Star House Expansion Strategy

Group 12

Brian Fernando, Wen Tao Lin, Krushna Malapati

James Pineda, Andrew Shih

Sutej Singh, Bara Zekeria

Project Scope

Star House wants an analysis of and justification for the optimal location of its next location

EDA / Data Wrangling

Assess Business Needs

Data Auditing

External Data Sourcing

Data Visualisation

Problem Statement

Star House is planning to expand their presence to other cities to target the most in need populations who are homeless youth aged 14-24. They have partnered with us to leverage data and analytics to find the right areas for their expansion.

What is the optimal county for Star House to expand to?

Key Performance Indicators

A variety of factors define and corroborate the choice of the optimal location
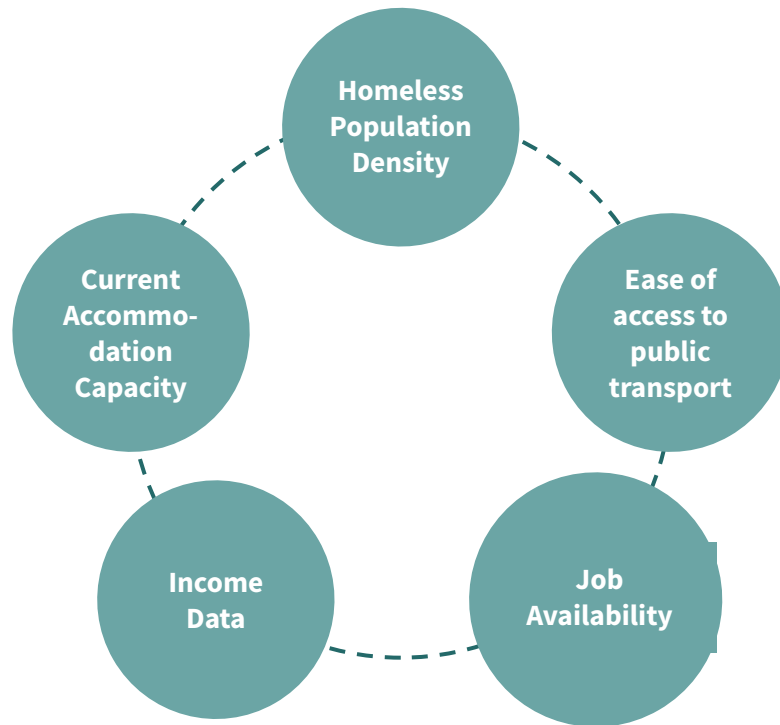
Project Roadmap

