

# Using GIS To Help Victims Of Domestic Violence: A Suitability Analysis For Locating A New Domestic Violence Shelter In Portland, Oregon



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## INTRODUCTION

- ▶ Mayor Potter & the Portland City Council Initiative for Domestic Violence
  - Control Crime Through Policing Strategies
  - Provide Victim Services
- ▶ Location of a Domestic Violence Shelter in PDX
  - Accomplished Through Combined Efforts of PSU Departments of Geography and Criminal Justice



## PROBLEM STATEMENT

- ▶ Locate Potential Site for New Domestic Violence Shelter Within Portland Metro Area Given:
  - Must Be
    - ▶ Within a Hot Spot  
( $> 2$  Std. Dev. of Mean DV Incidents for all Neighborhoods)
    - ▶ Within MFR or MUR Zone
  - Should Not Be
    - ▶ Located Within Five Mile Radius of Current Shelter
    - ▶ Located Within One-Quarter Mile of Artery- Anonymity
  - Should Be
    - ▶ Built on Low Slope Area
    - ▶ Located Within One-Quarter Mile of Public Transportation
    - ▶ Located Within One-Quarter Mile of a School
    - ▶ Located Near Law Enforcement

## OVERVIEW OF CONSTRAINTS & CRITERIA

### CONSTRAINTS

WITHIN HOT SPOTS  
WITHIN MFR & MUR

| CRITERIA                        | ORIENTATION    | WEIGHTS (%) |
|---------------------------------|----------------|-------------|
| AWAY FROM EXISTING SHELTERS     | NORMAL         | 20          |
| ON LOW SLOPE AREA               | INVERSE        | 20          |
| NEAR PUBLIC TRANSPORTATION      | INVERSE        | 15          |
| AWAY (1320 FT.) / NEAR ARTERIES | NORMAL/INVERSE | 20          |
| NEAR SCHOOL                     | INVERSE        | 15          |
| NEAR LAW ENFORCEMENT            | INVERSE        | 10          |
|                                 |                | 100%        |

