Advances in Transit GIS Analysis and Modeling

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GIS In Transit Conference, November 18, 2009

Outline

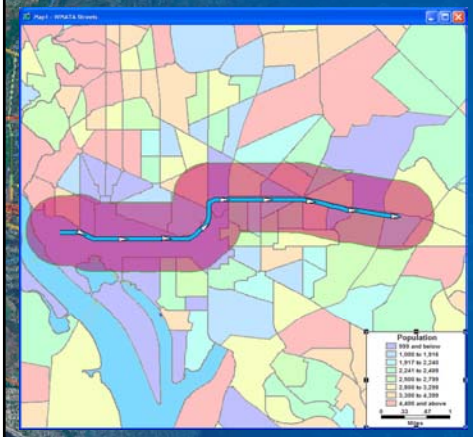
- Traditional Approaches
- Transit GIS Data Structure Design
- Transit Visualization and Analysis
- Transit Demand Modeling
- Incorporating Schedules
- Interfacing with Other Formats

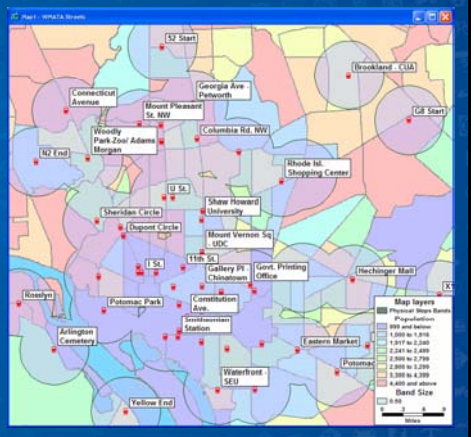
Traditional Approaches-GIS

- Routes as line features or events
- Stops as point features
- Limited GIS analysis

Traditional Approach Examples

- GIS Approach



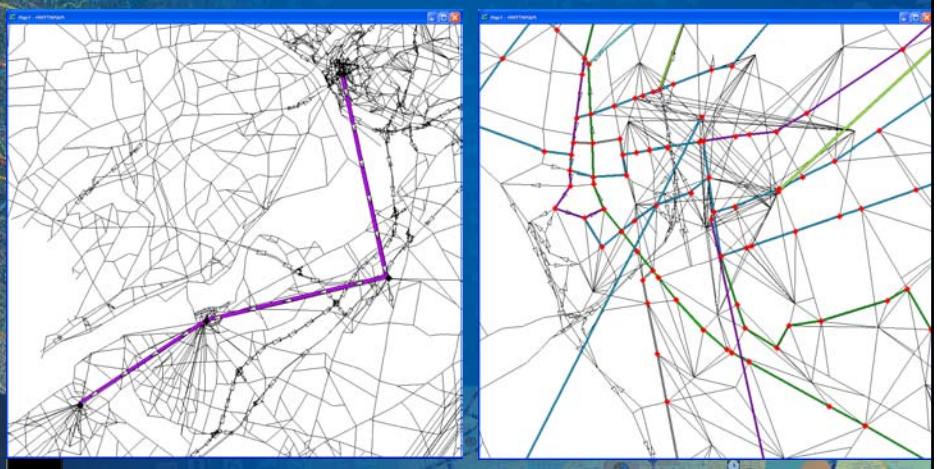


Traditional Approaches-Demand Modeling

- Non or limited GIS stick representation of routes or accessibility
- Custom software with limited interfacing capabilities

