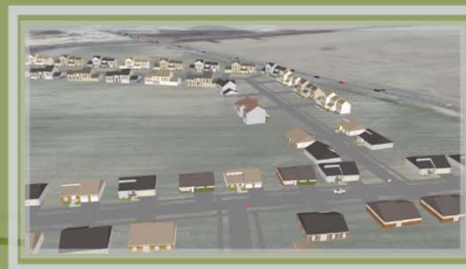
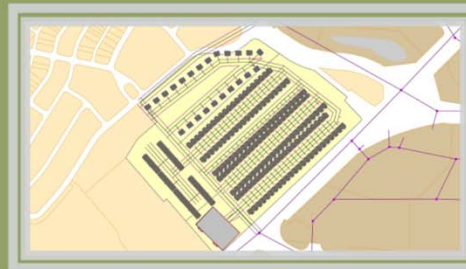


# *Land Use and Transportation Scenario Analysis and Microsimulation*



*14<sup>th</sup> TRB National Planning Applications Conference  
Columbus, OH  
2013*



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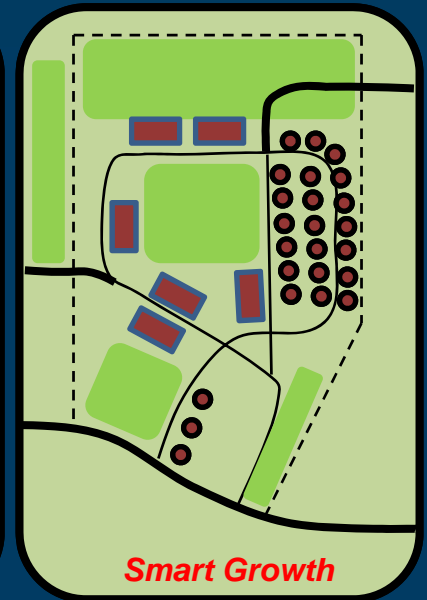
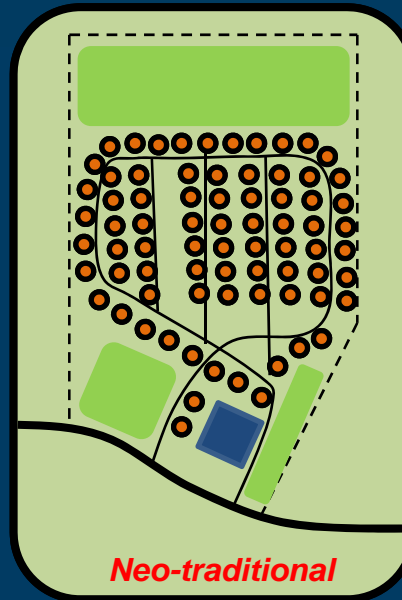
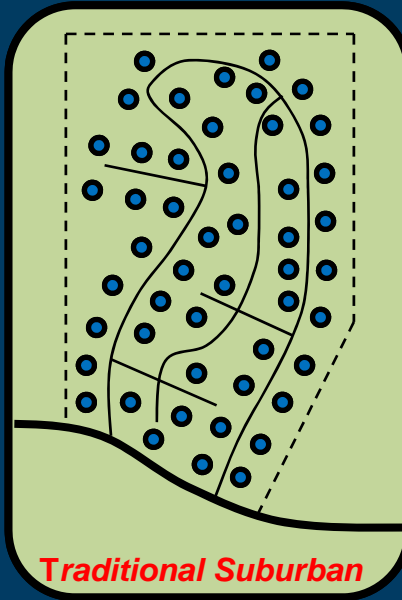
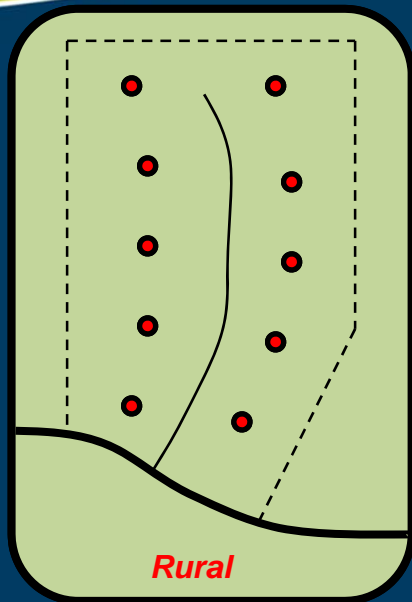
# *SMART TRANSPORTATION ANALYSIS*

## **Project Need:**

**How to quantify the benefits of Smart Transportation and Land Use Investments?**

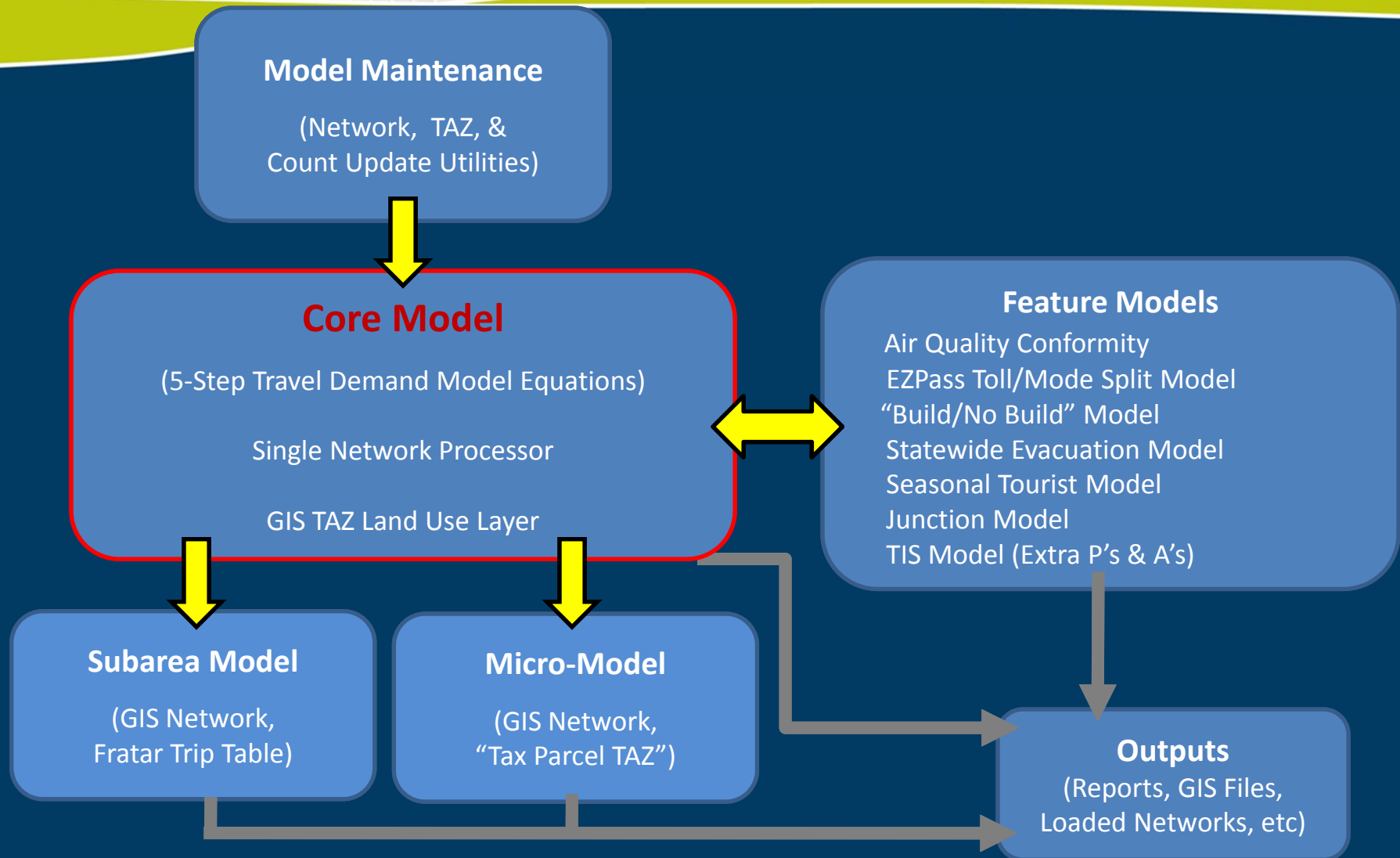
**Need a transferable process that will produce reasonable results statewide in a streamlined manner.**

