



Land Use/Transportation Evaluation for the Forest Drive Corridor

Presented by

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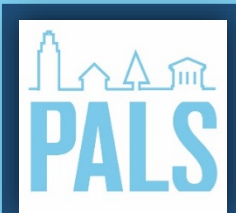




Objectives

- 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

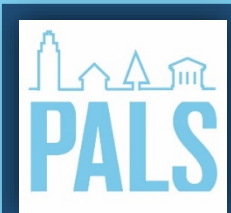




Alternatives

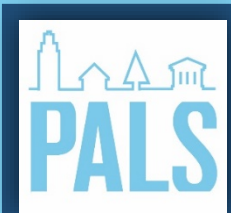
- Baseline scenario
- Zoning build-out
- Mixed use rezoning





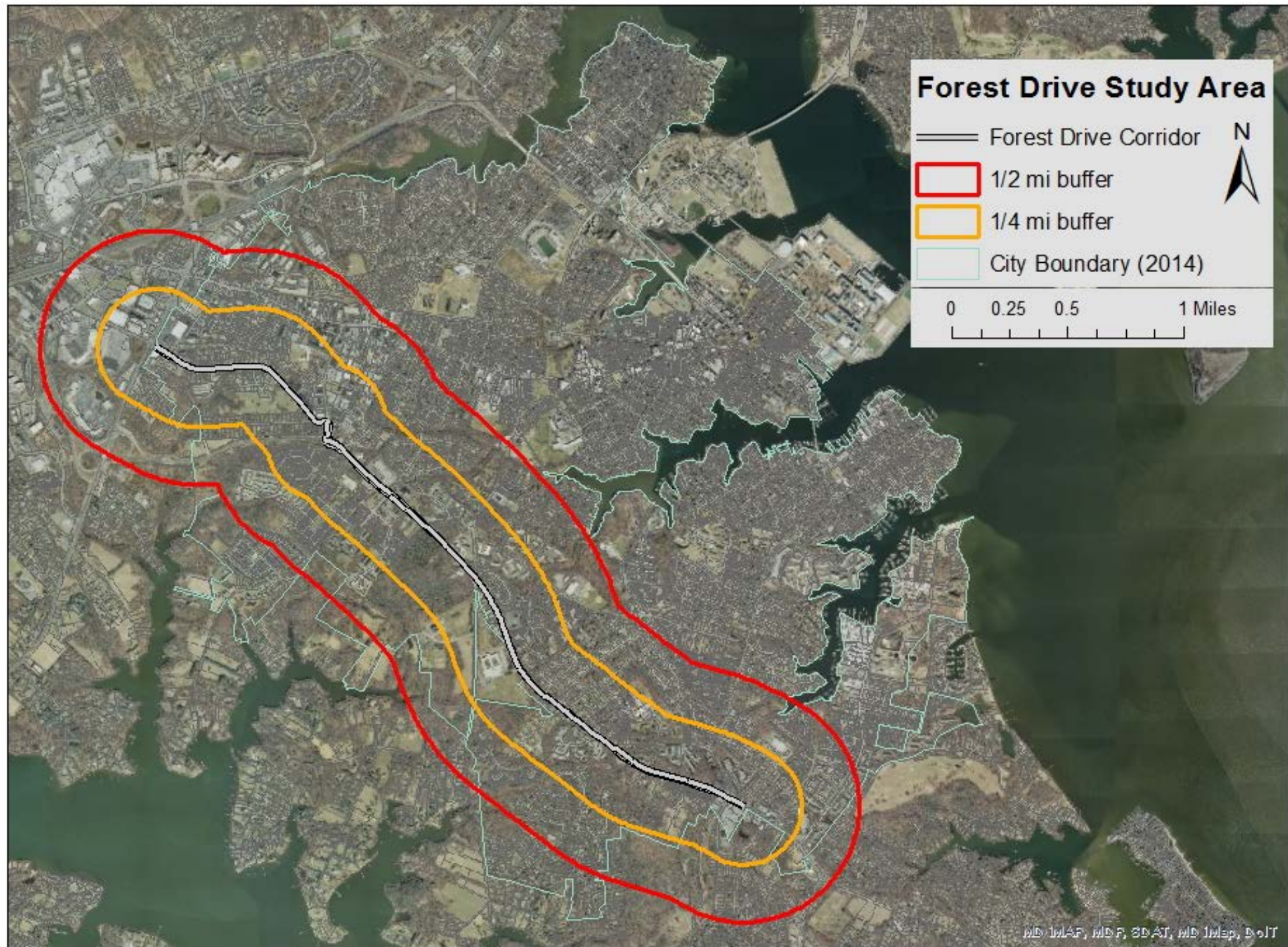
Data Sources

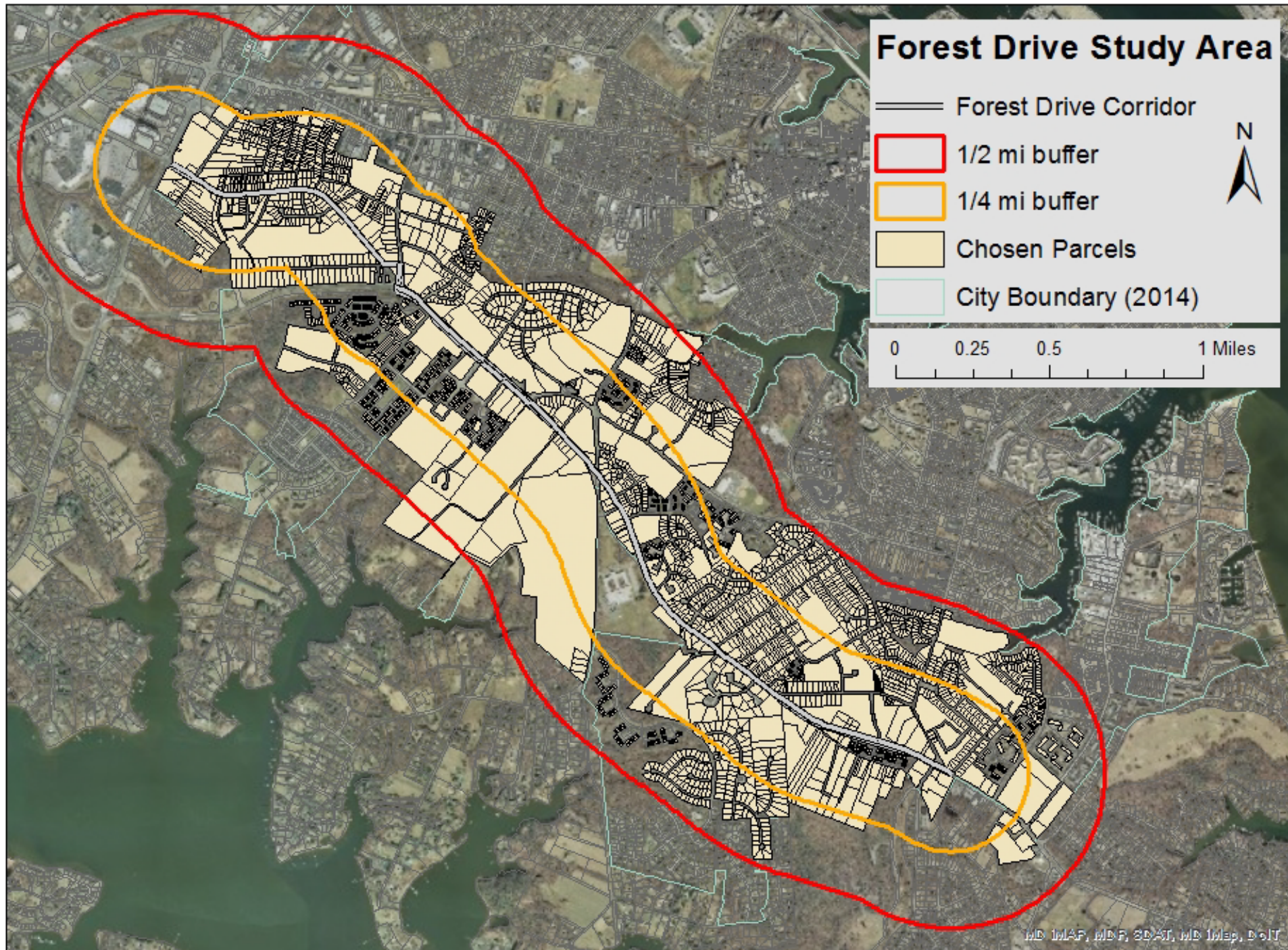
| Source | Datasets |
|--|--|
| Baltimore Metropolitan Council (BMC) | Average weekday daily raw simulated traffic volume, TAZ structure |
| Maryland Department of Planning (MDP) | Aerial imagery shapefiles |
| Institute of Transportation Engineers (ITE) | Trip generation rates Trip Generation Manual, 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 |

