



Background of Project

- Wanted to do a project that was meaningful
- Contacted Molly Vogt, GIS Manager at City of Gresham
- Informed of a need for a GIS analysis with the “severely underfunded” Gresham Fire Department



Meeting with Chief Scott Lewis



- Have funds to relocate Station #76 starting July, 2010
- Current site is too small, in disrepair
- **Where should Station #76 be moved to?**
- Fire station location is often a happening rather than a plan... for Station 76 this time he wants it to be a plan

Gresham Fire Department

- Multnomah County Fire District #10 service area
- Operates six fire stations within its service area and one shift in a shared Portland station
- Each engine is staffed and equipped as an Advanced Life Support (ALS) unit

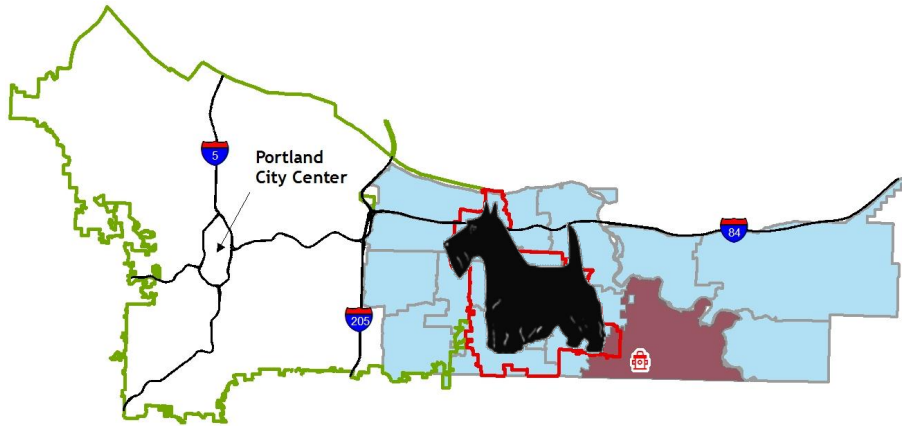
Gresham Fire Department

- Provides life safety services to city residents and contract districts for residents living in the cities of Gresham, Fairview, Troutdale, Wood Village and areas of unincorporated Multnomah County
- Each fire station responds to calls within its fire management area (FMA) with few exceptions to assist with other areas
- Goal response time: **FOUR MINUTES OR LESS**

Data

- Fire station locations
- Fire management areas
- City boundaries
- County boundaries
- Taxlots
- TAZ (Transportation Analysis Zones) current/projected population
- Roads

