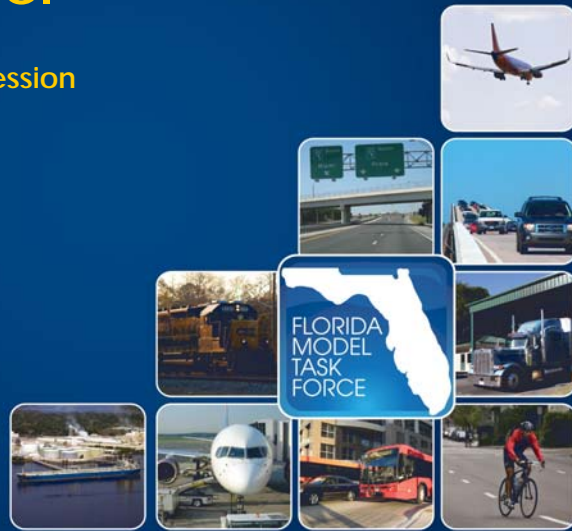


Statewide Multi-Modal Freight Model

presented to
MTF Freight Modeling Session

presented by
Colin Smith, RSG

December 6, 2012



Overview



- Project Schedule
- Motivation
- Advanced Freight Forecasting Model
- Statewide Framework
- Regional Framework



Project Schedule



- Currently:
 - Working with FDOT to complete data development
 - Developing statewide model components
- Early 2013:
 - begin CUBE Voyager/FSUTMS integration
 - Calibration and validation
- July 2013: deliver the model and final report

Task	2012												2013			
	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	
1: Kickoff Meeting																
2: Data Development																
3: Statewide Model Development																
4: Integration with FSUTMS																
5: Calibration and Validation																
6: Final Report																



Project Motivation




Enhance Florida's statewide freight forecasting capabilities
Provide a framework to support enhancements to regional freight forecasting

- Represent characteristics of firms and shipments
 - Synthesize firms and goods movements at the zone level
- Represent supply chains and distribution channels
 - Link commodity movements between buyers and suppliers
- Estimate shifts in long-haul and short-haul demand resulting from statewide investments
 - Connect movements from supplier to buyer in a single framework
- Capture trip-chaining that occurs
 - Represent distribution channels in the supply chain
 - Represent touring during pick up and delivery of goods



Advanced Freight Forecasting Model




Combine Supply Chain and Tour-based Methods

Supply Chain Models


Tour-based Models

Hybrid Models


mode and path selection



- Models shipments using the supply chain framework
- Regional pick up and delivery of shipments is handled by touring trucks




