

Regional Climate Vulnerability Assessment – Project Update

Land Use Advisory Committee

March 21, 2019



Today's Discussion

Overview

Localized Flooding & Extreme Heat

Lead by Example & Provide Resources

Next Steps & Feedback from LUAC

LUAC Feedback on Outreach & Communication

- **What is the best way to communicate these resources?**
- **How can we reach a wide audience?**
- **What sort of outreach is most effective, in your opinion?**
- **Are there any other considerations we should think of?**

Regional Climate Vulnerability Assessment



Climate impacts related to:

- **Water** - Floodways and localized flooding
- **Heat** - Urban Heat Island (UHI)

Two pronged approach:

- 1) Assess our regional systems and assets
 - Strategies to address vulnerabilities
- 2) Develop suggested strategies & tools for local governments



What are We Assessing?

- Localized Flooding Analysis
 - 👍 Transportation and Transit
 - 👍 Wastewater
 - 👍 Council-owned Housing
 - 👍 Regional Parks and Trails
 - 👍 Water Supply
- Localized Flooding Tools
 - 👍 Story Map
 - 👍 Interactive Flood Map
 - 👍 Publicly Available Data
- Extreme Heat Tools
 - 👍 Story Map
 - 👍 Interactive Extreme Heat Map
 - 👍 Publicly Available Data
- Human Vulnerability



Localized Flooding





Observation of Mega Rain Events* in MN

Over half of Mega Rain Events since 1866 occurred since 2002

Challenges



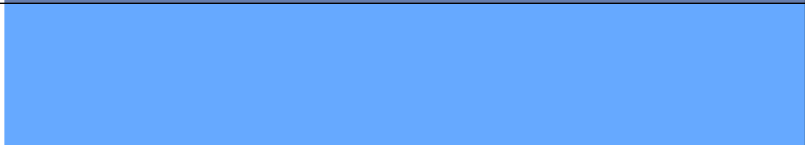
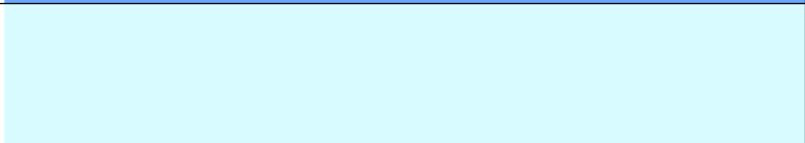
Most infrastructure planned for 5 to 10 year storm events

Under new modelling, the 100-year event has increased by 25%

*Defined as 6" or greater rains covering at least 1000 sq. mile and a peak amount of 8" or greater

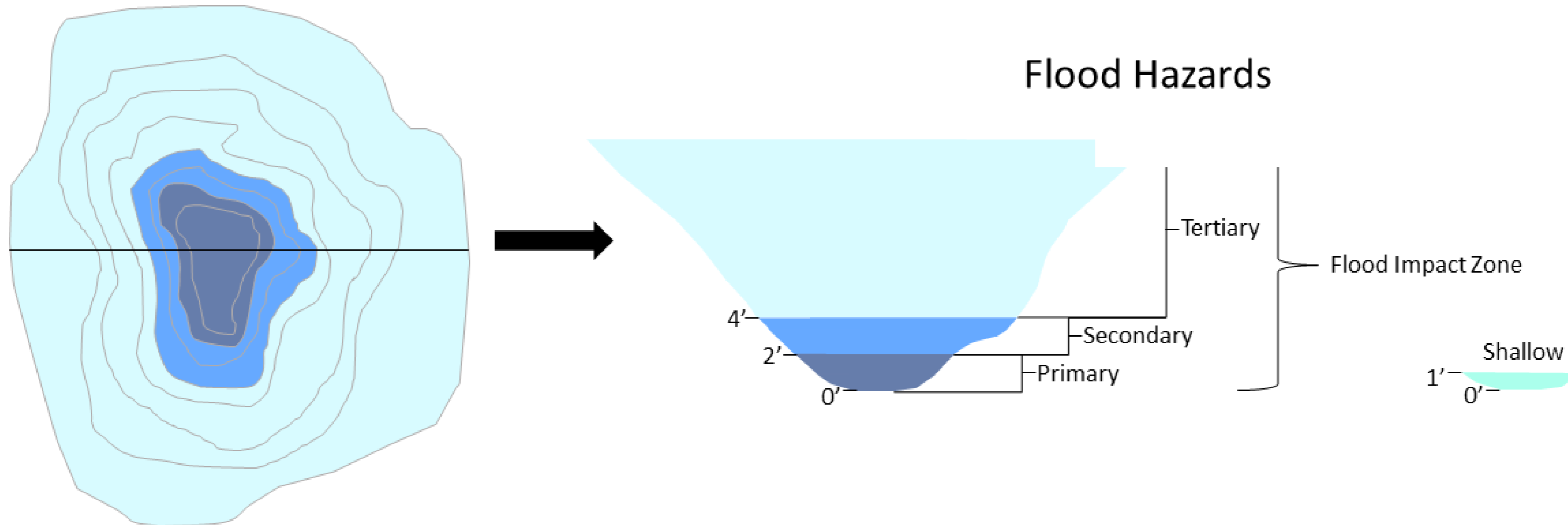


Council Bluespot Categorization

Bluespot Depth	Flood Hazard Category	Bluespot Symbology
3 in-1 foot total	Shallow	
0-2 feet	Primary	
2-4 feet	Secondary	
>4 feet	Tertiary	

Isolated 3in-1ft Bluespots

Flood Impact Zone (FIZ)



Regional Hwy Network

Overview Analysis

Potential Flood Vulnerability

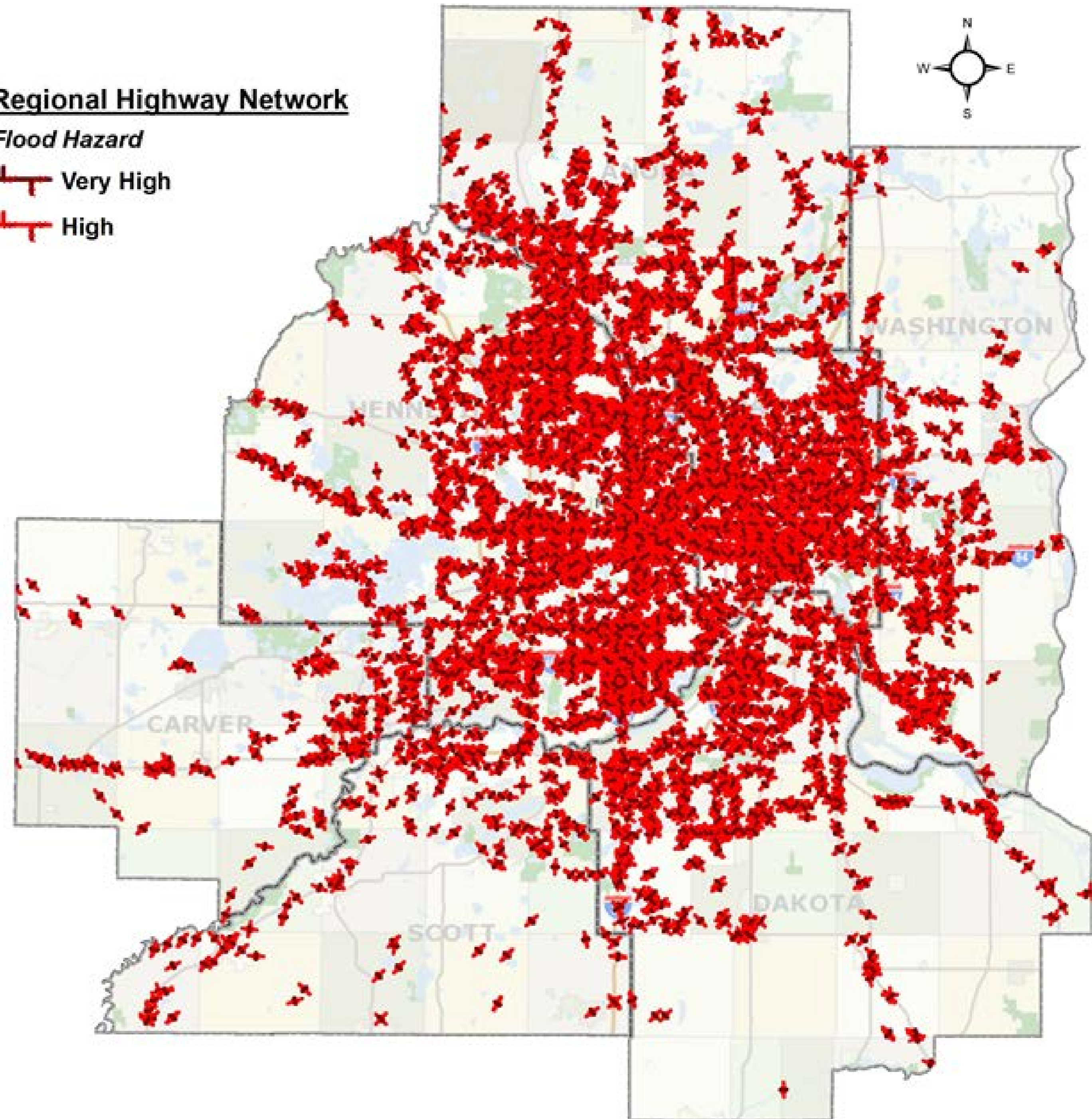
Anoka	102.01 miles
Carver	19.14 miles
Dakota	137.47 miles
Hennepin	652.78 miles
Ramsey	239.85 miles
Scott	19.24 miles
Washington	61.27 miles
7-County Total	1231.76 miles