# DATA

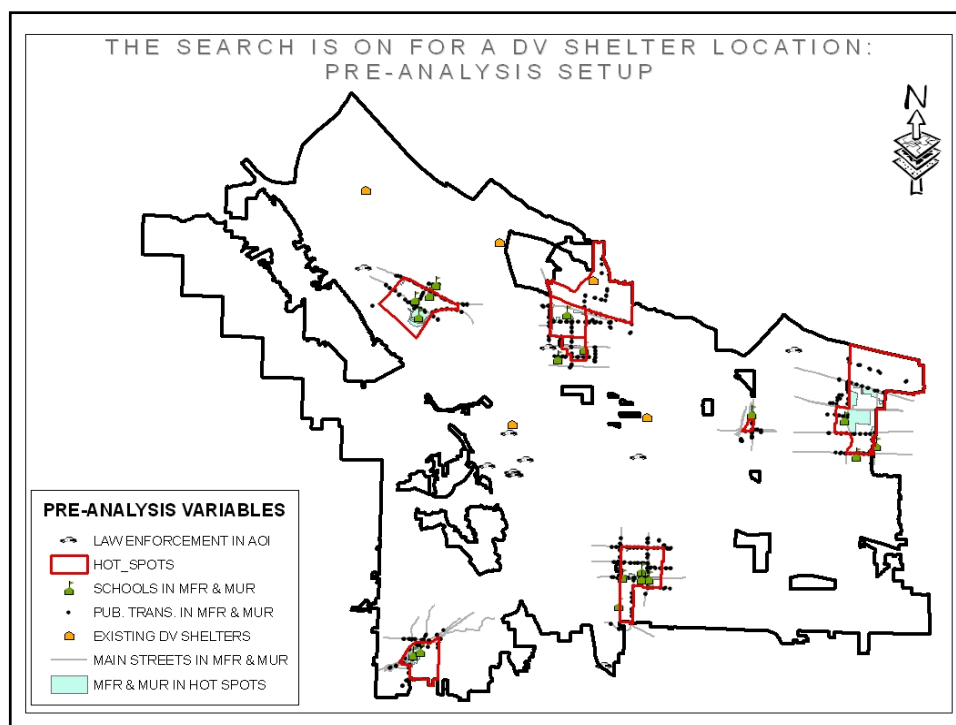
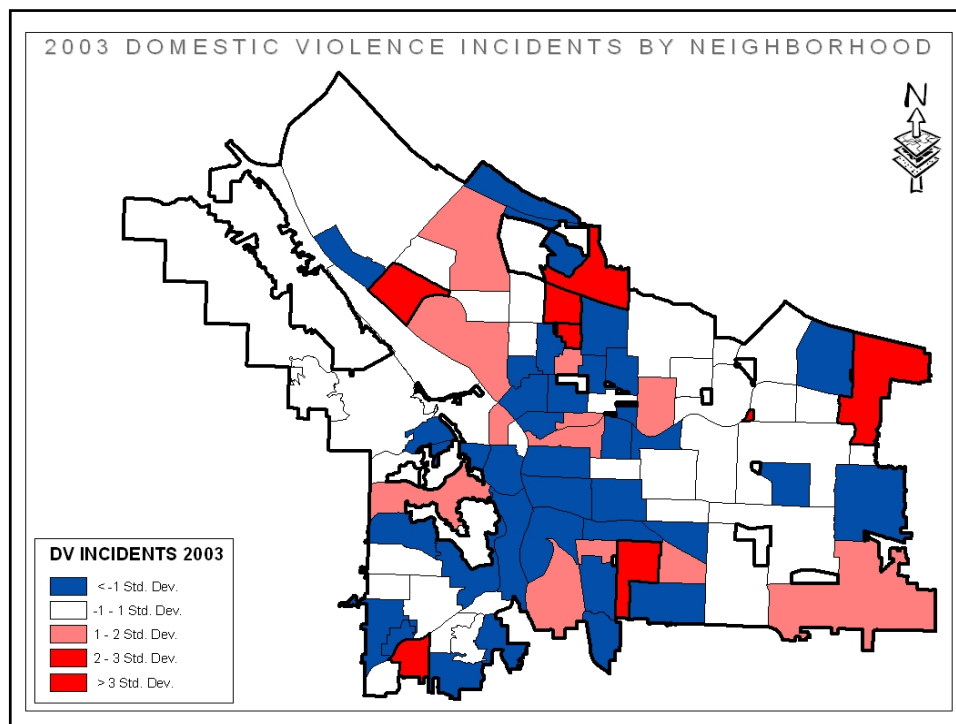
## ► *Data*

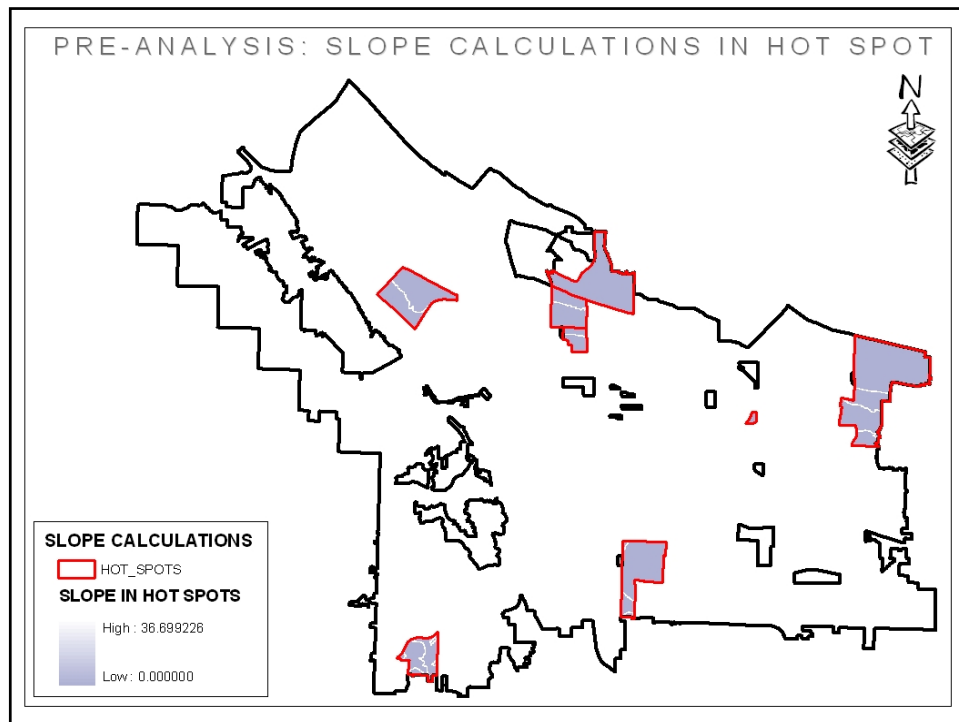
- Spatial data to be used includes:
  - Portland Metro Area Boundary
  - Portland Neighborhood Boundaries
  - Portland Transportation (Street Car, Max, and Bus) Routes
  - Portland Land Use-Zoning Boundaries
  - Portland Main Streets
  - Law Enforcement Locations
  - Existing Battered Shelters Locations
  - Portland School Locations
  - Elevation
- Attribute databases to be used include:
  - Incidents of Domestic Violence Per Neighborhood in 2003

