Florida Statewide Model
MPOAC

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January 27, 2017
Florida Statewide Model

- FLSWM Overview
- FreightSIM
- Other Items Of Interest
Statewide Model Uses

- Impact of Projects at Statewide Level
  - Corridor Improvements
  - Inter-City and Inter-Regional Trip Evaluation
- Sketch-Planning
- Evaluate Investment Scenarios
- Quantify economic impact
- Base Model for Sub-Area and Corridor Modeling
• Traditional four-step model on the passenger side

- Trip Generation
- Trip Distribution
- Mode Choice
- Trip Assignment

• 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)
Florida Statewide Model

- **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
Florida Statewide Model

Total Lane miles: 352,784

- Outlying States: 237,800 (67%)
- Outlying GA&AL: 19,309 (5%)
- Border: 15,827 (4%)
- Florida: 68,869 (20%)
- Outlying States: 237,800

Composition of:
- MPO Network Links
- TeleAtlas / NavTeq
- NTAD NHPN

GIS Network
TrueShape Roadways

Florida FDOT Statewide Model
Florida Statewide Model

Completed FLSWM Phase I Efforts

FLSWM Trip Length Distribution

- Person Trips: 0, 2,000,000, 4,000,000, 6,000,000, 8,000,000
- Miles

Graph showing trip length distribution for different purposes:
- Work
- Shop
- SocRec
- Other
- NHB
- TT
Overview of FLSWM Updates – Phase I Efforts

- **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
Florida Statewide Model

FLSWM is two models – a passenger model and a freight model. Both use the same network and are blended in final assignment.

Single Network - Blended Assignment Methodology
Florida Statewide Model
FreightSIM

• One of the first statewide commodities based models in the US.

• The Florida Freight Supply-chain Intermodal Model: FreightSIM is intended to:
  – Support freight plan development
  – Evaluate potential large scale infrastructure investments
  – Provide inputs to more detailed project level evaluations
  – Provide inputs to regional transportation planning
Florida Statewide Model

FreightSIM

• FreightSIM produces numerous outputs describing freight system performance, including:
  – Shipment movements by mode (road, rail, water, air), with truck based shipments also converted to truck trips
  – Commodity and truck zone to zone trip tables
  – Loaded transportation networks, and derived measures, e.g. vehicle miles traveled by functional class and area type

• The results are sensitive to many policy inputs and change in the economy, including:
  – Infrastructure Investments (highway system, ports)
  – Tolls, user fees, or pricing
  – Growth in employment and productivity by industry
Florida Statewide Model
FreightSIM

- FreightSIM is multimodal and captures import and export movements as well as domestic freight
- Freight flows through Florida’s deep sea ports are represented, for example those through the Port of Jacksonville

Example of model scenario results showing truck volumes on Florida’s highway system
Florida Statewide Model
Targeted Bluetooth Origin and Destination
Florida Statewide Model
Targeted Bluetooth Origin and Destination
## Interstate Crossings to Seaports

### PortMiami

#### From I-95 Stateline to PortMiami

<table>
<thead>
<tr>
<th>Detection Site(s)</th>
<th>% Trucks</th>
<th># Trucks</th>
<th>Dropoff*</th>
<th>% Origin</th>
<th>Speed*</th>
<th>Time*</th>
</tr>
</thead>
<tbody>
<tr>
<td>19-I-95 Jax Bdr</td>
<td>17.0%</td>
<td>141,261</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
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<tr>
<td>39-I-95 Palm Cst</td>
<td>15.1%</td>
<td>59,274</td>
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<td>85</td>
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<tr>
<td>35-I-95 N Smyrna</td>
<td>15.0%</td>
<td>25,628</td>
<td>23.8%</td>
<td>65</td>
<td>33</td>
<td></td>
</tr>
<tr>
<td>28-I-95 N SR 60</td>
<td>11.9%</td>
<td>17,765</td>
<td>5.6%</td>
<td>64</td>
<td>94</td>
<td></td>
</tr>
<tr>
<td>34-I-95 Bynt Bch</td>
<td>5.5%</td>
<td>7,450</td>
<td>7.3%</td>
<td>65</td>
<td>94</td>
<td></td>
</tr>
<tr>
<td>Port of Miami</td>
<td></td>
<td>1,218</td>
<td>4.4%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25-Tunnel</td>
<td>100.0%</td>
<td>1,047</td>
<td></td>
<td>34</td>
<td>98</td>
<td></td>
</tr>
<tr>
<td>18-Bridge</td>
<td>100.0%</td>
<td>171</td>
<td></td>
<td>31</td>
<td>107</td>
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#### From I-75 Stateline to PortMiami

