# Growing Shade

## Tree planting, canopy enhancement, and preservation tool

Committee of the Whole

February 2, 2022

# Today’s discussion

- Growing Shade Project purpose and regional policy
- Trees intersect with regional issues
- Addressing stakeholder needs
- Mapping tool demonstration
- Outreach and training efforts

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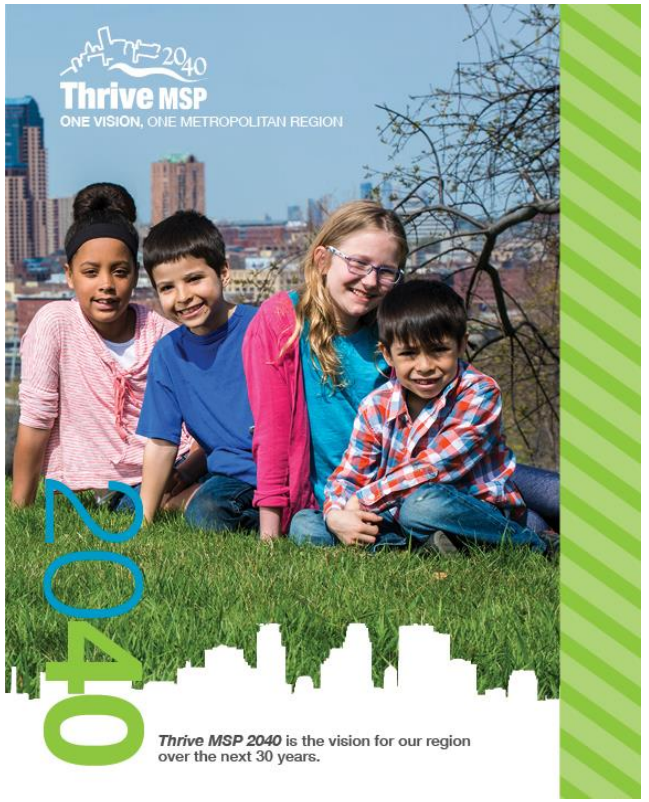
# Growing Shade Project purpose and regional policy

# Integrates with Council policies and initiatives

Stewardship Prosperity Equity Livability Sustainability




## Sustainability

- Protecting our regional vitality for generations to come
  - Lead by example
  - Partner with customers and stakeholders

## Equity

- Recognizing institutional and systemic barriers and creating access and opportunities that benefit all.
  - Environmental justice

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# Purpose

## Growing Shade

Is an interactive resource to inform tree canopy planting, enhancement, and preservation for the Twin Cities region.

The tool explores the intersection of tree canopy planning with conservation, climate resilience, environmental justice and public health outcomes.

- **Why?** – Demonstrated need from stakeholders for a tool to assist planning, given limited resources and capacity
- **What is included? –** Stories and an interactive, customizable tool providing dynamic data
- **Who is involved?** – Metropolitan Council, Tree Trust, and Nature Conservancy
- **What comes next? –** Training and outreach

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# Trees intersect with regional issues

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## Environmental justice

- The need for greening intersects with income, race, and ethnicity.

## Climate change

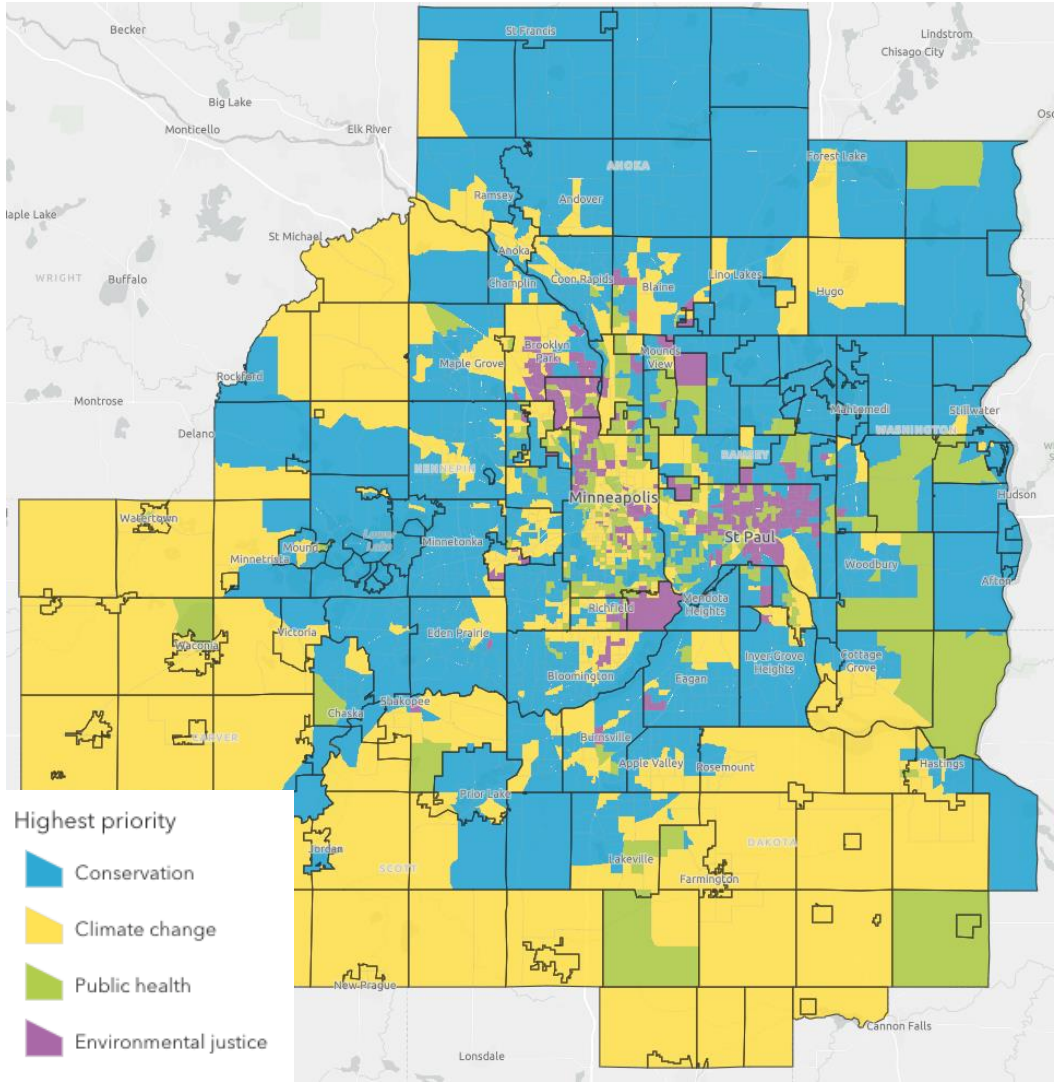
- Trees can mitigate some consequences of climate change by cooling land surface temperatures and reducing flooding.

## Conservation of natural resources

- Reducing tree canopy loss will be critical to offset carbon emissions and conserve biodiversity across the region.

## Public health

- Trees improve air quality and cool land temperatures leading to better health outcomes.



# Racist policies and history influence today's environmental conditions

## Systematic seizure of Indigenous land

- Dakota and Ojibwe people were coerced into signing land cession treaties beginning in 1805.

