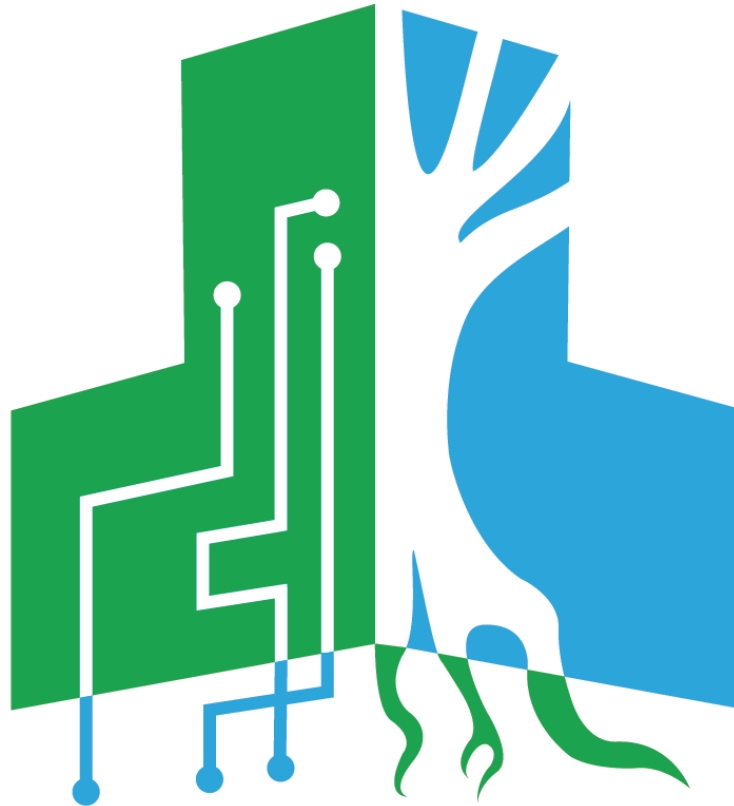


# URBAN SUSTAINABILITY TECH CHALLENGE





**MOTOROLA SOLUTIONS**  
**FOUNDATION**

## About the Motorola Solutions Foundation

The Motorola Solutions Foundation is the charitable and philanthropic arm of Motorola Solutions, originally founded in 1953. With employees located around the globe, Motorola Solutions seeks to benefit the communities where it operates. The company achieves this by making strategic grants, forging strong community partnerships and fostering innovation.

## Speaker

Monica Mueller, Executive Director



An aerial photograph of a dense urban environment, likely New York City. The image shows a grid of streets with numerous tall, multi-story buildings. A central street is visible with several cars and a yellow taxi. The buildings have various architectural styles, including some with flat roofs and others with more ornate facades. The overall scene is a high-angle view of a city street, showing the layout of the buildings and the flow of traffic.


At CNT, we think cities are the answer to big problems like climate change and poverty.



For decades, we've been  
reimagining how cities use  
resources like land and water.







We believe that what's good  
for the economy can also be  
good for the environment.





Some big challenges lie ahead,  
but we're working on creative,  
data-driven solutions that are  
good for everyone.



Together, we can build a world  
where all people can thrive.





# URBAN SUSTAINABILITY TECH CHALLENGE

- ...connected teams of **community organizations** and **students in STEM programs**
- ...identified **real-world problems** to better understand through data science
- ...used CNT's resources to advise on **data collection, analysis, and presentation skills**



# URBAN SUSTAINABILITY TECH CHALLENGE



MOTOROLA SOLUTIONS  
FOUNDATION

**SOCIOLOGY  
COLLEGE OF  
LIBERAL ARTS  
AND  
SCIENCES**



**COFI**  
Community Organizing  
and Family Issues



Christopher B. Burke Engineering, Ltd.

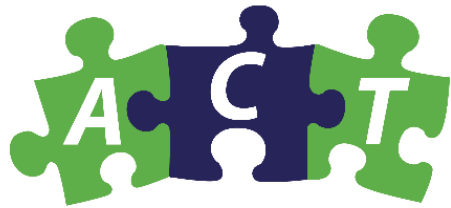
**ILLINOIS TECH**

Discover. Create. Solve.





# URBAN SUSTAINABILITY TECH CHALLENGE



**Austin Coming Together**



## **MISSION**

To increase the collective impact of our member organizations on improving education and economic development outcomes for the Austin community.

## **Vision**

We will create a thriving Austin community.

## **SPEAKER**

Jose Abonce, ACT

# Center of Neighborhood Technology

## UIC Group :

- Pratik Kulkarni
- Aditya Manmode
- Pranita Nadarge
- Raj Moona

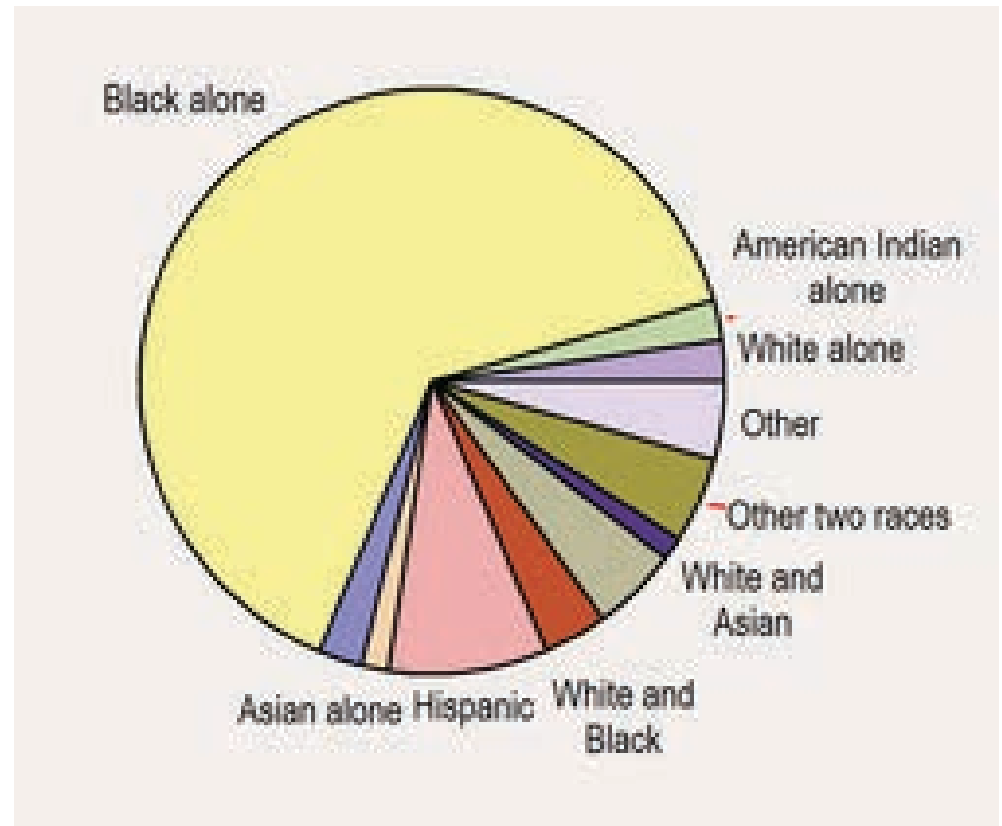




- Austin was created in 1865, when developer Henry Austin purchased 470 acres for a temperance settlement named “Austinville”
- Second largest community area by population and the second-largest geographically
- One of seventy-seven officially designated community areas in Chicago, Illinois. Located on the city's West Side

## Austin Demographic Information

- In the mid-1960s, African-Americans began moving into Austin neighborhood
- By 1970, the Austin community was 32% Black. A decade later, it was 73% Black and this trend has continued





# What are the Objectives?

Identify

Identify “Absentee Landlord” in Austin Neighborhood



Determine

Determine other variables, if any, that affect the ill maintenance of properties with “Absentee Landlord”



Use

Use data analytics and visualization techniques to represent the data insights



Some properties in Austin with  
Absentee Landlords

# Process-flow overview

---

Data Collection

Data cleansing and modification

Visualizations

Insights





# DATA COLLECTION



**FREEDOM OF INFORMATION ACT (FOIA)**



**COOK COUNTY ASSESSORS WEBSITE**

# DATA CLEANSING AND MODIFICATION

String manipulation on columns to compare addresses accurately



Consolidation of zip code datasets



Cross Mapping PINs with data available on Cook County assessors website



Classification of properties based on ownership



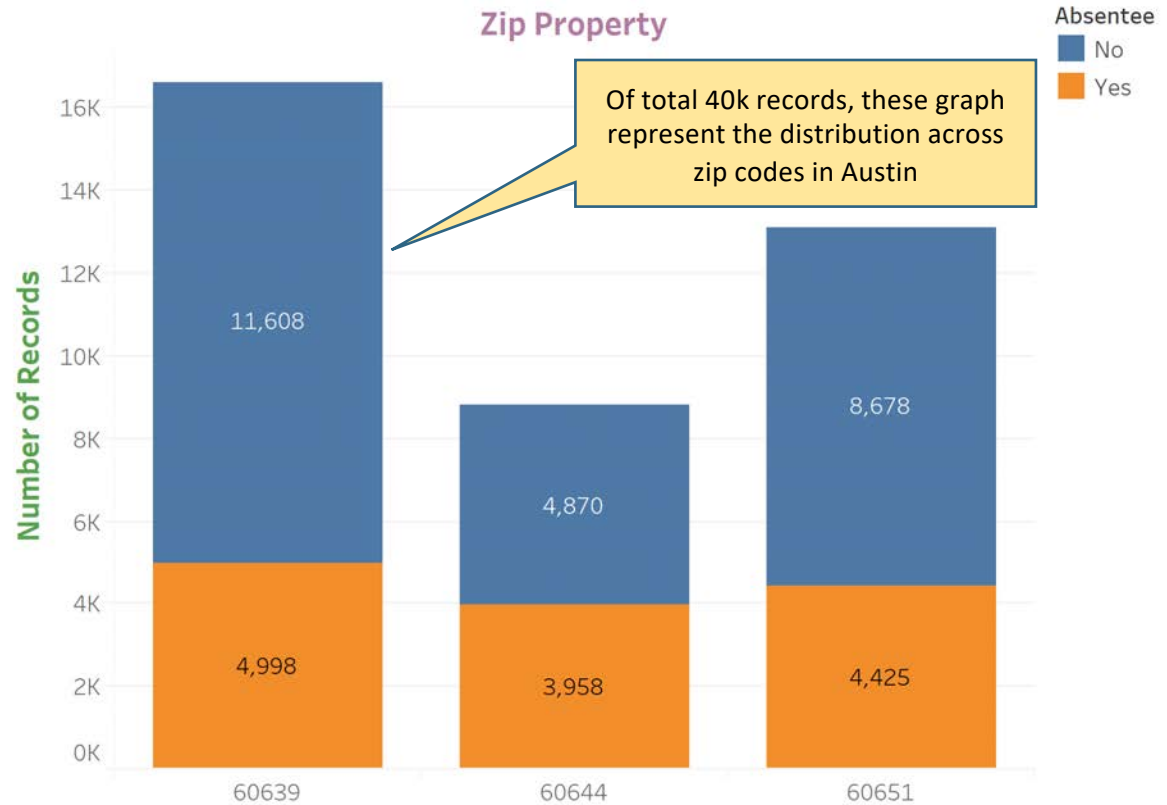
# Visualizations





## Distribution of Absentee Landlords across the 3 zip-codes

### Total Absentee Landlord



Sum of Number of Records for each Zip Property. Color shows details about Absentee. The marks are labeled by sum of Number of Records.

