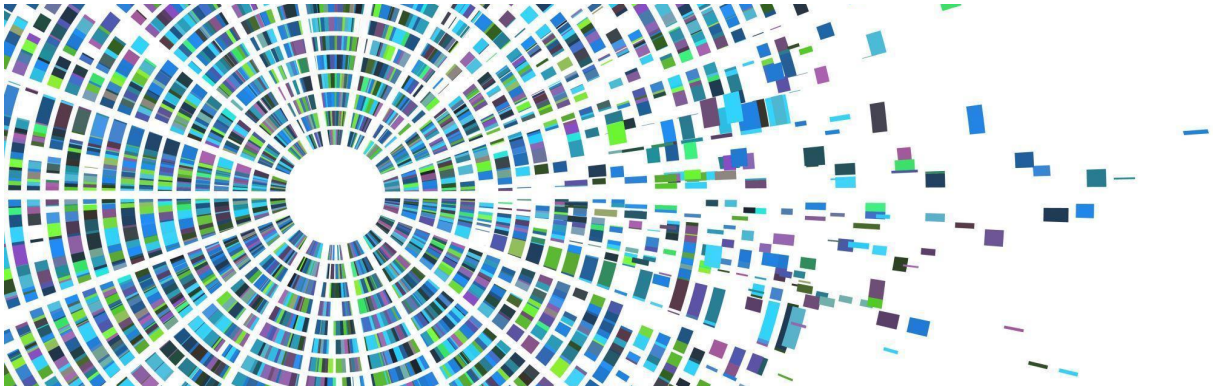


Blue Island
Civic Innovation Hub Capstone Project

The following tool is adapted from Hansen, L.J. and M. Ramirez. 2020. Rapid Climate Vulnerability Assessment Tool for Climate-Informed Equitable Community Development. Strong, Prosperous and Resilient Community Challenge.

This tool is to inform and help facilitate capstone projects for cohort members.

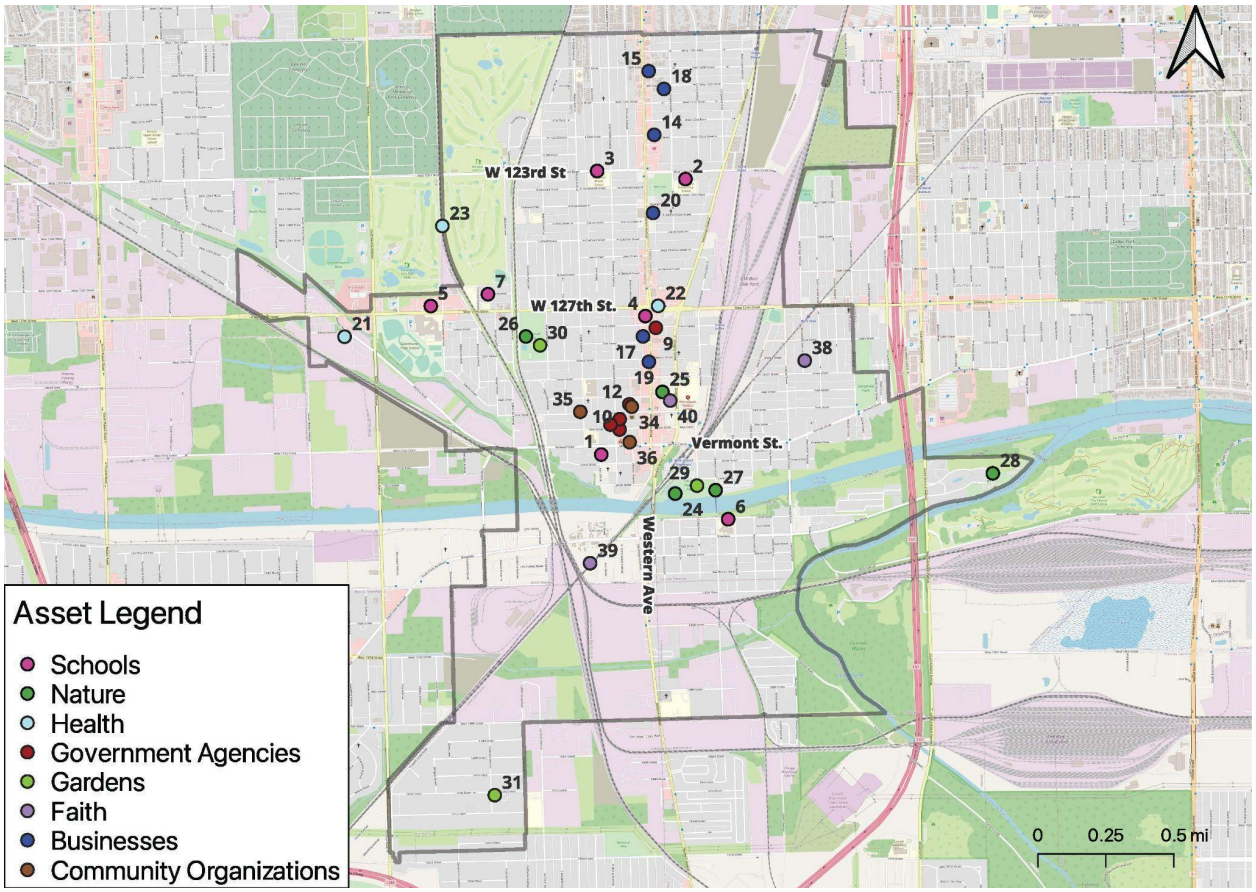
Step 1: Identify the goal

For the Civic Innovation Hub 2023 cohort, the goal is to:

Develop an intervention to improve your community's resilience to urban flooding issues as storm intensity and frequency increases with climate change. Resilience is the ability to respond, adapt, and move forward from a disruptive event.

