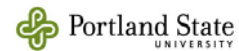


Network Analysis of Fire District Response Areas



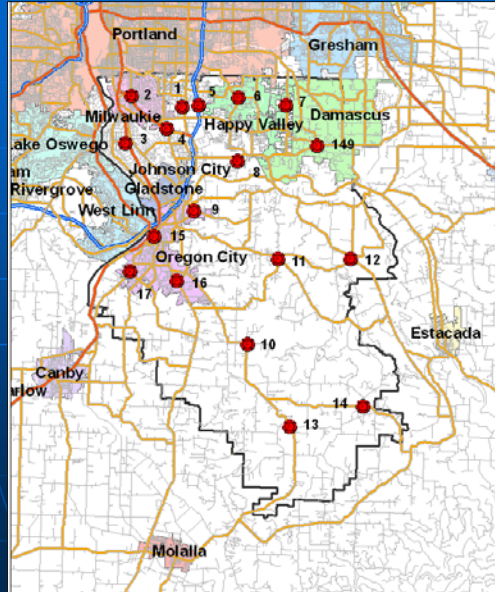
Craig Warden
Graduate Student
Geography



Purpose

- Use an ArcScript™ to determine response areas for fire district
- Compare to Network Analysis™
- Become familiar with geographic networks for thesis project

Clackamas Fire District

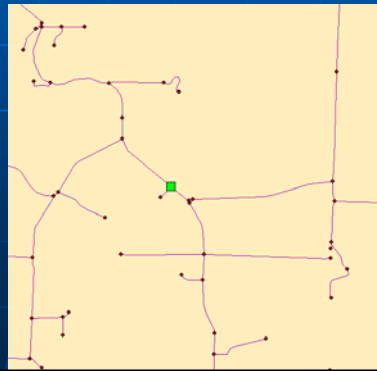


Data Preparation

- Focused on south portion with 3 stations = “Supply”
- Endpoints & intersections of road network = “Demand”
- Too difficult to model population or incidents at this stage
- StreetMaps USA™ (ESRI) clipped to be basis of network

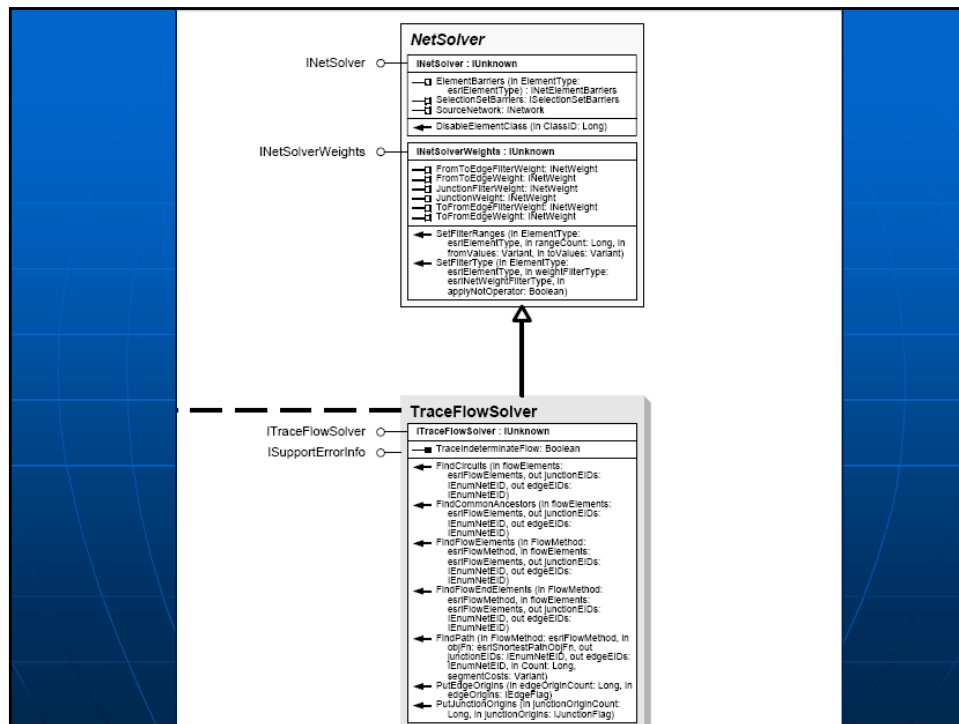
Geometric Network

- Network painstakingly (!!)
reconstructed using topology editing
- Time to travel (minutes) each line
segment as network
impedance
- Added to ArcMap™
with separate shape-
files of “Supply” &
“Demand”



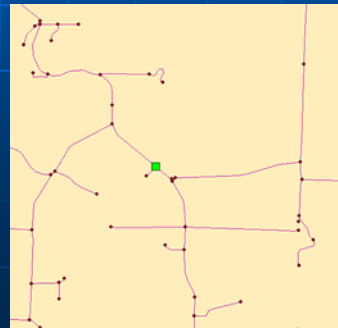
Major ArcObjects™ & Methods

- esriGeoDatabase.IGeometricNetwork
- esriCarto.I map
- NetObjD4.PathFinder
- esri.Geometry.IPointCollection
- esriGeometry.Ipolyline
- esriNetworkAnalysis.IPointToEID
(junctions & edges)
- Location-allocation ArcScript™: Li
Zou, Sep 17 2006,
<http://arcscripts.esri.com/details.asp?dbid=13985>

