

# **SPM Active Transportation Enhancement**

**September 23, 2015**

# Presentation Outline

- Background information
- Project goals
- Key findings
- Integration with SPM/2016 RTP
- Next steps

# **Project Background**

# Project Overview

- Regional agencies have typically relied on their regional models to provide key performance metrics
  - VMT, Delay, Congestion
- This approach worked well when SCAG focused on roadway and transit improvements
- But may not fully address new challenges
  - New types of strategies (active transportation & public health)
  - New metrics
  - New technologies and behaviors
- Need for a new approach

## 2016 RTP

- SCAG is looking into a broad range of strategies to support the RTP/SCS
  - Some similar (active transportation)
  - Some new (ridesourcing)
- SCAG is being asked to new metrics
  - Public health, fiscal impacts
- SCAG has some new tools (SPM)
- Need for some supplemental analysis

# Scenario Planning Model & ABM or Bike Model

- Scenario Planning Model is fast and easy to setup scenarios.
- Provides key statistics on travel metrics and other planning questions.
- ABM and Bike Model take longer but offer a richer set of transportation metrics.
- Scenario Planning model could be used to quickly analyze geographically large scenarios or many different scenarios.
- ABM and Bike Model could be used to look analyze final scenarios or to add detail to outputs.

# Urban Footprint Scenario Planning Model

## Data Development and Organization

Base Data



Future Plan / Scenario Data



## Scenario Development

Existing Plan Translation

Scenario Painting / Editing

## Analysis

Local Fiscal Impacts



Public Health



Transportation



Land Consumption



Building Energy Use



Household Costs



Greenhouse Gas Emissions



Building Water Use



# Place Types

Mixed Use Centers and Corridors	1	Urban Mixed Use
	2	Urban Residential
	3	Urban Commercial
	4	City Mixed Use
	5	City Residential
	6	City Commercial
	7	Town Mixed Use
	8	Town Residential
	9	Town Commercial
	10	Village Mixed Use
	11	Village Residential
	12	Village Commercial
	13	Neighborhood Residential
	14	Neighborhood Low
Employment Areas	15	Office Focus
	16	Mixed Office and R&D
	17	Office / Industrial
	18	Industrial Focus
	19	Low-Density Employment Park
Suburban	20	High Intensity Activity Center
	21	Mid Intensity Activity Center
	22	Low Intensity Retail Centered Neighborhood
	23	Retail Strip Mall / Big Box
	24	Industrial / Office / Residential Mixed High
	25	Industrial / Office / Residential Mixed Low
Suburban Residential	26	Suburban Multifamily
	27	Suburban Mixed Residential
	28	Residential Subdivision
	29	Large Lot Residential Area
Rural	30	Rural Residential
	31	Rural Ranchettes
	32	Rural Employment
Institutional	33	Campus / University
	34	Institutional
	35	Parks and Open Space

Density

Mix of Uses

Street Connectivity

Location/Accessibility



Urban



Compact



Standard

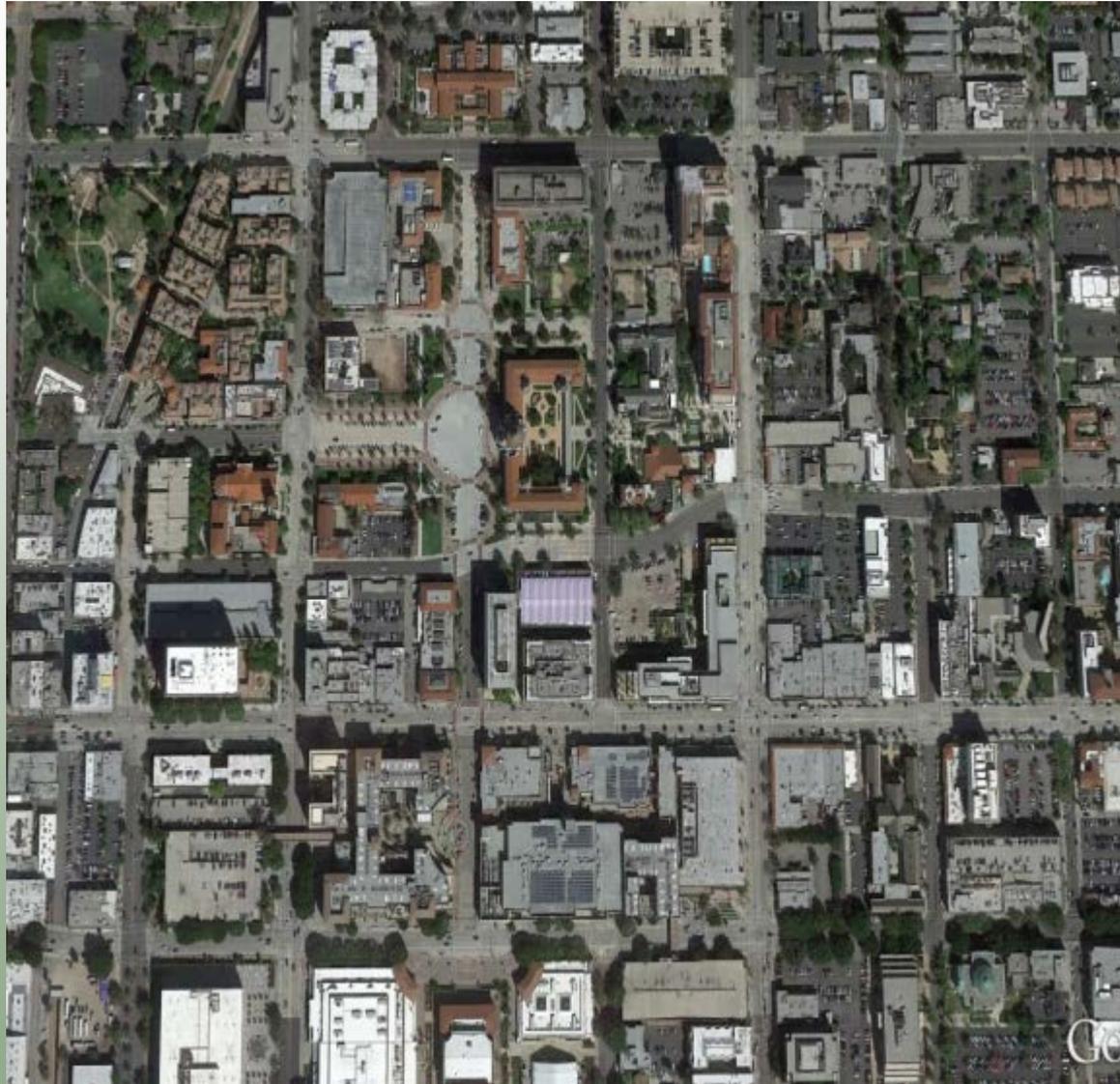
Land Development Category (LDC)

