Visualizations and Metrics in Transit Planning

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Model Users Group Meeting || Atlanta Regional Commission

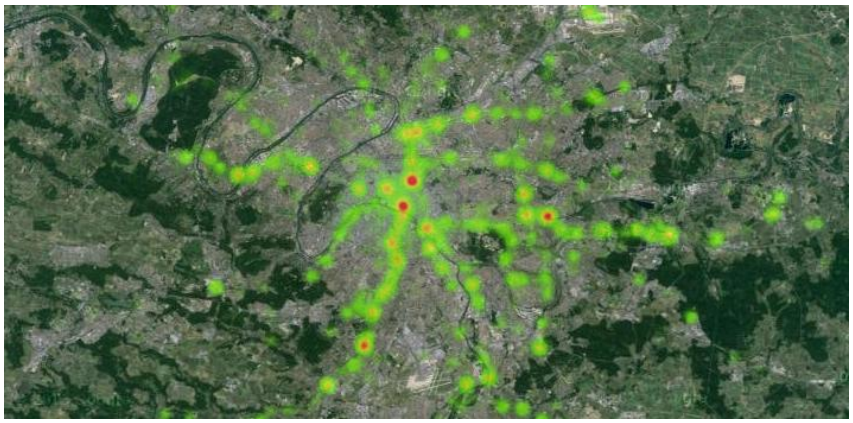
ATLANTA REGIONAL COMMISSION

Aaron Gooze	aarongooze@gmail.com	|| Fehr and Peers
Jack Reed	preed2@gsu.edu	|| GSU
Landon Reed	lreed@atlantaregional.com	|| ARC
James Wong	jcwong@gatech.edu	|| Georgia Tech

