Visualizations and Metrics in Transit Planning

December 5, 2013
Model Users Group Meeting || Atlanta Regional Commission

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Agenda

• Introduction
• Role of visualization
• Emerging Data Sources
• Site visit (www.transitio.us)
• Future Work
Casual visualization

Tweets about transit in Paris

Analytic Gap

Travel Demand Model

Travel Demand Model Output
Bridging the Gap

Casual visualization

Utility visualization

Travel Demand Model
Transit Decision Support Tool

- Calculates transit metrics
- Combines land-use/demographic info
- Visualizations - aid in data driven decision making
- Scalable to whole country
- Flexible for other geospatial data input
Requirements for Emerging Data Sources

- **Accessibility**
  - Is data open and available from most local sources or a central source?

- **Consistency**
  - Is the data organized and recorded in the same fashion for all scenarios?

- **Robustness**
  - Does the data have a level of detail that can be used for meaningful analysis?
Data Source Evaluation:
US Census, American Community Survey

• **Data provided**
  Age | Income | Race | Commute Patterns | Employment

• **Advantages**
  – Reliable and accurate data
  – Standard across regions

• **Disadvantages**
  – Granularity of the census block
  – Accessibility in correct format (API vs. downloads)
Data Source Evaluation: General Transit Feed Specification

• Data provided
  Routes | Stops | Stop times | Route shapes | Trips

• Advantages
  – Consistent across agencies
  – Accuracy of data

• Disadvantages
  – Variations exist in adherence to standards
  – No method for aggregated agency-level analysis
GTFS Output Examples

• Data can be calculated at the agency, stop or route level:
  – Headway
  – Stop spacing
  – Hours of service/span of service
  – Vehicles in service
  – Stop locations, names
  – Routes
Data Source Evaluation:
Yelp!, Google Places

• **Data provided**
  Restaurants | Schools | Parks | Landmarks | Religious Institutions

• **Advantages**
  – Dynamic and current nature of data
  – Consistency across regions

• **Disadvantages**
  – Limitation on amount of results
  – Accuracy can be suspect due to crowdsourcing
Google Places: Supported Place Types

- Many, many options to arrange data

  - accounting
  - airport
  - amusement_park
  - aquarium
  - art_gallery
  - atm
  - bakery
  - bank
  - bar
  - beauty_salon
  - bicycle_store
  - book_store
  - bowling_alley
  - bus_station
  - cafe
  - campground
  - car_dealer
  - car_rental
  - car_repair
  - car_wash
  - casino
  - cemetery
  - church
  - city_hall
  - clothing_store
  - convenience_store
  - courthouse
  - dentist
  - department_store
  - doctor
  - electrician
  - electronics_store
  - embassy
  - establishment
  - finance
  - fire_station
  - florist
  - food
  - funeral_home
  - furniture_store
  - gas_station
  - general_contractor
  - grocery
  - gym
  - hair_care
  - hardware_store
  - health
  - hindu_temple
  - home_goods_store
  - hospital
  - insurance_agency
  - jewelry_store
  - laundry
  - lawyer
  - library
  - liquor_store
  - localGovernment
  - locksmith
  - lodging
  - meal_delivery
  - meal_takeaway
  - mosque
  - museum
  - night_club
  - painter
  - park
  - parking
  - pet_store
  - pharmacy
  - place_of_worship
  - plumber
  - police
  - post_office
  - real_estate_agency
  - restaurant
  - roofing_contractor
  - rv_park
  - school
  - shoe_store
  - movie_theater
  - moving_company
  - museum
  - night_club
  - painter
  - park
  - parking
  - pet_store
  - pharmacy
  - place_of_worship
  - plumber
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  - rv_park
  - school
  - shoe_store
  - ...
EPA Smart Location Database

• National geo-database
• Census block-level data
• Land use and urban form fields:
  – Density
  – Diversity of land use
  – Urban design
  – Accessibility
  – Demographics
  – Employment
• Active project, still coming online
Considerations for Connecting Data

• Geospatial
  – Most data can be identified spatially on a map

• Temporal
  – Much of transit quality of service information is defined over time and space

• Currency/Automation
  – Data changes over time, it’s decreasingly useful to save data locally
Demonstration

• Alpha version

www.transitio.us
Lessons on Transit Analysis

• What is a route?
• What is an “average headway?”
• What is a “typical” weekday?
Next Steps

• Refining user scenarios:

  – **Equitable Transit Planning**
    What is the economic or demographic profile of areas where we are considering changes in transit service?

  – **Researchers**
    What are reasonable peer comparisons for transit agency statistics based on land use, people and economy?

  – **MPOs/Travel demand modeling**
What role does this play?

Casual visualization

Utility visualization

Travel Demand Model
Next Steps

- Create reporting features
- Generate contextual agency information
- Enhance visualization of datasets
Next Steps

• Production instance
• Populate with all US agencies
  – GTFS upload feature
  – Scenario planning / what-if scenarios
• Integrate with OpenTripPlanner Analyst tools