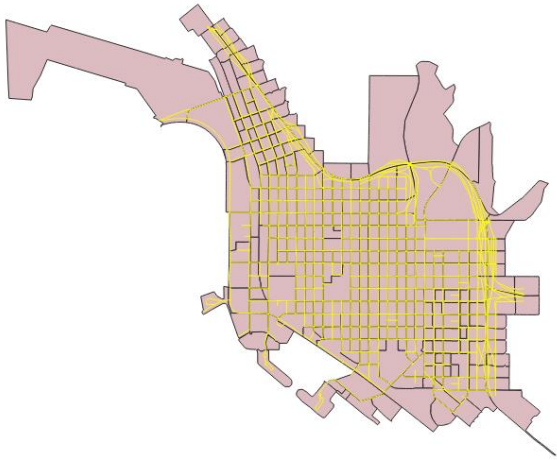


Update on Micro-transit Models

Siwei Hu

07/20/2023

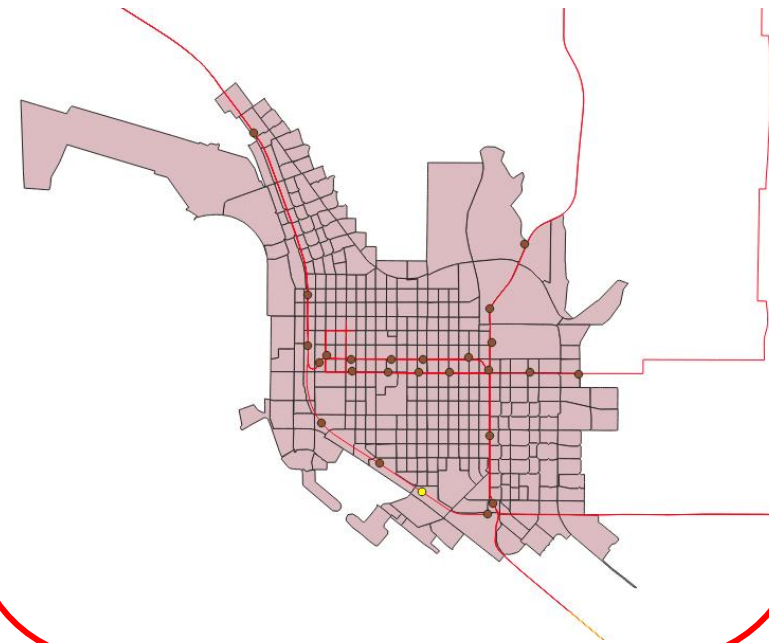
Fixed route transit system modeling



Walking network
(auto network using walking
speed – 3.57mile/hour)
Skims considered fixed

