

UC

# *Using GIS for Police Redistricting at the City of Beaverton*

*Presented by Maurice Johns - GIS Specialist*



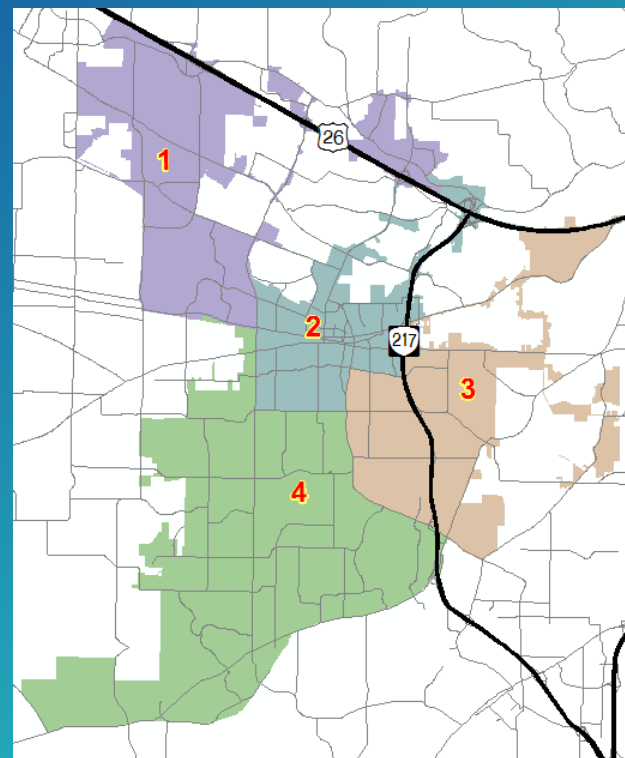
# About the City of Beaverton

- Located seven miles west of Portland, OR
- Incorporated in 1893
- Current population of 95,385
- 19.62 Square Miles in size
- Named a Top 50 Best Place to Live in America 2016 by *Money Magazine*
- Part of Silicon Forest with several large corporations located in the area including Nike, Columbia Sportswear, and Tektronix



# Why Redistricting?

- City has changed in size and population
- Current boundaries were created over 20 years ago
- Current traffic volume raised questions for proper dispersal of officers and response times



# Redistricting Criteria Part 1

*Districts were redrawn for each criteria based on equal amounts as well as accounting for divisions at major streets. Redrawn for 4 and 5 district boundaries.*

## 1. Response Time

- ArcGIS Online Ready-To-Use-Services (*Generate Service Area Tool*)

## 2. Number of Calls

- Spreadsheet provided by PD for 2011-15 with X,Y Coordinates
- Spatial Joined with 2010 US Census Block Boundaries
- Priority 1 & 2 calls only

## 3. Population

- 2010 US Census Blocks

# Districting for ArcGIS Toolbar

*“Districting for ArcGIS is an add-on that allows you to create defined groupings of geographic data, such as census tracts, ZIP Codes, and precincts, by creating a districting plan.” (From Product Website)*

Used in this project for creating equal areas for the number of calls and population based on the 2010 Census Block Geographic Boundaries

More information can be found at:

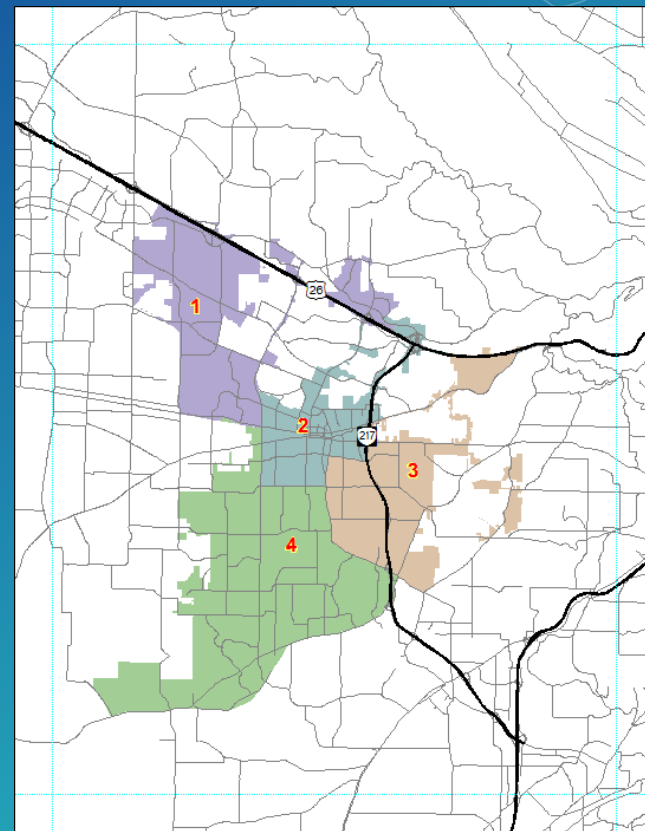
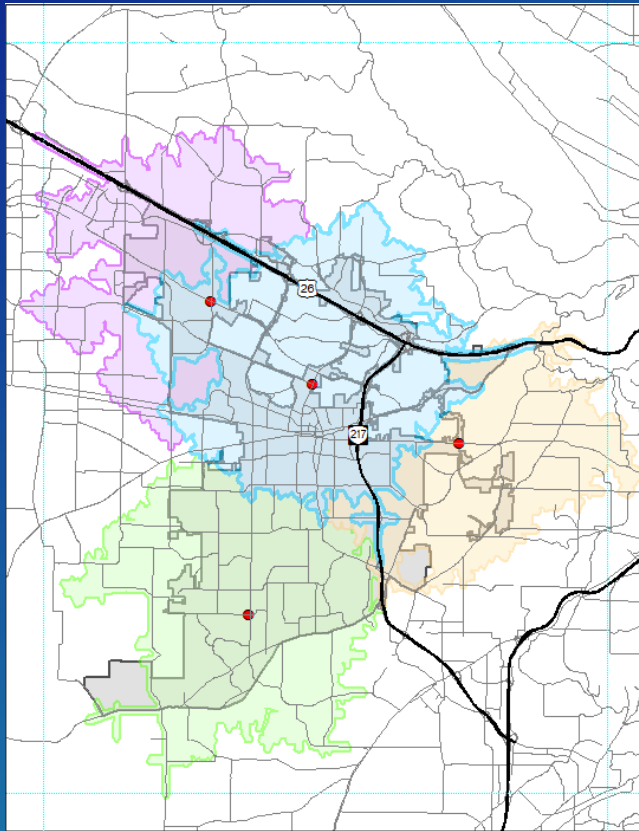
<http://www.esri.com/software/arcgis/extensions/districting>



# Response Time

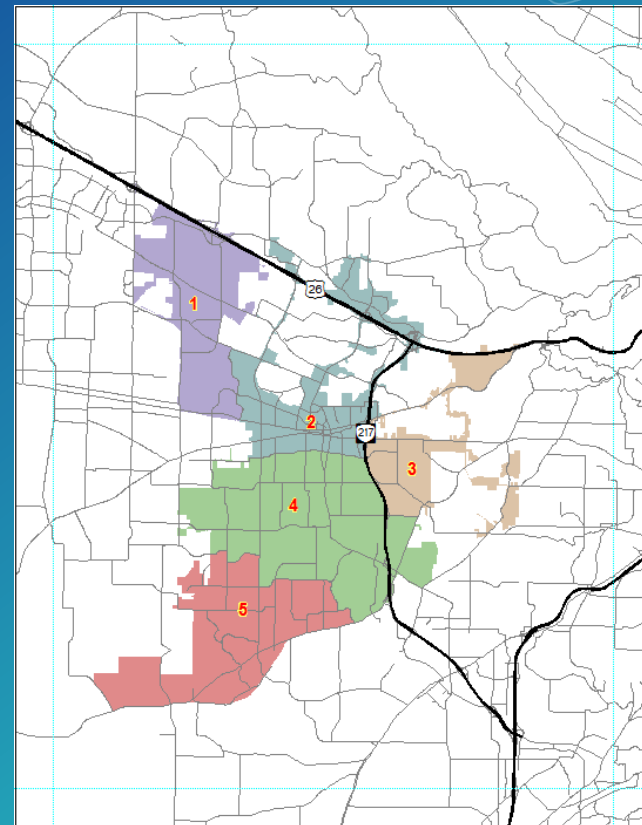
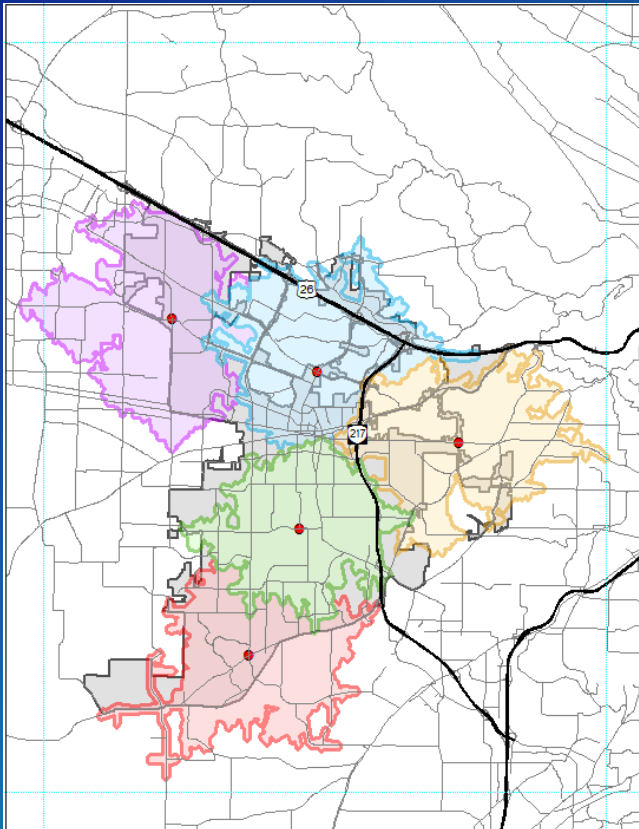
# Response Time – 4 Districts