Urban



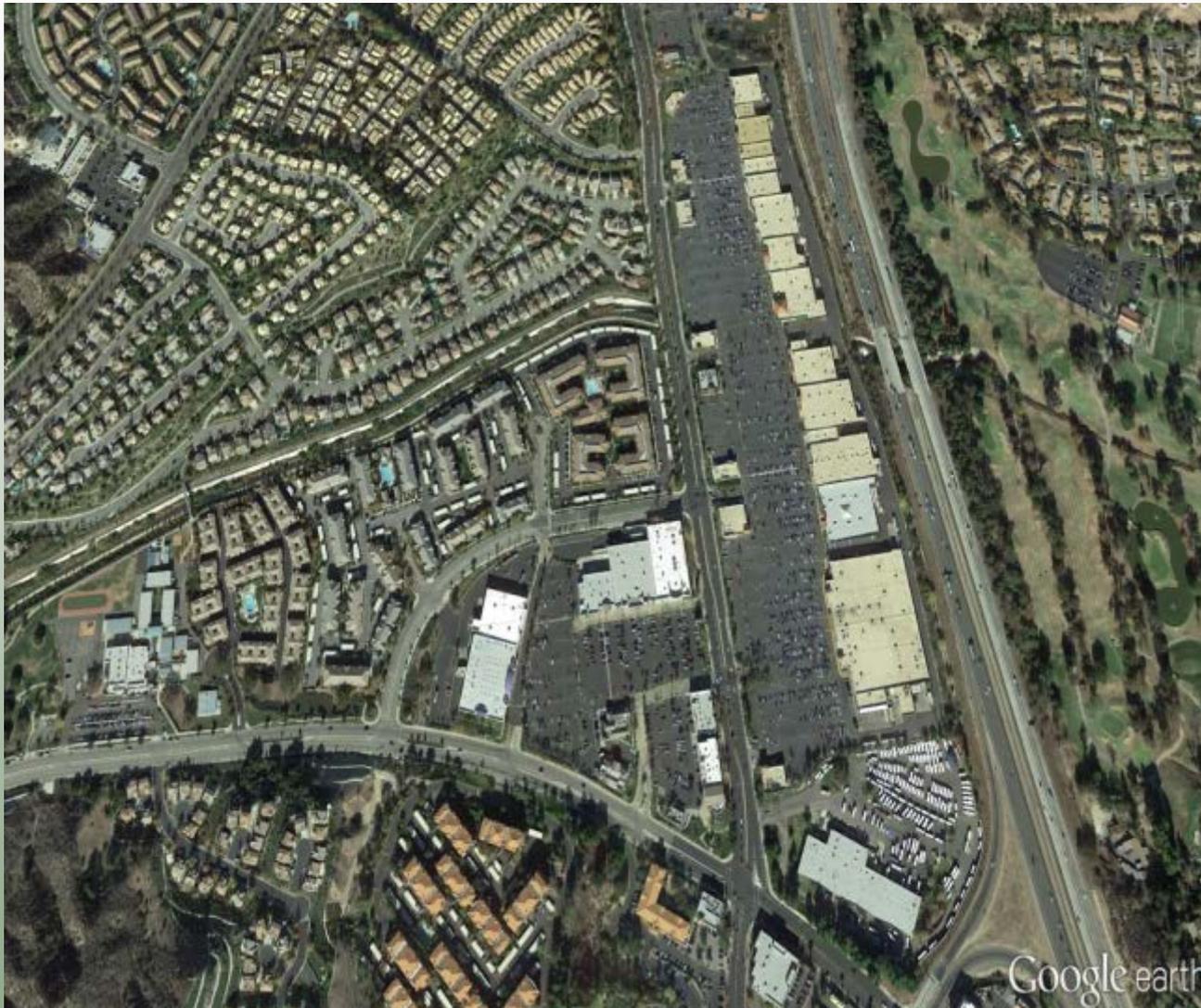
Land Development Category (LDC)