# Property Ownership

Ownership across Zipcodes



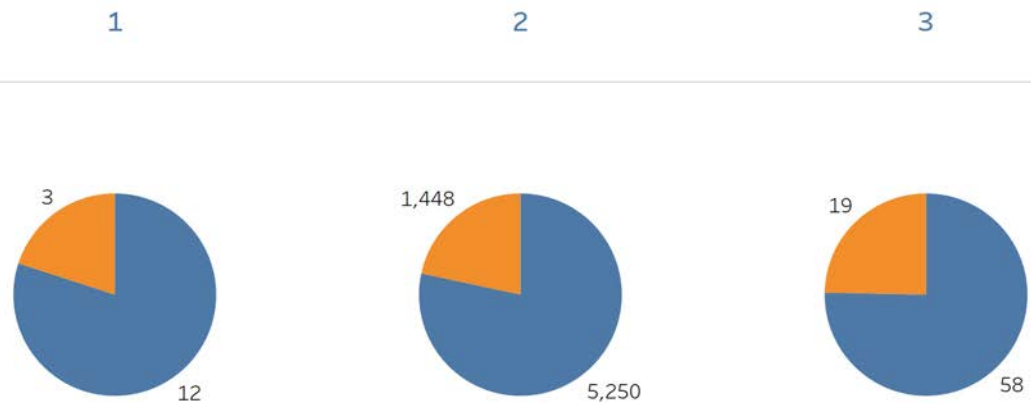
Count of Ownership for each Zip Property. Color shows details about Ownership. The marks are labeled by count of Ownership. The data is filtered on Absentee, which keeps Yes.

## Repair condition across Self owned properties

### Properties with Repair Conditions

- 1: Above Average
- 2: Average
- 3. Below Average

### Repair Condition



Count of Repair Condition broken down by Repair Condition. Color shows details about Absentee. The marks are labeled by count of Repair Condition. The data is filtered on Ownership and Repair Condition. The Ownership filter keeps SELF. The Repair Condition filter ranges from 0 to 3. The view is filtered on Repair Condition, which keeps 1, 2 and 3.

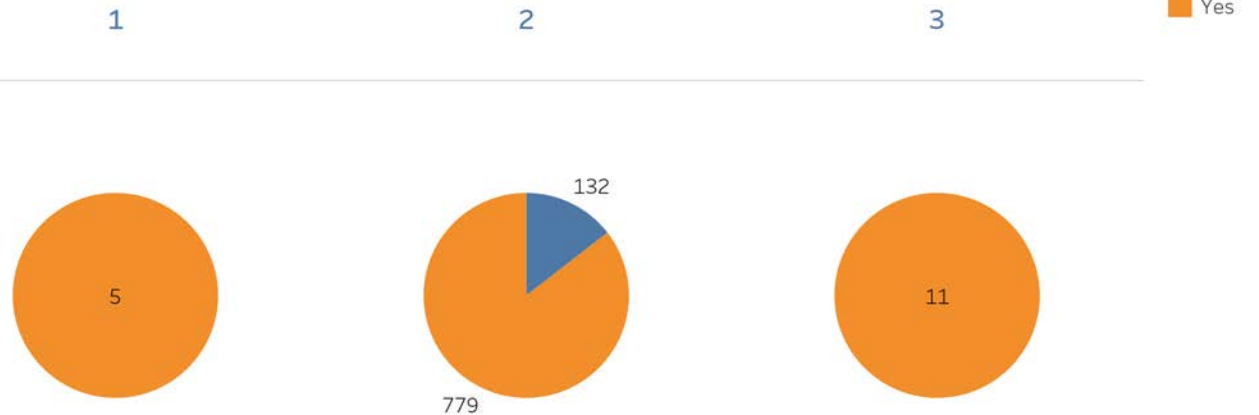


## Repair condition across PMC owned properties

### Properties with Repair Conditions

- 1: Above Average
- 2: Average
- 3: Below Average

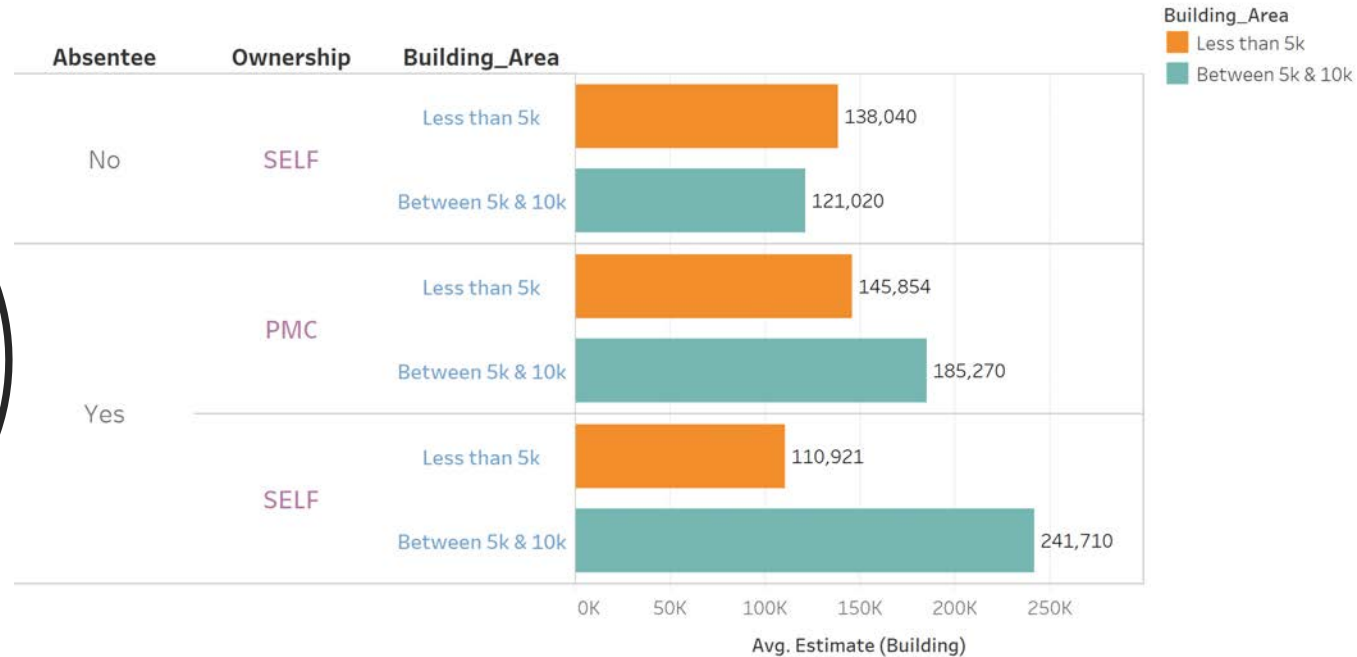
### Repair Condition



Count of Repair Condition broken down by Repair Condition. Color shows details about Absentee. The marks are labeled by count of Repair Condition. The data is filtered on Ownership and Repair Condition. The Ownership filter keeps PMC. The Repair Condition filter ranges from 0 to 3. The view is filtered on Repair Condition, which keeps 1, 2 and 3.

## Building estimates for below average maintained properties

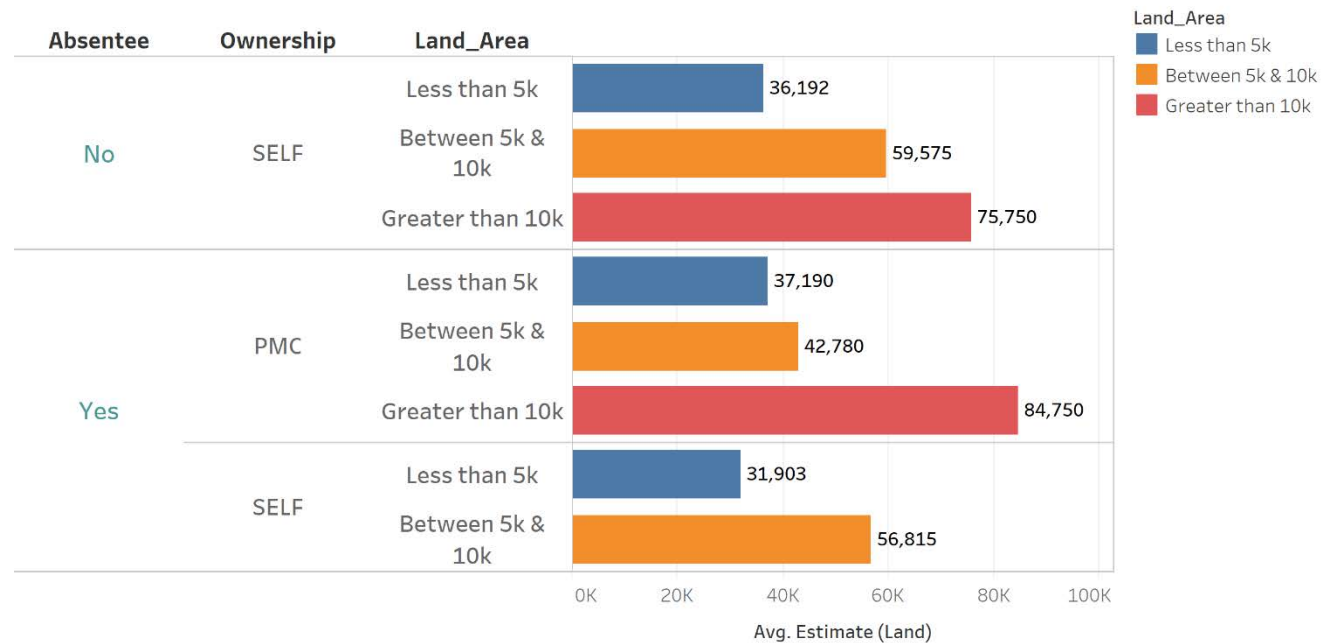
### Property Estimate below average repair condition



Average of Estimate (Building) for each Building\_Area broken down by Absentee and Ownership. Color shows details about Building\_Area. The marks are labeled by average of Estimate (Building). The data is filtered on Repair Condition, which keeps 3. The view is filtered on Building\_Area and Ownership. The Building\_Area filter keeps Between 5k & 10k, Greater than 10k and Less than 5k. The Ownership filter keeps PMC and SELF.