## Intentional exclusion of Black families

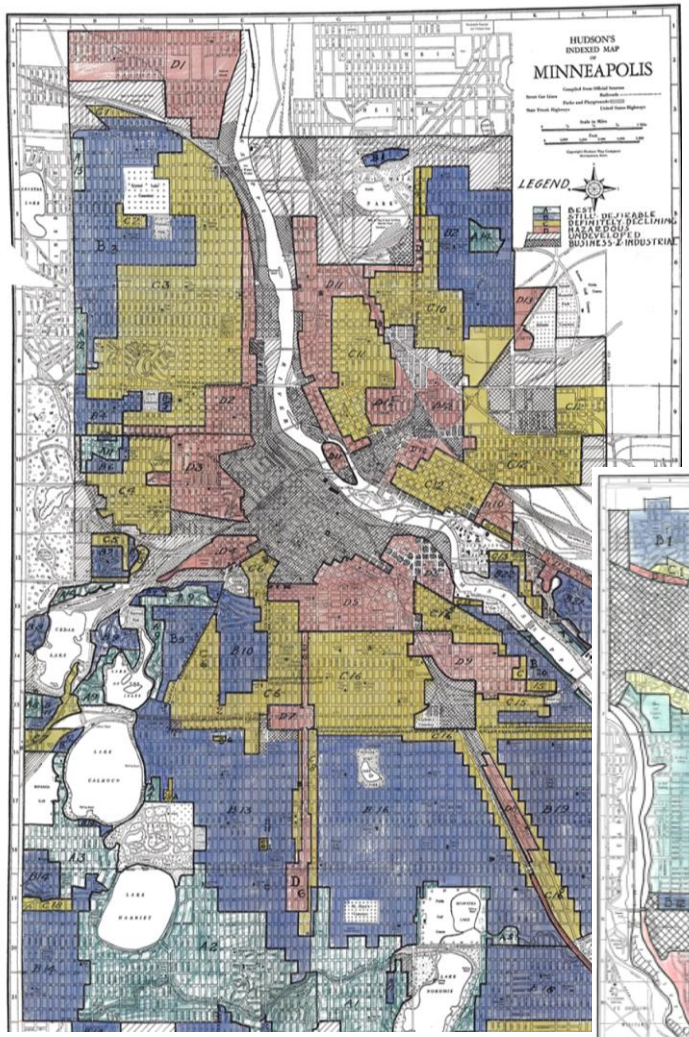
- Home Owners Loan Corporation "redlines" areas in 1934. Racial covenants continue in Hennepin County until 1955.

## Infrastructure prioritized over minority communities

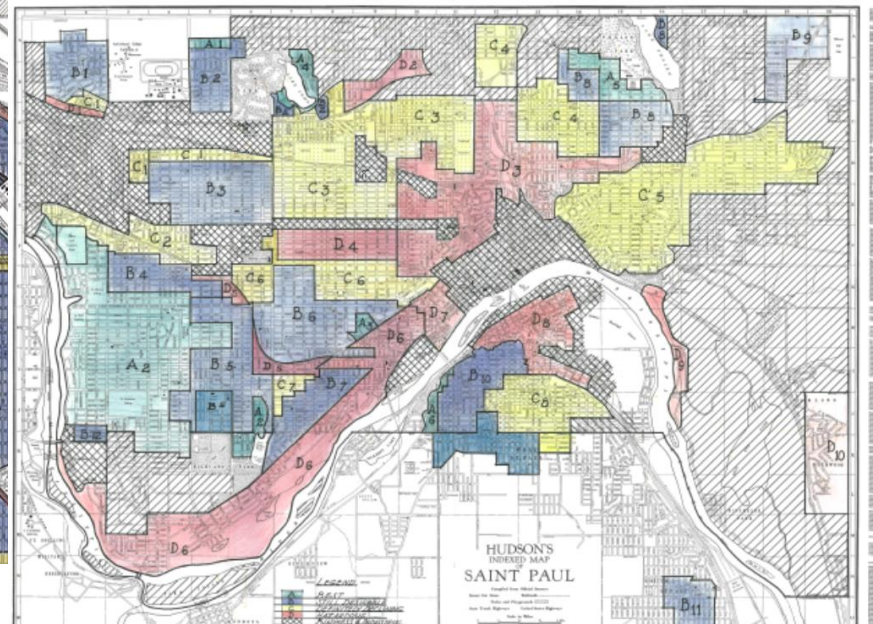
- Federal Aid Highway Act in 1956 followed by the completion of Interstate 35W (1967) and Interstate 94 (1968) displace Black residents and businesses.

## Consequences of racist policies persist

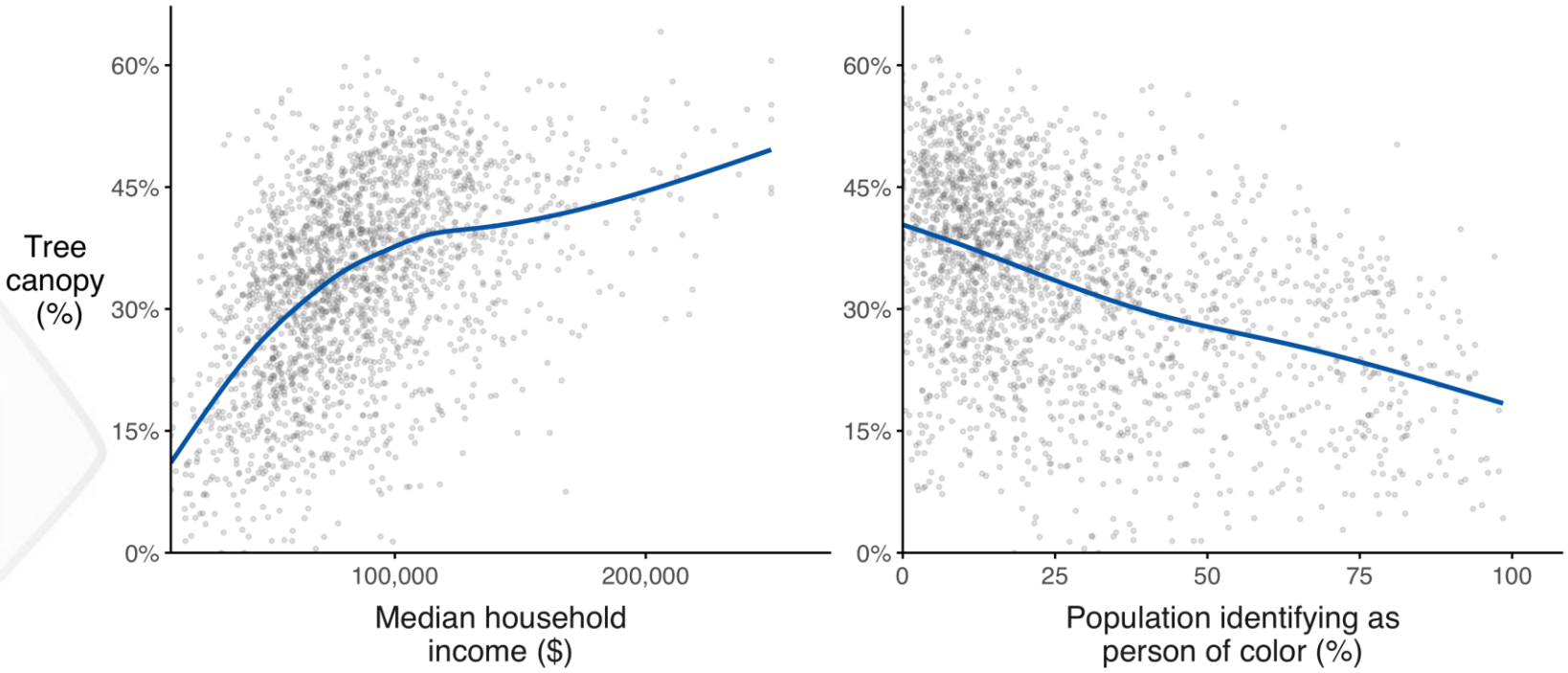
- Growing Shade's environmental justice lens identifies areas and people facing disproportionately negative consequences of land use decisions.