Define optimal city

Analyzing specific factors

Generalizing methodologies

Homeless Population Density

Ease of access to public transport

Job Availability

Income Data

Current Accommo-dation Capacity

Lucas County as the Optimal County

Lucas County is the county with the highest need metric since 2017
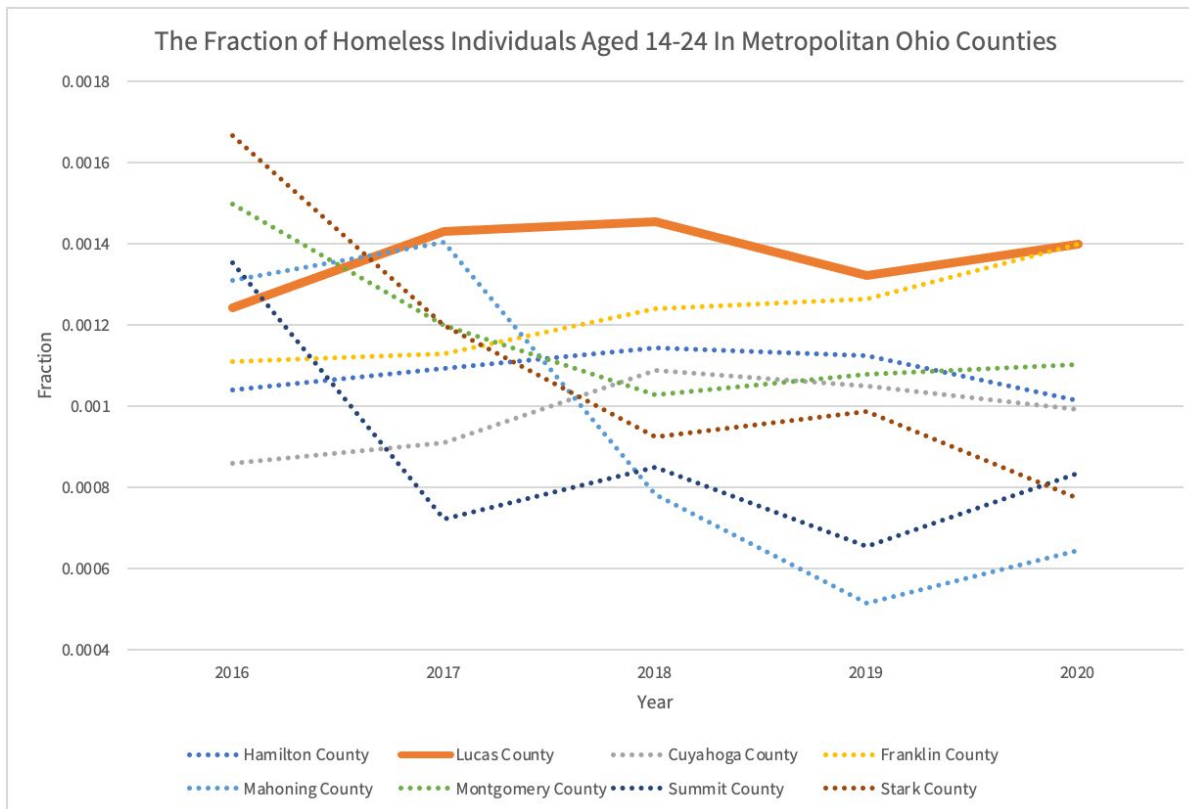
Criteria for selecting a county:

Located in Ohio due to existing government funding and support, as well as business connections

Wherever the need has been identified to be the highest for the population of interest

Metric chosen is **the fraction of homeless individuals aged 14-24 in populous Ohio counties**

The Fraction of Homeless Individuals Aged 14-24 In Metropolitan Ohio Counties

Legend: Hamilton County, Lucas County, Cuyahoga County, Franklin County, Mahoning County, Montgomery County, Summit County, Stark County

Source:
https://www.census.gov/data/datasets/time-series/demo/popest/2010s-counties-total.html
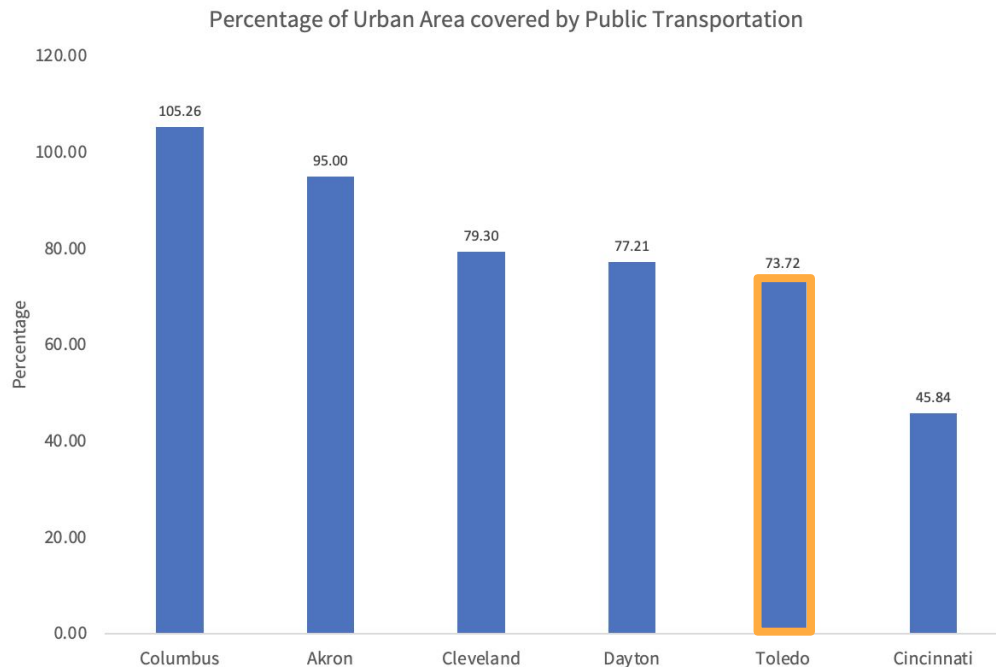
Transportation Statistics by County