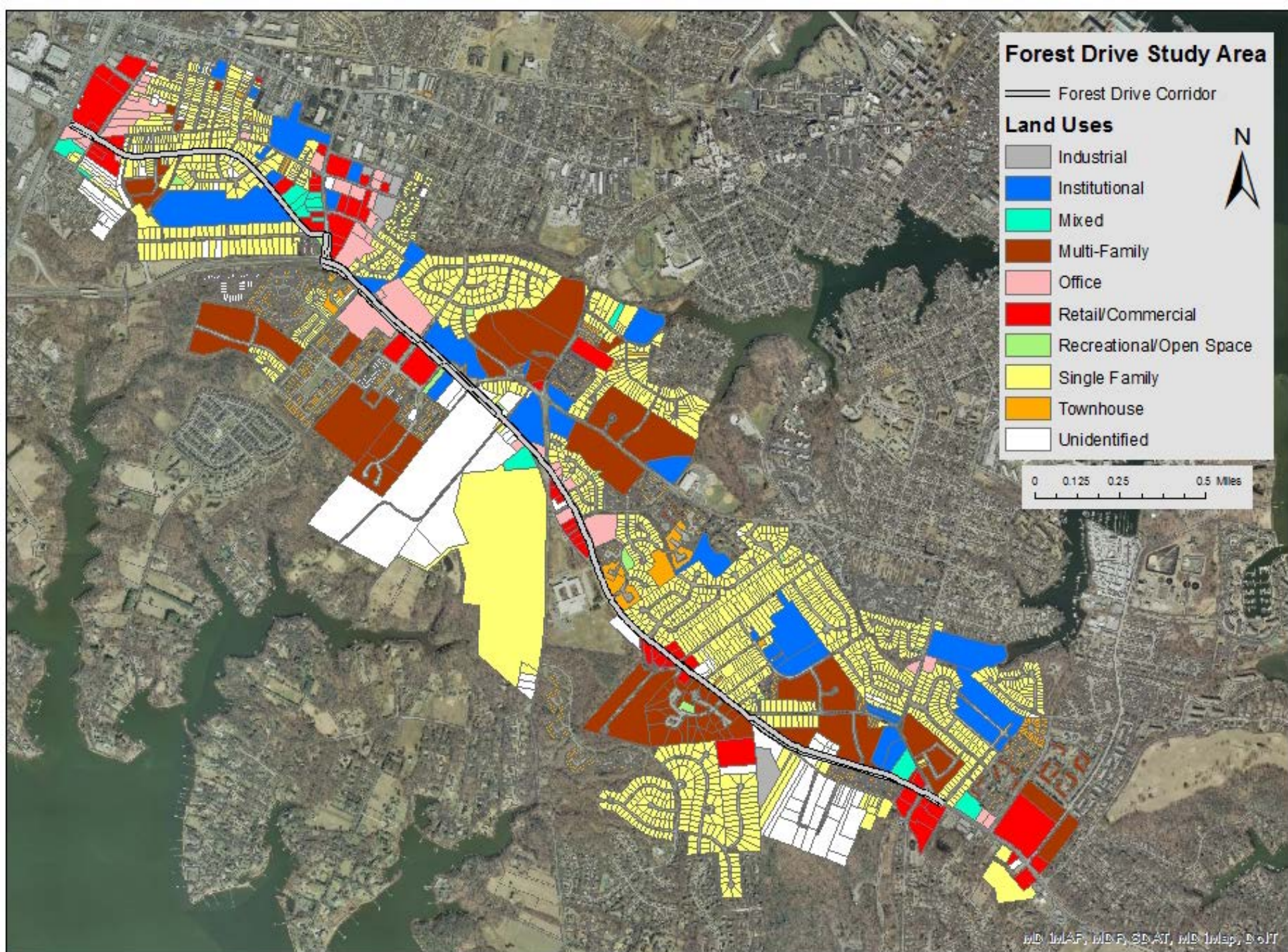


Methodology and Process

- 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

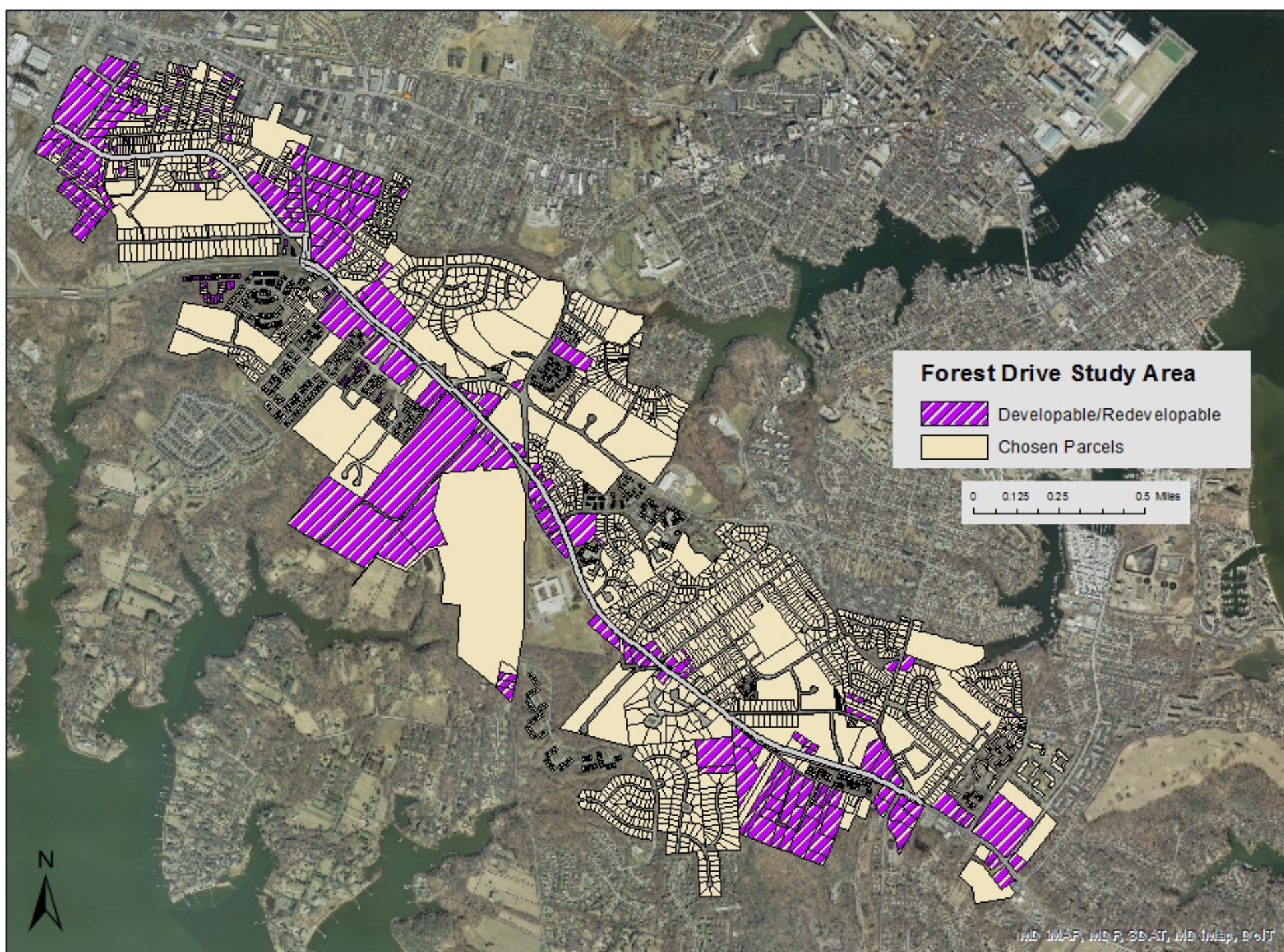
Criteria

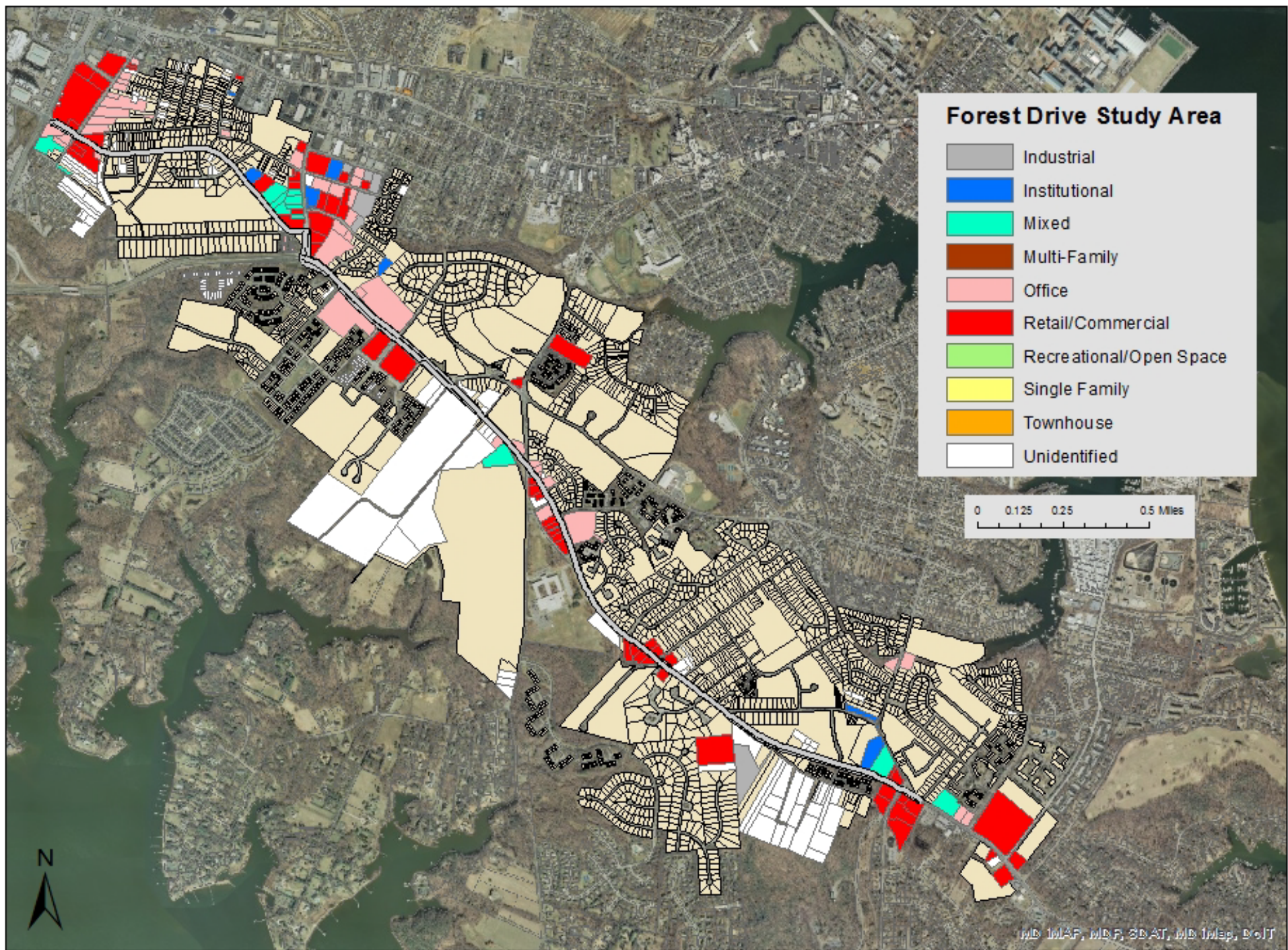
- Residentially zoned parcels with no land improvement value
- Commercial, industrial, mixed, or institutional parcels (all undeveloped and some developed)

