MUSA 507: PUBLIC POLICY ANALYTICS

HOMEWORK 06

CALCULATING RETAIL SITE SUITABILITY AND TRADE AREAS

XIAOQI TANG

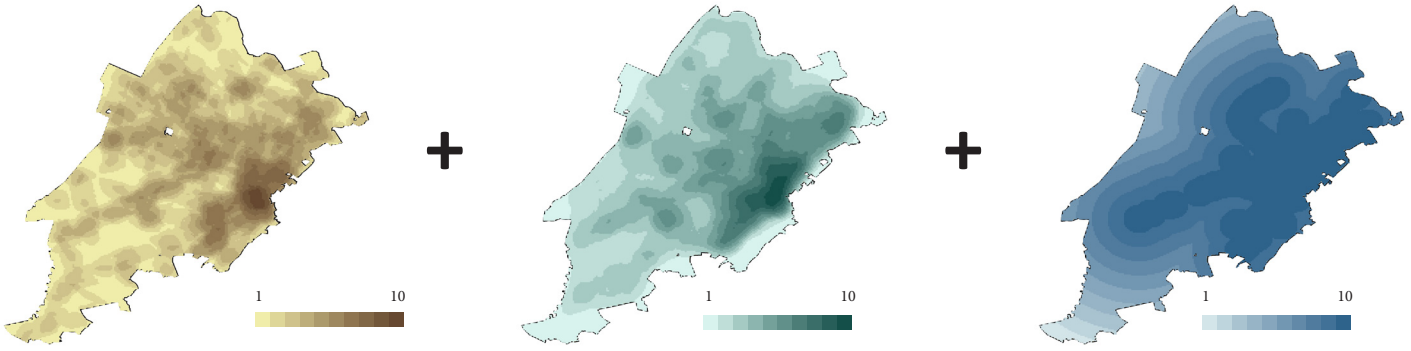
Site Suitability Map

For the site suitability map, I choose highway, road, rail station and employment center as my supply facors, and also choose median income as my demand factor. In the supply analysis, the travel potential of highway and road is calcullated by using line density tool; and rail station is calculated by euclidean distance tool. The combined transportation travel potential is calculated by "raster calculator". The weight is 2:3:1-highway:road:reai station.

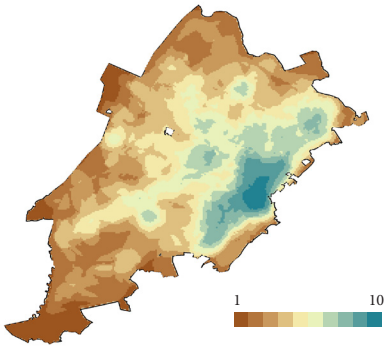
The combined travel potential.

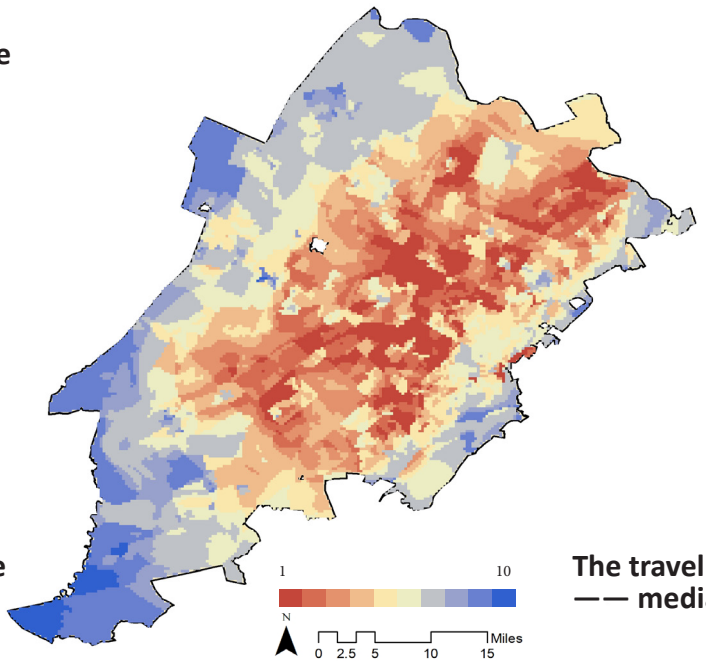
The travel potential for supply side—— transportation factor:

highway **ROAD** **rail station**



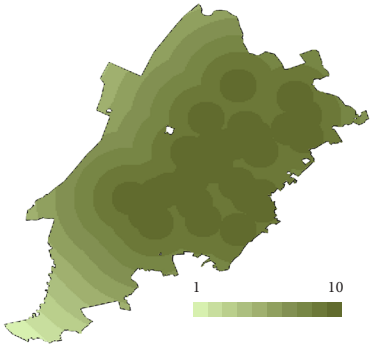
The travel potential for supply side ——combined transportation





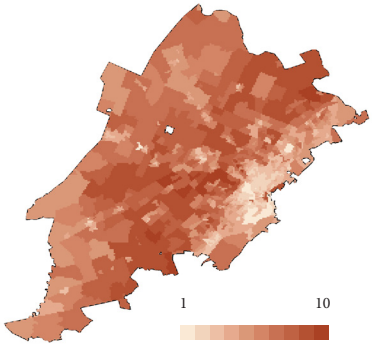
For the combined travel potential, the combined travel potential is calculated by the raster calculator tool. The equation is: the trvael potential of combined transportation*2 + employment center*2 + median income*1

The travel potential for supply side ——employment center



SUPPLY **DEMAND**

The travel potential for demand side ——median income



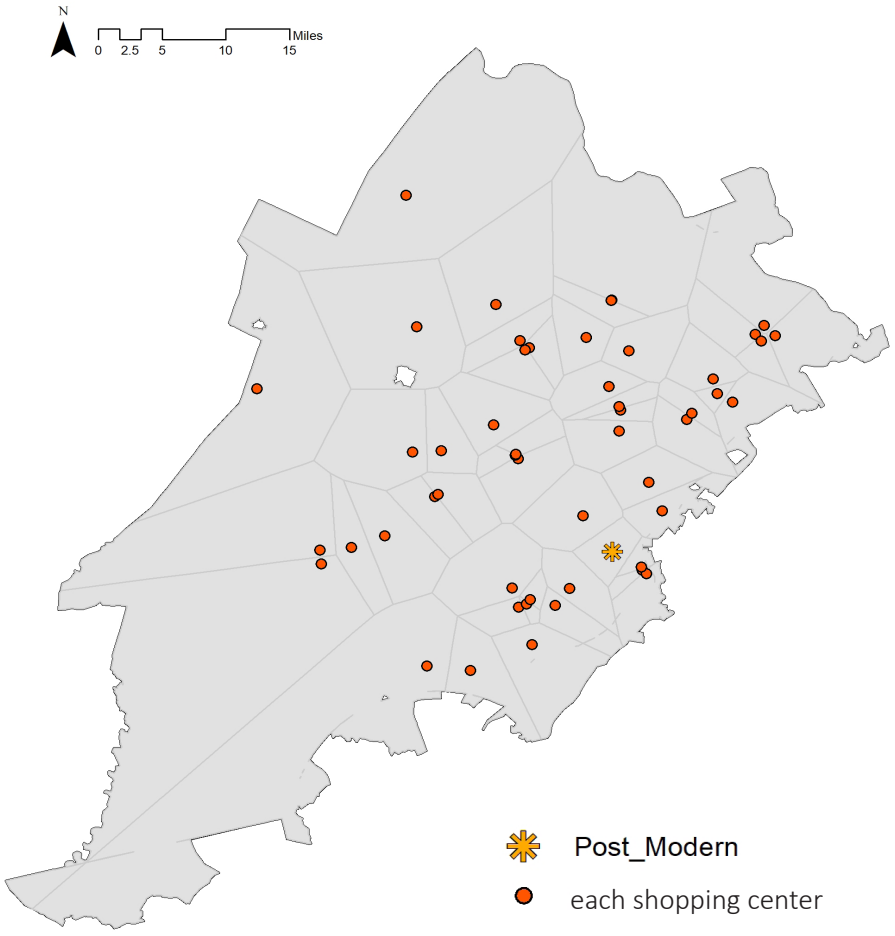
Trade Sheds

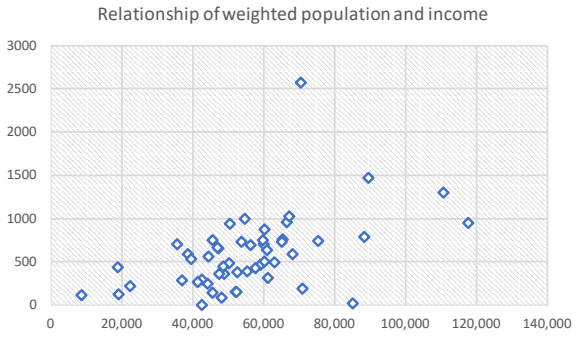
In order to specifiy the suitabilty, we calculated the population by census tracts and do some analysis. There is a table include population , number of housing units, weighted population and income. The map shows the location of Post@Modern and each shopping centers. The scattor plot shows the relationship between the weighted population and median income.

The Relationship of population, housing units and tracks

Fid	Income	Population	Total Number Of Housing Units	Weighted Population
0	117,737	3,885	1,589	958
1	88,337	4,176	1,915	793
2	68,015	3,536	1,387	589
