Florida Statewide Model Update

presented by

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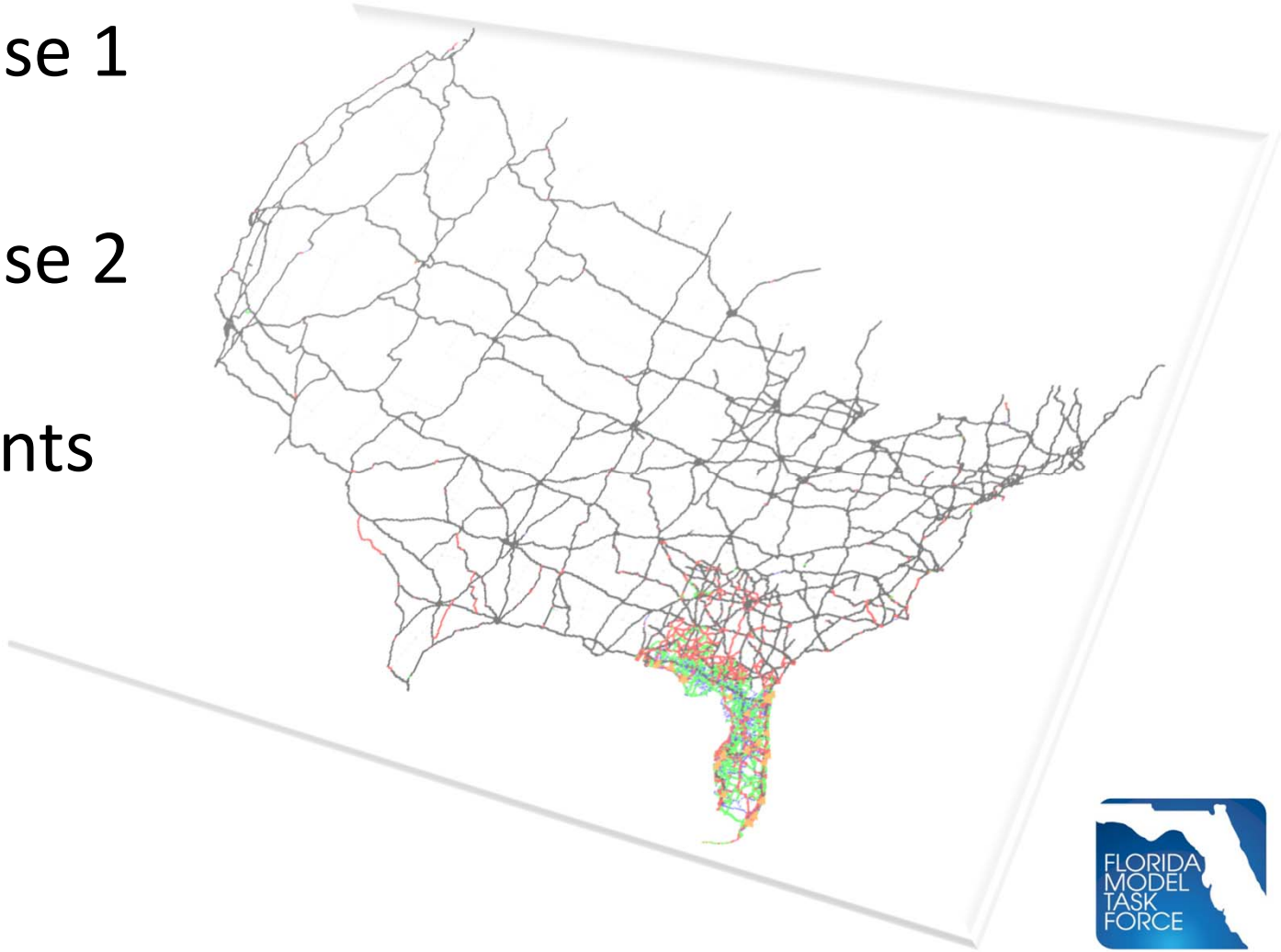
Presentation Outline

- FLSWM Overview
- FLSWM Phase 1 Efforts
- FLSWM Phase 2 Planned Enhancements

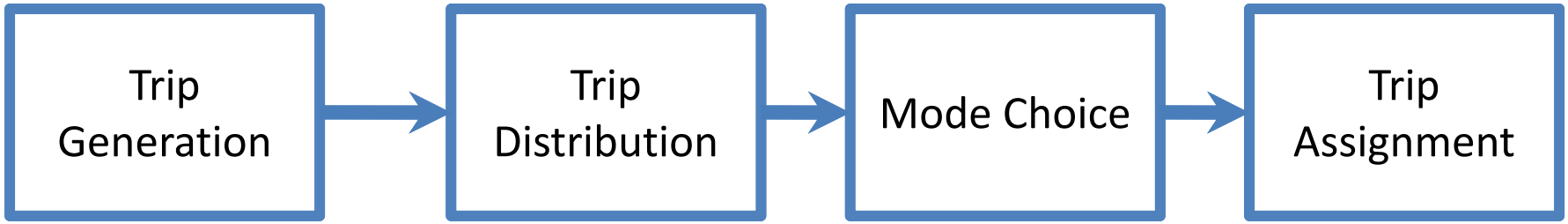


Model Overview

Cube/Voyager Model

Model Overview


- Traditional four-step model on the passenger side



- Provides traffic analysis capability for all areas of the state
- Rural area forecasting capabilities where local models have not been developed
- Currently no plans to move the FLSWM to an Activity-based Model (ABM)

