

City Resilience

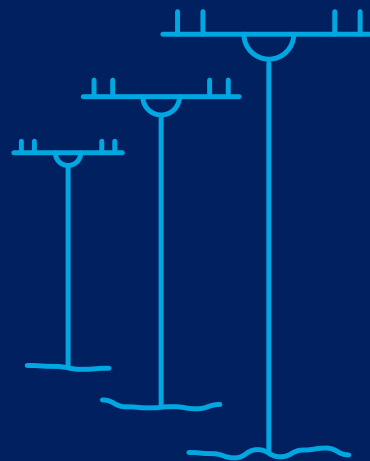
Capital Investment Committee: Managing Risk to Infrastructure
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Transforming the energy system to benefit the economy and environment.



Communities Team

Cities and communities are critical to creating a better energy system because collectively they are big enough to matter and small enough to make changes quickly. GPI's programs are designed to assist communities in different ways with all the elements needed to drive change.

- Energy Planning Technical Assistance
- GreenStep Cities program partner
- Metro CERT
- SolSmart technical assistance
- Small business energy efficiency

Presentation Overview

- I. Growing concerns among cities
- II. City vulnerability assessments
 - People
 - Built infrastructure
 - Natural Infrastructure
 - Energy facilities
- III. City examples:
 - St. Paul
 - Northfield



Growing Concerns

GreenStep Cities Statewide Listening Sessions

Emerging challenges of the **next ten years**:

