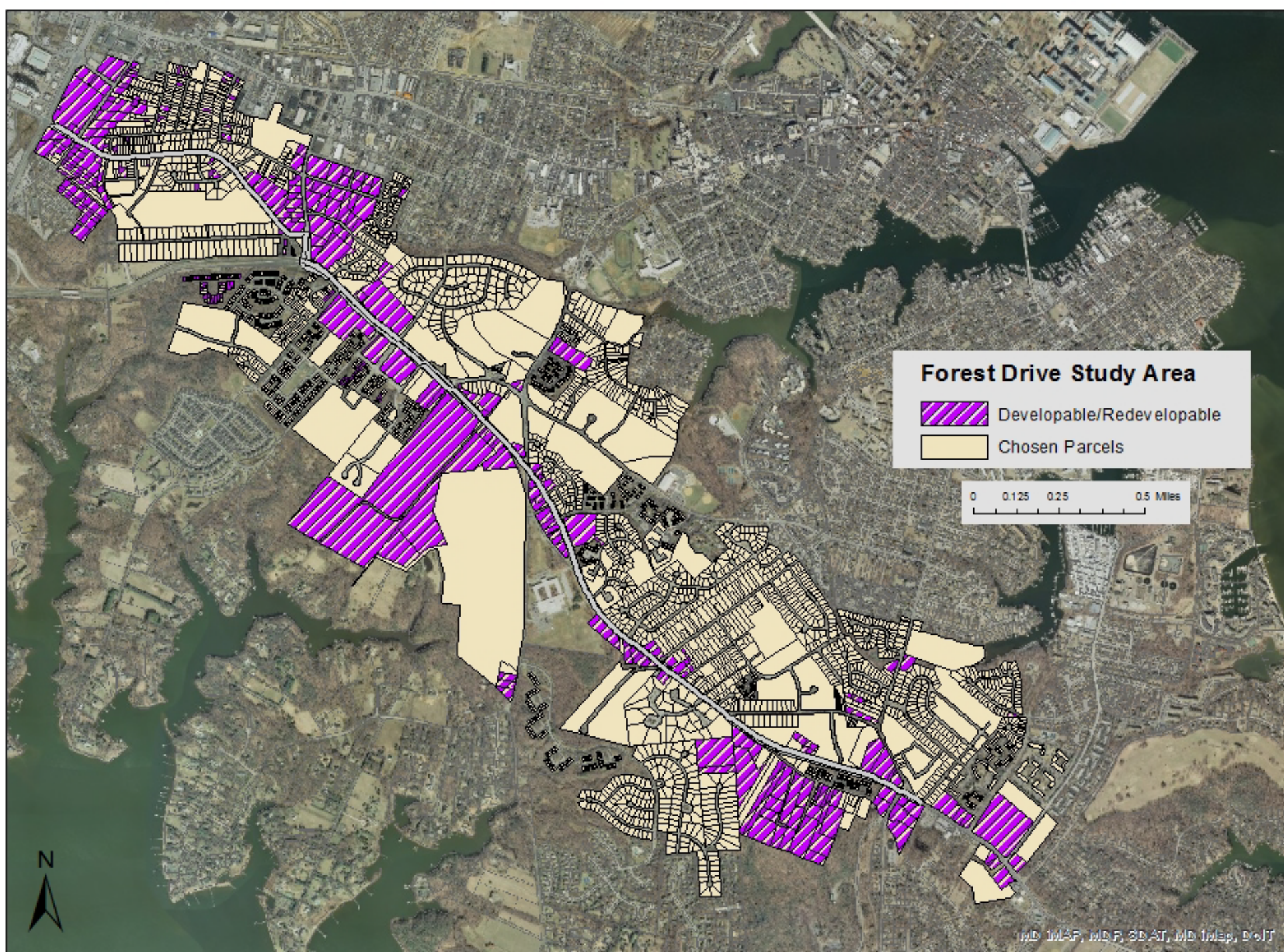
Criteria

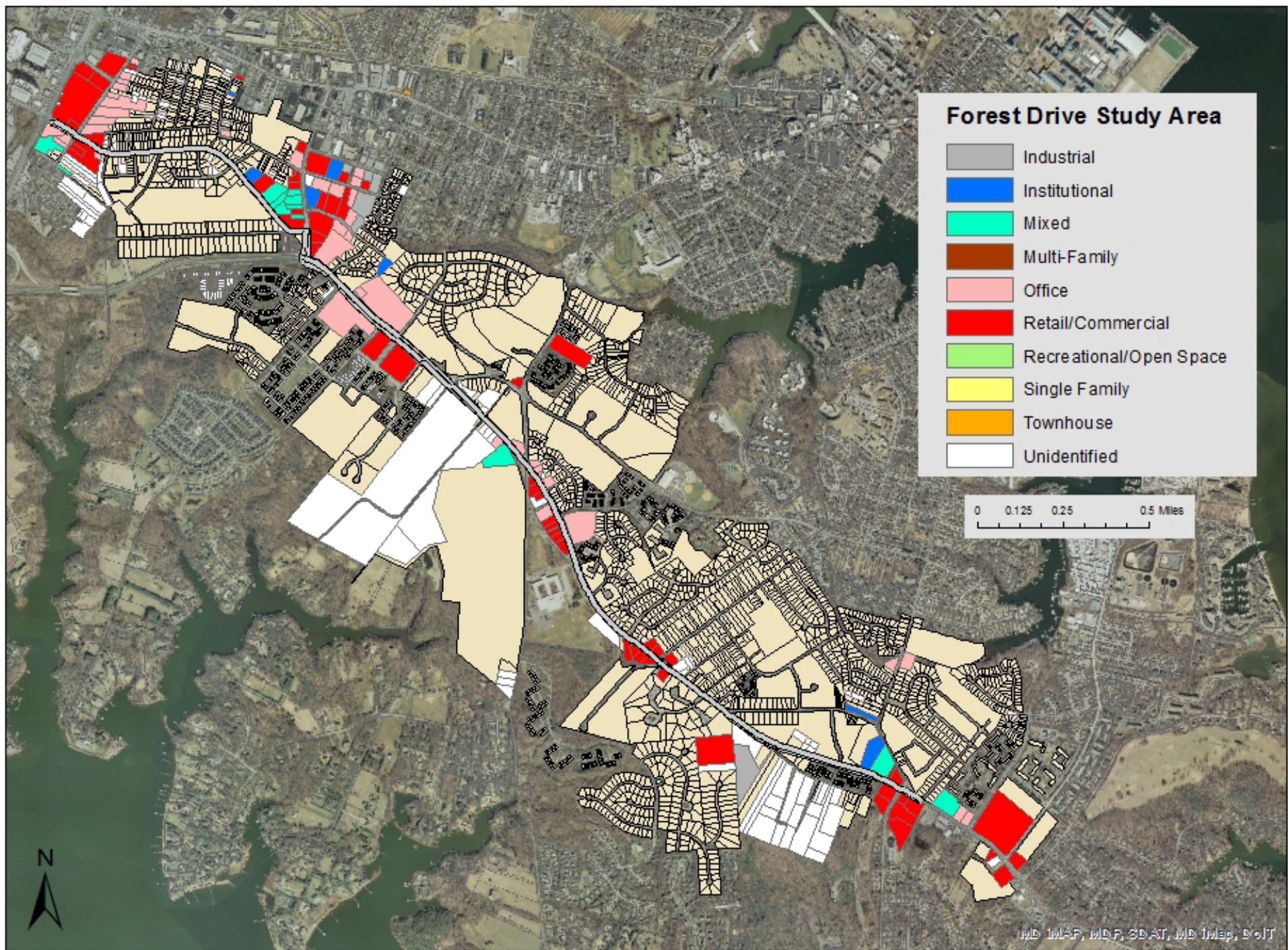
- Residentially zoned parcels with no land improvement value
- Commercial, industrial, mixed, or institutional parcels (all undeveloped and some developed)

Prioritization for projecting land use changes

- Undeveloped
- Oldest structures on developed sites
- Lowest improvement value on developed sites