7 Minute Service Area to Cover City Limits



# Response Time – 5 Districts

5 Minute Service Area to Cover City Limits



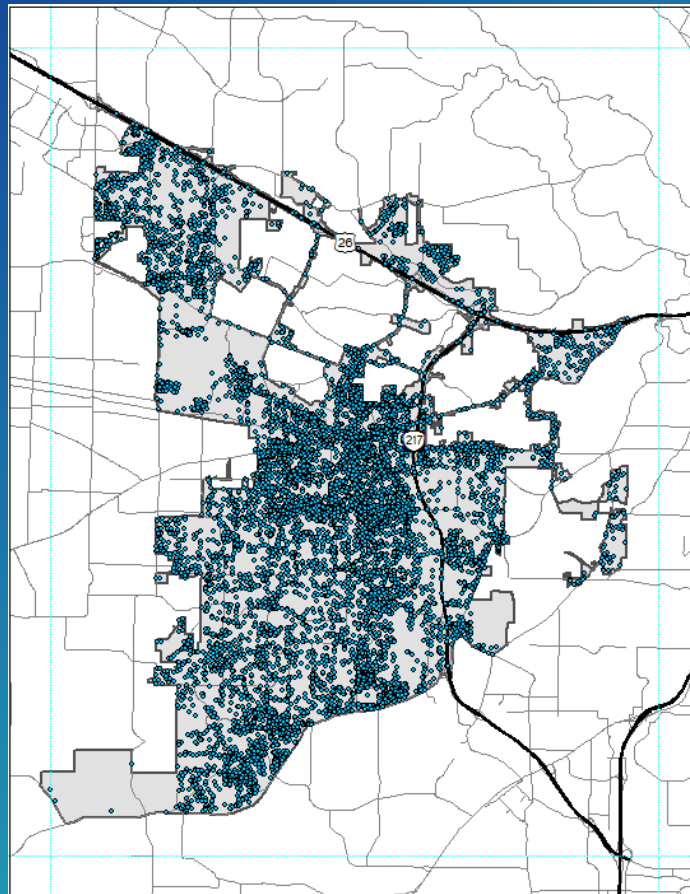


# Number of Calls

# Number of Calls (35,942 total)

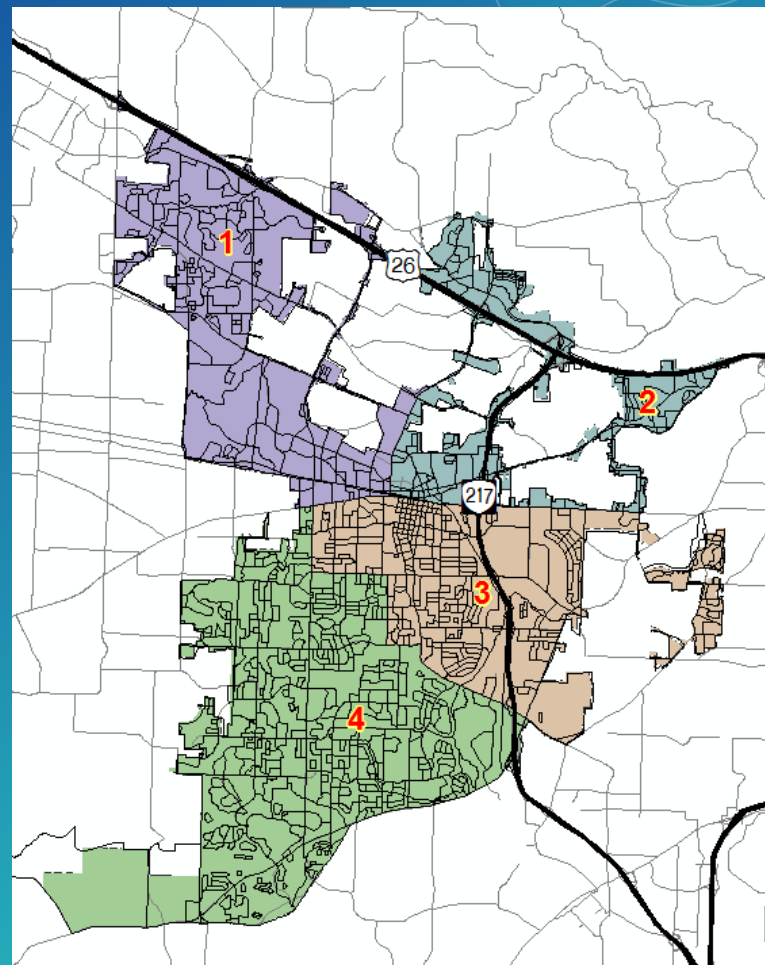
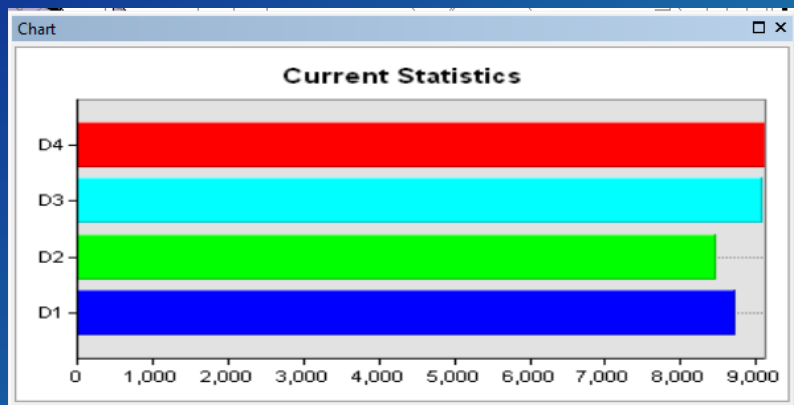
**Priority 1** – Appears to be an imminent threat to life