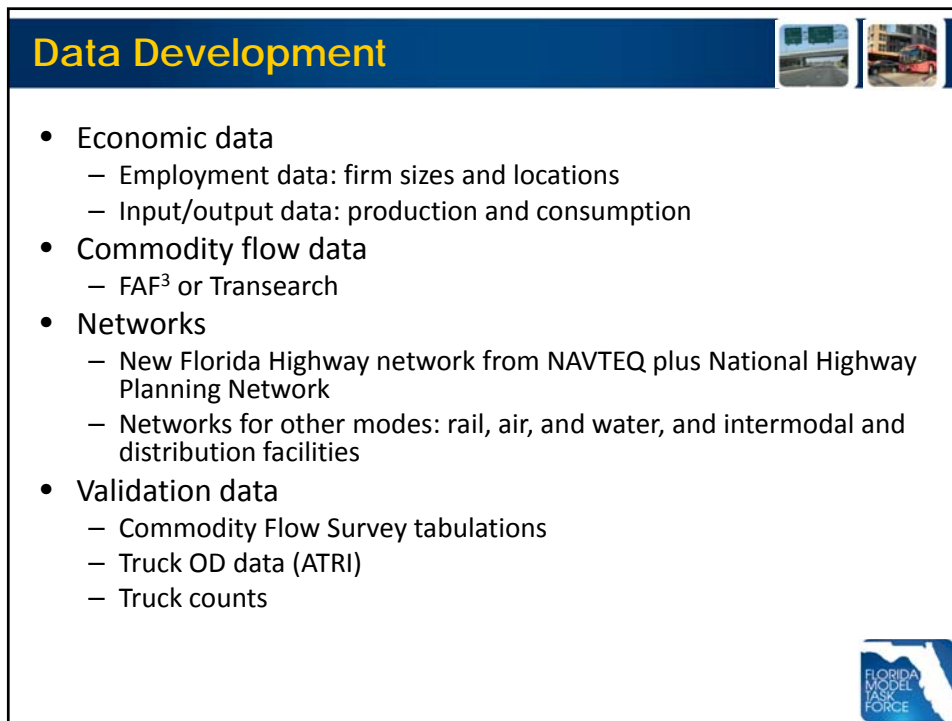
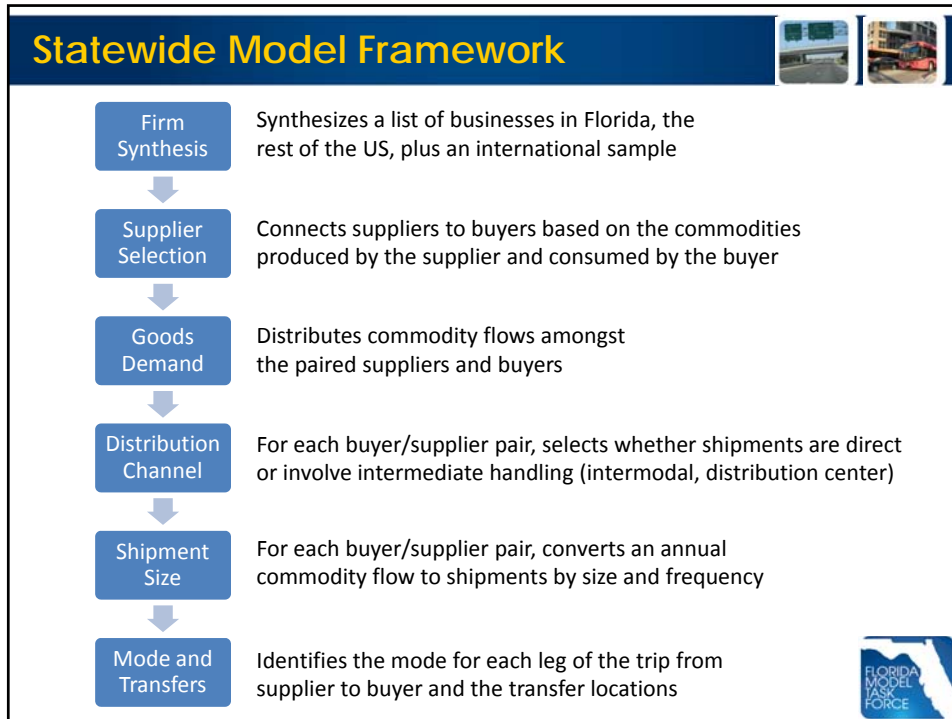
Geographical Context



Statewide Multi-Modal Freight Model

- Covers all of Florida and includes supply chains across the USA and internationally
- Synthesizes firms, represents connections between suppliers and buyers, and distributes commodity flows to, from, and across the USA
- For commodity flows (shipments) to, from, and within Florida, models distribution channel, including mode, and transfer locations
- Designed for connection to regional truck-touring models to represent regional delivery movements in detail





Integration, Calibration, and Validation



- Model Integration
 - Integrated within the CUBE Voyager/FSUTMS framework to provide access to network skim data and assignment
 - Demand model is programmed in the open source programming platform R
 - Executed using the CUBE application manager
- Model Calibration and Validation
 - Calibration of individual model components
 - Validation of the model system for intercity goods movements against truck ODs and truck counts