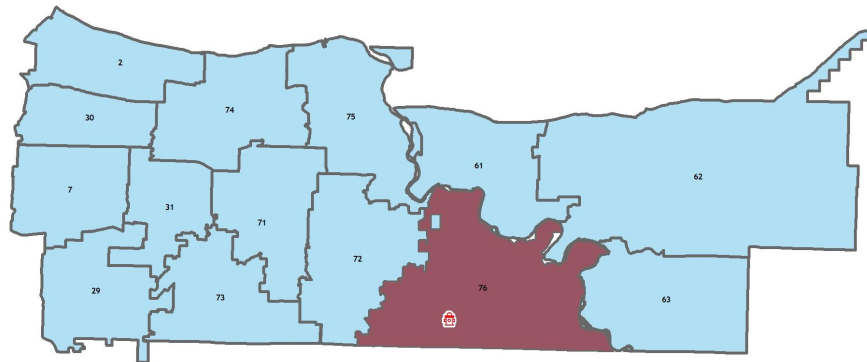
Vicinity - Greater Portland



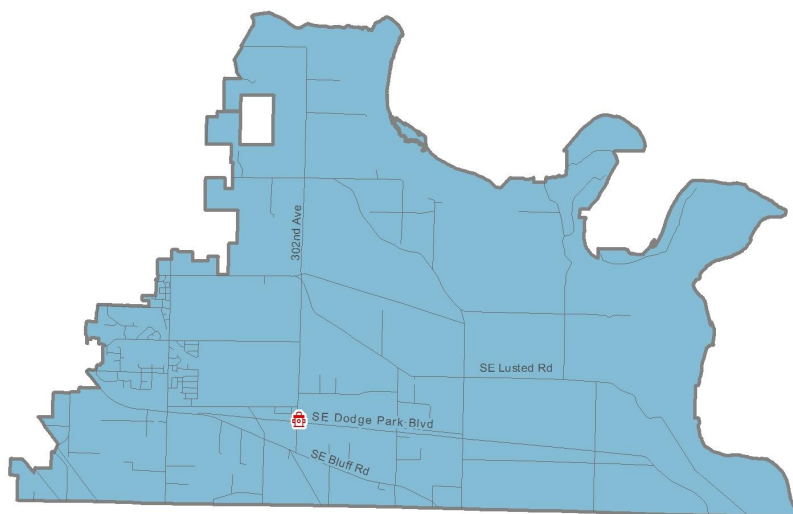
Where should Station #76 be moved to?

- Management area boundaries are set
- Service - cover own area not someone else's
- Incorporate SE side of Gresham without being at the cost of the unincorporated area
- Lot size/zoning codes do not matter
- Use current population and projected 2030 population

District #10 Fire Management Areas (FMAs)



FMA 76 - Current Fire Station Location



Analysis of Gresham Fire Service

- ECONorthwest (ECO) consulting company completed the report in February, 2010
 - ▣ Provided snapshot of service demand and response times
 - ▣ Identified trends over the past five years
 - ▣ Predicted future changes in demand
- Historical call data from every call from FY 04-05 to 08-09 provided by the City of Portland Bureau of Emergency Communications (BOEC)
 - ▣ Location and type of call and time stamps for each step of the response:
 - Call received
 - Dispatched
 - En-route
 - On scene
 - Cleared
- Forecasts for population growth from MetroScope to predict where growth will occur through the year 2030

Analysis of Gresham Fire Service

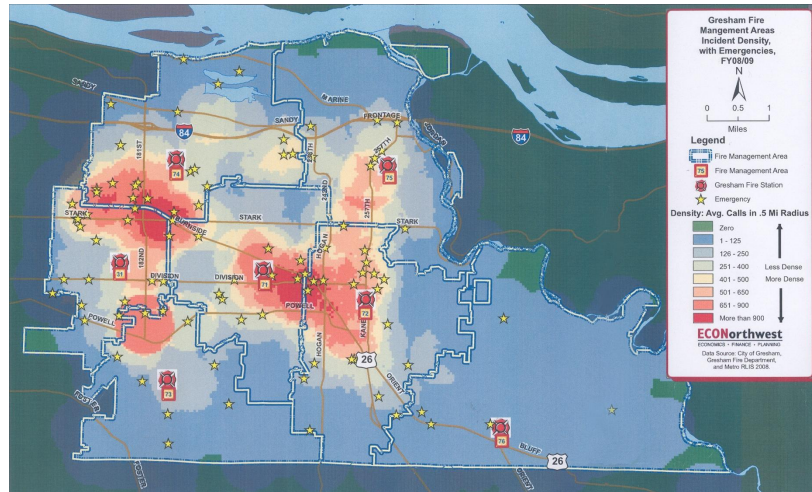
- “Station 76 in the Southwest has the largest service area, but also the area with the lowest density of incidents.”
- “Areas 75 and 76 have the lowest percent of response times under each time threshold (i.e., the slowest response times).”

Exhibit 4. Response time for applicable incidents by Station Area, FY 08-09

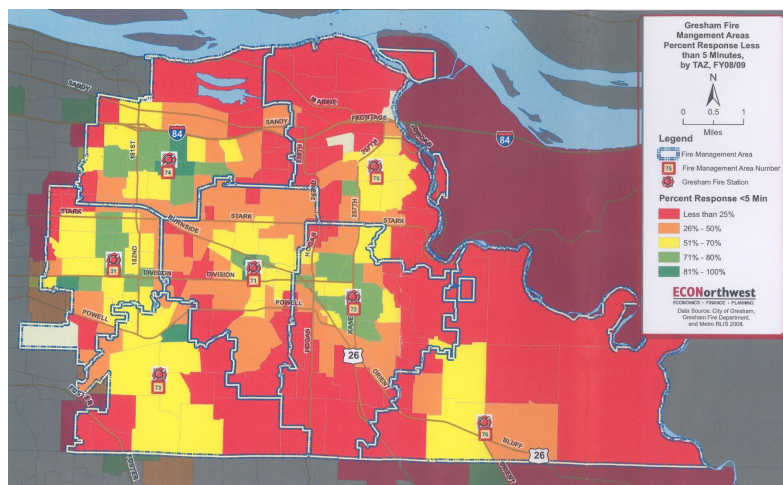
Incident Location	Total Incidents	Percent of Incidents Under...		
		3 minutes	5 minutes	7 minutes
Area 31	1,688	5%	54%	87%
Area 71	2,234	6%	46%	83%
Area 72	2,538	6%	47%	84%
Area 73	1,127	5%	52%	83%
Area 74	2,412	5%	42%	79%
Area 75	1,310	5%	38%	75%
Area 76	296	3%	24%	61%
Total	11,605	5%	46%	82%