**Priority 2** – Occurring now and appears to be an immediate threat to people or property.



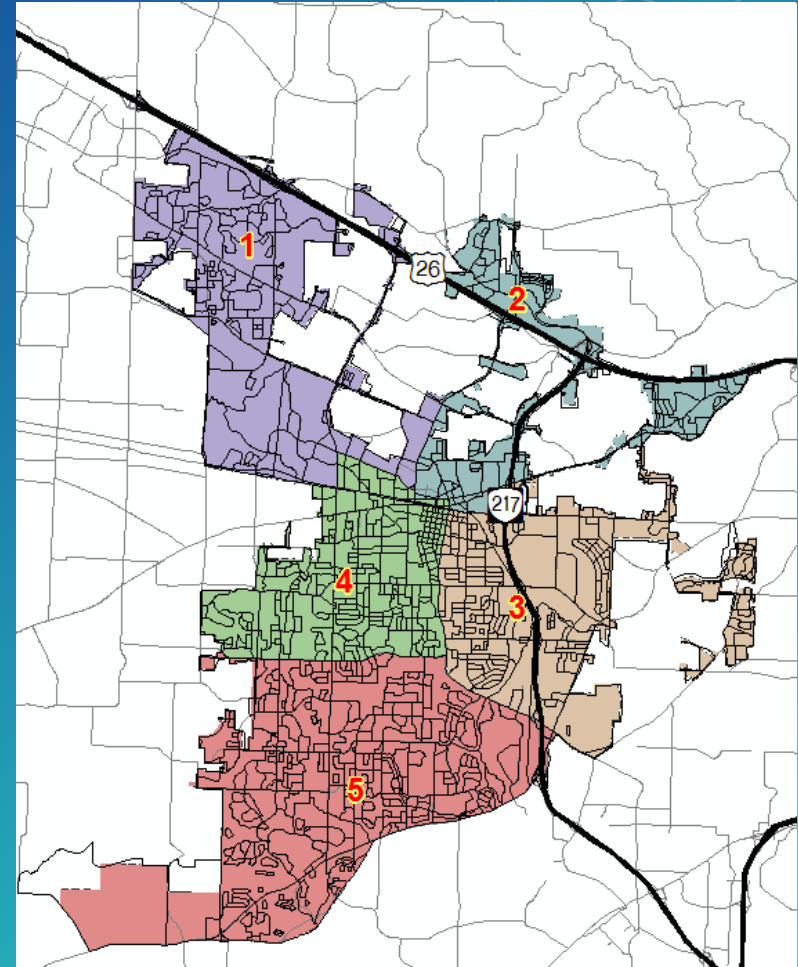
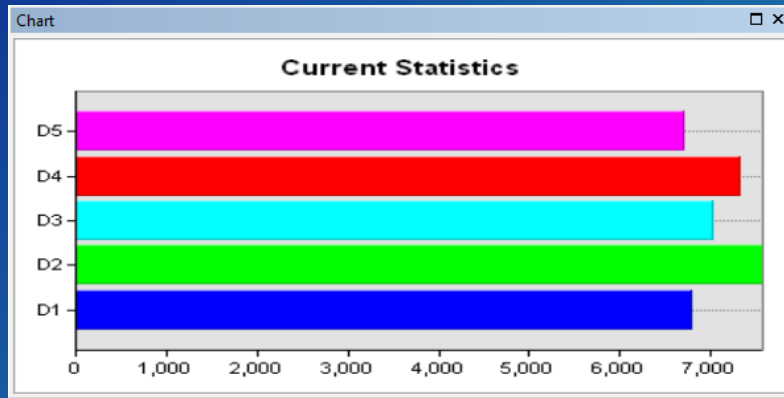
# Number of Calls – 4 Districts