Prioritization for projecting land use changes

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

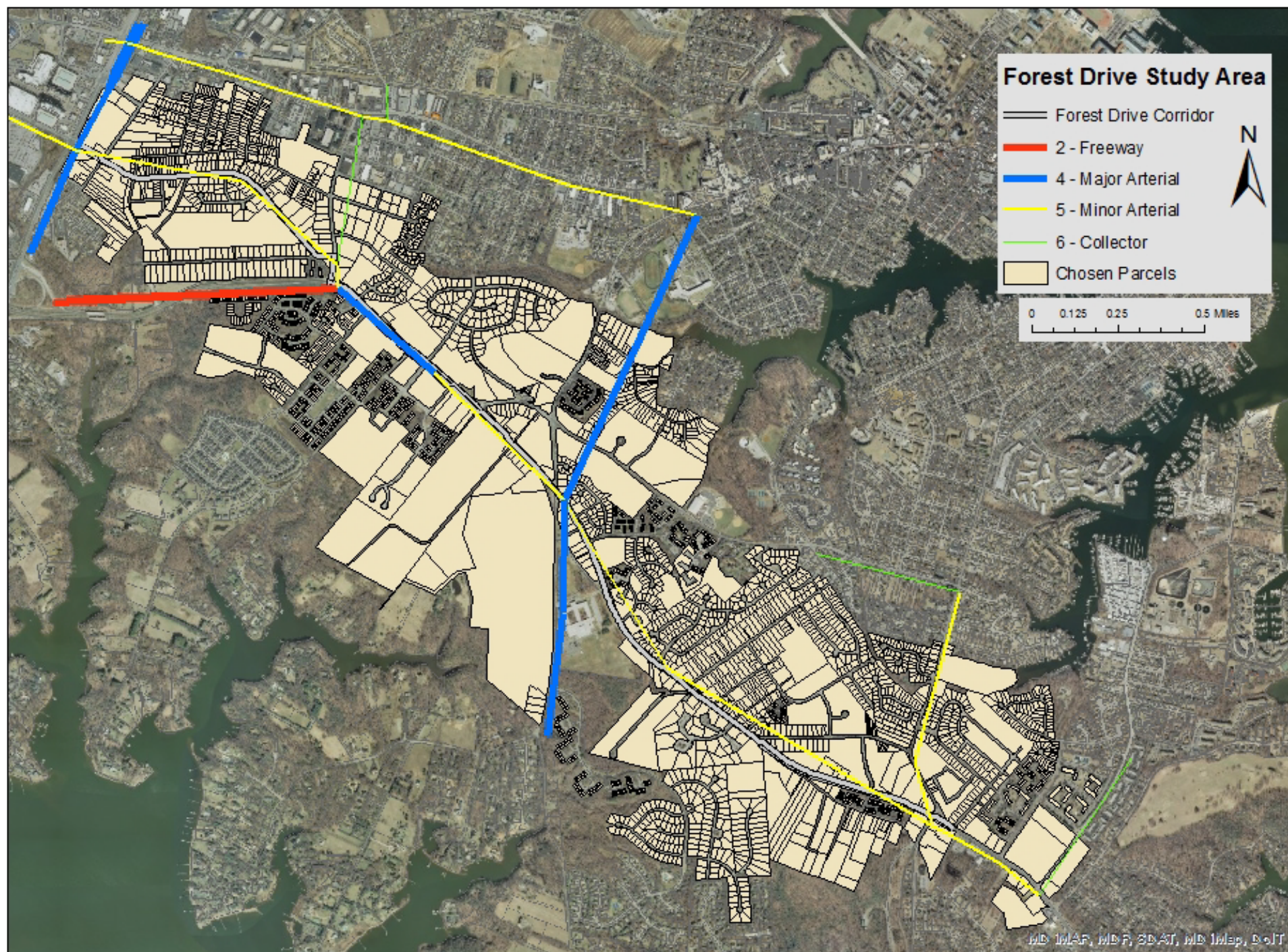




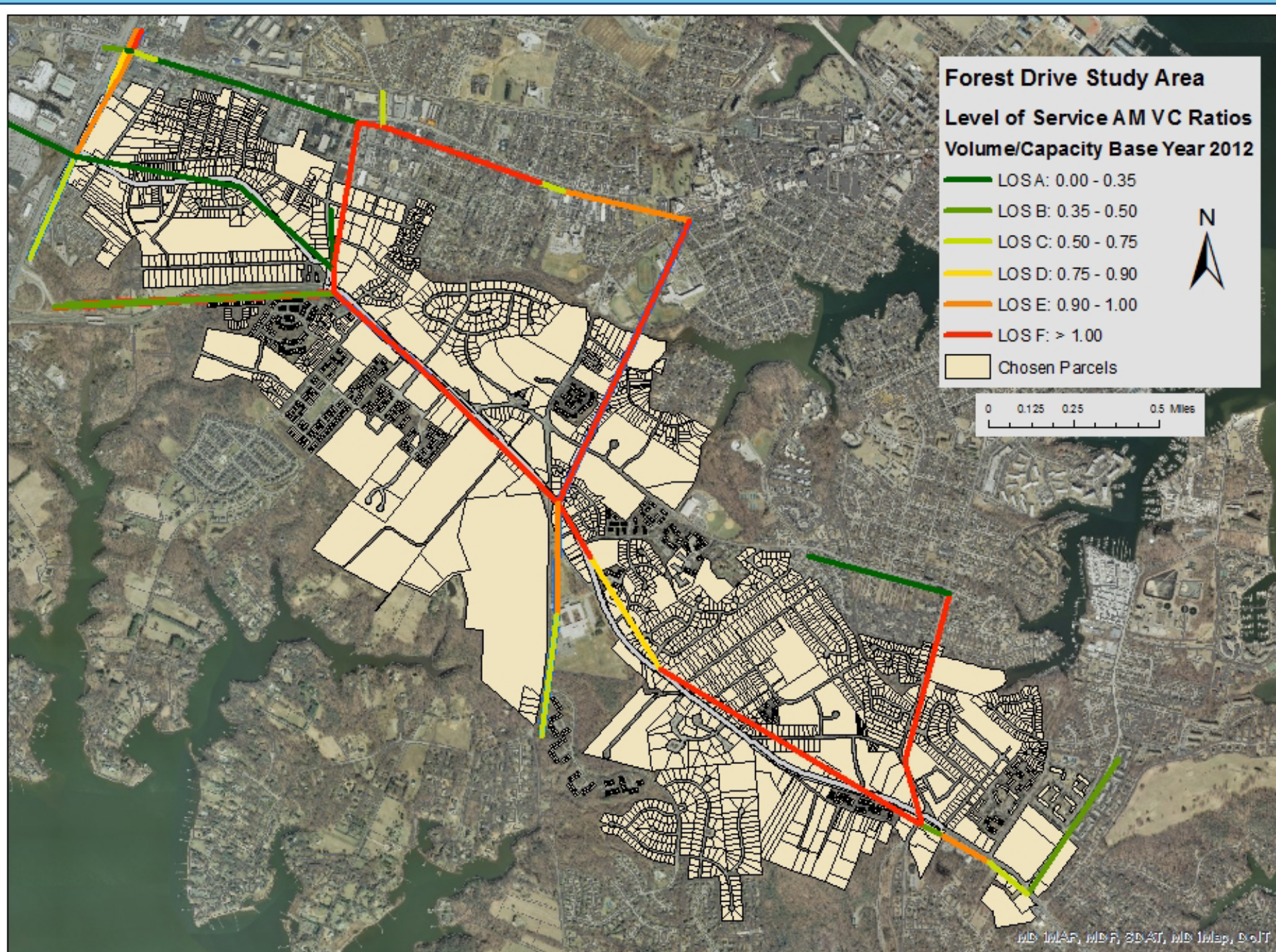


Current land uses on parcels suitable for future re/development

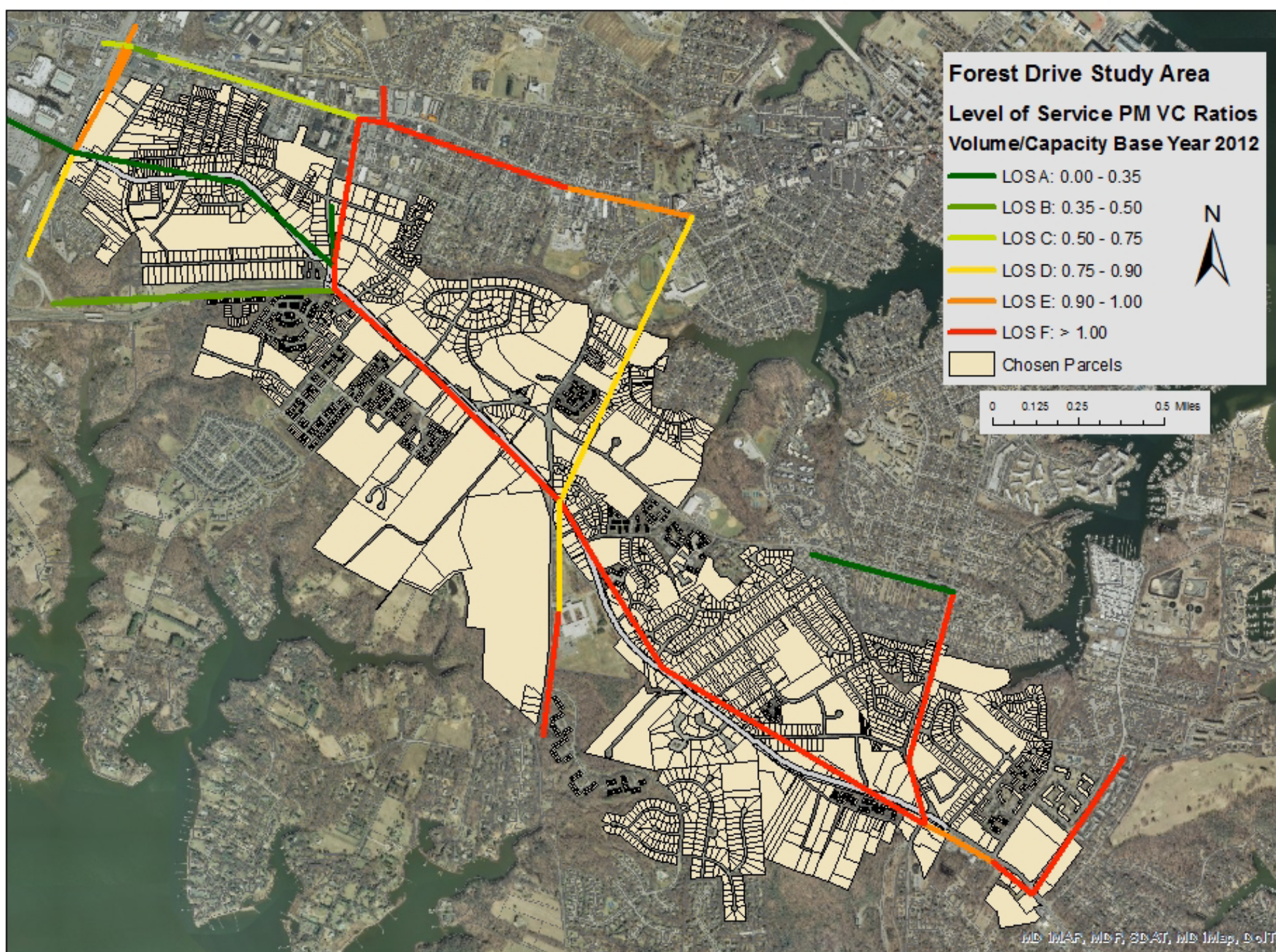
Sources:
UMD land use database, SDAT, Google Maps, site visit