Regional Highway Network

Flood Hazard

 Very High

 High



Localized Flooding – Acute and Chronic Stress

Flash flood traps cars under Roseville underpass [PHOTO]

Tuesday, July 5, 2016 by Mike Mullen in News



Local Roads

South Lyndale & 27th Street

March 11, 2019

MPRnews

Sections ▾

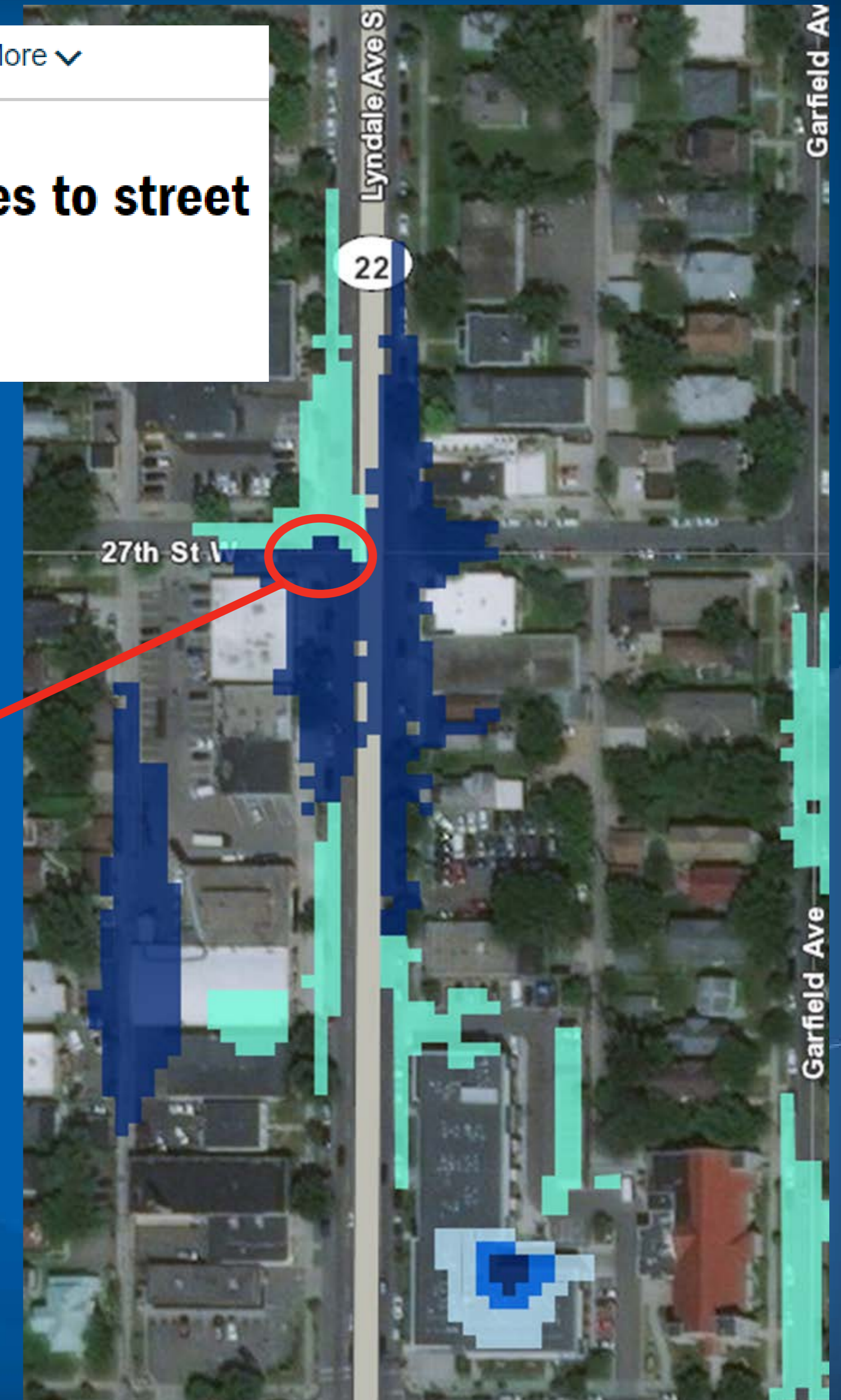
Members ▾

More ▾

A quick transition from snow piles to street flooding to potholes

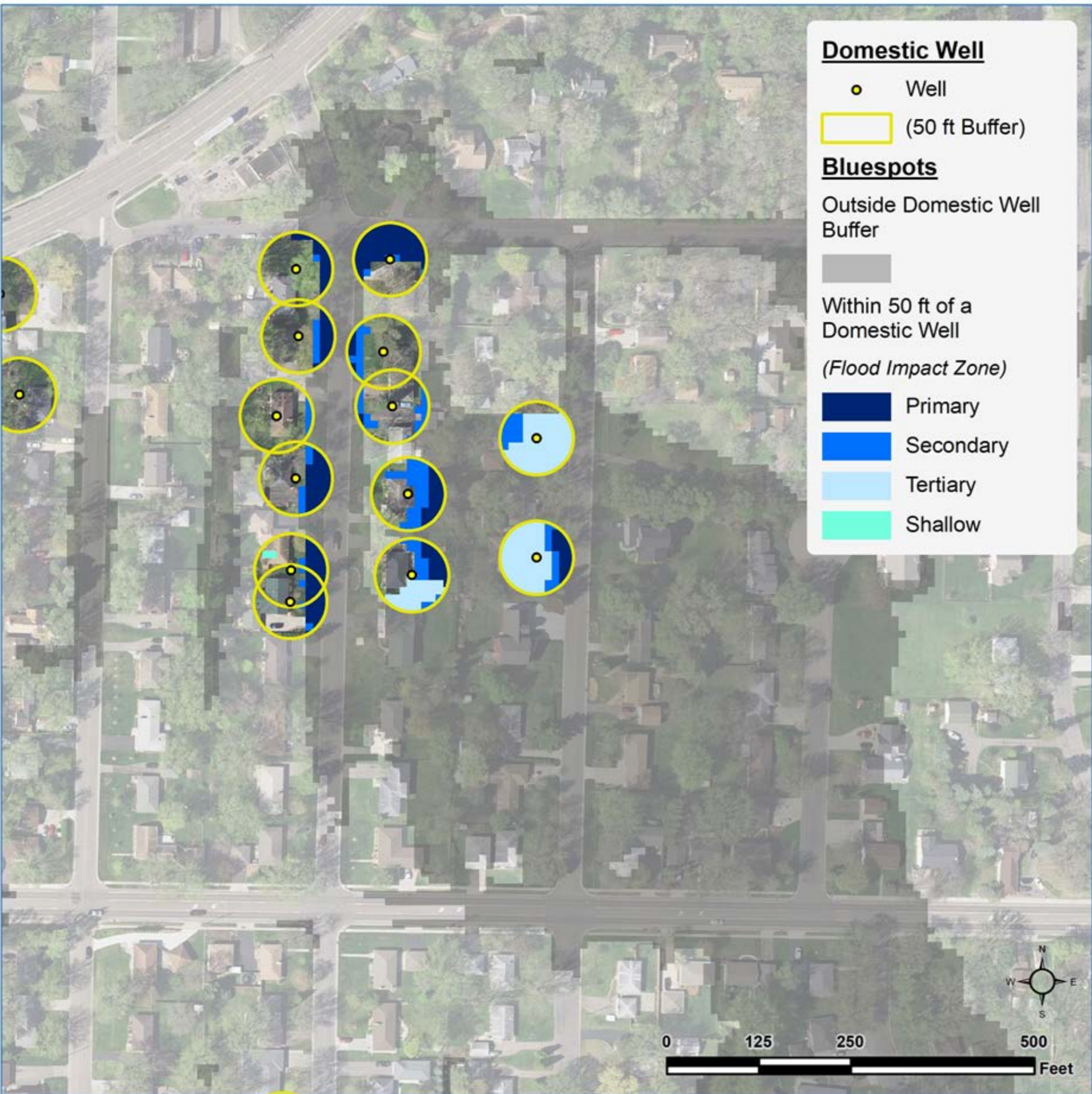


Tim Nelson · Mar 11, 2019



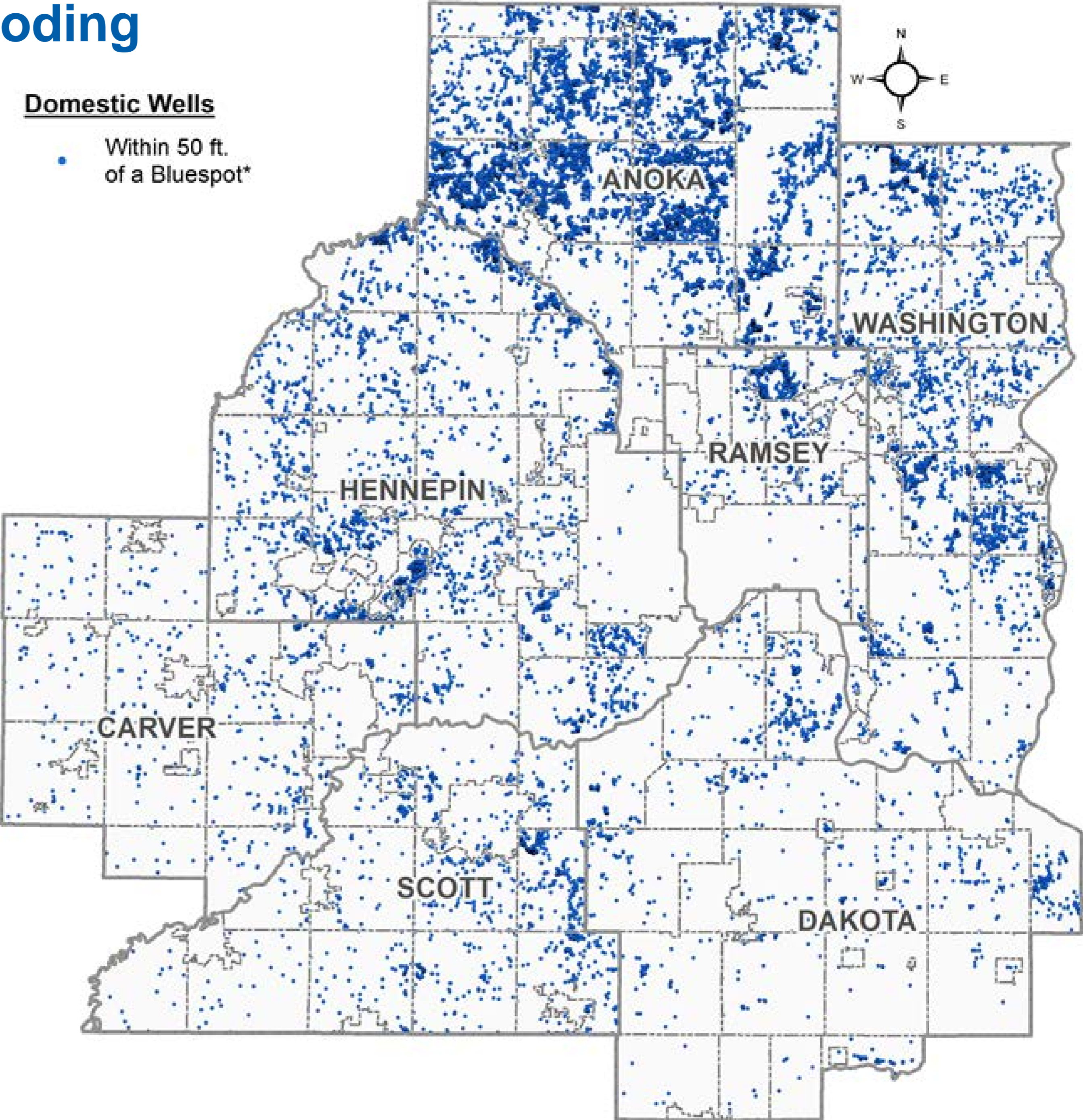
Draft Water Supply & Localized Flooding

Domestic Wells Overview & Domestic Wells Local Example



Domestic Wells

Within 50 ft. of a Bluespot*



Story Map – Transit