Step 2: Community Assets

Remember the workshop from June on community assets, take a look at the community asset map you created with your cohort members.



Schools

- 1-Council Oaks Montessori School

- 2-Paul Revere Primary School
- 3-Veterans Memorial Middle School
- 4-Morraine Valley Community Center
- 5-Dwight D. Eisenhower Highschool
- 6-Lincoln School
- 7-TLC Learning Center
- 8-St. Benedict School

Government Agencies

- 9-Cook County Health Blue Island Health Center
- 10-Blue Island Planning Department
- 11-Blue Island Police Department
- 12-Blue Island Public Library
- 13-Blue Island City Hall

Businesses

- 14-ALDI
- 15-Old National Bank
- 16-U.S. Bank Branch
- 17-La Vieja Castilla Restaurant
- 18-Tommy's Place
- 19-Three Sisters Antique Mall
- 20-Dollar Tree

Health

- 21-Illinois Department of Human Services
- 22-Duly Health and Care
- 23-Oak Street Health Blue Island Primary Care

Nature

- 24-Cal-Sag Channel
- 25-SEPA Station 3
- 26-Memorial Park Pool
- 27-Cal-Sag Trail
- 28-Fay's Point Marina

Gardens

- 29-RainReady Rain Gardens
- 30-Memorial Park Community Gardens
- 31-John D. Rita Recreation Center Community Garden
- 32-Council Oaks Montessori School Community Garden
- 33-Forestry Board and Tree Plan

Community Orgs

- 34-Friend of the Library
- 35-Blue Island Historical Society
- 36-Blue Island Chamber of Commerce
- 37-Kiwanis Blue Island Club

Faith

- 38-St. Donatus Catholic Church
- 39-Christian Life-Hope Center
- 40-St. Benedict Catholic Church (Mary Magdalene Parish)
- 41-A Walk of Faith Ministries Inc.

What are some particularly strong assets in your community that stand out?

Which of these can you see being part of a stormwater solution?

How could a stormwater solution help strengthen those assets?

Step 3: Identify top 3 strategies

As a community cohort, what strategies for resilience interest you? What strategy feels like the next step versus what would be a long term strategy? What strategy would respond to resident needs right now versus long term needs or seasonal needs vs constant needs?

Strategies can include identifying stormwater management projects, creating municipal resilience planning, improving social safety network, identifying a stormwater political candidate, etc. As you identify strategies, make sure that they align with achieving the goal from step 1. (Ex: *Create webpage on resources for what to do after home flooding, Identify a policy for where green stormwater infrastructure should be included*).

1.

2.

3.

When identifying a strategy and thinking through its implementation, it is important to consider how future stressors can impact the effectiveness of the strategy. Steps 4 through 7 will review stressors to consider.

Step 4: Gaps in Community Assets

Considering the strategies you've brainstormed:

What are some gaps you notice in your community assets?

Are any of these impediments to some particular stormwater solutions?

Could a stormwater solution help close any of these gaps?

Step 8: Evaluate

Considering the factors in steps 3-6, evaluate how they may impact the strategies your municipal group came up with in Step 2. What would need to be considered in the implementation to make sure that the strategy is beneficial to the community? What solutions can be embedded into the strategy to make it work effectively?

Strategies	**Impacts: How might current or future conditions impact this strategy?**	**Assets: Which community assets / initiatives can be used and how could they be helpful?**	**Solutions: What can be done to be mindful of these conditions?**
Ex: Create an educational session for community block clubs about flooding	*Ex: If high non-English speaking population, they will not understand English only resources.* *If block club is only active on west side of town, will need to consider how to do outreach for east side of town*	*Ex: Organization X is a trusted community partner that works with speakers of Y language. They could be someone to turn to.* *Library is a central organization that serves all sides of town.*	*Ex: Outreach to the block clubs, library, and other assets on the east side of town.* *Educational sessions are hosted by the mayor and can invite the consultant engineer to be a speaker for the panel.*
Ex: Install green stormwater infrastructure in new street designs	*Ex: If there isn't tax base or dedicated funding to maintain the green stormwater infrastructure it'll become an eyesore and useless.*	*Ex: We can participate in RainReady and prioritize this project.* *We can leverage our relationship with X agency to figure out the first maintenance funds.* *There's a lot of funding for the construction piece of the project. Can partner with OAI, Inc. to learn about other maintenance solutions.* *Very active parks volunteer group. They could be invited to support maintenance for street projects near park.*	*Ex: Work with agency X to get the annual budget in order.* *Partner the park district and OAI to develop training for volunteers and current staff, while the budget gets figured out.*

Step 9: Planning for Implementation

Reviewing the strategies and solutions, identify which ones the group is most interested in and fill out the following chart to think of high-level plans for implementation.