# GOAL: EVALUATING MULTIPLE, DETAILED LAND USE AND INFRASTRUCTURE SCENARIOS



<b>Density</b>	1 Unit/Acre	4 Units/Acre	8 Units/Acre	15 Units/Acre
<b>Net Units</b>	10 Units	50 Units	75 Units	75 Units
<b>Transit</b>	None	None	Yes	Yes
<b>Sidewalks</b>	None	Partial	Complete	Complete
<b>Trails &amp; Bikepaths</b>	None	None	Partial	Complete
<b>Inter-connected</b>	None	30% Cul-de-Sac	Partial Grid	Highly Connected

# BACKGROUND: PENINSULA MODEL OVERVIEW



# BACKGROUND: DELDOT'S PENINSULA MODEL

## Two Levels of Resolution

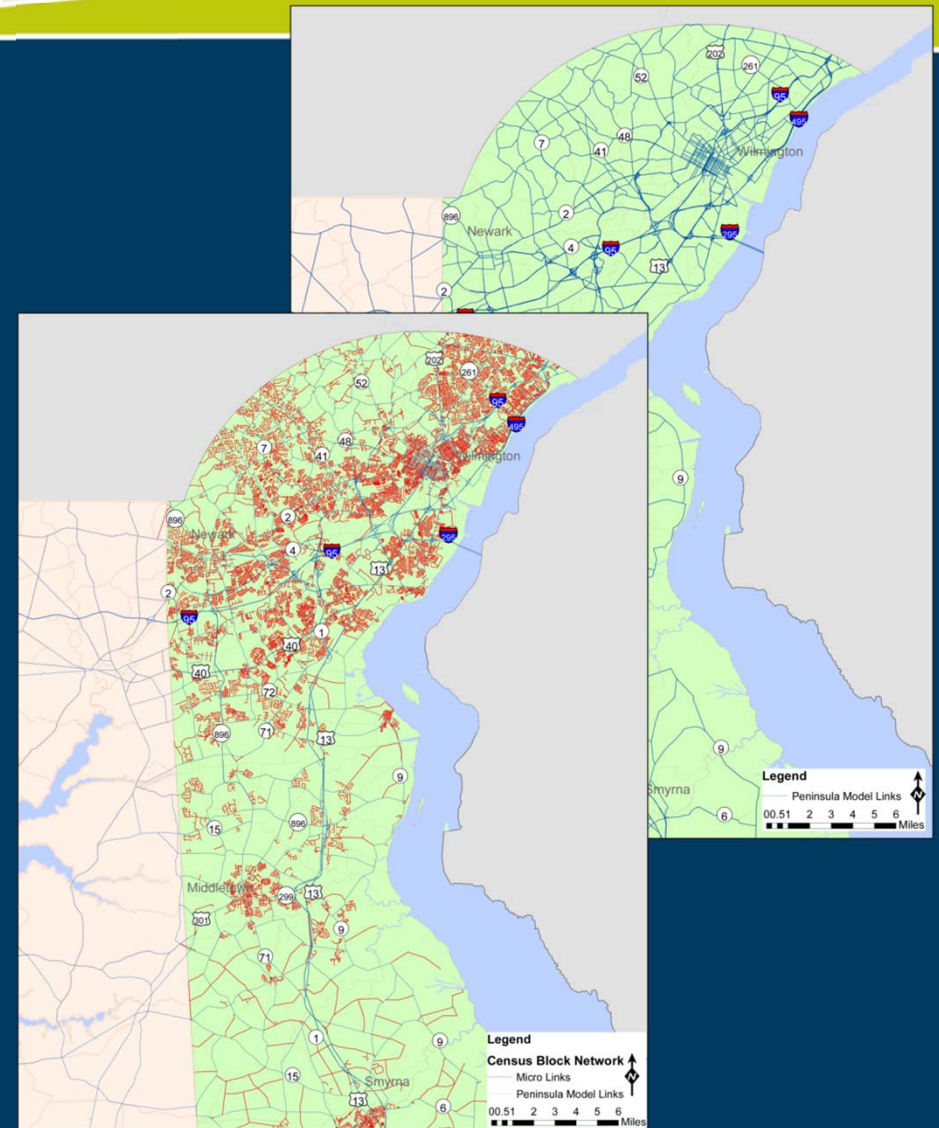
### Standard Resolution:


- 13,491 Links
- 2108 TAZs

### Enhanced Resolution:

- 177,211 Links
- 19,640 TAZs

Can be applied using windowing process in GIS for a hybrid setup





# LUTSAM

*(Land Use and Transportation  
Scenario Analysis and  
Microsimulation)*

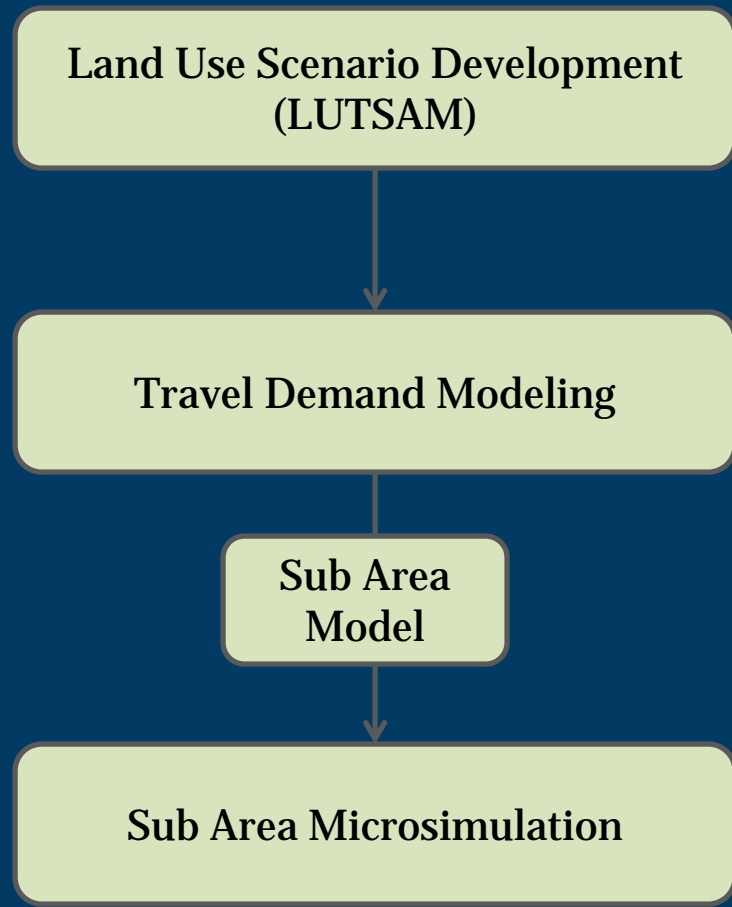


# WHAT IS LUTSAM?

LUTSAM is a modeling tool and process resulting from a collaboration between the Delaware Department of Transportation (DelDOT) and the State Smart Transportation Initiative (SSTI) at the University of Wisconsin – Madison.