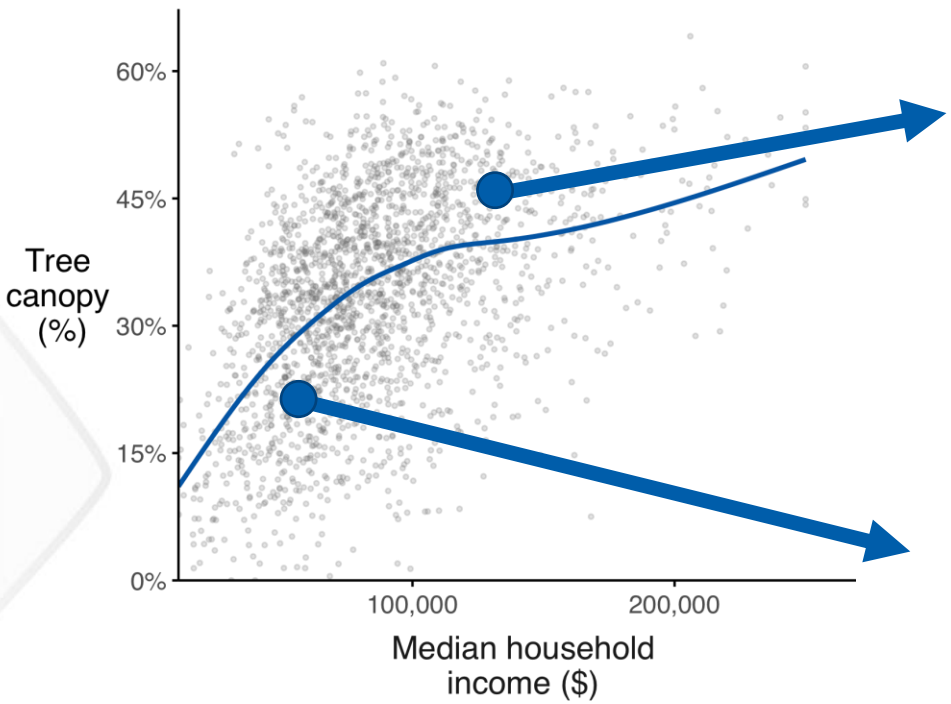


# Race and income disparities with tree canopy cover




Source: Analysis of Sentinel-2 satellite imagery (2021) and ACS 5-year estimates (2015-2019)

# Race and income disparities with tree canopy cover




<u>Saint Paul's Summit Hill</u>
42% tree canopy
$118,625 median income
9% residents of color
13.2 people per acre

<u>Minneapolis' Camden</u>
16% tree canopy
$46,528 median income
59% residents of color
13.3 people per acre

# Tree inequity creates hotter neighborhoods

## Extreme Heat Tool shows differences of up to 40°F across the region

- Shading from trees and evaporative cooling from all vegetation reduce land temperatures.
- Impervious surfaces and heat generated from human activities (vehicles, air-conditioning units) create urban heat islands and intensify temperature differences.

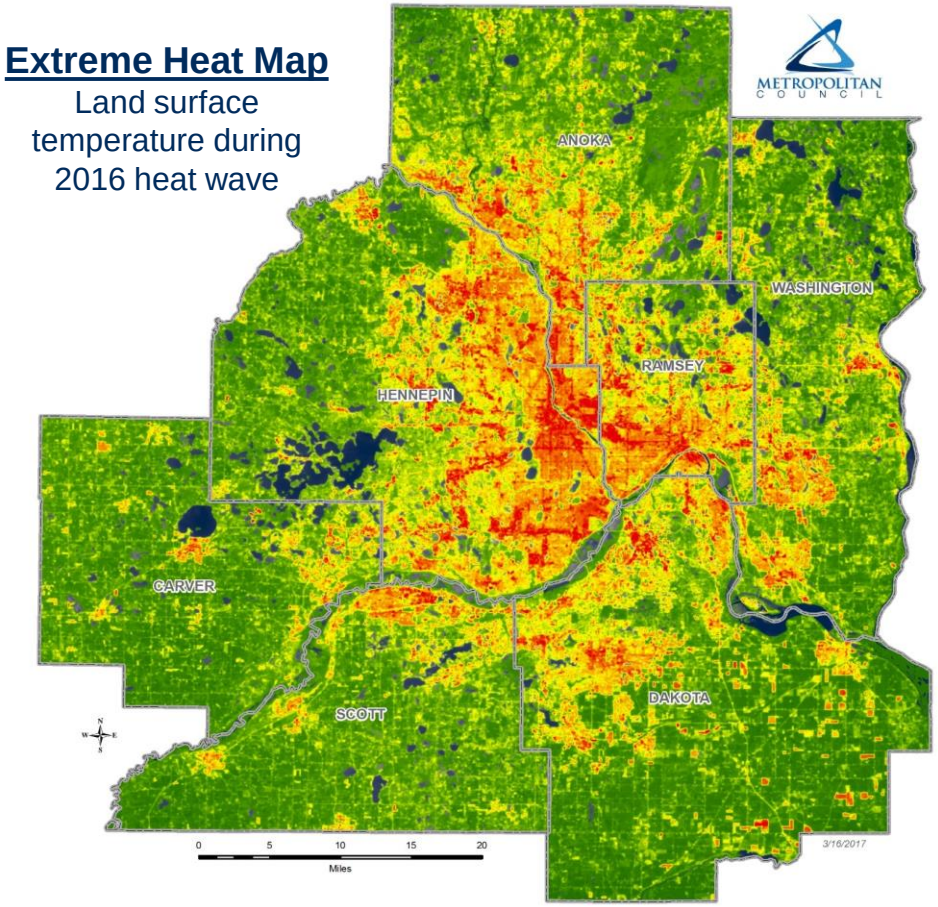
## Extreme heat is deadly

- Adding trees can reduce heat related deaths.
- Growing Shade's public health lens identifies areas whe trees could most improve health outcomes.

