

The background features a teal-to-blue gradient with faint, semi-transparent circular patterns and a scale. The scale is a large arc on the left side, with numerical markings from 150 to 260 in increments of 10. There are also several smaller circular elements with arrows, suggesting a technical or data-related theme.

GIS TECHNIQUES FOR HELPING DISPLACED PERSON'S WORLDWIDE

COLLEEN CAMPBELL

INTRODUCTION

- According to the UNHCR there are currently 65million displaced persons.
- Some challenges that face those who are displaced are:
 - Food, water, clothing, medical, transportation, loss of housing, disabilities, war zones, floods and other no go zones.
- Refugee camps and other temporary places can be discouraging. Often facilities are not in place, a lack of supplies, and outdated information such as printed maps.
- This is not just the case for “foreign crisis”, looking back at Hurricane Katrina there were many of these same challenges.

STAKEHOLDERS

- Within the crisis there are many stakeholders.
 - This consists of those who are fleeing, those who manage, host countries/cities, originating countries/cities, government agencies, and non-government organizations.
- These stakeholders each have their own priorities and concerns that need to be met. For instance The Jordanian government is doing many studies on the influx of population in their country.
- One way to help meet the various priorities of these stakeholders is to do predictive modeling. If a host city/country is aware of the possible influx prior to the arrival then many preparations can be made, making things smoother for all.

PARTICIPATORY GIS AND PROJECT GOAL

- When a group of people are able to input information and then receive outputs based on that information, a participatory system is created.
- Because, situations involving displaced persons, or potentially displaced persons is dynamic, having a GIS system that is also dynamic is important.

PROJECT GOAL

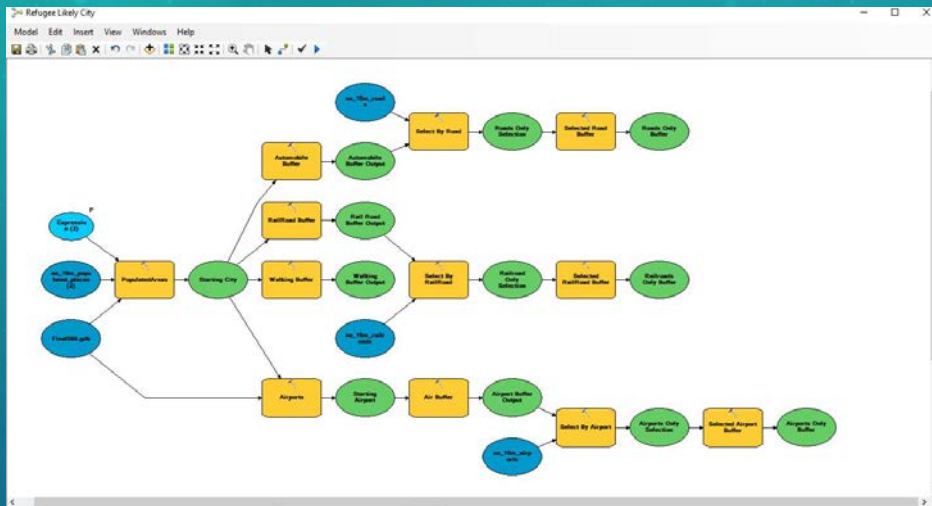
- Today's presentation is part of a larger project. The full project is about using GIS in many aspects of displaced persons support. Including mobile apps within camps for up to date mapping, geodatabases that can store inventories, individual records, and camp security information, and other models.
- This presentation shows a model of predicting where a person or group of people might travel within one day of a crisis. This helps cities to and camps to prepare for an influx of people.

METHODS

- Using ESRI Model Builder, I created a model using the following sources:
 - Country, city, railroads, roads, and airports. I downloaded this data from Trimble.
- Because the timeframe was 1 day travel I had to create buffers based on different modes of transportation.
- Speeds:
 - Walking 4mph @ 7.5hrs/day = 30miles/day
 - Automobile 45mph @ 12hrs/day = 540 miles/day
 - Train 59mph @ 20hrs/day = 980 miles/day
 - Air 500mph @ 8hrs/day = 4,000 miles/day

METHODS CONTINUED

- There are some areas where people cannot go. At first I thought about using elevations, but since I was already using existing infrastructure I put in cities and roads that were considered no go.
- These were selected randomly. Ideally, this would come from a database.
- Then the no go zones were removed from the existing buffers to give only the available travel areas.