Spatial Joined with Census Blocks – Districts with Roughly Equal Calls



# Number of Calls – 5 Districts

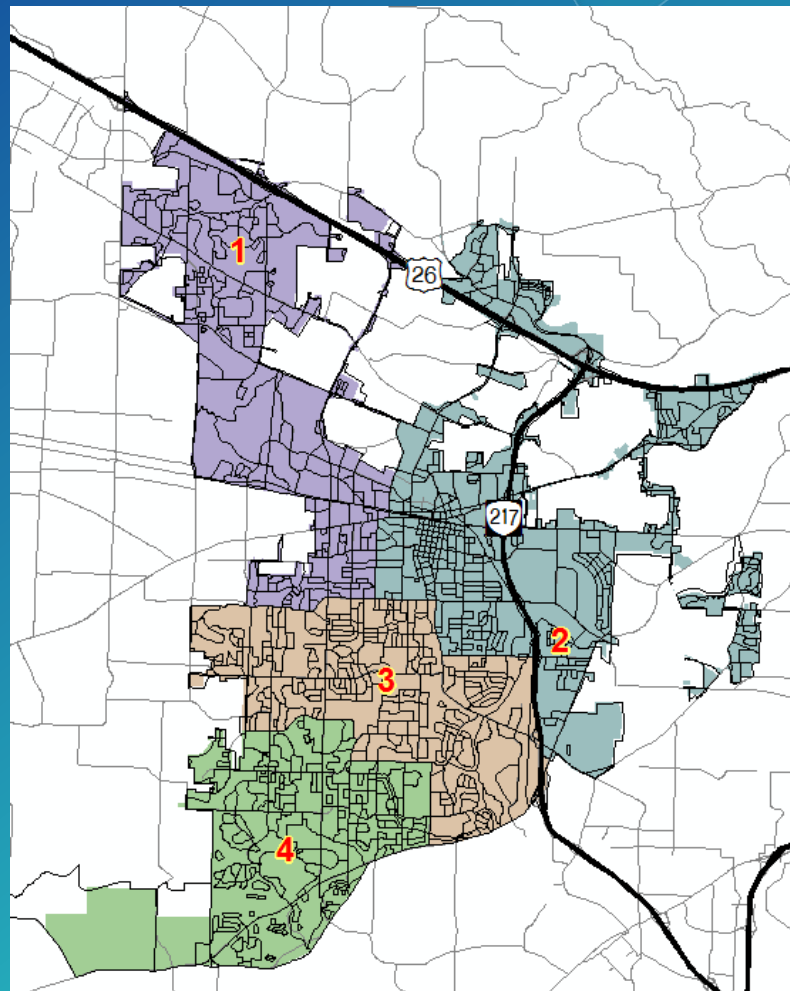
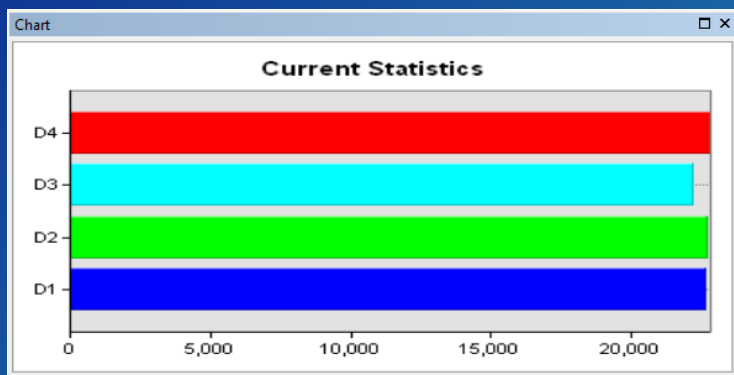