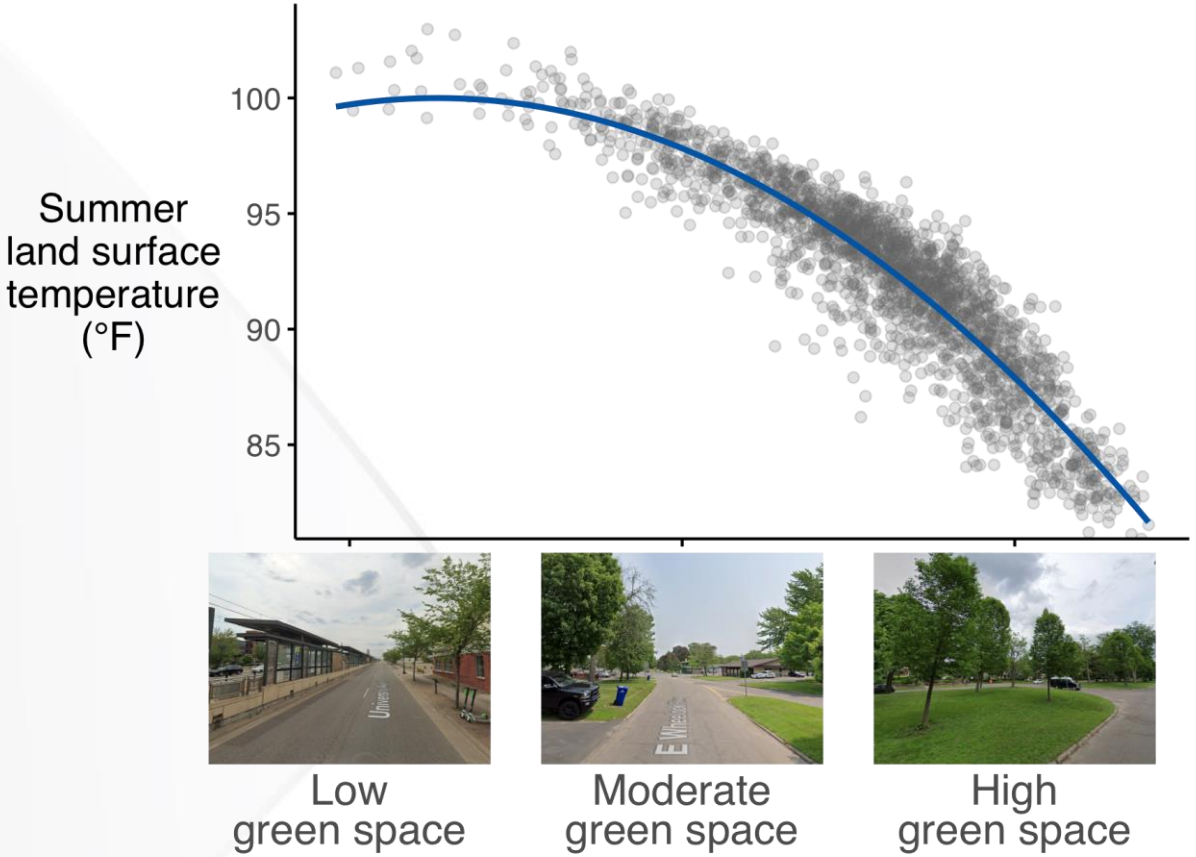
## Climate change underscores urgency

- An additional 40 days above 90°F are projected by 205
- Growing Shade's climate change lens identifies areas most at risk from climate change hazards.

**Extreme Heat Map**
Land surface temperature during 2016 heat wave

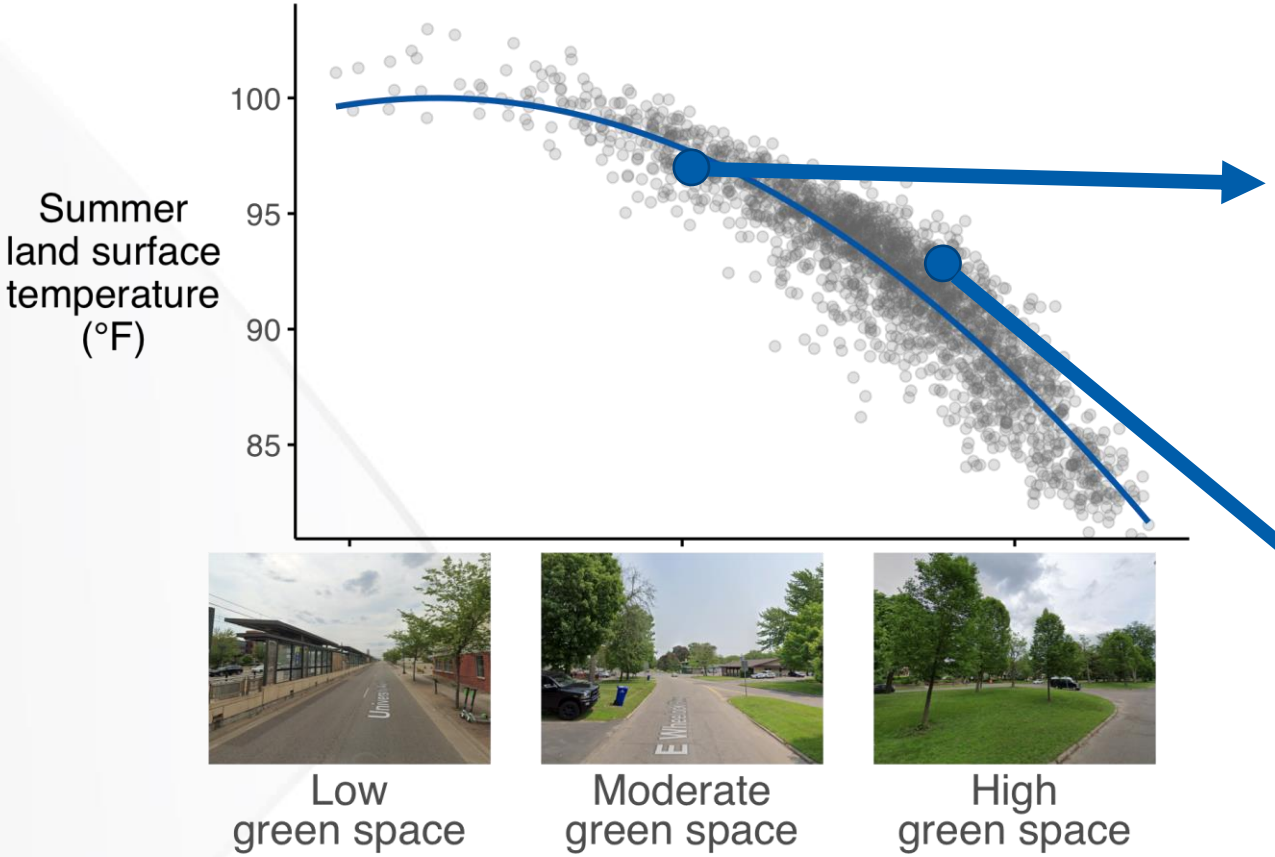


# Tree inequity creates hotter neighborhoods




Source: Analysis of Sentinel-2 satellite imagery (2021) and Landsat 8 satellite imagery (2016)