Calculated by ECONorthwest

Analysis of Gresham Fire Service



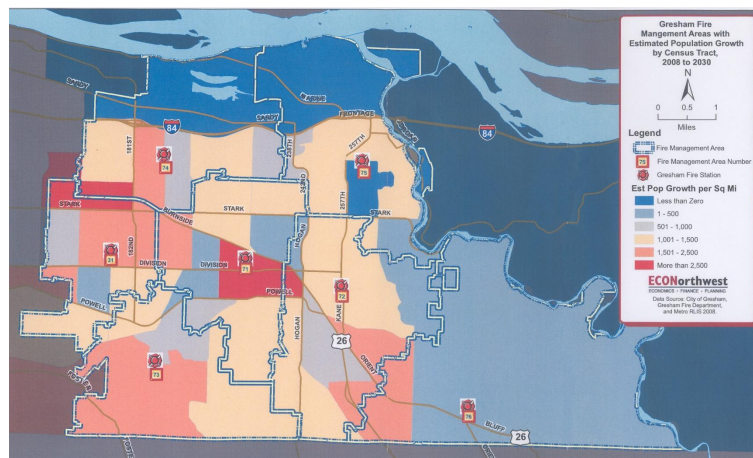
Analysis of Gresham Fire Service



Projected Population Growth

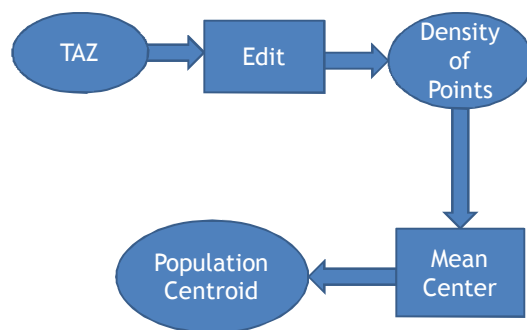
- Growing population leads to increased demand for public services
- Understanding where population growth is likely to occur can help in decision-making where additional resources will be necessary
- Metro provides long-term forecasts
 - ▣ Do not include major shifts in population
 - ▣ Does not predict future economic cycles that affect population changes
 - ▣ Have limitations, but are most current and accepted projections available at this scale
- **“The eastern portion of the GFES service area... is served by Station 76, and is forecast to experience slow population growth.”**