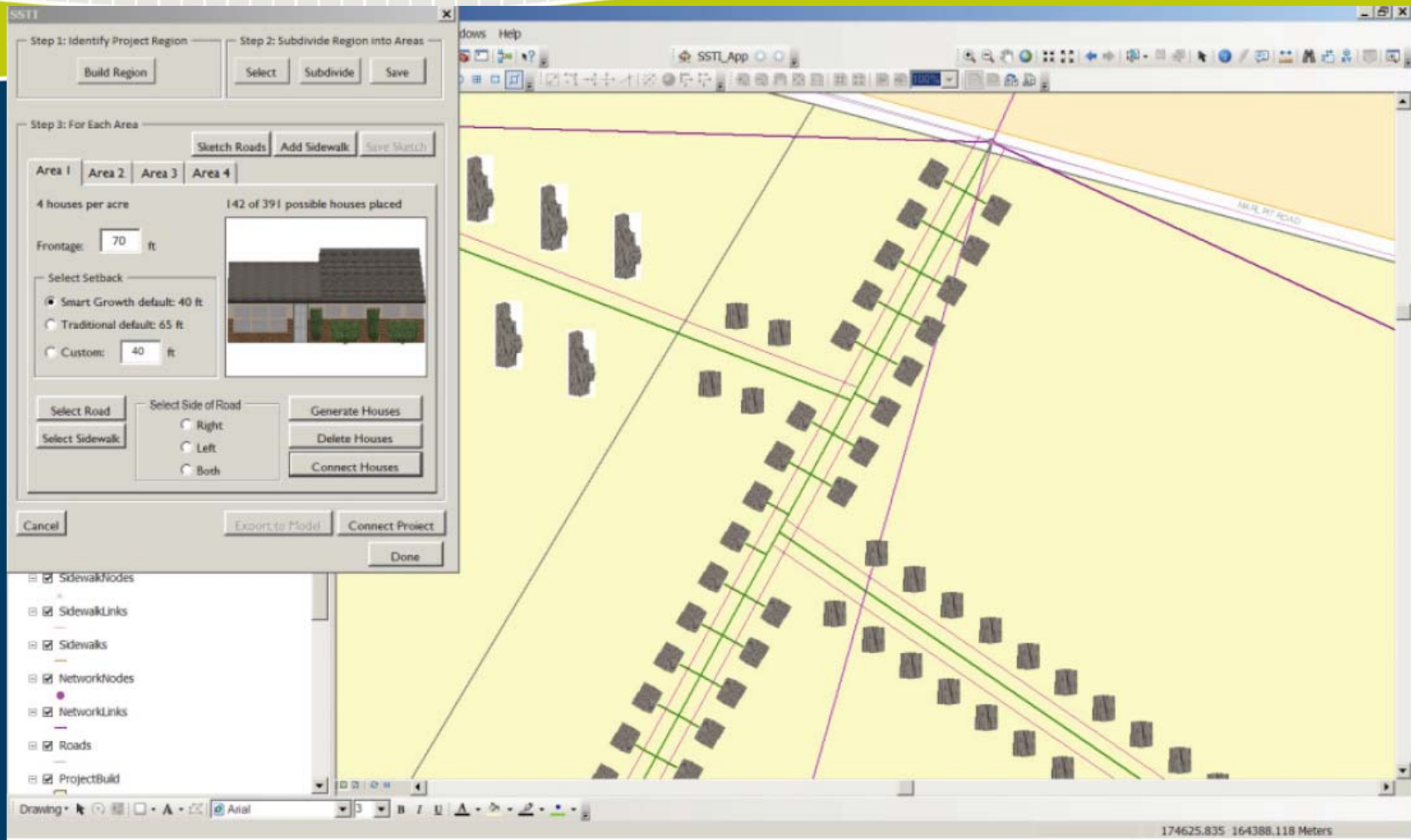
LUTSAM tests land use alternatives along with multi-modal investments, by integrating GIS, land use, travel demand and microsimulation.

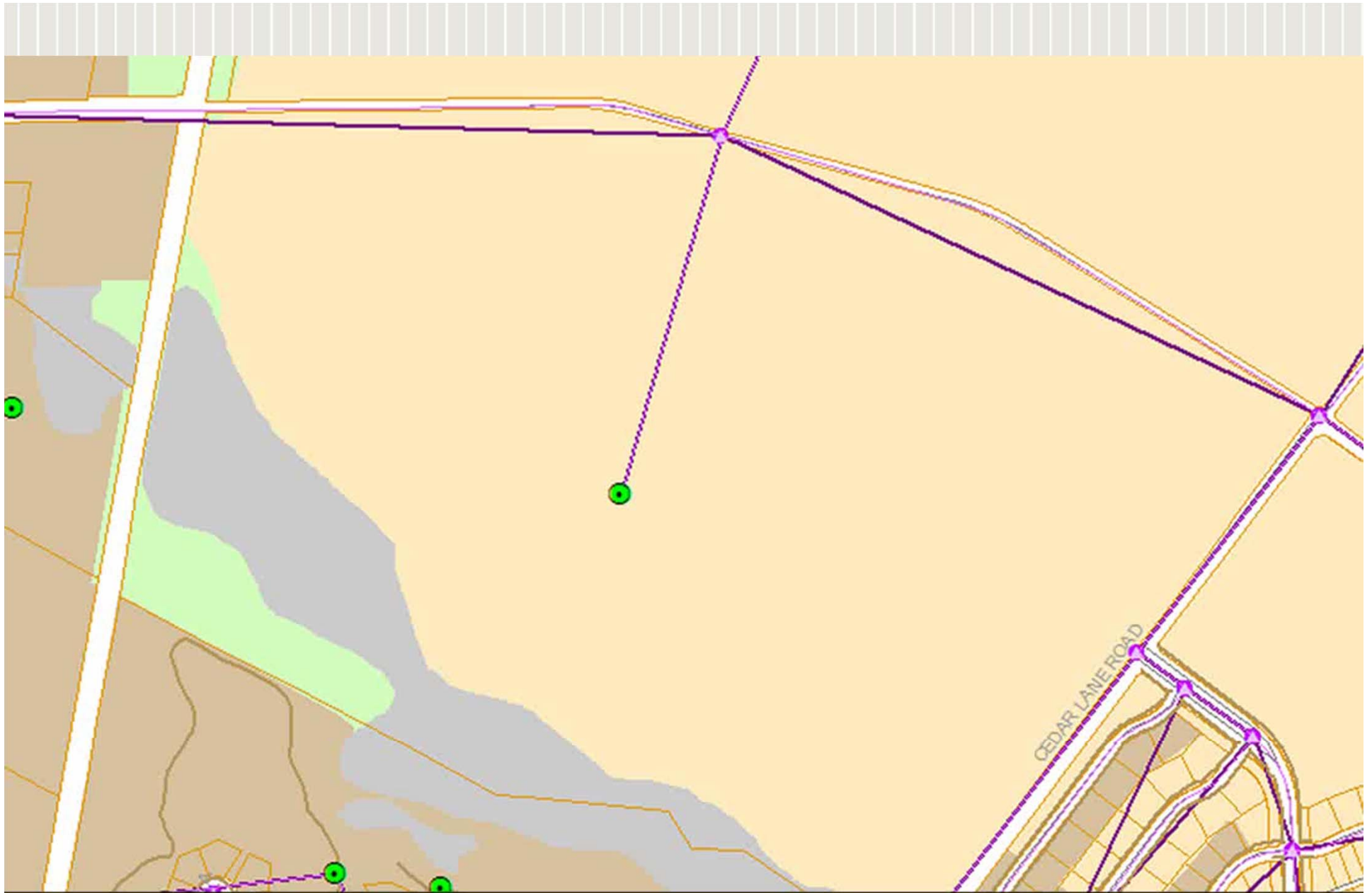
# SSTI - MODELING PROCESS FLOW





# LUTSAM USER INTERFACE





# LUTSAM INITIAL SCREEN



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# REGIONAL MODEL FLOW

MTDM Demographic Data Processor

- Peninsula Model TAZ Demographic Data
- Parcel (Micro TAZ) Database from LUTSAM

- Define Macro TAZs to be Micro-modeled
- Run Demographic Data Processor

- Randomly Assigns Household Type to each New Household
- Re-allocates remaining people, vehicles, and workers to parent TAZ households