More Information on our Website



Calming the Storm: Localized Flooding in the Twin Cities Region

In the mapped example, [Route 4](#) may be at potential risk of localized flooding. Buses are an adaptable transit mode compared to much of the other transit infrastructure. They can utilize the entire road network to reroute quickly in accordance with emergency plans. Bus stops can be moved to higher elevations or alternate locations to be served by re-routed buses. However, implementing and communicating rerouting strategies to vulnerable pedestrians during a flood event may be challenging.



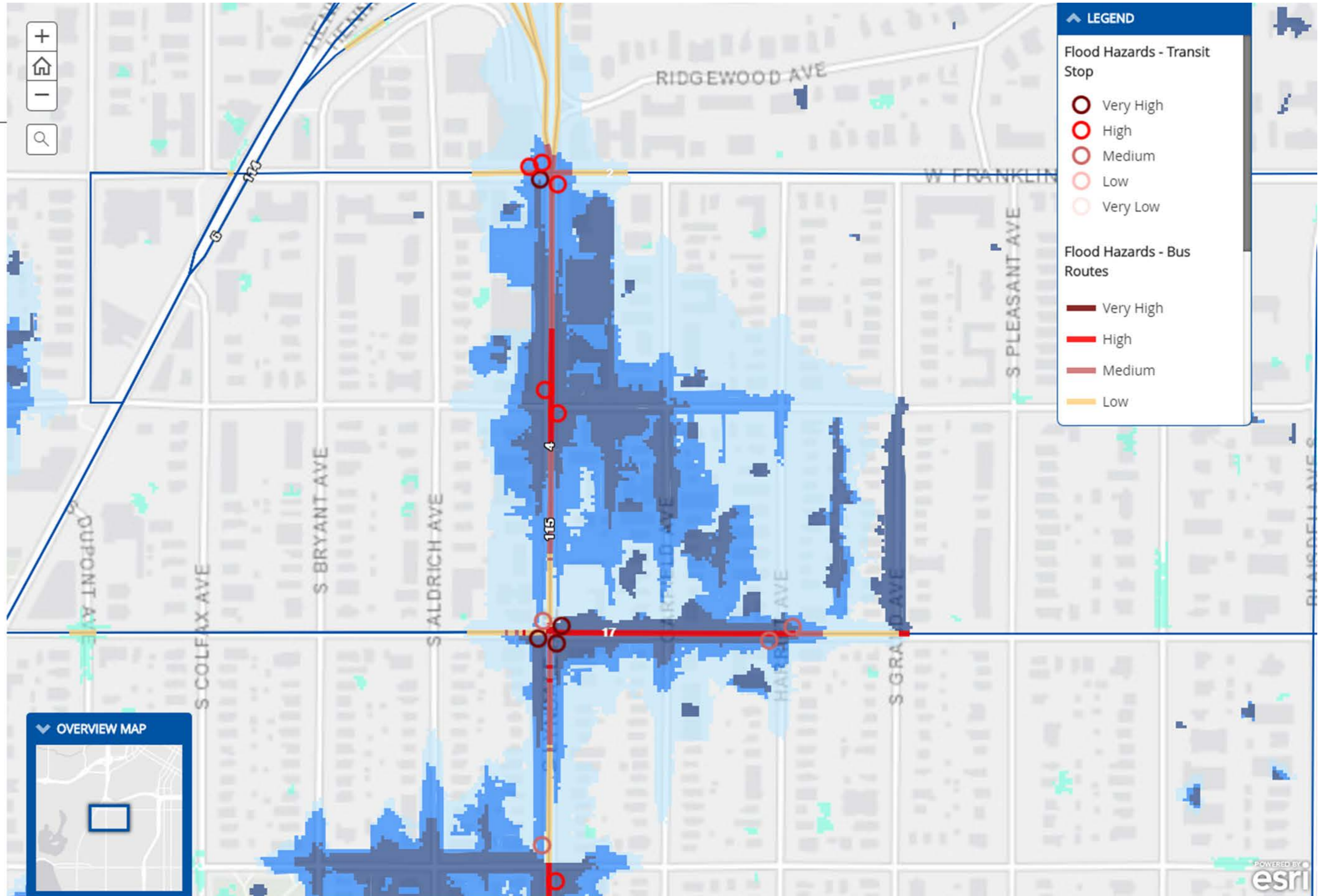
Photo on the A Line on Snelling Ave. (looking north, towards University Ave.)