Transportation

Natural
Gas

Equity

Resilience

Infrastructure

Urban
Forests

Water



Minnesota
GreenStep Cities

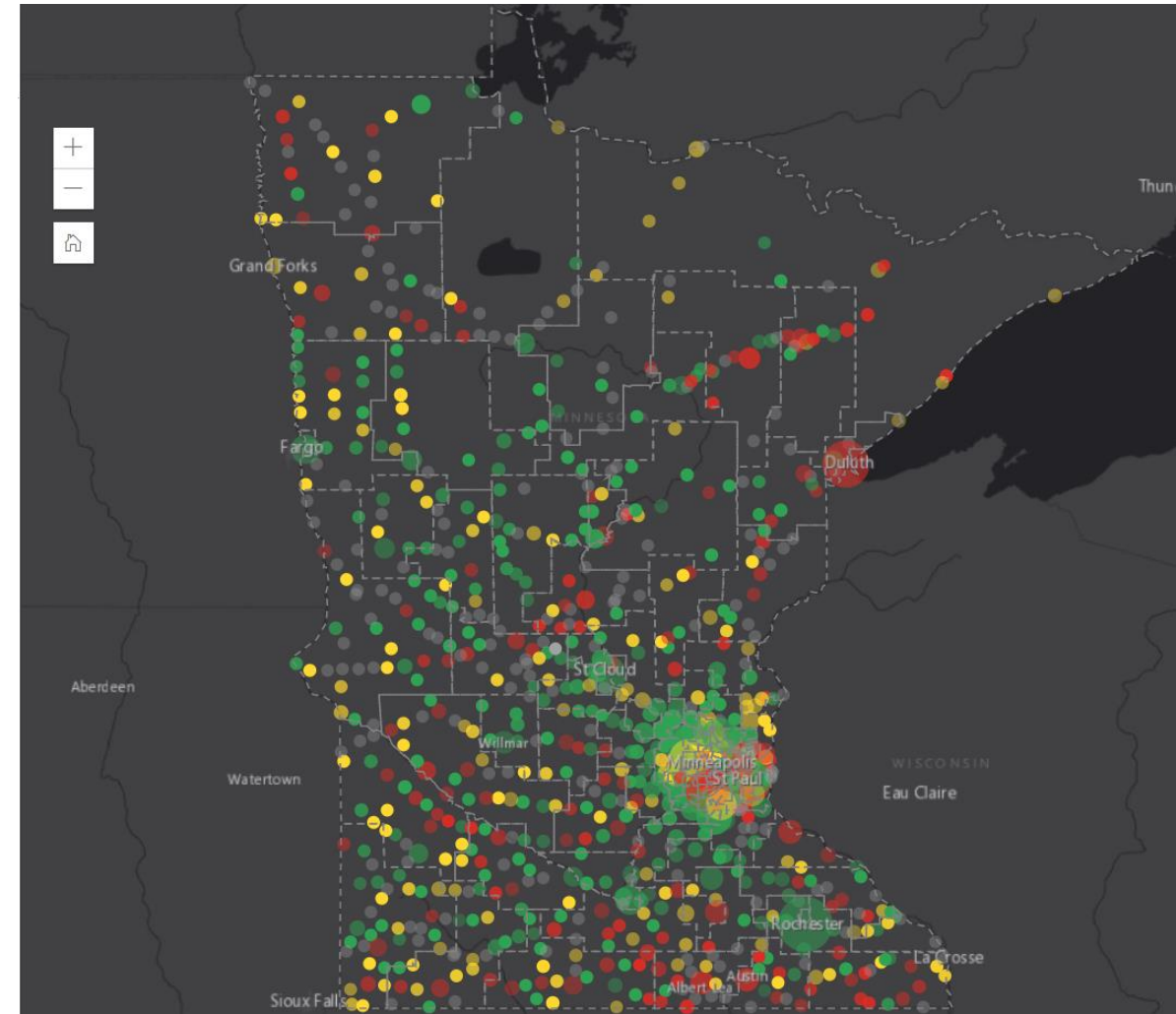


Growing Concerns

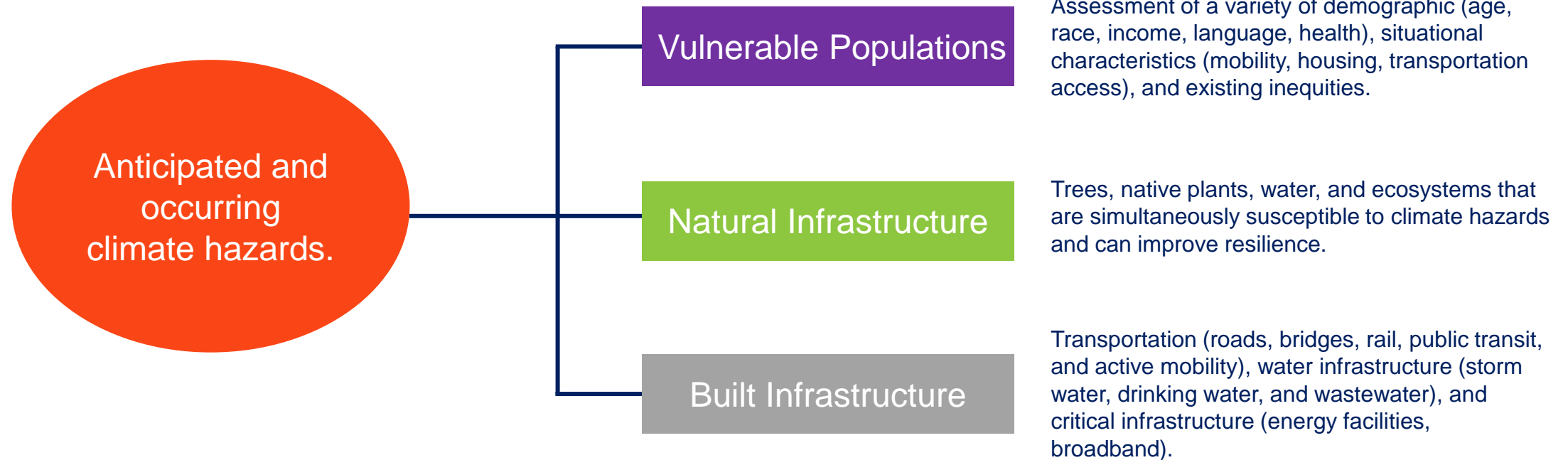
Infrastructure Stress Transparency Tool

Predominant Collection Sewer System Age

- City: <30 years old
- City: 30-50 years old
- City: >50 years old
- City: no system



Vulnerability Assessment



Northfield Climate Action Plan

Primary resilience concerns:

- Flooding (river, flash):
 - 2010 Cannon River flood
 - 2012 5.5" caused flash flooding
 - 2013 4"+ caused flash flooding
 - 2016 Cannon River flood
- Emerald Ash borer
 - 20.3% of all city trees are Ash



2010 Cannon River Flood, Northfield.
Photo Credit: Carleton College



Northfield: Resilience Strategies

- Enhance resilience of built infrastructure
 - Incorporate resilience into CIP
 - Add smart sewer systems to monitor flow
- Supplement with green infrastructure
 - Reduce impervious pavement
 - Increase stormwater ponds, infiltration basins
 - Incentivize rain gardens on private
- Increase and diversify tree canopy