3	38,583	4,392	1,946	595
4	110,616	8,277	2,648	1,307
5	75,296	5,217	1,548	745
6	63,008	4,347	1,392	498
7	54,648	9,050	3,229	1,004
8	48,879	3,667	1,278	367
9	89,491	7,151	2,298	1,471
10	65,227	5,108	1,922	768
11	66,422	5,787	2,010	965
12	44,159	1,869	743	254
13	50,106	3,237	1,216	492
14	45,484	6,130	2,451	753
15	55,431	2,469	890	391
16	58,977	2,759	1,069	468
17	42,500	1,801	704	297
18	42,500	27	14	4
19	85,081	26	9	20
20	18,714	2,880	480	443
21	8,569	826	501	118
22	22,417	1,663	509	227
23	19,083	1,070	433	132
24	39,570	4,500	1,814	537
25	52,463	2,668	973	380
26	48,534	3,205	1,114	454
27	47,500	2,690	1,024	362
28	35,569	6,160	2,365	705
29	53,651	4,879	1,877	737
30	67,148	6,032	2,005	1,030
31	48,194	851	383	95
32	70,875	1,325	474	199
33	60,061	4,963	1,905	707
34	52,083	1,408	559	157
35	60,231	3,517	1,342	505
36	60,843	4,206	1,673	638
37	61,061	2,191	808	314
38	47,269	5,226	1,941	660
39	60,262	5,714	2,009	874
40	50,543	8,521	3,159	947
41	45,652	1,283	430	143
42	56,281	4,804	1,793	698
43	57,708	3,096	1,067	431
44	59,663	5,199	1,821	752
45	36,969	2,424	971	291
46	44,392	4,373	1,642	566
47	41,369	2,134	814	272
48	65,018	4,885	1,755	733
49	70,332	11,409	3,937	2,580
50	46,875	4,694	1,815	665
51	52,250	1,059	377	156