# METHODOLOGY

## ► Pre-Analysis Setup

- Clip Portland Neighborhood Boundaries
- Join Crime Data With Neighborhoods Layer
  - Find Hot Spots: Symbolize Standard Deviations
  - Export Hot Spot Boundaries
- Select, Export and Clip MFR & MUR Zones to Hot Spots
- Clip Schools, Arteries, and Public Transportation up to One-Quarter Mile from MFR & MUR Zones in Hot Spots
- Clip Law Enforcement to Area of Interest
- "Georeference" Existing DV Shelter Locations





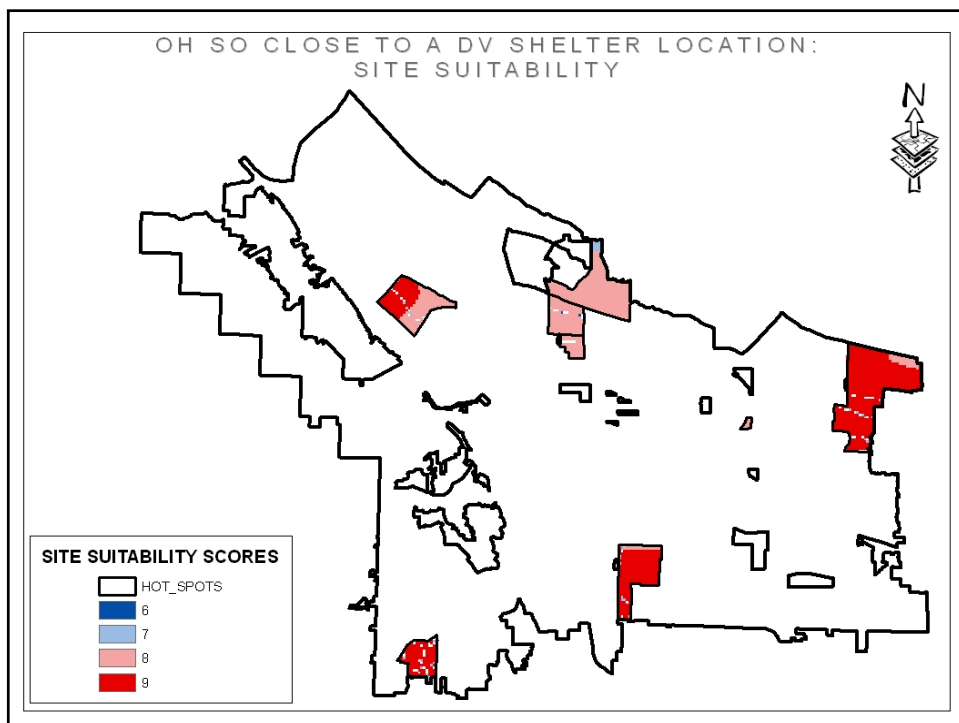
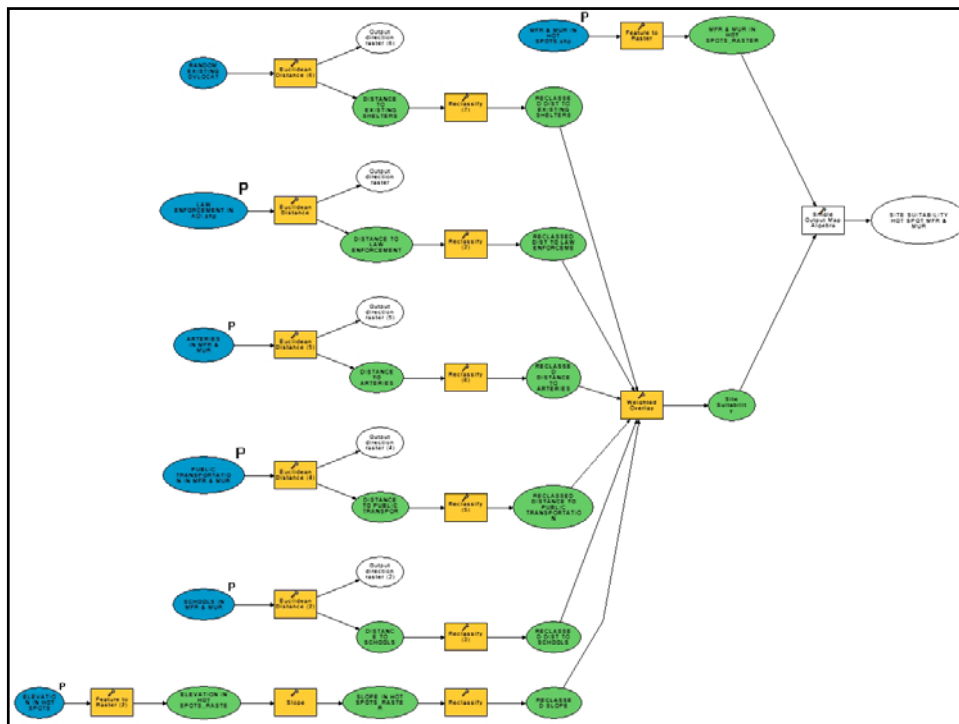
## Methodology