- Master Input Network
- Link and Node Database from LUTSAM

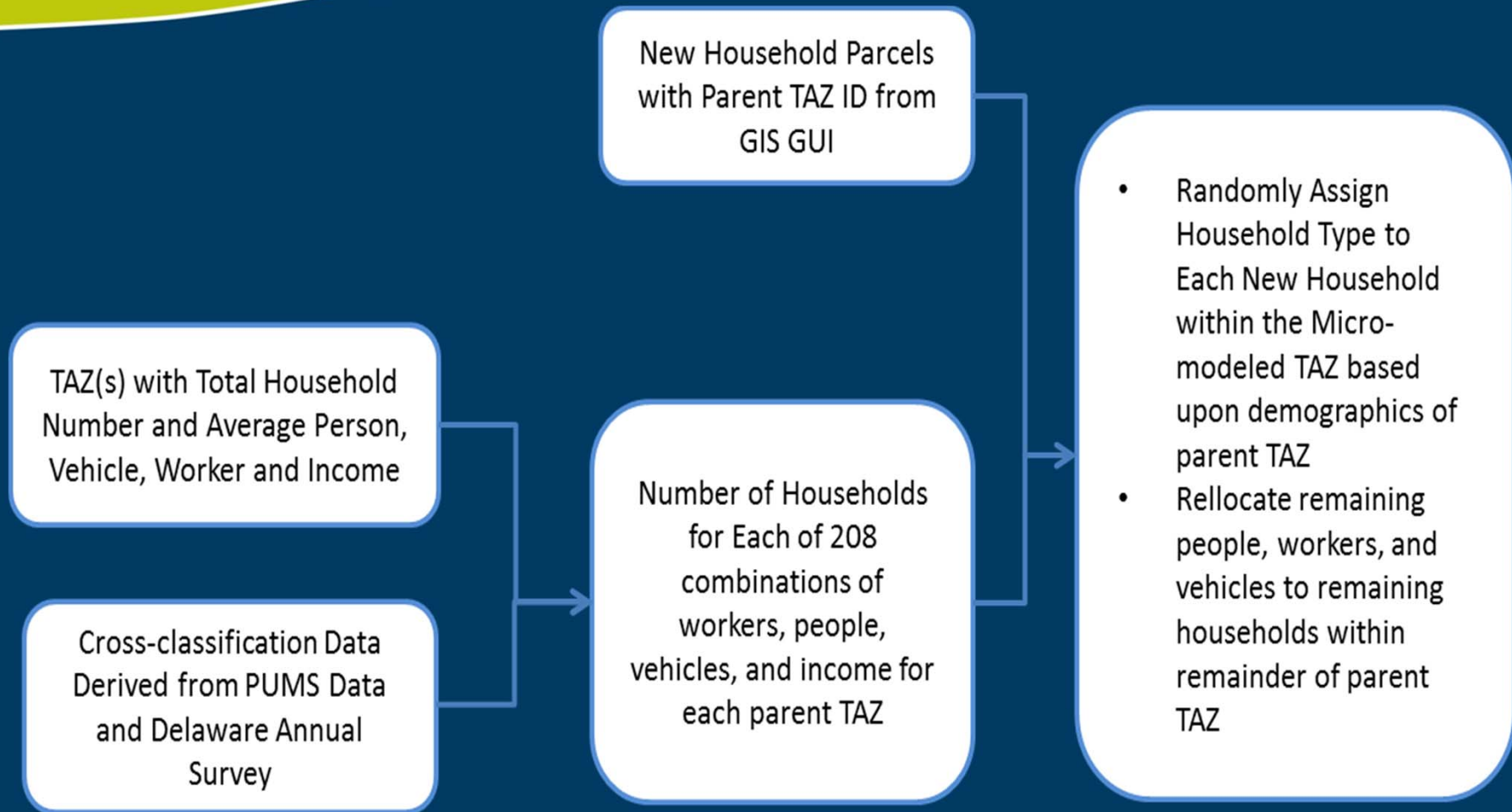
- Run Network Processor
- Combines Micro Model and Peninsula Model Links and Nodes into Single Model Network

- Refined Trip Generation
- Refined Trip Distribution
- Refined Mode Split
- Refined Traffic Assignment

- Extract AM/PM peak hour subnetwork and trip tables for microsimulation

MTDM Network Processor

# HOUSEHOLD SYNTHESIZER

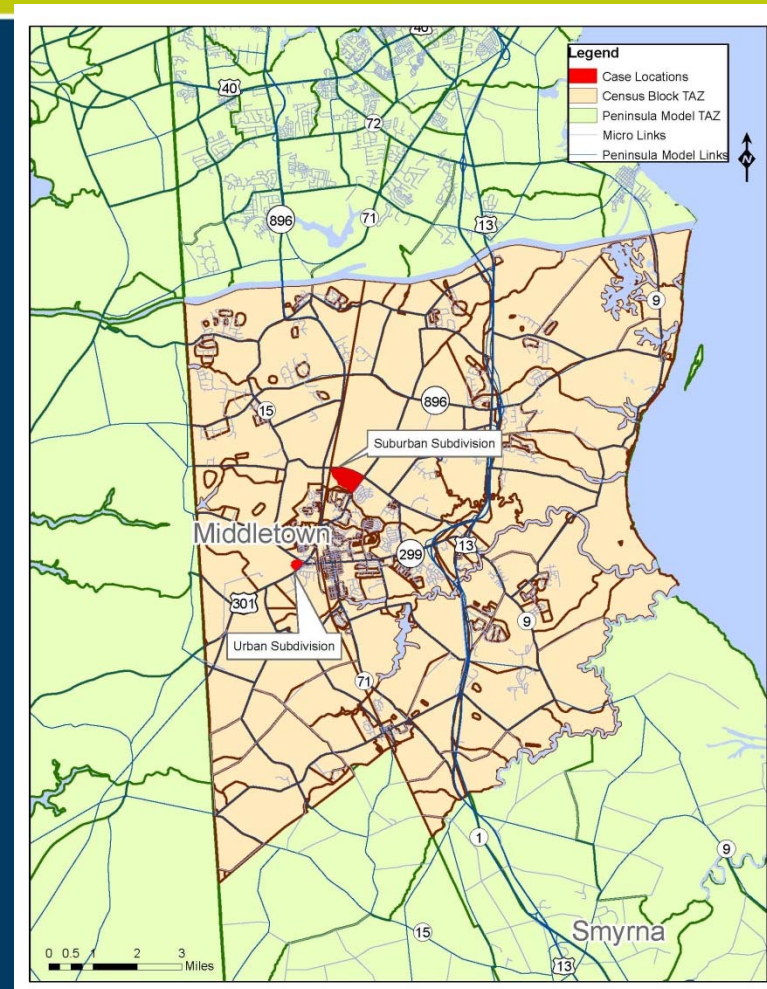


# *LUTSAM - Test Scenario*



# SCENARIO LOCATIONS

1. Suburban  
Traditional
2. Urban



# SCENARIO DESCRIPTIONS

## **Suburban Traditional**

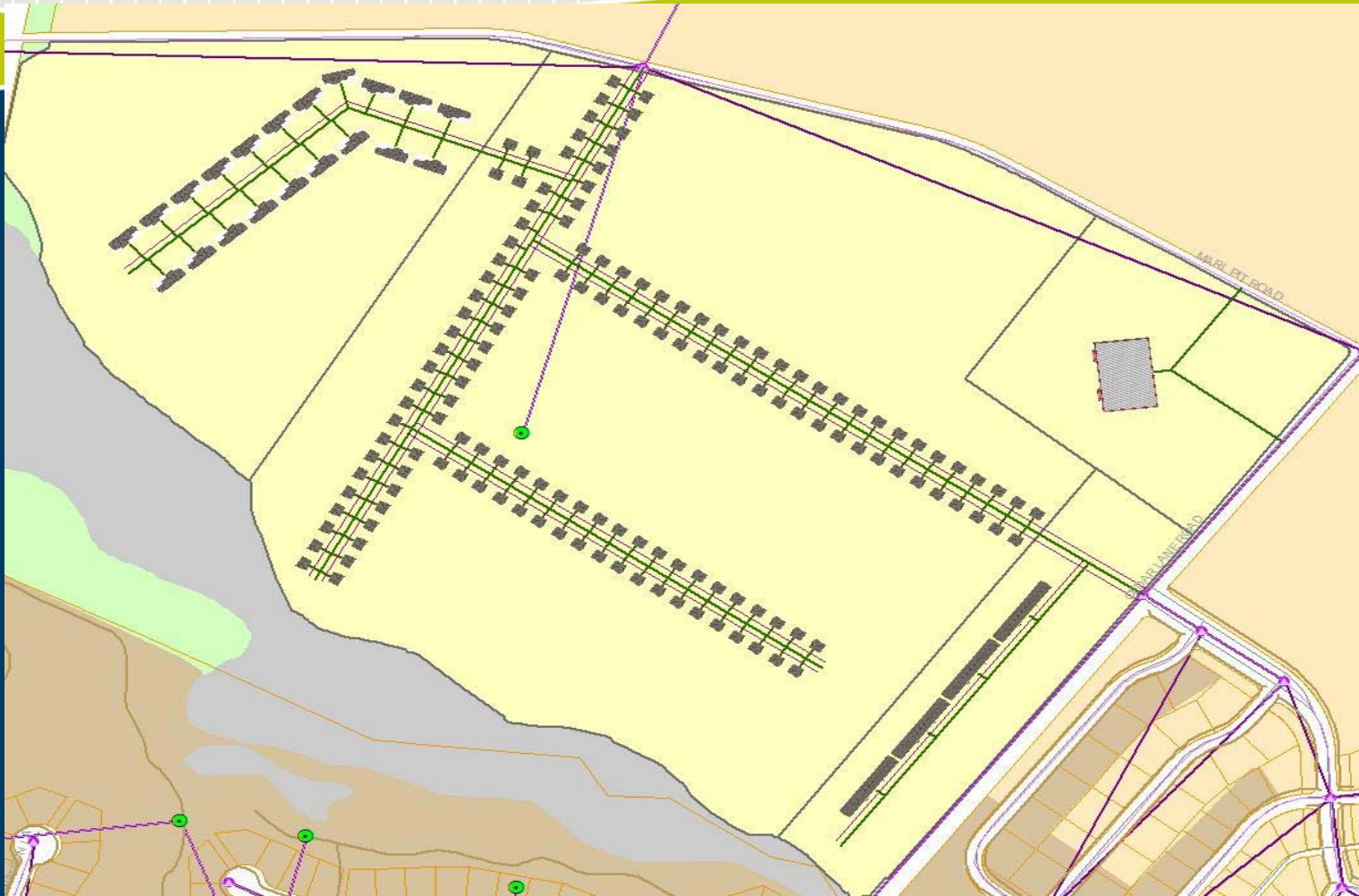
- 200 single/multi family homes with a big box store
- Traditional design
- Four entrances to adjacent roadways
- Poor connections and pedestrian facilities