Projected Population Growth

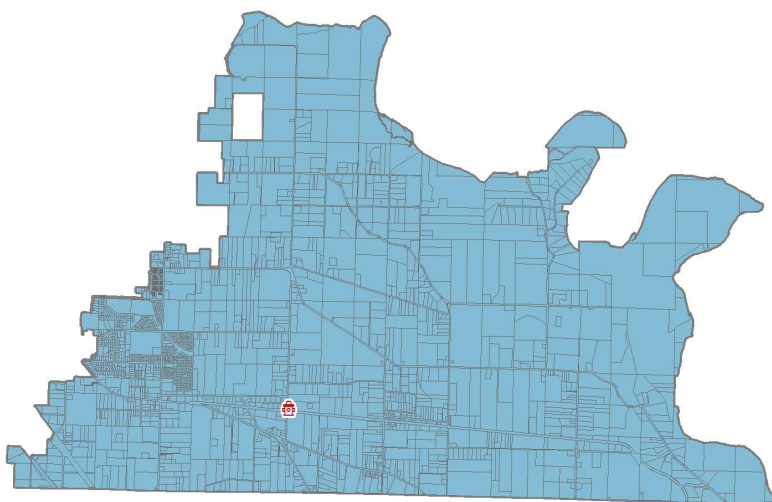




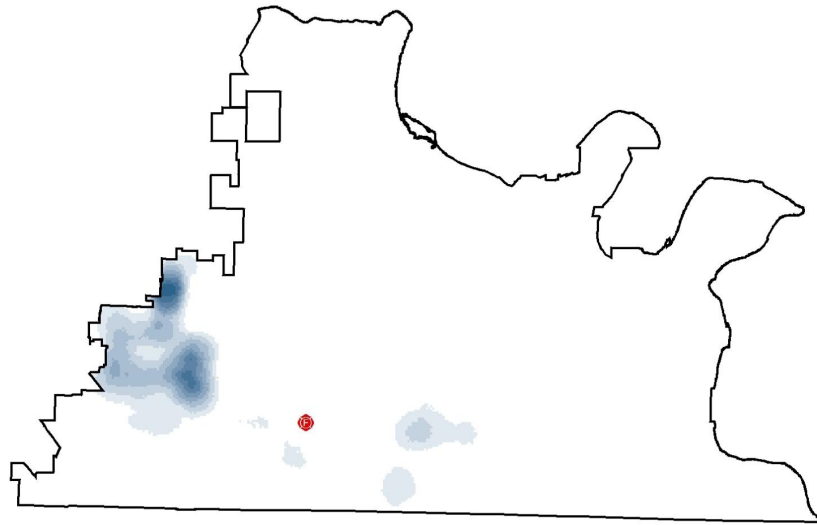
Population Model



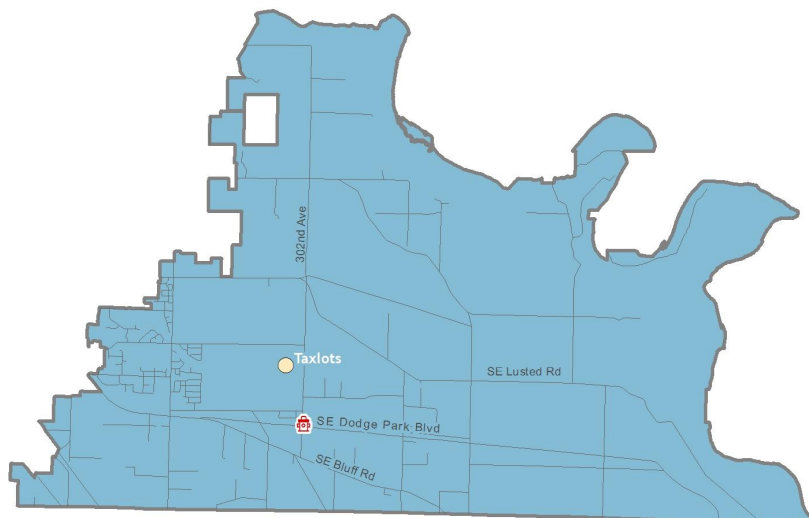
Taxlots



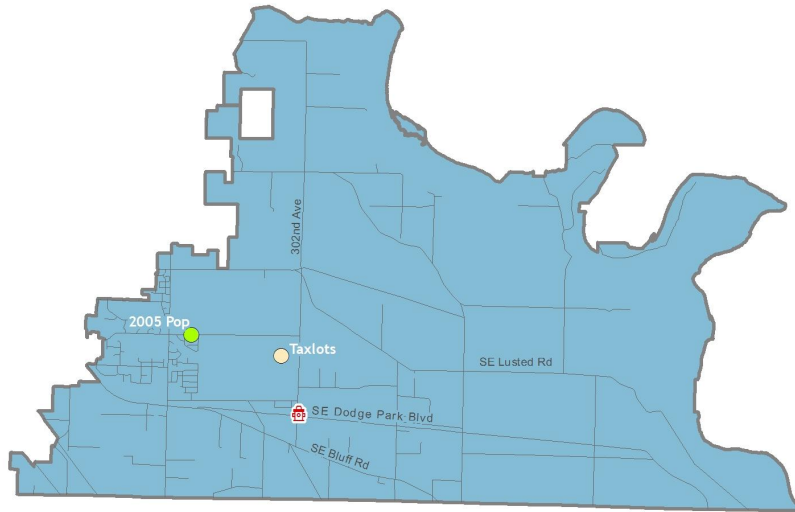
