Update on Travel Characteristics Study

Trip Characteristics Modeling Procedure
and
Using GIS to Determine and Plan for Future Transportation Needs
For
MetroPlan Orlando

Florida Model Task Force

Working Group

November 1, 2005

Study Team

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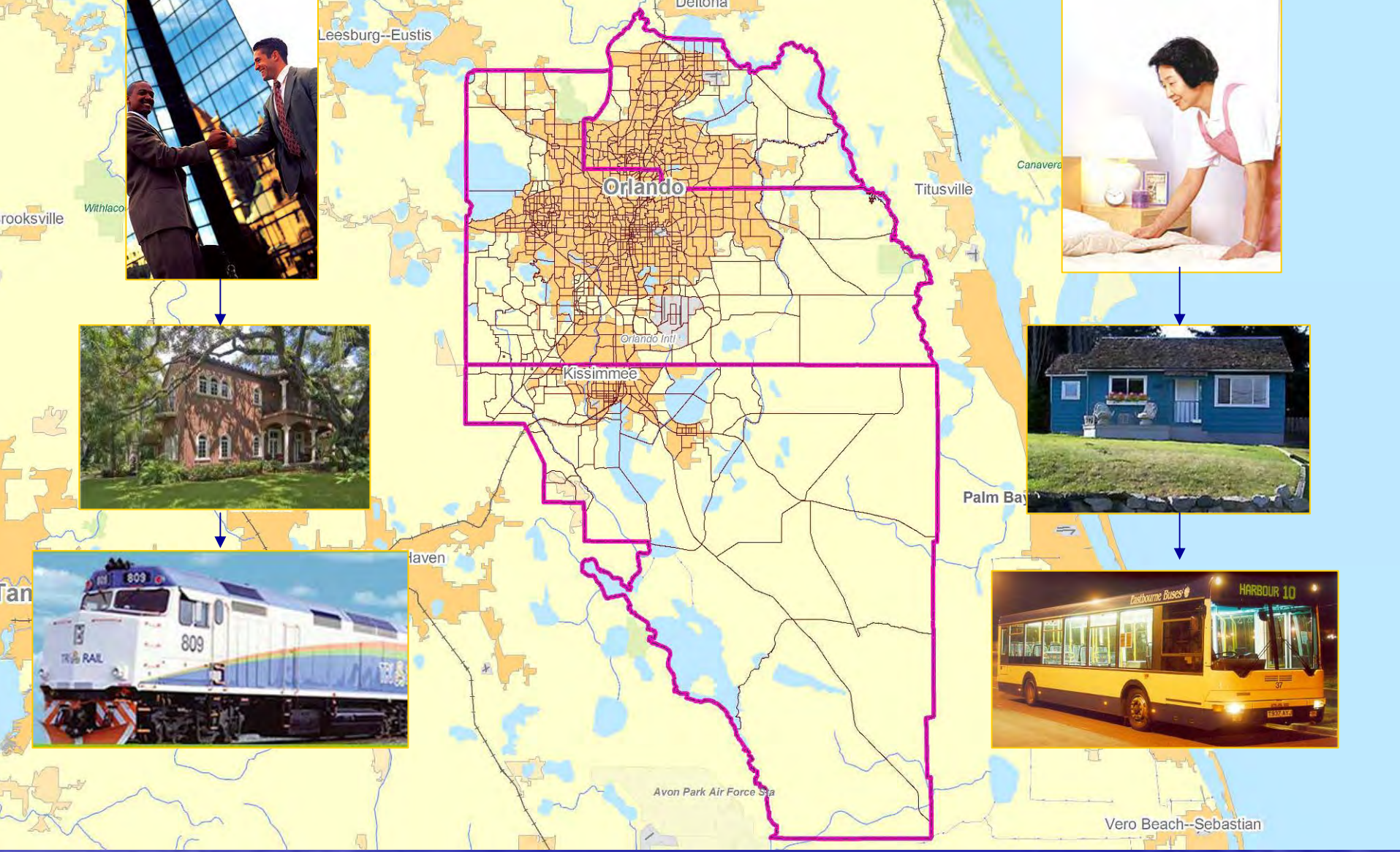


Lifestyle Analysis - where do people live, and where do they work?

TRIP CHARACTERISTICS BACKGROUND

STUDY OBJECTIVES

This study will develop a relationship between income and property values by TAZ, set up trip characteristics using existing data, develop a test case, and develop a survey. Trip Generation rates will be in different categories such as low, medium, and high income using property values from parcel level data as a surrogate for income. METROPLAN already has the parcel level data in the LUFAM model. The model structure will be developed and ready for the next round of validation for the LRTP update.

TASK 1: Develop relationship between property values and income for OUATS TAZs

TASK 2: Methodology for Trip Characteristics using existing data

A: Review Census Data

B: Review existing survey

C: New script files development

TASK 3: Perform a test case for OUATS using new procedure

TASK 4: Develop a survey of Trip Generation and Trip Distribution to check tested procedure

TASK 1: DEVELOP RELATIONSHIP BETWEEN PROPERTY VALUES AND INCOME FOR OUATS TAZs

- Determine relationship of residential parcels into Productions: High, Medium and Low ranges using property values
- Determine relationship for Commercial, Office, and Industrial into Attractions: High, Medium, and Low ranges using employment.

Productions

Suggested Production and Attraction Property Value Range for HBW

Production Category	2000 Income Value Range (Dollars)	2005 Property Value Range (Dollars)	Ex. TAZ 100 Data	
			SF	MF
Low	0-30,000	0-105,000	50	80
Medium	30,001-70,000	105,000-245,000	100	20
High	>70,000	>245,000	20	0

Attractions

NAICS (North American Industry Classification System) codes to SIC (US Standard Industrial Classification System) Codes

	FSUTMS Codes SIC	High Income	Medium Income	Low Income	Ex. TAZ 100 Data		
					H	M	L
Industrial	1-39	5	20	75	5	20	75
Commercial	50-59	10	30	60	10	30	60
Service	40-44, 60-69	10	60	30	10	60	30

Trip Distribution for HBW

Production:

ZDATA1a – High Housing
ZDATA1b – Medium Housing
ZDATA1c – Low Housing

Attraction:

ZDATA2a – High Employment
ZDATA2b – Medium Employment
ZDATA2c – Low Employment

Nine (9) Trip Distributions Gravity Model to detail Trip Interchanges for all trip mixes.

H-H	M-H	L-H
H-M	M-M	L-M
H-L	M-L	L-L

Variables for Trip Distribution:

Trip Length
Network

(Note: Auto occupancy may also vary with Trip Combination)

Modal Split

Mode9.syn files may be added for each additional trip combination. The mode split procedure may be refined or run in the current model chain.

Traffic Assignment

Follow current equilibrium loading for calculation.

Transit Assignment

To be reviewed and adjusted as necessary.

Evaluation of Highway and Transit Loading

Counts and loads, and % RMSE for links and link groups will compare loads.

Adjustment of New Procedure

After review of new procedure adjustment will be made to help the modeling procedure (more or less GM, vary % distribution of employment, different grouping of employment, etc.).

Survey

The output of the new modeling procedure will be the recommendation for a survey to obtain data (high, medium, low) for Productions and Attractions.

