Orf 467
Transportation Systems Analysis
Fall 2016/17

Orf 467F16 Final Projects

Tuesday, Nov. 8, 2016

What follows are a list of 8 Tasks/Projects related to the Nation-wide trips that Kyle has generated.

1. Walk & Bike Trips (ShortTrips)

- Find all trips whose distance is 1 (or whatever you justify) mile or less. Call these ShortTrips
  - Justify your choice of the threshold
- Characterize these as veryShortTrips (intraPixel
- Describe everything (spatial, temporal, purpose, age, etc. distributions) that anyone would want to know about the characteristics of these shortTrips
- Assess how many would be walking, bike or aTaxi (do your own mode-split model)

2. Find all LongTrips

- Find all trips whose distance is 100 (or whatever you justify) mile or more. Call These longTrips
  - Justify your choice of the threshold
- Describe everything (spatial, temporal, purpose, age, etc. distributions) that anyone would want to know about the characteristics of these LongTrips
- Find a file of the lat/lon/name of each Amtrak station and Major airport
- Find the distance to the nearest Amtrak station from each origin & each destination; append the distance and station name
- Find the distance to the nearest Major airport from each origin & each destination; append the distance and airport name
- Do a modeSplit model on these trips into, aTaxi->Rail/Plane->aTaxi, or aTaxi
  - analyze these trips (spatial, temporal, purpose, age, etc. distributions)

3. Find all TransitTrips)

- Find all trips (other than ShortTrips and LongTrips) that start or end within a 5 (and 10) minute walk of a fixed transit station (Including bus Park&Ride lots) and determine if they are candidates to be served by the transit system.
- list all major rail and express bus systems
- for each get the lat-lon of each station
- get distance and travel time arrays for each system
- find all trips that originate within 5 (10) minutes (Same (or neighboring) pixel (called Walk2Transit)
  - segregate all trips that also terminate within 5 (10) minutes(called UseTransit)_
- find all other trips that terminate within 5 (10) minutes (Same (or neighboring) pixel (called WalkFrTransit)
  - segregate all trips that also originate within 5 (10) minutes (make sure they are the same as the above.)
- Analyze these trips (spatial, temporal, purpose, age, etc. distributions)
- Do a modeSplit model on these trips into Transit Only, aTaxi->Transit, Transit->aTaxi, or aTaxi
  - analyze these trips (spatial, temporal, purpose, age, etc. distributions)

4. Find all aTaxiPersonTrips, Assess the Nation-wide Ride-sharing Potential & Generate the aTaxiVehicleTrip file assuming infinite sized aTaxis

- Trips that remain after ShortTrips and LonTrips are removed (Trips longer than a mile but shorter than 100 miles)
- Analyze these trips (spatial, temporal, purpose, age, etc. distributions)
- Assess the ride-share potential at a DepartureDelay (DD)=300sec; CommonDestinations(CD)= 3 pixels; MaxCircuity (MC)=20%, produce the aTaxiVehicleTrip file
- Analyze these aTaxiVehicleTrips (spatial, temporal, purpose, age, etc. distributions)
- Assess 'AverageVehcicleOccupancy' (AVO) using infinite sized aTaxis

5. What is the best aTaxi seating capacity?

- Working with 4 above, but now assuming a set of aTaxi sizes
- If all aTaxis were one size, what would that size be; 3-passenger, 4-pass, 5-pass???? (Justify based on energy operating costs and capital costs)
- If one were to build 4 sizes of aTaxis, what would they be? (Justify based on energy operating costs and capital costs)

6. Using the aTaxiVehicleTrips from group 4, Determine FleetSize and Empty_aTaxiRepositioning, single-size aTaxi

- Do this for different sized aTaxis (3, 4 5, 6 & 7) passenger versions
- Start with the formulations of Shirley Zhu'15 and assess fleetsize requirements and Empty_aTaxirepositioning strategies and determine/justify what is the 'Optimum' aTaxi size (number of seats)
- Compute the Empty_aTaxi Mile and assess its implication on AverageVehicleOccupancy (AVO)

7. Using the aTaxiVehicleTrips from group 4, Determine FleetSize and Empty_aTaxiRepositioning, for a Multi-size aTaxi fleet.

- Use 3, 6, 15 and 50 passenger versions
- Assess an optimum vehicle use strategy so as to minimize Operating costs in assigning a vehicle size to serve a ride-sharing group (If one has an 11 person group, it may be better to assign two 6 passenger vehicles than one 15 or even better to assign one 15 and one 3 depending on the circuity associated with those 11 travelers. Formulate the vehicle assignment routine
- Characterize the subtleties that are going on here.
- Compute the Empty_aTaxi Mile and assess its implication on AverageVehicleOccupancy (AVO)

8. How do we add VacationTrips???, what else is missing??? and Write/Manage the creation of the Orf467F16 Final Report: **Nationwide Mobility as a Service using aTaxis**.

- Figure out how to do this for Florida and other states.
- What else is missing??
- Critique on the whole process
- Produce the Orf467F16 Final Report