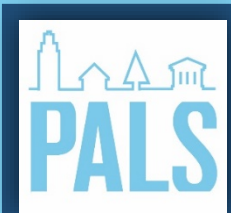
Source:
MSTM
2012



Source:
MSTM
2012



Source:
MSTM
2012



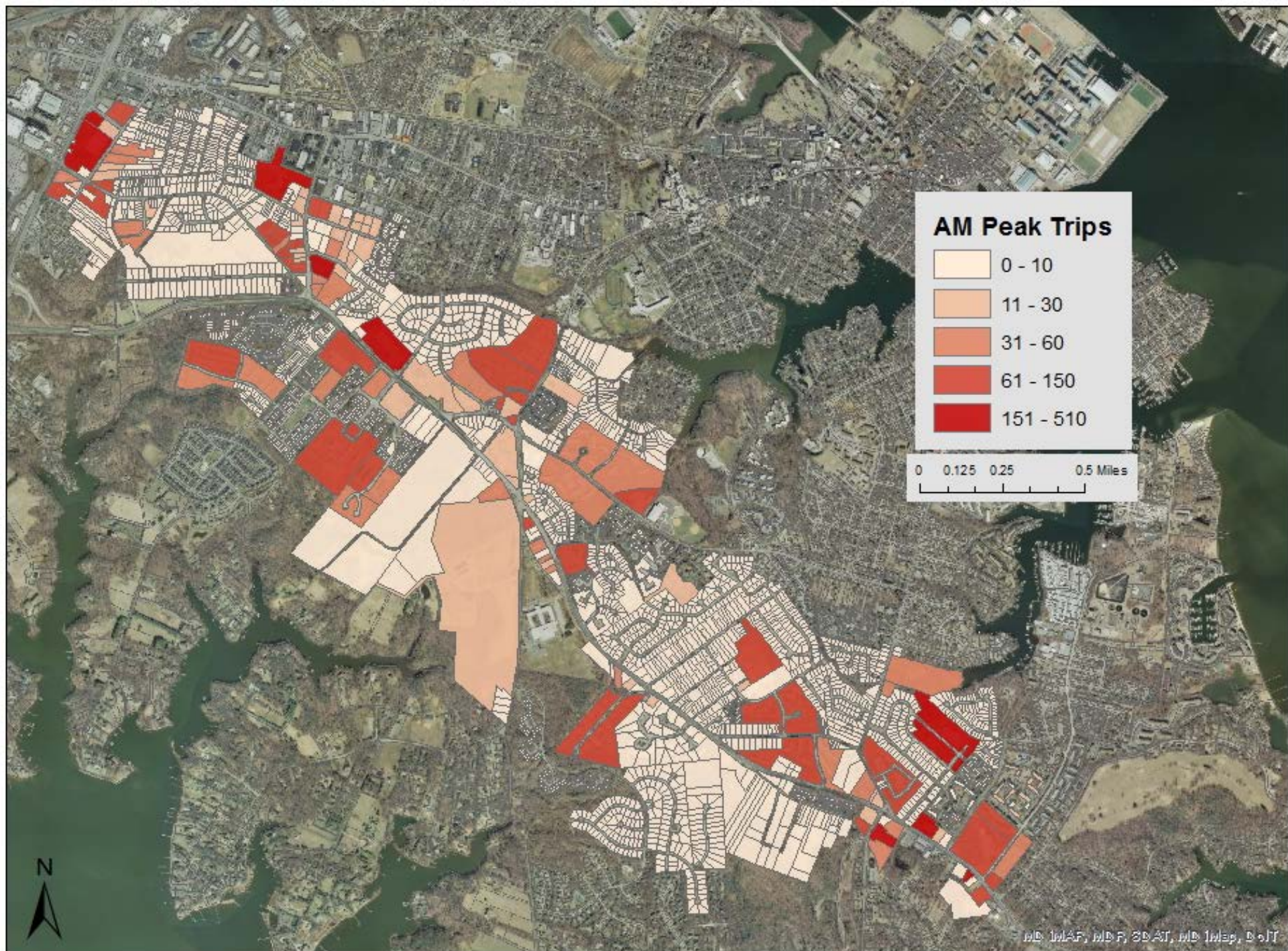
Trip Generation Rates

| 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 | |

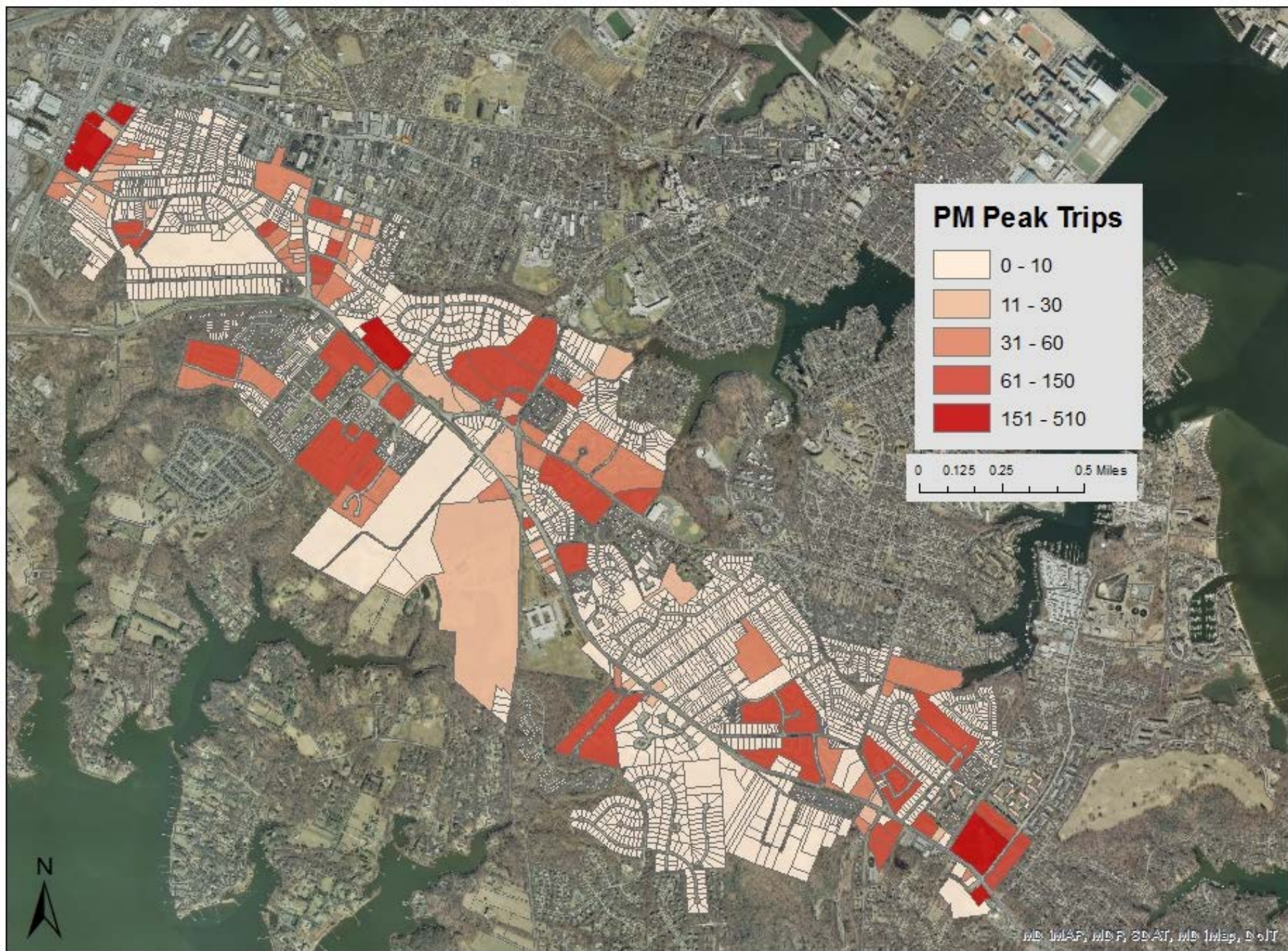
| Use | AM Peak Trip Rate | PM Peak Trip Rate | Vs. |
|----------------------------------|-------------------|-------------------|---|