Lucas County's high public transport coverage would centralize Star House' s location

Star House has mentioned that many kids in their organisation receive transportation passes to help their transportation as most of the kids do not drive.

Toledo (Lucas County) has a great public transport coverage of **73.72%**.

Data insight is received by **dividing the service area population by the urban area Population**.

Percentage of Urban Area covered by Public Transportation

Source: https://www.transit.dot.gov/ntd/data-product/monthly-module-adjusted-data-release
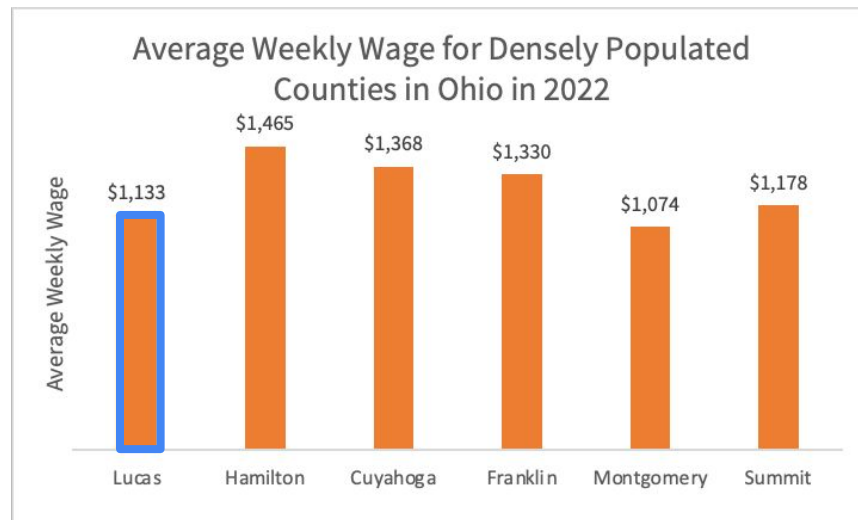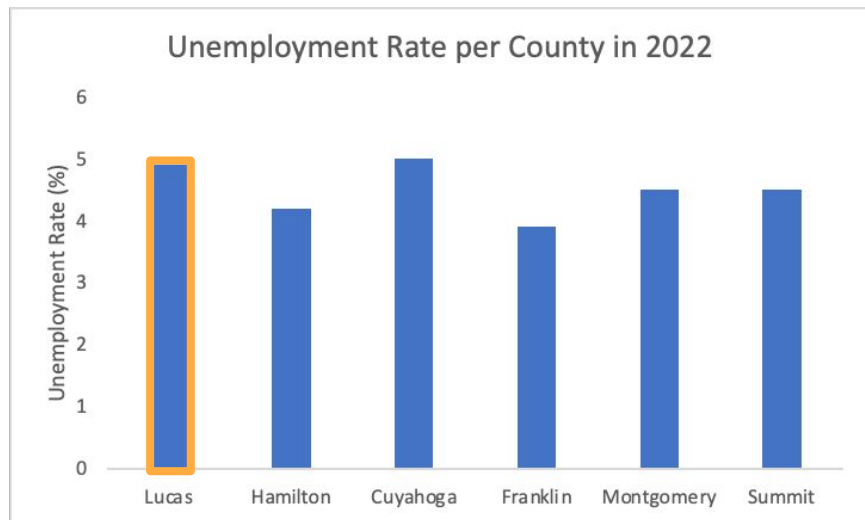
Job Availability by County