Trade sheds for each shopping center

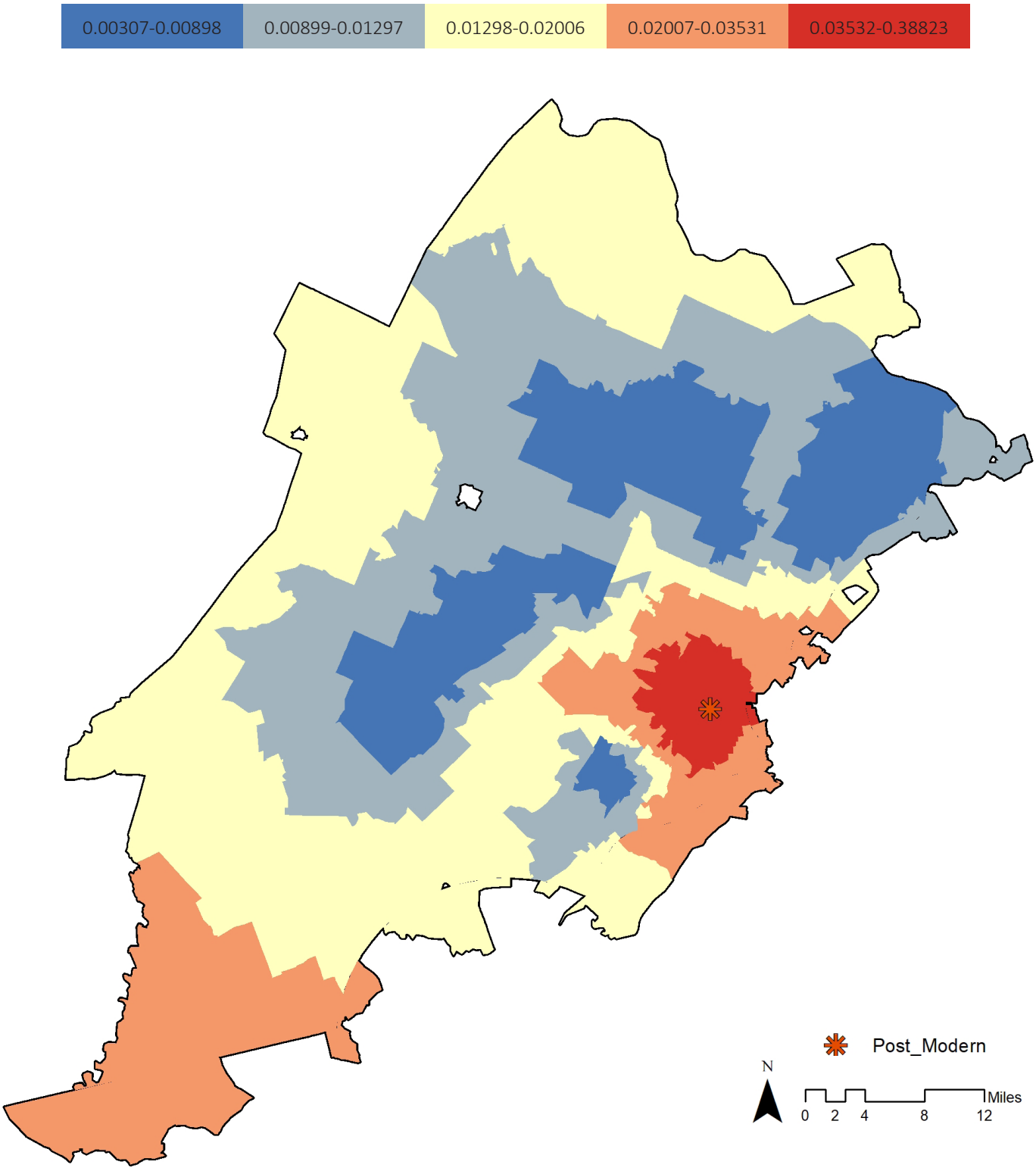




For the scattor plot, we can have the conclusion that there is a positive relationship between the weighted population and median incomes. However, as this graph shows these two paremeters, it can not show the relationship for each shopping center. So, this method may be not a good way to understand the potential customer and shops.