Density Based on Taxlots



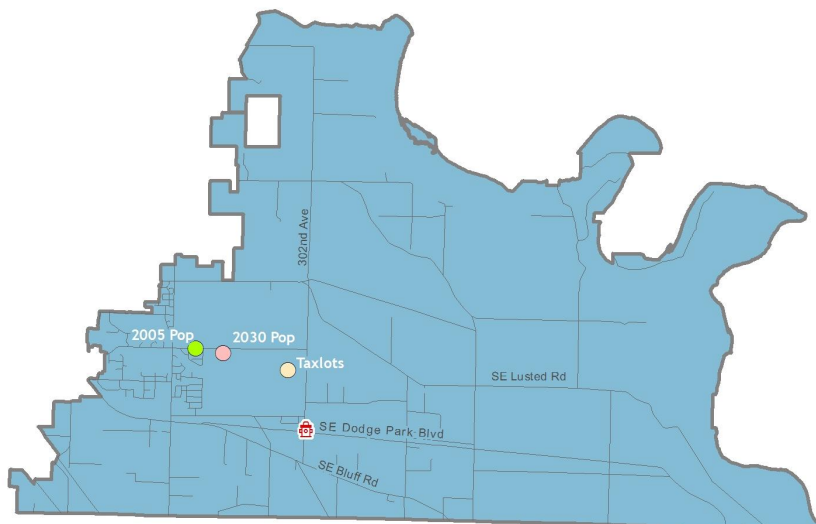
Proposed Site Based on Taxlot Centroids



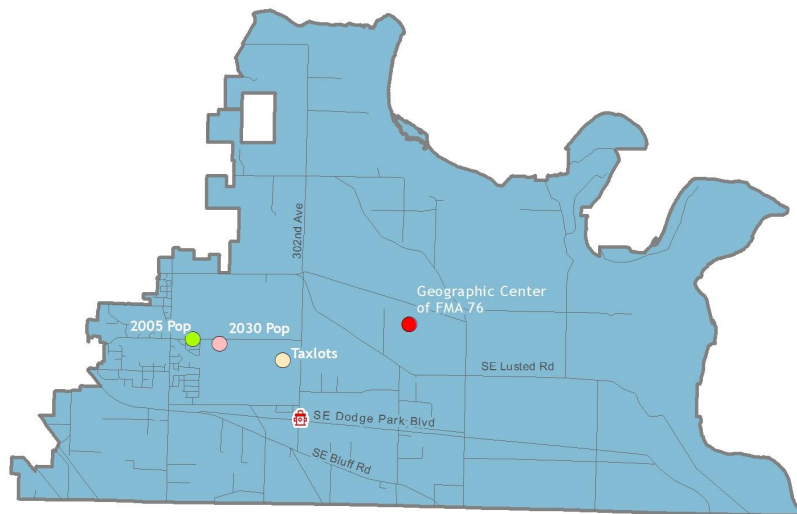
Proposed Site Based on 2005 Population Centroid