Low gentrification levels will facilitate homeless teens to immerse themselves within the target city

Two factors that were considered:
- unemployment rate
- average weekly wages

Based on the most densely populated counties, Lucas County is one of the **most promising counties for job availability**

Unemployment Rate per County in 2022

Average Weekly Wage for Densely Populated Counties in Ohio in 2022

Source: http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_13_5YR_DP03&prodType=table
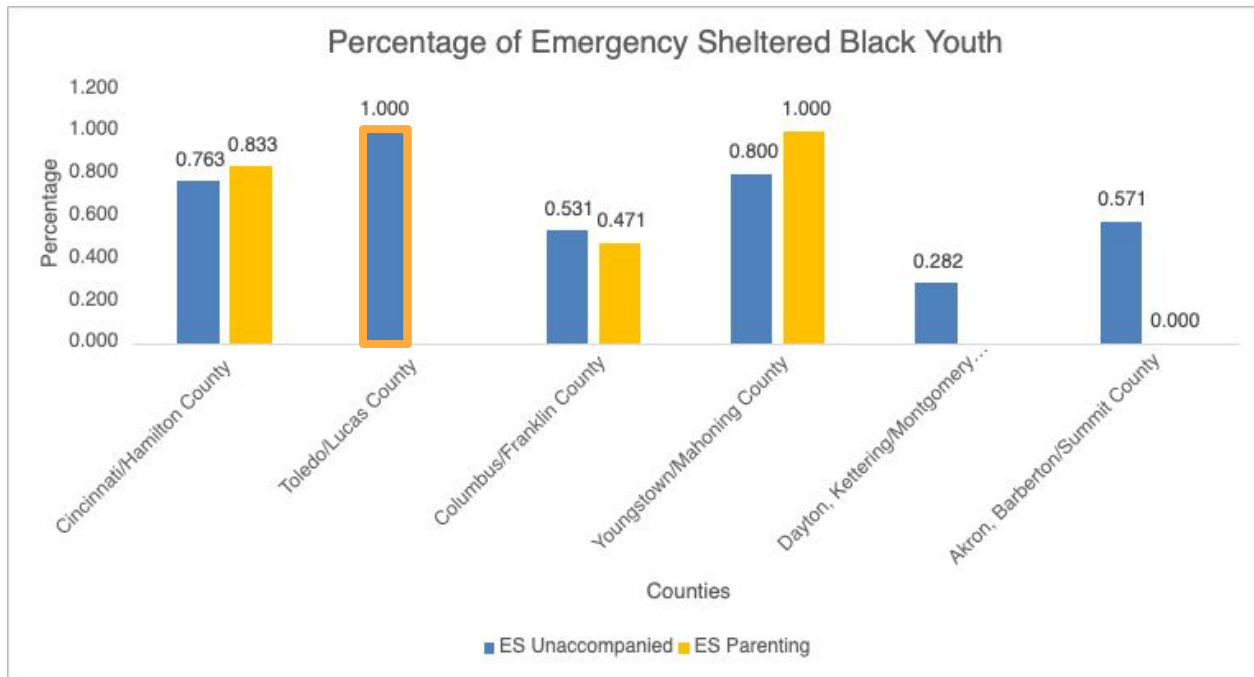
6

Emergency Sheltered Black Youth

Star House's main demographic matches that of Lucas County's, where the percentage of ES Black youth is highest

Lucas County has the highest percentage of **unaccompanied black youth** in need of **emergency shelter**.

Historically, Star House's primary demographic has been **black men** at around **18 years of age**.

The demographics of Lucas County show that the region would be best served by Star House's services.