## Land estimates for below average maintained properties

Land Estimate for below average repair condition

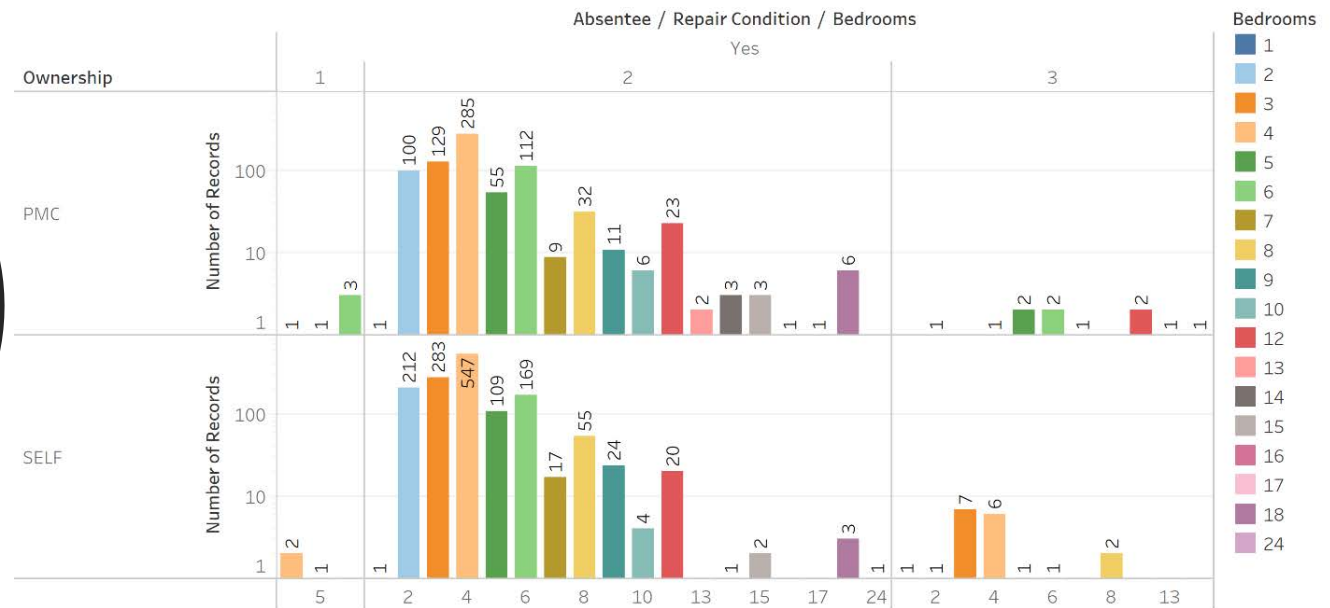


Average of Estimate (Land) for each Land\_Area broken down by Absentee and Ownership. Color shows details about Land\_Area. The marks are labeled by average of Estimate (Land). The data is filtered on Repair Condition, which keeps 3. The view is filtered on Land\_Area and Ownership. The Land\_Area filter keeps Between 5k & 10k, Greater than 10k and Less than 5k. The Ownership filter keeps PMC and SELF.



## Ownership across number of bedrooms

### Repair Condition based on Number of Bedrooms



Sum of Number of Records for each Bedrooms broken down by Absentee and Repair Condition vs. Ownership. Color shows details about Bedrooms. The marks are labeled by sum of Number of Records. The view is filtered on Repair Condition and Absentee. The Repair Condition filter has multiple members selected. The Absentee filter keeps Yes.

# KEY LEARNINGS



**Requesting datasets from Government**



**Performing data manipulation on large datasets**



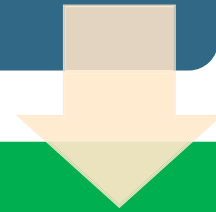
**Deriving insights from the available dataset using visualization technique**



**Becoming aware out the community concerns and issues they face**

## Conclusion

Maximum properties identified as “Absentee landlords” have ‘average maintenance’ condition



No correlation between “Absentee Landlord” and ill maintenance of the properties based on given data

# Recommendation

Get more data for the PINs with unavailable data

- Other attributes might become relevant like 'number of apartments', 'number of bedrooms', etc.

Look at the data for the following variables

- Income of the Owner
- If property is a single family or multi-family
- Licensed landlord (Yes/No)





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**ANY  
QUESTIONS?**

---

**THANK YOU**

# URBAN SUSTAINABILITY TECH CHALLENGE



## ILLINOIS TECH

Discover. Create. Solve.

## OUR MODEL

The COFI model uses parents' strengths and commitment to their children and to their neighborhoods to help make positive change in their own lives, their families and their communities. It emphasizes the commonalities (rather than the differences) between family and community leadership, and between private and public issues. COFI's Family Focused Organizing is a systematic and proven model of how people who are far outside the centers of power, become leaders, build organizations, and win.

## SPEAKER

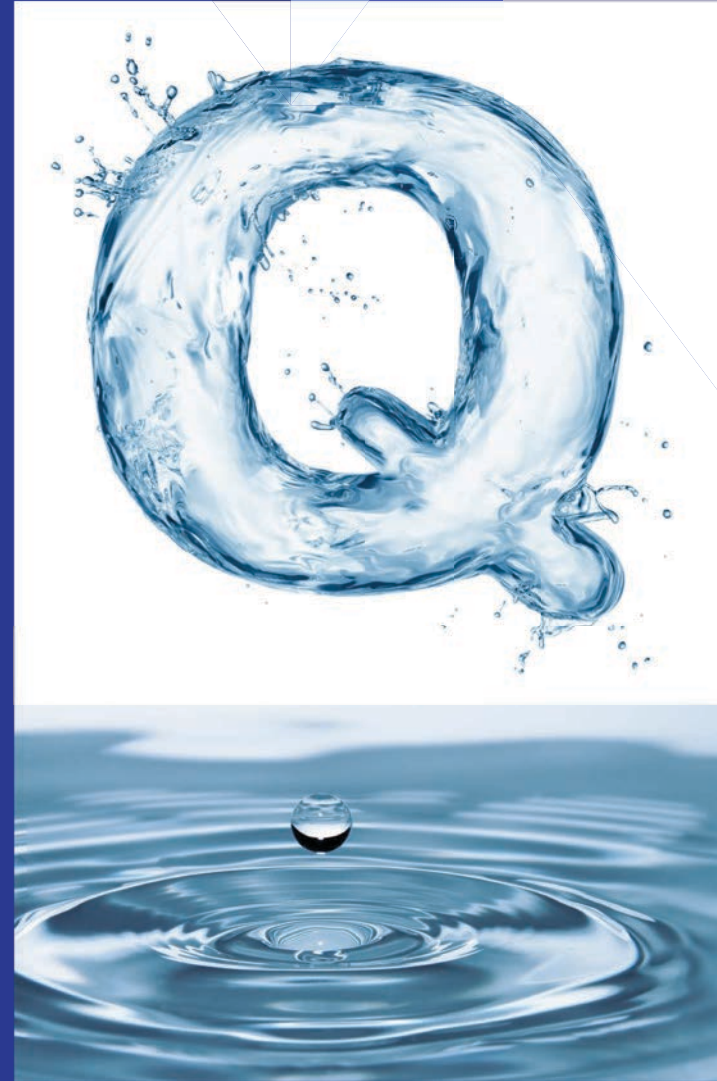
Emily Creahan, COFI

# Do Residents of Englewood Pay More For Utility?

Unexpectedly high cost of living experienced by residents with low income

Annamariya Tharayil, IIT  
Himanshu Mishra, IIT (*presenter*)  
Jen Jenkins, UIC

December 10, 2019





# The problem

## COFI's Claim

Residents of the Englewood community are paying unreasonably higher utility bills than other communities of Chicago