# Compact Walkable

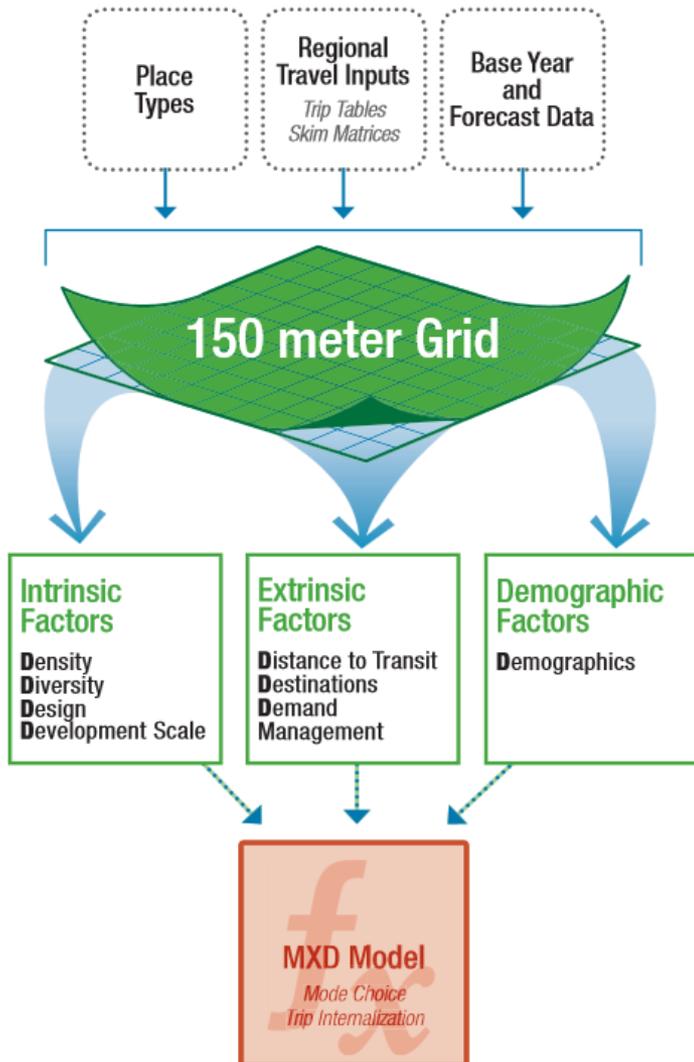


Land Development Category (LDC)

# Standard Suburban



# Existing SPM Process Uses MXD



- MXD trip generation was developed through collaboration between Fehr & Peers, the U.S. EPA, and an academic research team
- 230 mixed-use developments across the US were used to develop model
- Model was validated against 30 sites within California.
- SCAG uses SPZ data instead of 150 meter grid

# Existing SPM Process Uses MXD

- VMT is calculated using SCAG's existing and future transportation networks, regional accessibility, and travel distance/times.
- Final Urban Footprint results provide vehicle trips and VMT at the individual SPZ and region.

*Base-Year Vehicle Miles Traveled (VMT) Validation Chart*

<b>Region</b>	<b>Base Year Validation Daily VMT</b>	<b>UrbanFootprint Modeled Base Year Daily VMT</b>
<b>Sacramento Area (6 Counties, SACOG)</b>	<b>50,040,540</b> <i>(Fehr &amp; Peers, SACOG - SACMET model, 2008 MTP)</i>	<b>53,632,530</b>
<b>San Francisco Bay Area (9 counties, ABAG/MTC)</b>	<b>143,681,890</b> <i>(Fehr &amp; Peers, MTC - MTC model, 2009 RTP)</i>	<b>143,784,640</b>
<b>Southern California (6 Counties, SCAG)</b>	<b>378,105,370</b> <i>(Fehr &amp; Peers, SCAG - SCAG model, 2008 RTP)</i>	<b>378,117,580</b>
<b>San Diego (SANDAG)</b>	<b>80,584,670</b> <i>(Fehr &amp; Peers, SANDAG - SANDAG model, 20011 RTP/SCS)</i>	<b>82,432,940</b>
<b>San Joaquin Valley (8 Counties)</b>	<b>114,532,890</b> <i>(Fehr &amp; Peers, UC Davis - CSTDM 2009 Model)</i>	<b>111,197,210</b>

*UrbanFootprint travel model validation included comparisons of base/existing environment VMT to model outputs in the major regions of California. This chart shows base year daily VMT as reported by the regions, and VMT as modeled by UrbanFootprint.*

# **Project Goals**

# Project Goals

- Develop methodology to augment existing SPM by:
  - Enhance sensitivity to **active transportation** investment
  - Provide means to forecast benefit **without precision of detailed network** (since many communities do not have plans)
- Ensure applicability across SCAG region
- Limited to available data **on hand**
  - SPM, Travel Model, SCAG GIS
- Develop quantitative relationships wherever possible for local conditions

# Integration with SPM

- SCAG requested we work with SPM by integrating with the existing land use and demographic data
- Key variables in the SPM include:
  - Population
  - Employment
  - Placetypes
  - Intersection density
  - Transit stops

# Household Travel Survey

- California Household Travel Survey (CHTS) was selected to develop a mode share model
- About 100K trip records (individual trips) for the SCAG region
- 80% are auto trips, 20% are other modes
- Trip Length by mode is also reported
- Includes trips of all types (work, non-work, social, etc)

# Key Findings

## Key Observations

- Walking makes up roughly 90% of active transportation trips.
- Significant variation in walking and biking by land use
  - Active transportation ranged from less than 10% to more than 40% of mode share
- Key transportation factors
  - Bike lanes
  - Sidewalks
  - Roadway speed
  - Transit stops
  - Intersection density (crosswalk frequency)