Traditional Approach Examples

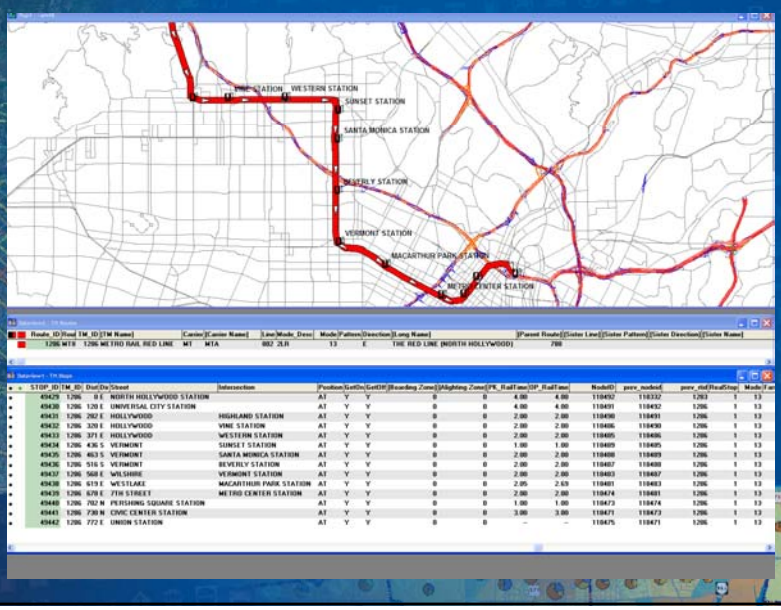
- Demand Modeling Schematic Approach



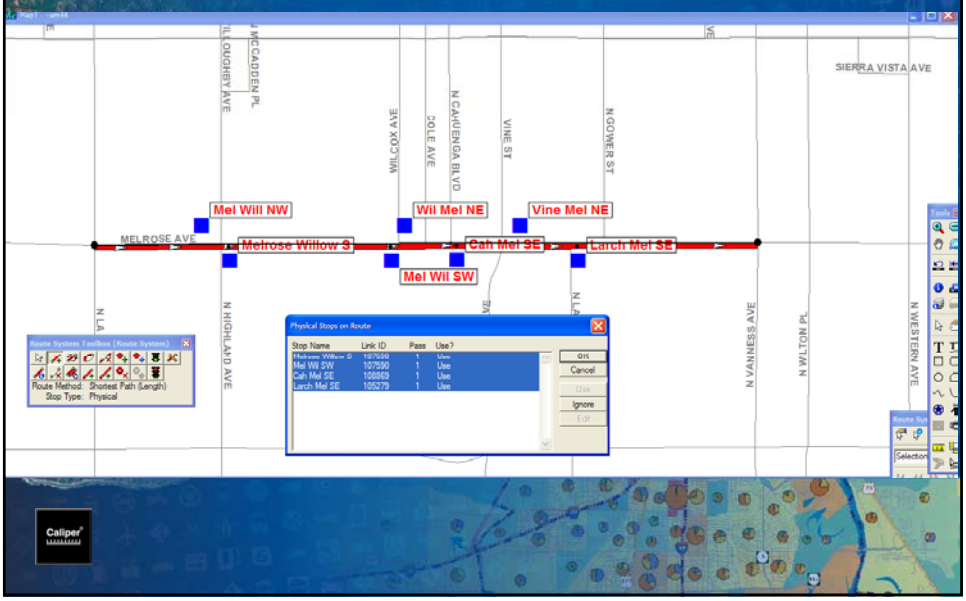
Transit GIS Database Design

- Routes follow line feature geography
- Routes and stops are "topological"
- Routes, stops, and route segments have attribute information
- GIS analysis can be performed with route, stop, and segment attributes
- Both route and physical stops can be used
- GIS structures can convert into network graphs for demand modeling

Transit GIS Data Demo



Physical Stop Demo



Transit Visualization and Analysis

- Typical GIS spatial and data analysis
- Specialized analysis
  - Route and stop offsetting, route directions
  - Aggregation of line attributes to the route
  - Aggregation of route attributes to the lines
  - Browsing Routes and tying stops to routes
  - Linear Referencing visualization