## Context

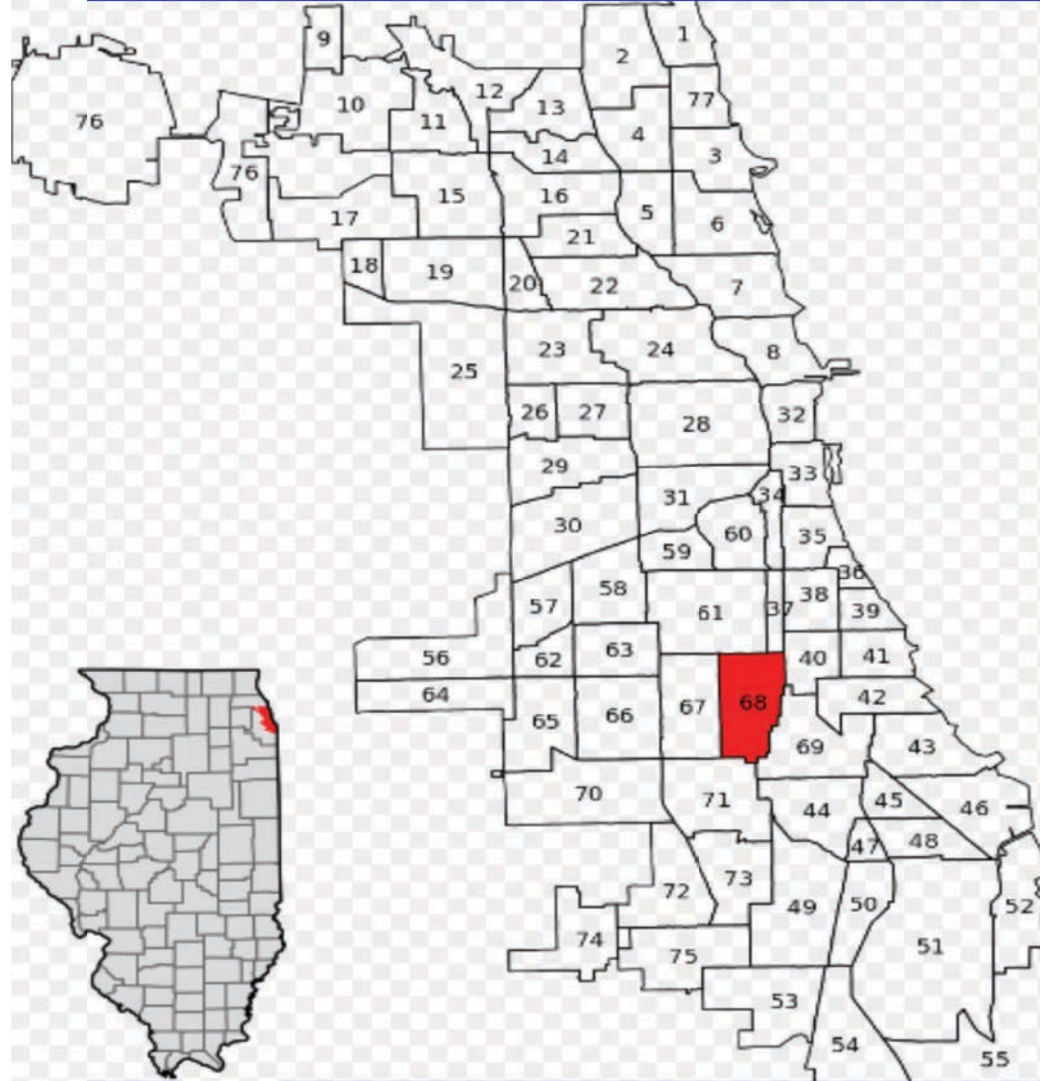
Englewood is a low-income community.  
The residents generally feel that they are being sidelined by the City because of their low-income.

## Problem statement

Check if the claim can be justified and supported by data  
  
Identify the key reasons behind the claim

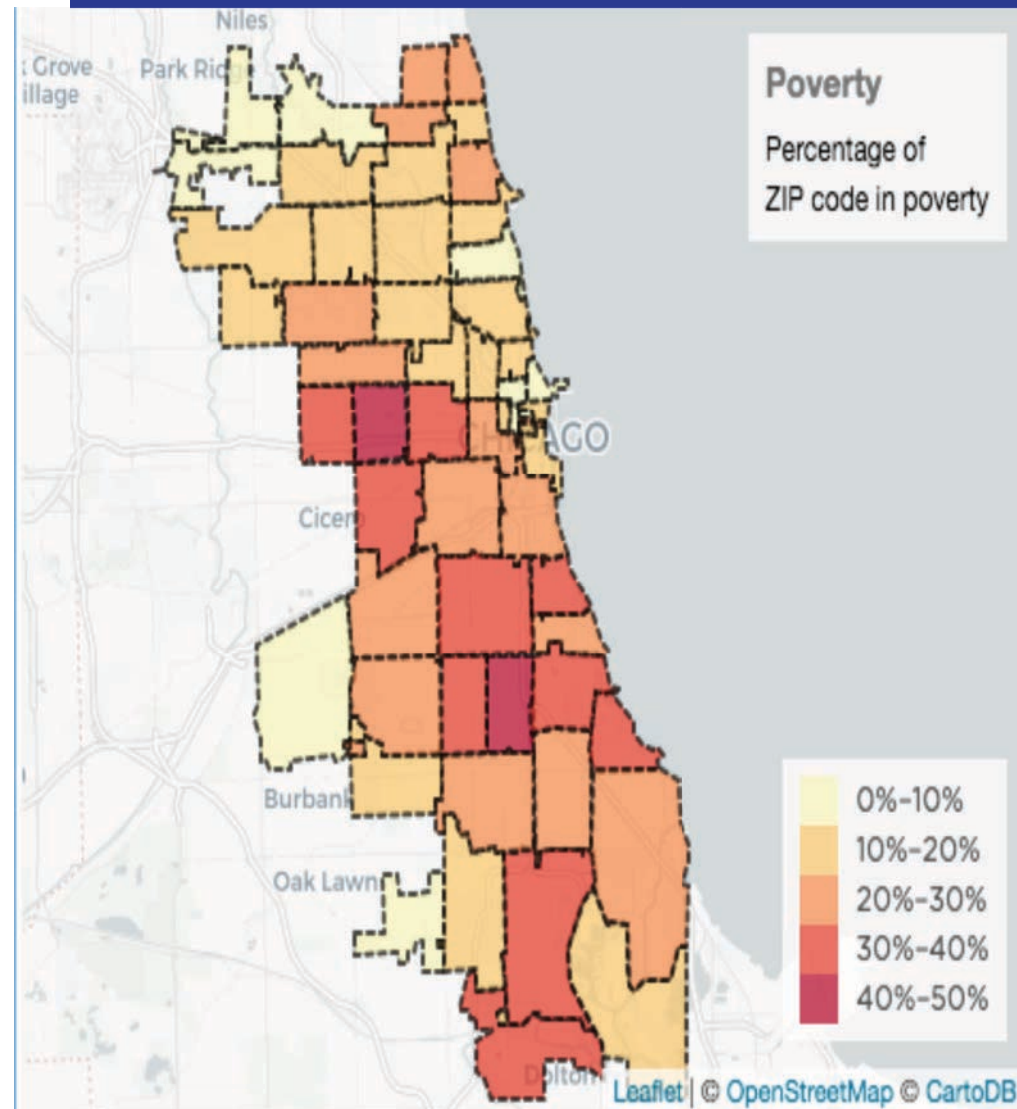
# Englewood

- One of the 77 official communities of City of Chicago
- Geographically bounded by W Garfield Boulevard on the north, S Racine Avenue on the west, 75th Street on the south, and Dan Ryan Expressway on the east



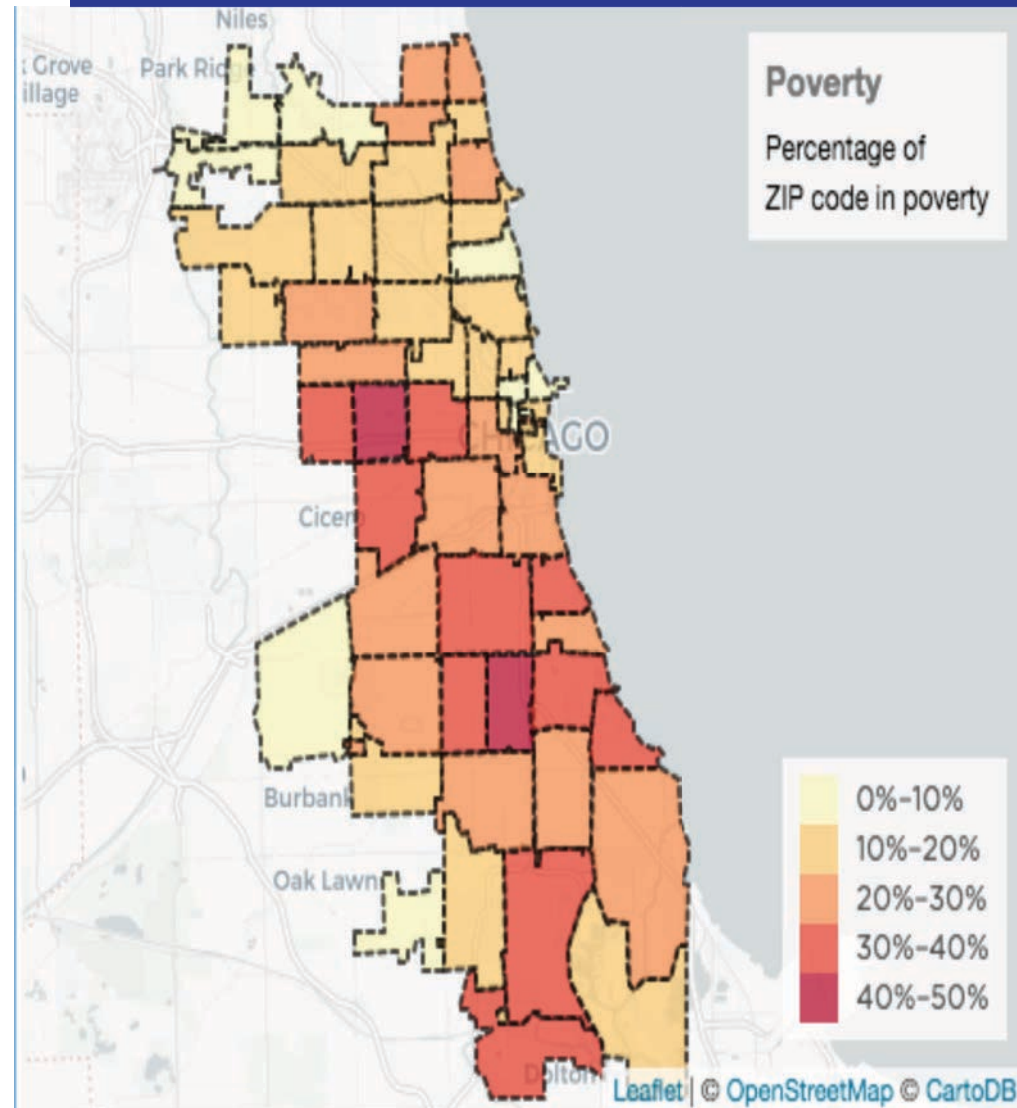
# Englewood

- One of the 77 official communities of City of Chicago
- Income. 40% to 50% people falls below the US poverty line (approx. \$25,750 annual income for a household of four persons in 2019)



# Englewood

- One of the 77 official communities of City of Chicago
- Income. 40% to 50% people falls below the US poverty line
- Demography. Primary race is Black/African American (94.98%)





# Challenge Deep-Dive

## Challenge

### Collect Data

Collect utility bills for Englewood community and few other communities to validate the claim.

## Approach

### Data Sources

- FOIA requests to related city departments
- Manual bill drive by COFI organizers
- Public sources

## Limitations

### Data or No Data

- Personal privacy information involved
- Manual bill drive is logistically infeasible
- Lack of authenticity of public sources.