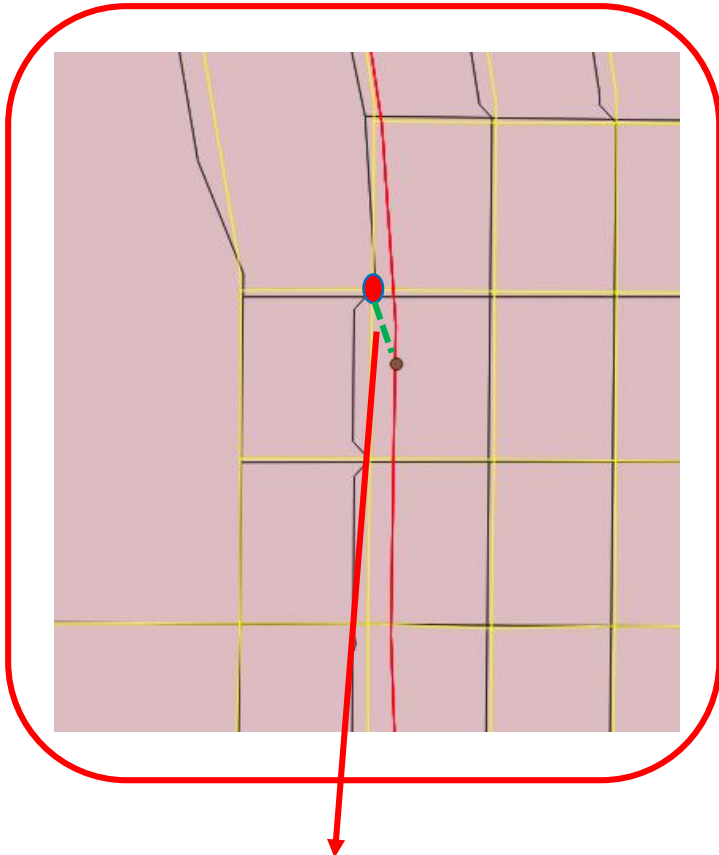


Network Node-Transit Stop Connector
(*transit waiting time will be
incorporated in this "connector", which
is stochastic*)



Transit network
(Transit network using 21 mile/hour
speed)
Skims considered fixed

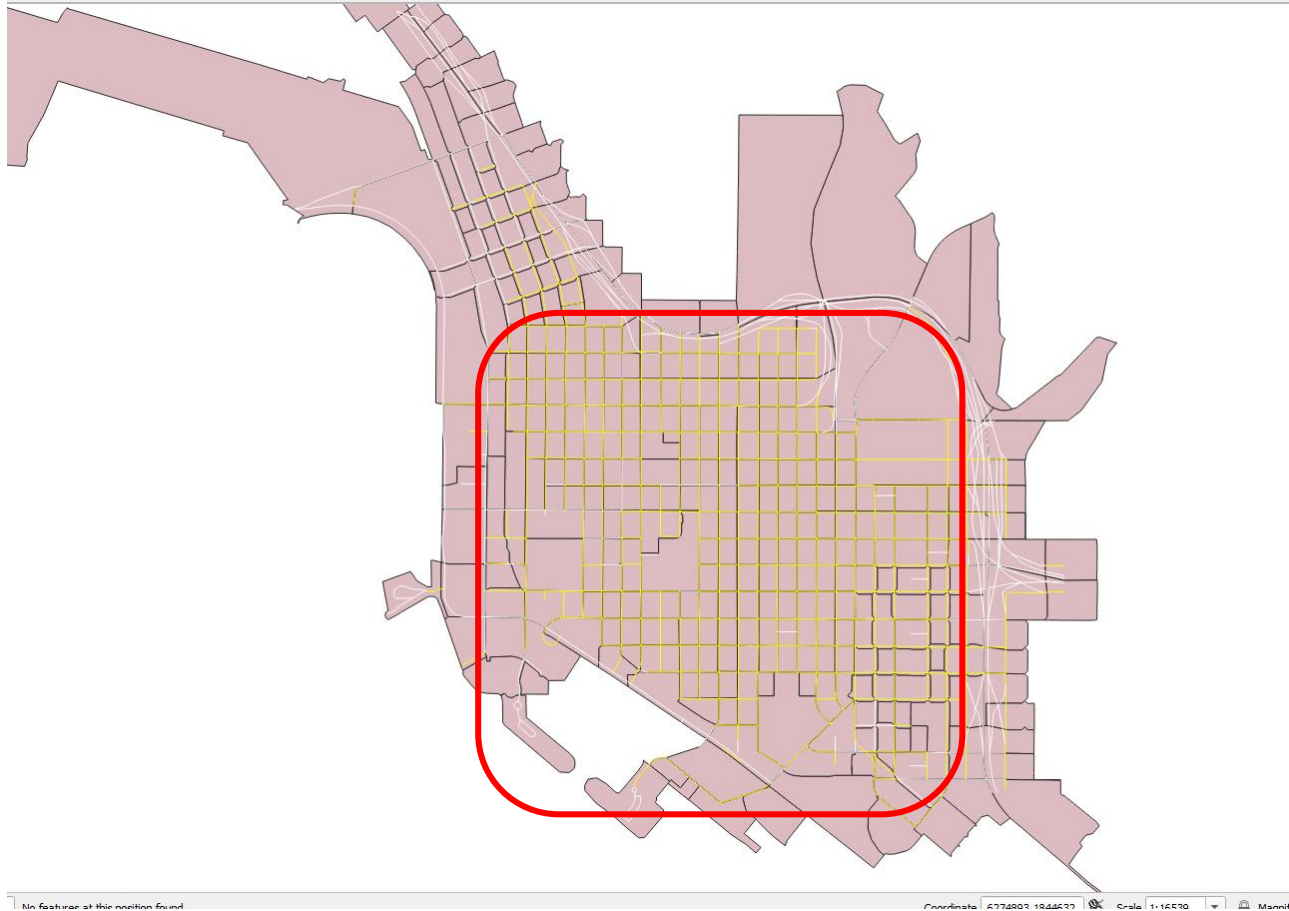
Question: Fixed route transit system modeling