Spatial Joined with Census Blocks – Districts with Roughly Equal Calls



# Population

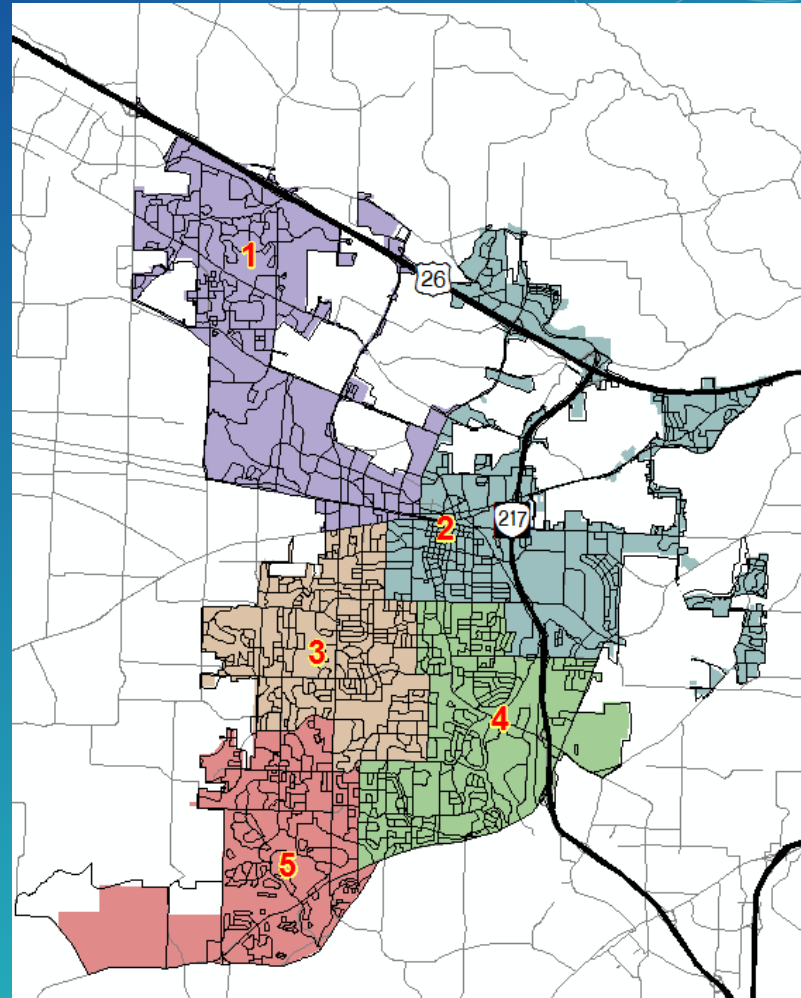
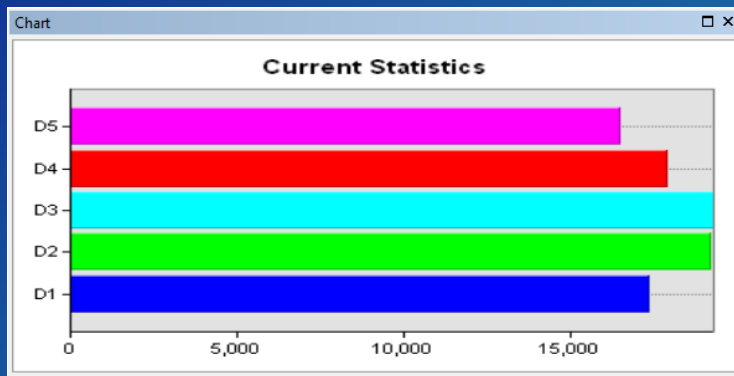
# Population – 4 Districts