| Building Materials Store | 2.6 | 4.49 | Trip generation per 1,000 SF gross floor area, weekdays |
| Hardware/Paint Store | 1.08 | 4.84 | |
| Nursery (Garden Center) | 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 | |

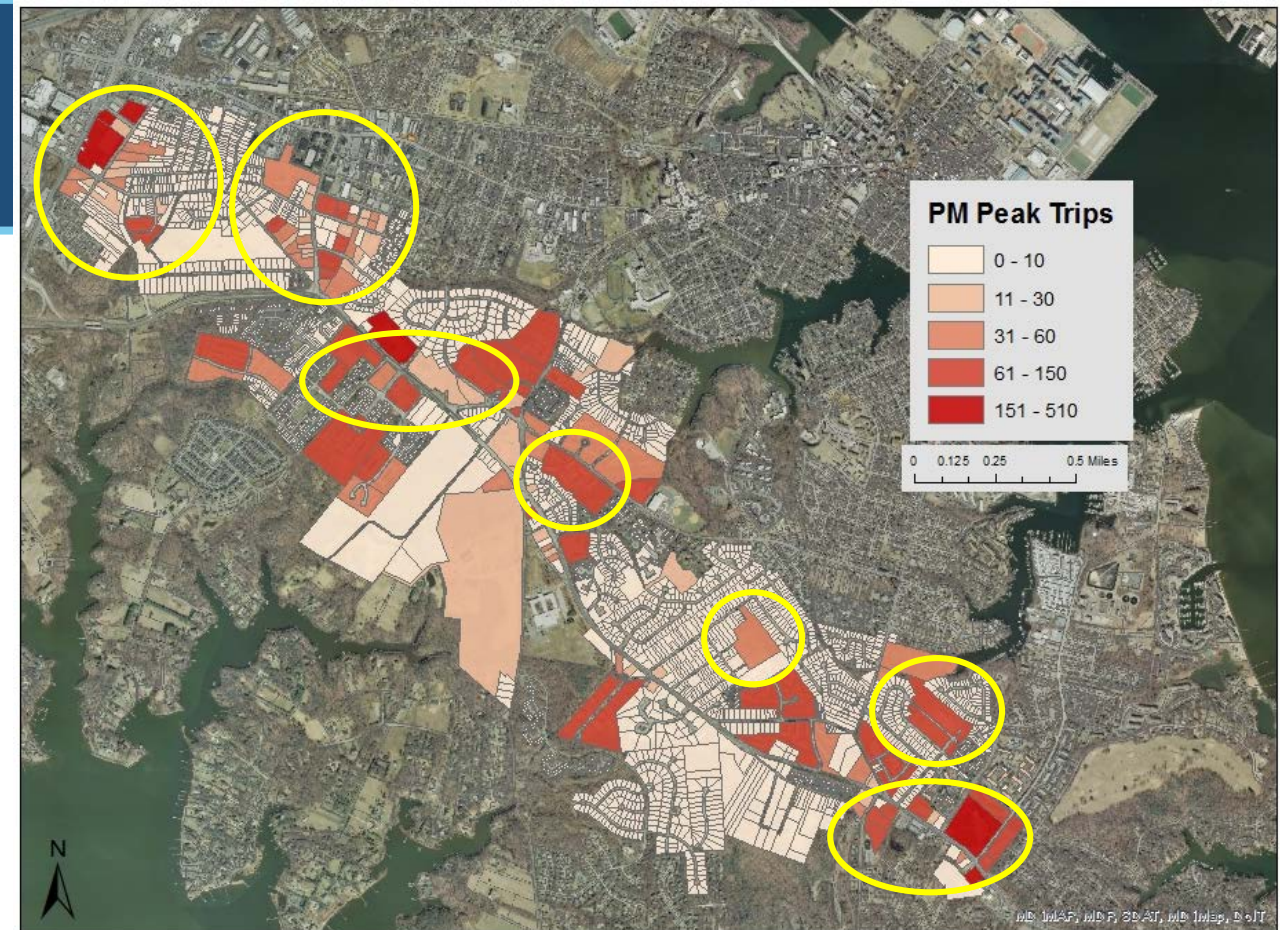
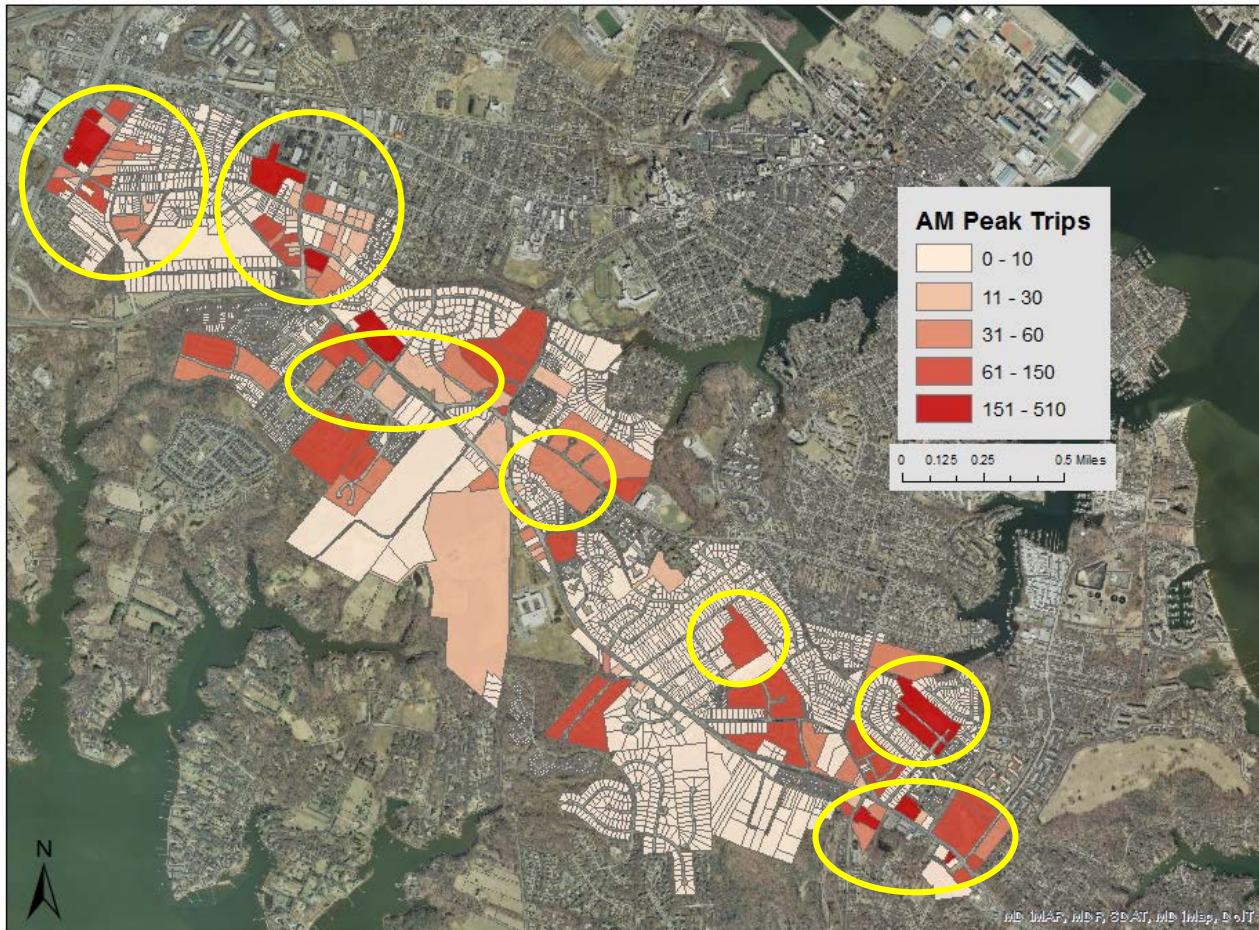
Source: ITE Trip Generation Manual, 9th Edition, Vol. 2-3