# Acquiring Data

- FOIA request with the Water Management Department
  - FOIA request with the Revenue Department
  - Public source and news articles
- We received 35 records for residences on N Sangamon Street in Englewood
  - Shut-off data for City of Chicago from 2007 to 2018
-

# Analysis

**35 Records**

Building  
Type

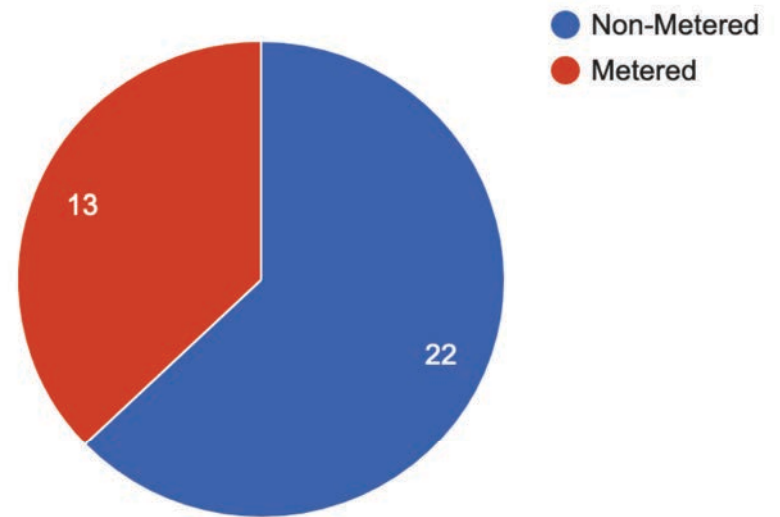
Past Due  
Day

Average Bill

Water Bill



# 35 Records



35 Records

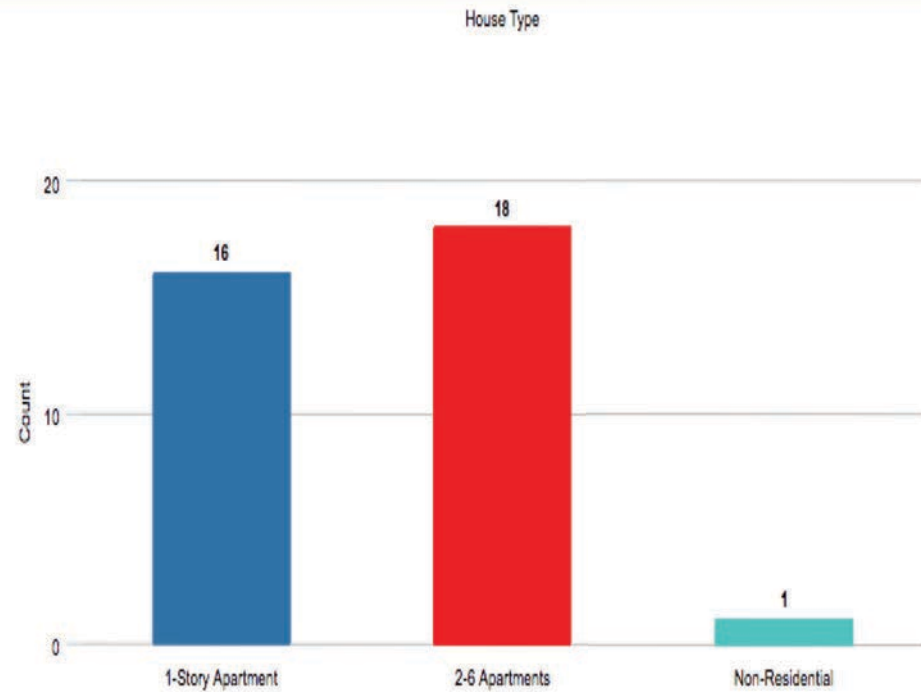
**Building  
Type**

Past Due  
Day

Average Bill

Water Bill

# Building Type



57 days for metered residences  
versus  
184 days for non-metered residences



35 Records

Building  
Type

Past Due  
Day

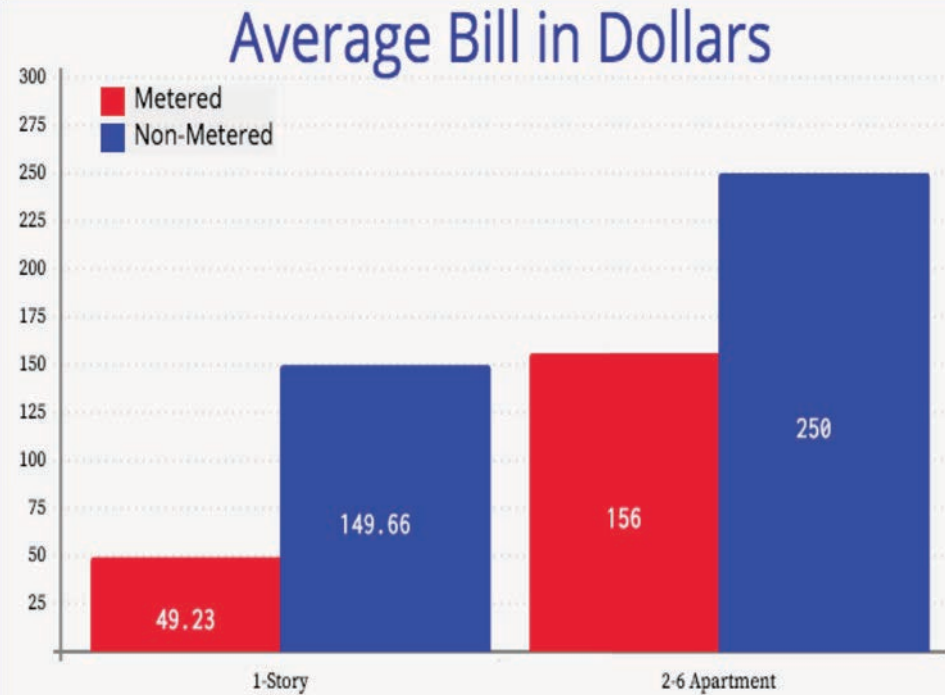
Average  
Bill

Water Bill



# Average Bill

monthly



35 Records

Building  
Type

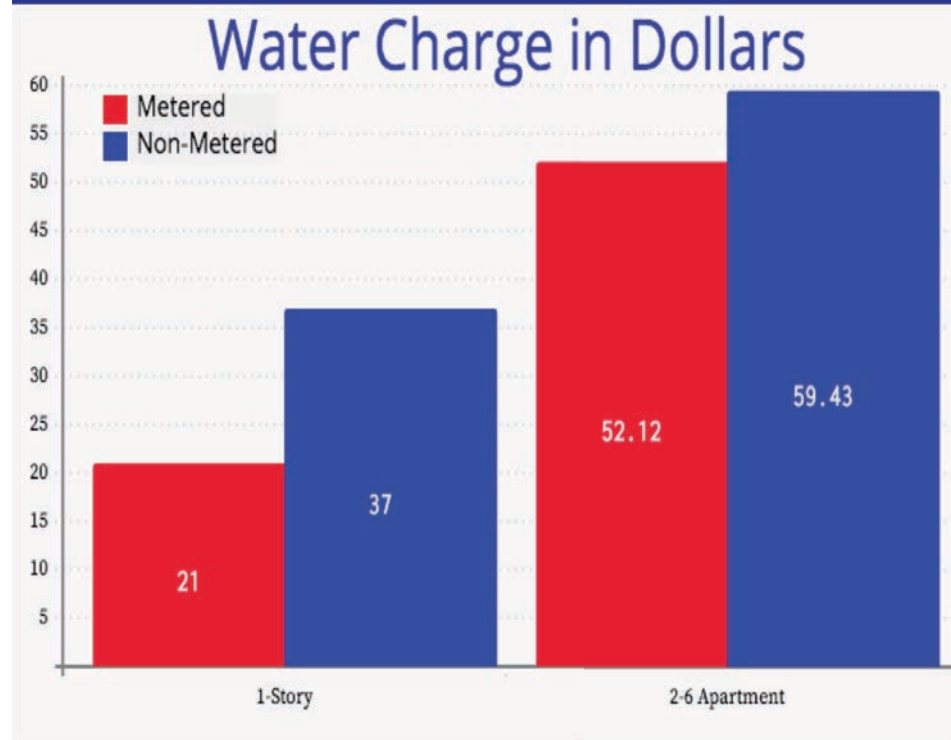
Past Due  
Day

Average Bill

Water Bill

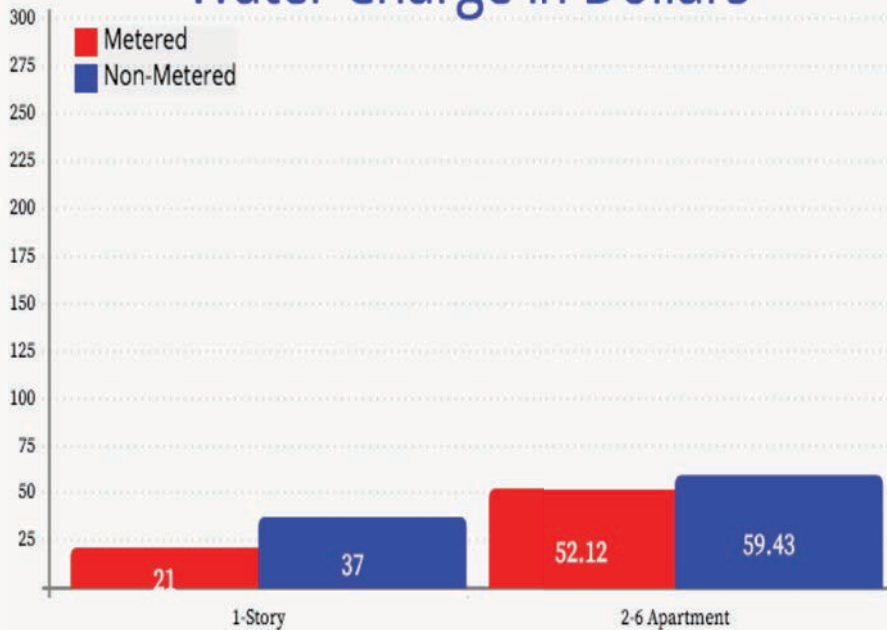
# Water Bill Charges

Per month

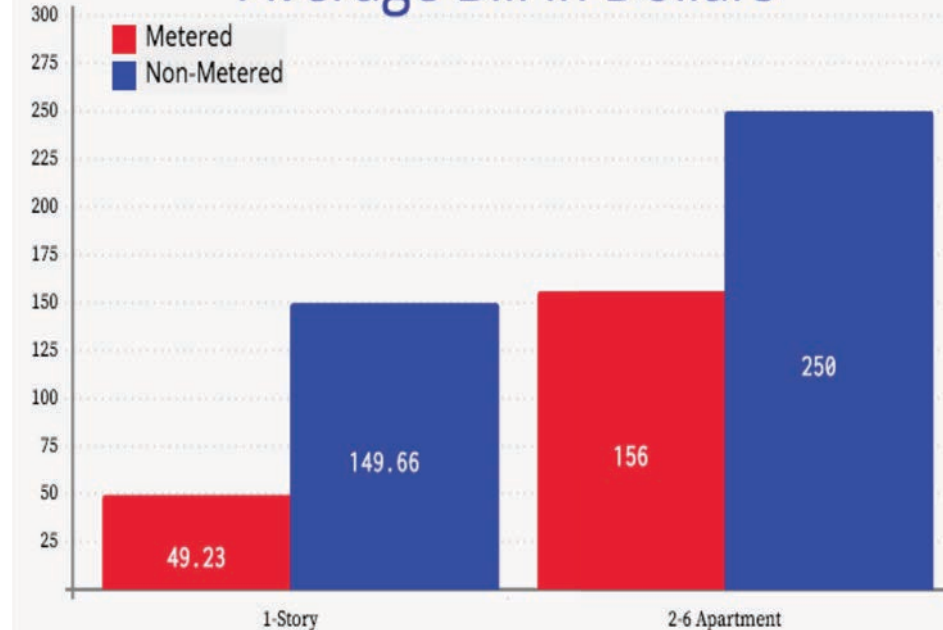


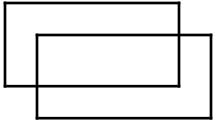
# Comparison

## Water Charge in Dollars



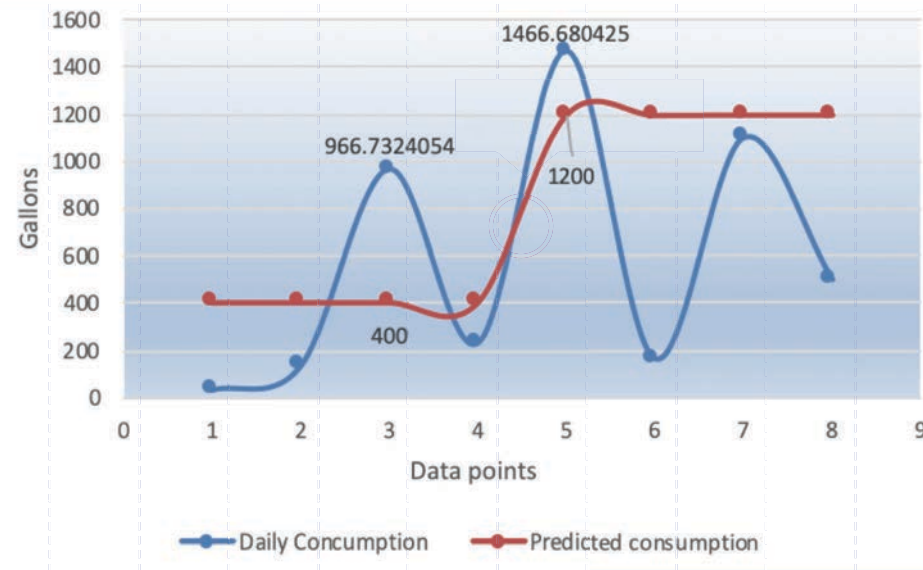
## Average Bill in Dollars





# Consumption

Actual consumption in several cases goes up to 2.4 times than expected



# Conclusion

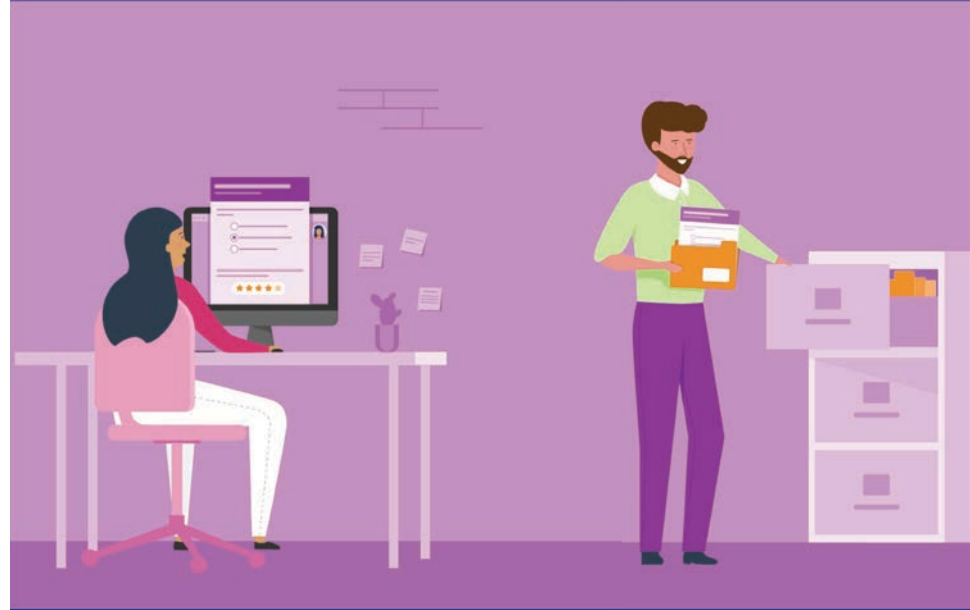
Penalties are the main reason of high bill amount