Solution			
Description			
How to implement (including policy changes or public education if necessary)			
Partners and Resources required			
Time frame (1-2 years, 5 years, 10 years)			
What does success look like			
How would success be measured (ex: # of dollars invested, # of projects installed)			
Likelihood of Success			

Step 10: Finalize Capstone Solution Project

Based on Step 9, which solution would the group like to focus on for the capstone project?

Chosen solution:

What are next steps to get this project going:

- What skills or assets do individuals in this group bring to make this project come to life?

- Who else do you need or want to talk to? Who needs to get on board? Who would it be helpful to present to?

- What are potential funding sources for this?

- How will the group be held accountable for implementing the project?

- How can CNT help? (This can inform future grant work CNT looks for)

Supplemental Information

Step 5: Understand Future Climate Conditions

Future climate conditions will look similar across Cook County and will include more hot days, fewer cold days, and greater precipitation. The following describes trends that will impact Cook County. The following data does not cover all impacts of climate change such as increased frequency of extreme weather events, tornadoes, etc. Source: https://crt-climate-explorer.nemac.org/

Temperature

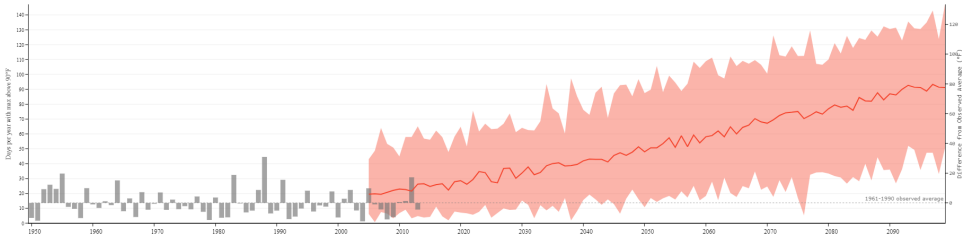
The following charts and numbers use a mathematical model to predict the change in the number of days in a year with temperatures over 90°F (very hot days) and under 32°F (cold days). High emissions scenarios mean that humans have not made changes to reduce greenhouse gas emissions. Low emissions scenarios mean that humans have made efforts to reduce greenhouse gas emissions.

Estimated Days above 90°F

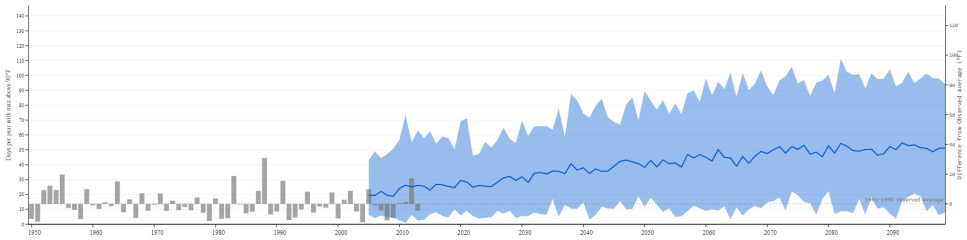
	High Emissions	Low Emissions
2030	37.4	34.5
2040	45	38.7
2050	53.5	42.1

Overall, the number of hot days is predicted to increase over time given climate change under both high and low emission scenarios.

High emissions scenario



Low emissions scenario



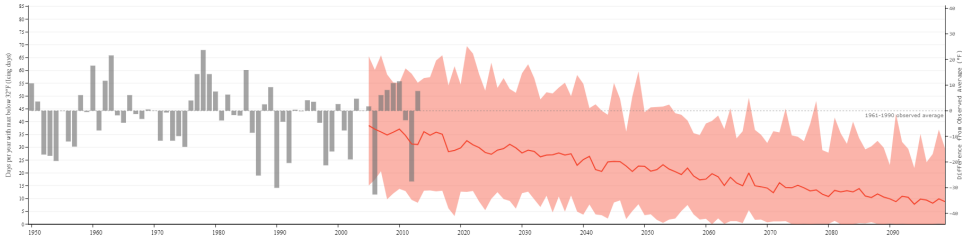
Estimated Days below 32°F

	High Emissions	Low Emissions
2030	27.1	27.9

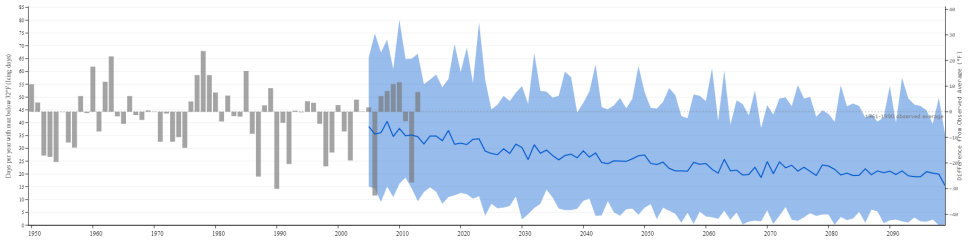
2040	23.3	26
2050	20.7	23.4

Overall, the number of cold days is predicted to decrease over time given climate change, under both high and low emission scenarios.