Agenda

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

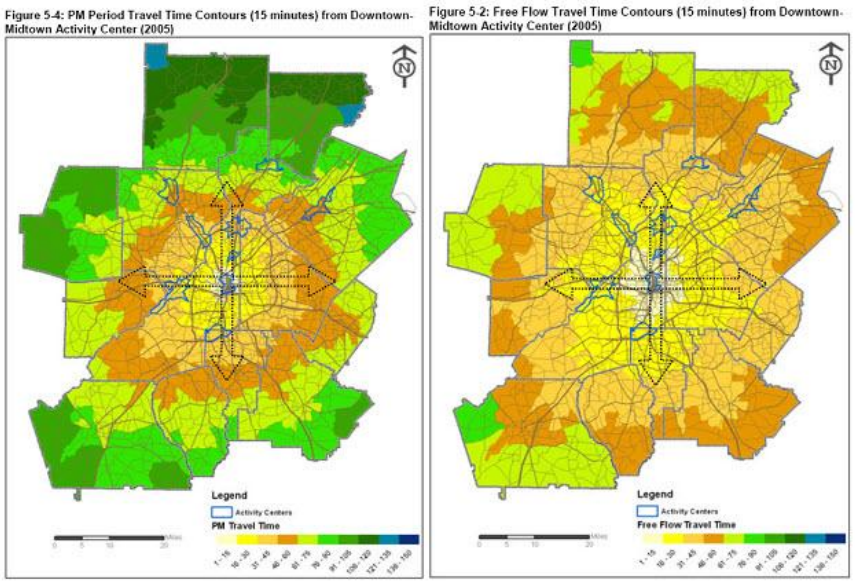
Casual visualization



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

Google Developers

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
local_government
locksmith
lodging
meal_delivery
meal_takeaway
mosque
movie_rental
movie_theater
moving_company
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
...
```

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?

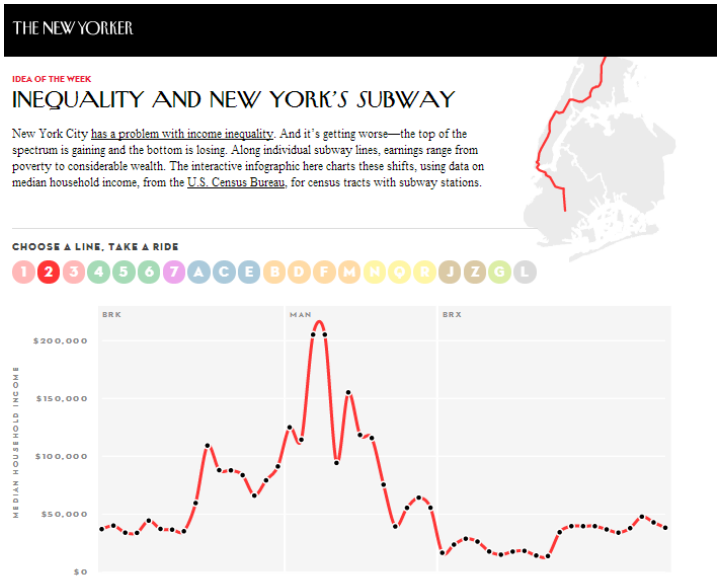
Casual visualization

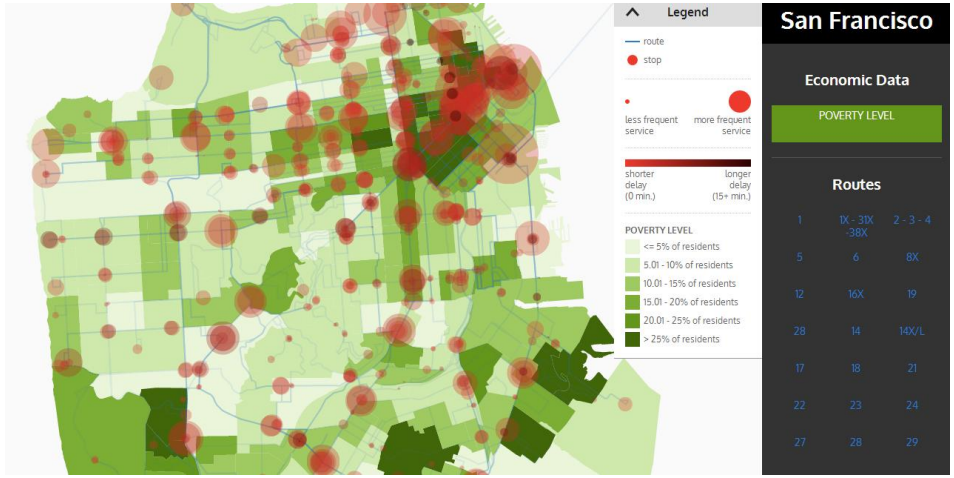
Utility visualization

Travel Demand Model

Next Steps

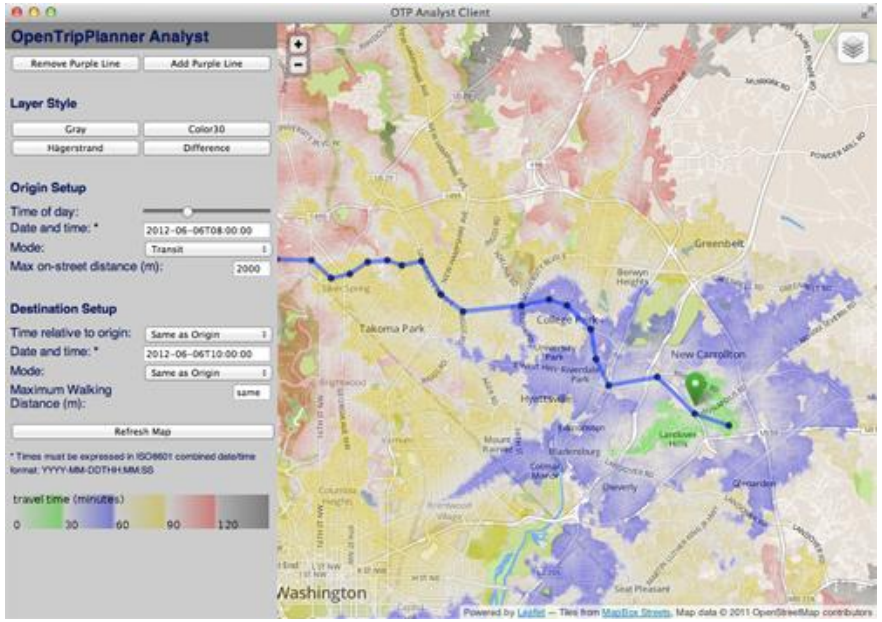
- Create reporting features
- Generate contextual agency information
- Enhance visualization of datasets





Next Steps

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



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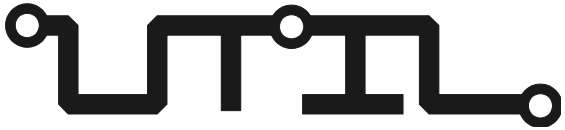

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Georgia Tech School of City & Regional Planning
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