- Non-metered residences have a higher bills than metered residences.
- Non-metered residence have more past due days.
- Past due bills resulted in a penalty of 1.25% of the bill.
- Due to cumulation of penalties, non-metered residences have to pay higher bills than metered residences



# Learnings

- Government processes take a long time (FOIA requests)
- Look out for various unconventional data sources
- Be simple and specific in requesting data
- Data collection is often the biggest hurdle to overcome



# QUESTIONS?

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Thank You!



# URBAN SUSTAINABILITY TECH CHALLENGE

**SOCIOLOGY  
COLLEGE OF  
LIBERAL ARTS  
AND  
SCIENCES**

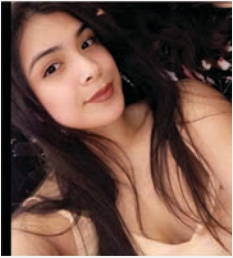




# HUMBOLDT PARK



# OUR TEAM



**Jesenia  
Frausto**



**Erica  
Johnson**



**Honey  
Salve**



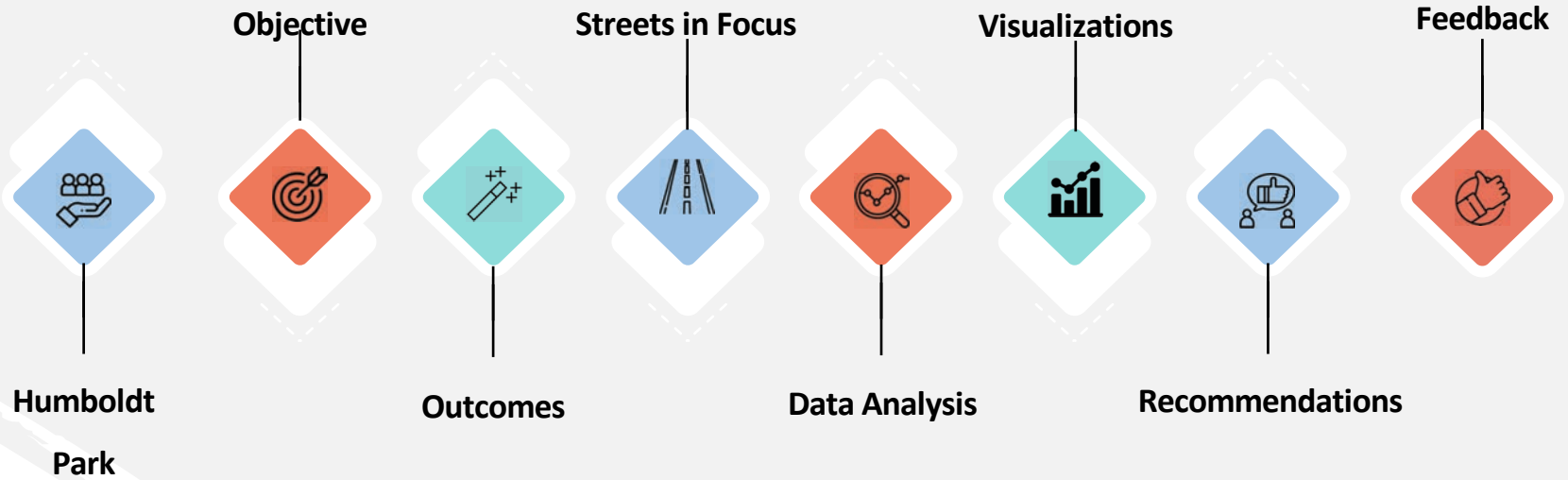
**Ankita  
Gosain**



**Jatin  
Bansal**



# AGENDA



# NEIGHBORHOOD AT A GLANCE

**Paseo Boricua (Division Street):** Puerto Rican-centric main commercial corridor between Western Avenue and California Street

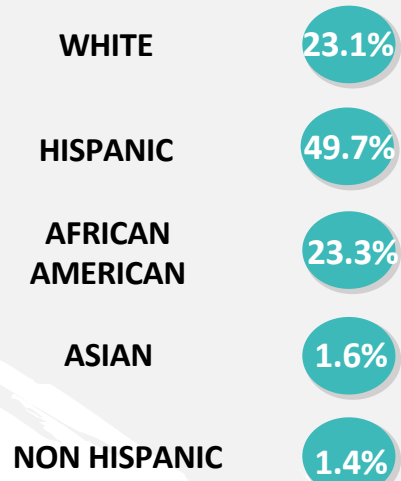
- Marked by the 50 ft steel Puerto Rican flags
- Home to Pedro Albizu Campos High School and highlights various elements of Puerto Rican culture, activism, art and cuisine
- Abundance of art and murals highly valued by youth