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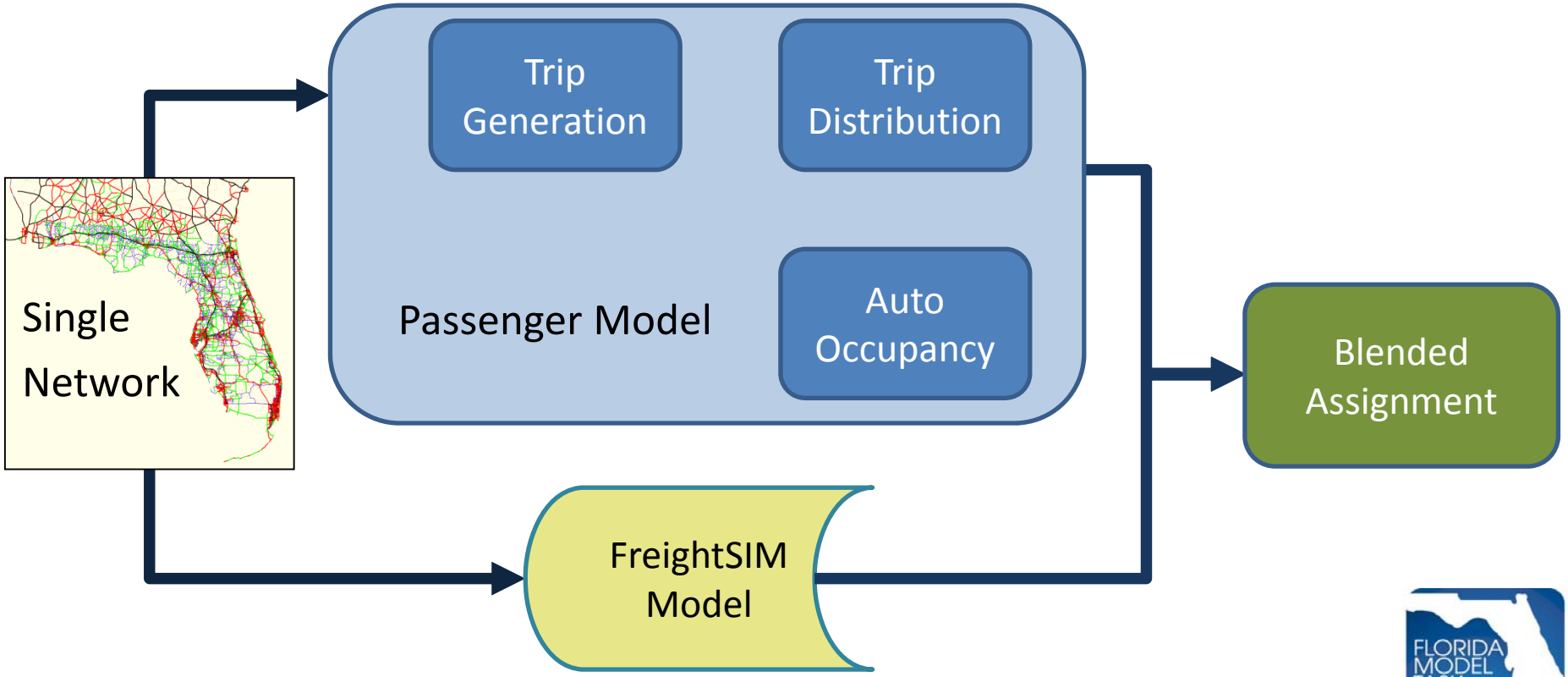
Model Overview

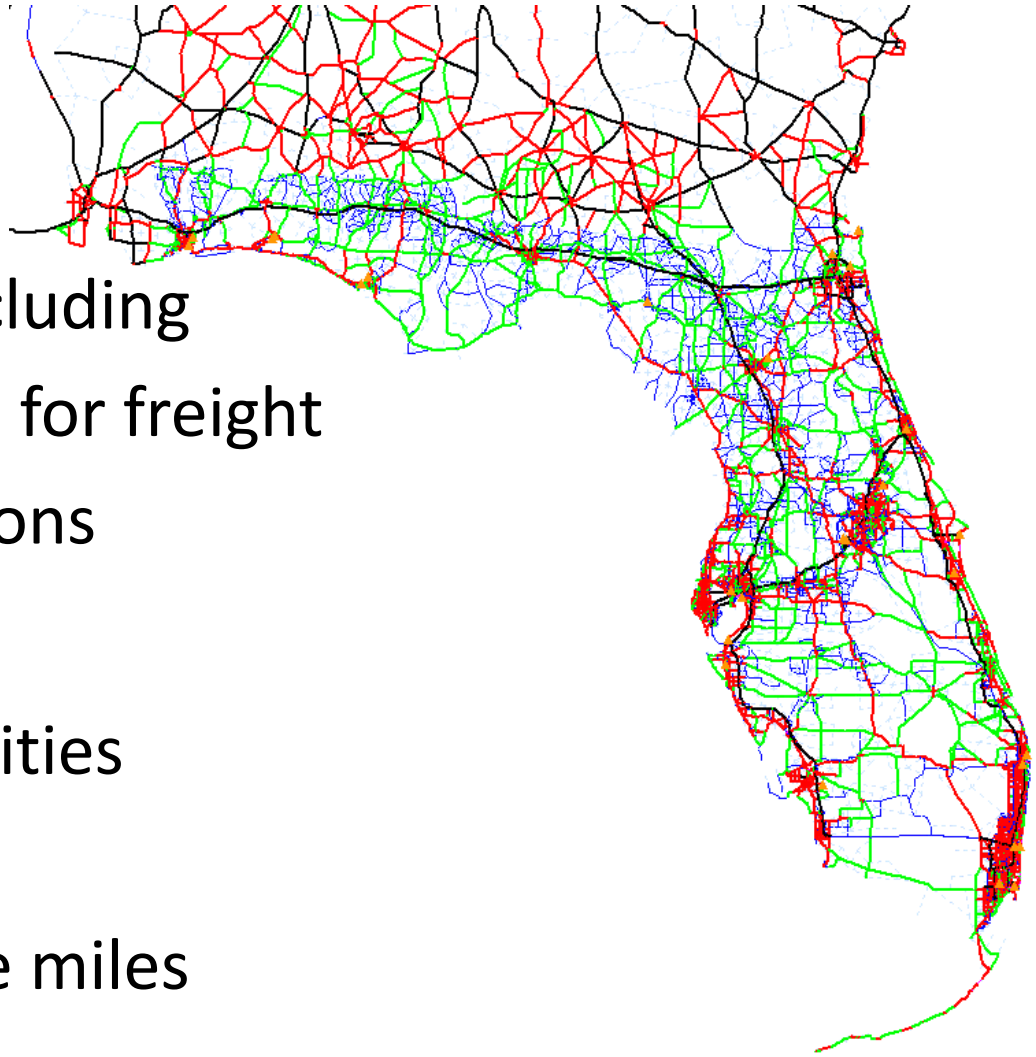
FLSWM is two models – passenger model and freight model