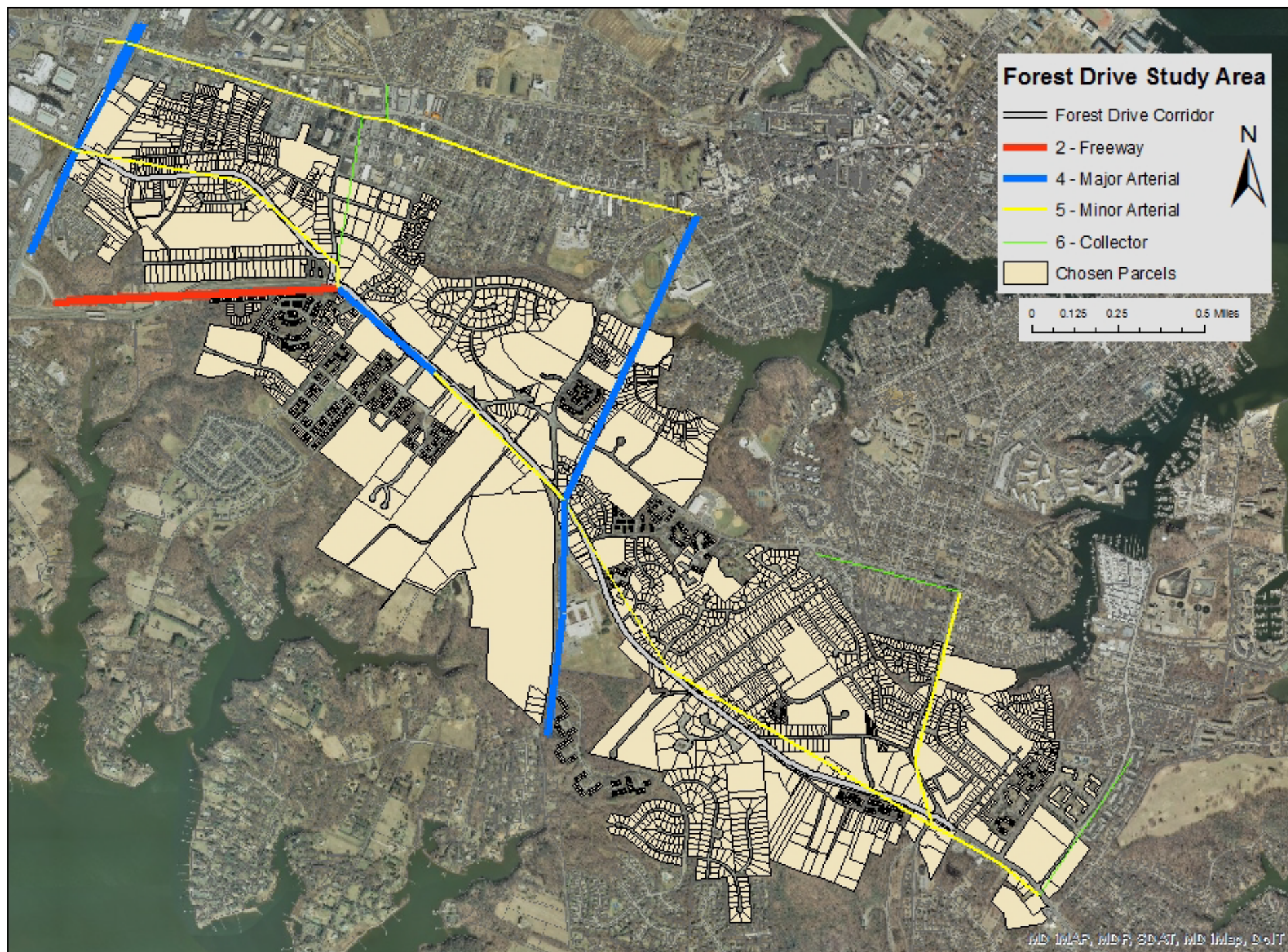




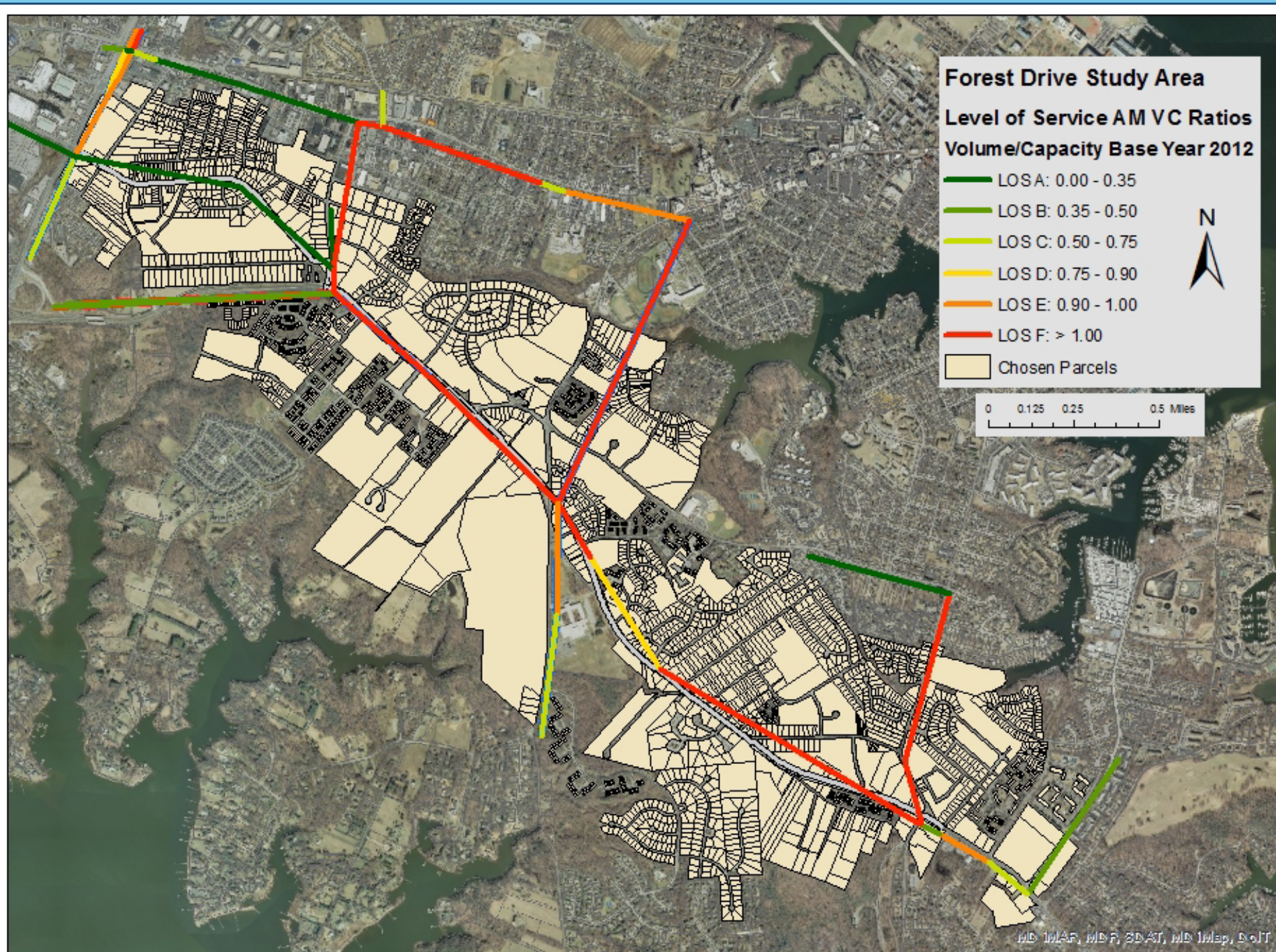


Current land uses on parcels suitable for future re/development

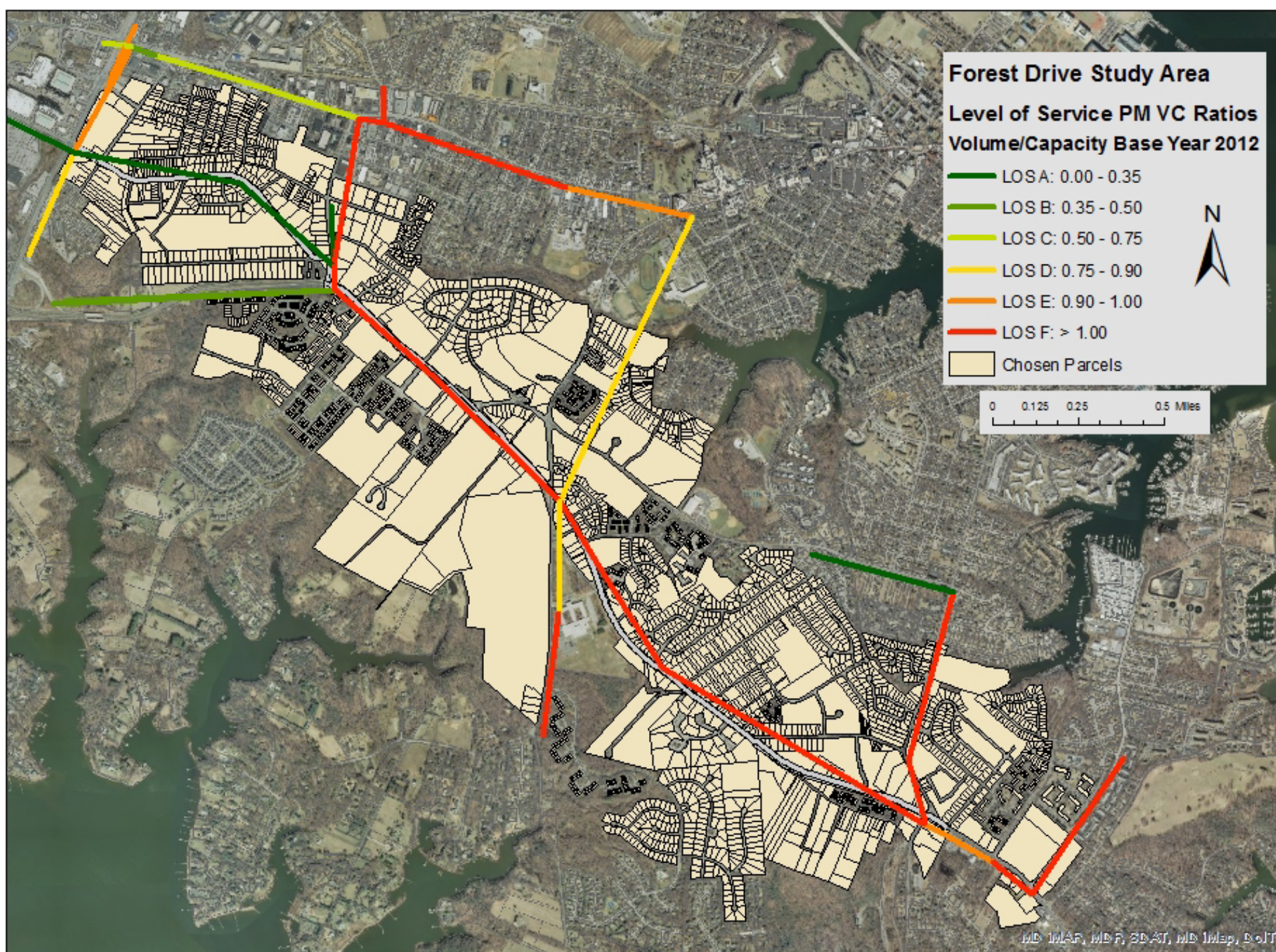
Sources:
UMD land use database, SDAT, Google Maps, site visit



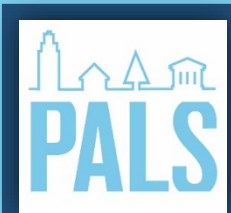
Source:
MSTM
2012



Source:
MSTM
2012



Source:
MSTM
2012



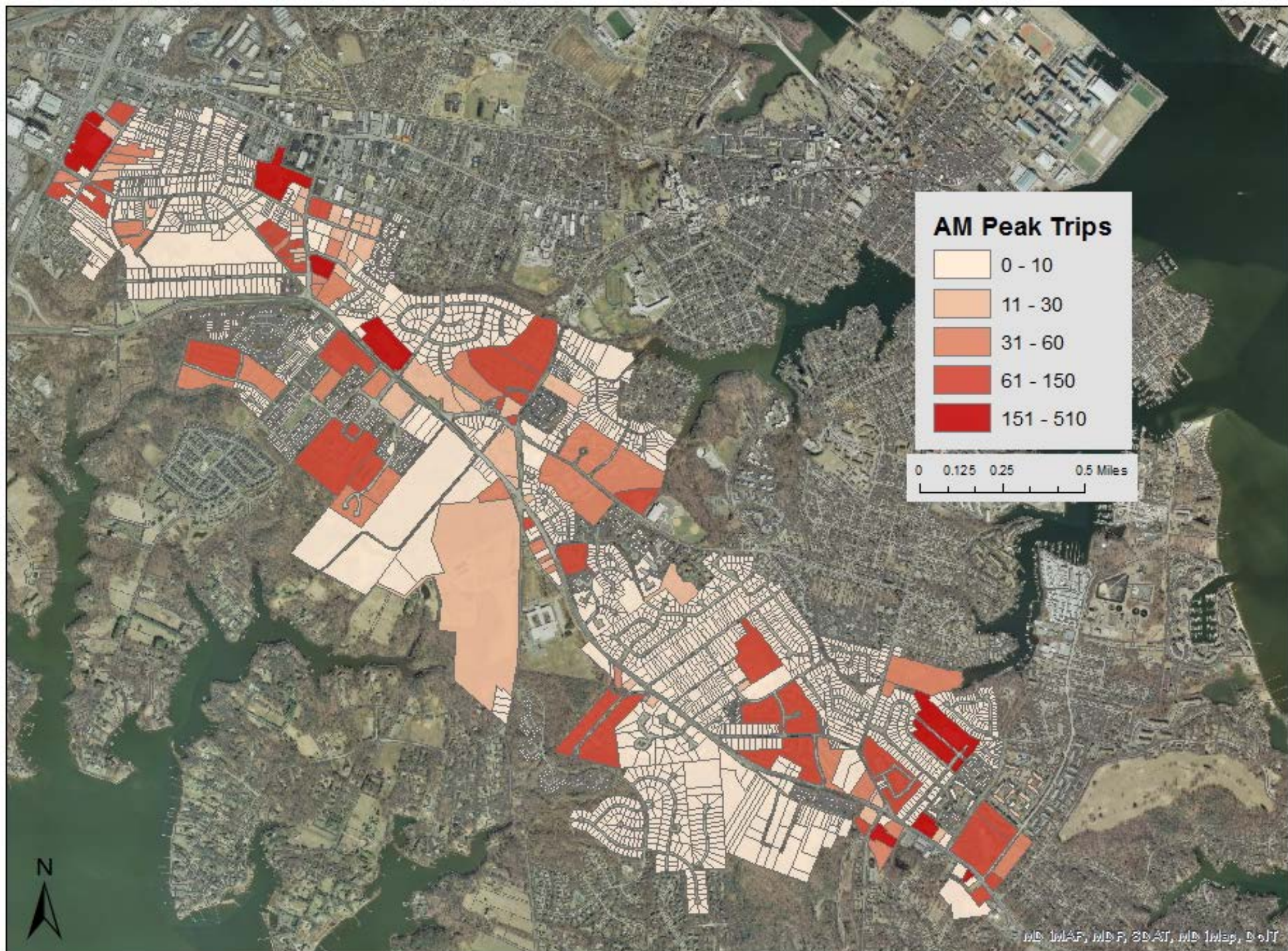
Trip Generation Rates

Use	AM Peak Trip Rate	PM Peak Trip Rate	Vs.
Single Family	0.75	1	Trips per dwelling Unit, weekdays
Town House	0.44	0.52	
Multi-Family	0.51	0.62	
Continuing Care	0.14	0.16	Trips per Unit, weekdays
Office	1.56	1.49	Trips per 1,000 SF gross floor area, weekdays
Light Industrial	0.92	0.97	
Heavy Industrial	0.51	0.68	
Warehousing	0.3	0.32	
Church	0.56	0.55	
Day Care Center	12.18	12.34	
Elementary School	5.2	1.21	
Private School (K-8)	11.59	6.53	
Synagogue	0.14	1.69	
Museum	1.04	7.3	
Animal Hospital	4.08	4.72	
Health/Fitness Club	1.41	3.53	
Community Center	2.05	2.74	
Post Office	8.23	11.22	
Cemetery	0.17	0.84	
Unidentified	0	0	