What is being done?

Metro Transit identifies potential hazards impacts to operations while engaging in scenario planning and emergency planning with partner agencies.

What can we do?

Using the data, we can perform a network-wide screening of all vulnerable



Story Map – Regional Parks & Trails

More Information on our Website



Calming the Storm: Localized Flooding in the Twin Cities Region

Parks

Regional parks contain a diversity of nature-based resources-and accommodate a variety of outdoor recreation activities. **Coon Rapids Dam Regional Park**, located in both Hennepin and Anoka counties, allows visitors the opportunity to explore the area around the Mississippi River including the Coon Rapids Dam and Cenaiko Lake. The park has several structures, indicated here with icons, located within potential Flood Impact Zones. These structures include **picnic and performance pavilions, restrooms, and parking lots**. Road access to the Coon Rapids Dam Visitor Center parking lot may be impacted by Shallow flooding.



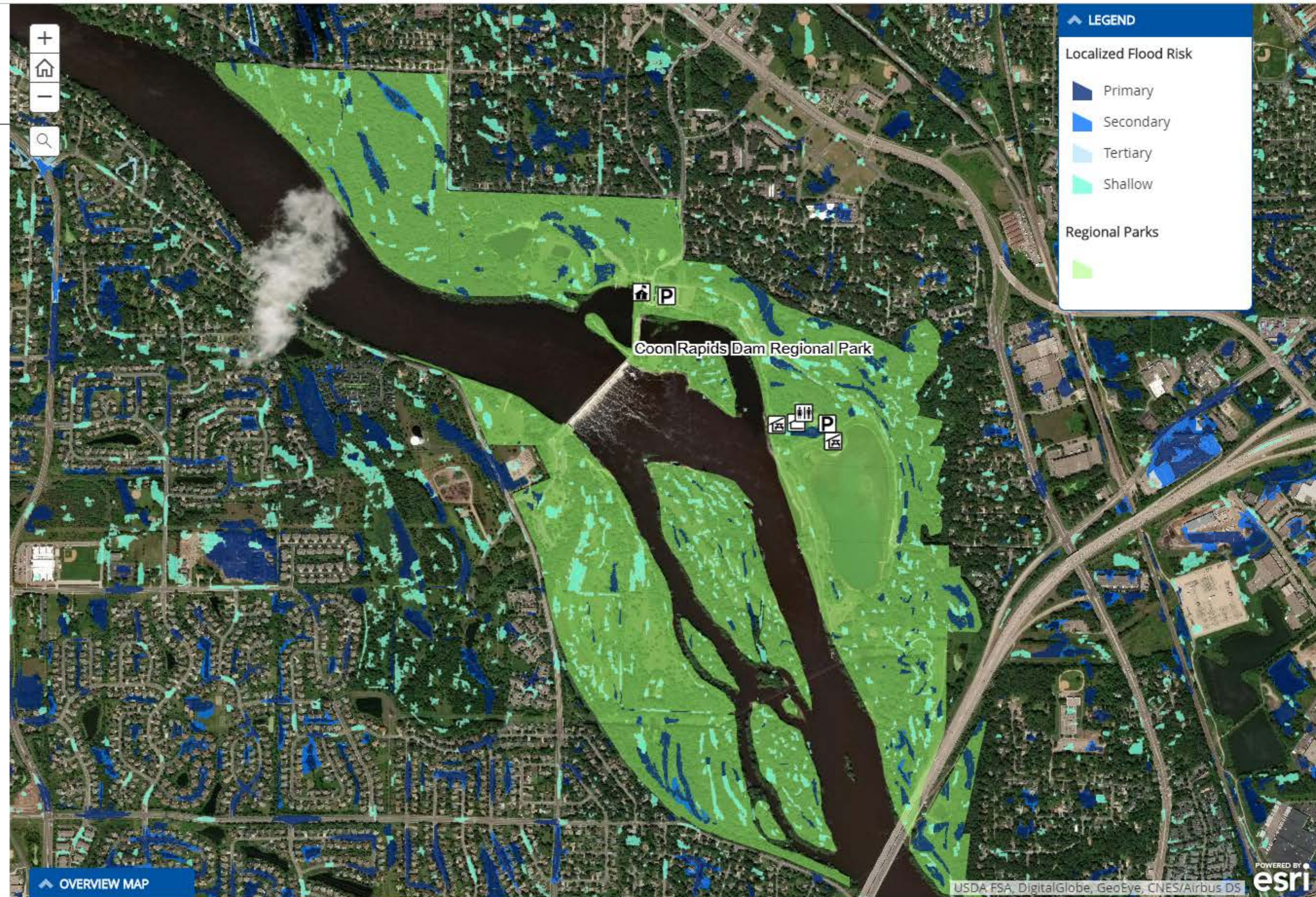
Two men fishing at Coon Rapids Dam Regional Park

What are we doing?

When flooding occurs, local authorities close areas and create detours. Additionally, flood mitigation is planned for during capital planning.

What can we do?

The Metropolitan Council may consider convening a regionwide stakeholder planning group to assess the potential impacts of localized flooding to inform current maintenance and future planning. The Council can also



Story Map – What can Communities Do?

More Information on our Website



Calming the Storm: Localized Flooding in the Twin Cities Region

What can Communities do?

Explore the [Localized Flood Map Screening Tool](#) to learn what areas and assets within your community may be most at risk for potential localized flooding impacts.

Prioritize high risk sites to conduct a more in-depth site analysis.

Get Familiar with the [Minnesota Stormwater Manual](#) to learn about the regulations, terminology, and Best Management Practices (BMPs) that can support good stormwater management. Consider [employing diverse approaches](#) to raise awareness of the issue of localized flooding.

Plan strategically to ensure that flooding takes place only where it does the least damage. Include surface stormwater features that divert water away from high-risk assets and consider site development that incorporates multi-purpose stormwater planning to address multiple objectives.

- [Policies and strategies](#) can be included in comprehensive plans or official controls to ensure that proactive measures are taken to reduce flooding.
- Recreational areas within a park may be designed to occasionally flood during high intensity rain events. [Consider planning with nature](#) as an innovative approach to reduce localized flooding.
- A multi-purpose stormwater planning effort, one that includes [green infrastructure](#) as well as gray infrastructure, can protect vital local assets, while allowing for flooding when and where most appropriate.
- Even low-cost efforts, like community [adopt-a-drain](#) programs, can have a substantial impact in reducing strain on local stormwater infrastructure.