GENERAL TRAVEL DEMAND MODELING SERVICES

- Ohio Department of Transportation, October 2004
- HBW 4 Income Quartiles – NAICS
- Attractions equation from correlation between surveyed attraction and available SE variables

Aggregation of NAICS Employment

Category	2-Digit SIC[1]	2-digit NAICS
Basic	01-51	11-42, 48, 49, 51 (50%)
Retail	52-59	44, 45
High Income Service	60-67, 80, 81, 87, 89, 91-97	52, 53 (80%), 54 (80%), 55, 62 (90%), 92
Low Income Service	70-79, 82-86, 88	51 (50%), 53 (20%), 54 (20%), 56, 61, 62 (10%), 71, 72, 81

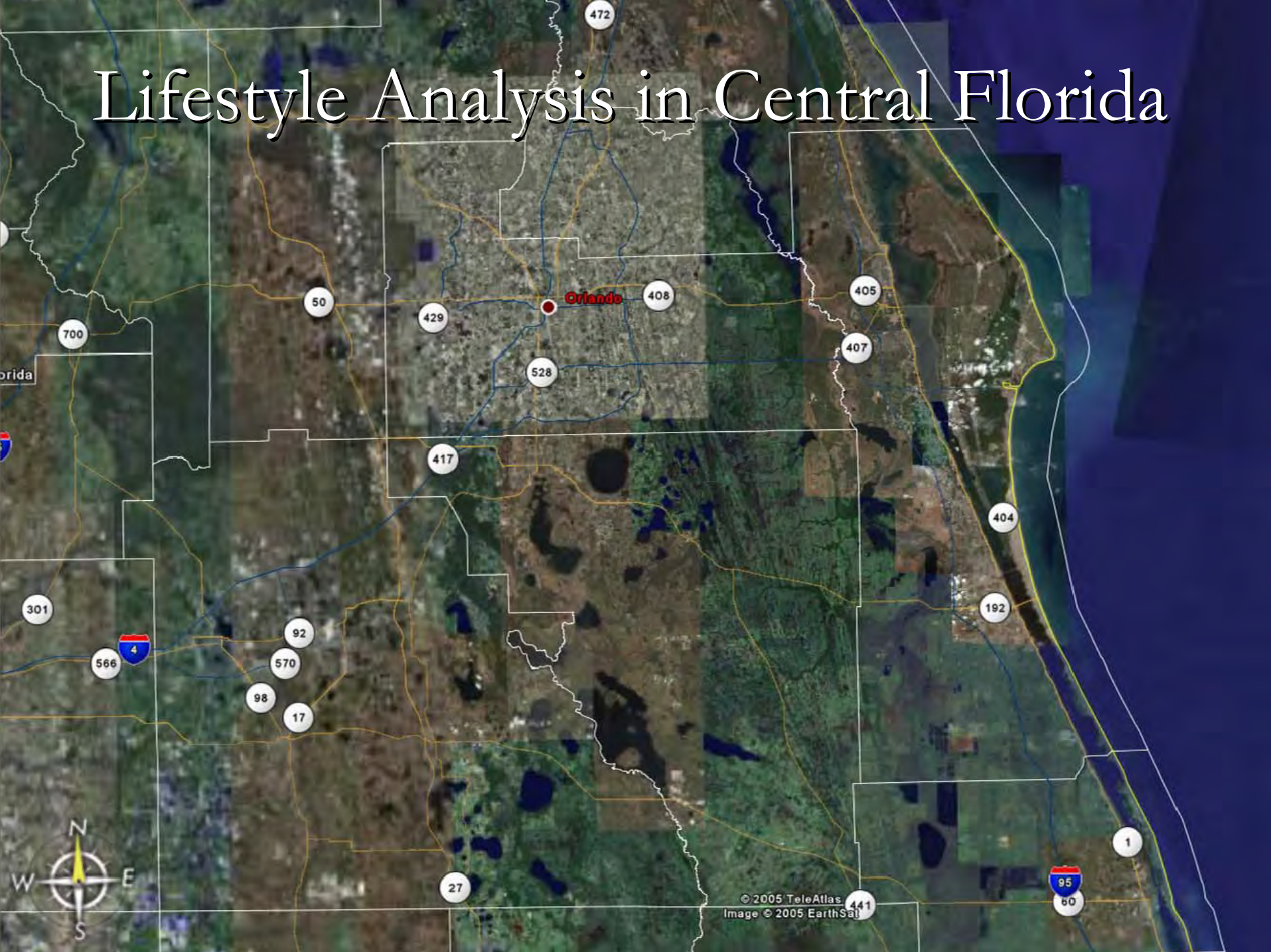
[1]*Model Specifications and Data Collection Program for Small MPO Study Areas in Ohio, ODOT (1999)*

HBW – Option 3

Dependent Variable	Attraction Model
Income Quartile 1 Attractions	[Low Income] $^{0.800857}$
Income Quartile 2 Attractions	0.504*[Low Income]
Income Quartile 3 Attractions	0.387* [Retail] + 0.385* [High Income] + 0.270*[Basic]
Income Quartile 4 Attractions	0.844* [High Income] + 0.369*[Basic]

GIS to Forecast Transportation Needs

Lifestyle Analysis in Central Florida



GIS Technologies

ArcGIS – The Comprehensive Geographic Information System

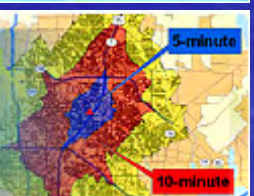
ArcView – Desktop GIS for Mapping, Data Integration, and Analysis

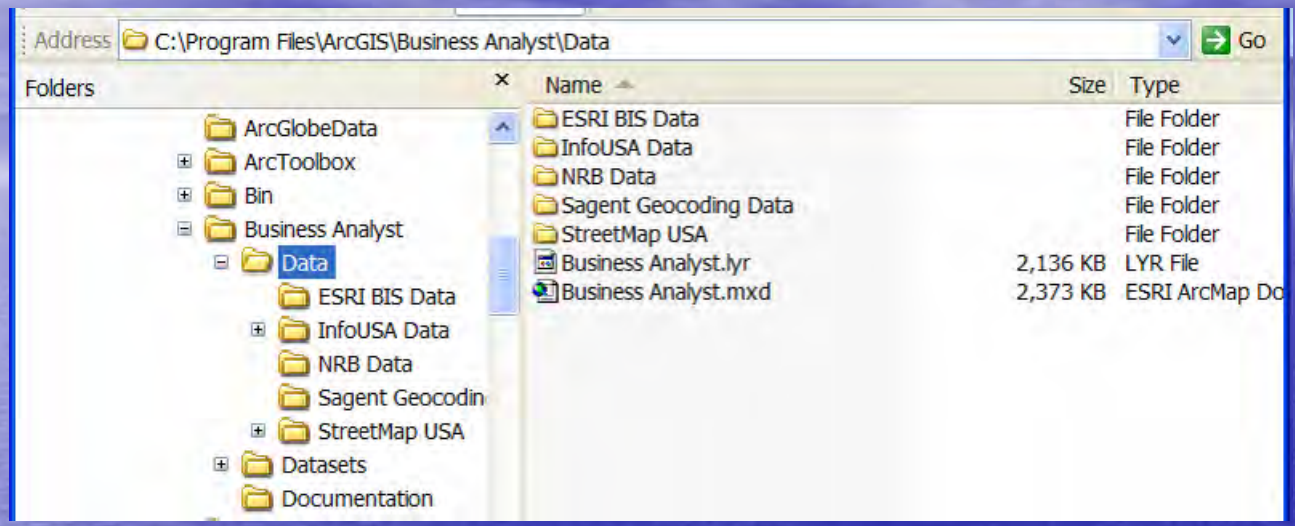
ArcGIS Spatial Analyst
Advanced Raster GIS Spatial Analysis