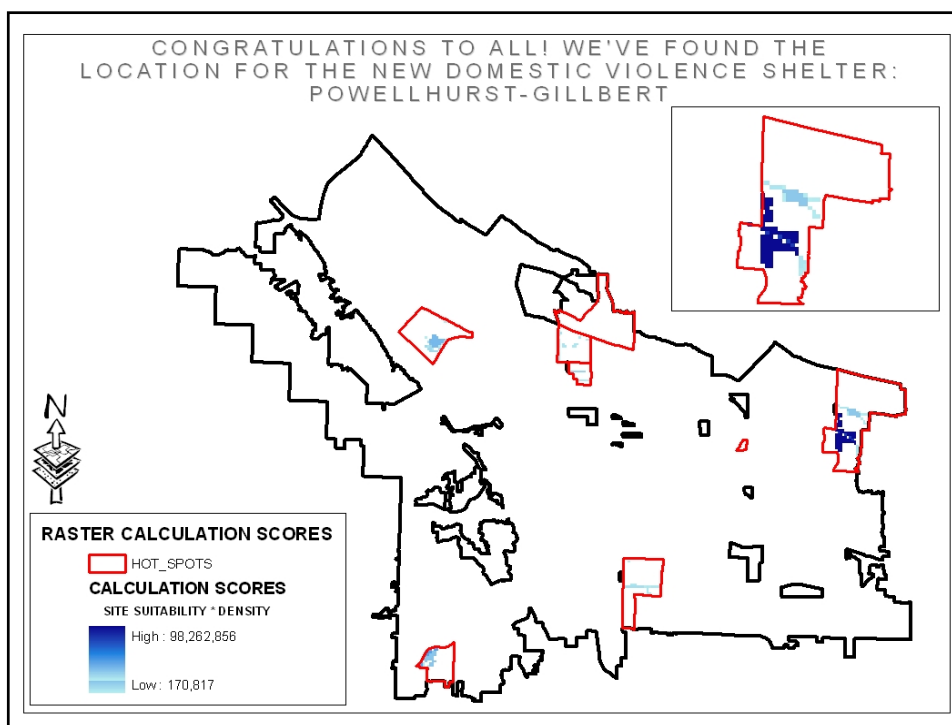
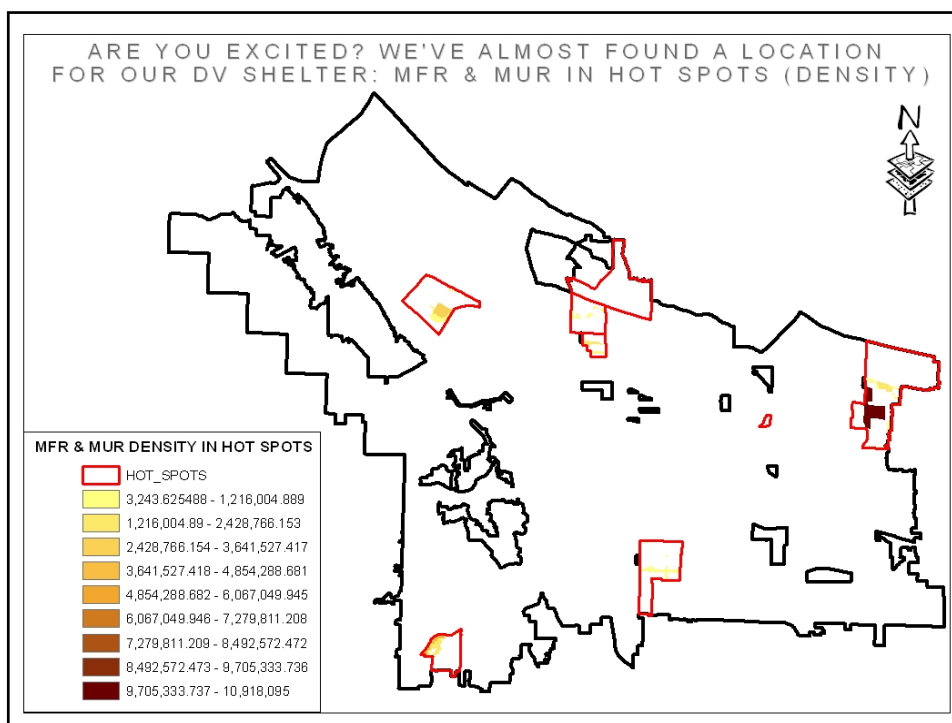
### ► Analysis