Spatial Joined with Census Blocks – Districts with Roughly Equal Calls



# Population – 5 Districts

Districts with Roughly Equal Population



# Final Results



# Redistricting Criteria Part 2

## Priority Based Weighted Criteria

1. Response Time Area – 50%
2. Number of Calls Area – 35%
3. Population Area – 15%

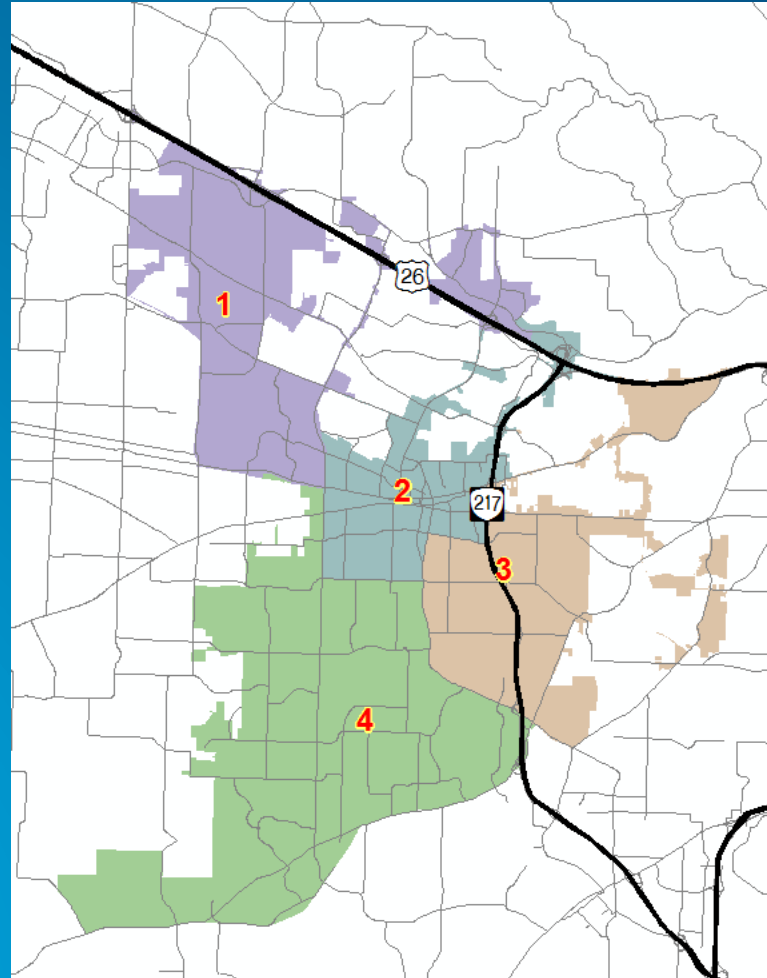
# Four Districts Weighted Criteria Summary