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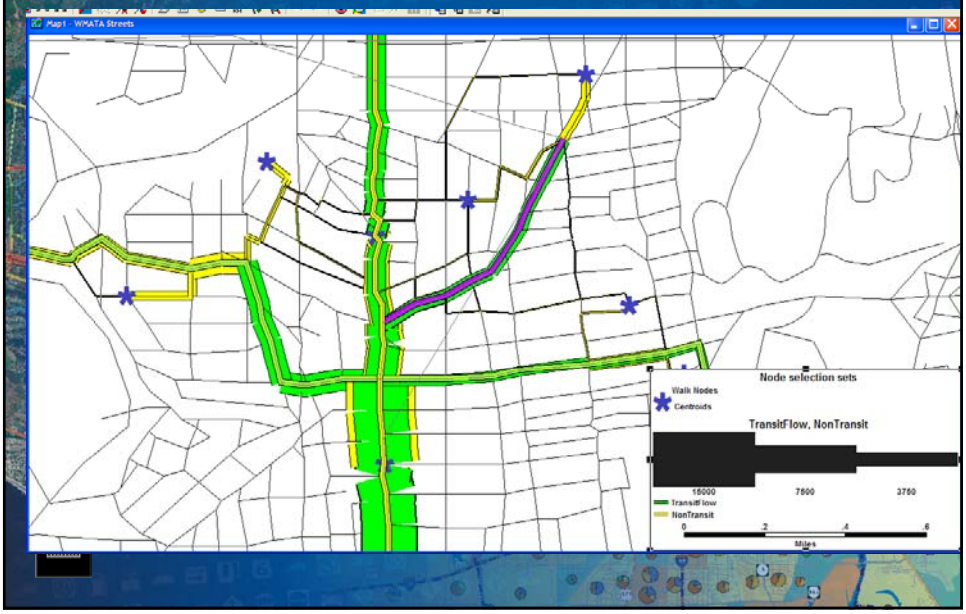
Transit Visualization and Analysis Demo

Transit Visualization



Transit Demand Modeling

- GIS data structures converted into network graphs
- Access/Egress/Transfers are defined naturally over GIS street networks
- Matrix data structures are used
- Transit pathfinding, skimming, and assignments
- Datasets are retained in GIS formats
- Outputs are in conventional database and GIS formats

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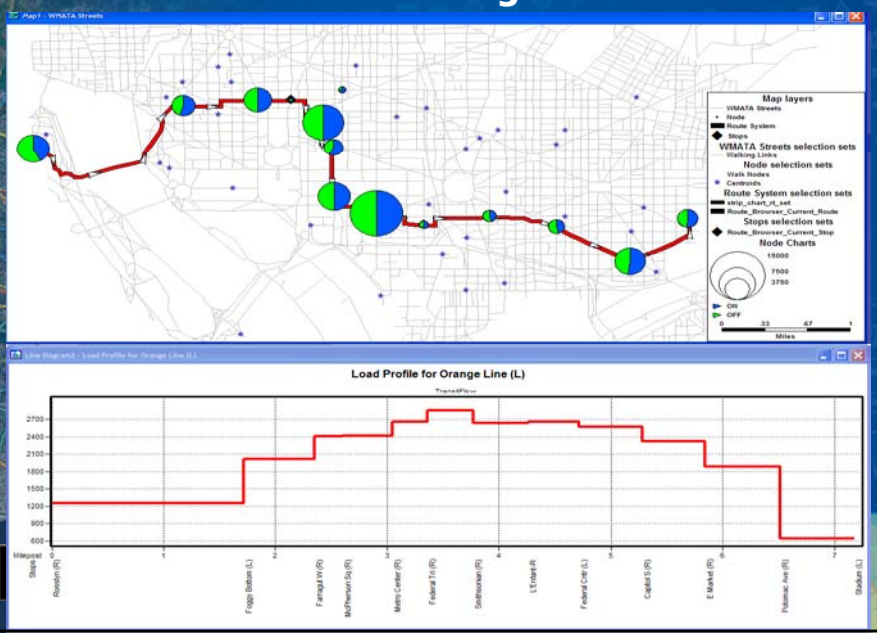
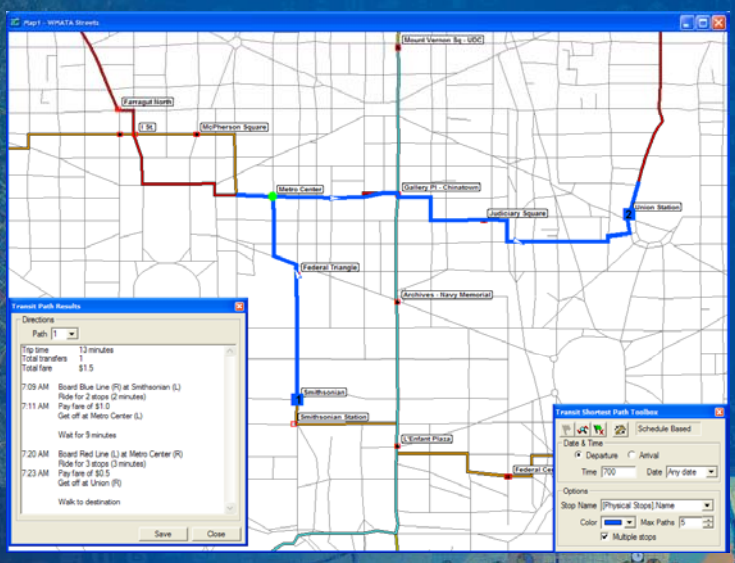
Transit Demand Modeling Demo