ArcGIS 3D Analyst – Three-Dimensional Visualization and Analysis

ArcIMS – Publish Maps, Data, and Metadata on the Web

ArcGIS Business Analyst – Advanced Business Analysis with a Complete Data Set

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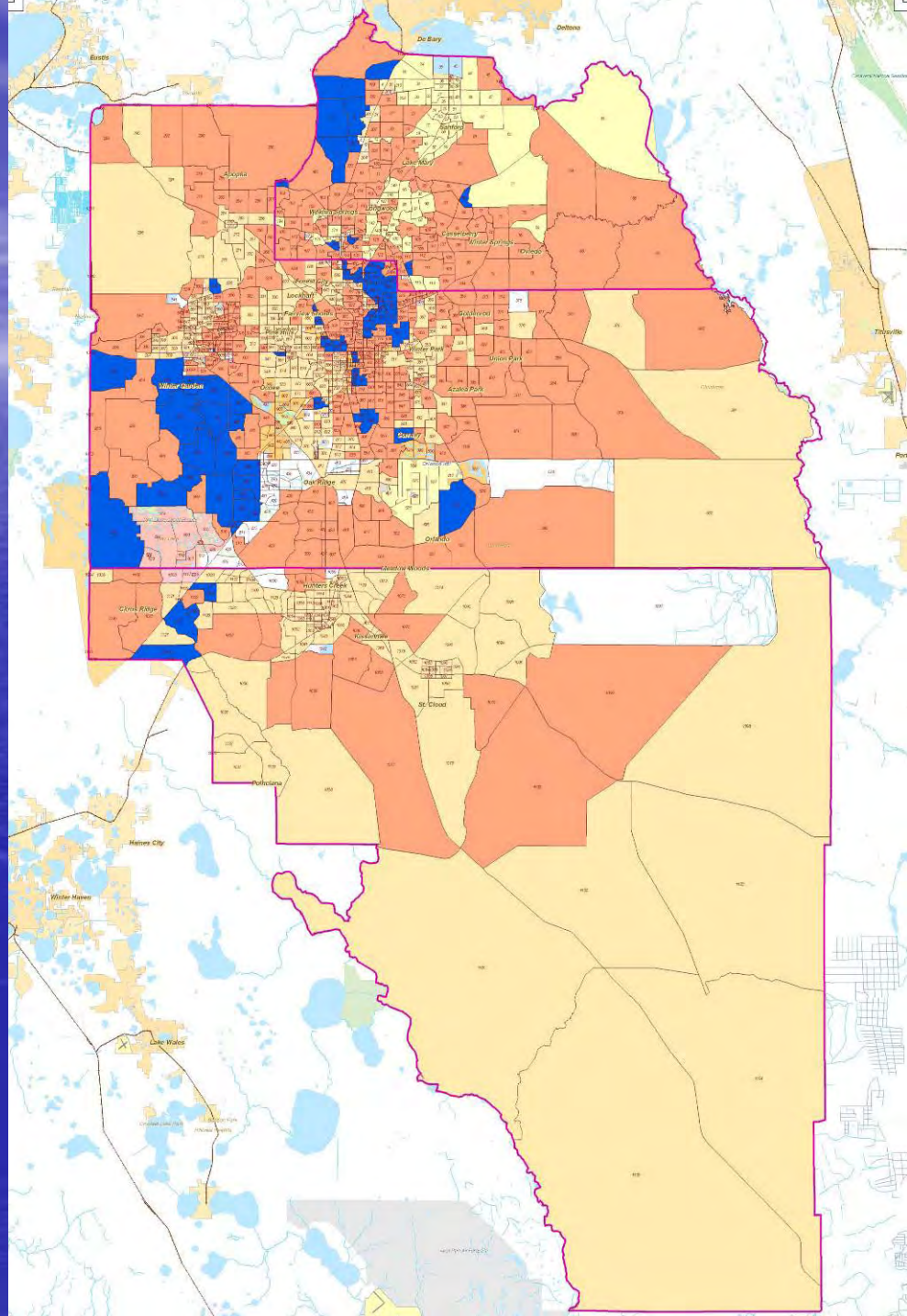
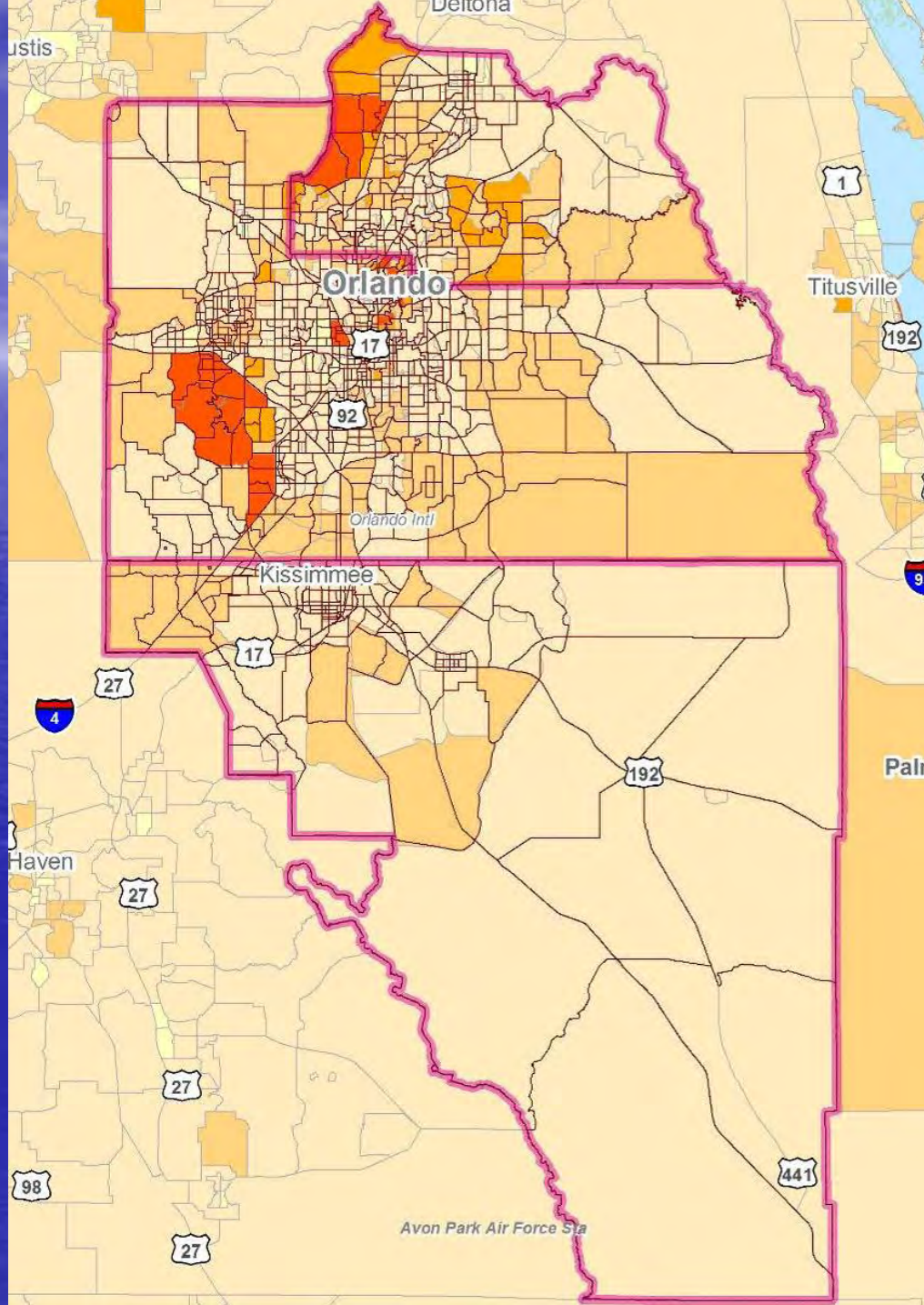
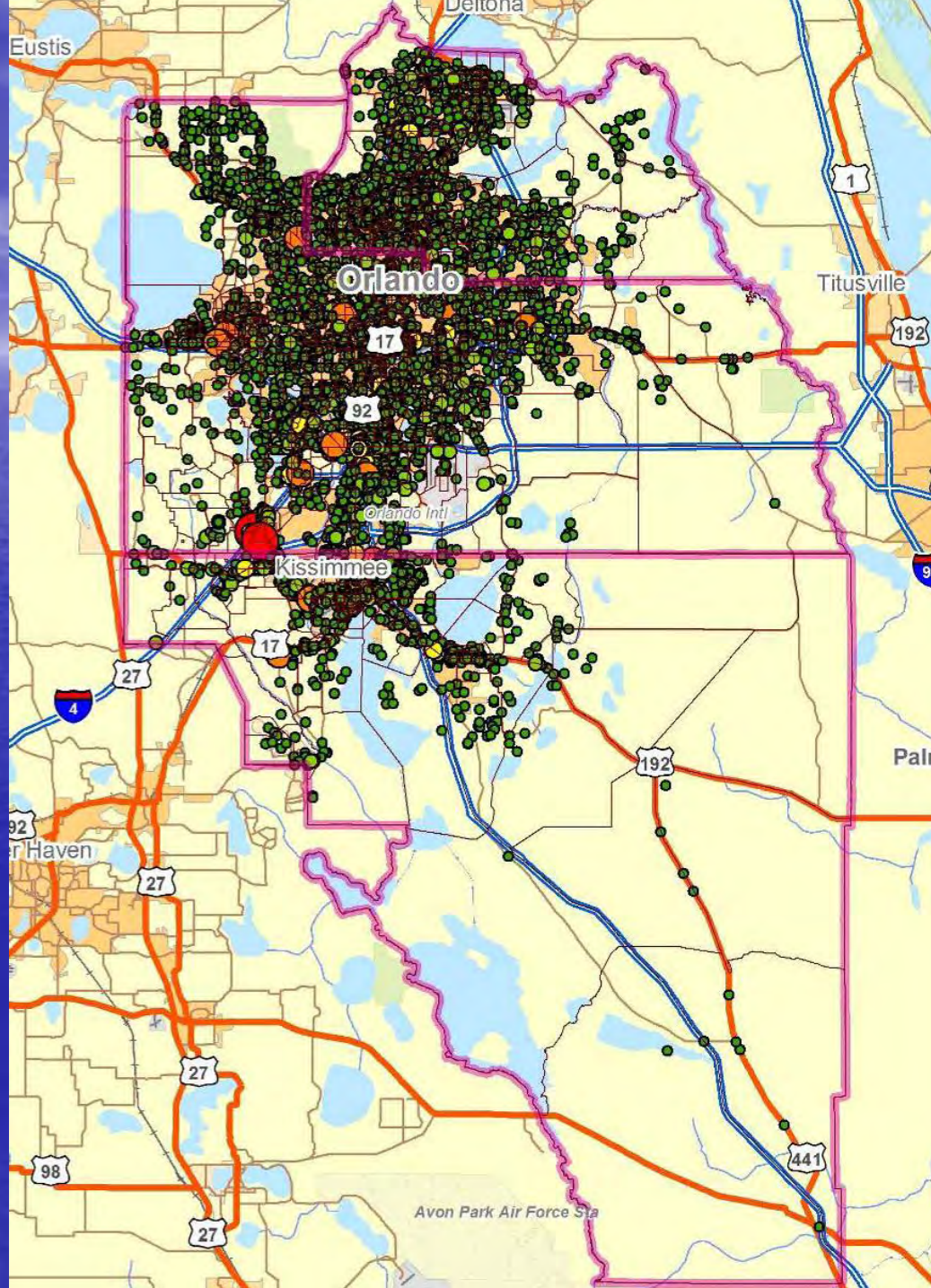
Trip Production- By Assessed Values



