Overview

- NAVTEQ (“HERE”, 2012) Data Overview
- FLSWM Network Overview
- NAVTEQ to Model Network Conflation
  - Network concepts
  - Processing Procedures
- GTFS Integration for Transit Network
- Next Steps...
NAVTEQ DATA OVERVIEW

NAVTEQ Data Overview

Advantages of GIS Based Network

- Real-world Network / Roadway Distances
- Frequent updates: Quarterly or Yearly Based
- Integration with other GIS based data sets
  - RCI
  - Florida Traffic Information System
  - INRIX Speed Data
  - FAF
- Restricted Turning Movements
- Points of Interest
- Roadway elevations
- Traffic Pattern Models by
  - Day of Week, Month, Season, Year
### NavStreets Overview

<table>
<thead>
<tr>
<th>NAVTEQ Shapefile Products</th>
</tr>
</thead>
<tbody>
<tr>
<td>Streets</td>
</tr>
<tr>
<td>Major Highways</td>
</tr>
<tr>
<td>Railroads</td>
</tr>
<tr>
<td>Waterway Polygon &amp; Segments</td>
</tr>
<tr>
<td>Land Use Features</td>
</tr>
<tr>
<td>Points of Interest:</td>
</tr>
<tr>
<td>- Service: Shopping, Restaurants, etc.</td>
</tr>
<tr>
<td>- Public: Parks, Education, Parking, etc.</td>
</tr>
<tr>
<td>- Commercial: Business Facilities</td>
</tr>
<tr>
<td>Traffic Patterns</td>
</tr>
<tr>
<td>Restricted Driving Maneuvers</td>
</tr>
<tr>
<td>Elevation Levels</td>
</tr>
</tbody>
</table>

### Streets Shapefile Overview

- **106 Fields**
- **Comprised of**
  - Feature Type
  - Functional Class
  - Speed Category
  - Number of Lanes
  - Access Characteristics
  - Ramp
  - Toll
  - Limited
  - Truck Route
**NAVTEQ Analytic Traffic Patterns**

- Database of average flow velocities
- Historical Data for one calendar year
- Provides speeds for links in km/hr, down to one KPH increments
- 15 minute increments
- Averaged for
  - Annual
  - Monthly
  - Seasonal
- Provides models for each day
- Speeds could calculate:
  - Capacity
  - Volumes

**FLSWM NETWORK OVERVIEW**

FLSWM Network Overview
Border & Fringe Area Network

<table>
<thead>
<tr>
<th>Network</th>
<th>Border</th>
</tr>
</thead>
<tbody>
<tr>
<td>Border: NHPN</td>
<td>AL &amp; GA: NHS</td>
</tr>
<tr>
<td>External: STRAHNET</td>
<td></td>
</tr>
</tbody>
</table>

Border: NHPN
AL & GA: NHS
External: STRAHNET
FLSWM to NAVTEQ Network Conflation

Special Concerns

• Double Line coding
• One to many links issue
**Conflation Process Overview**

1. **GIS Data Preparation**
   - General buffering
   - Initial Geoprocessing & Screening
   - Resizing Buffer
   - Level 2 Geoprocessing & Screening
   - NAVTEQ Network Refinement & Buffer Adjustment

2. **FLSWM Link Conflation**
   - FLSWM NAVTEQ Network
   - Final Screening
   - Adding Additional Facilities

**Proximate Conflation by Buffers**

- NAVTEQ
- FLSWM
- FSUTMS

Node
Buffering Rectangle
Link Midpoint
Conflation
Conflation Efforts

Conflation: I-95 at I-595

NAVTEQ

FSUTMS

2005

NAVTEQ Buffer

FSUTMS Network
Conflation to NAVTEQ
Conversion of NAVTEQ Streets to Cube Network

NAVTEQ GIS to Cube Network
Cube V5.14 or above - The latest GIS Functions
Build Network from Shape Function

- NAVTEQ GIS Shape File
- Using Zlevel Database
- Node_ID field from the Zlevel Database
- New Option: not to select A & B nodes
- Need to Create from "DIR TRAVEL" Field
  - B: Both Directions
  - F: Forward Direction
  - T: Backward Direction
- Keep it as low as possible e.g. 0.0001

Cube NAVTEQ Application (Citilabs)

Restricted Driving Maneuvers - Maneuver Links (RDMs)

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Field Name</th>
<th>Format</th>
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</thead>
<tbody>
<tr>
<td>Link_ID</td>
<td>Link_ID</td>
<td>Decimal(10.6)</td>
</tr>
<tr>
<td>Condition ID</td>
<td>Condition_ID</td>
<td>Decimal(10.6)</td>
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<tr>
<td>Maneuver Link ID</td>
<td>Maneuver Link ID</td>
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<tr>
<td>Sequence Number</td>
<td>Seq_Number</td>
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</table>

Z-Levels (Zlevels)

<table>
<thead>
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<tbody>
<tr>
<td>Link_ID</td>
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<tr>
<td>Point Name</td>
<td>From_Name</td>
<td>Number(4.1)</td>
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<td>Node ID</td>
<td>Node_ID</td>
<td>Number(15.5)</td>
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<td>Z-Level</td>
<td>Z_Level</td>
<td>Number(2.3)</td>
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<tr>
<td>Intersection Name</td>
<td>Intersect</td>
<td>Char(1)</td>
</tr>
<tr>
<td>Z-Shape</td>
<td>Do_Shape</td>
<td>Number(2.3)</td>
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<tr>
<td>Aligned</td>
<td>Aligned</td>
<td>Char(1)</td>
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</table>

Traffic

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Field Name</th>
<th>Format</th>
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</thead>
<tbody>
<tr>
<td>Link_ID</td>
<td>Link_ID</td>
<td>Decimal(10.6)</td>
</tr>
<tr>
<td>Traffic Form</td>
<td>Traffic_Type</td>
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</tr>
<tr>
<td>Traffic Time</td>
<td>Traffic_Time</td>
<td>Time(14)</td>
</tr>
</tbody>
</table>

Note: Text in the Z-Level dataset: do it again! DBSE Network without any errors! All Done!
Turn Penalty based on RDMs
Includes all sequential movements

Turn Penalty based on RDMs
Single sequential movement with logical access restrictions
Uncongested Travel Time Isochrones from Downtown West Palm

2005 SERPM Network

NAVTEQ Network

104 minutes Google Maps

90-120 minutes NAVTEQ Network

Legend

Google Maps

Legend

NAVTEQ Network

TRANSIT NETWORK INTEGRATION

GTFS Integration for Transit Network
Transit Network Options

- Google Transit Feed
  - Stops
  - Routes
  - Trips
  - Stop Times
  - Fare Attributes
  - Fare Rules
  - Transfers

- Existing GTFS:
  - Broward County
  - HART
  - Miami-Dade
  - PSTA
  - Sarasota County
  - Space Coast Area
  - Tri-Rail

- Local Knowledge in easy to use GIS Format

Google Transit

[Google Transit Map]

GTFS Data Exchange

Next Steps...

- Refine modeling variables moved from FLSWM
- Utilization of GIS Database from Model Information eXchange System (MIXS) and other transportation statistic Databases
- Validation & Calibration of the NAVTEQ network model
- Performance evaluations of the NAVTEQ highway network in Macro and Meso-scopic Levels
Questions