## **Urban**

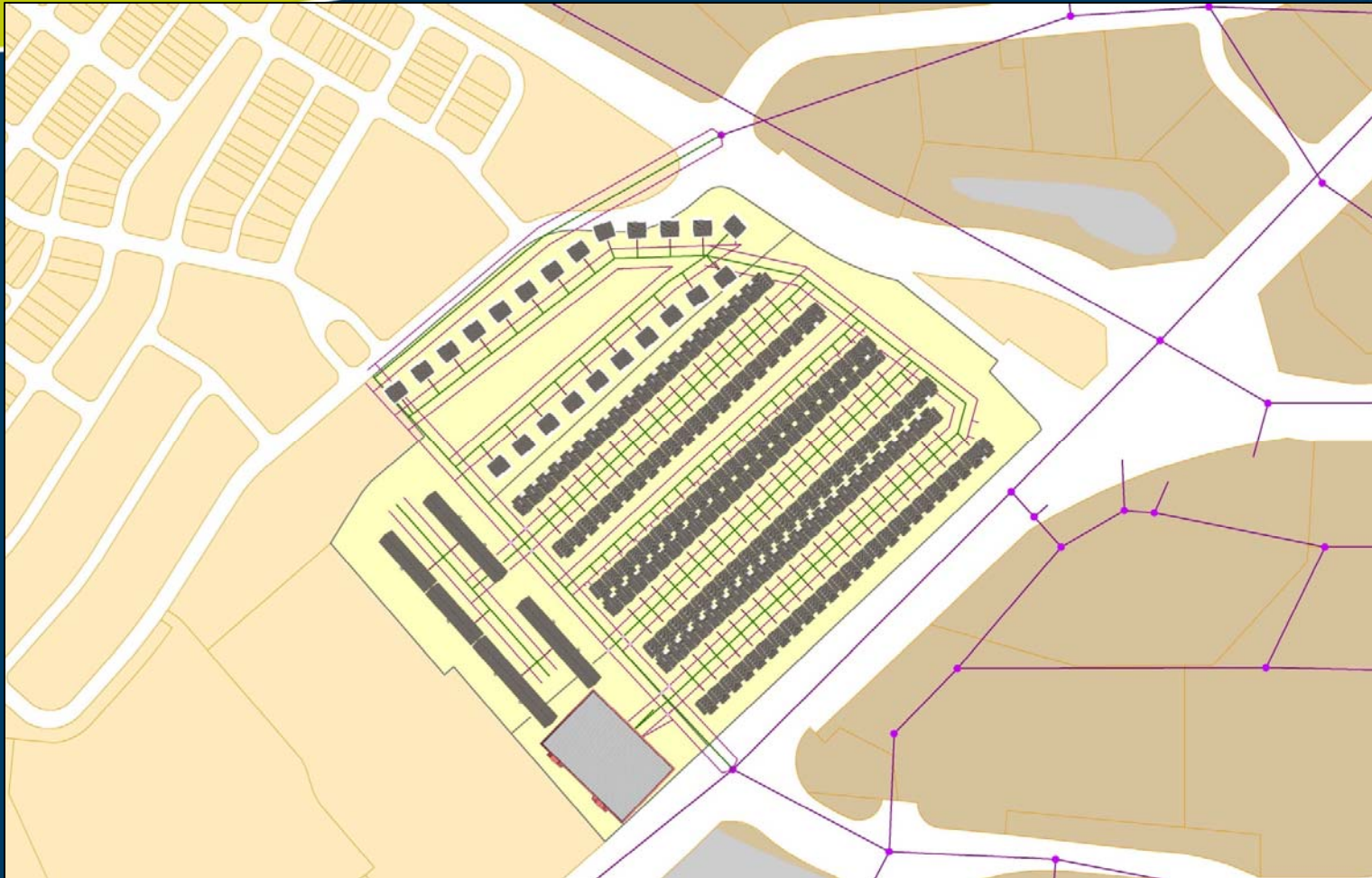
- 200 single/multi family homes with one big box store
- Compact, dense design
- Two entrances to adjacent roadways
- Well connected and completely walkable/bikeable community