# Tree inequity creates hotter neighborhoods

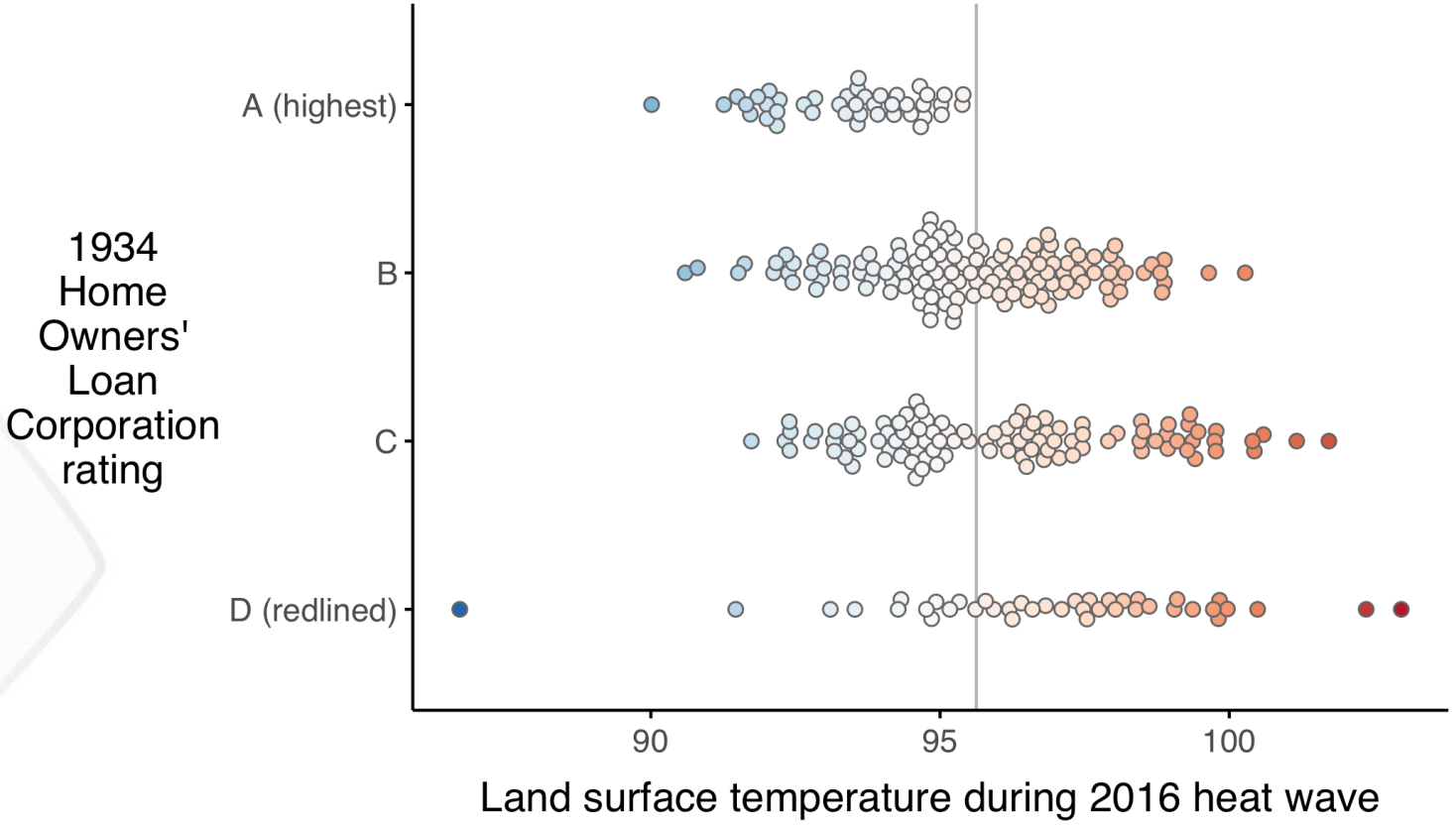



Source: Analysis of Sentinel-2 satellite imagery (2021) and Landsat 8 satellite imagery (2016)

<u>Minneapolis' Camden</u>
16% tree canopy
$46,528 median income
59% residents of color
13.3 people per acre
97 °F

<u>Saint Paul's Summit Hill</u>
42% tree canopy
$118,625 median income
9% residents of color
13.2 people per acre
94 °F

# Tree inequity creates hotter neighborhoods




Source: Analysis of Landsat 8 satellite imagery (2016) and Equity Considerations dataset (2021)

# Growing shade means more than planting new trees

## Mature trees offer the largest benefits

- Larger canopies provide more shade.
- Mature forests store more carbon, are more biodiverse, and better improve water and air quality.

## Increasing mortality risks

- New plantings are vulnerable to drought.
- Emerald ash borer has resulted in removal of thousands of ash trees. Climate change can facilitate the spread of pests.
- Development can impact forest and tree health.

## Importance of conservation and management of existing canopy

- Growing Shade's conservation lens identifies areas identifies areas with the region's highest stock of existing trees and greenspace.

# Addressing stakeholder needs

# Stakeholder survey responses (2021)

Top 3 current considerations for tree planting and maintenance

1) Replacing removed trees
2) Planting for increased diversity
3) Addressing canopy gaps

# Stakeholder survey responses (2021)

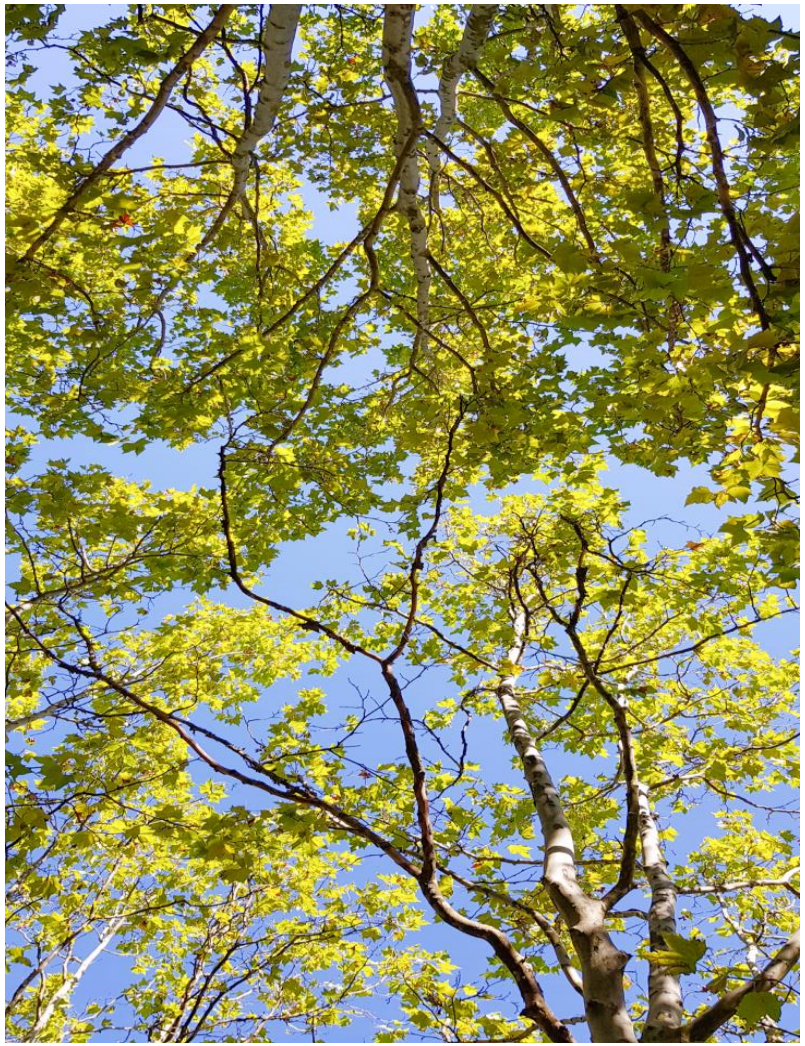
Top 3 factors practitioners **would like to start considering** in tree planting and maintenance

1) Planting in areas of vulnerable or historically underserved communities
2) Planting in appropriate land use types
3) Planting to reduce heat island effect

# Stakeholder survey responses (2021)

What would you like to see in the tool?