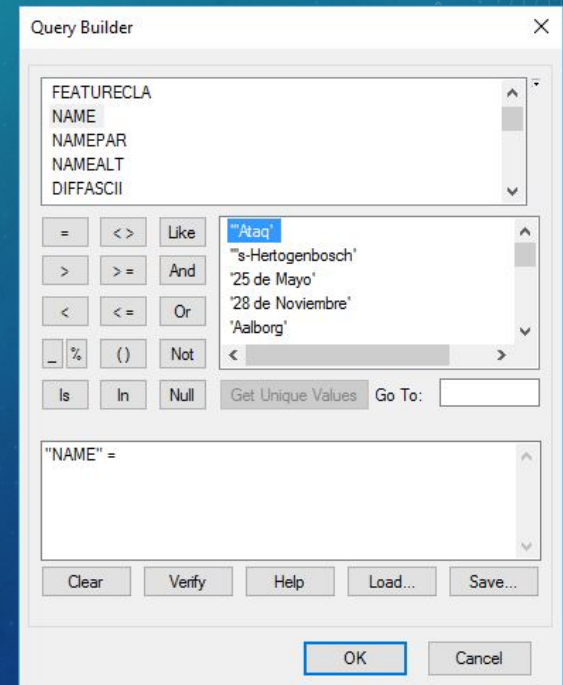
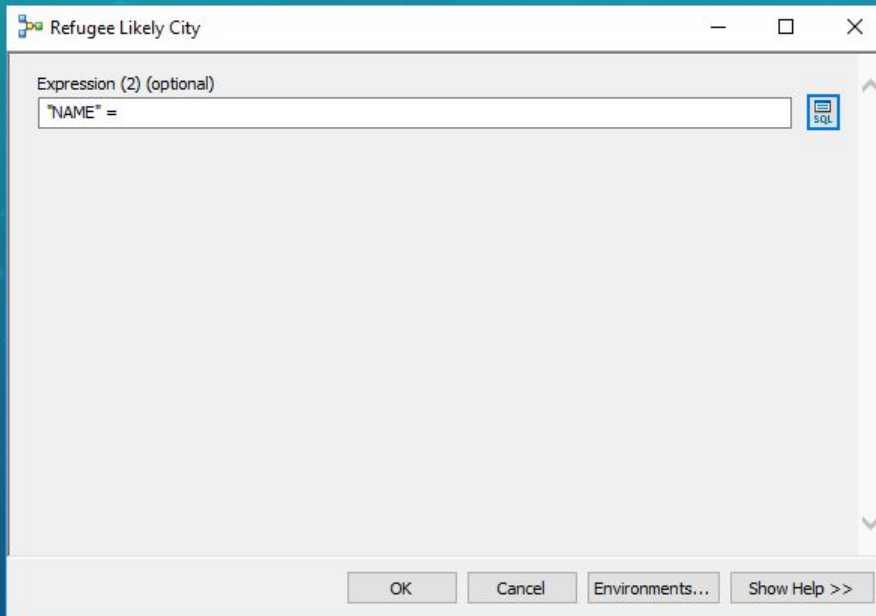