Percentage of Emergency Sheltered Black Youth

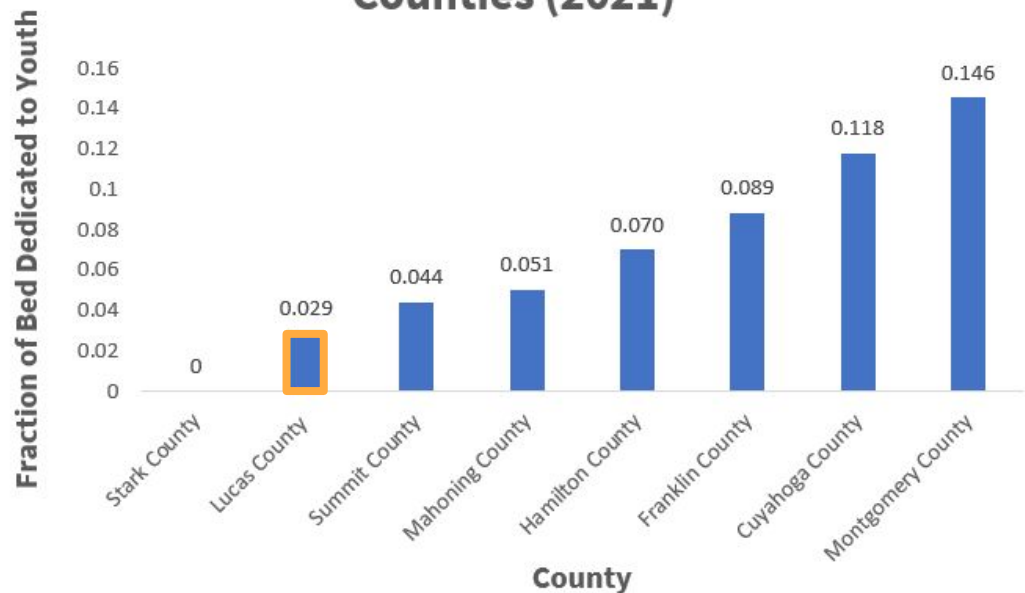| County	ES Unaccompanied	ES Parenting
Cincinnati/Hamilton County	0.763	0.833
Toledo/Lucas County	1.000	
Columbus/Franklin County	0.531	0.471
Youngstown/Mahoning County	0.800	1.000
Dayton, Kettering/Montgomery...	0.282	
Akron, Barberton/Summit County	0.571	0.000

Housing Inventory County

Star House could target counties that have low number of beds dedicated to youth

Comparing the bed count (ES, TH, SH) of counties, the fraction of total bed dedicated to **youth** is one of the lowest in **Lucas County** (anchored by Toledo).

If we want to help our target population, we should move into Lucas County and open a drop-in center to offer the youth in need with security.

Total Beds Dedicated to Youth in Ohio Counties (2021)

County	Fraction of Bed Dedicated to Youth
Stark County	0
Lucas County	0.029
Summit County	0.044
Mahoning County	0.051
Hamilton County	0.070
Franklin County	0.089
Cuyahoga County	0.118
Montgomery County	0.146