1) Interactive map with priority tree planting analysis
2) Ability to make and export maps
3) Map snapshots to illustrate connections between tree canopy, underserved communities and various impacts



# Advisory group direction for the tool

1) Incorporate neighborhood-level voices in the tool
2) Provide up-to-date data to aid in decision-making
3) Ensure ease of access and clarity
4) Provide data reports and customizable features at multiple scales
5) Ensure that audiences are varied and diverse
6) Data should be actionable

# Beta testing & user survey

1) University of St. Thomas marketing class user survey, Nov 2021
2) 44 survey respondents
3) Positive response to the tool function
4) Story content and scope supported
5) Recommended minor changes to help with access and readability
6) Changes incorporated in Dec 2021 and Jan 2022


UNIVERSITY OF St.Thomas

# Five stories highlight considerations for Growing Shade

**Frogtown Green**
Equity and environmental justice

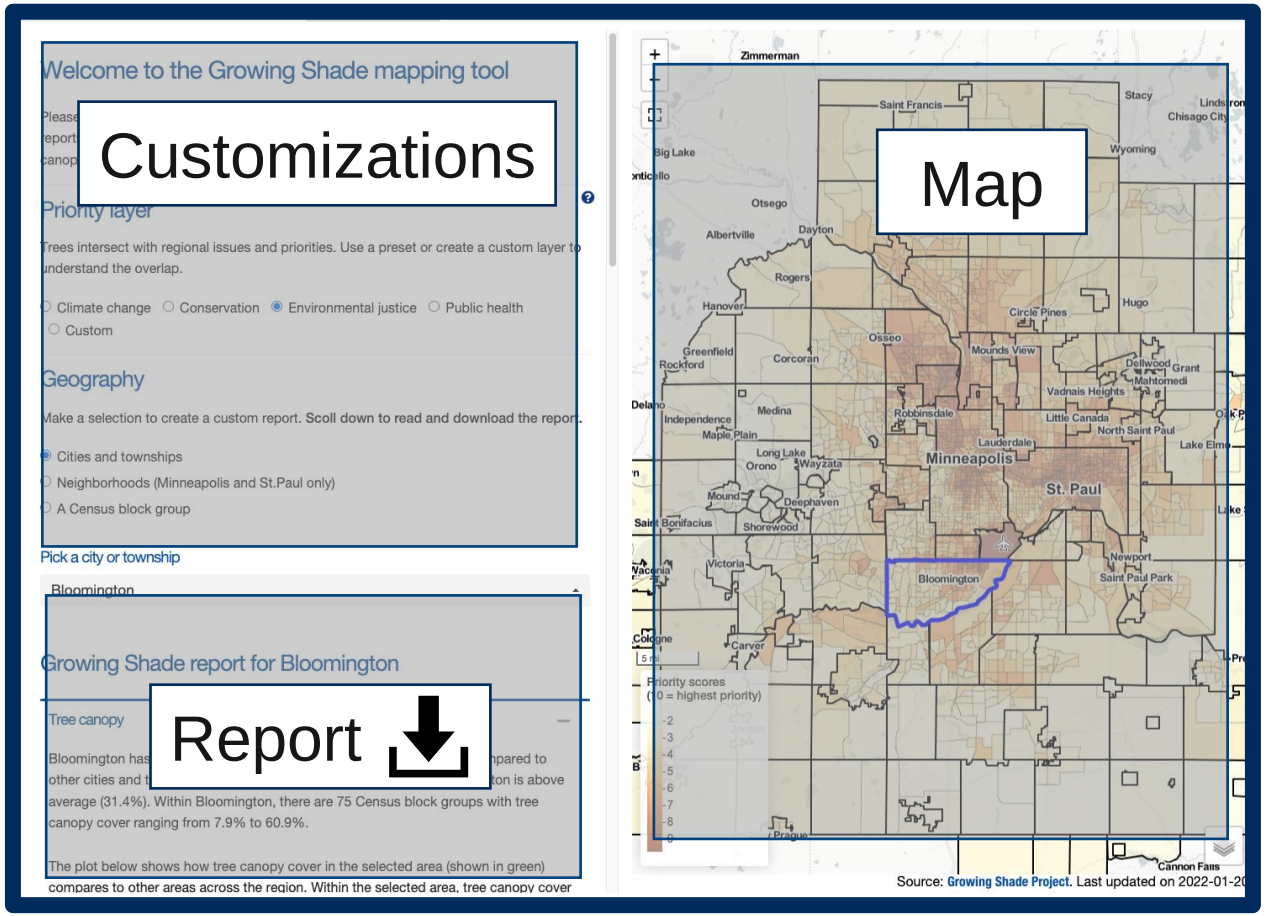
**Lower Phalen Creek Project**
Dakota (Indigenous) perspective

**Washington Conservation District**
Conservation and climate change

**Brooklyn Center Community Schools**
Education and temperature

**Tree Trust**
Tree maintenance and green infrastructure

# Mapping tool has custom prioritization and reporting



# Growing Shade fills a key gap

## Fully customizable

- Important for grant making and planning

## Leverages detailed data on race, ethnicity, economics

- Combines generalized national issues with specific regional priorities

## Highly actionable

- Reports and underlying data connect micro and macro level perspectives

## Temporally accurate

- Remote sensing, fundamental ecological principles, and machine learning were used to identify the 2021 tree canopy