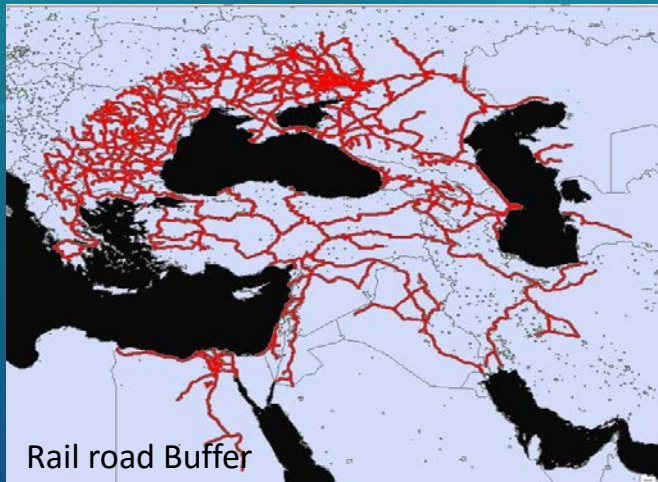
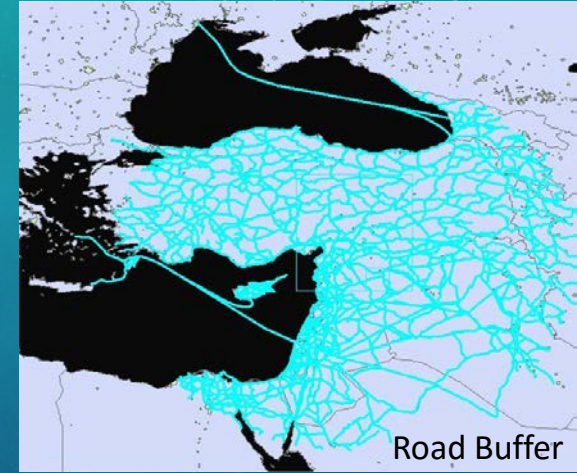
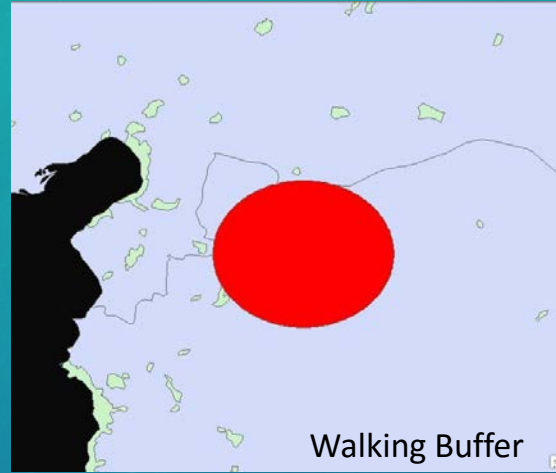
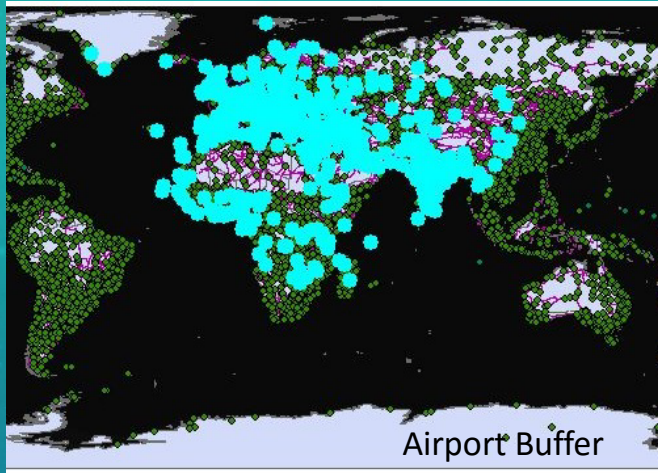
- This is the model with the original buffers. This does not have any no go zones added yet.

BASIC MODEL

CITY SELECTION

The user is able to easily choose a city as the starting point when the model opens to run.