Single Network - Blended Assignment Methodology



Model Overview

- Zonal Structure
  - 8,518 Florida TAZs
  - 9,538 total TAZs including out-of-state zones for freight plus external stations
- Network
  - Includes all SIS facilities
  - Many local roads
  - Total of 68,900 lane miles



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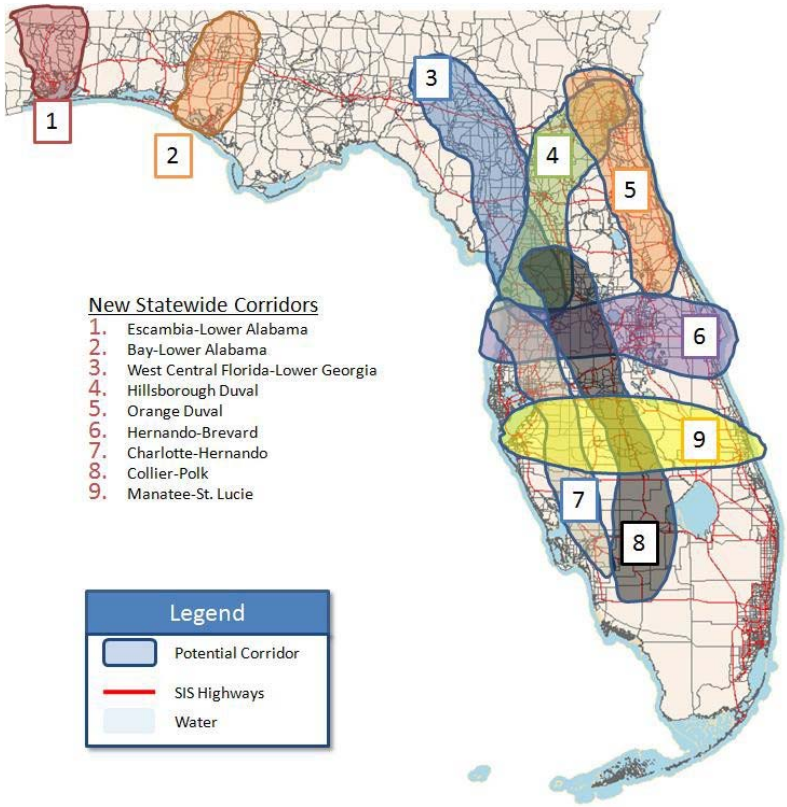
Model Overview

FLSWM Analysis Applications

Existing corridors

Potential corridors



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Model Overview

Other potential uses

- Regional model EE/EI analysis
- Subarea extraction and sub-region model development
  - Rural region model development (i.e. Big Bend)
  - District model development for those with larger rural areas (i.e. District 2 model)
- Freight analysis

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FLSWM Phase 1 Efforts

Overview of 2010 Model Updates

Zones/SE Data	Updated zone structure and socioeconomic data (Pop, DU, Emp)
Network Updates	Updated speeds, area and facility types and refined 2010 count database
Trip Generation	Developed trip rates for each trip purpose by county
Trip Distribution	Updated friction factor curves, recalibrate gravity model, refined trip distribution and length by trip type
Trip Assignment	Updated/refined volume-delay curves by area type and facility type
Truck Component	Incorporated freight model; removed the QRFM components and replaced with standard FSUTMS truck/taxi purpose

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FLSWM Phase 1 Efforts

Network updates

- Posted speeds now used
  - Main source is the RCI database for the state system
  - Many local roads have been updated via Google's streetview
- Urban/rural area types refined to reflect 2010 definitions
- Facility types refined to reflect FDOT functional classifications
- 2010 counts input onto the network
  - Used 2010 Turnpike State Model count database as a reference to improve on count accuracy in volume and location where necessary