Network Node-Transit Stop
(transit waiting time will be
incorporated in this “connector”)

- Question:
 - Shall we just assume each passenger's waiting time w_i follows a uniform distribution, whose mean is related to the transit vehicle headway?
 - *We just assign waiting time for passengers, but don't calculate the actual waiting time for passengers, right?*
 - calculating the actual waiting time might require the timetable of transit system, and the exact time passenger arrives at the transit stop.

Demand Nodes



- *Auto, fixed route transit, and microtransit demand will be loaded in these nodes*, whose link speed is 20 mph.

Yellow links with speed = 20 mph

Demand Modeling

final_trips - Excel

File Home Insert Draw Page Layout Formulas Data Review View Help Acrobat Team

Clipboard Font Alignment Number

trip_id

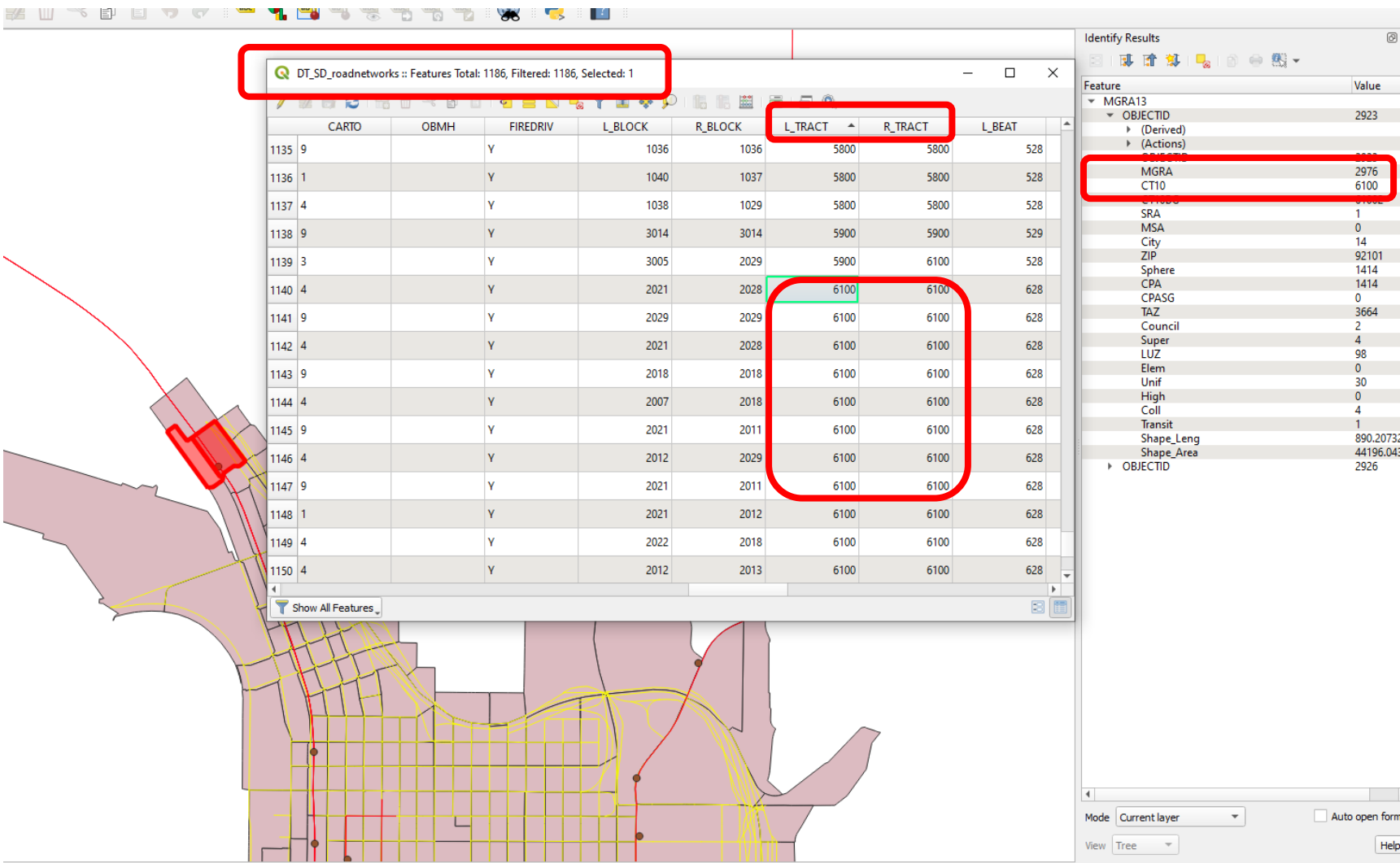
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
1	trip_id	person_id	household	primary	trip_num	outbound	trip_count	destination	origin	tour_id	purpose	destination	depart	trip_mode	mode_ch	catap	btap	path_set
2	34097	103	40	work	1	TRUE	1	102542	100027	4262	work			7 WALK_TR	6.045507	2154	1589	shortest
3	34101	103	40	work	1	FALSE	1	100027	102542	4262	home			11 SHARED3F	3.202741			
4	34105	103	40	work	1	TRUE	1	102542	100027	4263	work			15 BIKE	3.06436			
5	34109	103	40	work	1	FALSE	2	100274	102542	4263	shopping	20.37406		17 BIKE	3.700226			
6	34110	103	40	work	2	FALSE	2	100027	100274	4263	home			18 BIKE	1.839864			
7	34161	104	40	eatout	1	TRUE	1	105873	100027	4270	eatout			7 WALK_TR	0.953281	1669	1589	shortest
8	34165	104	40	eatout	1	FALSE	1	100027	105873	4270	home			10 WALK_TR	0.970069	1589	1669	shortest
9	34313	104	40	othdiscr	1	TRUE	1	100219	100027	4289	othdiscr			12 SHARED2F	0.878863			
10	34317	104	40	othdiscr	1	FALSE	3	102542	100219	4289	shopping	19.49408		21 WALK_TR	8.054431	2154	2372	fastest
11	34318	104	40	othdiscr	2	FALSE	3	102565	102542	4289	shopping	45.04744		21 WALK_TR	15.76373	1895	1933	shortest
12	34319	104	40	othdiscr	3	FALSE	3	100027	102565	4289	home			21 BIKE	11.74689			
13	34665	105	40	othmaint	1	TRUE	1	105845	100027	4333	othmaint			12 SHARED2F	0.339204			
14	34669	105	40	othmaint	1	FALSE	1	100027	105845	4333	home			18 SHARED2F	0.31513			