Source: https://www.hudexchange.info/resource/3031/pit-and-hic-data-since-2007/
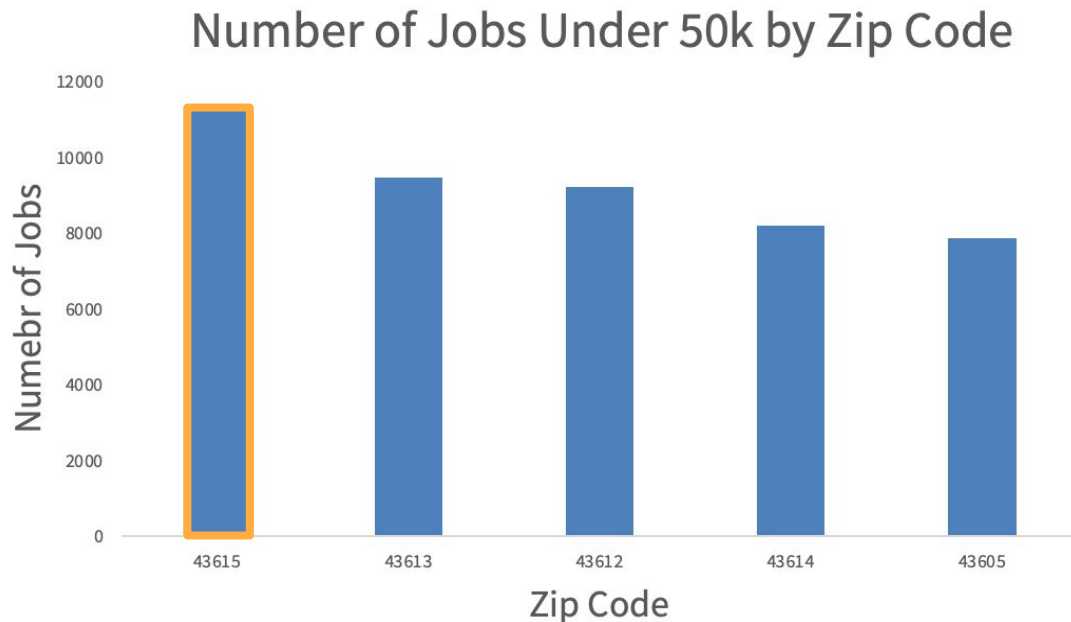
Optimal Location

Star House should be located within the 43615 zip code

The number estimated salary for a homeless person getting a job, is under $50k annual. The highest number of residents (**11350**) with this salary constraint live in the 43615 area.

It may be smart to locate in an area within accessible distance from Rogers High school, as this is our target population

Number of Jobs Under 50k by Zip Code

Next Steps

The next steps include finding optimal locations outside of Ohio and considering other factors
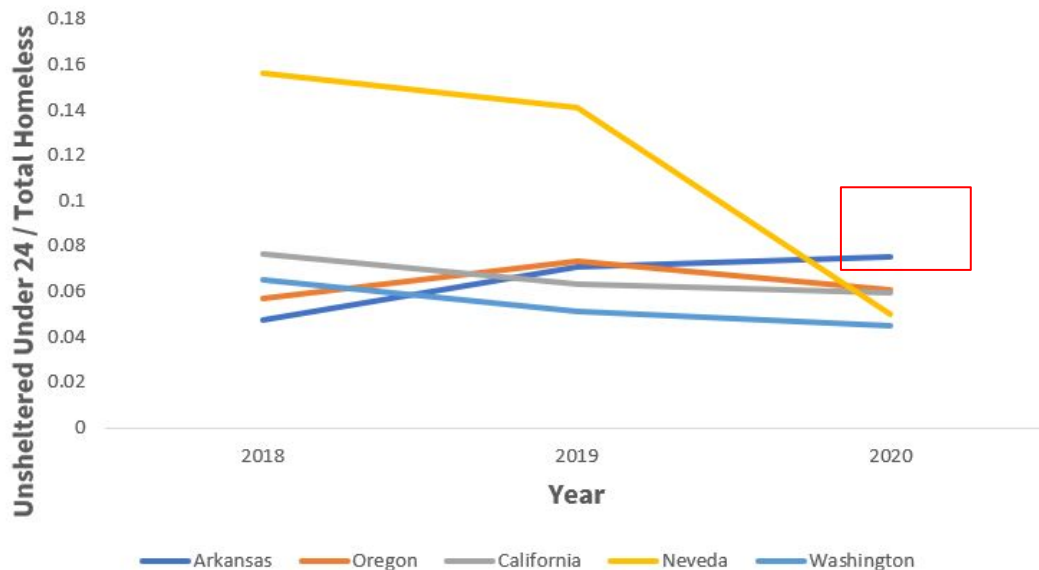
Future Expansion

In the next 20 years, open a Star House in every state. Because government policies and funding differ per state, additional knowledge is required to expand across state lines.