Collaborate with local and agency stakeholders, such as Watershed District staff, to manage stormwater locally, on site, as much as possible. Local flood mitigation efforts have the power to reduce climate impacts for the whole region. For example, locally diverting stormwater away from transit



Resources – Localized Flooding

<https://metro council.org/cva>

Localized Flood Map Screening Tool

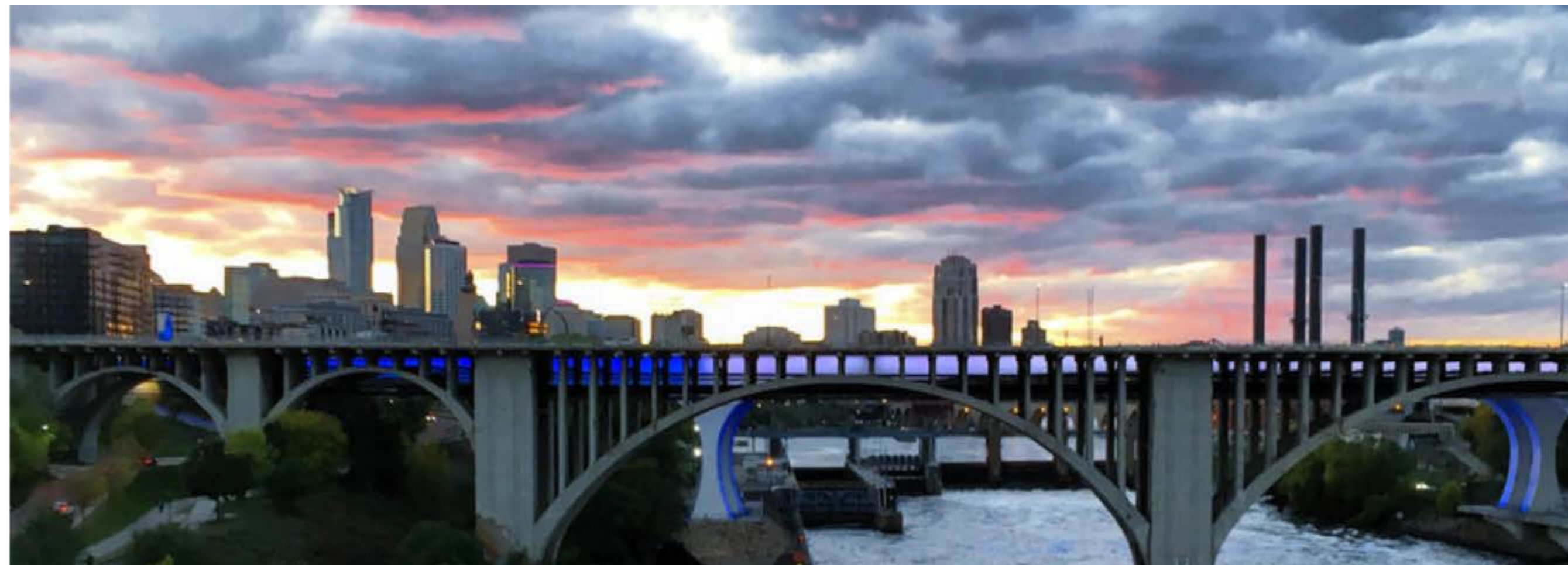


Localized Flooding Story Map

Calming the Storm: Localized Flooding in the Twin Cities Region

Table of Contents



1. [What is this?](#)
2. [Introduction: Mapping Localized Flood Risk](#)
3. [Transportation & Transit](#)
4. [Metropolitan Council Facilities](#)
5. [Wastewater](#)
6. [Regional Parks & Trails](#)
7. [Water Supply \(Coming Soon\)](#)
8. [What can communities do?](#)
9. [Next Steps](#)



Extreme Heat

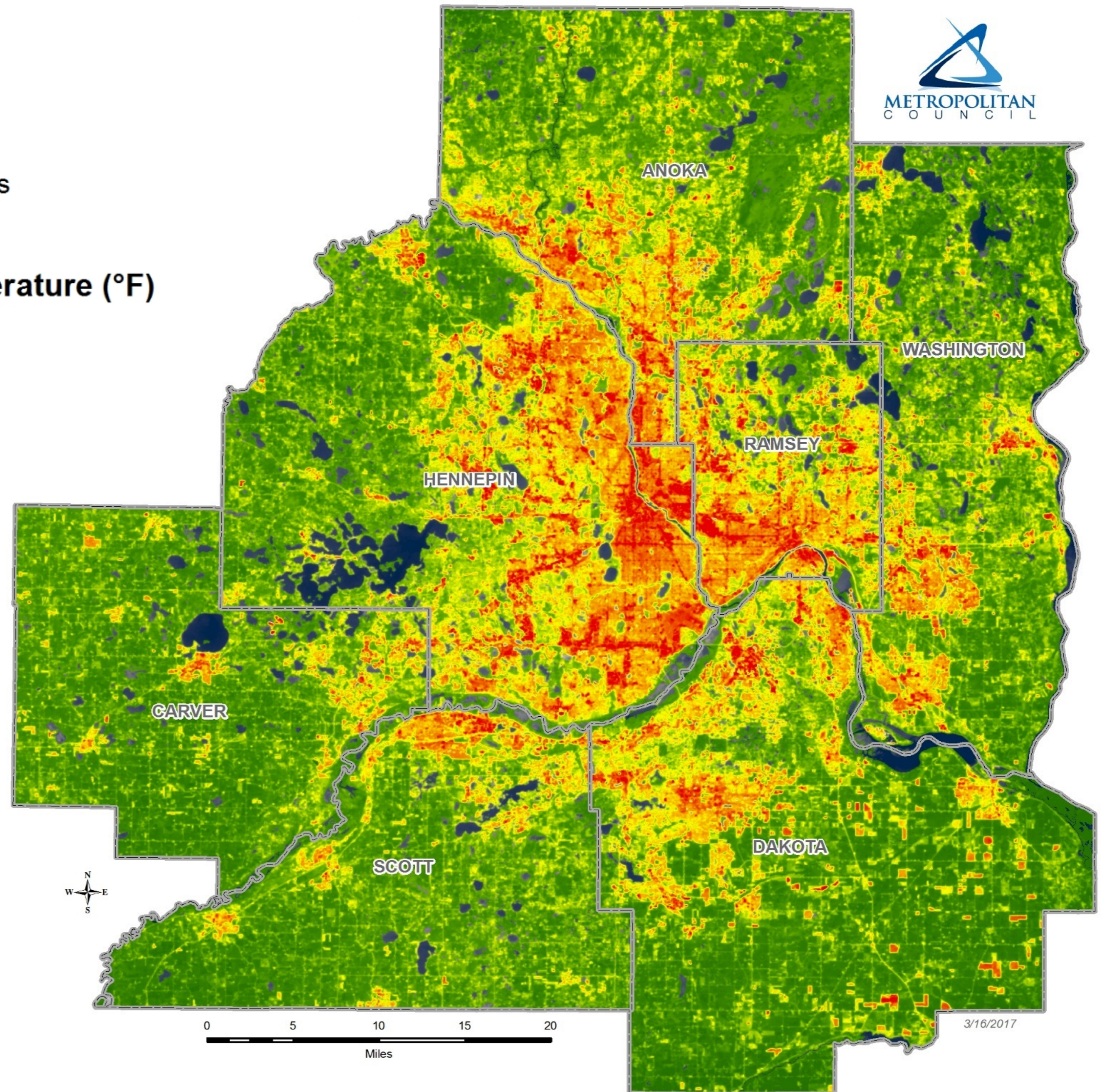
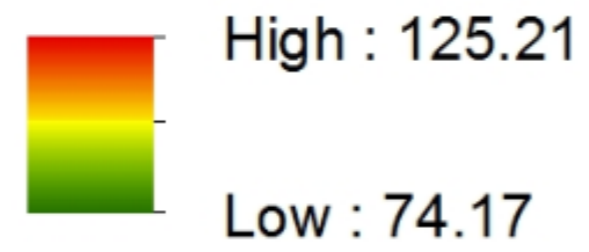
Extreme Heat Land Surface Temperature (LST)