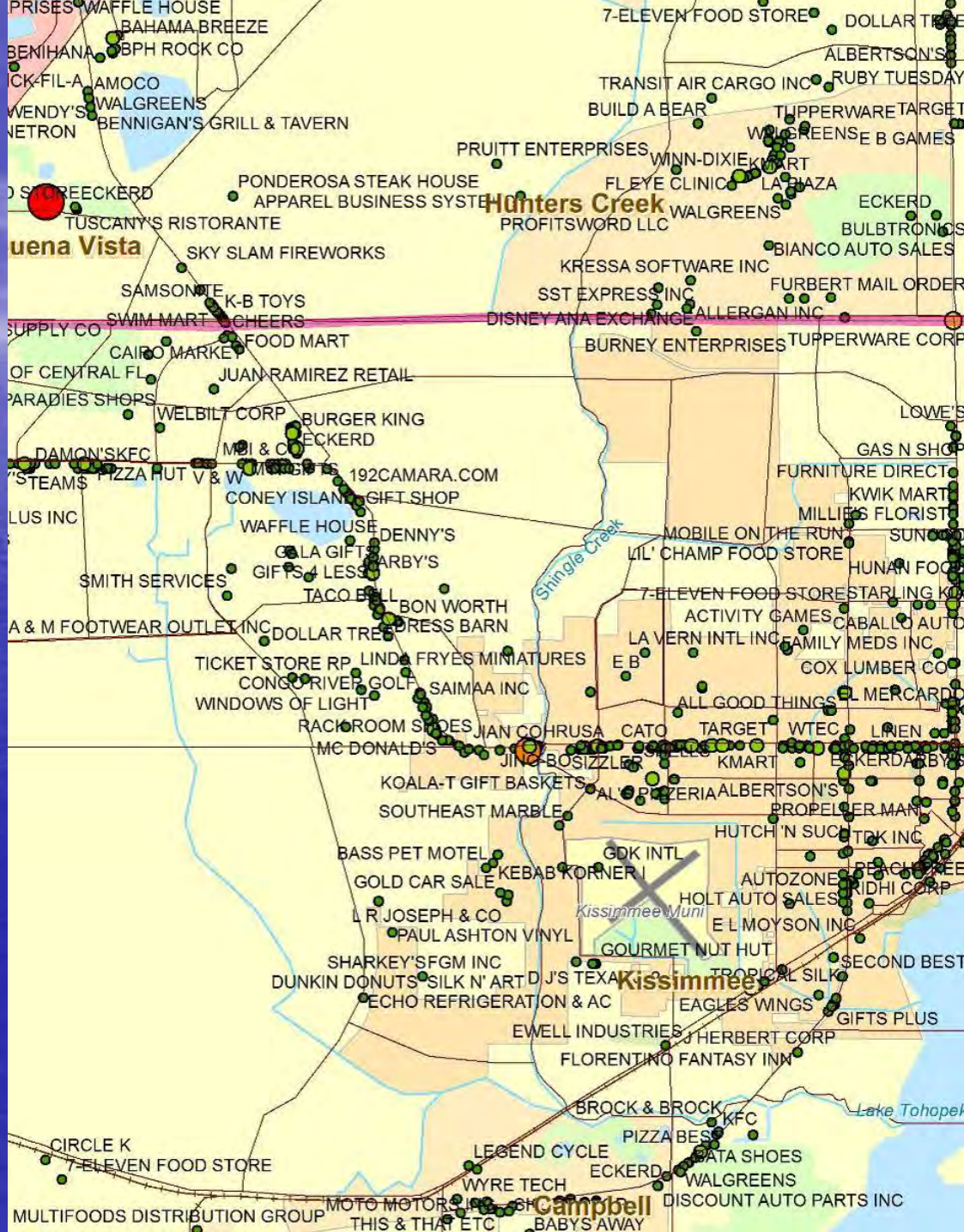
Trip Production- By Median Income



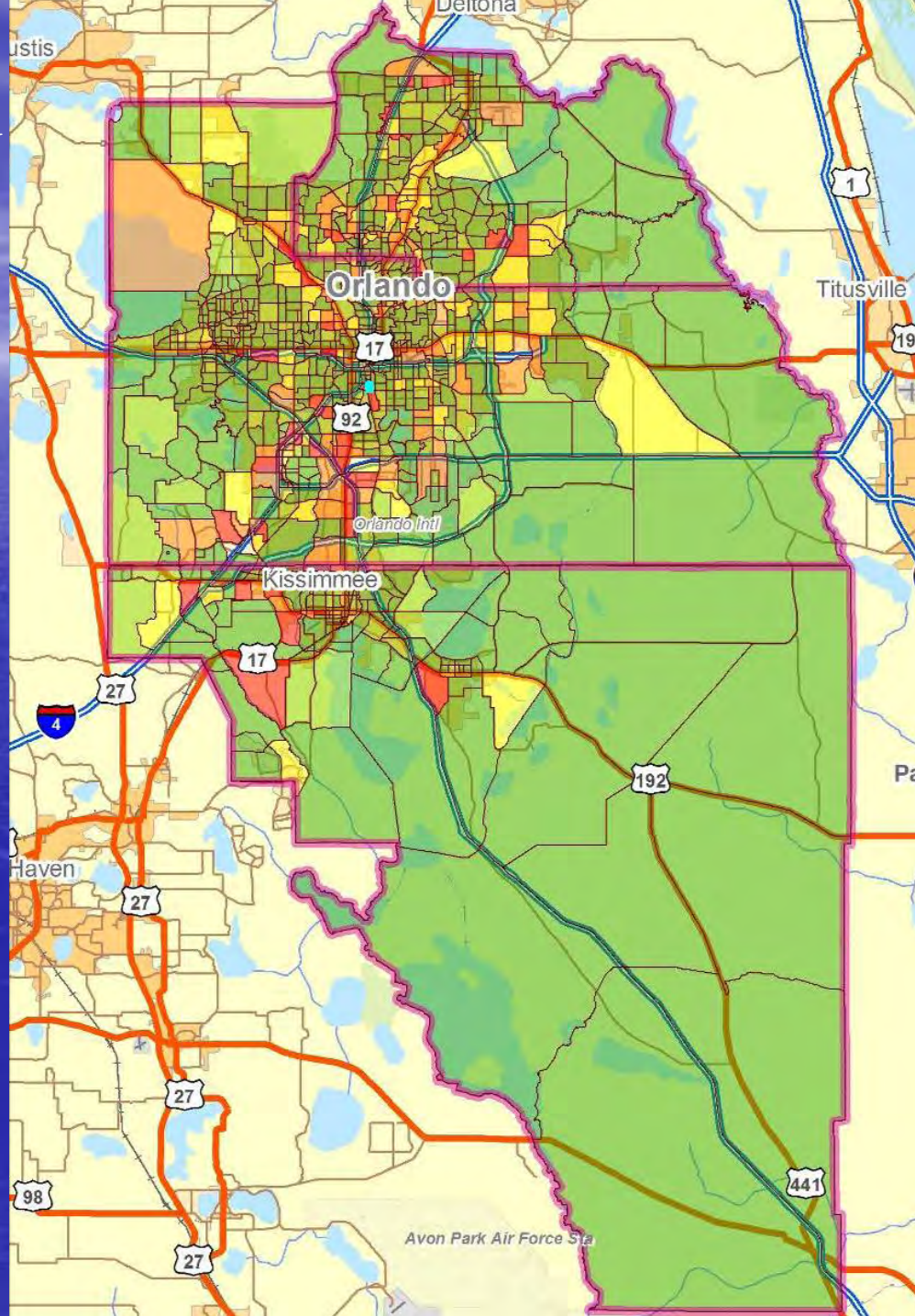
Trip Attraction - By Commercial Employment