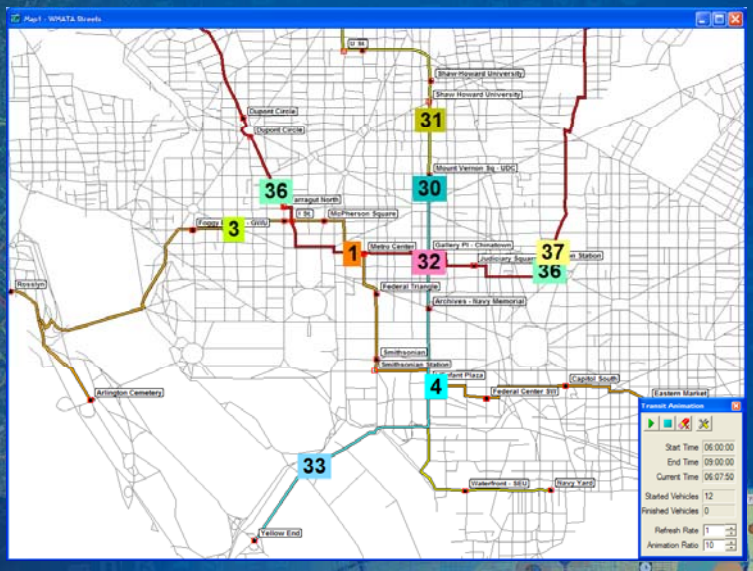
Incorporating Schedules

- Schedules entered interactively via the GIS engine
- Schedules stored in conventional database format and imported in
- GIS visualization tools for schedules
- Interactive geography-based queries for schedules using path-finding tools
- Web-based queries for schedules