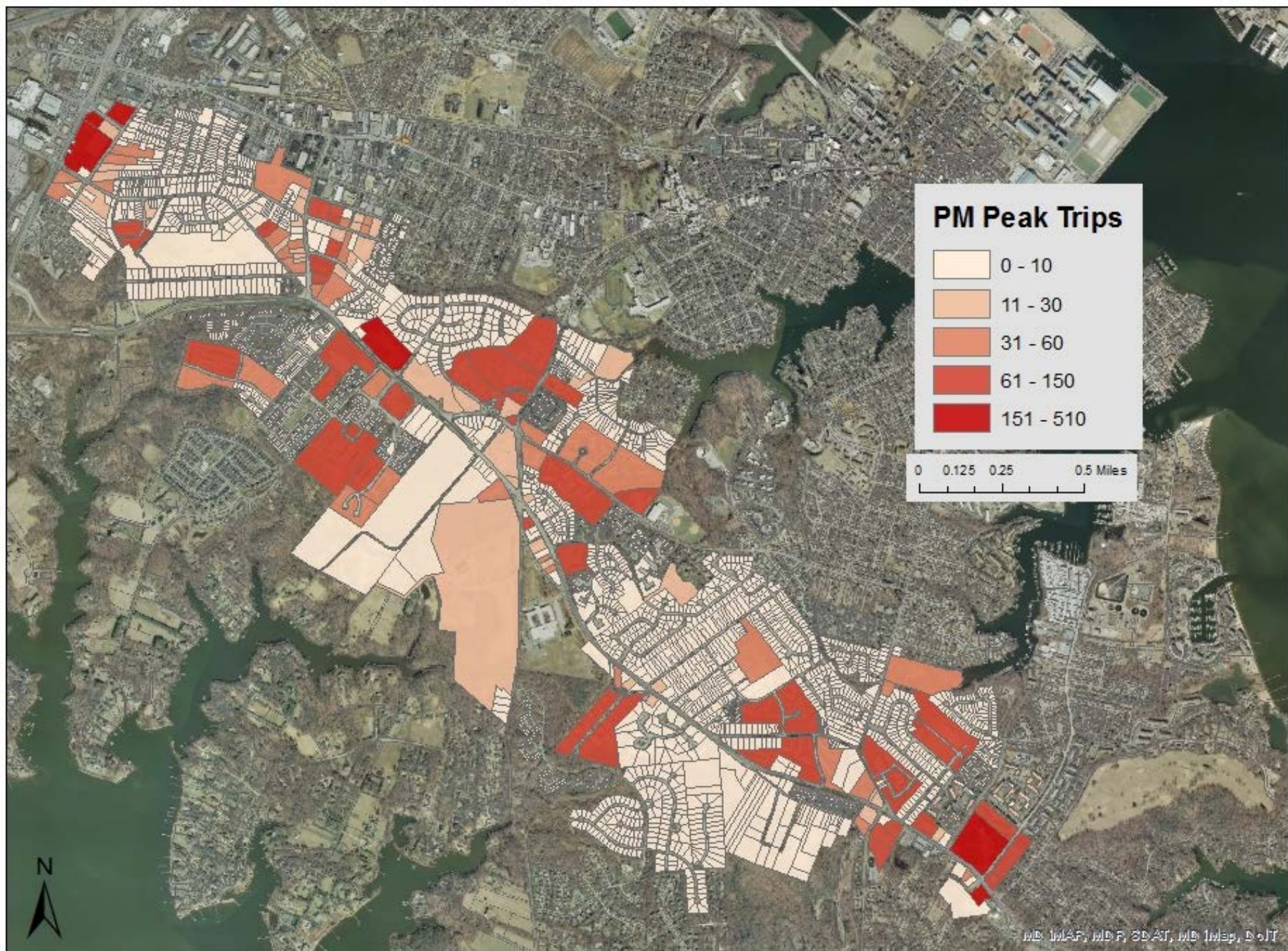
Use	AM Peak Trip Rate	PM Peak Trip Rate	Vs.
Building Materials Store	2.6	4.49	Trip generation per 1,000 SF gross floor area, weekdays
Hardware/Paint Store	1.08	4.84	
Nursery (Garden Center)	2.43	6.94	
Shopping Center	0.96	3.71	
Specialty Retail Center	6.84	2.71	
Automobile Sales	1.92	2.62	
Automobile Parts Sales	2.21	5.98	
Tire Store	2.89	4.15	
Supermarket	3.4	9.48	
Convenience Market (15-16 hours)	31.02	34.57	
Discount Supermarket	2.53	8.34	
Wholesale Market	0.51	0.88	
Apparel Store	3.83	4.2	
Pharmacy with Drive Thru	3.45	9.91	

Use	AM Peak Trip Rate	PM Peak Trip Rate	Vs.
Furniture Store	0.17	9.91	Trip generation per 1,000 SF gross floor area, weekdays
Fast Food Without Drive Thru	43.87	26.15	
Fast Food With Drive Thru	45.42	32.65	
Automobile Care Center	2.25	3.11	
Gas Station	12.16	13.87	
Gas Station w Conv Market	10.16	13.51	
Gas Station w Conv Market/Car Wash	11.84	13.86	
Self Service Car Wash	8	5.54	
Drive-in Bank	2.63	5.42	
Hair salon	1.21	1.45	
High-Turnover Sit Down Restaurant	10.81	9.85	
Variety Store (dollar store)	3.81	6.82	
Medical-Dental Office	2.39	3.57	
Fire Station (Government Office)	1.02	1.21	

