5B. Part 2. Reflecting on the Analytical Methods used in the Help End Homelessness Exercise

Part 1

Purpose: We created a risk map to predict where people are becoming homeless
This is important because creating a clear plan to address homelessness starts by recognizing areas of risk. This is important information in terms of identifying opportunities for prevention. We used a rubric to assess which area people are becoming homeless. This rubric consisted of the following key factors: poverty, addiction, lack of affordable housing, unemployment, mentall illness, domestic violence, and and high health care costs.
Technique:
Examine attribute table
Copy census tract

- Select any census tract
- Use Feature Class to Feature Class, creating a copy of a feature layer
    - Input Feature: Risk Factors
    - Output Feature: Target_Tract
- This creates a copy of the feature layer

Move selected area outside of the region
Edit attribute table of Target_Tract

- Open attribute table for Target_Tract and Risk Factors
- Delete 2017 Total Population field
- In the Risk Factors table, sort the 2011-2015 ACS Households with income Below Poverty Level field by descending
- Make the following edits in the Target_Tract

2011-2015 ACS Households with Income Below Poverty Level	1809
2011-2015 ACS Percent of Households with Income Below Poverty Level	100
Change in number of HH below poverty level 13-17	311
ACS HHs w/Public Assist Income	525
ACS % HHs w Public Assistance Income	42.40711
Change in number of HH w Public Assistance 13-17	145
ACS HHs w/1+ Persons w/Disability	1068
ACS % HHs w 1+ Person w Disability	100

ACS HHs/Gross Rent 50+% of Income	1132
% HHs paying 50+% of income for rent	100
Change in number of HHs paying 50+% of income for rent	207
2017 Unemployed Population 16+	371
2017 Unemployment Rate	52
Change in Unemployment Rate	52
No Health Insurance Pop 18+	2760
% No Health Insurance Pop 18+	74.94635
% Veterens with PTSD	25
Est veterens w PTSD	92
Est Serious Mentall Illness Cnt	1004
Est % w a Serious Mental Illness	12.5
Substance Abuse Incidents	233
Substance Abuse Rate	600
Domestic Violence Incidents	91
Domestic Violence Rate	4.545455

- Now the target tract has the worst values for each risk factor

Similarity Search

- Input Feature: Target_Trcat
- Candidate Features: Risk Factors
- Output Feature: Risk_Surface
- Most or Least Similar: Most similar
- Match Method: Attribute value
- Number of Results: 0
- Attributes of Interests: select all, and then unselect
    - Uncheck UniqID
    - Shape_Length
    - Shape_Area
- Expand Additional Options

    - Fields To Append To Output: TRACT and 2017 Total Population
- This allows us to compare all the census tracts to our target tract, the tool ranks how similar tracts are depending on their attributes
- This also creates an output

Symbology for Risk_Surface

- Purple- Red (5 Classes)
- Reverse symbol order
- Remove the target tract
- Format symbols: width of 0.25
- View symbology by attribute
    - Transparency: Field of 2017 Total Population and no normalization
        - Use 0% for high values and 70% for low values
        - Adjust top value so it's 4000 and lower value so it's 8000

Part 2

Purpose: We prioritized prevention by finding the best locations for targeted prevention Prevention is integral to reducing homelessness. It is easier and less expensive to direct efforts into preventing homelessnes, and minimize the problem at its root. Analyzing spatial patterns in this step will allow us to incorporate homeless prevention programs into places where this issue is prevalent, and will make a difference.

Technique:

Similarity Search

- Input Features To Match: Target_Tract
- Candidate Features: Risk Factors
- Output Features: Unemployment_Project
- Uncheck Collapse Output To Points
- Most Or Least Similar: Most Smiliar
- Match Method: Attribute values
- Number of Results: 25
- Attributes Of Interest: check 2017 Unemployment Population 16+, 2017 Unemployment Rate, and Change in Unemployment Rate 2010-17
- Fields to Append To Output: TRACT
- This creates an output. 25 tracts with the attributes that are similar to the "worst case" target tract for unemployment risk factors are present.

Similarity Search

- Same criteria as before, but with a few modifications
    - Attribtues Of Interest: uncheck the unemployment variables and check ACS HHs/Gross Rent 50+ % of Income, % HHs paying 50+ % of income for rent, and Change in number of HHs paying 50+ % of Income for rent
    - Output Features: Affordable_Housng_Project
- This adds an output to the contents

Delete the target tract record from each output

- Open attribute table for Unemployment_Project
- Delete the first record in the table with a MATCH_ID of 1