Grouping	Place Types	Observed AT Mode Share		
		Range	Average	Median
1	City Mixed Use, City Residential, Town Mixed Use, Urban Commercial, Urban Mixed Use, High Intensity Activity Center	25-44%	30%	27%
2	Village Commercial, Town Residential, Village Mixed Use, City Commercial, Town Commercial, Urban Residential, Industrial/Office/Residential Mixed High	18-27%	23%	24%
3	Neighborhood Residential, Village Residential, Campus Residential, Institutional, Suburban Multi-Family	14-23%	20%	20%
4	Neighborhood Low, Suburban Mixed Residential, Middle Intensity Activity Center, Industrial/Office/Residential Mixed Low, Office Focus	13-18%	15%	16%
5	Residential Subdivision, Low Intensity Retail Centered Neighborhood, Parks Open Space, Mixed Office and R&D, Low Density Employment Park	8-12%	11%	10%
6	Retail Strip Mall/Big Box, Office/Industrial, Industrial Focus, Large Lot Residential, Rural Residential, Rural Employment, Rural Ranchettes, Military	7-10%	8%	8%

# Western LA Place Type Distribution

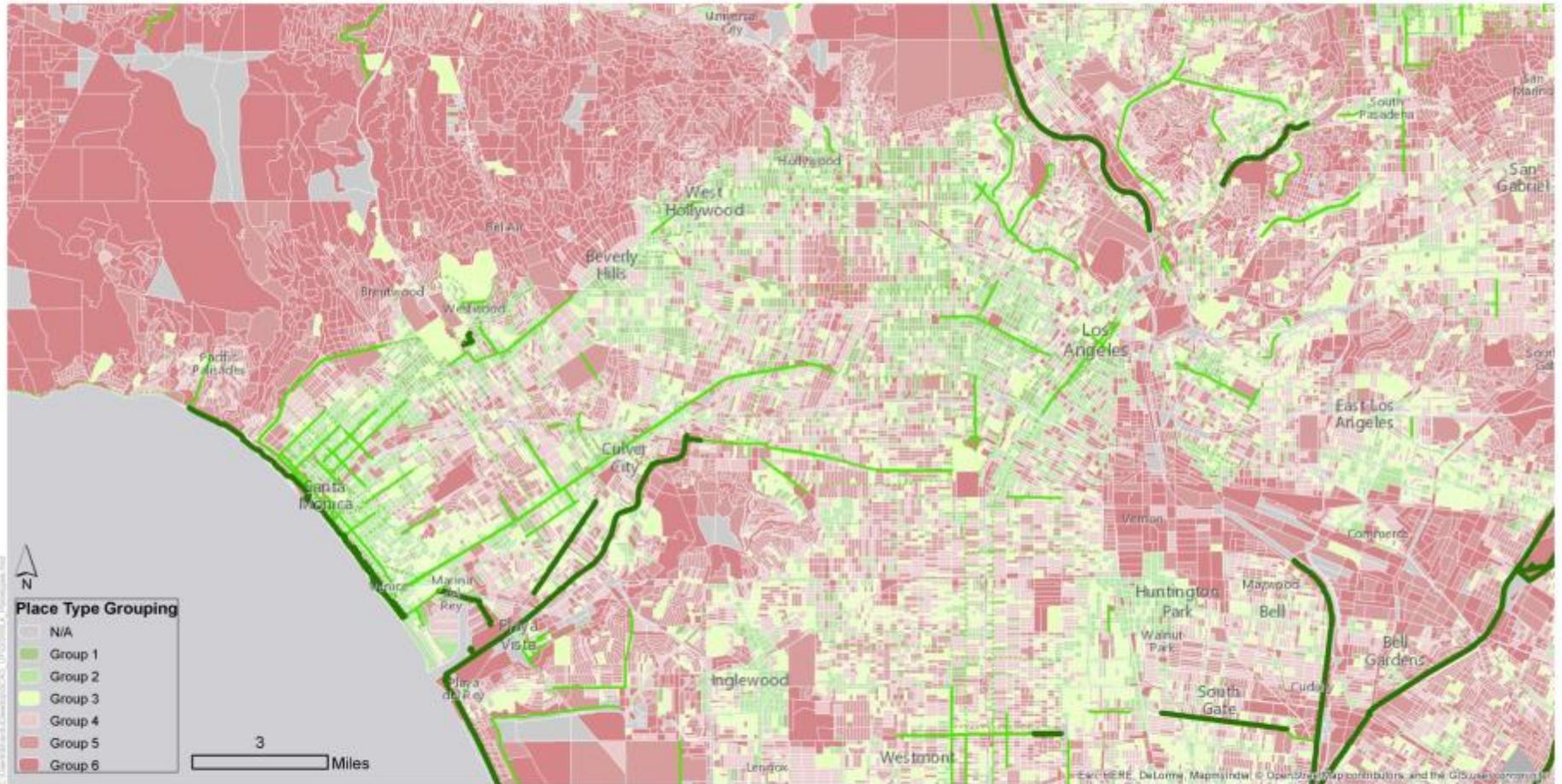


Figure 1  
West Los Angeles Place Type Grouping



# Long Beach Place Type Distribution

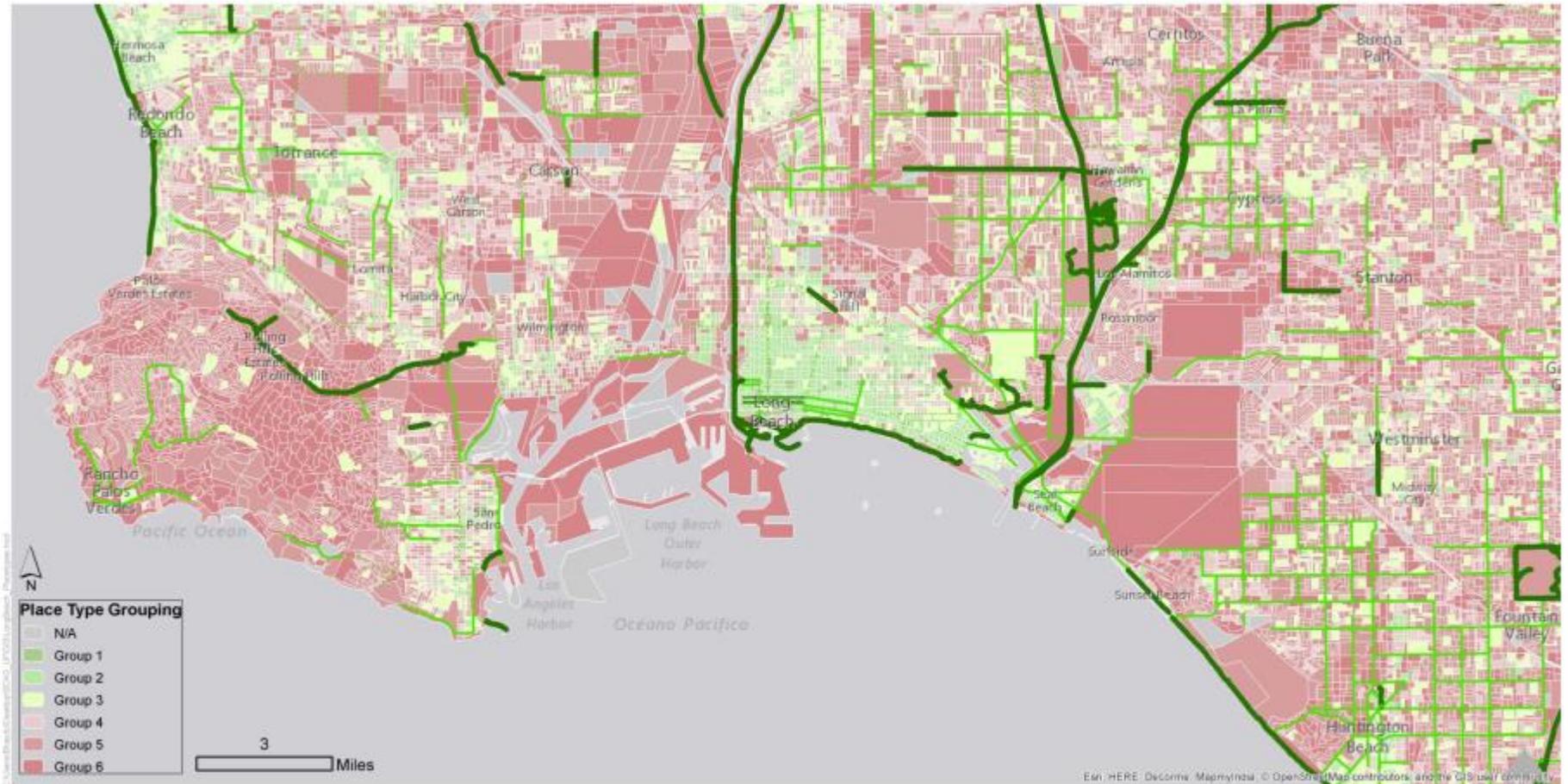


Figure 3  
Long Beach Place Type Grouping