# NEIGHBORHOOD AT A GLANCE

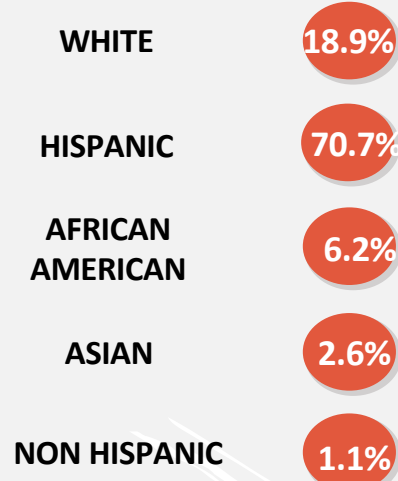
## HUMBOLDT PARK

55,011



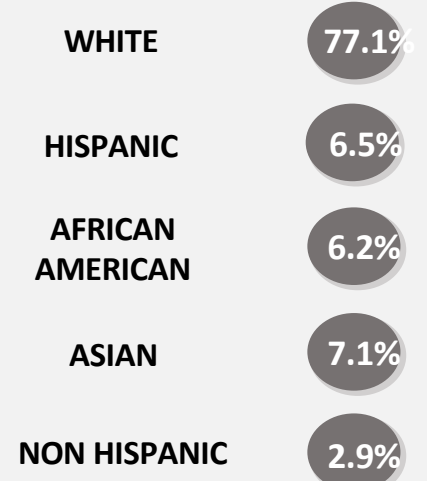
## PILSEN

78,877



## LINCOLN PARK

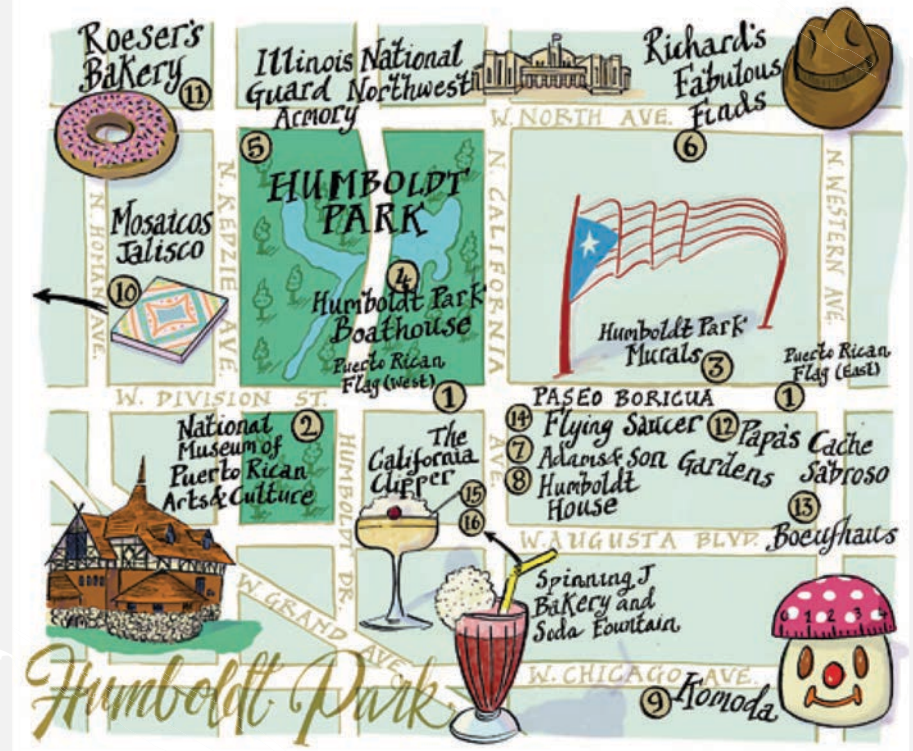
67,260



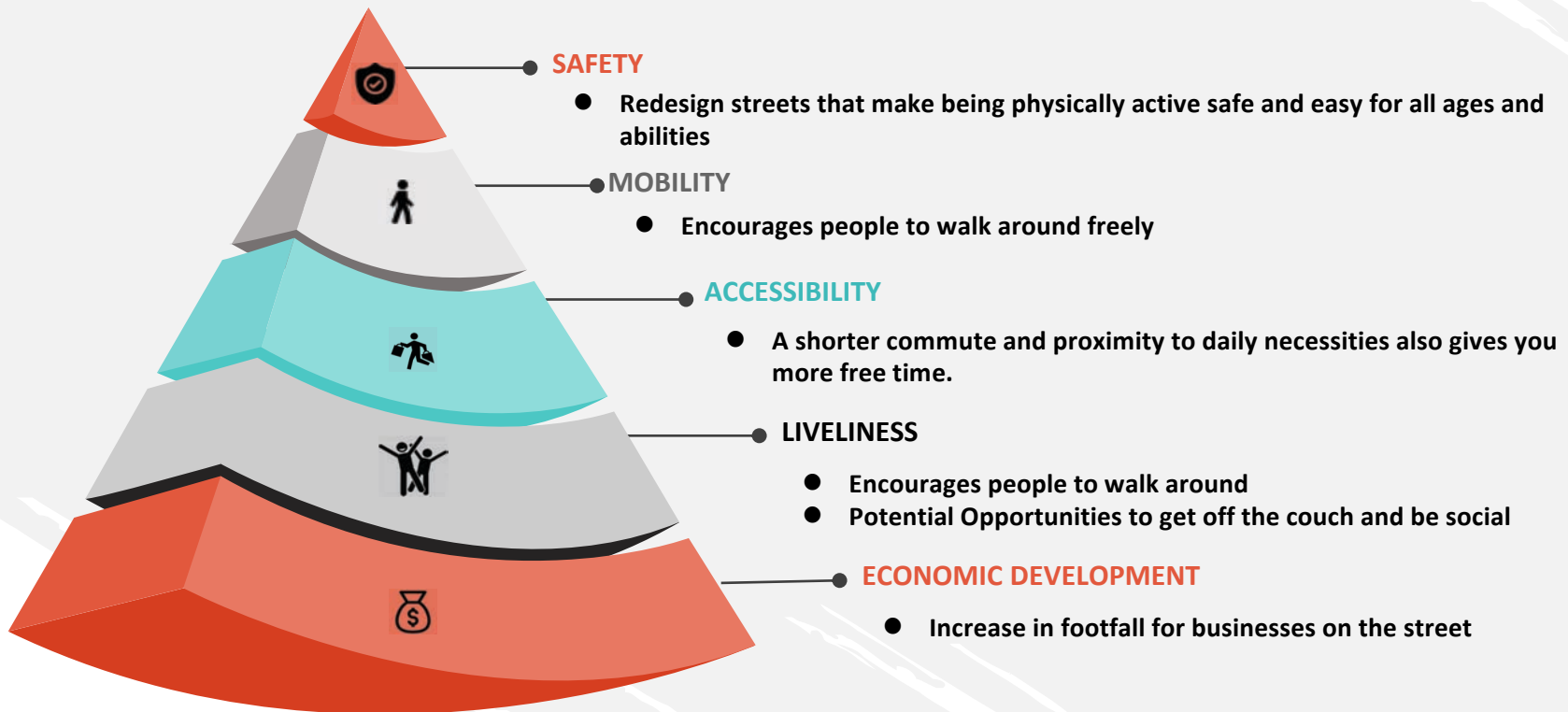
# OBJECTIVE

Improve **Street vitality** factor  
for:

Division Street between  
Western and California Avenue



# NEED FOR COMMUNITY DEVELOPMENT



# STREETS IN FOCUS

W Division St



Walk Score  
**84**

W 18th St



Walk Score  
**88**

N Lincoln Ave



Walk Score  
**94**



# DATA COLLECTION



## Walk Score Data

- Used python to scrape data from Walk Score website modal



## Pin placing on Google Map and Google Earth

- Segregated and pinned the various street vitality factors



## Python : Data cleaning

- Used to clean the KML files derived from Google earth
- Combined data from both sources to create a master data