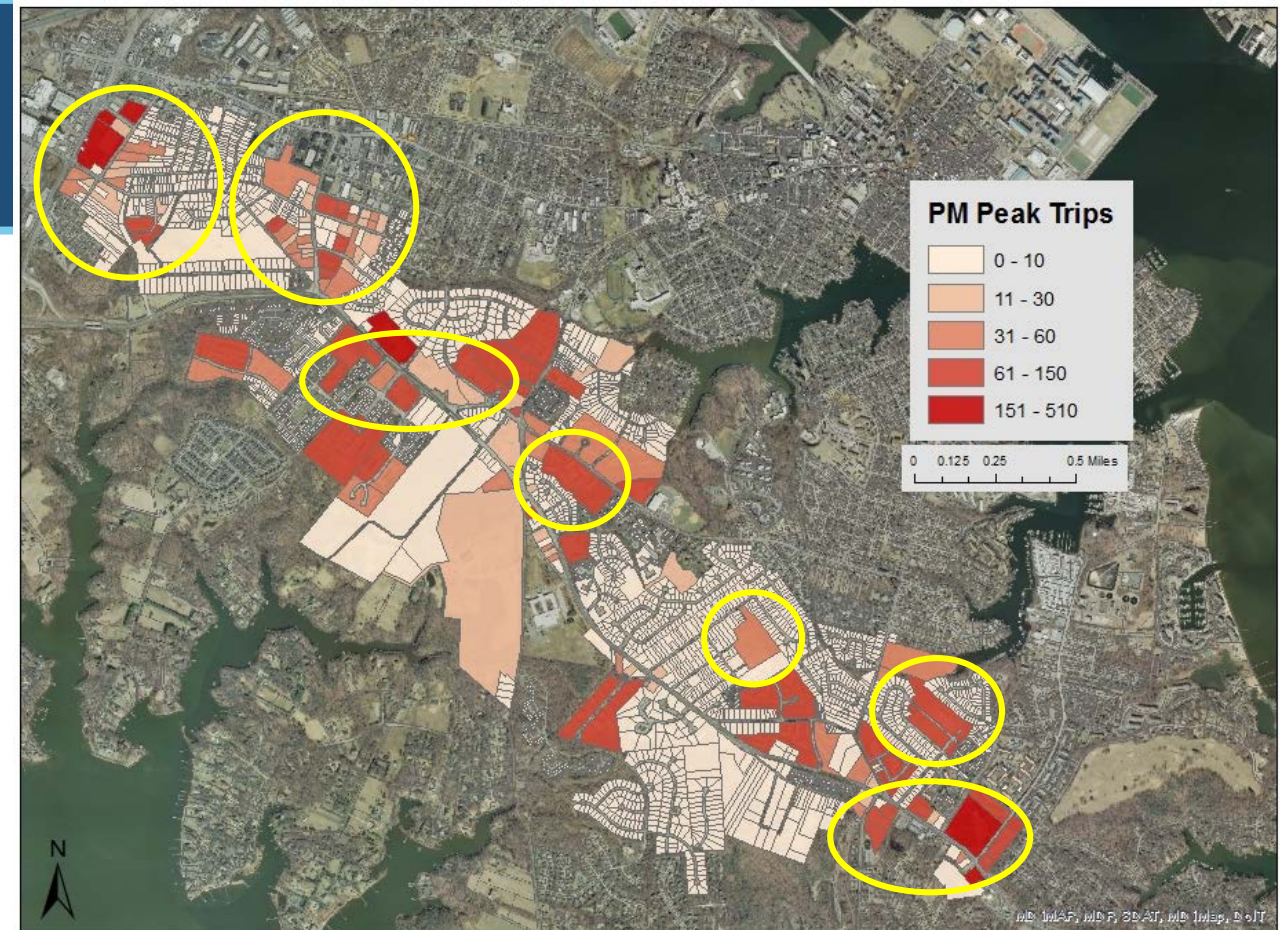
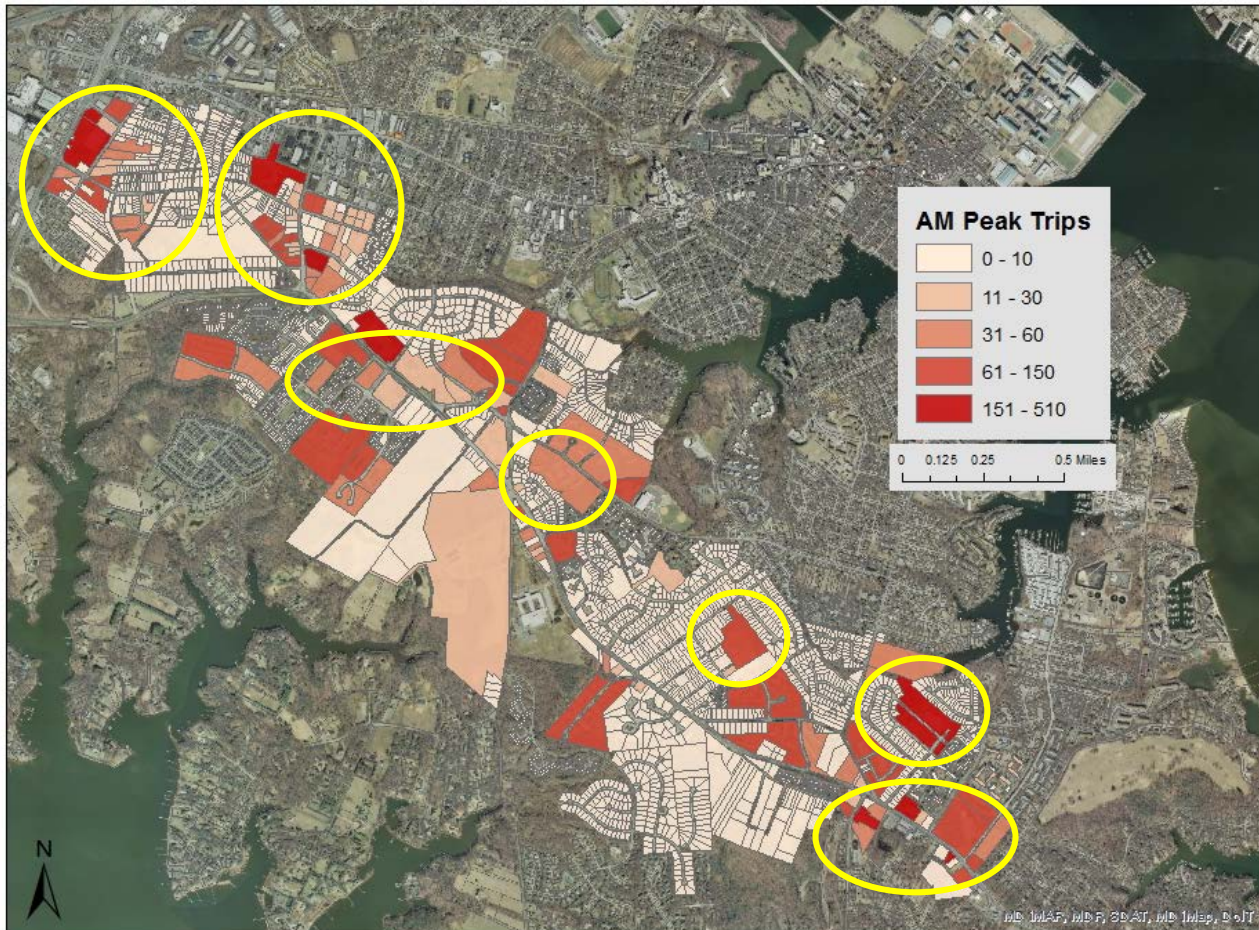
Source: ITE Trip Generation Manual, 9th Edition, Vol. 2-3



Source:
ITE-based
calculation



Source:
ITE-based
calculation

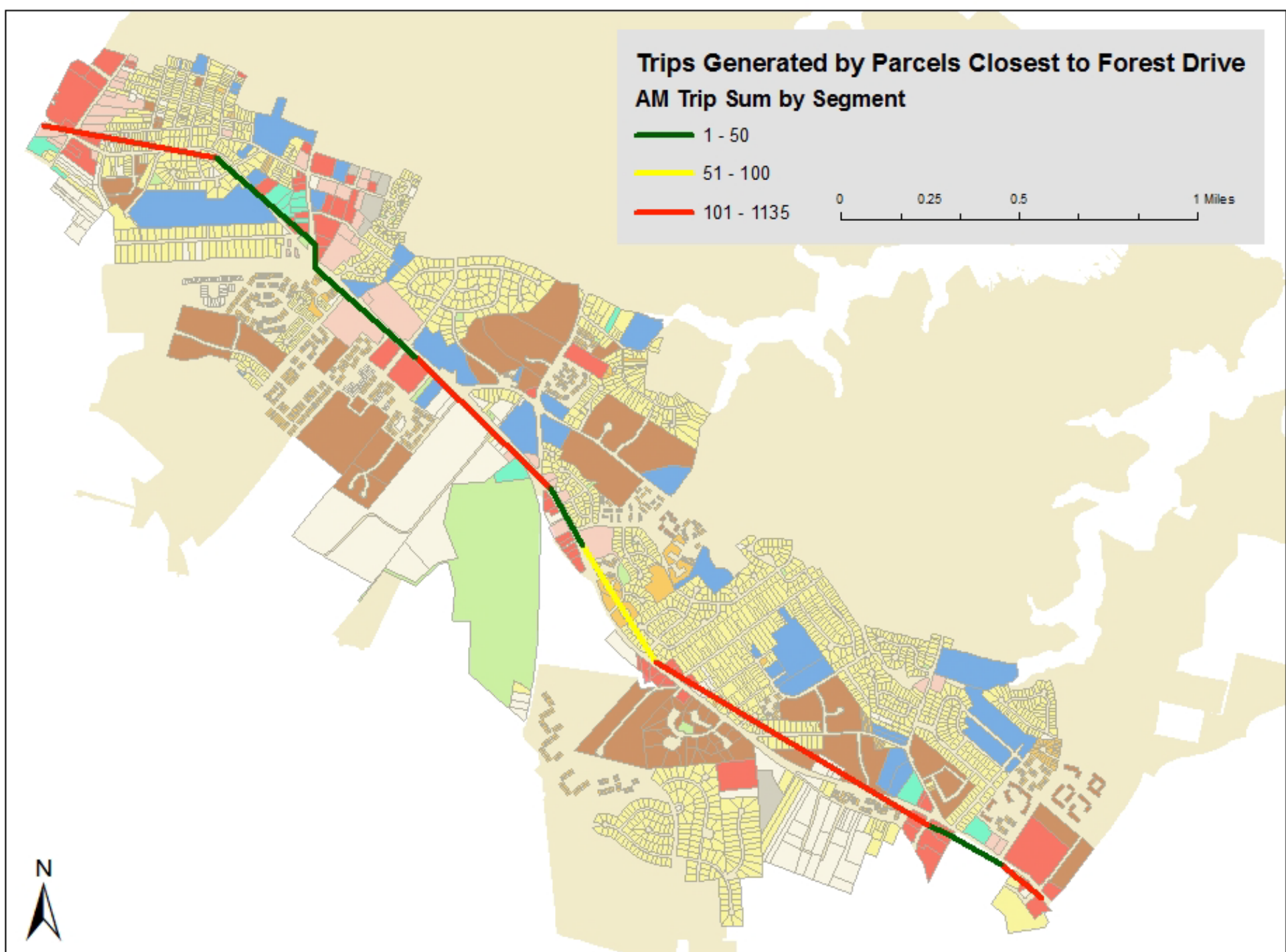
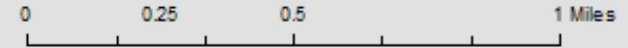