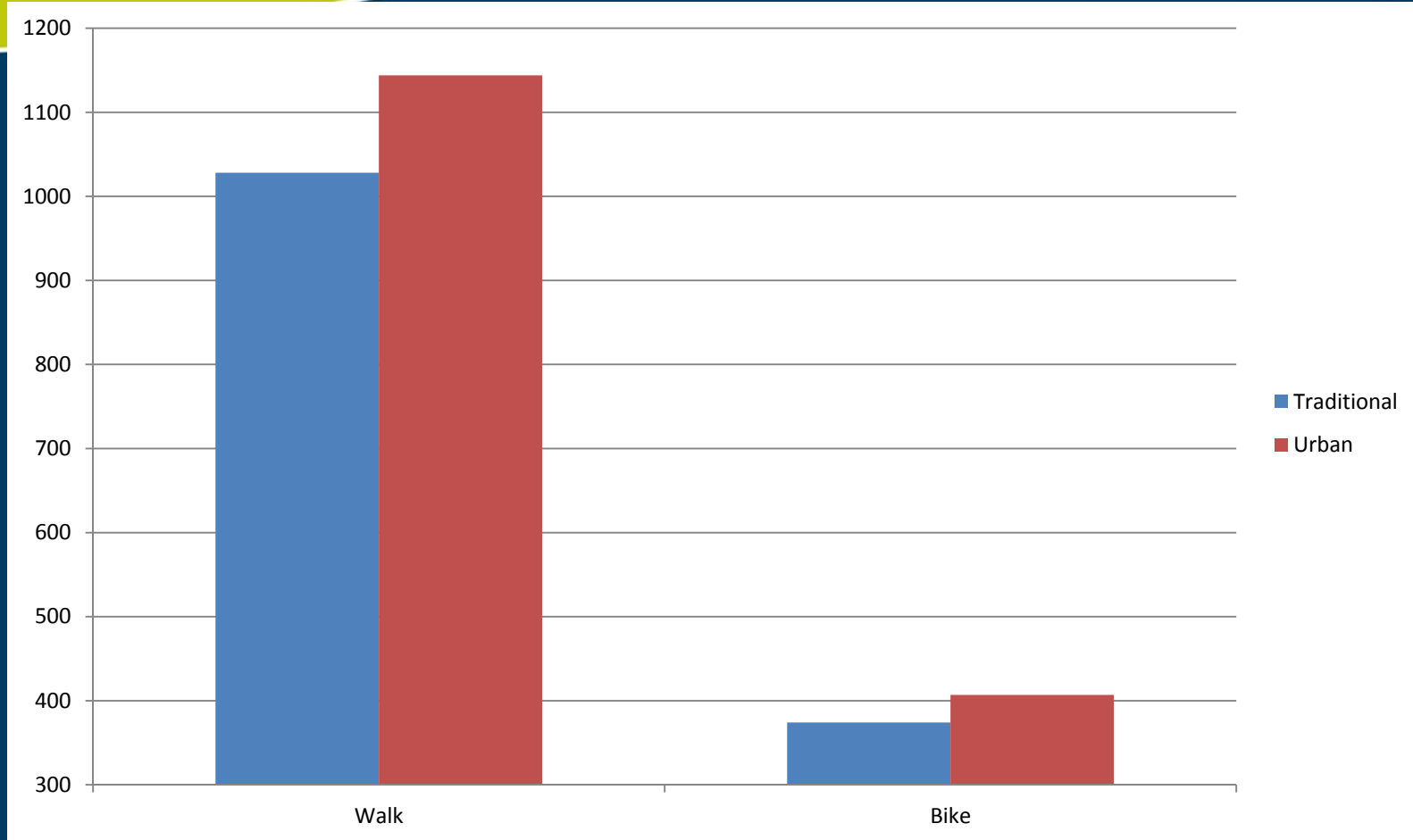
# SUBURBAN TRADITIONAL



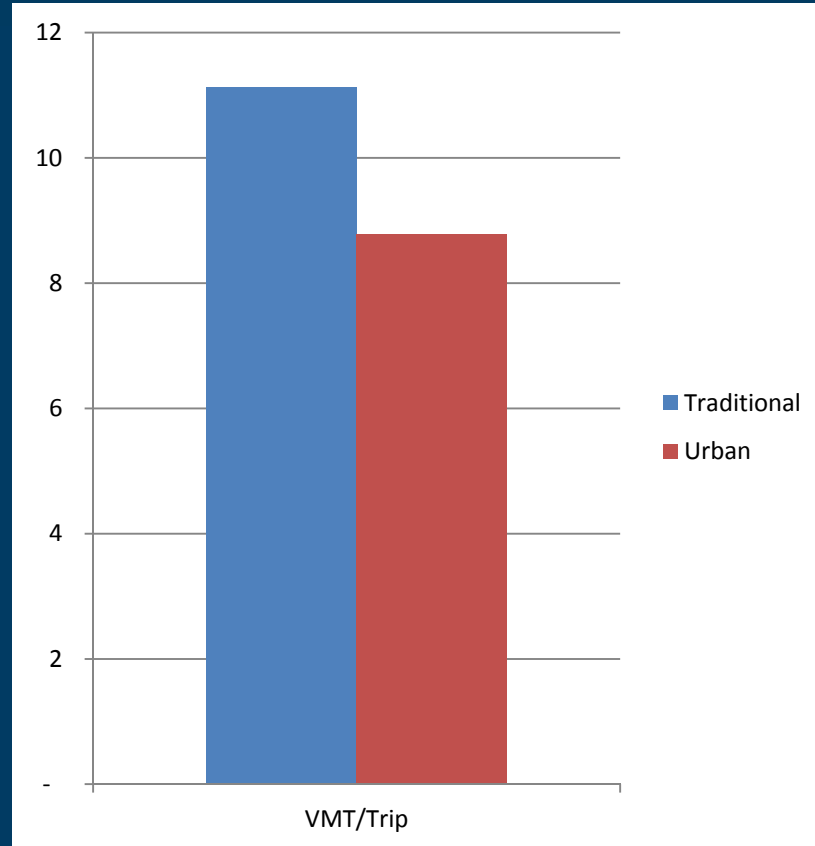
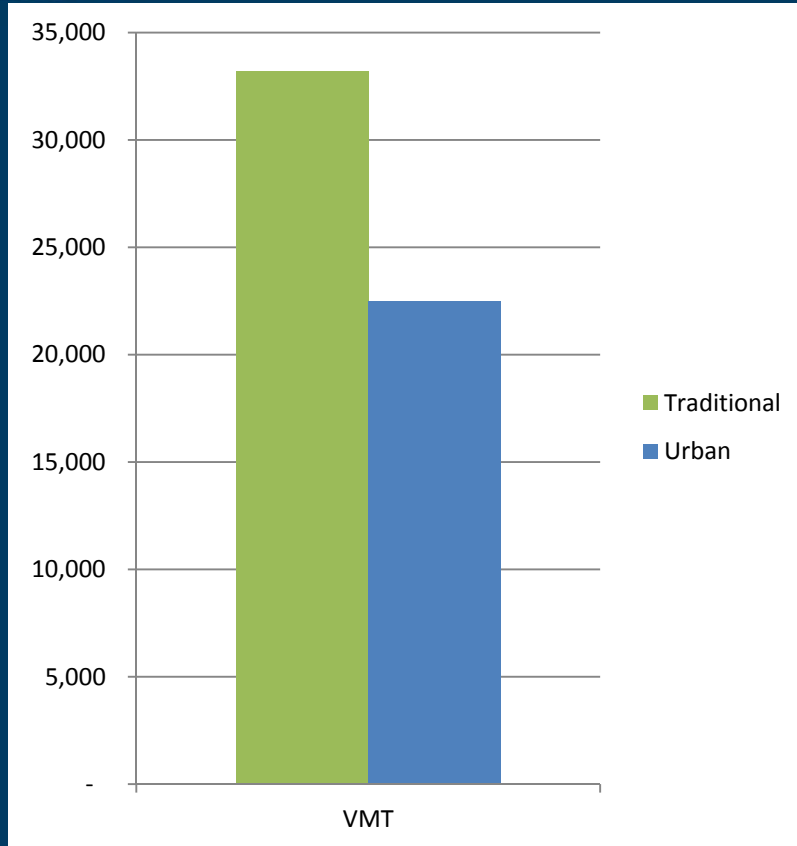
# URBAN GRID



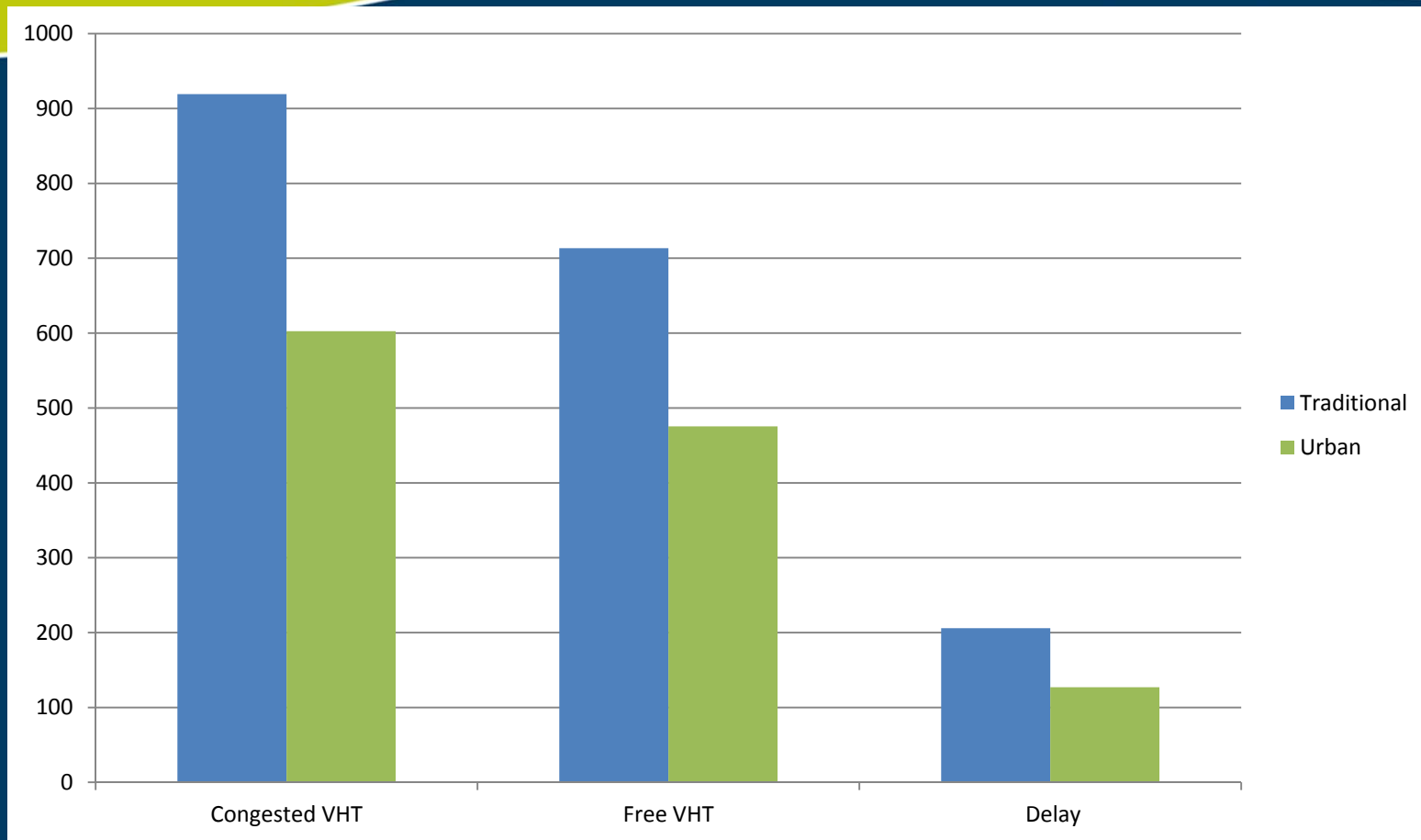
# WALK/BIKE TRIPS (DAILY)