High emissions scenario



Low emissions scenario



Precipitation

Research by the Metropolitan Water Reclamation District (MWRD) shows that as little as 0.3 inches of rainfall can overfill our sewer systems. Based of The Climate Explorer, the data shows that:

> *For both high and low emissions scenarios, Cook County may experience 5 more days per year of precipitation over 1 inch over the next 30 years.*

Degree Days

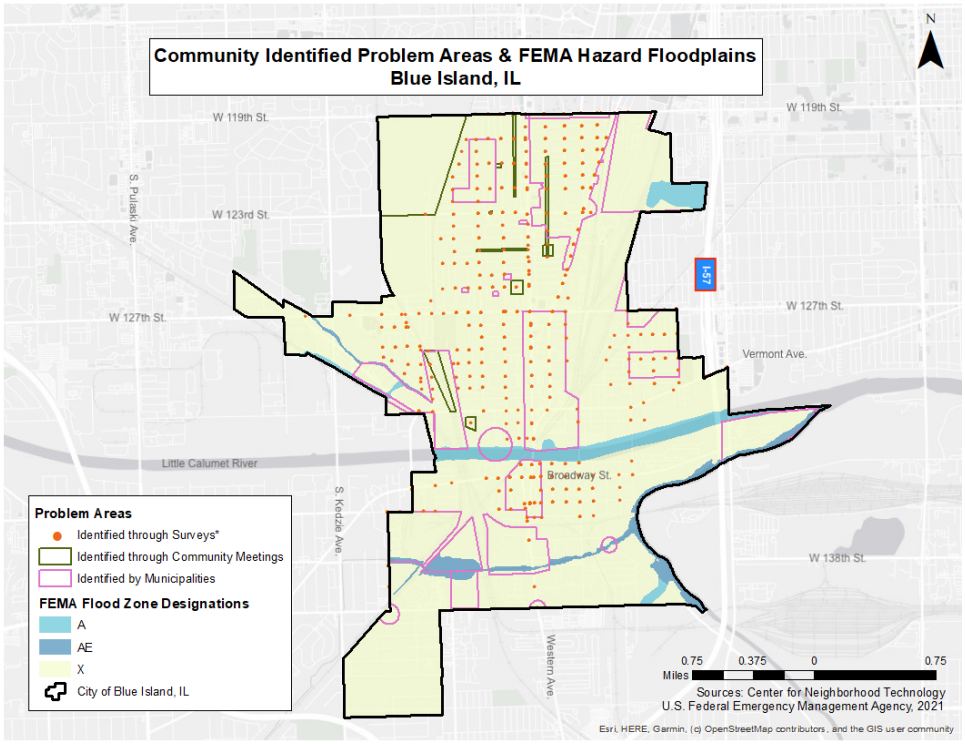
With changes in extreme temperature, energy demand will shift to ensure that people live in comfortable temperatures. This likely means higher energy bills and the need for communities to more frequently host open heating or cooling centers.

> *Looking to 2050, Cook County will see between an estimated 9% to 14% reduction of heating degree days compared to 2020, meaning that energy usage (and bills) to heat homes during colder months will decrease.*
>
> *On the other hand, Cook County will see between an estimated 25% to 31% increase in cooling degree days compared to 2020. This means that energy usage (and bills) to cool homes during warmer months could increase by almost a third.*

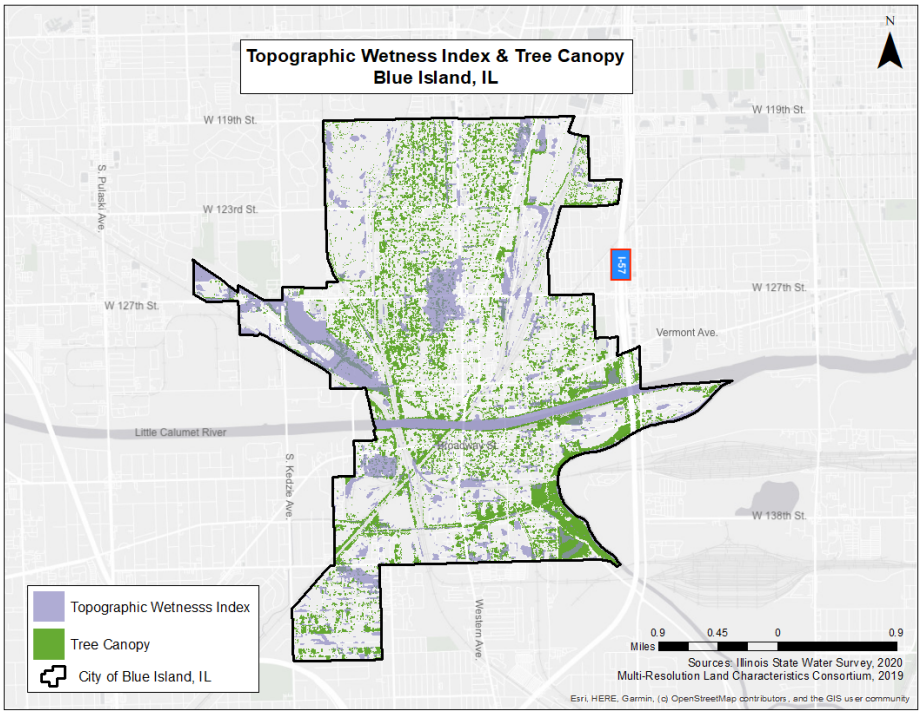
Step 6: Pre- Existing Conditions Local to the Community (Environment)

The following section looks at current conditions in your community related to environmental burdens.