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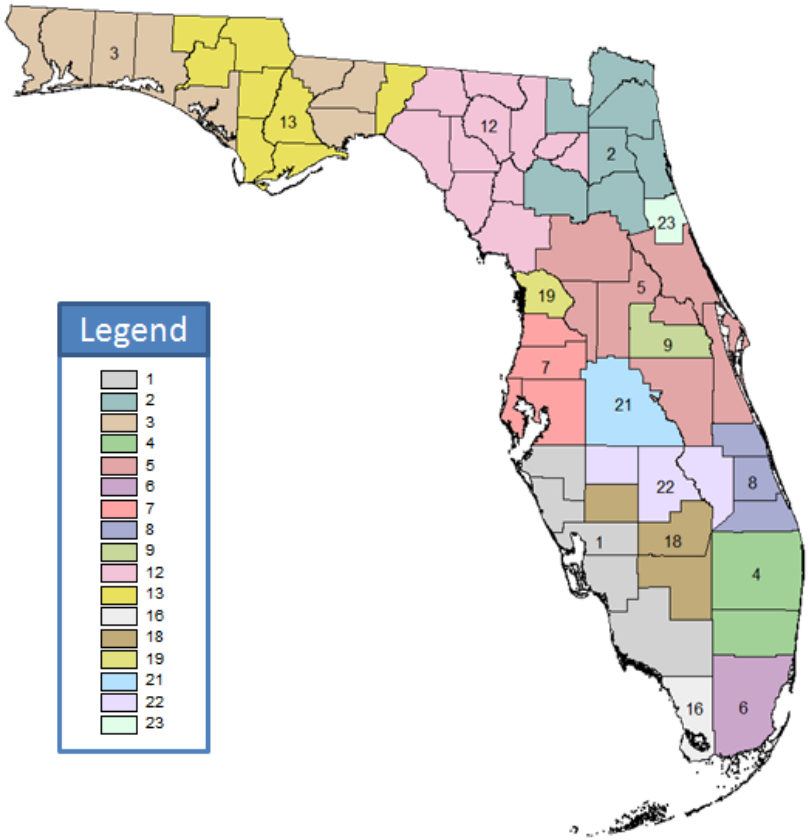
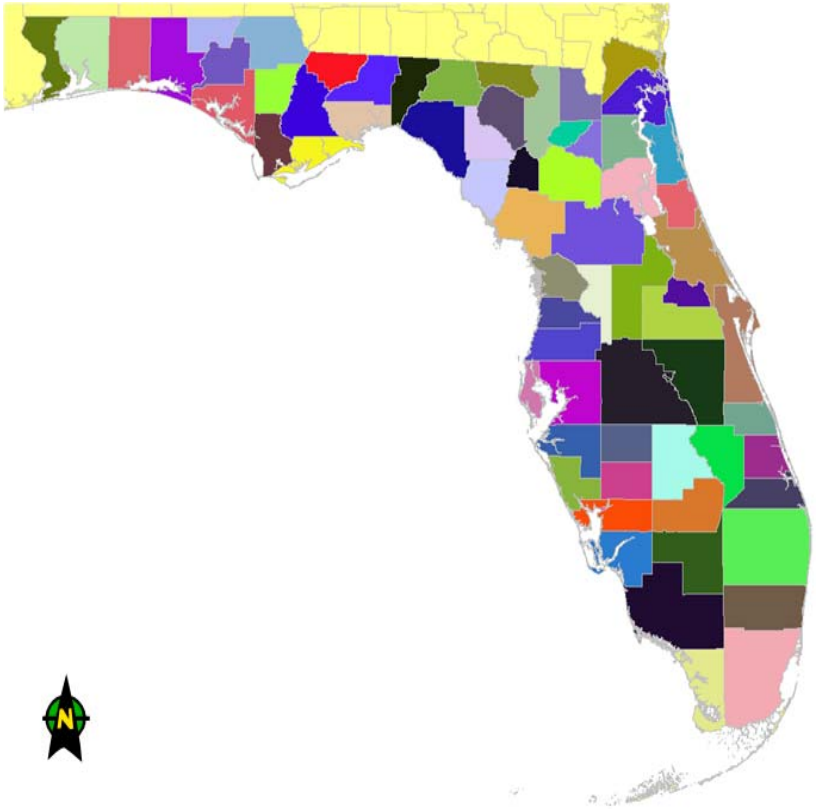
FLSWM Phase 1 Efforts

Trip Generation Rate Changes

Previous trip generation based on 17 regions



Now trip generation based on 67 areas (county level)



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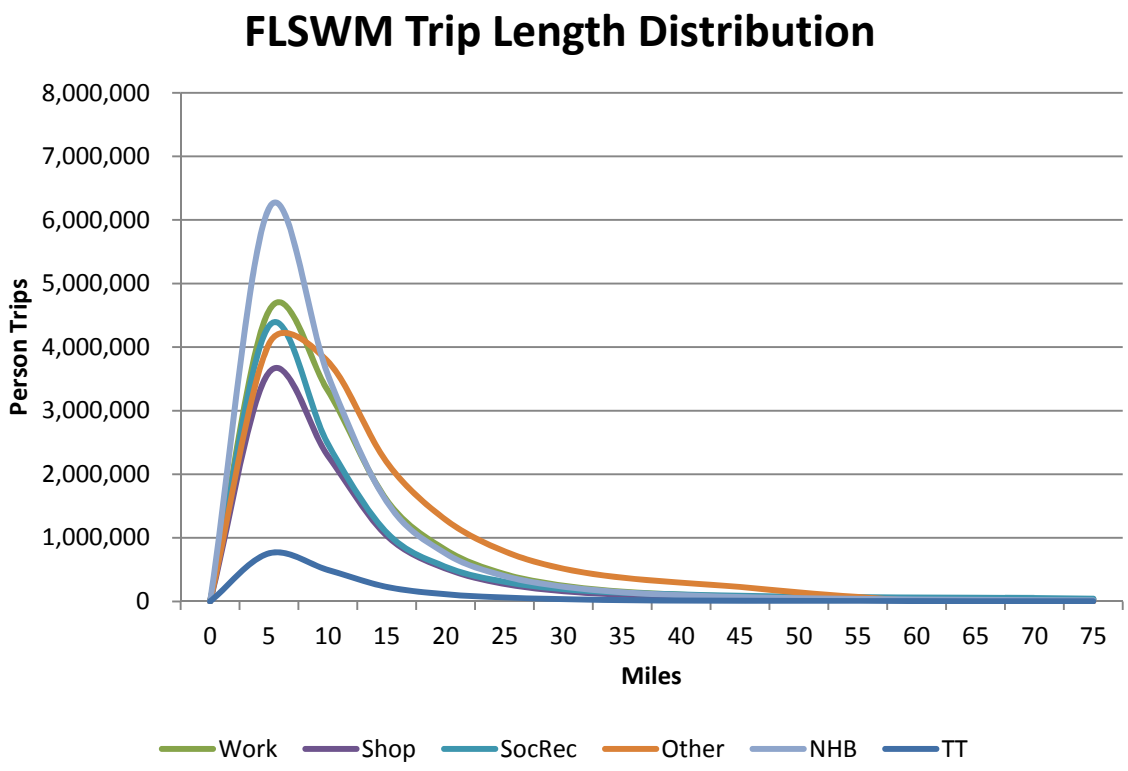
FLSWM Phase 1 Efforts

Trip Distribution Updates



Person Trips			2000
Miles	Total	FLSWM	NHTS
<25	53,799,266	89.6%	92.0%
25-50	4,240,695	7.1%	5.6%
50-150	1,802,312	3.0%	1.8%
150-300	181,488	0.3%	0.4%
>300	-	0.0%	0.2%
Total	60,023,760		
INTRA	4,341,559		