# INFLUENCING FACTORS

TREES



STREET LIGHTS



TRASH BINS



MURALS



ART, CULTURE & ENTERTAINMENT



FOOD & DRINKS



RETAIL STORES



BUS STOPS



SCHOOLS



BENCHES



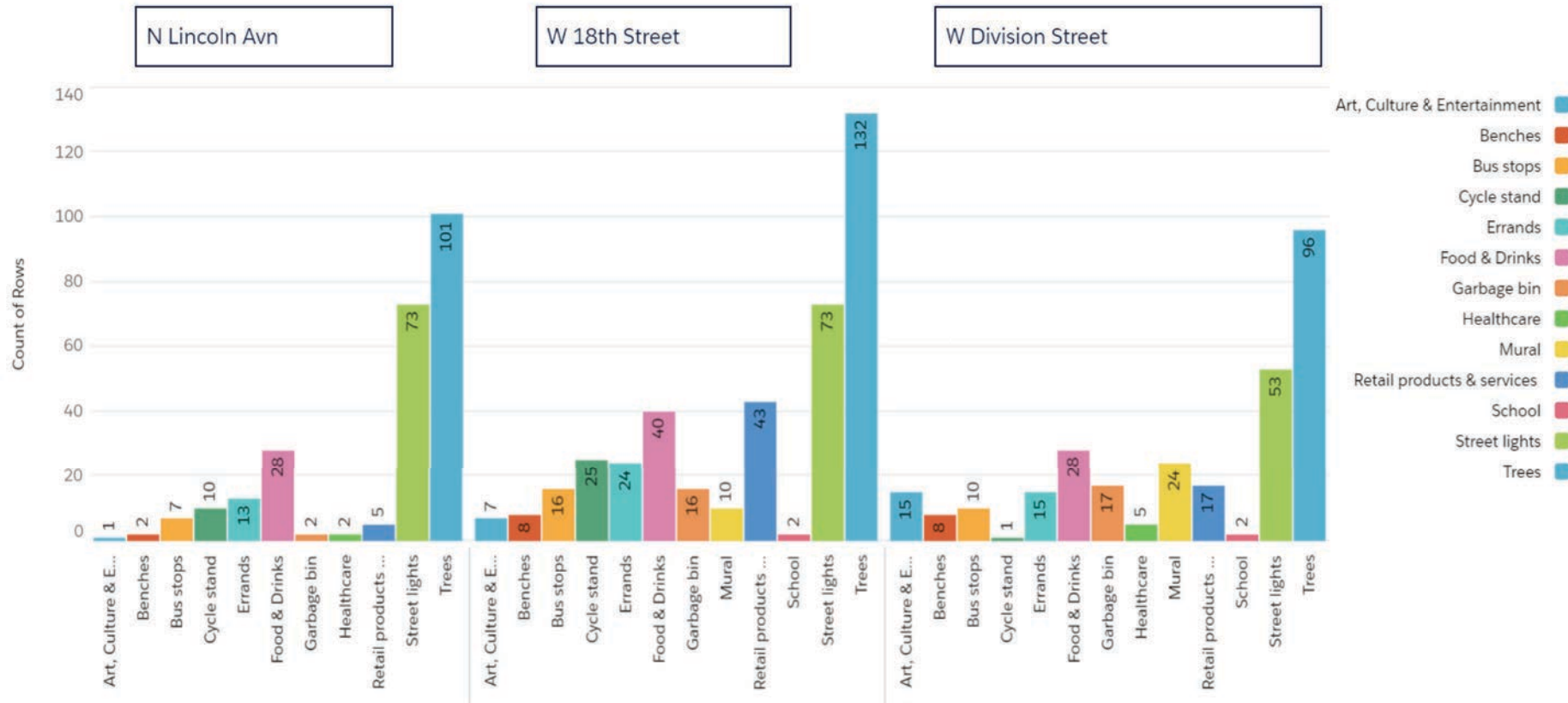
ERRANDS



BICYCLES



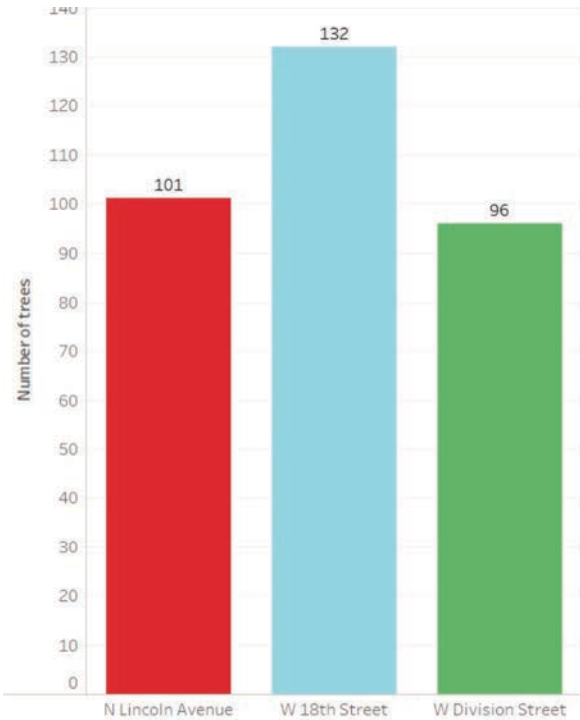
# DATA VISUALIZATION





# RECOMMENDATIONS

# TREES AND VERTICAL GARDENS



Humanizes the street by attracting people to outdoor activities.

Urban forestation can lower people's stress levels and enhance well-being

Types of green spaces that can be added:

- Tree-lined streets
- Flowerbeds
- Parks & Campuses

## EXAMPLES



# UTILIZE WIDE PAVEMENTS

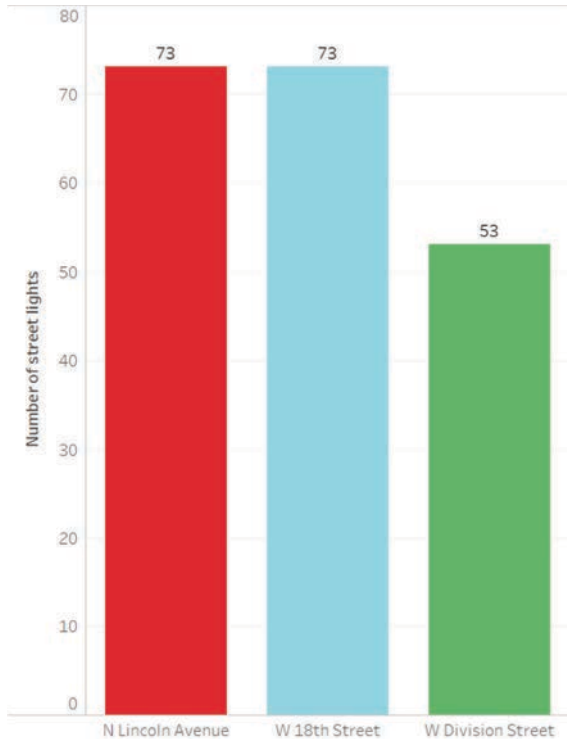


**Underutilized pavements offer huge potential for usable and desirable open spaces**





# ADD STREET LIGHTS



**Efficient and people-oriented lighting** facilitates the occupancy of public spaces at night, enhancing safety.



When installed on the **pedestrian and cyclist scale**, public lighting creates the necessary conditions to move more safely when there is no natural light.

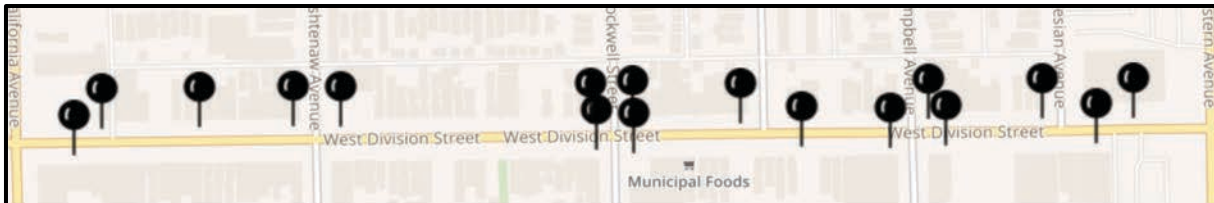




## PLACE TRASH BINS STRATEGICALLY

- Sidewalk trash cans and recycle bins are essential to the health and function of the community.
- Their presence along streets with high pedestrian discourages littering, resulting in a healthier more aesthetically pleasant environment.

**Placement: minimum 4 trash bins at an intersection (1 each corner)**

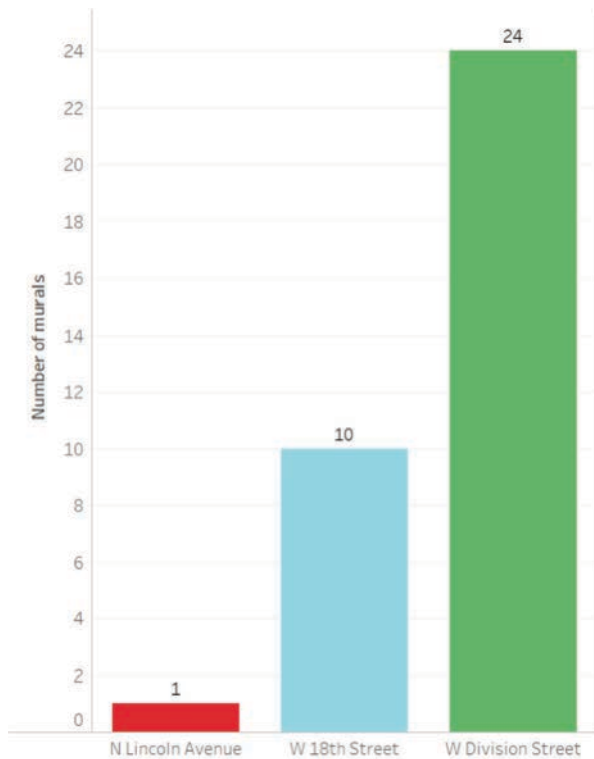


### CURRENT PLACEMENT OF TRASH BINS



## RECOMMENDED PLACEMENT OF TRASH BINS

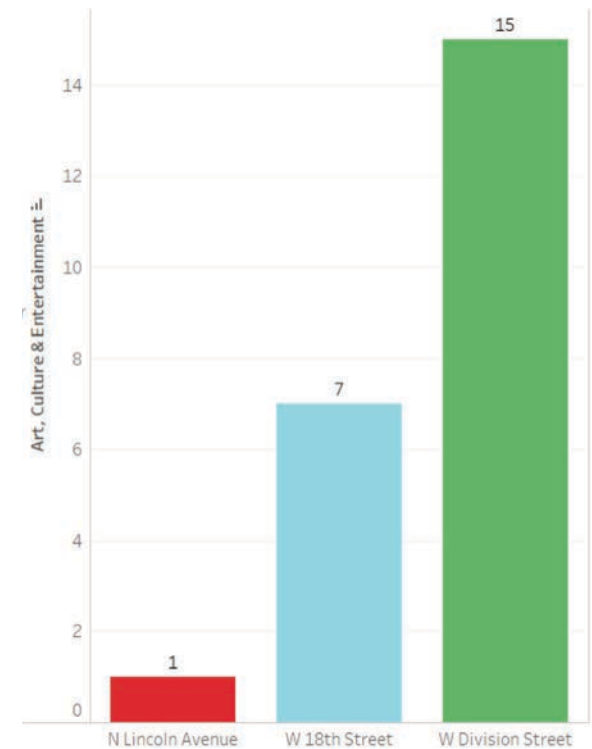
# ORGANIZE TOURS AND ART WALKS



Offering education about neighborhood murals will help preserve area's culture and heritage



Art walk in Pilsen



**Comparatively, W Division Street has more number of murals and centers for art/culture/entertainment**

# URBAN SUSTAINABILITY TECH CHALLENGE

**SOCIOLOGY  
COLLEGE OF  
LIBERAL ARTS  
AND  
SCIENCES**

**UIC**



**UIC**

**BUSINESS**

## **MISSION**

Dr. Pedro Albizu Campos Puerto Rican High School's mission is to provide a quality educational experience needed to empower students to engage in critical thinking and social transformation, from the classroom to the Puerto Rican community, based on the philosophical foundation of self-determination, a methodology of self-actualization and an ethics of self-reliance.

## **SPEAKERS**

Yuritza Stanley, student, Albizu Campos

Marvin Garcia, Albizu Campos



QUESTIONS?

The background features a light gray field with several broad, diagonal, white brush-like strokes. In the top right corner, there is a small horizontal bar with three colored segments: red, teal, and black.

**THANK YOU!**

# URBAN SUSTAINABILITY TECH CHALLENGE



Austin Coming Together



MOTOROLA SOLUTIONS  
FOUNDATION

**SOCIOLOGY  
COLLEGE OF  
LIBERAL ARTS  
AND  
SCIENCES**



**COFI**  
Community Organizing  
and Family Issues



**BUSINESS**



Christopher B. Burke Engineering, Ltd.

**ILLINOIS TECH**

Discover. Create. Solve.



# THANK YOU!