Proposed Site Based on 2030 Population Centroid

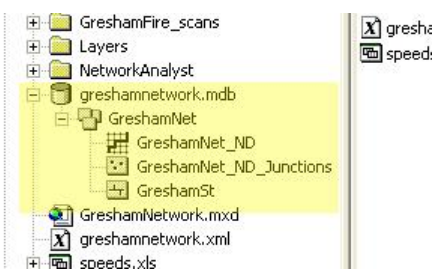


Mean Center (Centroid) of FMA 76

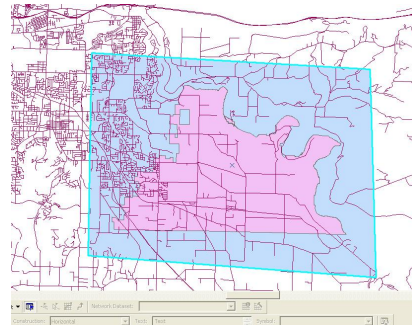


Network Analyst: New Network Dataset

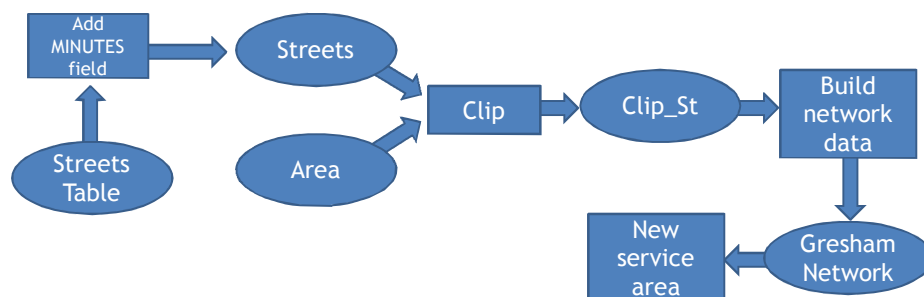
- Steps for creating a network dataset:
 - Create new personal geodatabase
 - Create new feature dataset
 - Import feature classes (Gresham street data)
 - Create new network dataset from imported street data



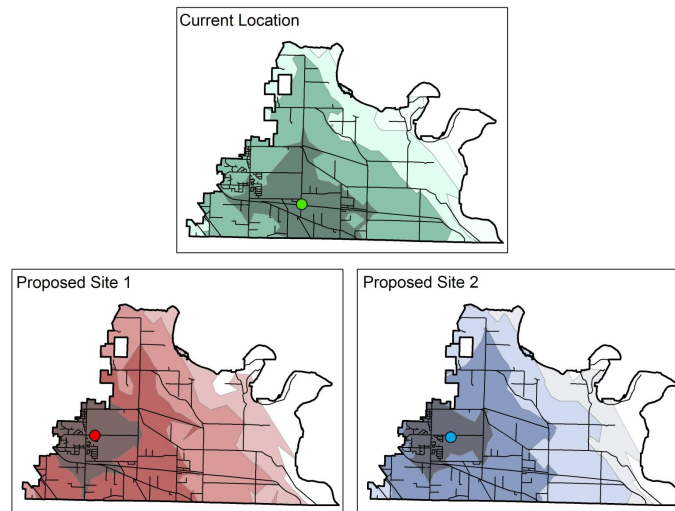
Network Analyst: Preparing Tables and Clipping Features

[illegible]