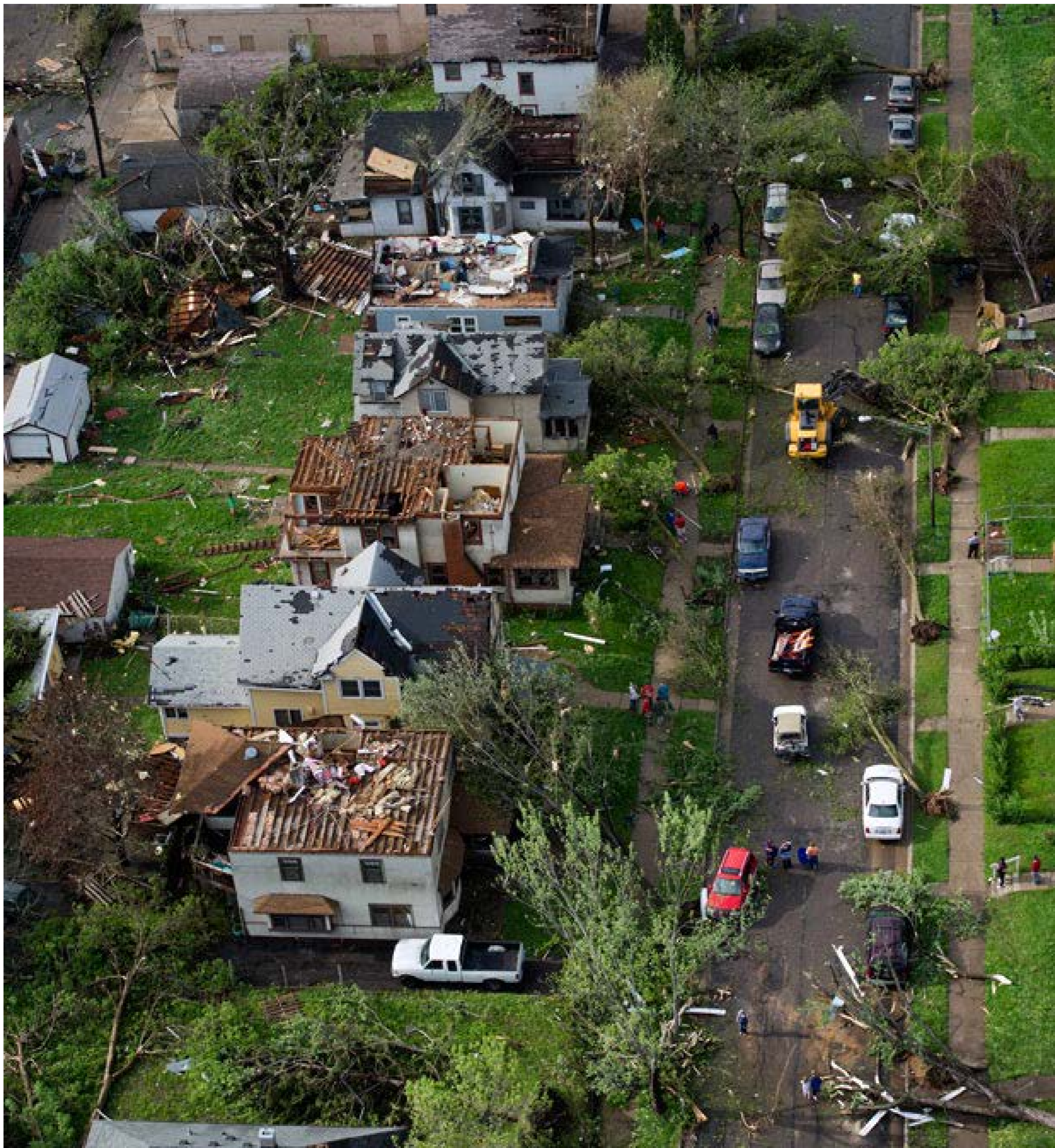


-  County Boundaries
-  Lakes and Rivers

Land Surface Temperature (°F)

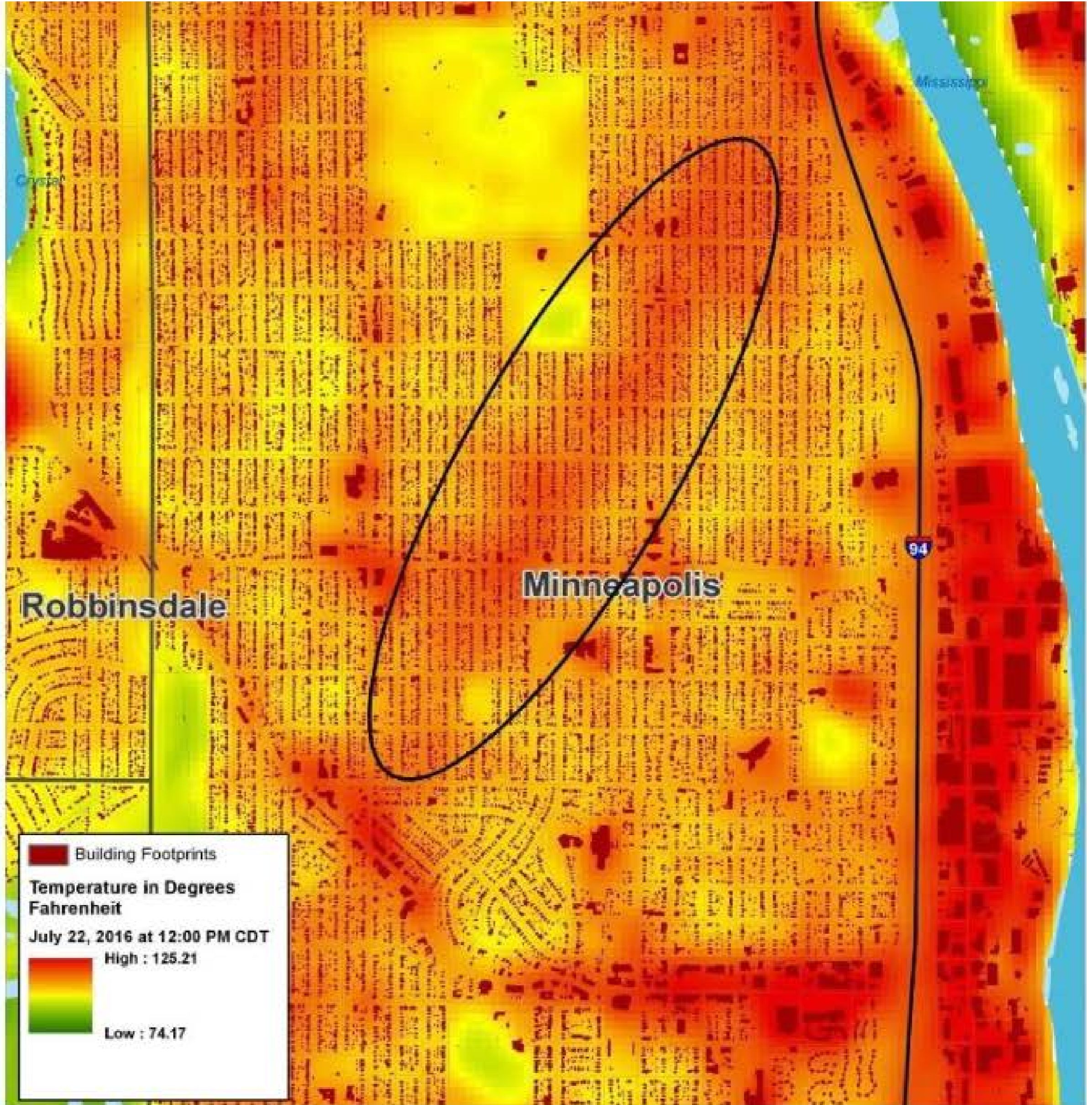
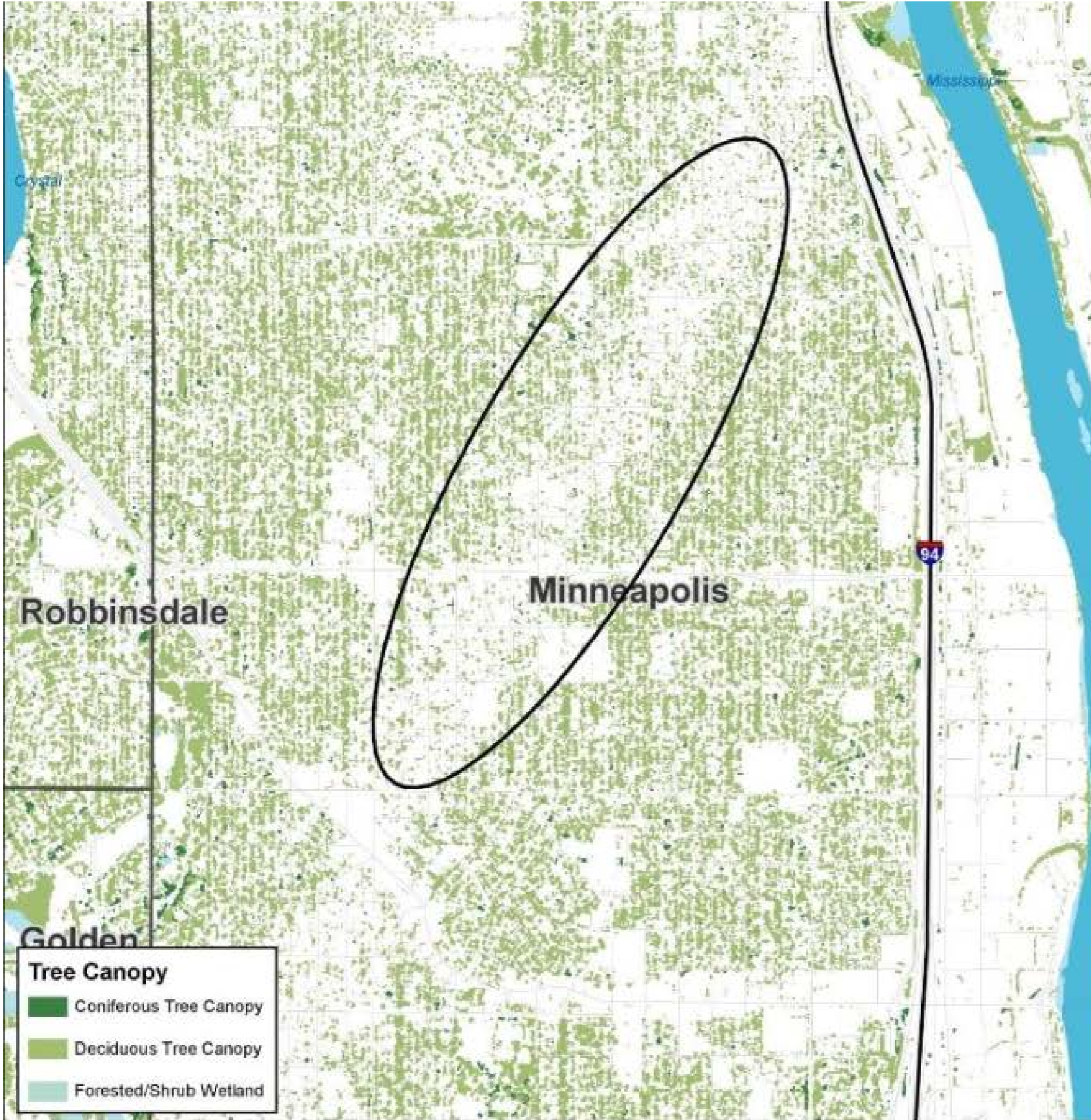
Value