Source:
ITE-based
calculation

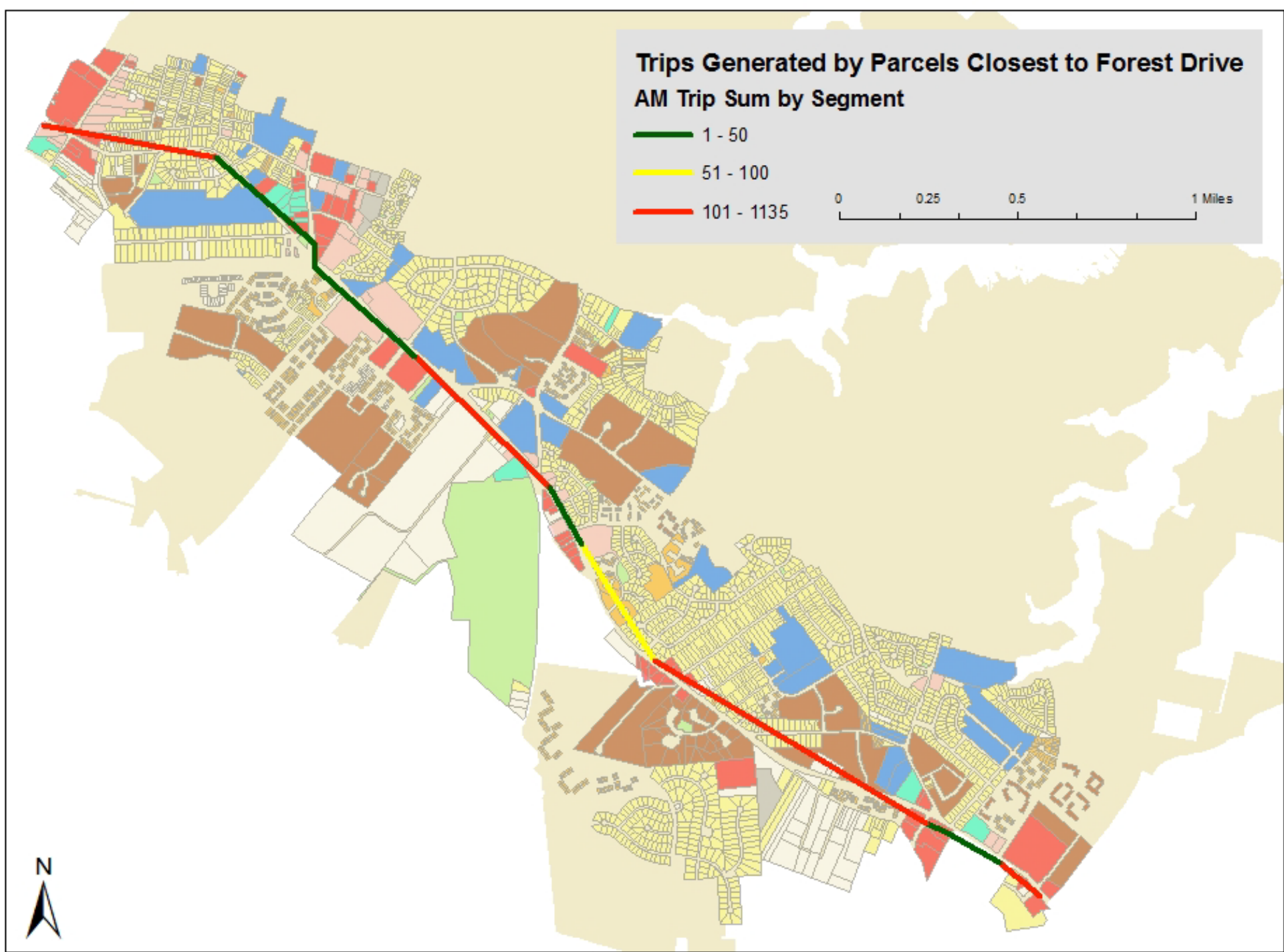


Source:
ITE-based
calculation



- Elementary schools
- Mixed use areas with offices

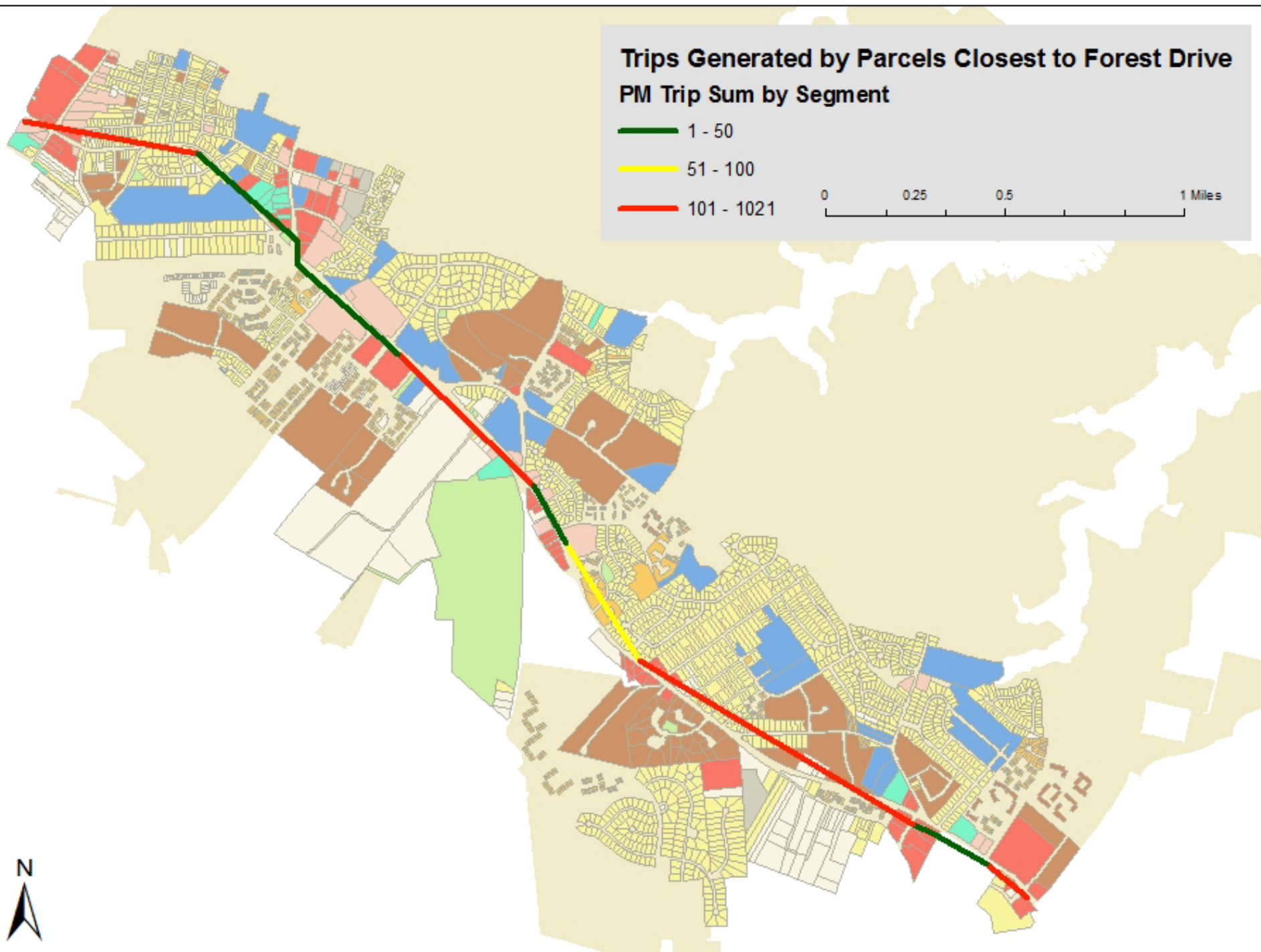
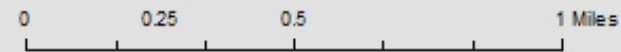
- Retail areas
- Apartments