- Feature to Raster
  - Elevation in Hot Spots & MFR & MUR in Hot Spots
- Slope Calculation
  - Elevation in Hot Spots
- Euclidean Distance Measurements
  - Existing DV Locations, Law Enforcement Locations, Public Transportation and Schools
- Reclassified
  - DV Locations, Law Enforcement Locations, Public Transportation, Schools and Slope
- Weighted Overlay ➡ Site Suitability
  - All of the Above
- Raster Calculator ➡ Final Site Location
  - MFR & MUR in Hot Spots and Site Suitability

**CRITERIA**

**CONSTRAINTS**





## RESULTS

- ▶ Hot Spot:  
Powellhurst-Gilbert
- ▶ MFR & MUR: Highest  
Density of All Hot Spots
- ▶ Nearest Existing Shelter is  
5.25 Miles Away
- ▶ Zero Slope
- ▶ Public Transportation  
Surrounds Area
- ▶ Nearest Major Road is .25  
Miles Away
- ▶ Nearest School is Slightly  
Over .25 Miles Away
- ▶ Law Enforcement is 2.25  
Miles Away



## CONCLUSION/DISCUSSION

- ▶ Conclusion
  - Problem Solved with Minimal Deviation From Original Constraints And Criteria
- ▶ Discussion
  - Any Problems With Analysis?
  - Was Location Suitable?
  - What Additional Factors Should Be Taken Into Account?
  - Did The Model Solve Our Problem?
  - Could This Approach Be Used Elsewhere?



THANK YOU FOR YOUR  
ATTENTION AND FEEDBACK!



## DOMESTIC VIOLENCE STATISTICS

| NAME                  | 2003 DV<br>INCIDENTS<br>(AVG = 104) | POP    | CHANGE<br>(00-03) | CRIME<br>RATE |
|-----------------------|-------------------------------------|--------|-------------------|---------------|
| CULLY                 | 311                                 | 14,818 | -11%              | 21            |
| BRENTWOOD/ DARLINGTON | 340                                 | 11,455 | -3%               | 30            |
| MONTAVILLA            | 376                                 | 15,997 | -3%               | 24            |
| ST. JOHNS             | 388                                 | 11,355 | -24%              | 34            |
| LENTS                 | 420                                 | 18,433 | -14%              | 23            |
| HAZELWOOD             | 459                                 | 20,079 | -8%               | 23            |
| CENTENNIAL            | 485                                 | 21,826 | -14%              | 22            |
| POWELLHURST-GILBERT   | 487                                 | 17,881 | -8%               | 27            |

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