<table>
<thead>
<tr>
<th>Detection Site(s)</th>
<th>% Trucks</th>
<th># Trucks</th>
<th>Dropoff*</th>
<th>% Origin</th>
<th>Speed*</th>
<th>Time*</th>
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<tbody>
<tr>
<td>21-I-75 at Border</td>
<td>26.9%</td>
<td>148,269</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
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<tr>
<td>22-I-75 Gainesville</td>
<td>9.7%</td>
<td>33,649</td>
<td>77.3%</td>
<td>67</td>
<td>85</td>
<td></td>
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<tr>
<td>37-TPK N Okeechobee</td>
<td>16.2%</td>
<td>17,765</td>
<td>10.7%</td>
<td>68</td>
<td>51</td>
<td></td>
</tr>
<tr>
<td>23-TPK Ft D Plaza</td>
<td>17.2%</td>
<td>6,166</td>
<td>7.8%</td>
<td>66</td>
<td>105</td>
<td></td>
</tr>
<tr>
<td>36-TPK Delray Bch</td>
<td>8.5%</td>
<td>2,569</td>
<td>2.4%</td>
<td>64</td>
<td>96</td>
<td></td>
</tr>
<tr>
<td>Port of Miami</td>
<td></td>
<td>765</td>
<td>1.2%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25-Tunnel</td>
<td>100.0%</td>
<td>616</td>
<td></td>
<td>37</td>
<td>85</td>
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<tr>
<td>18-Bridge</td>
<td>100.0%</td>
<td>149</td>
<td></td>
<td>25</td>
<td>126</td>
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#### From I-10 Stateline to PortMiami

<table>
<thead>
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<th>Detection Site(s)</th>
<th>% Trucks</th>
<th># Trucks</th>
<th>Dropoff*</th>
<th>% Origin</th>
<th>Speed*</th>
<th>Time*</th>
</tr>
</thead>
<tbody>
<tr>
<td>09-I-10 Pensacola</td>
<td>14.4%</td>
<td>90,482</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
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<tr>
<td>22-I-75 Gainesville</td>
<td>9.7%</td>
<td>5,331</td>
<td>94.1%</td>
<td>59</td>
<td>356</td>
<td></td>
</tr>
<tr>
<td>37-TPK N Okeechobee</td>
<td>16.2%</td>
<td>3,735</td>
<td>1.8%</td>
<td>68</td>
<td>51</td>
<td></td>
</tr>
<tr>
<td>23-TPK Ft D Plaza</td>
<td>17.2%</td>
<td>1,519</td>
<td>2.4%</td>
<td>66</td>
<td>105</td>
<td></td>
</tr>
<tr>
<td>36-TPK Delray Bch</td>
<td>8.5%</td>
<td>676</td>
<td>0.9%</td>
<td>64</td>
<td>96</td>
<td></td>
</tr>
<tr>
<td>Port of Miami</td>
<td></td>
<td>18</td>
<td>0.7%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25-Tunnel</td>
<td>100.0%</td>
<td>12</td>
<td></td>
<td>37</td>
<td>85</td>
<td></td>
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<tr>
<td>18-Bridge</td>
<td>100.0%</td>
<td>6</td>
<td></td>
<td>25</td>
<td>126</td>
<td></td>
</tr>
</tbody>
</table>

* From previous to current location
Interstate Crossings to Seaports

PortMiami

<table>
<thead>
<tr>
<th>Route Origin</th>
<th>Total Trucks</th>
<th>Average Speed</th>
<th>To PortMiami</th>
<th>Average Travel Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>GA FL 95</td>
<td>1,218</td>
<td>56 mph</td>
<td></td>
<td>6:44</td>
</tr>
<tr>
<td>GA FL 75</td>
<td>765</td>
<td>60 mph</td>
<td></td>
<td>7:02</td>
</tr>
<tr>
<td>AL FL 10</td>
<td>18</td>
<td>59 mph</td>
<td></td>
<td>11:33</td>
</tr>
</tbody>
</table>
Seaport to Seaport

Observations

- Most significant activity occurred between ports in the same or adjacent regions
- Most notable interactions were between PortMiami and Port Everglades and Port Manatee and Port Tampa Bay
- Evidence of long distance interactions was most associated with JAXPORT
Cruise Passenger Vehicles

Observed Trips to Palm Beach

<table>
<thead>
<tr>
<th>Origin</th>
<th>Number of Observed Trips</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other</td>
<td>50</td>
</tr>
<tr>
<td>Palm Beach CT</td>
<td>11</td>
</tr>
<tr>
<td>I-95 Bynt Bch</td>
<td>169</td>
</tr>
<tr>
<td>I-95 N SR 60</td>
<td>12</td>
</tr>
<tr>
<td>TPK Ft D Plaza</td>
<td>44</td>
</tr>
</tbody>
</table>

Number of Observed Trips, % of Observed Trips
Resulting Data Set

- 35 Days of Data
- 45 Detection Locations
- 25 Million Records
- 4 Million Unique Vehicles
- Model Validation
- Multiple Comparative Transportation Analyses
- Speed, Travel Time, Origin/Destination for Regional, Inter-Regional & Interstate Studies
Florida Statewide Model
Port Everglades DTA and Microsimulation Models
Florida Statewide Model
Port Everglades DTA and Microsimulation Models
Florida Statewide Model
Port Everglades DTA and Microsimulation Models

Multi Resolution Drill Down
Ability to Scenario Plan at an Operational Level.
Florida Statewide Model

Other Research Initiatives

- Tourist Data – Tourist Model
  - University of Florida, Department of Tourism
    - National Research Center for Tourism
- Contraflow vs. Hard Shoulder
- Urban Area Incident Evacuation
  - Research Funded
  - Soliciting for a researcher
- Economic Forecast using FreightSIM
  - Dr Peng, University of Florida, Department of Civil Engineering
Statewide Model Contact:

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