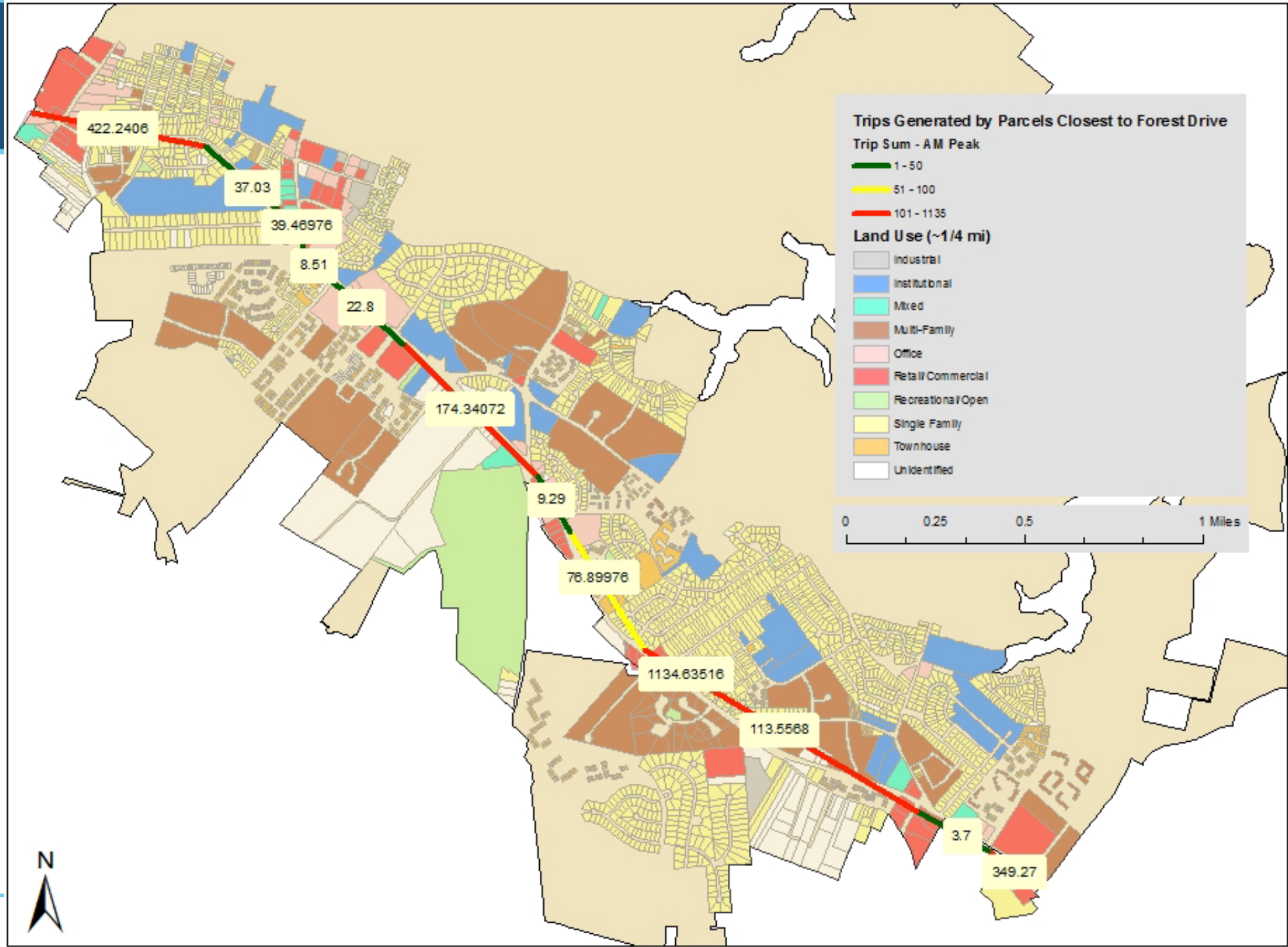
Source:
ITE-based
calculation;
MSTM
network

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

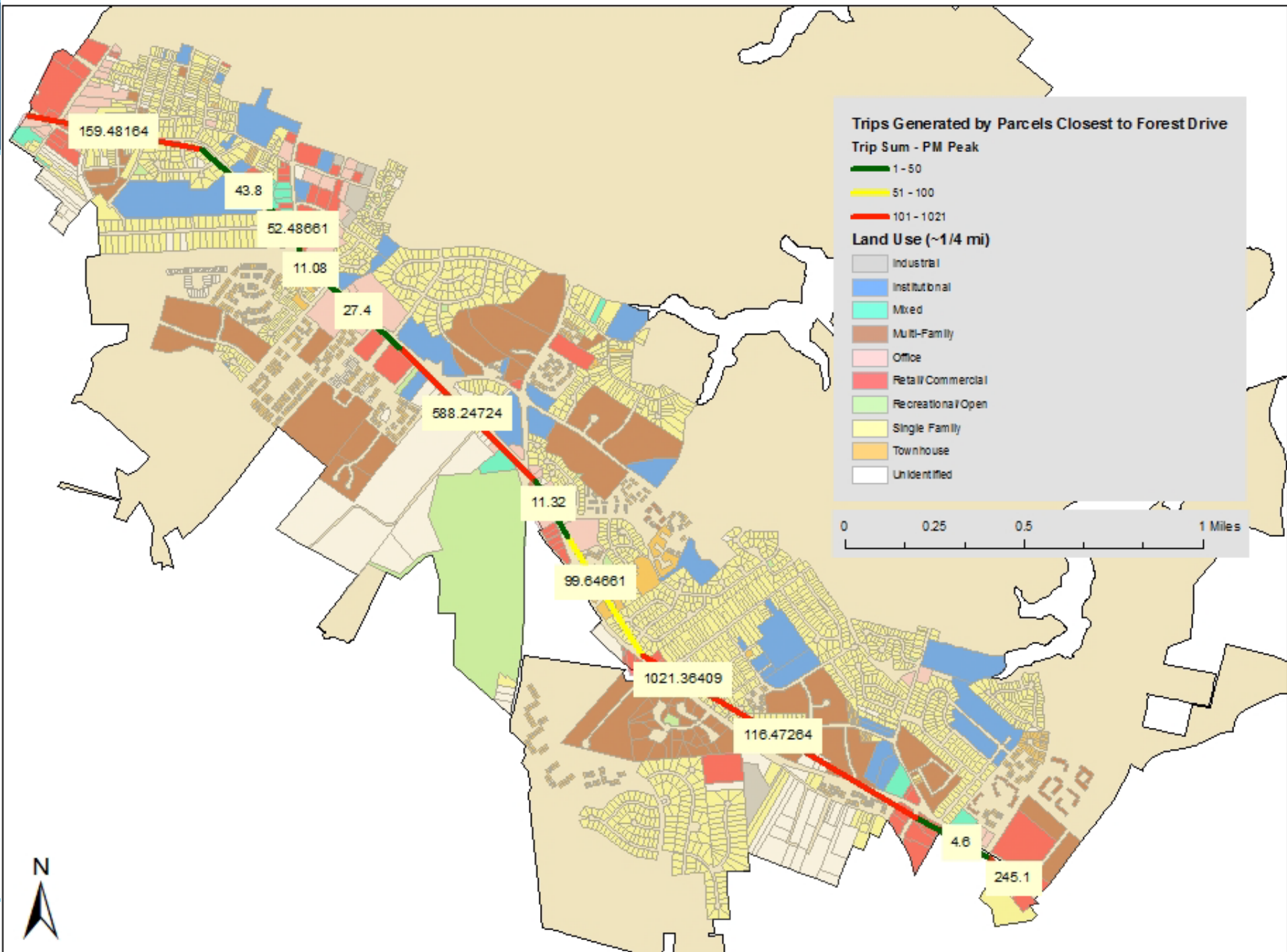
- 1 - 50
- 51 - 100
- 101 - 1021



Source:
ITE-based
calculation;
MSTM
network

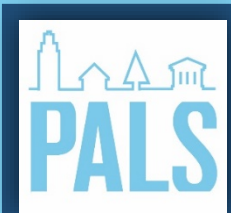


Source:
ITE-based
calculation;
MSTM
network



Source:
ITE-based
calculation;
MSTM
network





Average Annual Daily Trips

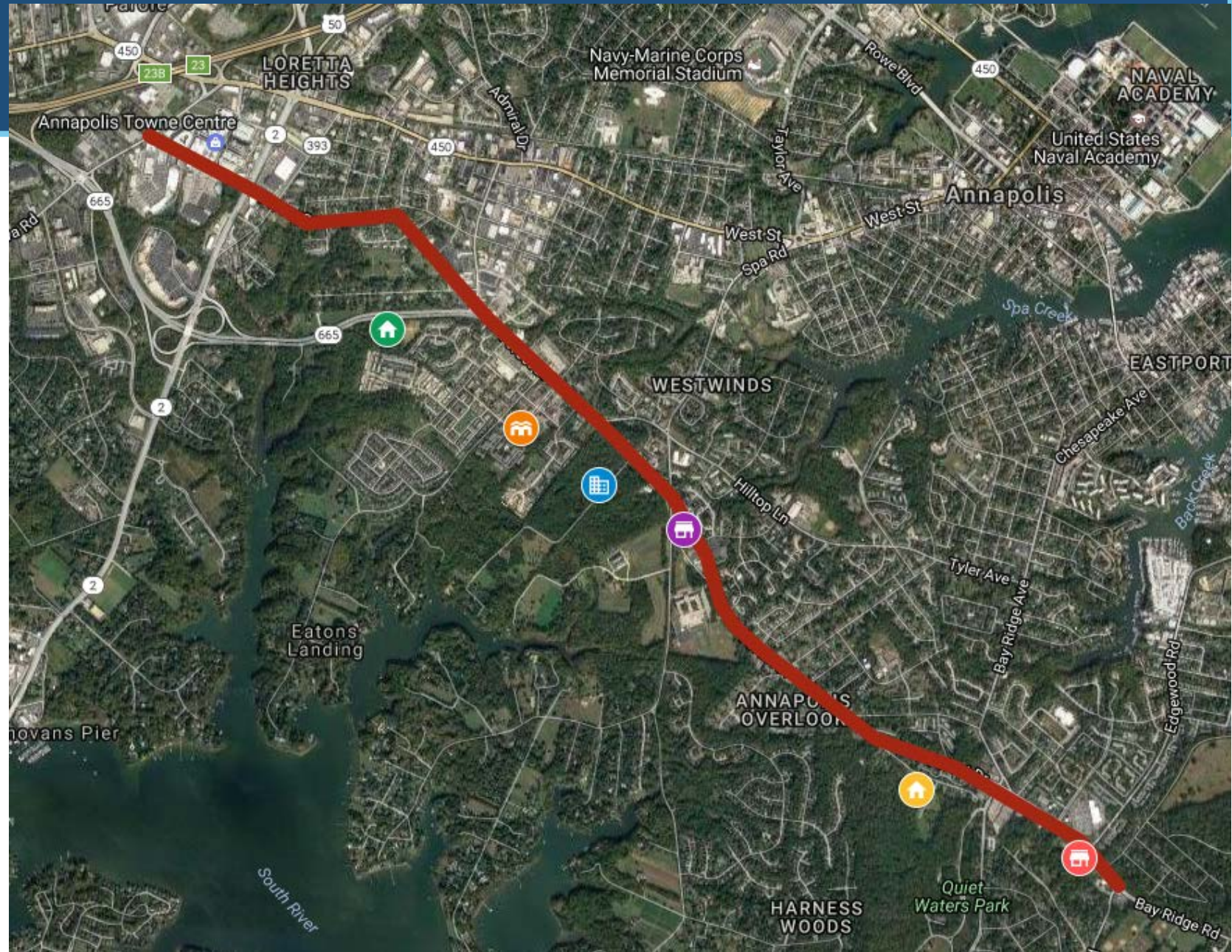
| Route | Rd Name | Location Description | AADT 2007 | AADT 2008 | AADT 2009 | AADT 2010 | AADT 2011 | AADT 2012 | AADT 2013 |
|--------|-----------|---------------------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| MD 665 | Forest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