Vehicle Trips			2000
Miles	Total	FLSWM	NHTS
<25	31,333,001	88.6%	92.0%
25-50	2,656,422	7.5%	5.6%
50-150	1,220,485	3.4%	1.8%
150-300	166,730	0.5%	0.4%
>300	-	0.0%	0.2%
Total	35,376,638		

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FLSWM Phase 1 Efforts

Trip Person and Vehicle Trip Purpose Comparison

Old Structure

Person Trip Purposes	Vehicle Trip Purposes
Passenger HBW	Short Urban/Rural
Passenger HBSH	
Passenger HBSR	
Passenger HBO	
Passenger NHB	
Passenger Long-dist. Business	Long-dist. Business
Passenger In-state Tourist	In-state Tourist
Passenger Out-of-state Tourist	Out-of-state Tourist
External/Internal	External/Internal
QRFM Light Truck	Light Truck
Freight model	Medium Truck
	Heavy Truck

New Structure

Person Trip Purposes	Vehicle Trip Purposes
Passenger HBW	Short Urban/Rural
Passenger HBSH	
Passenger HBSR	
Passenger HBO	
Passenger NHB	
External/Internal	External/Internal
Truck/Taxi	Truck/Taxi
Freight model	Medium Truck
	Heavy Truck

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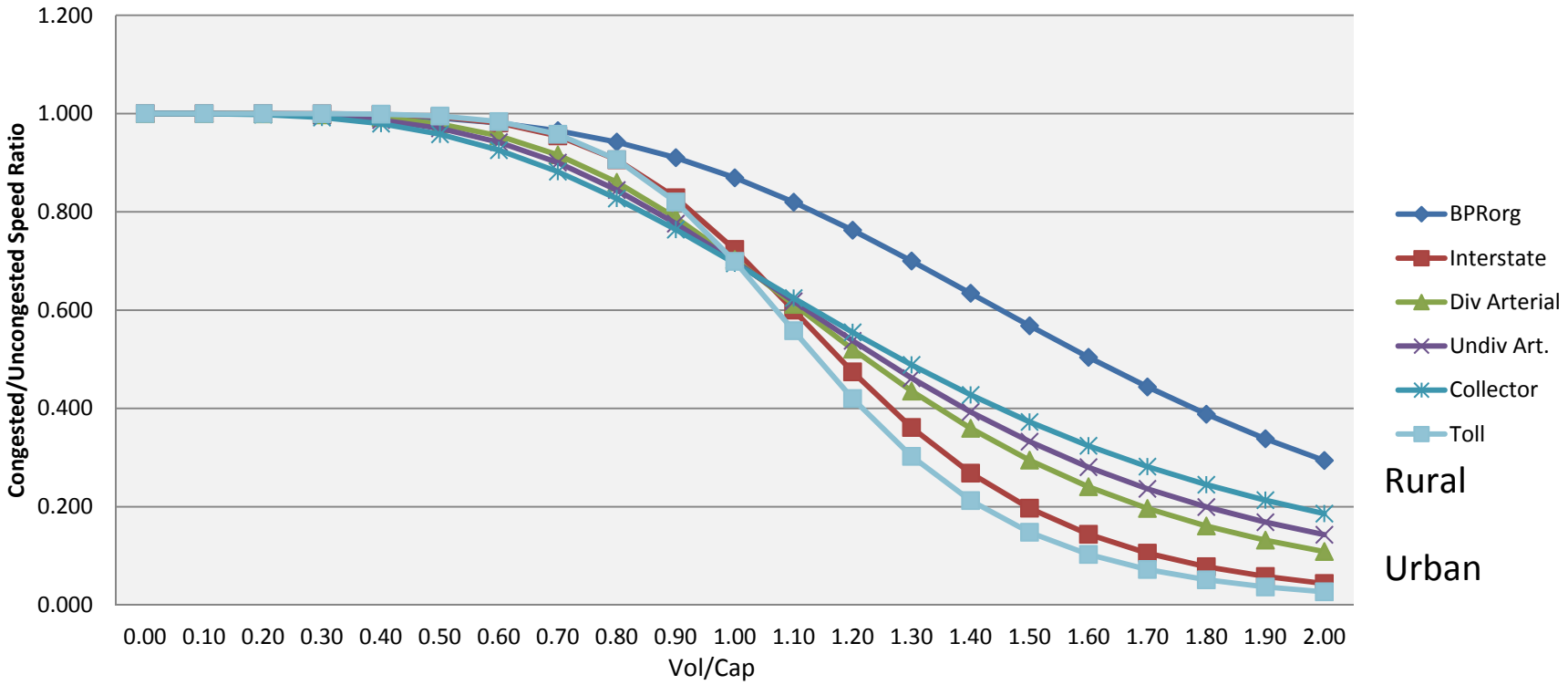
FLSWM Phase 1 Efforts

Volume/Delay Curve Updates

Current FLSW Volume/Delay Curves



FLSWM Phase 1 Efforts

FLSWM FreightSIM

- Only supply chain statewide model in the U.S.
- Captures import/export and domestic freight movements
- Purposes:
  - Support freight planning
  - Evaluate potential large-scale infrastructure investments
  - Provide corridor level freight evaluations
  - Regional transportation planning tool

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FLSWM Phase 1 Efforts

2010 FLSWM Phase 1 Recap

Task	Task Description
A	FLSWM Input Data (Network Updates)
A-1	Update passenger vehicle speeds
A-2	Update truck speeds
A-3	Update facility types based on FDOT functional classifications
A-4	Update capacities
A-5	Back-check of overall network updates
B	Trip Generation Updates
B-1	Develop trip generation rates by county using expanded TSM trip table as a guide
B-2	Rewrite the scripting of trip generation
B-3	Verify trip generation rates are within acceptable ranges
B-4	Reporting/documentation/QA
C	Trip Distribution Refinement
C-1	Recalibrate friction factor curves and the gravity model
C-2	Refine trip distribution by trip type (including long-distance business trip rework)
C-3	Verify trip length distribution reasonably replicates surveys
C-4	Reporting/documentation/QA
D	Trip Assignment
D-1	Develop volume-delay curves
D-2	Refine volume-delay curves
D-3	Finalize model validation
D-4	Reporting/documentation/QA
E	Update Truck Component
E-1	Update truck percentages using 2010 data
E-2	Rewrite the scripting to remove QRFM medium and heavy trucks from that process