Network Model

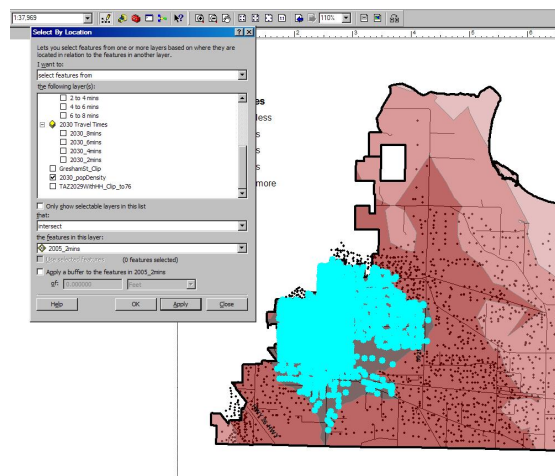


Network Analyst: Service Areas

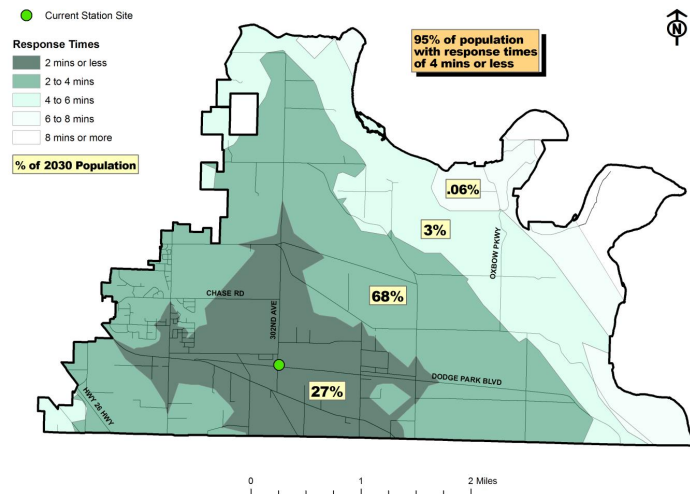


Population and Response Times

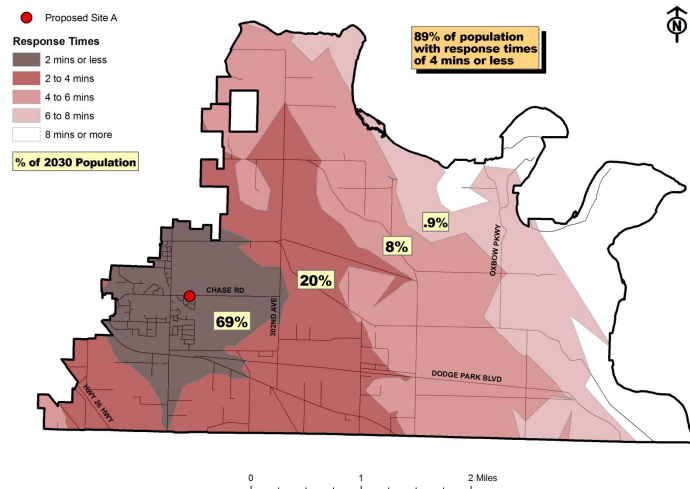
- **Select by Location**
used to calculate
percentage values for
2030 projected
population within each
response time area



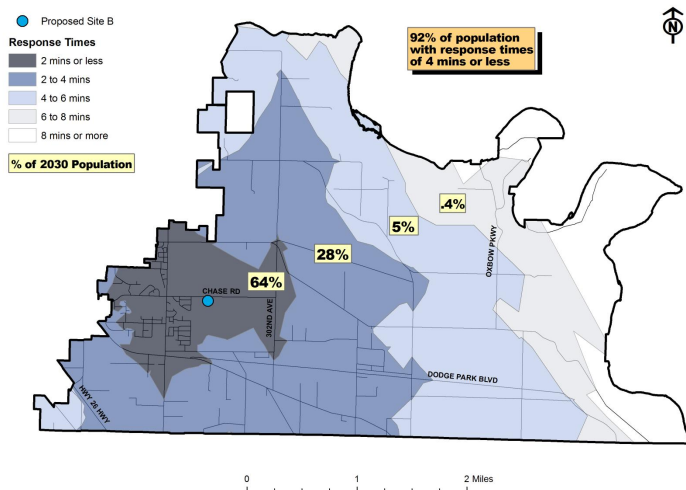
Response Times: Current Site



Response Times: Proposed Site A



Response Times: Proposed Site B



Conclusions

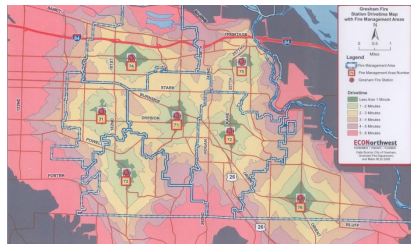
- **Where should Station #76 be moved to?**
- There are a number of locations that could work for the new fire station all in the same vicinity
- It may not be economically practical to move it from the current location

Limitations

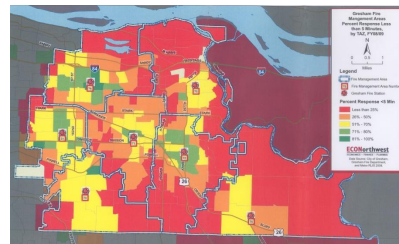
- Because we don't actually know where the population will be increasing, it is difficult to predict where increased emergencies will occur in the next 20 years
- Information regarding future zoning
- We did not have access to the actual travel time data nor the data created from the consultant study
- Traffic Analysis Zones (TAZ) were the smallest census areas available but still very large for our area of study
- Most of FMA 76 is unincorporated county and therefore data was limited
- Knowledge: If we knew what we know now...

Limitations

Travel Times via Network Analyst



Travel Times via Actual Data (11,803 calls)



Further Study

- Spatial Analyst
- Incorporate land uses into 2030 population dasymetric maps
- Reevaluate with 2010 census data
- Reevaluate with actual travel times for the past ten years
- Consider lot size and zoning for station location

Questions?