Symbology for Unemployment_Project

- Primary symbology: Graduated Symbols
- Field: 2017 Unemployment Population 16+
- Method: Quantile
- Classes: 3
- Min: 5
- Max: 20
- Select background symbol
    - Click layers
        - Select solid stroke symbol
        - Select no color
- Select template symbol
    - Change Shape fill symbol: Buffered gradient fill
    - Colors: Malachite Green and Indicolite Green
    - Outline color and width: 40% and 0.5 width
- Adjust class breaks
    - Smallest symbol: upper value = 99 and label = fewer than 100
    - Middle symbol: upper value = 200 and label = 100 to 200
    - Largest symbol: upper value = 371 and label = more than 200

Symbology for the ACS HHs/Gross Rent 50+ % of Income field in the Affordable_Housing_Project

- Repeat previous instructions with the following modifications:
- Colors: Dark Amethyst and Lepidolite Lilac
- Smallest symbol: upper value = 299 and label = fewer than 300
- Middle symbol: upper value = 600 and label = 300 to 600
- Largest symbol: upper value = 1023 and label = more than 600

Part 3

Purpose: We mapped homeless communities to demonstrate homeless community characteristics and their needs

At this stage, we are emoving forward from collecting data for targeted prevention programs and shifting our focus to providing resources and aid to those already struggling with homelessness. We focus on questions such as “Who are the homeless? What are their needs? Where are they located?”

Technique:

Hot spot analysis to find the concentration of homeless people in the area

- Optimized Hot Spot Analysis: unsheltered
    - Input Features: Homeless Population Data
    - Output Features: Unsheltered_Density_Hot_Spots
    - Analysis Field: Unsheltered Homeless Pop Density

        - Expand Override Settings
            - Distance Band: 20000
        - This creates an output
- Optimized Hot Spot Analysis: sheltered
    - Input Features: Homeless Population Data
    - Output Features: Sheltered_Density_Hot_Spots
    - Analysis Field: Sheltered Homeless Pop Density
    - Expand Override Settings
        - Distance Band: 20000
    - This creates an output

Symbology for Unsheltered_Density_Hot_Spots

- Format all symbols: 0.2 for width

Select Layer By Attribute

- Input Rows: Homeless Population Data
- Selection type: New Selection
- New expression
    - Expression: Where Homeless Veterens is not null
- Add clause
    - And Total Homeless People is greater than or equal to 10
- This selects the tracts that are in accordance with these expressions

Create a new feature class using the selected tracts

Copy Features

- Input Features: Homeless Population Data
- Output Feature Class: Homeless_Tapestry
- This adds a new layer to Contents

Symbology for Homeless_Tapestry

- Primary Symbology: Graduated Colors
- Field: Total Homeless People
- Method: Natural Breaks (Jenks)
- Classes: 5
- Color scheme: Red-Purple (Continuous)

Charting homeless community characteristics to analyze differences among homeless communities

- Create chart for Homeless_Tapestry and select scatter plot
    - Adjust x and y axis labels
    - Remove linear trend
    - Update title
    - Click log for x and y axis
    - Select the dot at the very top right, the furthest one
- Create chart for Homeless_Tapestry and select bar chart
    - Filter by selection

    - Select mean for aggregation and community for Category or Date in data tab
    - Choose the different shelter types for the numeric fields
        - Adjust labels
    - Adjust x and y axis labels
    - Select census tracts
- Create chart for Homeless_Tapestry and select bar chart
    - Filter by selection
    - Select mean for aggregation and community for Category or Date in data tab
    - Choose the different key factors for the numeric fields
    - Adjust title
    - Adjust x and y axis labels
    - Select a few census tracts
- Create chart for Homeless_Tapestry and select histogram
    - Enter the following settings:
        - % under age 18 for number
        - Square root for transformation
        - 40 for number of bins
        - Uncheck mean
    - Change the category for the x acis to numeric, also add decimal places to two
    - Adjust title and x and y axis labels
    - Select the highest tail of the histogram
    - Also explore other characteristics, such as Female
- Create chart for Homeless_Tapestry and select bar chart
    - This is a bar chart to aggregate community census tracts
    - Enter the following settings:
        - Choose community for Category or Date and sum for Aggregation
        - Choose Total Homeless People for numeric fields
        - Adjust title and x and y axis labels

Part 4

Purpose: We promoted consensus by determining the best locations for investment and allocation of new resource

In this step, we answered the question “Where are the best locations to invest in new resources to aid and support people experiencing homelessness?” From a planning perspective, it’s important to map out different planning scenarios to develop a neutral presentation of choices. This cultivates both transparency, collaboration and encourages a more focused engagement. Different planning scenarios target different objectives, so in this section we studied different planning scenario maps to note which locations maximize the number of objectives being met.