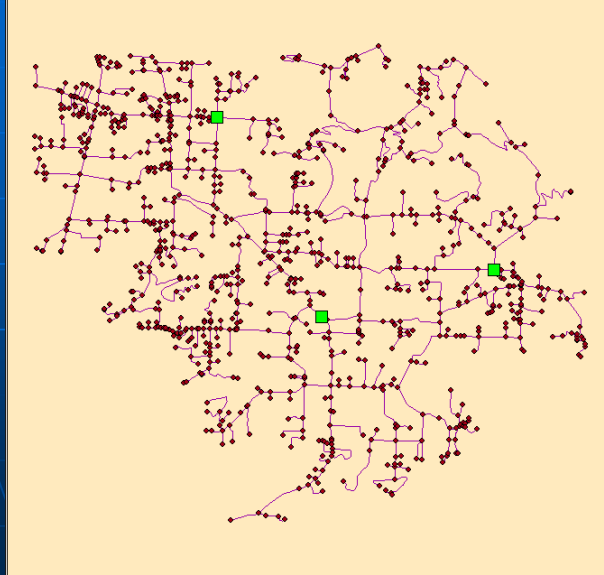


Path Finder™ Algorithm

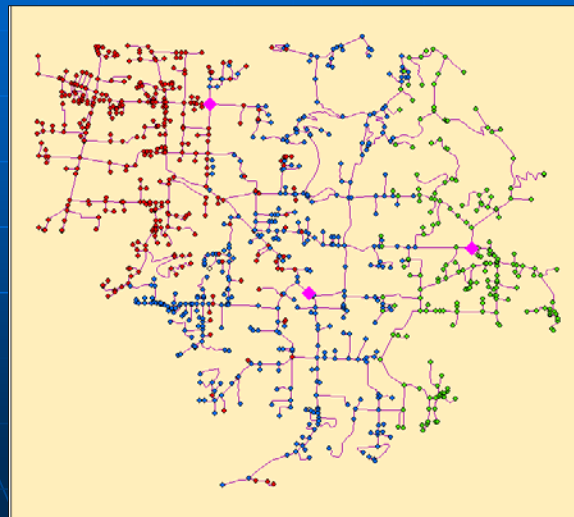
- Calculates “cost” of all possible paths from each “supply” to “demand” point
- Assigns each demand to “closest” supply
- Each line segment & junction has impedance



Final Geometric Network



After Path Finder Analysis



Results Matrix

OBJECTID	To 386	To 611	To 896	MinCost	MinTold
1.000000000000	70.39963158030	45.21011658390	24.14410390700	24.14410390700	To 896
2.000000000000	49.25573584810	27.73799731210	50.08473617400	27.73799731210	To 611
3.000000000000	48.10337020830	28.89036295190	51.23710181380	28.89036295190	To 611
4.000000000000	62.94588542540	37.75637042890	16.69035775210	16.69035775210	To 896
5.000000000000	61.62928665240	36.43977165590	15.37375897910	15.37375897910	To 896
6.000000000000	34.66656915470	49.62235662340	66.13251894530	34.66656915470	To 386
7.000000000000	26.38935876270	37.94503312560	54.45519544740	26.38935876270	To 386
8.000000000000	52.43509406970	38.20486484100	42.72952053510	38.20486484100	To 611
9.000000000000	32.19767302270	48.67491768670	65.18508000860	32.19767302270	To 386
10.000000000000	33.44995331760	49.92719798160	66.43736030350	33.44995331760	To 386
11.000000000000	34.96656784420	51.44381250810	67.95397483000	34.96656784420	To 386
12.000000000000	36.28712561730	52.76437028120	69.27453260310	36.28712561730	To 386
13.000000000000	37.97912193090	67.85308576750	81.89784222650	37.97912193090	To 386
14.000000000000	36.11771393570	65.99167777230	80.03643423130	36.11771393570	To 386
15.000000000000	35.92942039300	50.88520786170	67.39537018350	35.92942039300	To 386
16.000000000000	30.73345441000	47.21069907400	63.72086139580	30.73345441000	To 386
17.000000000000	35.02913138270	51.50637604670	68.01653836850	35.02913138270	To 386
18.000000000000	33.62993884090	50.10718350480	66.61734582670	33.62993884090	To 386
19.000000000000	33.59079780800	48.54658527670	65.05674759860	33.59079780800	To 386
20.000000000000	33.59079780800	48.54658527670	65.05674759860	33.59079780800	To 386
21.000000000000	27.87170488010	44.34894954410	60.85911186600	27.87170488010	To 386
22.000000000000	29.17508328330	45.65232794730	62.16249026920	29.17508328330	To 386
23.000000000000	28.18637080120	44.66361546520	61.17377778700	28.18637080120	To 386
24.000000000000	29.09595722330	45.57320188730	62.08336420920	29.09595722330	To 386

Questions?