Flood Conditions *(Urban Flooding Baseline)*



The map above displays community identified areas of concern and flood zone designations by the U.S. Federal Emergency Management Agency (FEMA). Areas of concern were determined by municipalities, through community meetings, and surveys (survey results were located at the closest intersection to the area of concern to maintain residents' privacy). There is substantial overlap in areas identified as problematic to flooding by the residents and the municipality. These areas are in the center of Blue Island, especially along and adjacent to Western Ave. FEMA flood zone designation A is the highest flood risk, AE moderate risk, and X low risk. Most of Blue Island is considered low flood risk by FEMA, the highest risk areas are along the Little Calumet River. Notably, there is little overlap between FEMA and community identified risk areas.



The map above displays the Topographic Wetness Index (TWI) and tree canopy. The TWI (in purple) shows where water would pool in depressed areas when the sewer system is full. Tree canopy (areas with trees) is green. Western Blue Island is susceptible to flooding, especially along the area surrounding Stony Creek where tree canopy is sparse. Other areas that are susceptible to flooding are near the intersection of Western Ave. and W 127th St., along the Little Calumet River, and in the northeast near the train tracks with sparse tree canopy.

Flood insurance claims data:

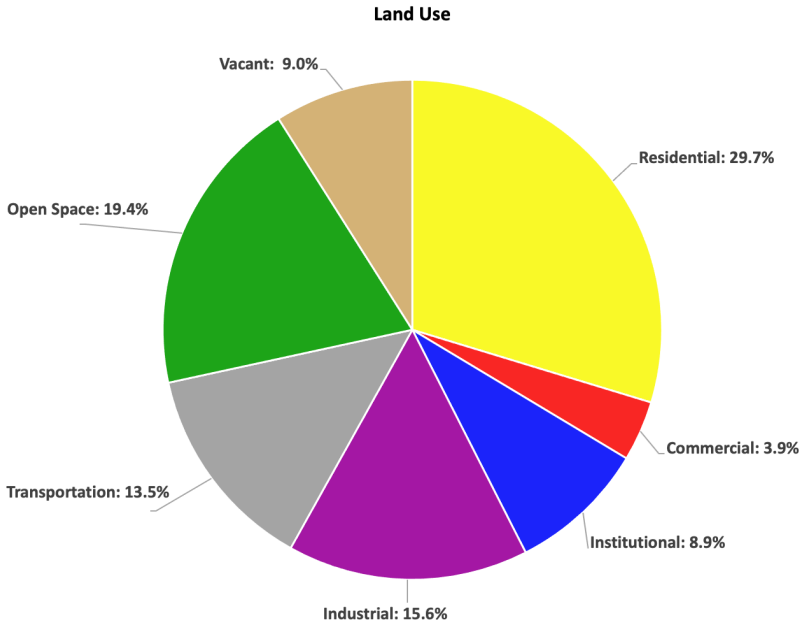
- FEMA National Flood Insurance Program (NFIP) (2010-2020): **0**
- Select Private Insurance (2007-2011): **25**
- Small Business Administration Disaster Relief (2010-2020): **445**

At the federal level, flood insurance is available through the Federal Emergency Management Agency's (FEMA) National Flood Insurance Program (NFIP). Homes in the federally drawn floodplain are required to purchase NFIP flood insurance. In the case of severe storm events, the federal government can make a disaster declaration for a state or region, which makes a separate pot of funds, called Disaster Relief funds, available to impacted homeowners and renters through FEMA. Homeowners and renters do not need to carry insurance to make a claim and receive Disaster Relief funds. Private insurance companies also offer flood insurance coverage, generally as a rider on a home or rental policy. Flood insurance claims are made only after a flooding incident occurs and only if the homeowner or renter has a current flood insurance policy or there is an applicable disaster declaration. If a home floods and is not covered by any form of insurance and there is no applicable declared disaster, their incident is not reflected in the claim count.

Percent of Impervious Area: 41.5%

Impervious areas consist of solid, human-made surfaces like streets, railroads, parking lots, and buildings that prevent rain from soaking into the soil. More impermeable surfaces result in more rain entering the sewer system and pooling on sidewalks, parking lots, and yards, which can lead to more flooding.