# Mapping tool demonstration

https://metrotransitmn.shinyapps.io/growing-shade/

and

https://metrocouncil.org/growingshade

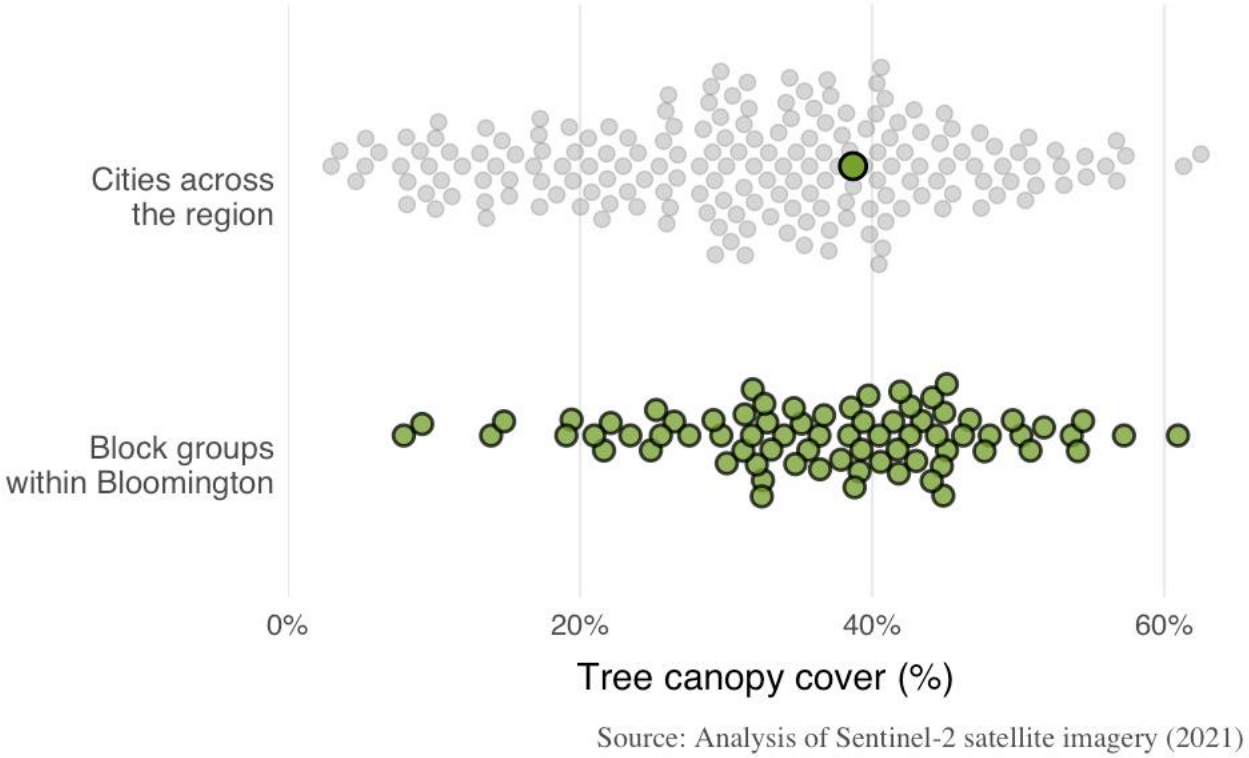
# Bloomington – state of the canopy

## Bloomington has average tree canopy cover compared to other cities

- Our methods suggest a 45% tree canopy cover goal.

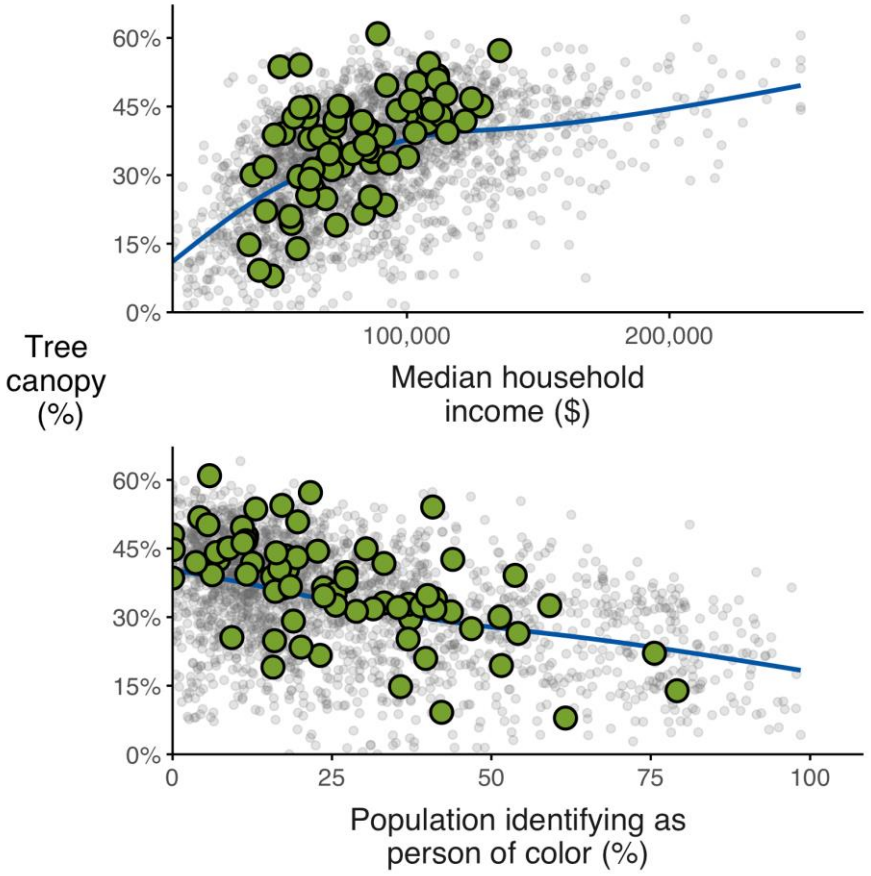
## Tree cover varies across Bloomington

- Census block groups range from 8% to 61% canopy cover.




Source: Analysis of Sentinel-2 satellite imagery (2021)

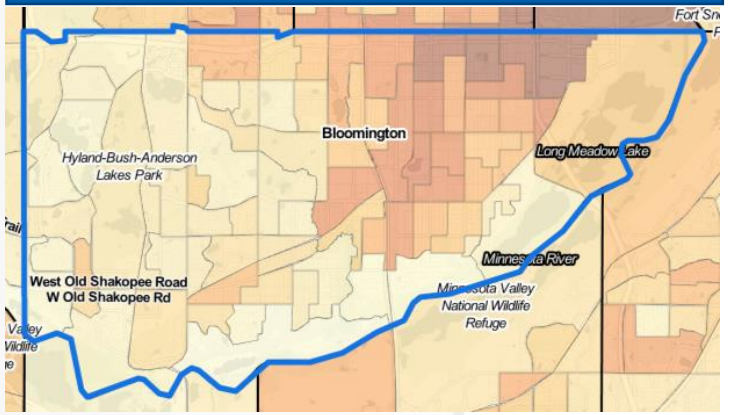
# Bloomington – focus on inequities




Source: Analysis of Sentinel-2 satellite imagery (2021) and ACS 5-year estimates (2015-2019)

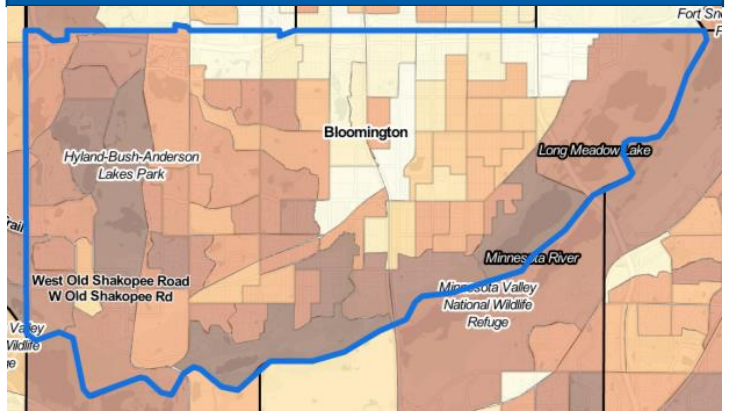
# Bloomington – explore priority layers

## Environmental justice



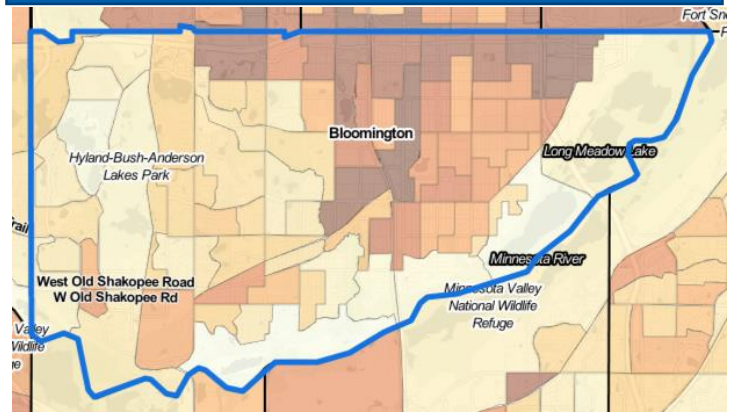

Northeast area has higher share of residents identifying as a person of color and residents have lower incomes.