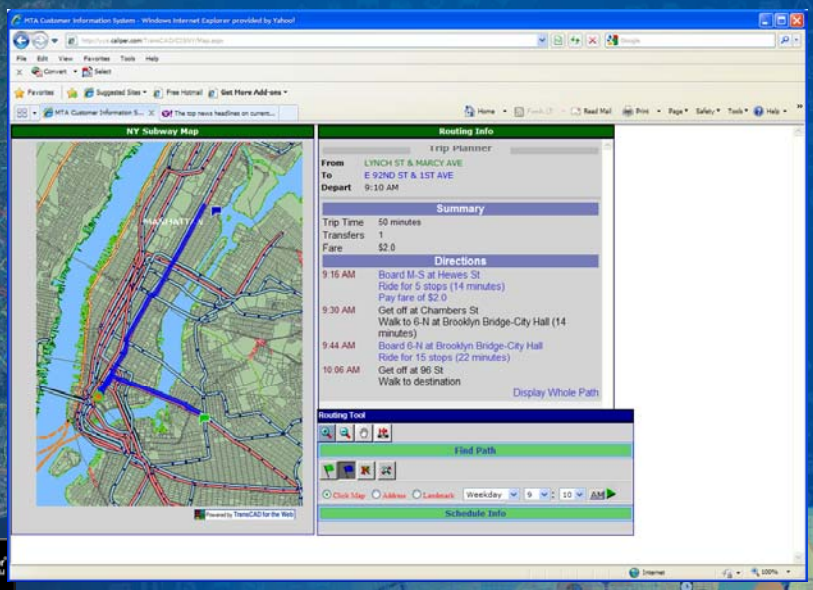
Schedules Demo



Schedule Demo



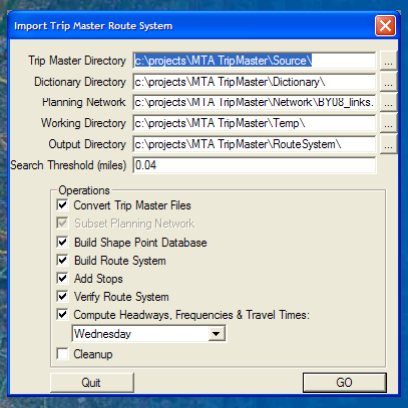
Schedule Demo-Web

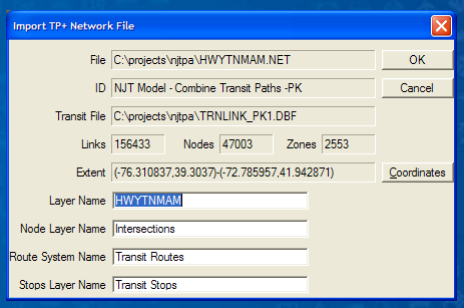


Interfacing with other Formats

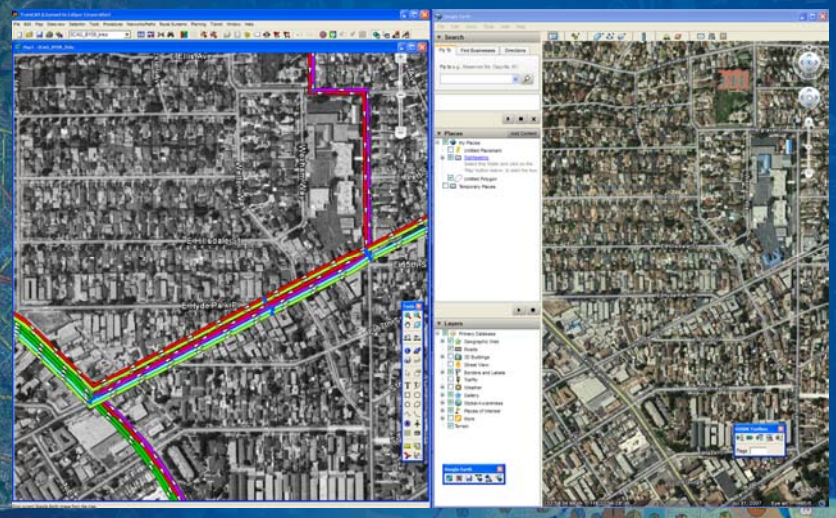
- Viewing Aerial Imagery, Bing, Google Earth and other GIS files
- Incorporating other database formats natively (Excel, Access, Oracle, Text, etc.)
- Exporting into other formats (Shape, Clipboard, Text, etc.)
- Importing from Specialized Formats (Google Transit Feed, Travel Model Software, etc.)

Interfacing Demo





Interfacing Demo



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Thank You

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