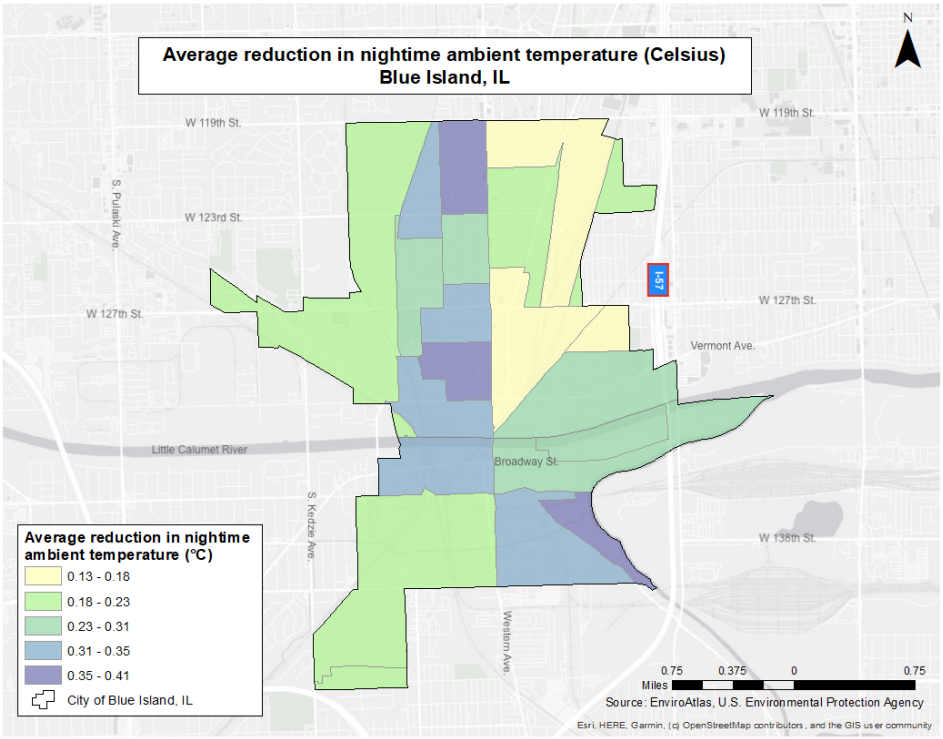
Land Use Pie Chart



Blue Island has a notably high proportion of industrial land use, making up about 16% of the city's total land area. This is more than twice that for Cook County (6%) and the Calumet Region (7%). It's important to consider land use because that can impact what kind of interventions are possible in the space.

Urban Heat Island Effect (*EnviroAtlas*)

Urban heat island effect is when different areas of a community feel hot temperatures much more intensely than other areas in the community, though the weather is the same. This can occur because of the built environment (the roads, buildings, bridges, parking lots, etc) which is made from materials like concrete and asphalt which absorb the heat. It absorbs the heat and keeps it in the area for a longer time, so it takes longer to cool down at night and can make it feel more uncomfortable for people. Areas with more plants and trees typically experience less urban heat island effect because of the shade they provide, the process of transpiration - when leaves release water vapor which cools the air down, and the reflection of sunlight by the leaves.



In the above map, darker colors represent greater reductions in nighttime ambient temperature, lighter colors represent smaller reductions in nighttime ambient temperature. Smaller reductions in nighttime temperature may reflect urban heat island effects, where buildings and impermeable surfaces retain heat absorbed during the daytime and result in warmer nighttime temperatures. This means it'll feel hotter in these areas, thus likely increasing discomfort in homes and increasing air conditioning usage and therefore costs. The lowest decreases in nighttime temperatures exist in the northwest and northeast of the city, where train tracks run. The greatest decreases in nighttime temperatures are in the center of the city and along the Little Calumet River.

Energy Burden *(LEAD)*

Energy burden is defined as the percent of average annual household income spent on average annual housing energy costs. A household is considered overburdened if energy costs make up more than 6% of their annual income before taxes.[1] In Blue Island, the average annual housing energy costs is **$1,881** and the energy burden is **3%.** Though this percentage is less than the 6% threshold, this does not mean that some households are not experiencing burden from energy costs, because costs need to be considered within the specific context of the household's income and spending needs.

Air Quality *(Urban Flooding Baseline)*

- Numeric values for Number of Days where PM 2.5 is above little risk –level: **185**
- Numeric values for Number of Days where Ozone is above little risk –level: **47**

Particulate matter (PM) refers to particles found in the air. PM 2.5 refers to a particle size less than 2.5 micrometers in width, which is about 30 times smaller than the width of a human hair. It's emitted from activities ranging from cooking to diesel truck driving. PM 2.5 can travel deep into the lungs and cause serious illness over time.

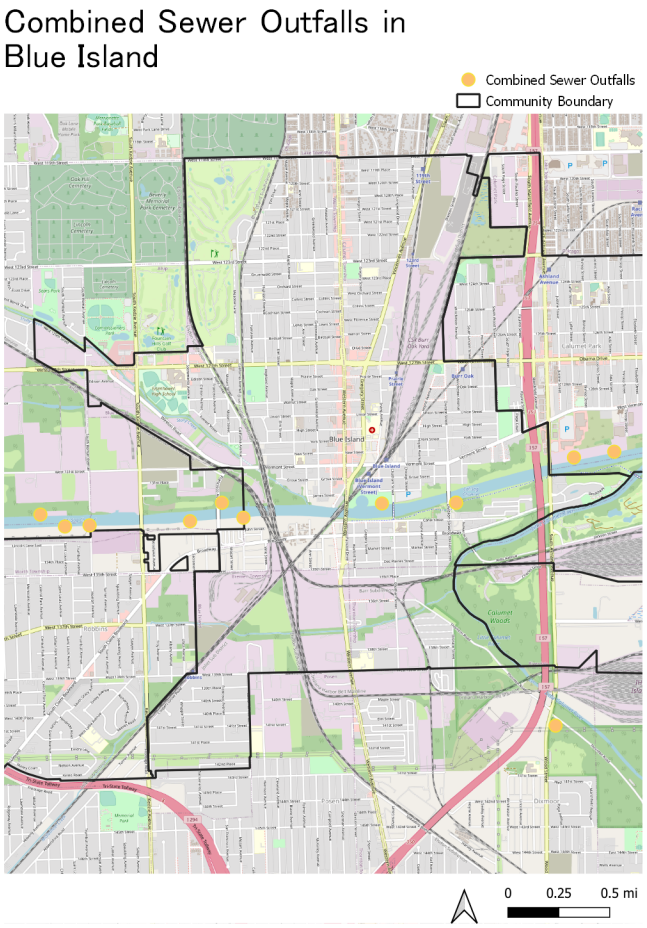
Blue Island has experienced an estimated 185 days of PM 2.5 when the pollutant is over 12 micrograms per cubic meter of air (or 12 ug/m3), the amount at which the U.S. Environmental Protection Agency (EPA) standard begins. Any amount higher is dangerous.