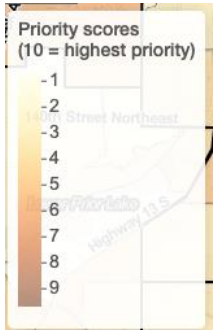
## Conservation




Hyland-Bush-Anderson Lakes Regional Park contributes substantial green space and tree canopy value to the western side.

## Climate change

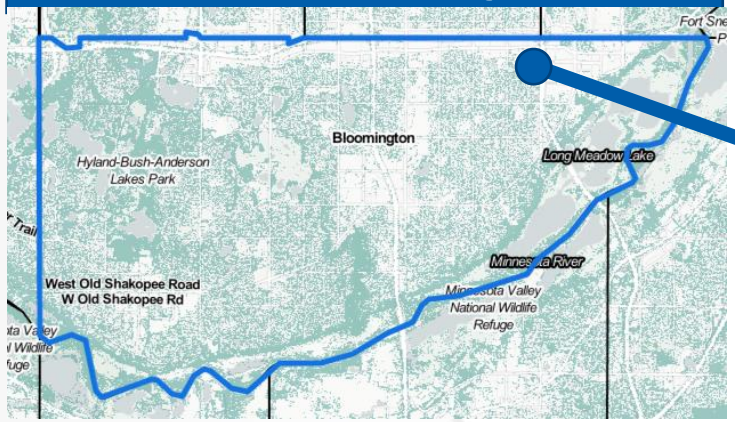



Impervious surfaces in the central region and 494 corridor have high temperatures and high flooding risk.

# Bloomington – taking action

## Environmental justice

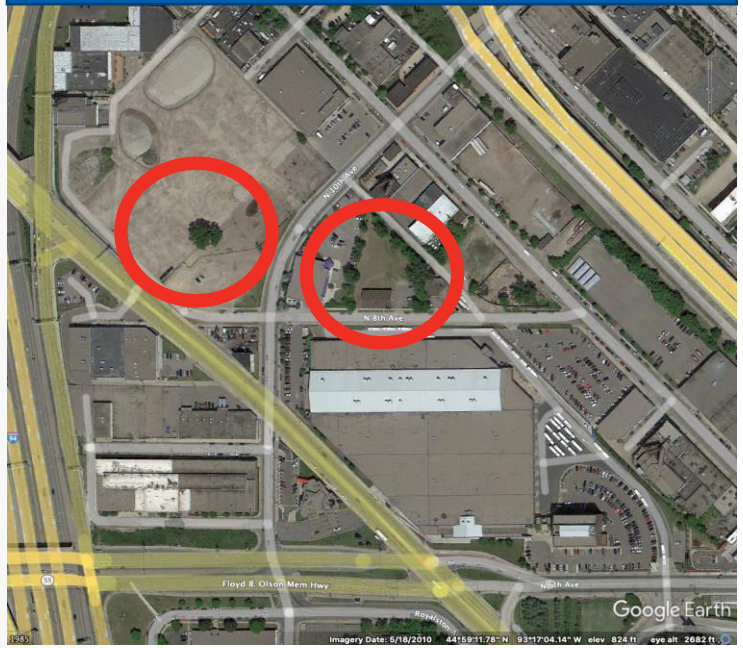



Northeast area has higher share of residents identifying as a person of color and residents have lower incomes.

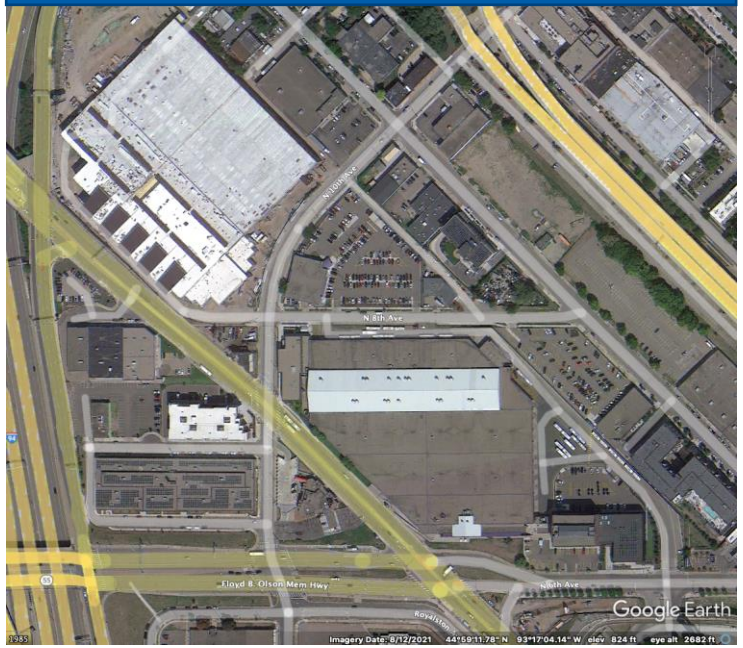
# Evaluate site-level decisions and plan

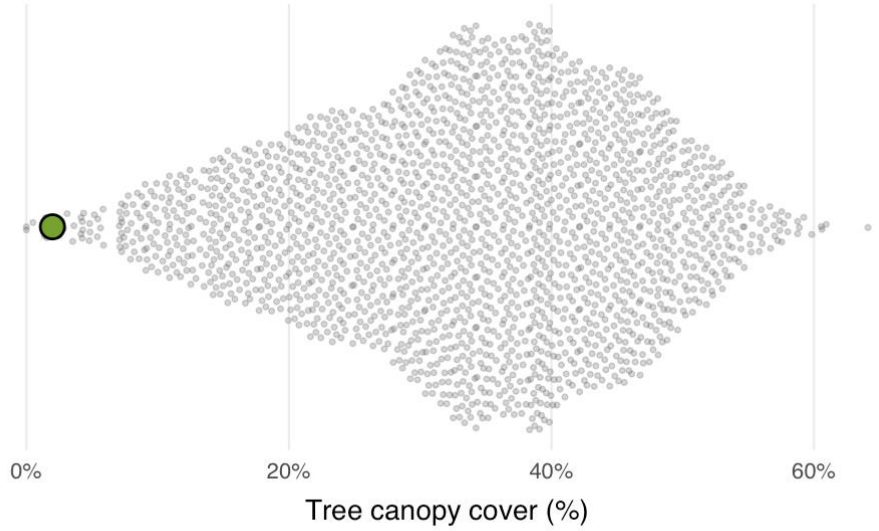
- Heywood Campus removed trees and added impervious surface
- Heywood's location has the lowest tree canopy across the region (<2%)

2010




2021




Source: Analysis of Sentinel-2 satellite imagery (2021)

# Outreach and training efforts

# Outreach & Training (Phase 1)

**Committee of the Whole Presentation**
Feb 2, 2022

**MN Shade Tree Advisory Council**
Feb 17, 2022

**PlanIt Implementation Webinar**
Feb 24, 2022

**MN Shade Tree Short Course**
March 15, 2022

# Outreach & Training (Phase 2)

**Promotional video**
March 2022

**Training video**
March 2022

**PlanIt Panel Discussion**
April 2022

**Train the trainer event(s)**
April 2022

**Media event(s)**
April 2022

https://metrotransitmn.shinyapps.io/growing-shade/

and

https://metrocouncil.org/growingshade

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