Technique:

Compute social equity index

Sumamry Statistics Tool

- Input Tables: Additional Resources
- Output Table: Sum_Pop_Variables
- Fields and statistic type
    - 2017 Total Population and sum
    - Total Sheltered People and sum
    - Total Homeless People and sum
- This writes what the sum values are for each field to the new output table

Add field

- Input Table: Additional Resources
- Field Name: SocialEquityIndex
- Field Type: Float
- Field Alias: Social Equity Index

Calculate Field

- Input Table: Additional Resources
- Field NameL Social Equity Index
- Expression: (!TOTPOP_CY! / 9446500) - (!totPeople! / 49703)

Symbology for Additional Resources

- Primary Symbology:Graduated Colors
- Field: Social Equity Index
- Method: Standard Deviation
- More: Reverse values
- Adjust colors and outline width
- Adjust labels for each class break

Repeat last 3 steps for field name SocialEquityFlag, field type short and expression 0

Select Layer By Attribute

- Input Rows: Additional Resources
- Selection type: New selection
- Expression: write the expression Where Social Equity Index is greater than 0.000862
- This selects four tracts

Calculate Field

- Input Tabe: Additional Resources
- Field Name: SocialEquityFlag
- Expression: 1
- This sets the value of the SocialEquityFlag field in the selected tracts to 1

Save map

Compute Accessibility Index

Add new field to the Additional Resources layer, name it AccessibiltiyIndex and select Float for type, write Accessibility Index for field alias

Calculate the values for the accessibility index field

- Input table: additional resources

- Field name: accessibility index
- Expression: (!totPeople! / 49703) - (!totSheltPeople! / 12933)

Symbology for accessibility index

- Repeat steps from social equity index symbology procedures

Add new field to additional resources called AccessibilityFlag with a short field type
Calculate the AccessibilityFlag field with all values being 0
Select Layer By Attribute

- Select tracts with an accessibility index greater than 0.001315

For the selected records, set the AccessibiityFlag values so they are equal to 1
Add a new field

- Input table: Additional resources
- Field name: RiskIdc
- Field type: Float
- Field alias: Risk Index

Add join witht he following settings

- Layer Name or Table View: Additional Resources.
- Input Join Field: TRACT.
- Join Table: Risk_Surface.
- Output Join Field: TRACT.
- Make sure that Keep All Target Features is checked

Calculate field

- Input Table: Additional Resources
- For Field Name: Additional_Resources.RiskIdx
- For Expression: 2344 - !Risk_Surface.LABELRANK!

Remove join

- For Layer Name or Table View, choose Additional Resources
- For Join, choose Risk_Surface

Symboogy for Risk index, repeating procedures from previous symbology sections

For riskflag, add a field, calculate field, select layer by attribute and calculate field

- Field type is short
- Calculate field to make all values 0 and then 1 the second time
- For select layer by attribute, select the tracts that are greater than 1513

Save map
Repeat previous symbology measures for the Total Sheltered People field
Add a Field and Select By Layer

- Name the field centralizedflag and a field type of short
- Calculate the field's values to be 0

- Select tracts where values for Total Sheltered People is greater than 85 and set the centraliationflag to 1 for these tracts

Save map
Copy features

- Input Features: Additional resources
- Output Features: SS_Target_Tract

Select the copied census tract and move it away from the county
Edit the SS_Taret_Tract field values for Victim COunt, 311 Call Count and Chronically Homeless

- Sort fields from largets to smallest

Similarity Search tool

- Input Features To Match: SS_Target_Tract
- Candidate Features: Additional Resources
- Output Features: Street_Strategy_Rankings
- Number Of Results: 0
- Attributes Of Interest: VictimCount, 311 Call Count, and Chronically Homeless

Add new field for street strategy index

- For Input Table: Additional Resources
- For Field Name: SSIndex
- For Field Type: Float.
- For Field Alias: Street Strategy Index.

Join the output from the similarity search tool to the additional resources layer
Add join

- Layer Name or Table View: Additional Resources
- Input Join Field: OBJECTID
- Join Table: Street_Strategy_Rankings
- Output Join Field: CAND_ID
- Turn off Keep All Target Features

Calculate Field

- Input Table: Additional Resources.
- Field Name: Additional_Resources.SSIndex.
- Expression: 941 - !Street_Strategy_Rankings.LABELRANK!.

Remove the join from the additional resources layer
Repeat symbology procedures
Add field named streetstrategyflag with a field type of short and set the field to 0

Select layer by attribute, select tracts where the street strategy index is greater than 606 and set the field to 1 for the selected tracts
Save map
Perform a spatial overlay in order to recognize which tracts show a capacity to target more than one planning scenario objective
Add a new field

- Input Table: Additional Resources.
- Field Name: NumObjsMet.
- Field Type: Short.
- Field Alias: Number of Objectives Met.

Calculate the sum using the calculate field

- Input Table: Additional Resources.
- Field Name: Number of Objectives Met.
- Expression: !SocialEquityFlag! + !AccessibilityFlag! + !RiskFlag! + !CentralizationFlag! + !StreetStrategyFlag!.

Modify symbology