District Weighted Acreage: = (RTA\*0.5)+(CA\*0.35)+(PA\*0.15)

District	1	2	3	4	Total Area
<b>Response Time Area</b>	3022.7	1606.4	2594.4	5332	12555.5
<b>Calls Area</b>	3035.5	1530.9	2818.6	5170.5	12555.5
<b>Population Area</b>	3288.4	3860.3	2662.3	2744.5	12555.5
<b>Totals</b>	3067.035	1918.06	2683.055	4887.35	12555.5
<b>Percent</b>	24%	15%	21%	39%	1
<b>Current Acres</b>	3022.69	1606.43	2594.41	5332.04	12555.57
<b>Current Percent</b>	24%	13%	21%	42%	1

# Weighted Criteria Summary Results

No changes!

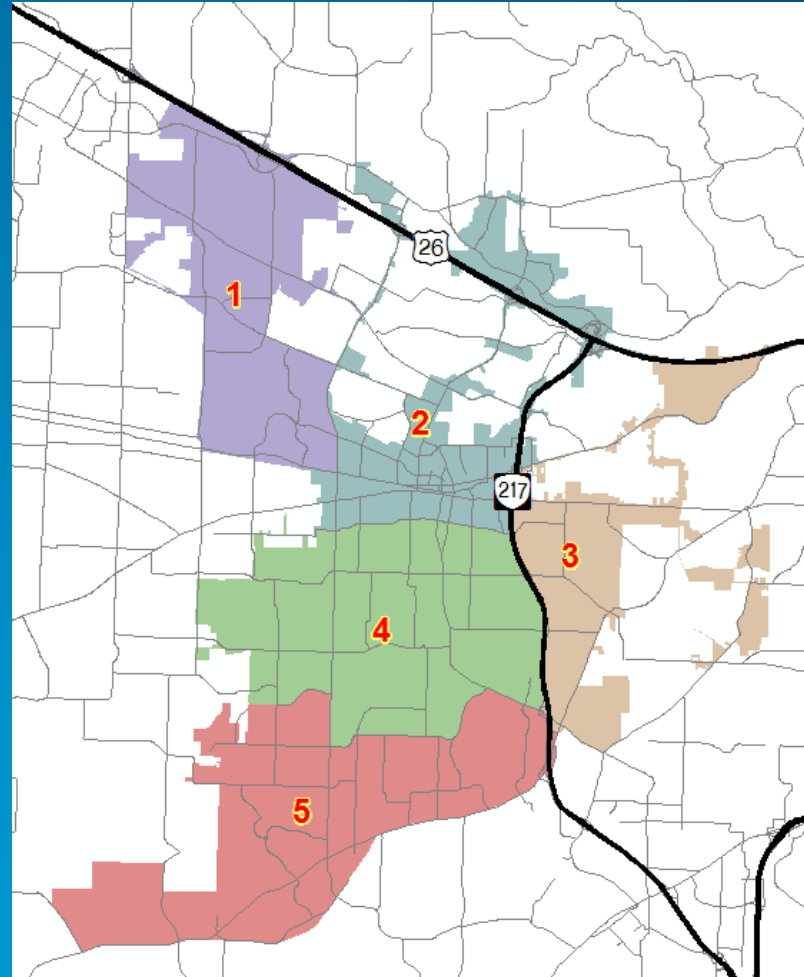


# Five Districts Weighted Criteria Summary

District Weighted Acreage: = (RTA\*0.5)+(CA\*0.35)+(PA\*0.15)

District	1	2	3	4	5	Total Area
Response Time Area	2208.9	2192.2	1422.5	3924.7	2807.2	12555.5
Calls Area	2817	1389.5	2350.3	1863.3	4135.4	12555.5
Population Area	3035.4	3146.5	1924.3	2208.7	2240.6	12555.5
Totals	2545.71	2054.4	1822.5	2945.81	3187.08	12555.5
Percent	20%	16%	15%	23%	25%	1

# Weighted Criteria Summary Results



# Next Steps

- Ground truth with patrol officers
- Share with partners (Fire, School and Parks District)
- Share with Public for feedback
- Share updated boundary with 911 Dispatch
- Implantation set for January 2018 to coincided with new schedule
- On-going evaluation

# Questions?

Contact Info: [mjohns@beavertonoregon.gov](mailto:mjohns@beavertonoregon.gov)