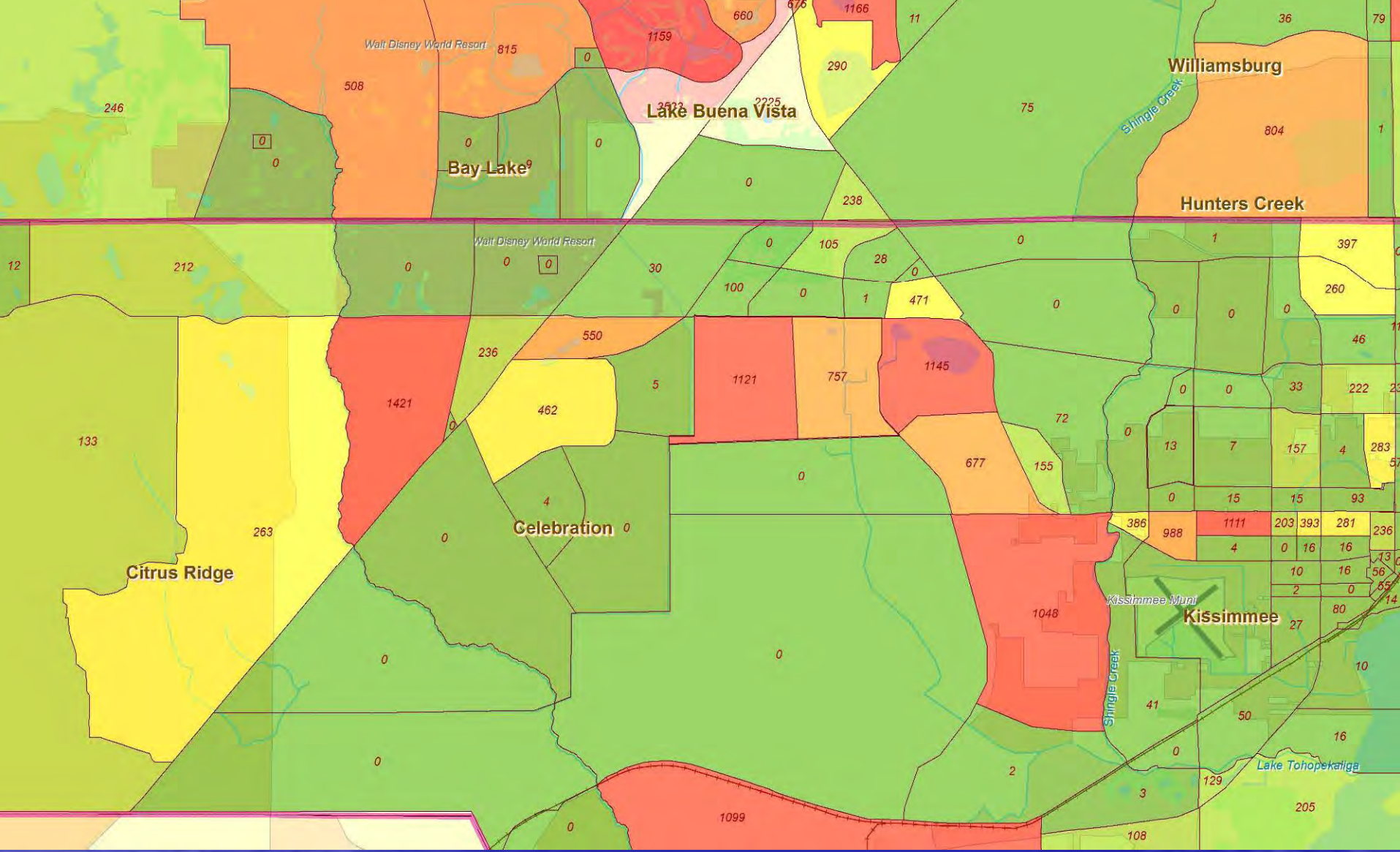


Trip Attraction- By Commercial Employment by Size of Business



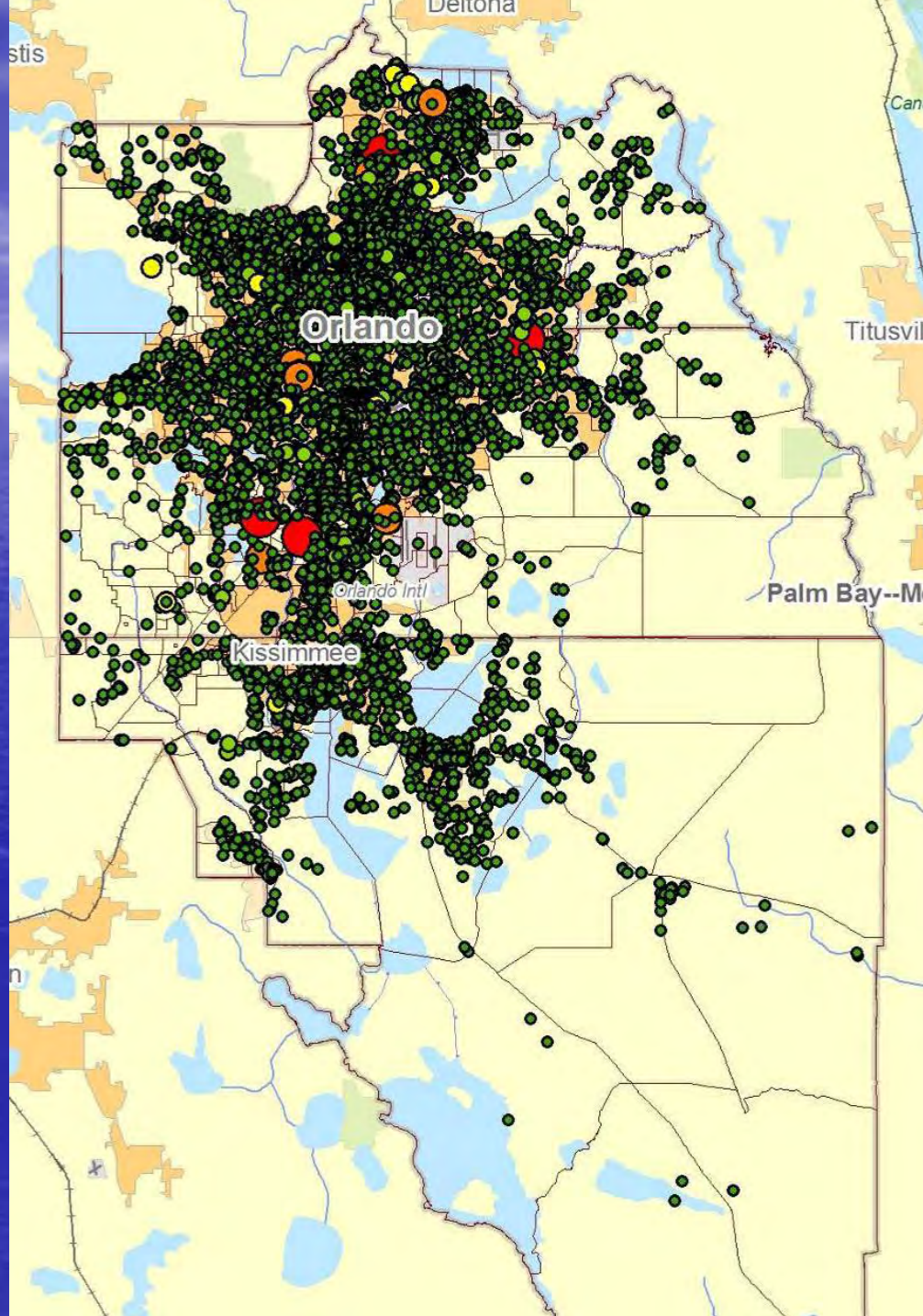
Trip Attraction-By Commercial Employment by TAZ