Ozone, a gas toxic to humans, is vital to keeping us safe from the sun's harmful rays but only when it's in the upper atmosphere. However, ozone can be found at the ground-level as a byproduct of industrial activity, traffic pollution, and other sources that people can inhale. Exposure to ozone at ground level can make it more difficult for people to breathe because it damages the lungs and airways in the body.

Blue Island has experienced an estimated 47 days of when ozone levels are over 50 parts per billion (or 50 ppb). This means 50 units of ozone within 1 billion units of air. The U.S. National Ambient Air Quality Standards (NAAQS) determined that ground-level ozone should be 70 ppb or less because more than that can harm healthy adults. 50 ppb of ozone may harm vulnerable populations like asthmatic children.

1 https://www.elevatenp.org/wp-content/uploads/Energy-Burden-in-IL.pdf

Water Pollution *(MWRD, EJ Screen)*



Above is a map of all the combined sewer outfalls the Metropolitan Water Reclamation District has identified near Blue Island. Combined sewer outfalls are utilized when sewer systems are at capacity and so rainwater is discharged (emptied) directly into a water body to reduce flooding. These discharges can have bacteria or other microbes that can lead to illness, so it is important to be careful around these water bodies.

Wastewater discharge National Percentile: 99%

This number indicates that Blue Island is in the 99th percentile for wastewater discharge, meaning that only 1% of communities nationally have a greater risk of exposure to pollution in downstream water bodies from facilities that are required to report to the EPA.

Step 7: Community Conditions (non-Environment)

The following section shares demographic data as well as data on additional characteristics that could potentially impact strategy implementation.

Demographic Data *(Urban Flooding Baseline and EJScreen 2.2 for limited English-speaking households)*

- People of Color: 79%

People of color are marginalized because of systemic racism. Due to historical and current policies, these populations tend to have less access to opportunities, resources, or social safety nets compared to their white counterparts.

- Low Income Households: 46%

This is defined as below 200% of the federal poverty level. Low-income households are vulnerable to flooding because they have less money to commit to a federal or private flood insurance policy, many of which are add-ons to existing insurance policies. Additionally, the cost to recover from a flood event can be quite high. For low-income households, paying for repairs or to replace damaged property may cause financial strain, making it harder for the homeowner to recover.

- Limited English-Speaking Households: 5%

While the United States has no official language, English is predominantly written and spoken. Municipalities may not have considered translating flooding emergency or aid resources into other languages, providing less information to some households. Additionally, guidance and resources on filing flood insurance claims may not be readily available in languages other than English, Spanish, and other more frequently spoken languages, leaving some households without sufficient guidance. Filing insurance claims in non-English languages is not the default option. Though other languages, like Spanish, are sometimes provided, not all languages are and navigating the process to file insurance claims is not simple or clear.

- Population with a disability: 10.4%

The U.S. Census Bureau asks individuals to self-report data about 6 disability types: difficulty with 1) hearing, 2) vision, 3) cognition, 4) walking, 5) self-care, and 6) independent living. Depending on an individual's disability, flooding at home or in public spaces may present a particular set of challenges. The individual may have limited access to travel options during a flood event, be isolated and stranded when they need help, or have additional financial burdens to consider, among other challenges.

- Population under 18: 22.8%
- Population over 65: 11.1%

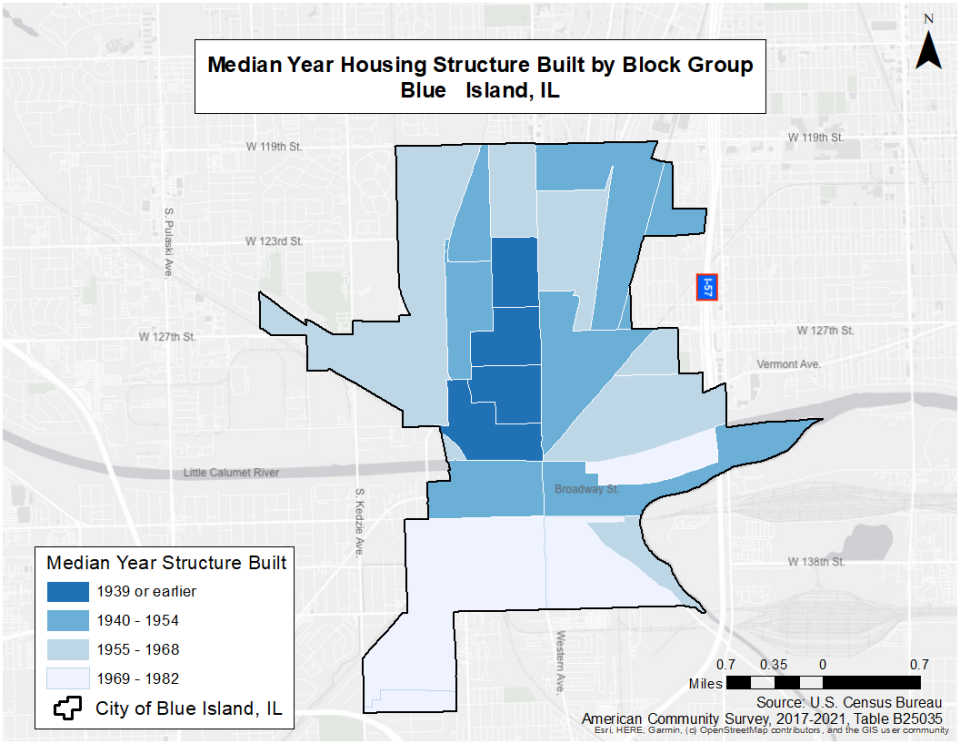
People who are young and elderly are at higher risk for negative outcomes of flooding due to their age, especially with regards to the quality of their health. There may be different resources necessary to better support these age groups.