# VMT & VMT/TRIP



# VHT & DELAY

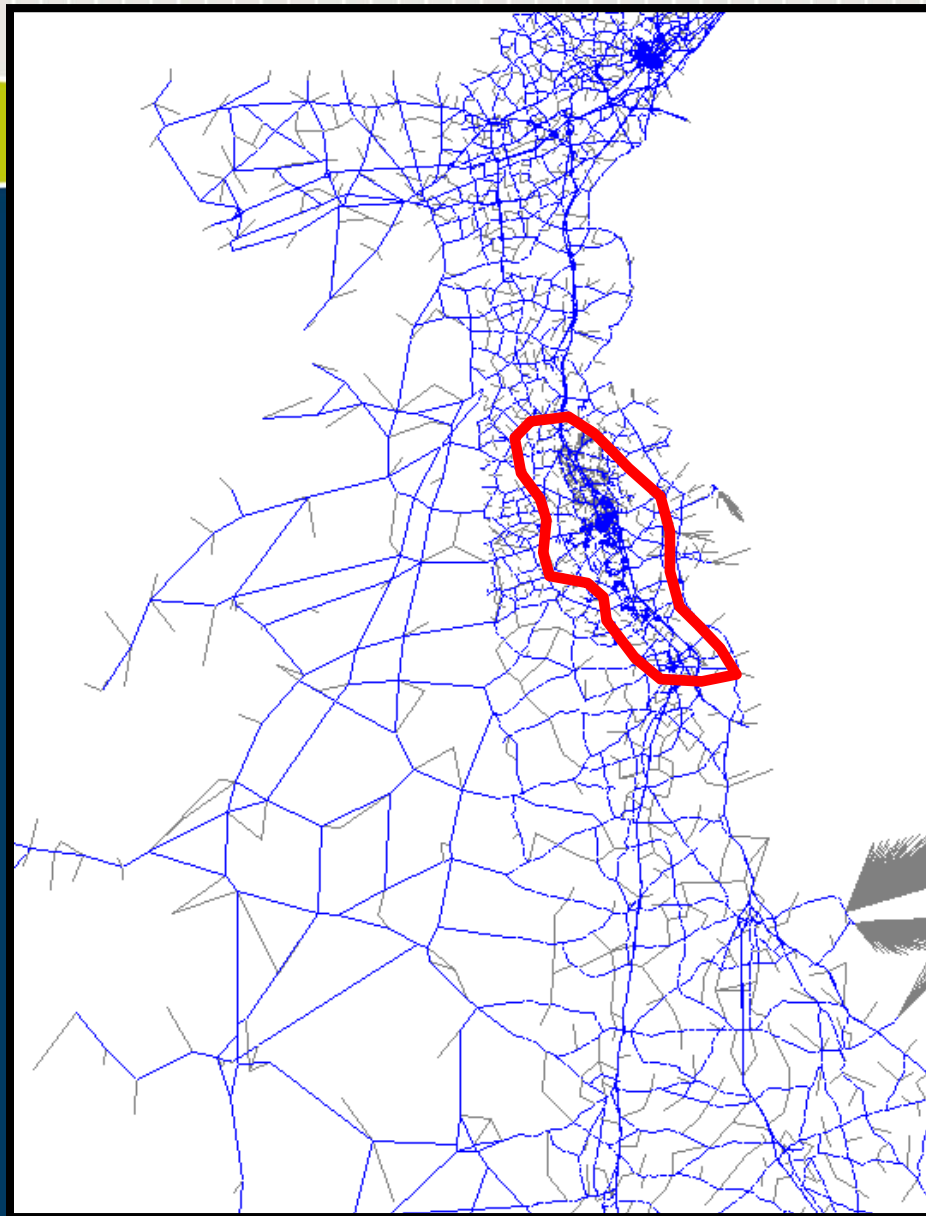




# SMYRNA TRANSPORTATION AND LAND USE STUDY



# SMYRNA TRANSPORTATION AND LAND USE STUDY



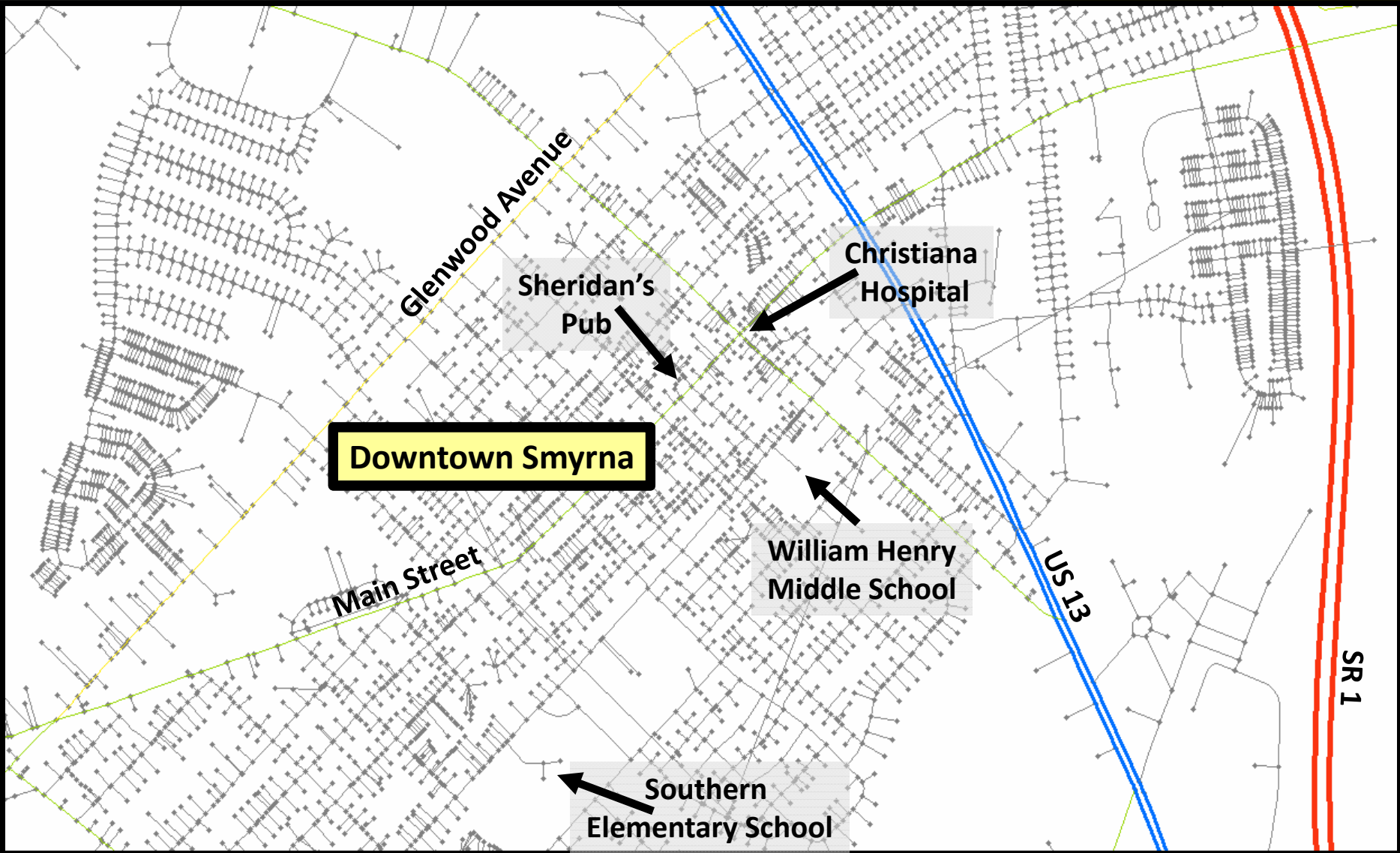
**Regional Model TAZ = 2,136**

**Census Block TAZ = 22,500**

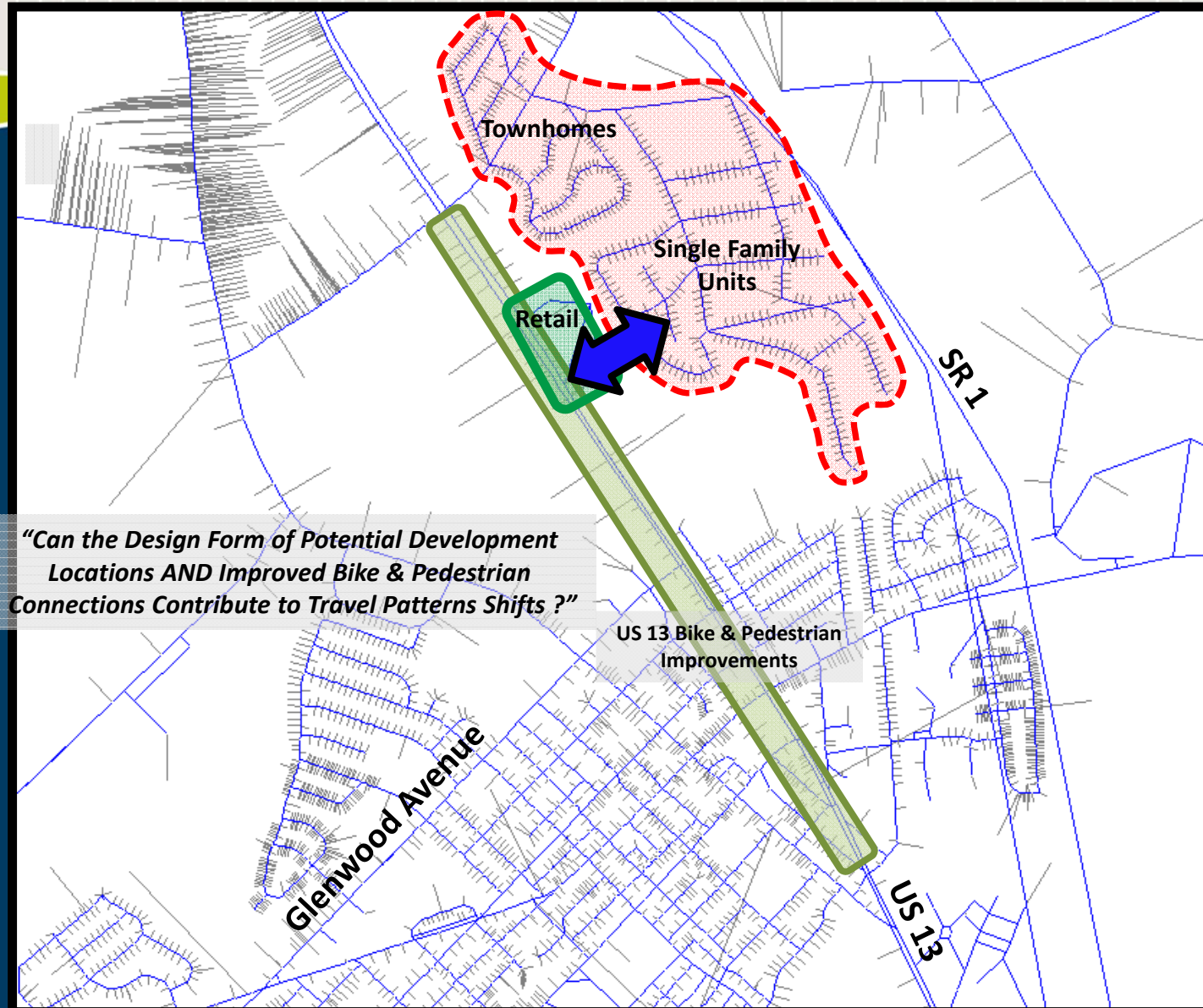
**Tax-Parcel TAZ = 7,700**



# SMYRNA TRANSPORTATION AND LAND USE STUDY



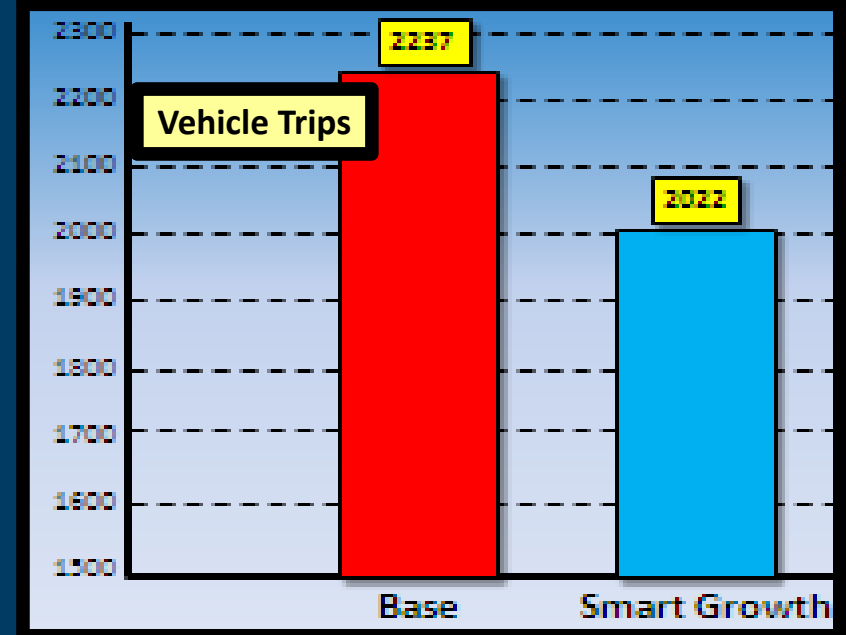
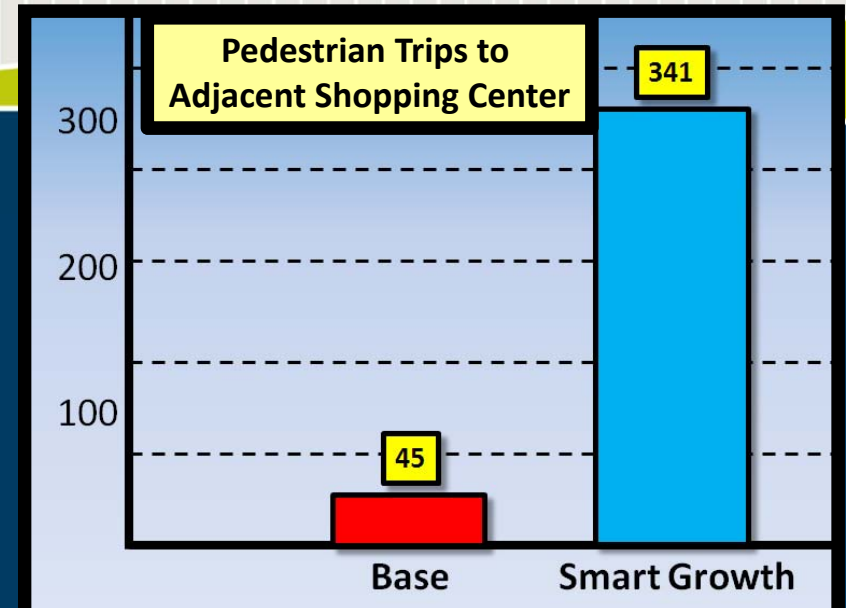
# SMYRNA TRANSPORTATION AND LAND USE STUDY



# SMYRNA TRANSPORTATION AND LAND USE STUDY

## Results:

- Significant Increase in Bike/Walk Trips
- 10% Decrease in Auto Trips to Shopping
- 10% Less VMT / Unit
- Less Travel on Arterials & Key Intersections
- 11% Less Emissions / Unit





# SMYRNA SAMPLE VIDEO



Traditional Growth



Smart Growth

# Conclusions

- Useful for a variety of applications
  - Regional studies
  - Small area studies
  - Corridor studies
  - Transit evaluations
  - Multimodal Studies
- Allows Standard MPO and Statewide Travel Demand Models to operate at the tax parcel level, taking advantage of the benefits of both regional and parcel based models.

# Contacts



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