Urban Tree Canopy Loss

Urban Heat Island Effect



Story Map – Urban Tree Canopy & Invasive Species

More Information



Keeping Our Cool: Extreme Heat in the Twin Cities Region

A Slow-moving Insect

What is the problem?

Today, the invasive Emerald Ash Borer (EAB) beetle **threatens the survival of 1 in 5 community trees** in Minnesota. Without strategies to mitigate this loss of tree canopy, losing these trees will increase extreme heat across our region.

Ideally, each ash tree lost to EAB will be replaced by at least one new tree. However, **replacing ash trees is an expensive and lengthy process**. Even after a replacement tree is planted, it will take decades for the new tree to reach the shade-providing expanse and carbon-capturing capacity of the mature tree that was removed. The Minnesota Shade Tree Advisory Committee (MNSTAC) has published a document on the cost of and solution to the [EAB problem in Minnesota](#).

What should be done?

Surface temperatures in Minnesota communities may temporarily increase before new trees are planted and grow to maturity. However, if ash trees are removed and are not replaced at all, the consequences would be far graver. Permanently losing the canopy provided by these ash trees could lead to a sustained intensification of UHI.

How does EAB relate to the tornado?

Like the tornado that tore through North Minneapolis, leaving a path of higher land surface temperatures, the **loss of ash trees will increase UHI in region communities until the canopy is restored**.

What areas are most at risk from the loss of ash trees?

High risk areas are those already experiencing high land surface temperatures. These areas will continue to heat up with loss of tree canopy,



Story Map – What can Communities Do?

More Information



Keeping Our Cool: Extreme Heat in the Twin Cities Region

What Can Communities Do?

Identify existing conditions

First, Communities can use our [Extreme Heat Map Tool](#) to help identify potential community 'hot spots' to better target strategies.

Plant & maintain trees

The region can benefit from increasing tree and vegetated cover in areas where heat islands are prominent. [Plants can be used to lower surface temperatures in urban areas by 20-45°F through providing shade and 2-9°F through evapotranspiration.](#)

Increasing tree canopy is one of the most cost-effective mitigation strategies because the initial costs of trees and maintenance are outweighed by the benefits. A recent [partnership between the University of MN and the City of Ramsey demonstrates the real value of urban trees.](#) Increasing tree and vegetation planting also improves air quality, prevents flooding, and improves water quality

Integrate trees into design

Integrating trees and vegetation into parking lot design, like [this example from the Minnesota Landscape Arboretum](#), decreases urban heat island effect by creating shade. Trees provide other co-benefits which include storm water treatment and improved air quality.

Deciduous trees provide shade in the summer and allow sun to enter buildings in the winter. This allows for more efficient cooling and heating of a building or home.



summer sun

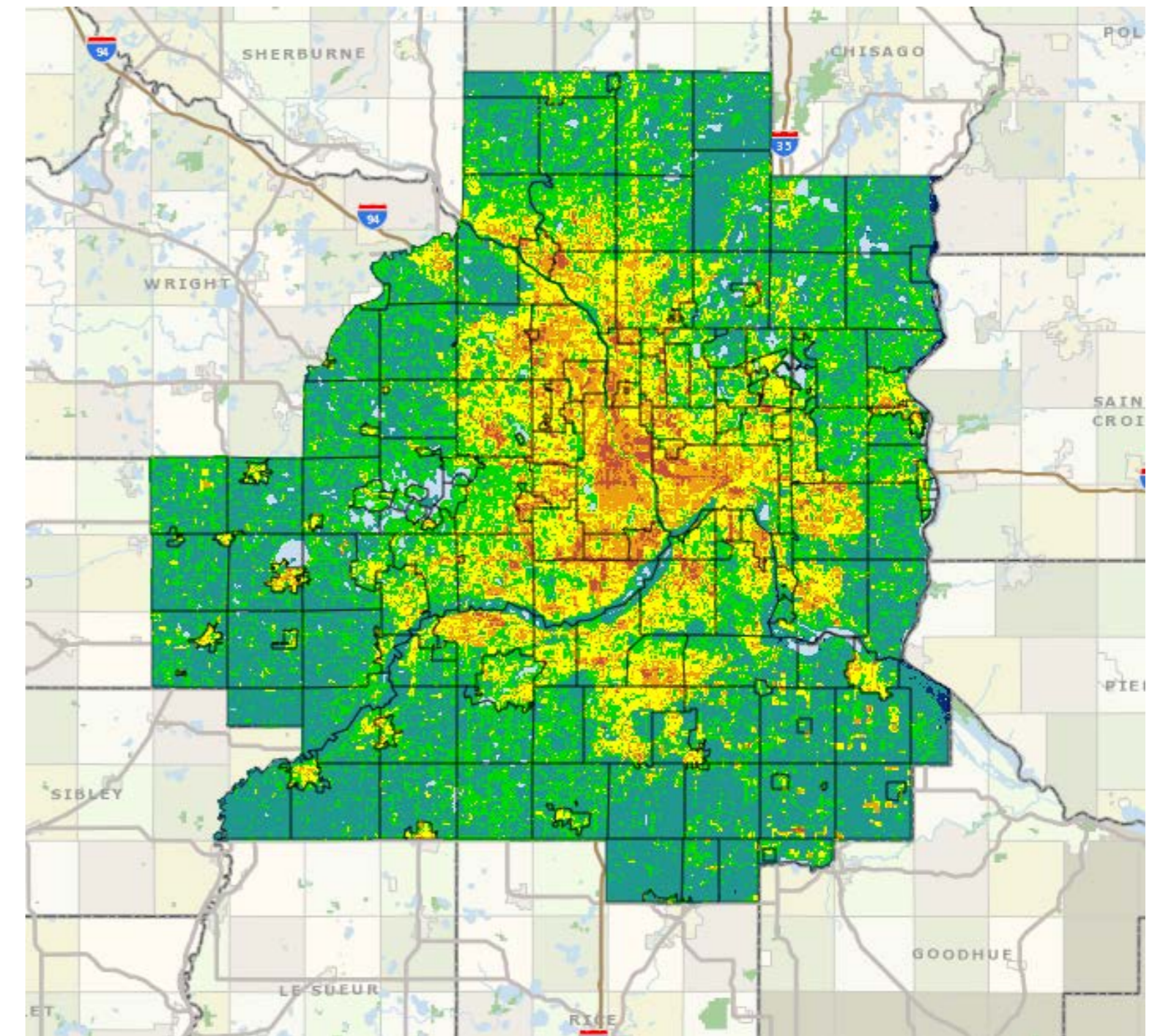
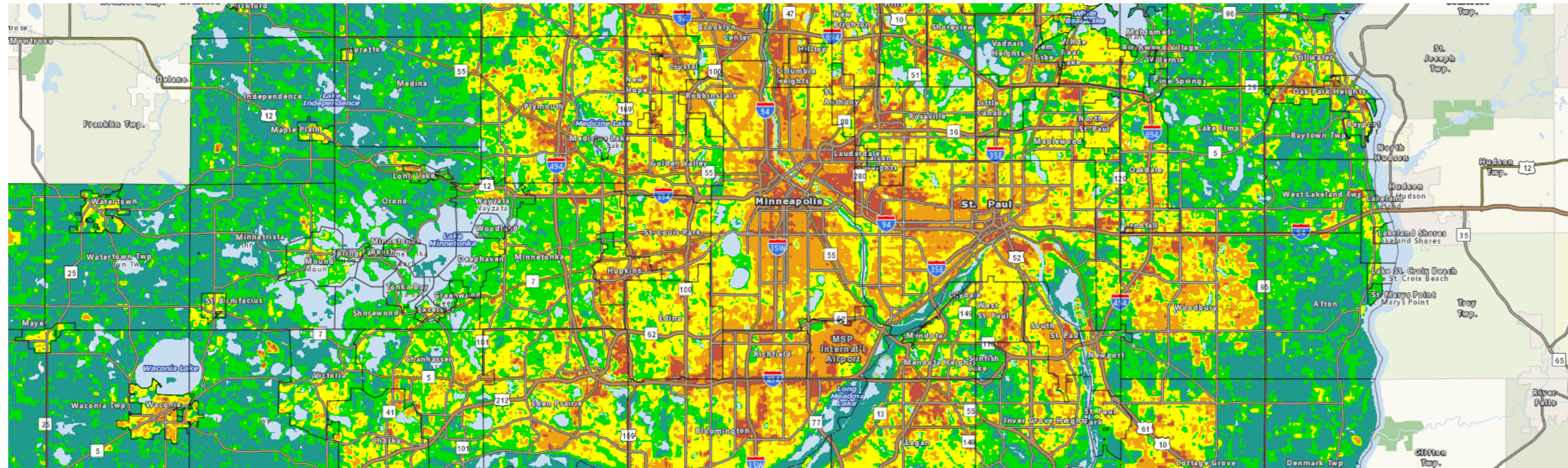
winter sun