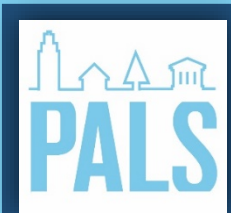
- Only dealing with a portion of the average daily trips
- Corridor use is not limited to the adjacent parcels
- Key question is how individual land use changes will impact these collective totals



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)

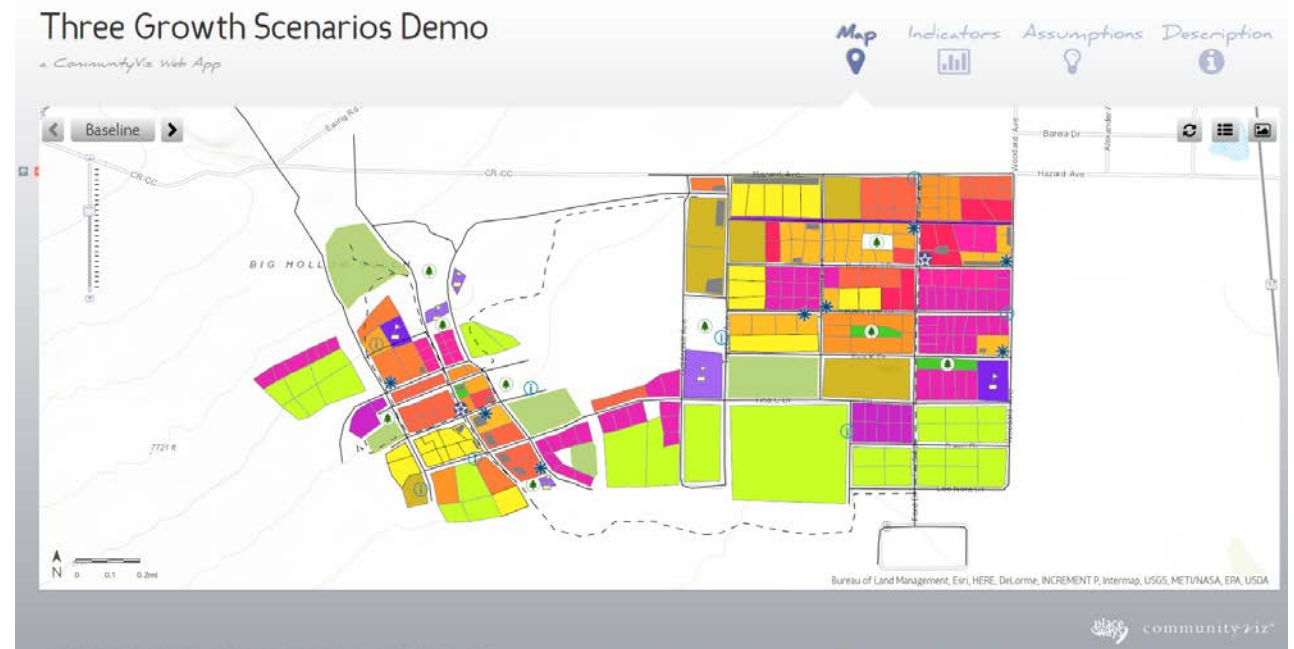


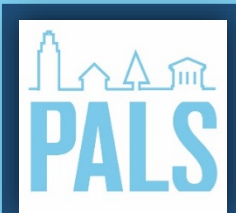


Estimated Future Peak Trips Generated

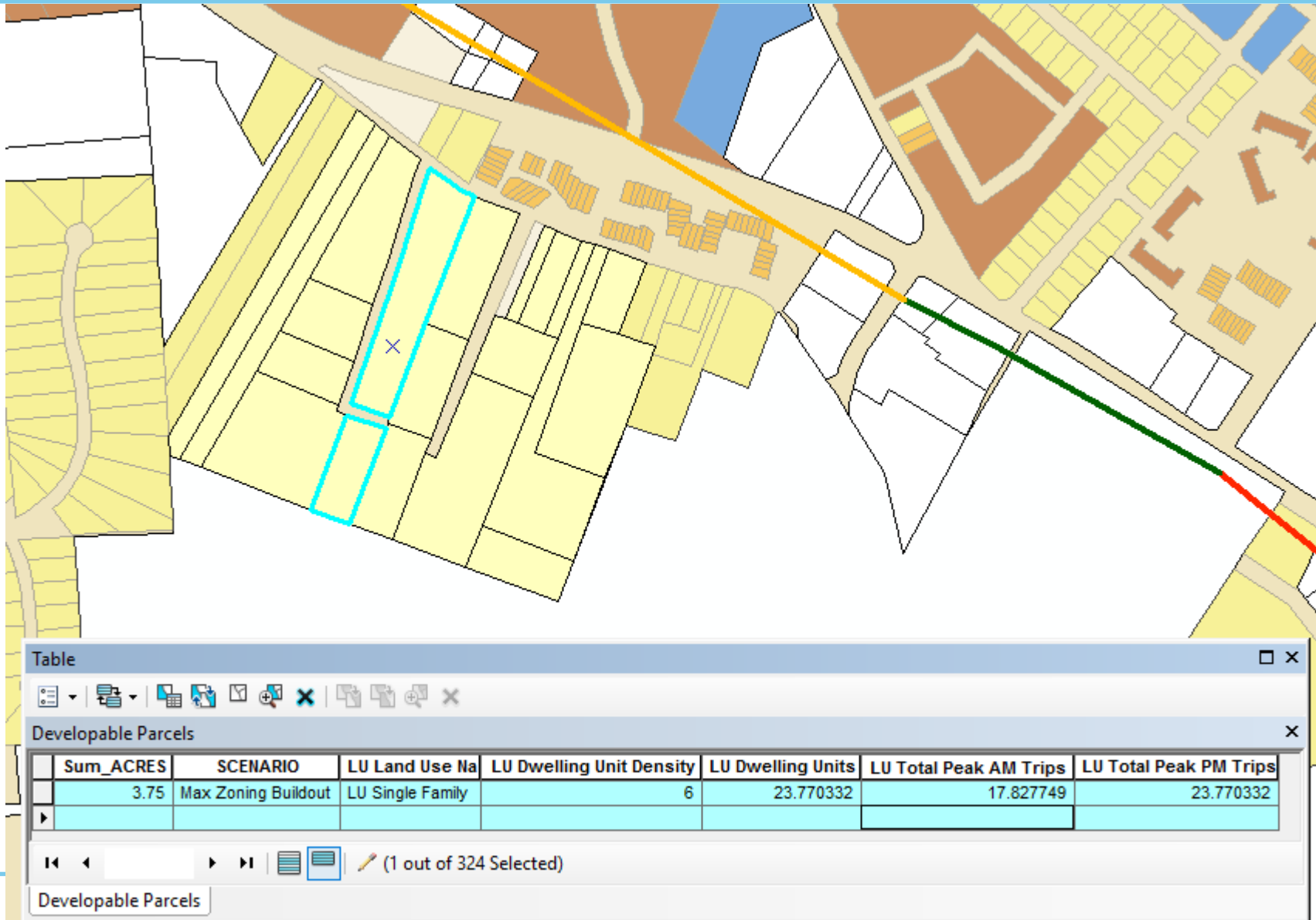
| Development Name | Use | Size | AM Peak Trips | PM Peak Trips |
|-----------------------|----------------------|--------------------|---------------|---------------|
| Crystal Springs | Mixed – Multi-Family | 326 units | 166.26 | 202.12 |
| Crystal Springs | Mixed – Townhomes | 113 units | 49.72 | 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 |

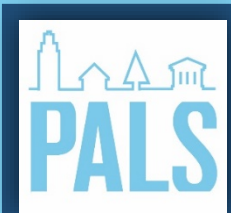
- Tools to envision alternatives and understand their potential impacts;
- ...explore options and share possible outcomes with stakeholders;
- ...examine scenarios from all angles - and feel confident that you've made the best possible decisions.





Tasks Ahead – Projecting Traffic





Limitations and Further Research

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

Q&A