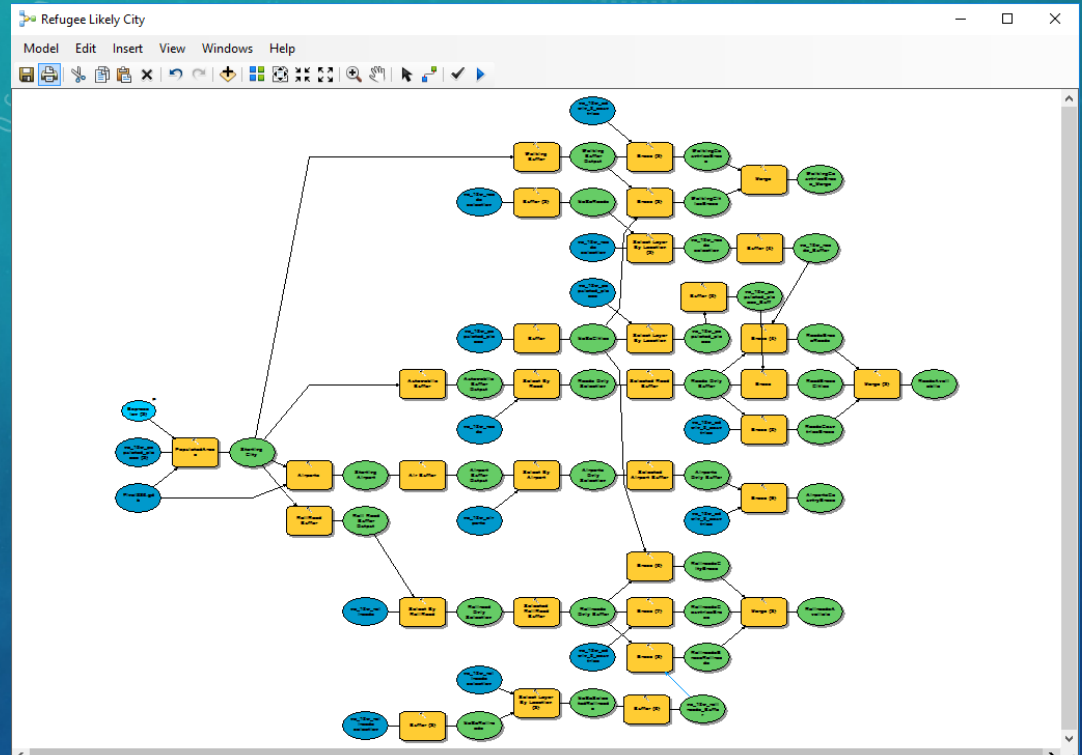


BUFFER RESULTS

These are the more basic buffers. They are generalized to just distance with no other parameters included.

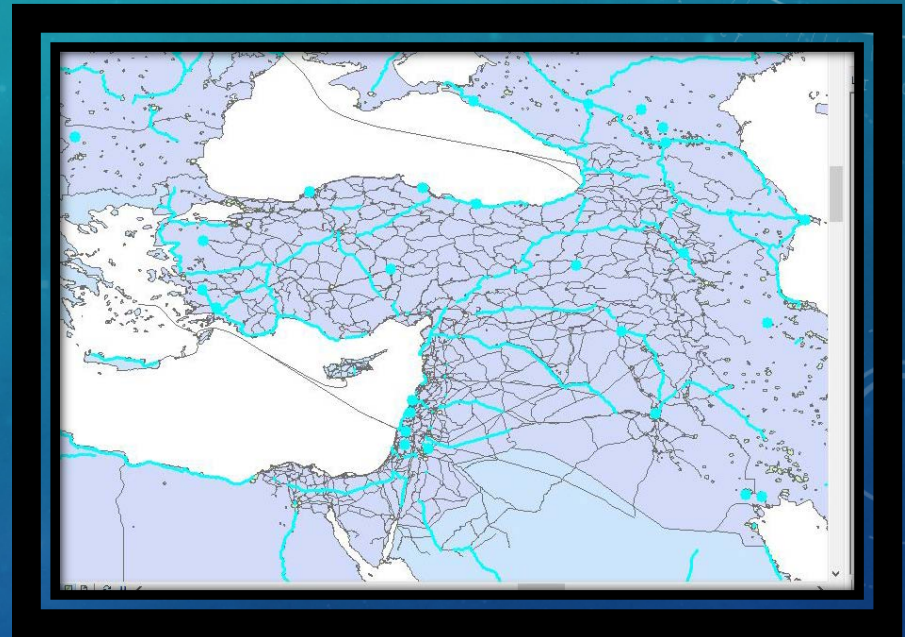
FULL MODEL

This model contains variables for 'no go' zones. They are arbitrary in this example.



FULL MODEL RESULTING BUFFERS

Here you can see the roads that are available for use are highlighted while, roads that are not available for use are not. This gives a quick look at what roads and possible destinations a displaced person might use.



FURTHER RESEARCH

- More parameters could be added to make this model more accurate such as elevations, temperature, time of year and weather.
- Giving multiple time frames 2 days, 1 week, or 1 month could give better ideas of where and when to expect influx.
- This would be useful if developed into a web app that those who do not have GIS knowledge could use.

ACKNOWLEDGMENTS

- UNHCR
- Including People with Disabilities in Emergency Relief Efforts. Rapid Response. November 2014 Pauline Oosterhoff et al.
- Promoting Participatory community building in refugee camps with mapping technology Xu, y. Matiland C. and Tomaszewski. B.
- Getting to know ArcGIS Model Builder. David W. Allen
- USC Spatial Sciences Department