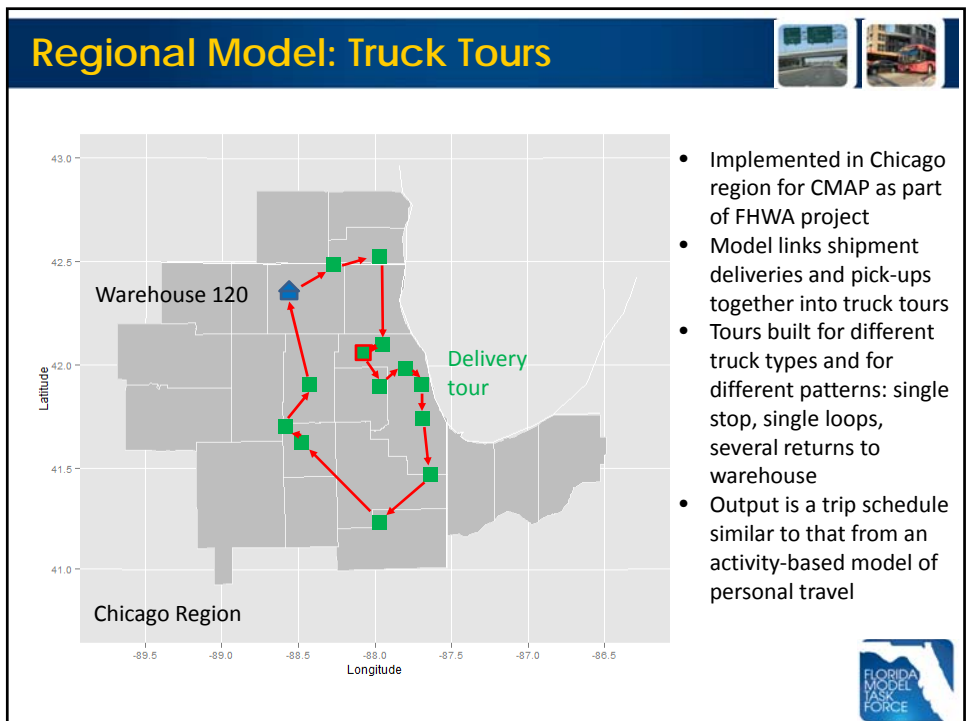
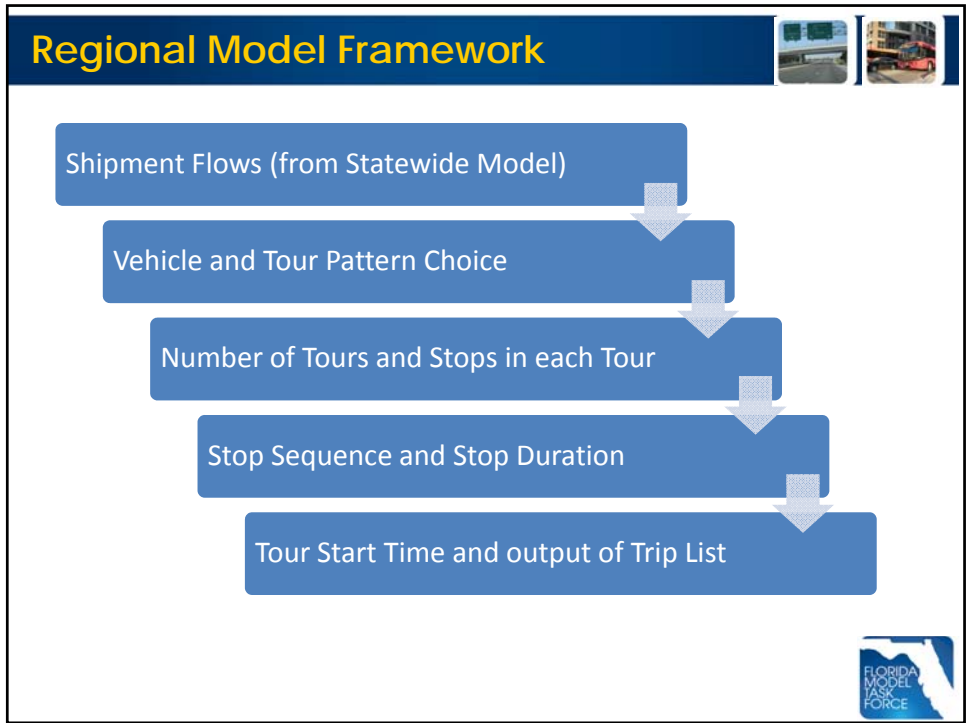


Statewide Policy Sensitivity



- Changes in land use and economy: spatial distribution of employment and mix of industries
- Changes in transportation supply
 - Major highway network changes
 - Changes to rail capacity
 - Intermodal facility capacity changes, including deep water ports and airports
- Changes in distribution center network
 - New facilities (with regional significance)
- Changes in commodity flow origins and destinations outside Florida





Regional Policy Sensitivity



- Regional model input is the output from the statewide model, so statewide model's sensitivity feeds through to regional model
- Local (more detailed) distribution of employment and land use affects local truck travel patterns
- Local changes in transportation supply, non-truck traffic growth causing congestion, and resulting truck travel times
- Local policies such as truck routes, truck prohibitions, delivery windows, and size limits can be modeled



Connections to the Statewide Model



- Statewide model is designed to be integrated with regional models
- Statewide model develops shipment paths including transfer locations and modes, and intercity truck movements
- Statewide model outputs include a list of regional shipment pick-ups and deliveries that must be met in a given day: that can then be microsimulated in the regional model
- Possible modes of operation
 - Integrate complete statewide model with regional model and run models sequentially
 - Provide an extract from the statewide model of regional shipment demand and run the regional model separately



Regional Model Implementation



- Data needs: establishment surveys and truck surveys to support regional model development and calibration
 - Proposed travel behavior inventory (discussion tomorrow morning) includes these surveys
- Consider piloting a regional truck model in partnership with an MPO/District, integrated within their regional model
- Consider further regional implementations if the pilot is demonstrated to be successful



Contact



Maren Outwater
Resource Systems Group, Inc
maren.outwater@rsginc.com
414-446-5402
www.rsginc.com

Colin Smith
Resource Systems Group, Inc
colin.smith@rsginc.com
802-295-4999
www.rsginc.com