- Elementary schools
- Mixed use areas with offices

- Retail areas
- Apartments

Trips Generated by Parcels Closest to Forest Drive AM Trip Sum by Segment

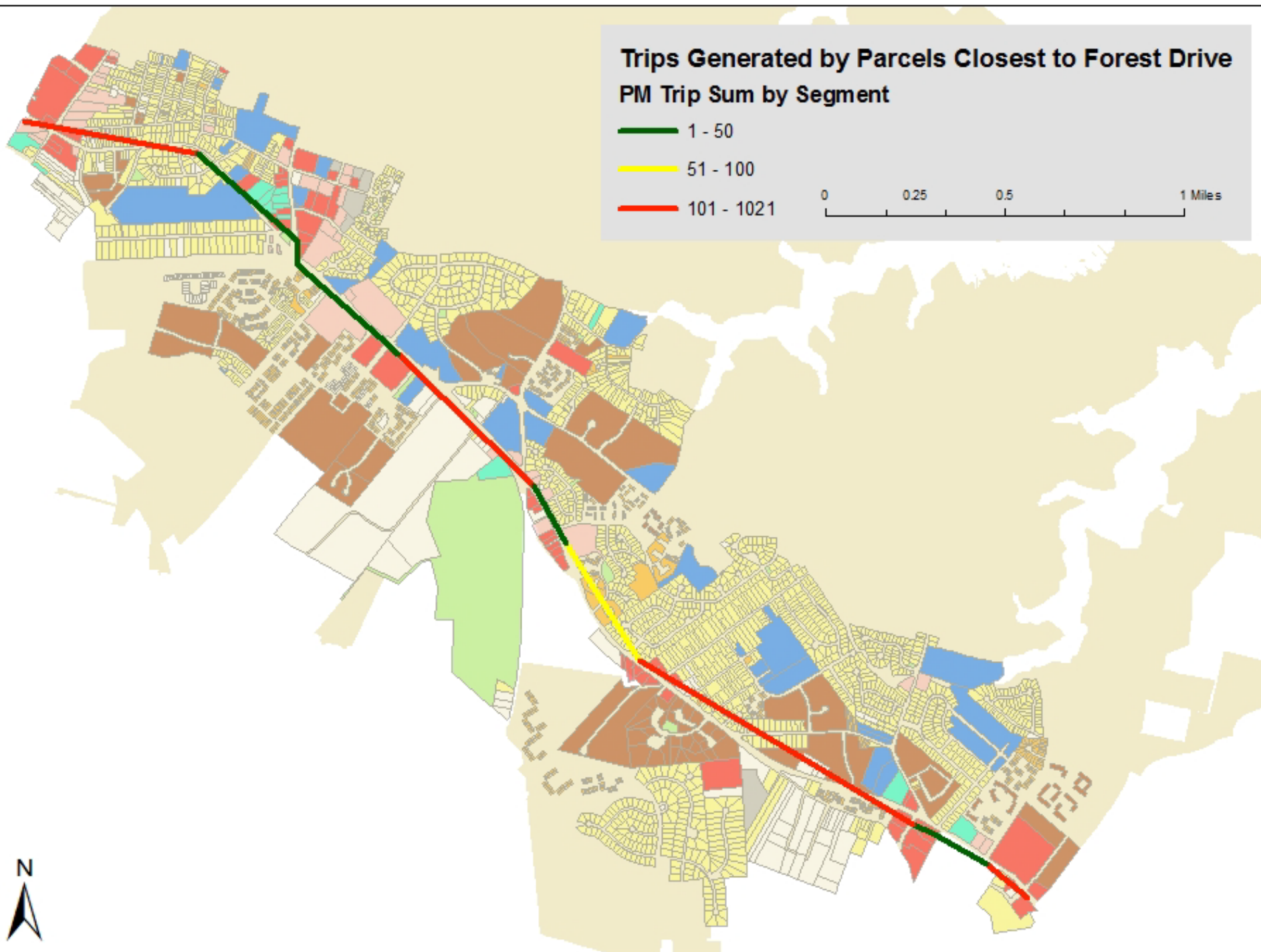
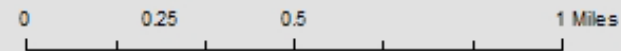
- 1 - 50
- 51 - 100
- 101 - 1135



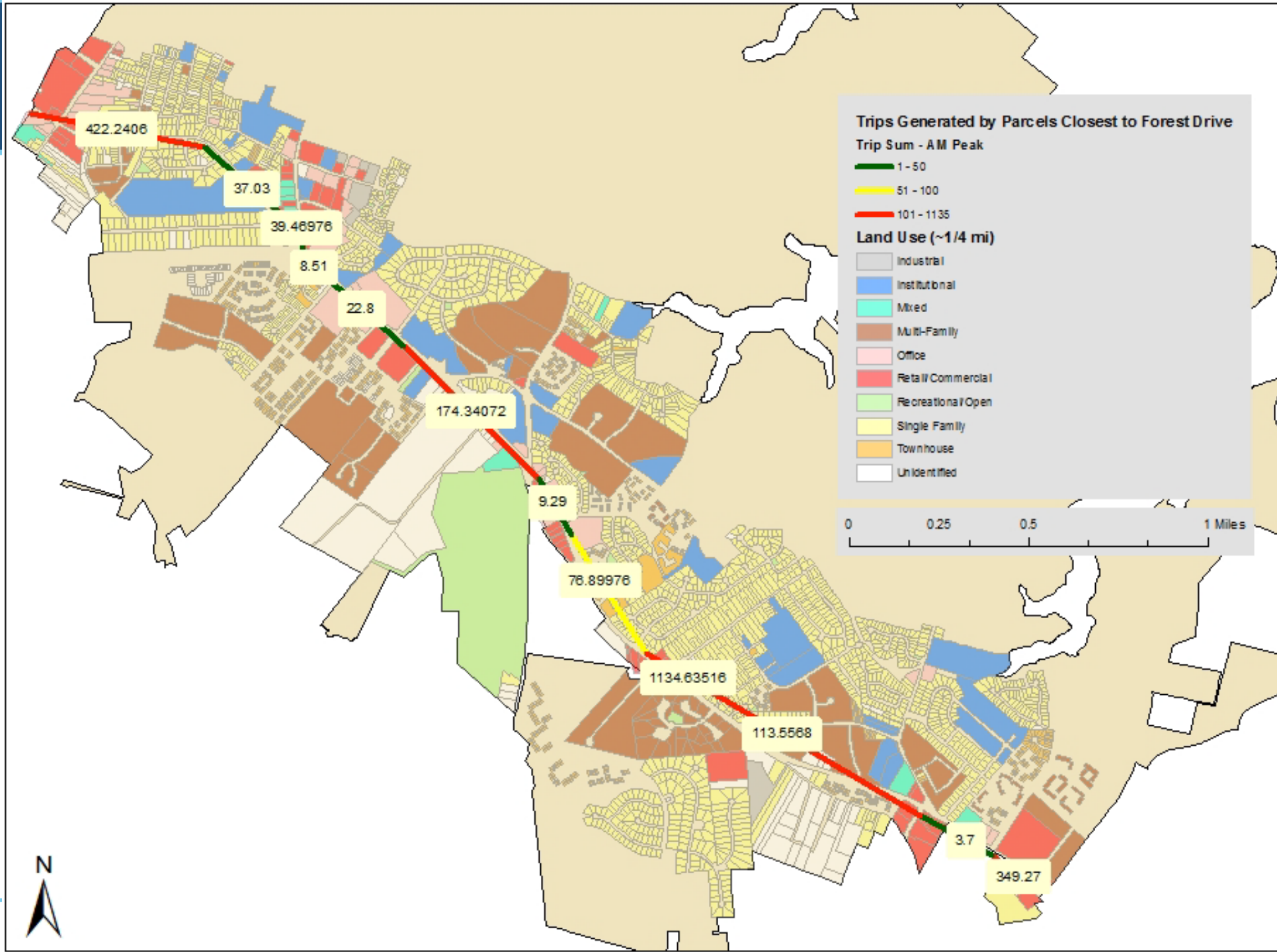
Source:
ITE-based
calculation;
MSTM
network