# Irvine Place Type Distribution

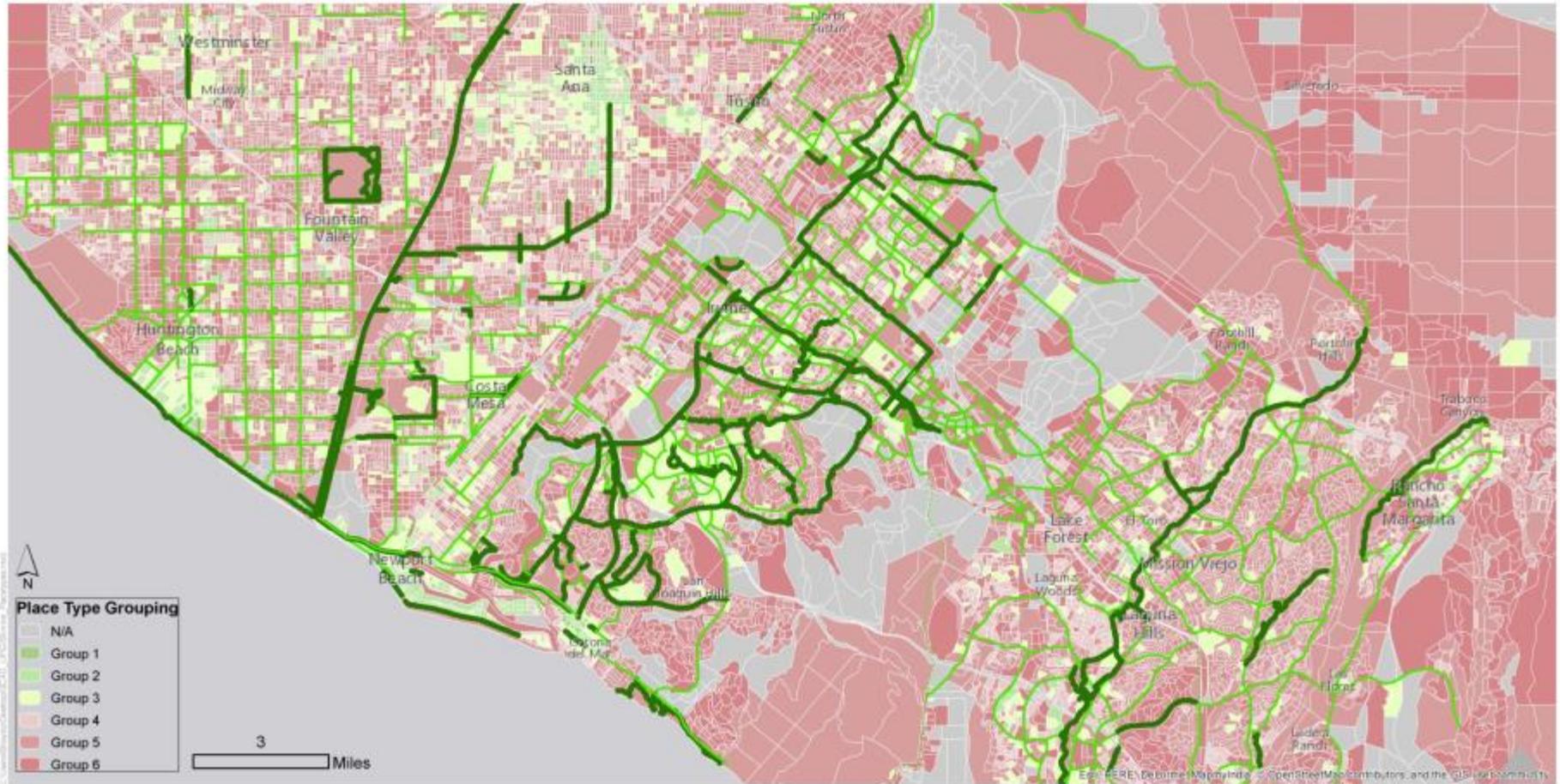


Figure 4  
Irvine Place Type Grouping

# Riverside Place Type Distribution

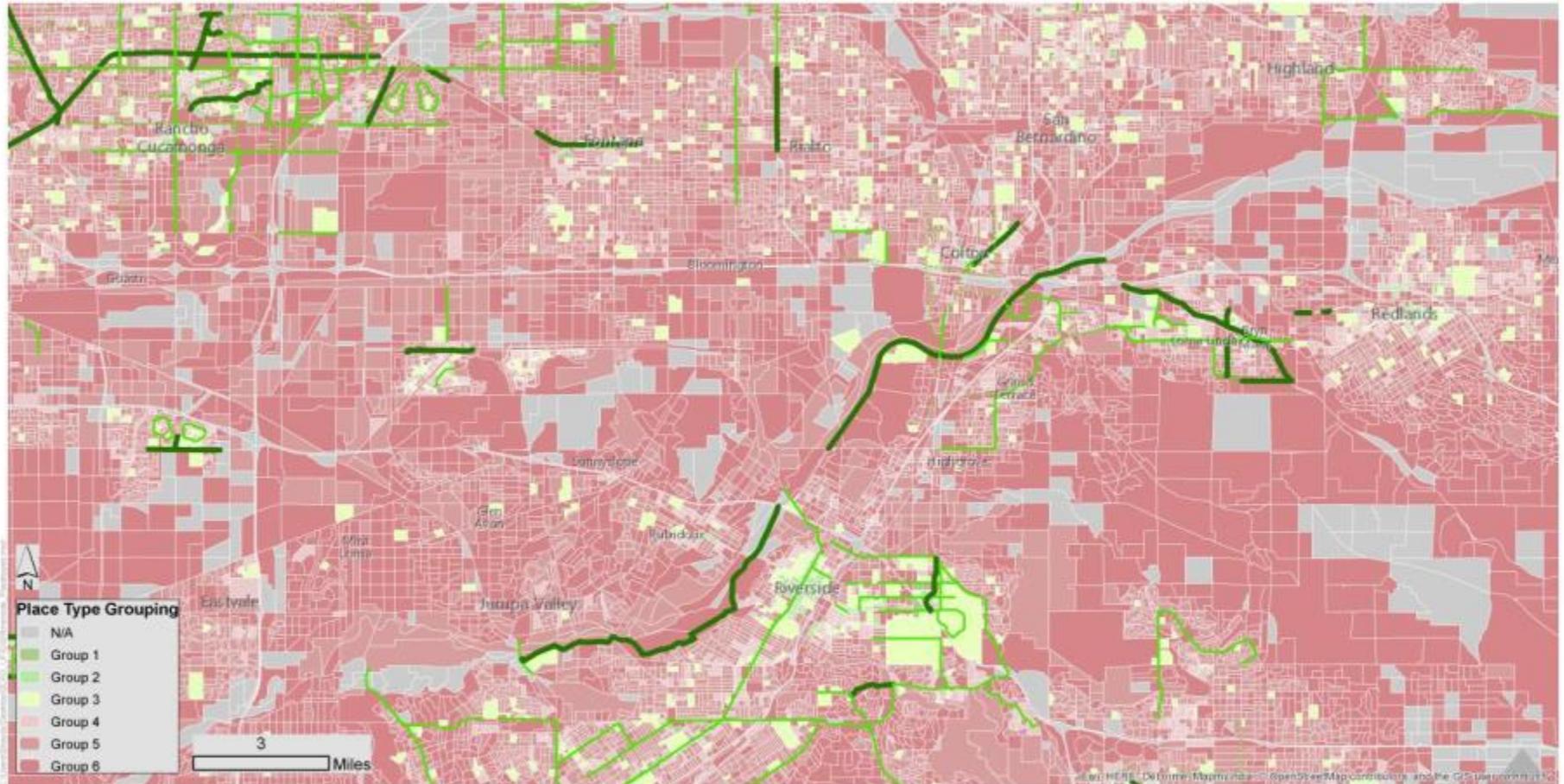


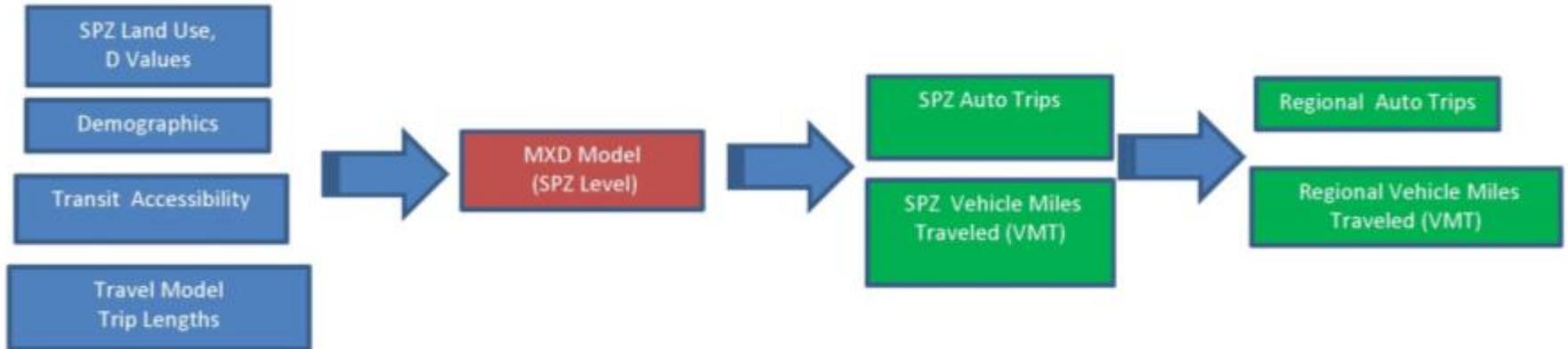
Figure 5  
Riverside Place Type Grouping

# Trip Lengths

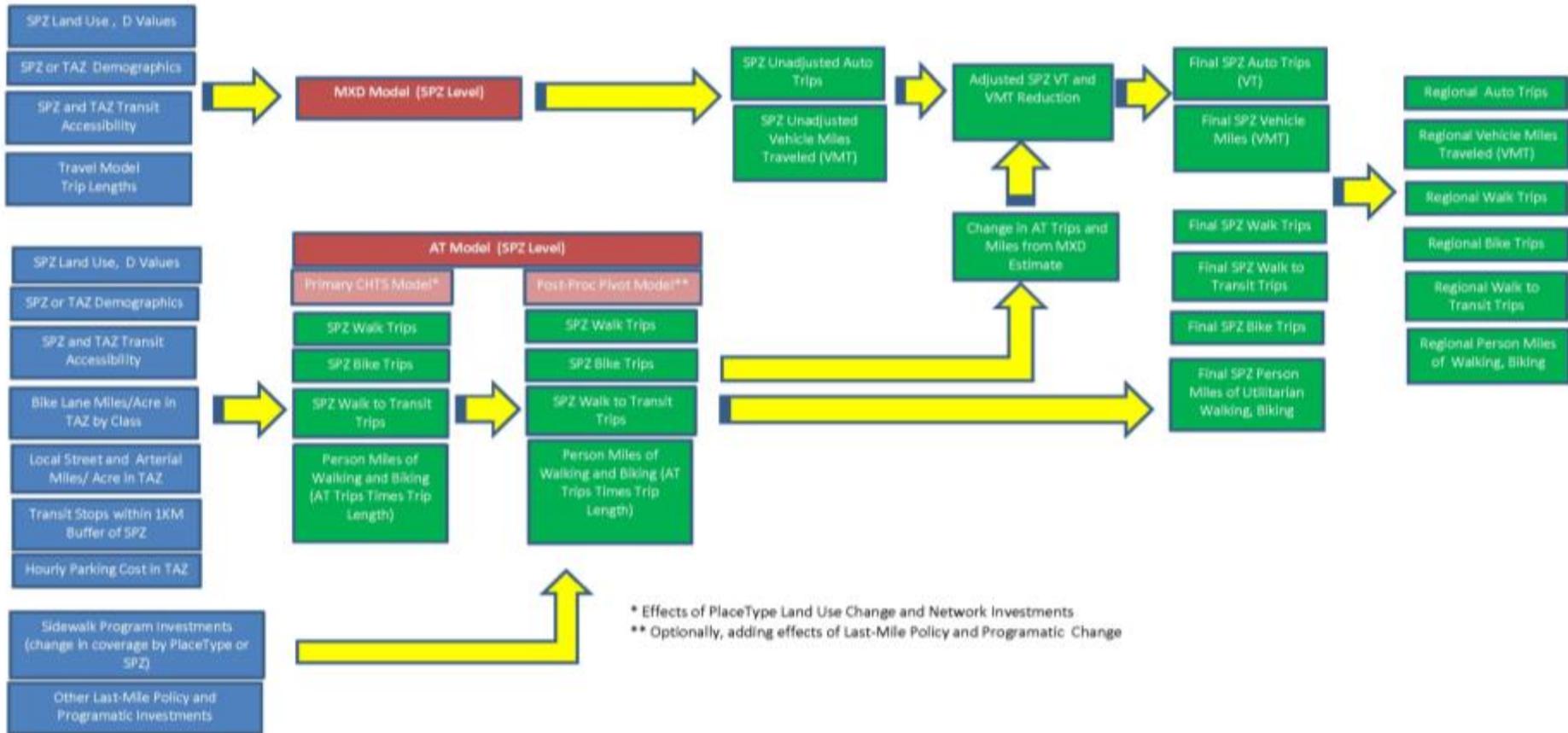
Place Type Grouping	Place Types	Walk Trip Length	Bike Trip Length
1	City Mixed Use, City Residential, Town Mixed Use, Urban Commercial, Urban Mixed Use, High Intensity Activity Center	0.5	2.5
2	Village Commercial, Town Residential, Village Mixed Use, City Commercial, Town Commercial, Urban Residential, Industrial/Office/Residential Mixed High	0.5	2
3	Neighborhood Residential, Village Residential, Campus Residential, Institutional, Suburban Multi-Family	0.5	2
4	Neighborhood Low, Suburban Mixed Residential, Middle Intensity Activity Center, Industrial/Office/Residential Mixed Low, Office Focus	0.5	3
5	Residential Subdivision, Low Intensity Retail Centered Neighborhood, Parks Open Space, Mixed Office and R&D, Low Density Employment Park	0.7	2.5
6	Retail Strip Mall/Big Box, Office/Industrial, Industrial Focus, Large Lot Residential, Rural Residential, Rural Employment, Rural Ranchettes, Military	0.7	3

