



The Inspiration

- Oh, Kyushik and Seunghyun Jeong. "Assessing the spatial distribution of urban parks using GIS." *Landscape and Urban Planning* 82 (2007): 25-32. ScienceDirect. (*available at* sciencedirect.com, last visited March, 13, 2011)
- Network Analyst

The Problem

- GIS, where to work?
 - Not all office locations are created equal
 - Euclidean distance is not often applicable in an urban environment
- 

Assumptions

- Potential GIS employees want to be able to walk to nearby points of interest
 - Potential GIS employees will walk no more than 985 feet (Based on Thurstain-Goodwin, M. and Unwin, D. 2000.)
 - Potential GIS employees follow traffic laws
 - Potential GIS employees spend an average of 15 seconds waiting at crosswalks
 - Potential GIS employees cannot fly
- 

The Process

- Locating Workplaces and Points of Interest
 - Building the Network
 - Running the Network
 - Summary Statistics
 - Generating Personality Archetypes
 - MCE
-

Locating Workplaces

- Twelve GIS employers
 - Bonneville Power
 - Environmental Services
 - GeoNorth
 - METRO
 - Multnomah County
 - Oregon Department of Transportation
 - Portland General Electric
 - Portland State University
 - Real Urban Graphics
 - Sanborn
 - U.S. Geological Survey
 - U.S. Forest Survey

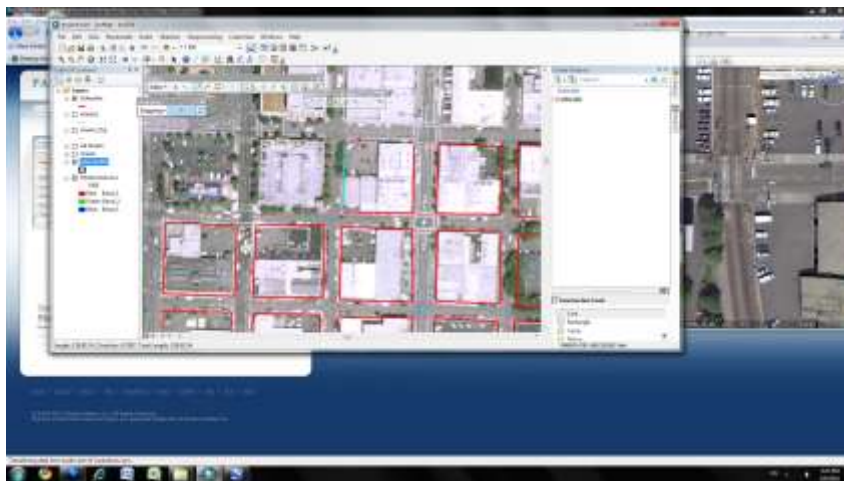


Locating Points of Interest

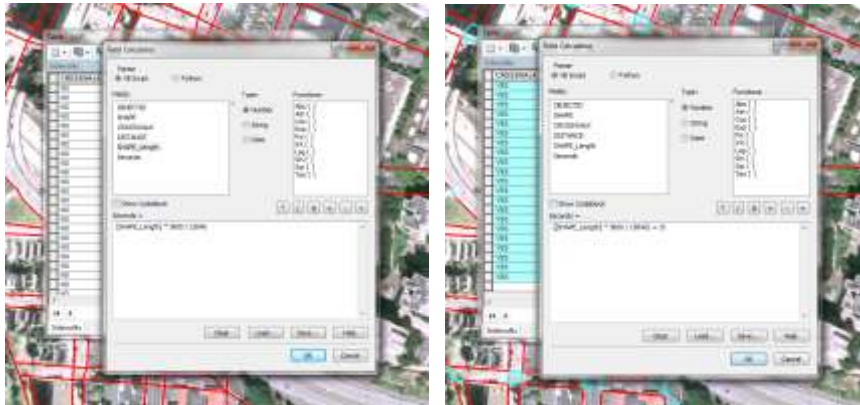


- 300 Meter Buffers + Google Earth
- Eight Categories of Interest
 - Bank
 - Bar
 - Bus Stop
 - Coffee Shop
 - Grocery Store
 - Max Stop
 - Restaurant
 - Streetcar Stop

Building the Network



Building the Network: Time



Building the Network: Result

Street VS Sidewalk



Running the Network



Running the Network: Harvesting Data

OBJECTID	Shape	FeatureID	OBJECTID	Total_Segments	Shape_Length	Name	Type
1	Point	21	21	22,572,278	22,572,278	Carle Vase	Restaurant
2	Point	81	81	94,882,122	179,240,030	Carle Vase	Restaurant
3	Point	89	89	94,882,122	179,240,030	Carle Vase	Restaurant
4	Point	87	87	94,882,122	179,240,030	Carle Vase	Restaurant
5	Point	28	28	97,524,122	180,200,030	Carle Vase	Restaurant
6	Point	88	88	94,882,122	179,240,030	Carle Vase	Restaurant
7	Point	47	47	94,882,122	179,240,030	Carle Vase	Restaurant
8	Point	21	21	91,098,122	224,421,030	Carle Vase	Restaurant
9	Point	48	48	142,542,122	319,145,030	Carle Vase	Restaurant
10	Point	8	8	718,481,068	485,705,030	Carle Vase	Restaurant
11	Point	72	72	125,421,030	411,382,030	Carle Vase	Restaurant
12	Point	18	18	127,037,030	420,360,030	Carle Vase	Restaurant
13	Point	32	32	127,037,030	420,360,030	Carle Vase	Restaurant
14	Point	17	17	124,123,030	420,360,030	Carle Vase	Restaurant
15	Point	18	18	126,361,030	479,381,030	Carle Vase	Restaurant
16	Point	18	18	144,511,030	383,344,030	Carle Vase	Restaurant
17	Point	8	8	148,191,030	383,344,030	Carle Vase	Restaurant
18	Point	28	28	183,798,030	422,361,030	Carle Vase	Restaurant
19	Point	88	88	183,798,030	422,361,030	Carle Vase	Restaurant
20	Point	77	77	172,202,030	422,361,030	Carle Vase	Restaurant
21	Point	74	74	172,202,030	422,361,030	Carle Vase	Restaurant
22	Point	67	67	184,191,030	412,344,030	Carle Vase	Restaurant
23	Point	89	89	184,191,030	412,344,030	Carle Vase	Restaurant
24	Point	18	18	184,191,030	412,344,030	Carle Vase	Restaurant