Resources – Extreme Heat

<https://metro council.org/cva>

Extreme Heat Map Tool



Extreme Heat Story Map

Keeping Our Cool: Extreme Heat in the Twin Cities Region

Table of Contents

1. [What is this?](#)
2. [Introduction to Extreme Heat](#)
3. [Urban Heat Island Effect \(UHI\)](#)
4. [Pieces of UHI](#)
5. [UHI in the City of St. Anthony](#)
6. [A Fast-moving Storm](#)
7. [A Slow-moving Insect](#)
8. [Mitigation Actions](#)
9. [The Extreme Heat Map Tool](#)
10. [Extreme Heat & Human Vulnerability](#)
11. [Next Steps](#)



Next Steps

- **Finalize CVA Chapters**
 - Spring 2019
- **Finalize Web Content & Tools**
 - Spring 2019
- **Stakeholder Outreach**
 - Winter/Spring 2019-20

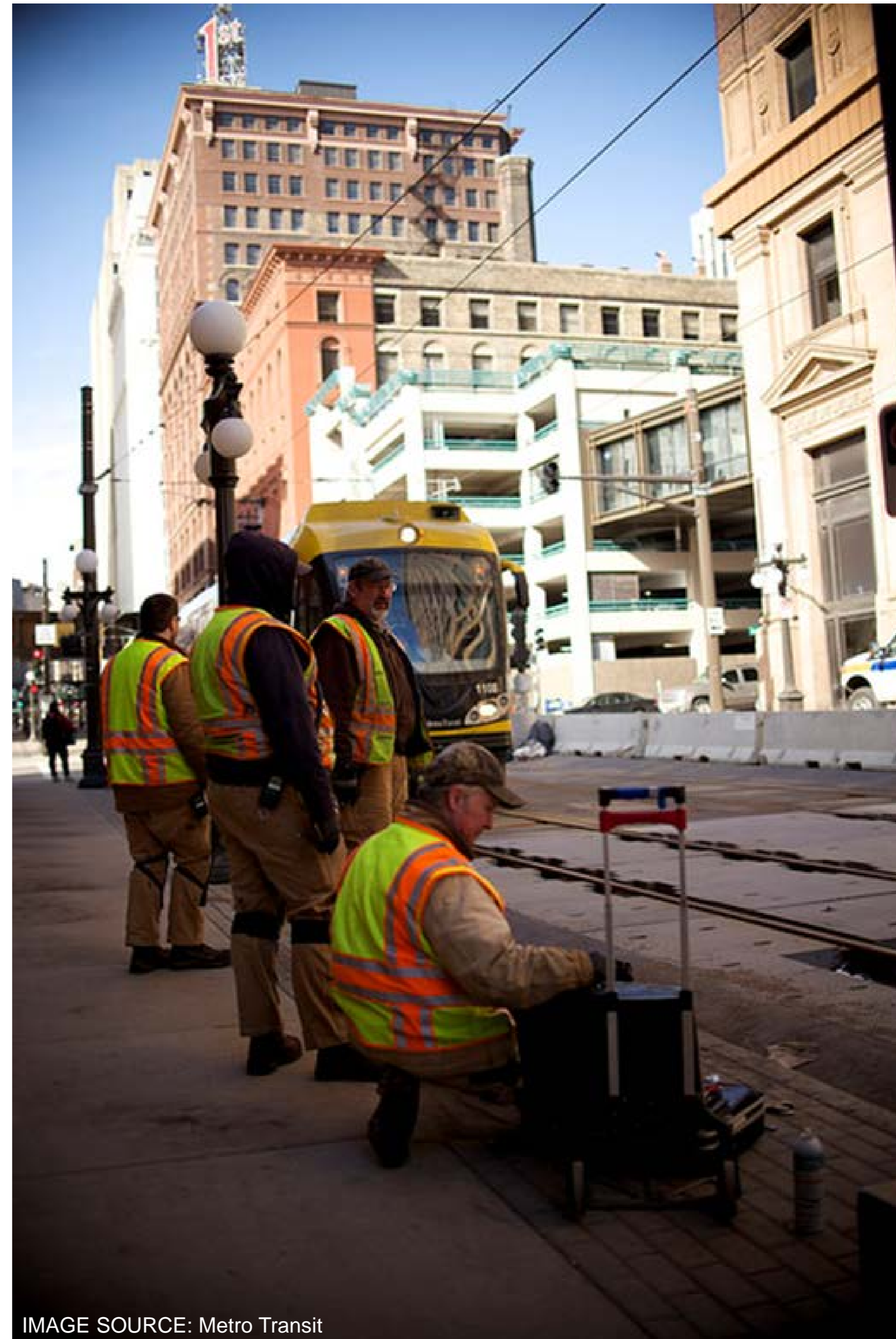


IMAGE SOURCE: Metro Transit

LUAC Feedback on Outreach & Communication

- **What is the best way to communicate these resources?**
- **How can we reach a wide audience?**
- **What sort of outreach is most effective, in your opinion?**
- **Are there any other considerations we should think of?**

Any Questions?

THANKS!

Eric Wojchik

Local Planning Assistance

651-602-1330

eric.wojchik@metc.state.mn.us

Emily Resseger

Water Resources- EQA

651-602-1033

emily.resseger@metc.state.mn.us



**METROPOLITAN
COUNCIL**