# **Integration with SPM/2016 RTP**

# Existing SPM Process



# SPM Enhancement



# Transportation Only Improvements

- Transportation only factors include:
  - Bike lane density
  - Percent of roadways with sidewalks
  - Transit stops
  - Intersection density
  - Network density of lower speed roads (25 mph)
  - Network density of higher speed roads (35 mph)
  - Parking costs

## Percent of Roadways With Sidewalks

Grouping	Place Types	Low	Medium	High
1	City Mixed Use, City Residential, Town Mixed Use, Urban Commercial, Urban Mixed Use, High Intensity Activity Center	50%	75%	100%
2	Village Commercial, Town Residential, Village Mixed Use, City Commercial, Town Commercial, Urban Residential, Industrial/Office/Residential Mixed High	50%	75%	100%
3	Neighborhood Residential, Village Residential, Campus Residential, Institutional, Suburban Multi-Family	35%	50%	100%
4	Neighborhood Low, Suburban Mixed Residential, Middle Intensity Activity Center, Industrial/Office/Residential Mixed Low, Office Focus	35%	45%	100%
5	Residential Subdivision, Low Intensity Retail Centered Neighborhood, Parks Open Space, Mixed Office and R&D, Low Density Employment Park	20%	40%	50%
6	Retail Strip Mall/Big Box, Office/Industrial, Industrial Focus, Large Lot Residential, Rural Residential, Rural Employment, Rural Ranchettes, Military	10%	25%	35%

## Bike Lane Density (Weighted Average of Facilities by Square Mile)

Grouping	Place Types	Low	Medium	High
1	City Mixed Use, City Residential, Town Mixed Use, Urban Commercial, Urban Mixed Use, High Intensity Activity Center	0	0.1	0.25
2	Village Commercial, Town Residential, Village Mixed Use, City Commercial, Town Commercial, Urban Residential, Industrial/Office/Residential Mixed High	0	0.1	0.25
3	Neighborhood Residential, Village Residential, Campus Residential, Institutional, Suburban Multi-Family	0	0.1	0.75
4	Neighborhood Low, Suburban Mixed Residential, Middle Intensity Activity Center, Industrial/Office/Residential Mixed Low, Office Focus	0	0.1	0.75
5	Residential Subdivision, Low Intensity Retail Centered Neighborhood, Parks Open Space, Mixed Office and R&D, Low Density Employment Park	0	0.1	0.75
6	Retail Strip Mall/Big Box, Office/Industrial, Industrial Focus, Large Lot Residential, Rural Residential, Rural Employment, Rural Ranchettes, Military	0	0.1	0.25

# Implementing Transportation Only Improvements

- Change in either bike lane density or percent of roads with sidewalks or both
- First Mile/Last Mile
  - Likely both but perhaps mostly sidewalks
  - Could also be modeled through changes in transit stops or land uses
- Additional bike infrastructure
  - Will increase bike lane density directly, which will lead to increased biking trips

# Next Steps

## What Happens Next?

- We prepared a spreadsheet version to analyze strategies for the RTP and SCAG is currently running the model.
- SCAG will be engaging Calthorpe to code these variables and equations into the SPM

## Future Work

- SCAG has an extensive database of land use, demographic, transportation, and travel behavior information
- Locally collected data
- Records on 20,000 households and 100,000 trips
  - Statistically valid survey
  - Includes data on trip type, trip location, and information on traveler
- SCAG could assist CTC's, COG's, Counties, and Cities in doing a similar or related analysis

# Questions