- Export Data
- Join Data to Points of Interest (FacilityID to OBJECTID)
- Only use routes 985 feet or less in length

Summary Statistics

- Categorize by Point of Interest type
- Mean: Average time values
- Generates Frequency

Generating Personality Archetypes



Urban Bohemian

- Weights
 - Coffee Shop: .45
 - Bar: .45
 - Grocery Store: .1
 - Bank: 0
 - Bus: 0
 - Max: 0
 - Restaurant: 0
 - Streetcar: 0



Alcohol Enthusiast

- Weights
 - Bar: .4
 - Bank: .4
 - Bus: .07
 - Max: .07
 - Restaurant: .06
 - Coffee Shop: 0
 - Grocery Store: 0
 - Streetcar: 0



Yuppie

- Weights
 - Restaurant: .3
 - Grocery Store: .3
 - Coffee Shop: .2
 - Streetcar: .2
 - Bar: 0
 - Bank: 0
 - Bus: 0
 - Max: 0



Wall Street Refugee

- Weights
 - Bar: .4
 - Bank: .3
 - Restaurant: .3
 - Bus: 0
 - Coffee Shop: 0
 - Grocery Store: 0
 - Max: 0
 - Streetcar: 0



Car Deficient Nerd

- Weights
 - Bus: .7
 - Restaurant: .15
 - Coffee Shop: .05
 - Grocery Store: .05
 - Bank: .05
 - Bar: 0
 - Max: 0
 - Streetcar: 0



Income Challenged Grad Student

- Weights
 - Coffee Shop: .25
 - Max: .25
 - Restaurant: .2
 - Bar: .2
 - Grocery Store: .1
 - Bus: 0
 - Bank: 0
 - Streetcar: 0



Thirsty Urbanite

- Weights
 - Max: .4
 - Bar: .3
 - Coffee Shop: .25
 - Streetcar: .05
 - Bus: 0
 - Restaurant: 0
 - Bank: 0
 - Grocery Store: 0



Mr./Ms. Vanilla

- Weights
 - Restaurant: .1666
 - Coffee Shop: .1666
 - Grocery Store: .1666
 - Bank: .1666
 - Bar: .1666
 - Bus: .0555
 - Max: .0555
 - Streetcar: .0555



MCE

$$\sum_{i=1}^8 MCE_i = weight_i * \left(\frac{frequency_i}{\sqrt{time}} \right)$$

	A	B	C	D	E	F	G	H	I
1		Urban Bohemian	Alcohol Enthusiast	Yuppie	Wall Street Refugee	Car Deficient Nerd	Income Challenged	Thirsty Urbanite	Mr./Mrs Bland
2	RUG	0	0.057418633	0.037255689	0.02168973	0.378269164	0.072832165	0.057287242	0.058501257
3	PGE	0	0.100165023	0	0.040472074	0.528967922	0	0	0.063930722
4	USGS	0.035410188	0.103396295	0.020516008	0.045106676	0.375884378	0.072427967	0.103672391	0.073979952
5	Bonn	0.029626123	0.071503467	0.051034229	0.039768164	0.252193542	0.195404639	0.200289007	0.085163814
6	Metro	0.120826371	0.12345882	0.105107946	0.131511614	0.20942859	0.099314998	0.067422501	0.12074944
7	MultiCo	0.13187014	0.180221452	0.123476358	0.153031677	1.080374678	0.126751183	0.080808212	0.182628903
8	ODOT	0.244835113	0.26268119	0.270537274	0.340516036	0.842816464	0.327434639	0.251783166	0.267656196
9	USFS	0.294734732	0.352431679	0.427414275	0.508684738	0.446332483	0.492317952	0.168319105	0.389274733
10	PSU	0.182741067	0.361303688	0.45271156	0.350655503	1.714420175	0.380340606	0.299847345	0.439448236
11	GeoNorth	0.292179729	0.334856864	0.394217965	0.649255613	1.193444678	0.904950126	0.281712166	0.371319627
12	Sanborn	0.224767372	0.699227469	0.620643954	0.717966831	2.632306777	0.744803964	0.813918833	0.721462871
13	EnvServ	0.178775254	0.874180767	0.644127659	0.692837231	5.046796375	0.543031832	0.309894169	0.881190364

Challenges

- Topology
 - The Invisible Unchangeable Rule



- Network Analyst
 - Finickiness

Shortcomings

- Need for better normalization
 - Crosswalk times
 - Archetypes devised entirely “in house”
 - Limited number of factors
 - Human error
- 