The Probability of Post@Modern

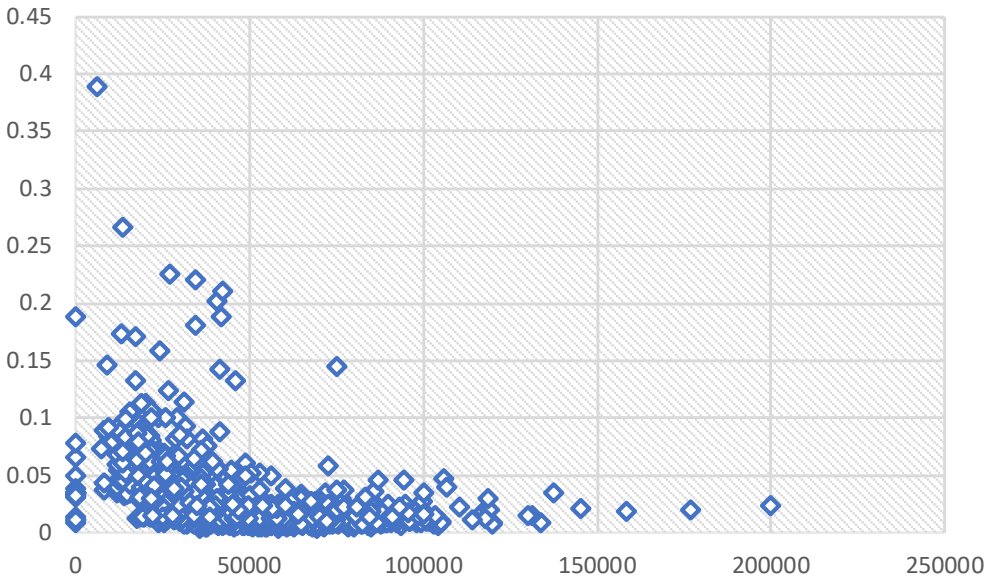
In order to clearly and succinctly show off the probability, I rejoined the calculated consumer probability data to my original centroid shapefile.



In this case, the mean probability is 0.026, so I choose the probability of 0.026 as a cut off point. And then use summarize tool to calculate minimum, maximum, average and standard veviation for the three socioeconomic characteristics(population, rent, and percentage of white)

	Min	Max	Mean	SD
Population				
tract below 0.026	5	12,136	3,995.01	1,930.54
tract above 0.026	0	10,116	3,726.81	2,236.81
Rent				
tract below 0.026	0	2,001	751.51	266.83
tract above 0.026	0	1,587	551.52	217.81
Percentage of white				
tract below 0.026	1	100	82.87	22.80
tract above 0.026	0	100	41.33	35.79

Graph of the Relationship between Probability and Median Income



As the scatter plot picture shows, with the increasing of the median income, the probability slowly goes down. So there is a negative relationship between the median income and the probability.

It's a good way to understand the travel potential raster and the potential customers. People have higher possibility going to this shop who is more likely to be the lower income people.

The Huff Model is More Reasonable and Make Sense

After these two analysis, I do believe that the second method which considering both distance to Post@Modern, distance to local competitors in their area, and the square footage of existing developments is more meaningful.

It shows the probability of going to Post@Modern shop by each ract. And also the scatter plot shows the relationship of the median incone and the probabilibty, which is negative. That means the main customer of the Post@Modern are the lower income people.

As for the suggestion,if the shop is going to sell jewelry, it may not have a good future, because the target customer are low income people who maybe can not afford it. And also if the shop is going to sell car dealership, it may not have a great deal, because it may expensive for the target customer. So I think it will have a good future s that sell the farm tractors. Because the target customers are low income people who might kind of doing farm activities.

Based on the analysis, the main target customers are low income people. My suggestion is that it should not develop the Post@Modern shop whose target customers are high income people.