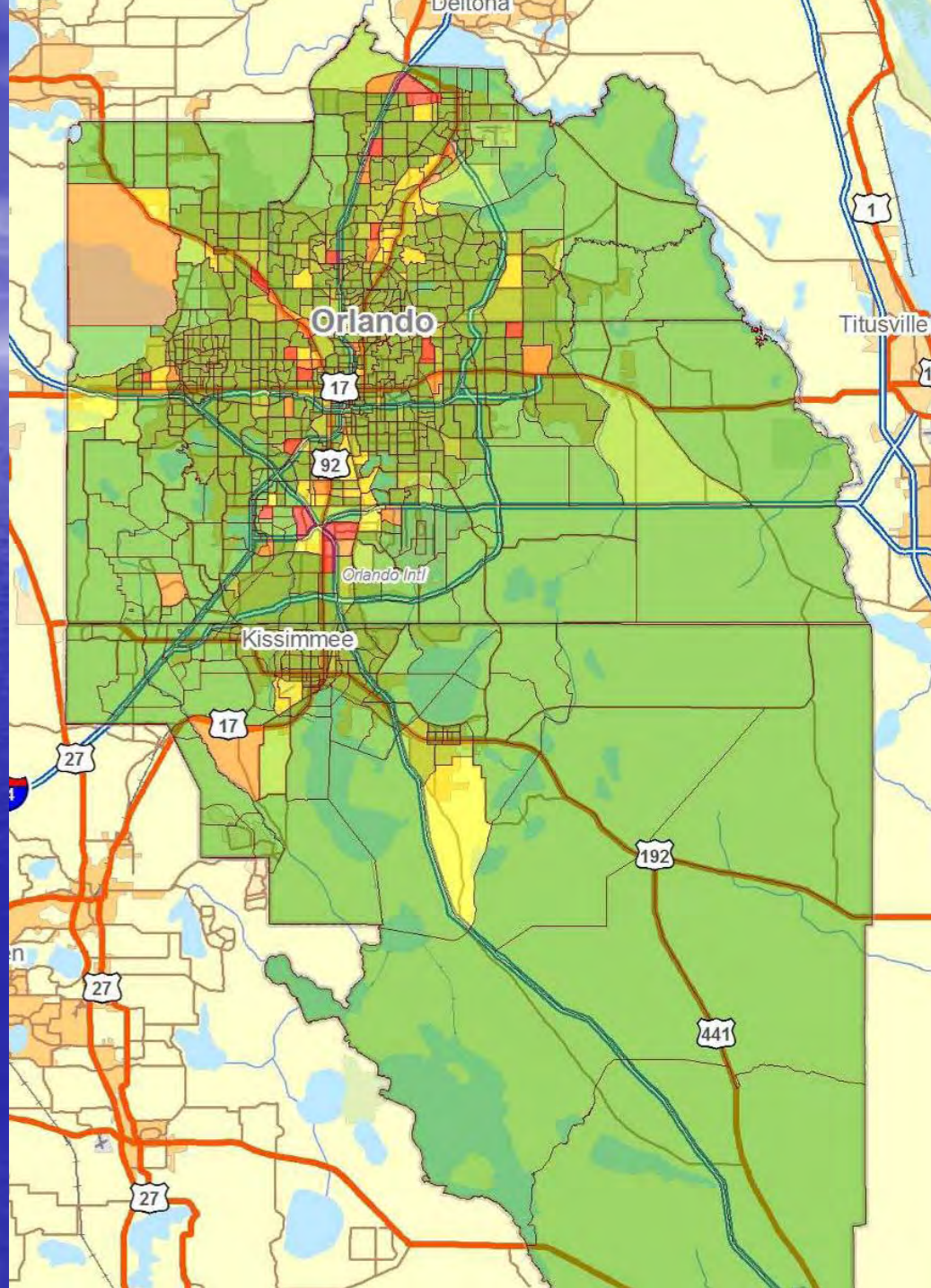
Trip Attraction- By Commercial Employment by TAZ

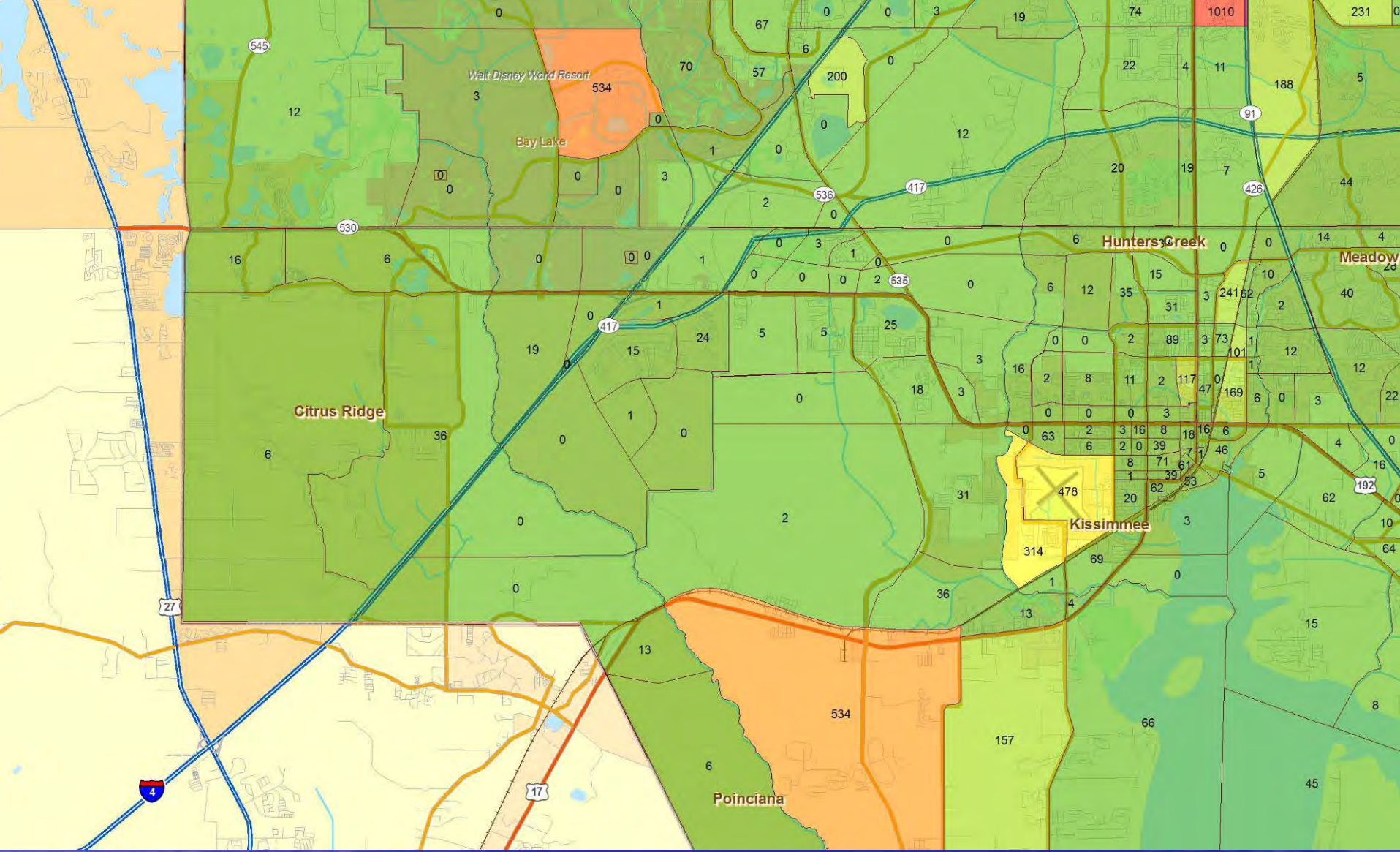
Trip Attraction - By Industrial Employment