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FLSWM Phase 2 Efforts

Phase 2 Goals

Network and Land Use Updates	Migrate to Navteq Bring in more network and make zone splits Bring in parcel data for SE data refinement
Trip Generation	Trip generation by purpose and county in place
Trip Distribution	Trip length distribution by purpose in place
Trip Assignment	Further refine the volume-delay curves Add in a dynamic area type feature Improve volume-to-count ratios and RMSEs
Truck Component	Improve the truck volume-to-count ratios

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FLSWM Phase 2 Efforts

Key network/database enhancements

- Use Navteq network features
- Populate all appropriate Navteq segments with modeling network attributes
- Develop zones and zonal data that are true to Navteq line work and take into account natural feature boundaries such as lakes, rivers, coastal areas, etc.
- Provide an interface that implements a many-to-one conversion process
- Develop a product that gives the ability to
  - warehouse all necessary network attributes in a database
  - bring in the correct attributes and model year into Cube for processing
  - output model attributes back to the database for analysis and use by others
  - reduce model run times (passenger model under 2 hours with 8-core system)
- Bring in parcel data for each county to better geo-reference existing socioeconomic data and provide a mechanism to merge land use modeling with the travel demand forecasting process

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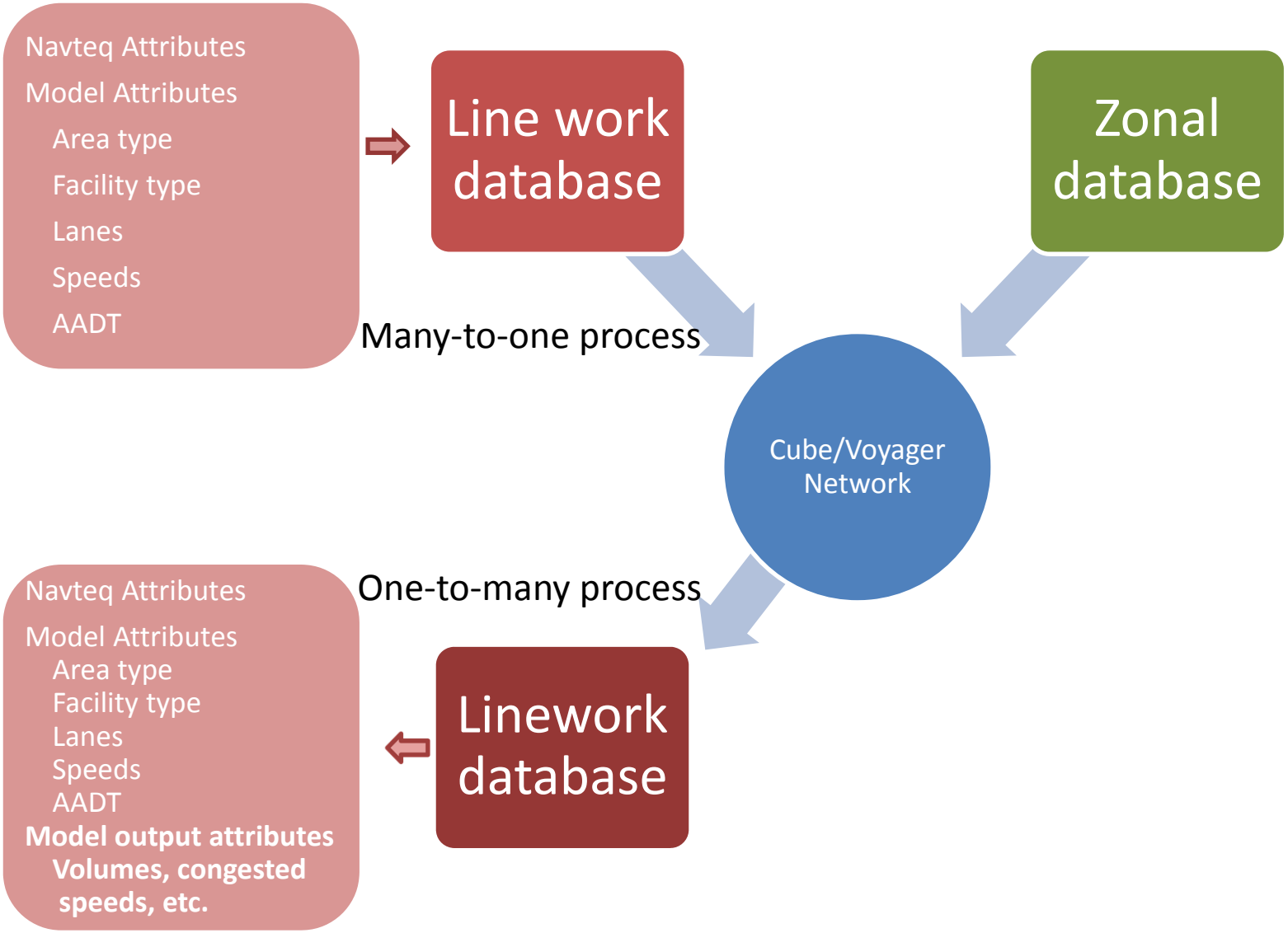
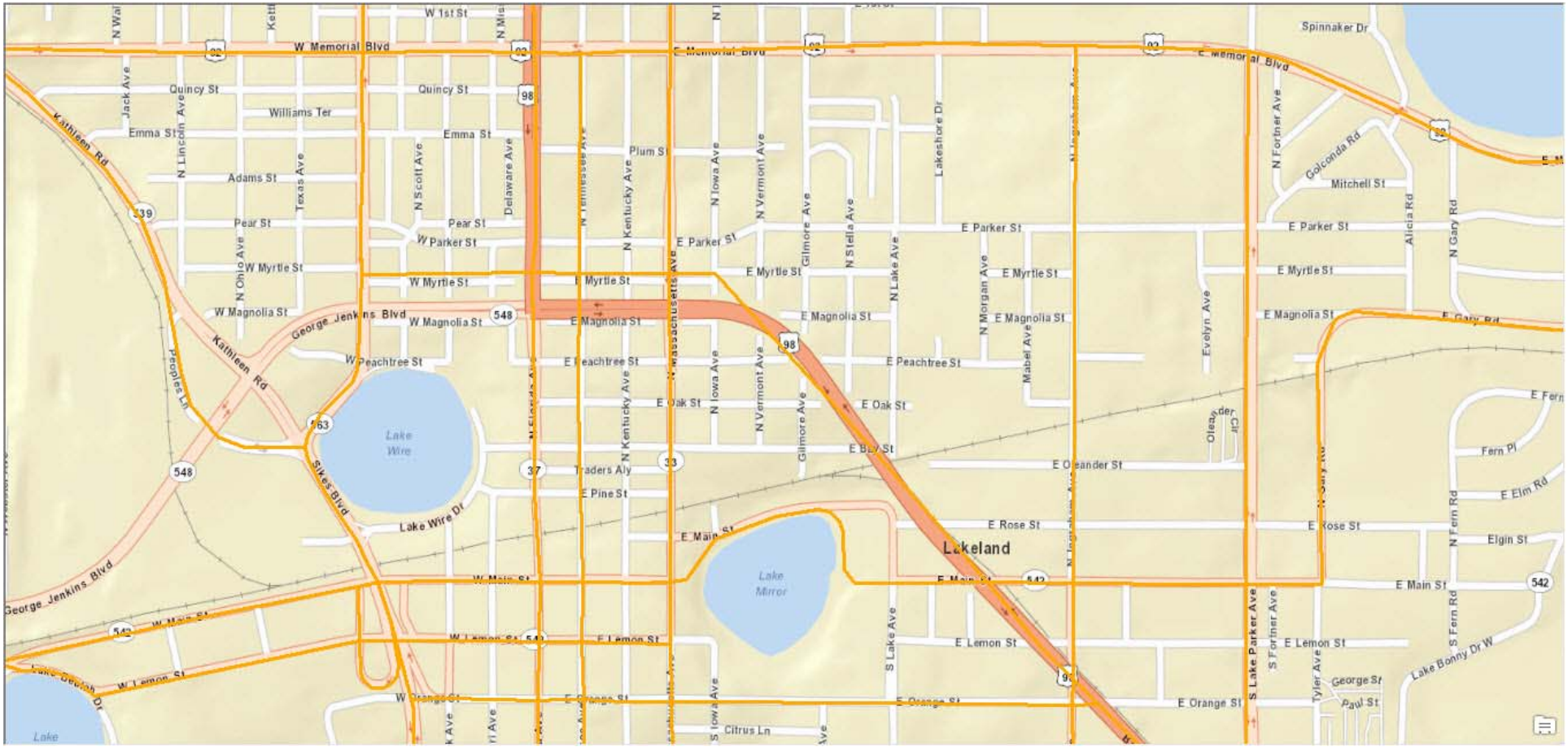
FLSWM Phase 2 Efforts