Trips Generated by Parcels Closest to Forest Drive PM Trip Sum by Segment

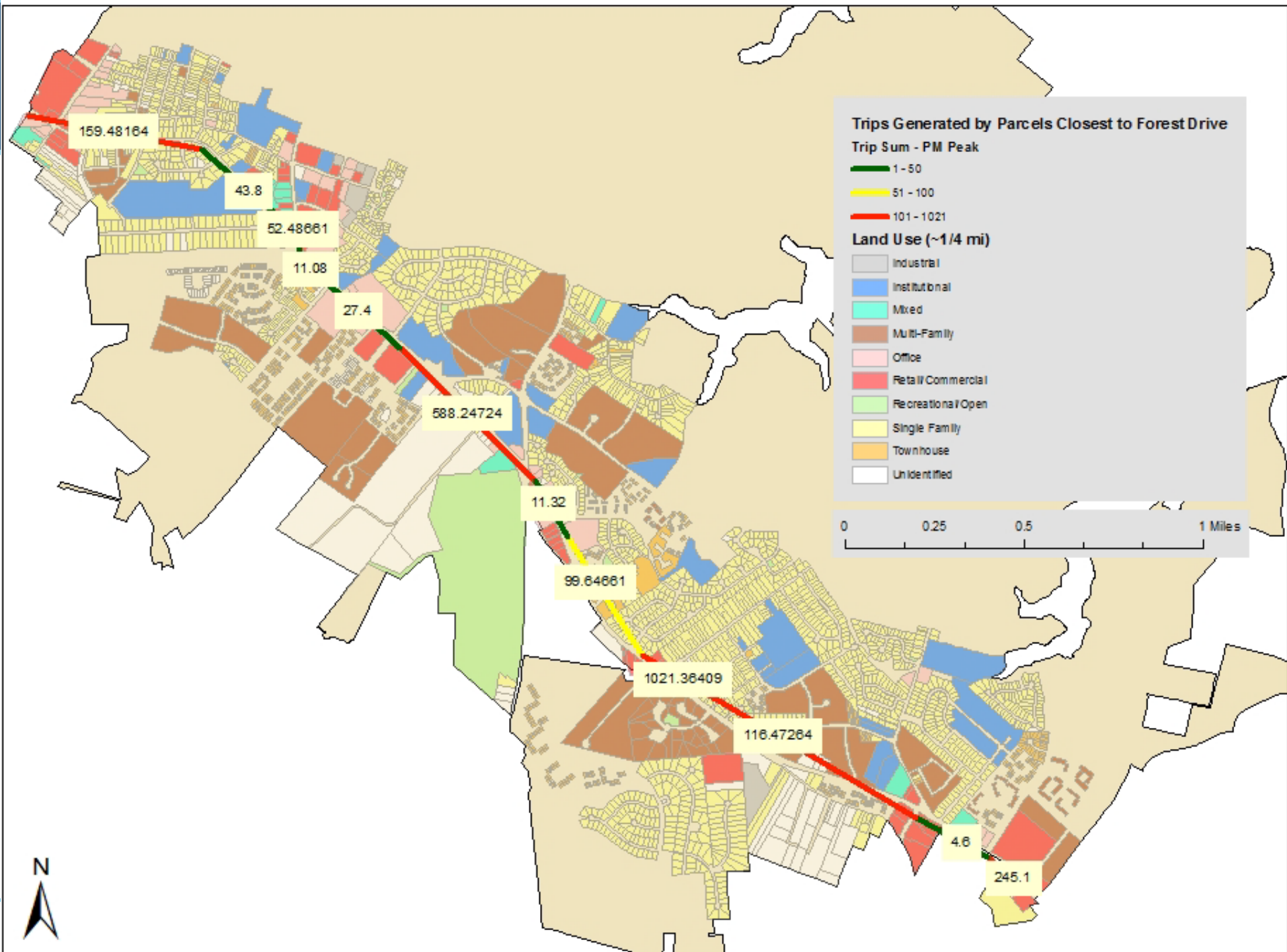
- 1 - 50
- 51 - 100
- 101 - 1021



Source:
ITE-based
calculation;
MSTM
network

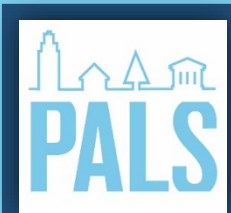


Source:
ITE-based
calculation;
MSTM
network



Source:
ITE-based
calculation;
MSTM
network





Average Annual Daily Trips

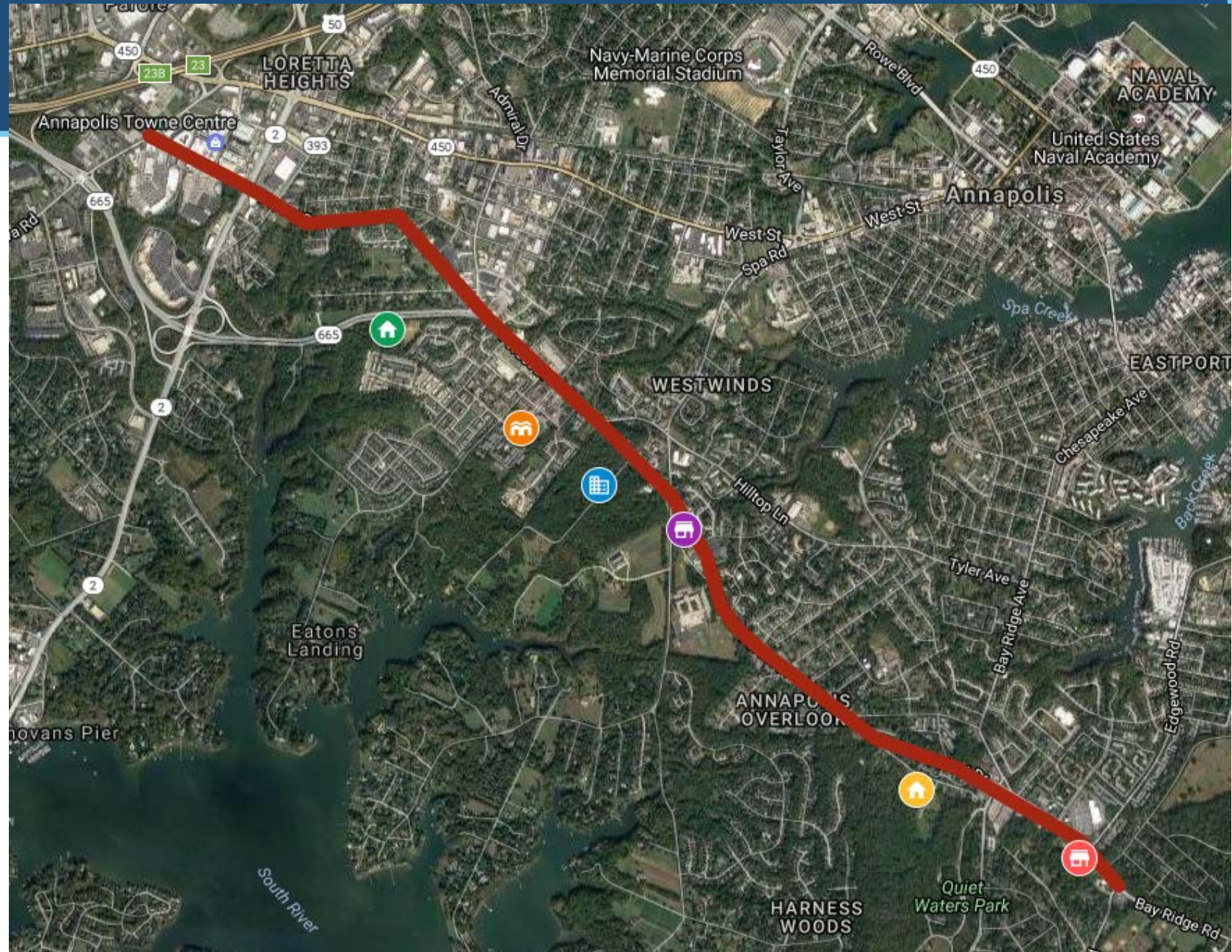
Route	Rd Name	Location Description	AADT 2007	AADT 2008	AADT 2009	AADT 2010	AADT 2011	AADT 2012	AADT 2013
MD 665	Forest Dr	Chiquapin Round Rd to Forest Dr	41,952	39,130	39,131	39,372	36,530	36,241	36,312

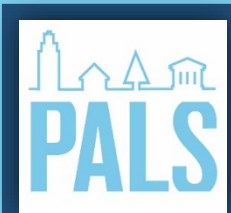
- Only dealing with a portion of the average daily trips
- Corridor use is not limited to the adjacent parcels
- Key question is how individual land use changes will impact these collective totals



Development Pipeline

-  Quiet Waters Preserve (SF/Towns)
-  Village Greens Townhomes
-  Rocky Gorge (SF/Towns)
-  Bay Village (retail/office)
-  1503 Forest Drive (office/retail)
-  Crystal Springs (mixed)