- ActivitySim's trip output is in MGRA level
- However, *our network table doesn't say which node is in which MGRA.*

Trip demand from ActivitySim
(OD are in MGRA level)

This slide explain how we connect ActivitySim
output to our request input

Demand Modeling



- ActivitySim's trip output is in MGRA level
- However, *our network table doesn't say which node is in which MGRA.*
- But our network table says *which nodes are in which census tract.* And *MGRA Table also says which MGRA is in which census tract.*
- So we plan to aggregate the OD demand in MGRA level to census tract level, and then distribute demand randomly among all the nodes in the census tract.

This slide explain how we connect ActivitySim output to our request input

Current on-going work

- **Preparation of Integration (Thursday morning, work on it)**
 1. Supply side
 - Transit network shortest path (stochastic waiting time for every passenger) – **working, especially stochastic waiting time**
 - Auto network shortest path (fixed travel time) - **finished**
 2. Demand side
 - Convert ActivitySim **MGRA level** Demand to the **nodal-level demand** in our multi-modal system – **working**
- **Integration (Thursday afternoon and evening, work on it)**
 1. **Choice Models - finished;**
 2. **FleetPy (simulation) – need to convert its output into choice model;**
 3. **Fixed Route Transit (Supply side – item 1 – working on it);**
 4. **AutoNetwork (lookup table - finished);**