Trip Attraction- By Industrial Employment by Size of Business

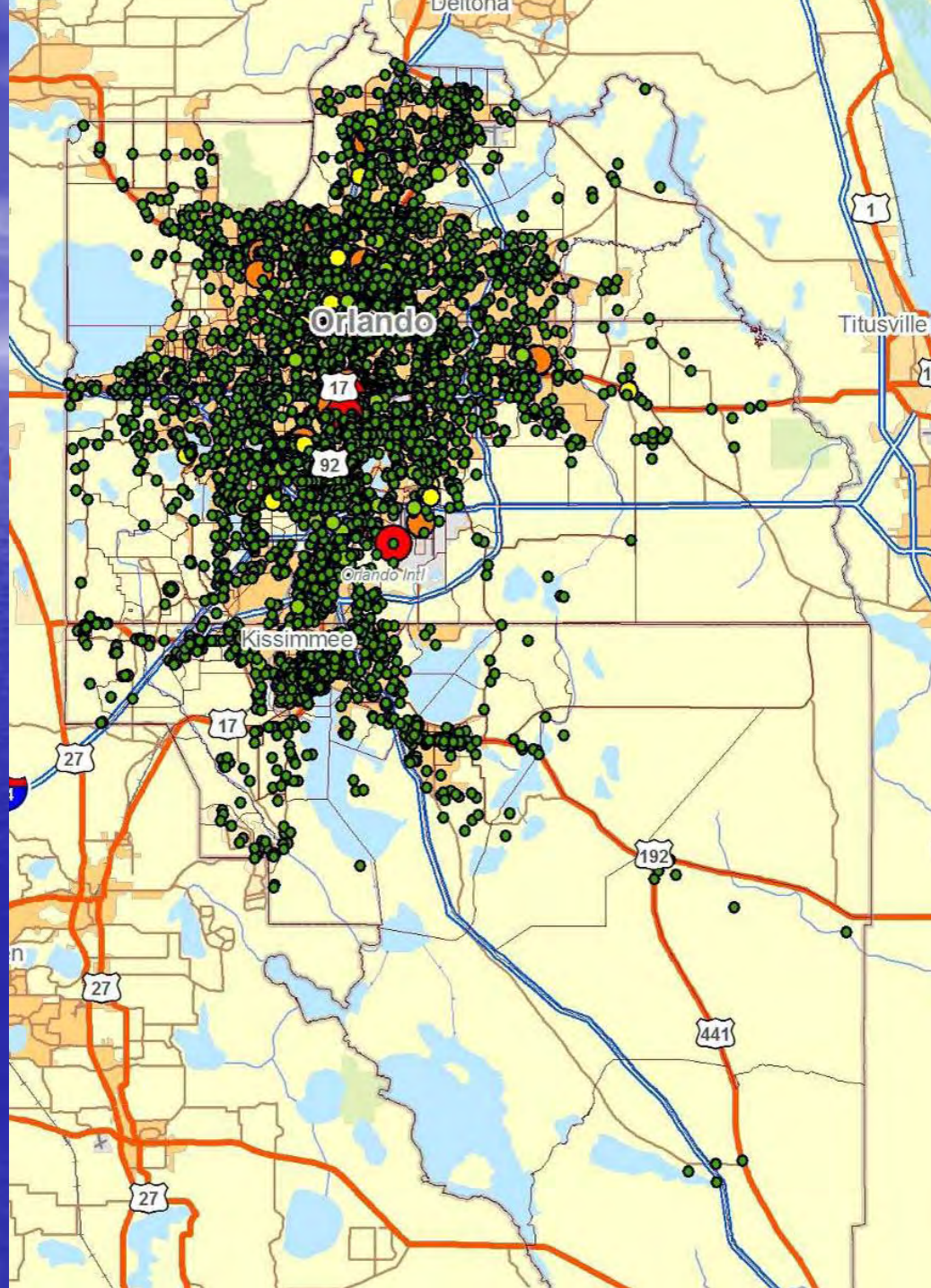
Trip Attraction-By Industrial Employment by TAZ





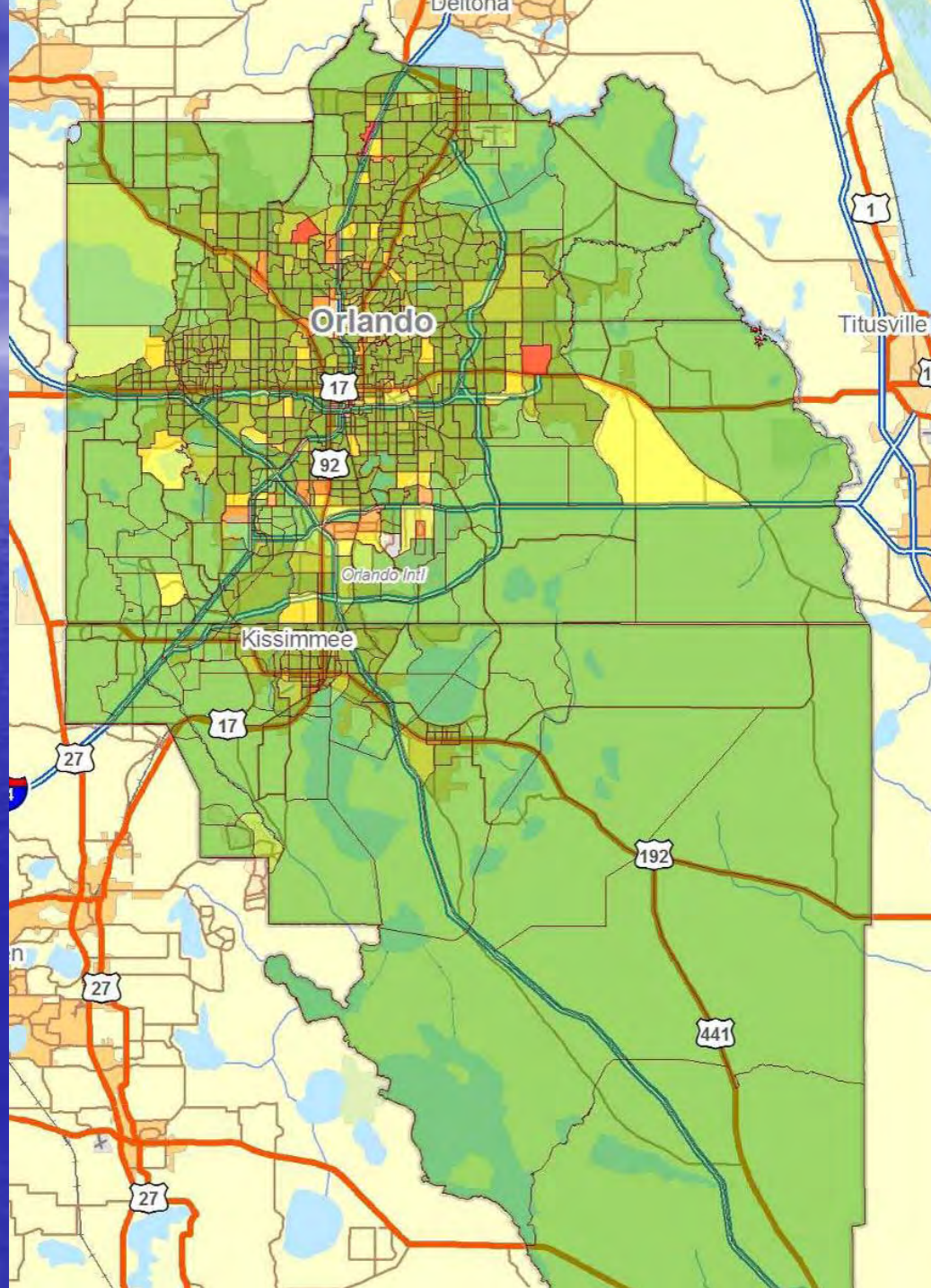
Trip Attraction- By Industrial Employment by TAZ