Methodologies

Additional factors to look at include: whether states enforce abortion-friendly policies (pertinent to pregnant women) and job availability at the county level. The methods used for this study can be replicated with different filters.

Unsheltered Population Percentage Under Age 24 (Top 5 States)

Source:
https://www.hudexchange.info/resource/3031/pit-and-hic-data-since-2007/

note 2021 excluded due to missing data/attributes

Next Steps

An additional next step is integrating the aforementioned features into a model to generate scores for each city.

Scoring Model

We will combine the KPIs to achieve a final score for the counties to rank. We can use the machine learning model to fine tune the weights. Initially we will go with weights as described here.

The reasoning for the initial weights is preference order of the KPIs. We consider the homeless population density to be the most important metric and hence the weight of 1. Following the same logic of preference we assign 0.5 to access to public transportation and 0.25 to access to current accommodation capacity

finalScore = Homeless Population Density
  + 0.5 (Access to public transportation)
  + 0.5 (Job Access)
  - 0.25 (Access to Help Already)

Weight	Feature
1.00	Homeless population density
0.50	Access to public transportation
0.50	Job Access
-0.25	Access to Help Already

Increasing importance of feature

+
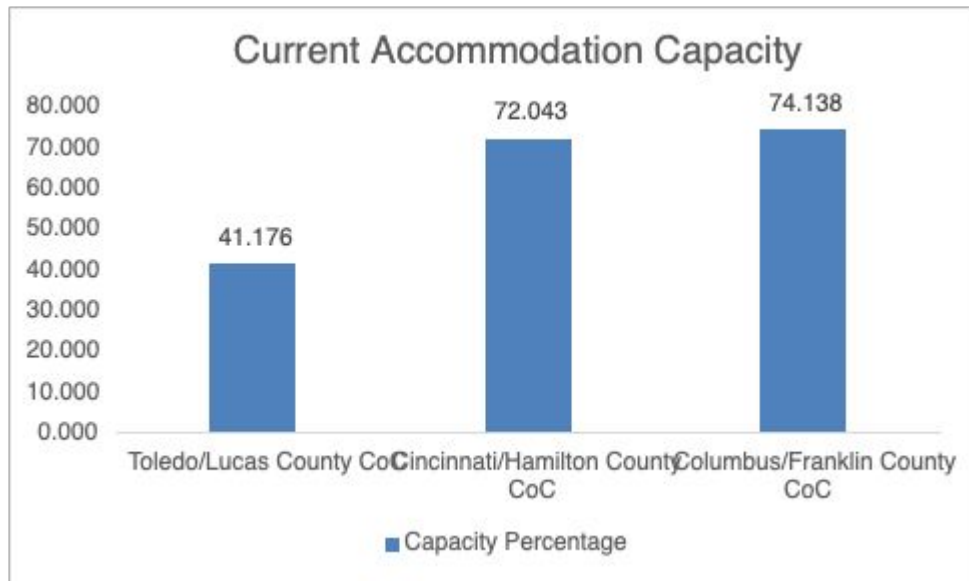
Sum to final score

Appendix

Appendix A: Current Accommodation Capacity

Lucas County's low accommodation capacity can be better served by Star House's services.

Lucas County has the lowest percentage of current **accommodation capacity**.

Lucas County needs more beds/shelters for the young homeless population

Current Accommodation Capacity

CoC	Capacity Percentage
Toledo/Lucas County CoC	41.176
Cincinnati/Hamilton County CoC	72.043
Columbus/Franklin County CoC	74.138

Appendix B: SNAP Beneficiaries by County

Star House should take into account of Hamilton County's high predicted growth rate

SNAP does not represent homeless population, but we can assume homeless population grows/declines at a similar pace.

Average 2-year growth rate		
Lucas County	**Franklin County**	**Hamilton County**
1.13%	**4.30%**	**5.35%**

SNAP Population by County

Legend: Lucas, Hamilton, Franklin

Source: https://www.hudexchange.info/resource/3031/pit-and-hic-data-since-2007/