Many-to-one and One-to-many



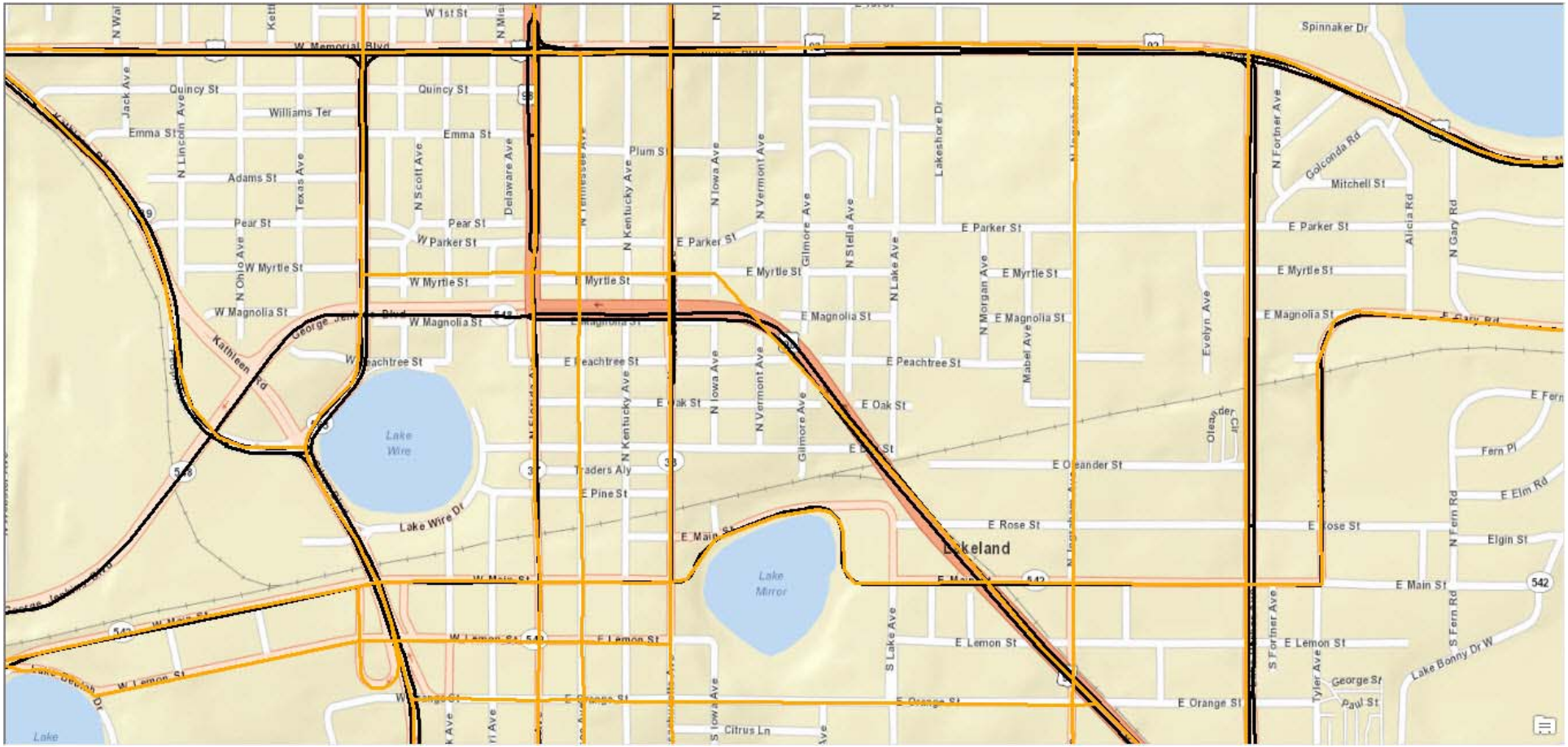
FLSWM Phase 2 Efforts

Current 2010 network – downtown Lakeland



FLSWM Phase 2 Efforts

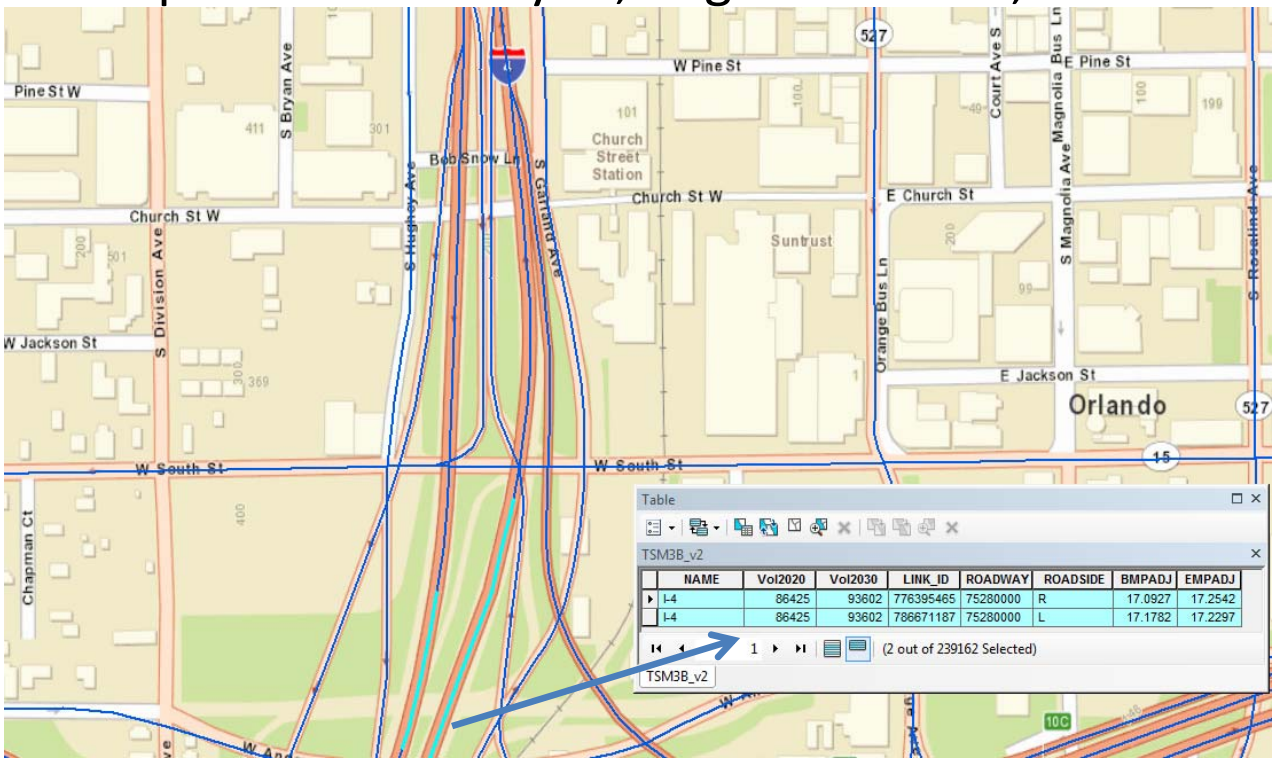
Network adjustments will be made using Navteq



FLSWM Phase 2 Efforts

Advantages of Navteq Network

- Navteq more accurately reflects Florida's road alignments
- Florida public agencies have access to Navteq through the state-wide contract
- FDOT has placed its Linear Referencing System (LRS) on Navteq
- Every Navteq segment in the State Highway System or TranStat basemap has a Roadway ID, Begin Mile Post, End Mile Post



FLSWM Phase 2 Efforts

Because each FLSWM segment will be tagged with LRS and model information….

- FLSWM existing and future year data can be extracted for the Strategic Intermodal System (SIS) by roadway ID/MP and included in Central Office's SIS Investment Tool (SIT). SIT is used to rank roads in most need of work program dollars
- FLSWM future volumes can be compared to those submitted by the Districts in the LOS submittal to Central Office. The comparisons can be done using the roadway ID/MP definition

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FLSWM Phase 2 Efforts – Future Years

Land Use Modeling Integration

- Made possible by
  - Migration to Navteq
  - Use of parcel data
- Uses county control total forecasts from other agencies (i.e. BEBR)
- Allocates incremental land use growth amounts within the county based on
  - Available land
  - Accessibility
  - Other variables

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FLSWM Beyond Phase 2 Efforts

- Development of a light truck model based on truck surveys
- Toll Choice Model
  - Develop toll choice within the mode choice phase
  - Implement ramp-to-ramp tolling
- Tourist Model Development
  - Need for tourist surveys

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FLSWM Update – Question and Answer