Tax Base *(CMAP community profile)*

- Total Retail Sales: $183,986,375
- Equalized Assessed Value: $248,493,494

Knowing the amount of tax base a community has is important because it informs how government leaders think about the budget to fund different programs. Total retail sales contribute to the tax base through sales tax. For Cook County suburbs (excluding the City of Chicago), 50% of suburbs have total retail sales of more than $262,161,678. Blue Island's total retail sales are less than that. Depending on the sales tax rates of the municipalities, it may mean that Blue Island has fewer dollars from sales tax coming in than half of Chicago suburbs in Cook County. Equalized assessed value is the dollar figure used to determine the collectible property tax in a municipality which funds many programs and services in a municipality, including its schools. For Cook County suburbs (excluding the City of Chicago), 50% of suburbs have an equalized assessed value of more than $404,081,517. Blue Island's equalized assessed value is less than the median, meaning that Blue Island has less property tax coming in than half of Chicago suburbs in Cook County. With less money coming in, the municipality will need to depend on grant funding and financing from external sources to implement stormwater management.

Housing Data *(American Community Survey, Housing & Transportation Index)*



This map shows the median year in which housing structures were built for each block group in Blue Island. The census block groups with the oldest housing in Blue Island are in the center of the community adjacent to Western Ave. The census block groups with the newest housing are on the southern edge of the community.

Renters and Owners
Renters make up 49.7% of the community, whereas owners make up 50.3% of the community. It is important to consider homeowner and renter populations when developing programming to ensure that many people can access the program.

Housing cost as a percent of Income: 19%
Housing costs impact how much additional money households may have to respond to flooding disasters.

Number of Units in Residential Structure:

- 1 (single family homes): 51%
- 2-4 unit buildings: 18%
- 5-9 unit buildings: 16%
- 10+ unit buildings: 10%

The above data breaks down the type of housing available in the community. Knowing the type of residential structures can inform what type or which programs certain structures may benefit from and it can identify structures that will require programs for renters and owners versus just owners or just renters.

Mobility Data (*Urban Flooding Baseline, Housing & Transportation Index*)

Percent of Households with Lack of car access: 0%
Where public transportation access is limited, lack of car access is a particular concern. Car access in these places is an important measure of mobility to access jobs, amenities, resources during crises, evacuation routes (when the need arises) and more.

Autos per household: 1.70
The number of auto vehicles per household is another measure of mobility. In households where multiple people work, having more than 1 vehicle might be necessary, especially where public transportation access is limited.

Transportation is the second greatest cost for a typical household in America, therefore to understand the economic burden of living in a community, it is important to understand the average cost of various transportation costs.

Average Annual Transit cost: $139
The value above considers a household's average transit use and the average cost of public transit. It is useful to compare this value to average annual auto ownership to understand the difference in affordability. This value must also be understood within the context of available public transit options.

Average Annual Auto ownership cost: $10,673
While lack of car access may not be a significant issue in Blue Island, car ownership comes at a significant cost, making up a considerable share of overall income.

Transit Connectivity Index (0-100): 46
This number is a measure of bus routes and train stations nearby while considering how frequently they come. The higher the number, the more locations and higher frequency. The lower the number the fewer the locations and less frequency.

Park Data *(CMAP)*

Accessible Park Acreage per 1,000 residents: 1.76
Blue Island has about 1.76 acres of accessible parks per 1,000 residents compared to 3.57 acres per 1,000 residents for Cook County overall. This indicates that Blue Island residents have about 2x less accessible parks than Cook County residents overall. Park access is known to increase mental health and can be a place to implement climate change mitigation measures.

Health Data *(Urban Flooding Baseline, CDC Places)*

- Percent lack of health insurance: 13%
- Asthma prevalence as rate: 10.3%
- Heart disease as rate: 5.2%
- Poor mental health: 14.0%
- Poor physical health: 10.6%

Understanding health conditions in a community is important to understand the vulnerabilities residents have to negative outcomes of climate change issues, like flooding. With underlying health issues, flooding worsens their quality of life, adding to the burdens of their day to day life. Additionally, knowing the percentage of folks that do not have health insurance can inform investments that need to go into free, accessible health clinics and health interventions.