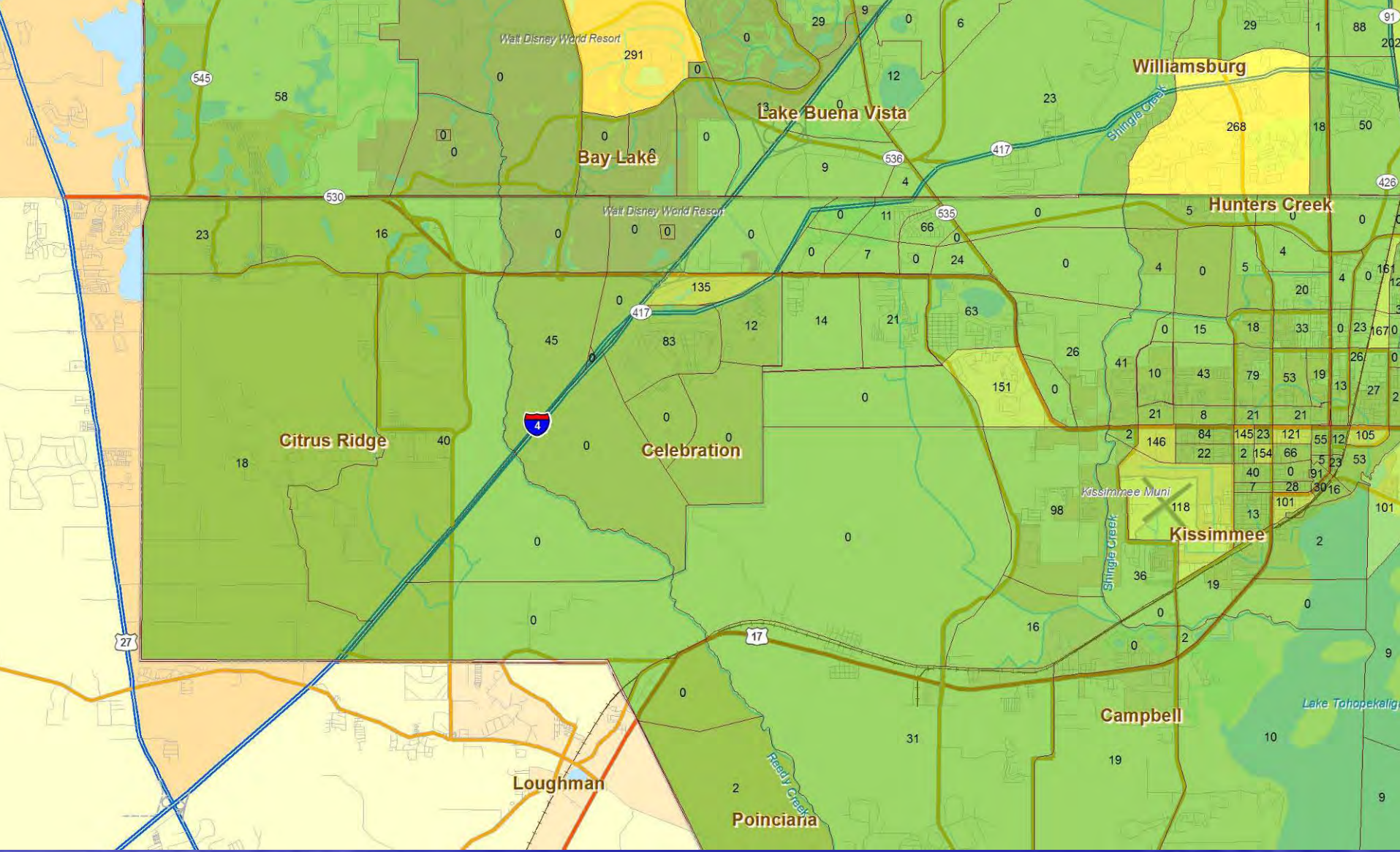
Trip Attraction - By Service Employment



Trip Attraction- By Service Employment by Size of Business

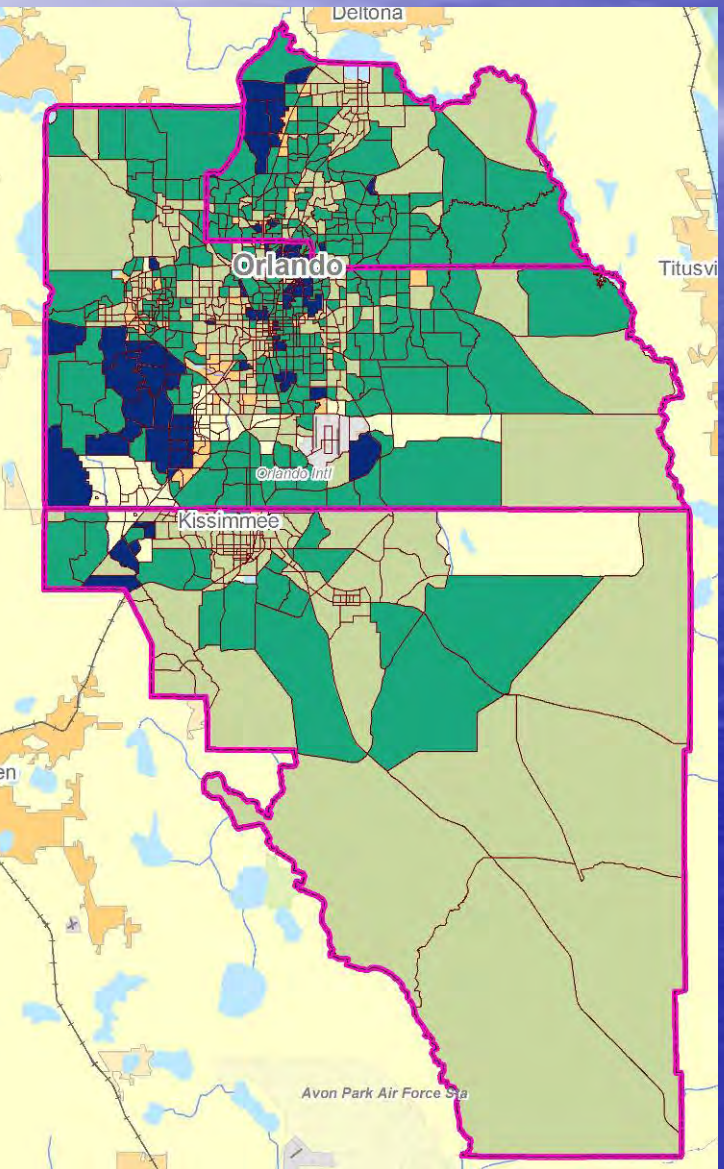
Trip Attraction-By Service Employment by TAZ



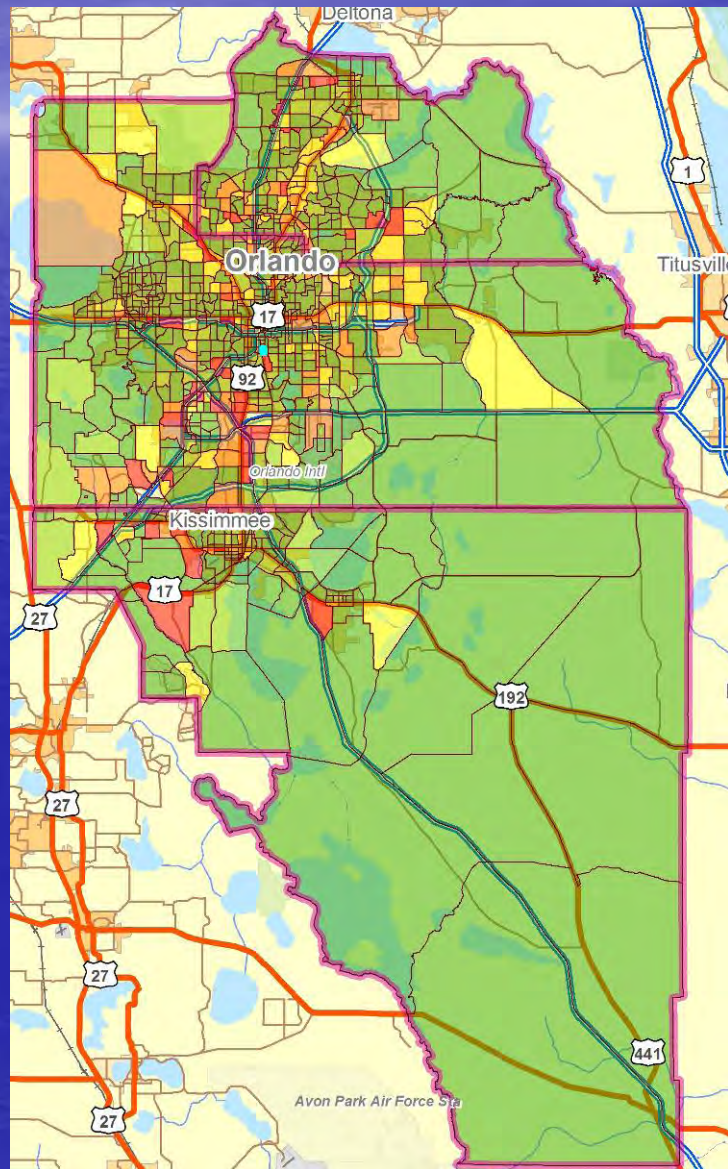


Trip Attraction- By Service Employment by TAZ

Transit Production



Transit Attraction



Thank You!