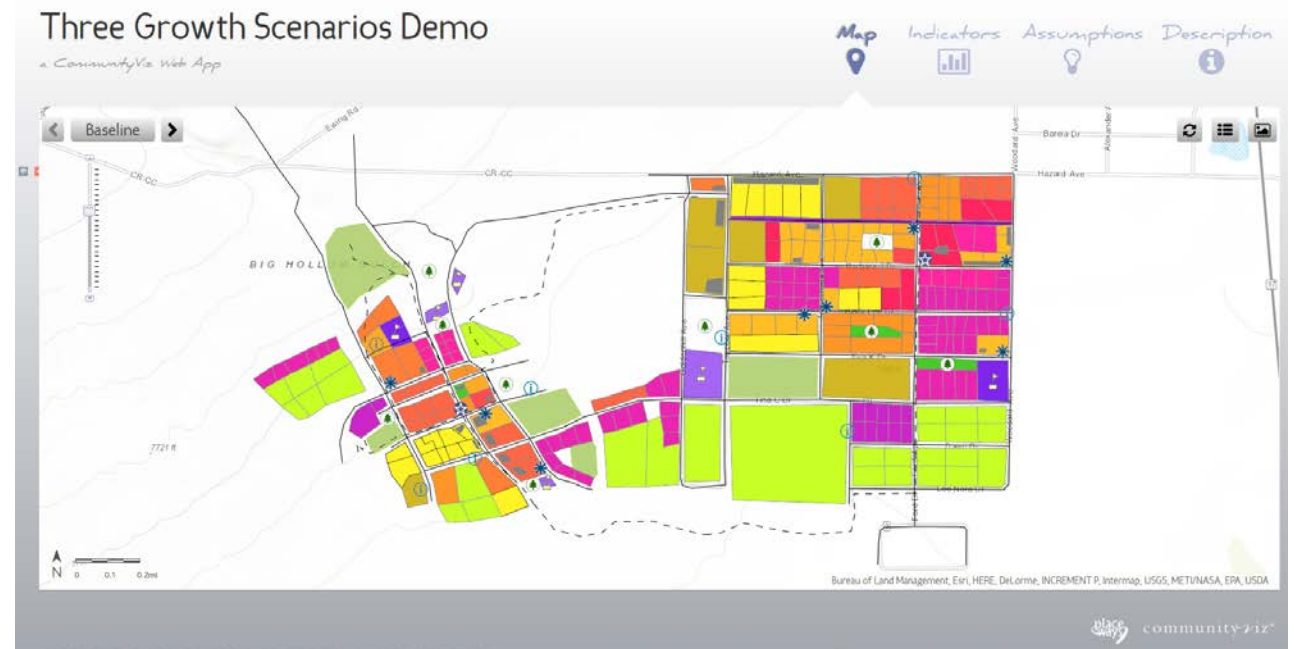


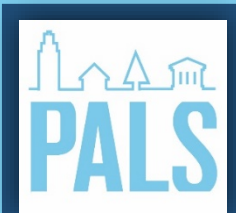


Estimated Future Peak Trips Generated

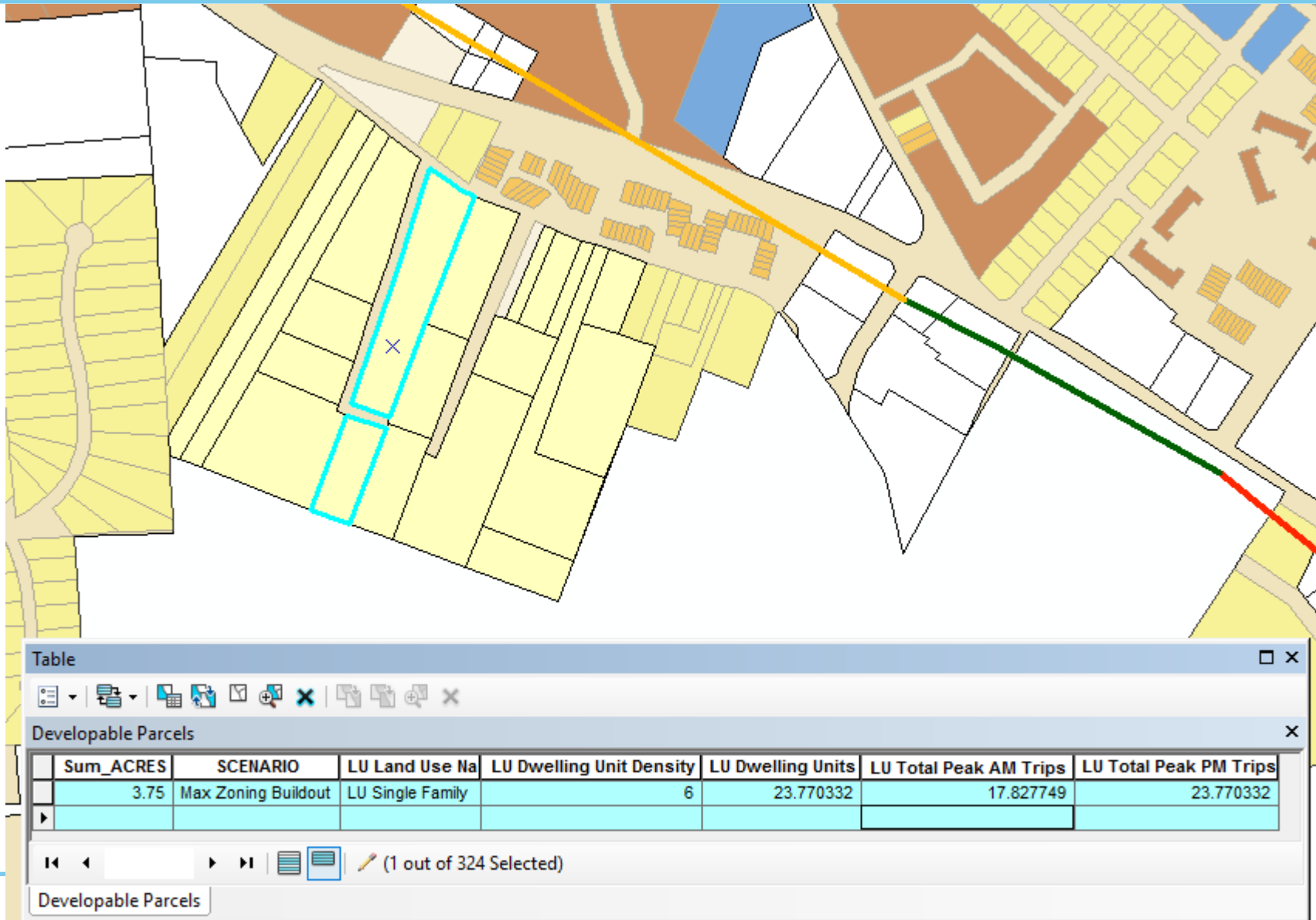
Development Name	Use	Size	AM Peak Trips	PM Peak Trips
Crystal Springs	Mixed – Multi-Family	326 units	166.26	202.12
Crystal Springs	Mixed – Townhomes	113 units	49.72	58.76
Crystal Springs	Mixed – Retail	141,000 SF	135.36	523.11
Village Greens	Townhomes	47 units (unbuilt)	20.68	24.44
Rocky Gorge	Townhomes	31 units	13.64	16.12
Rocky Gorge	Single-Family	17 units	12.75	17
Quiet Waters Preserve	Townhomes	72 units	31.68	37.44
Quiet Waters Preserve	Single-Family	86 units	64.5	86
Bay Village	Restaurant	8,400 SF	90.8	82.74
Bay Village	Office	11,000 SF	17.16	16.39
Bay Village	Grocery Store	19,650 SF	66.81	186.28
1503 Forest Drive	Office	22,680 SF	35.38	33.79
1503 Forest Drive	Retail	3,780 SF	25.86	10.24
Total			731	1294

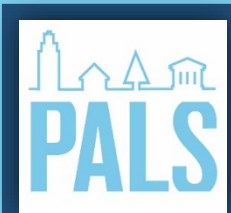
- Tools to envision alternatives and understand their potential impacts;
- ...explore options and share possible outcomes with stakeholders;
- ...examine scenarios from all angles - and feel confident that you've made the best possible decisions.





Tasks Ahead – Projecting Traffic





Limitations and Further Research

- ITE land use category mismatches
- Split zoning
- Through-trip considerations

Q&A