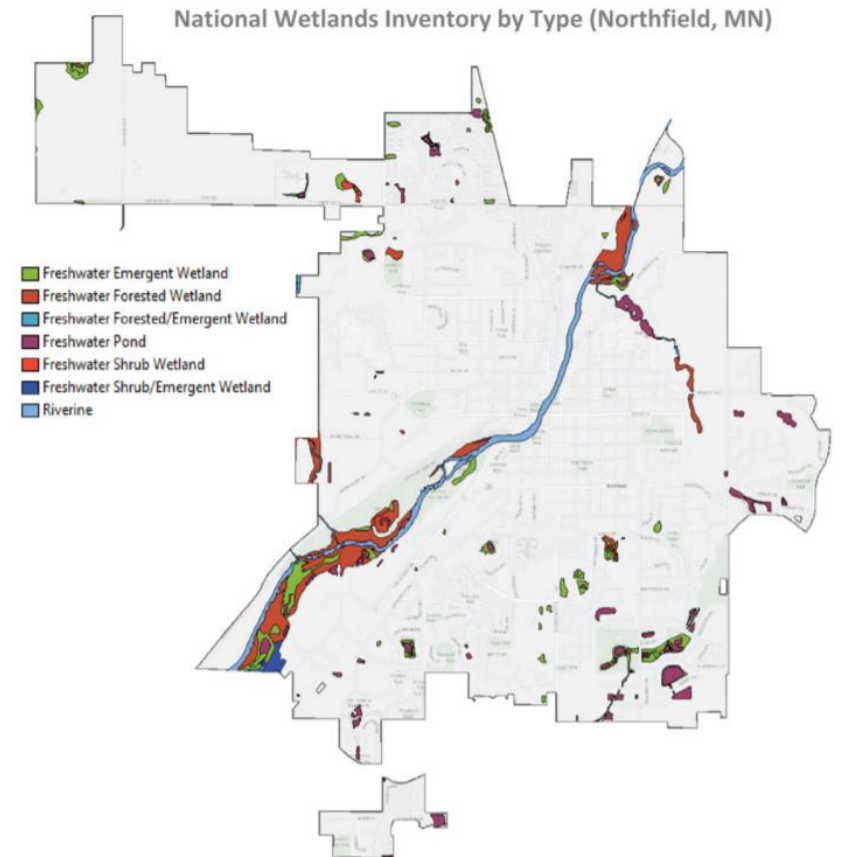
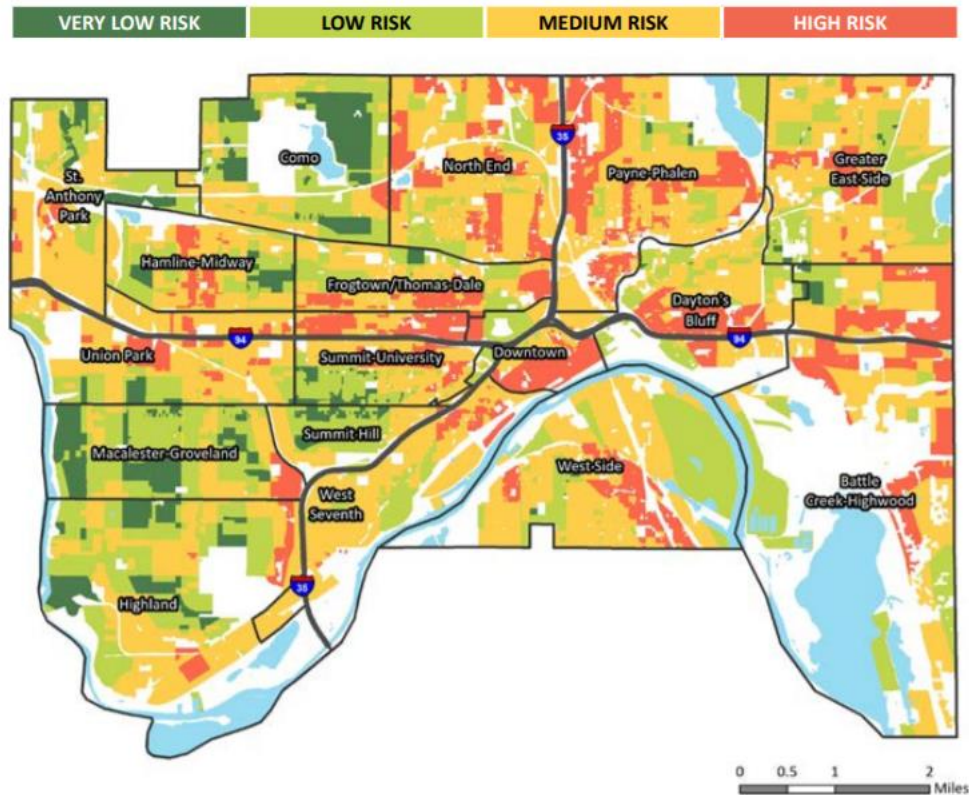


Figure 15. Inventory of all wetlands in Northfield. Source: Statewide Wetland Inventory (Minnesota DNR, 2018); map generated by Jessi Wyatt.



St. Paul Climate Action and Resilience Plan

Air Quality



Map 1. Identifies the relative risk exposure to poor air quality (very low, low, medium, and high risk) across the city of Saint Paul. This analysis was originally conducted by Saint-Paul Ramsey County Public Health through its Climate Change Vulnerability Assessment in 2016.

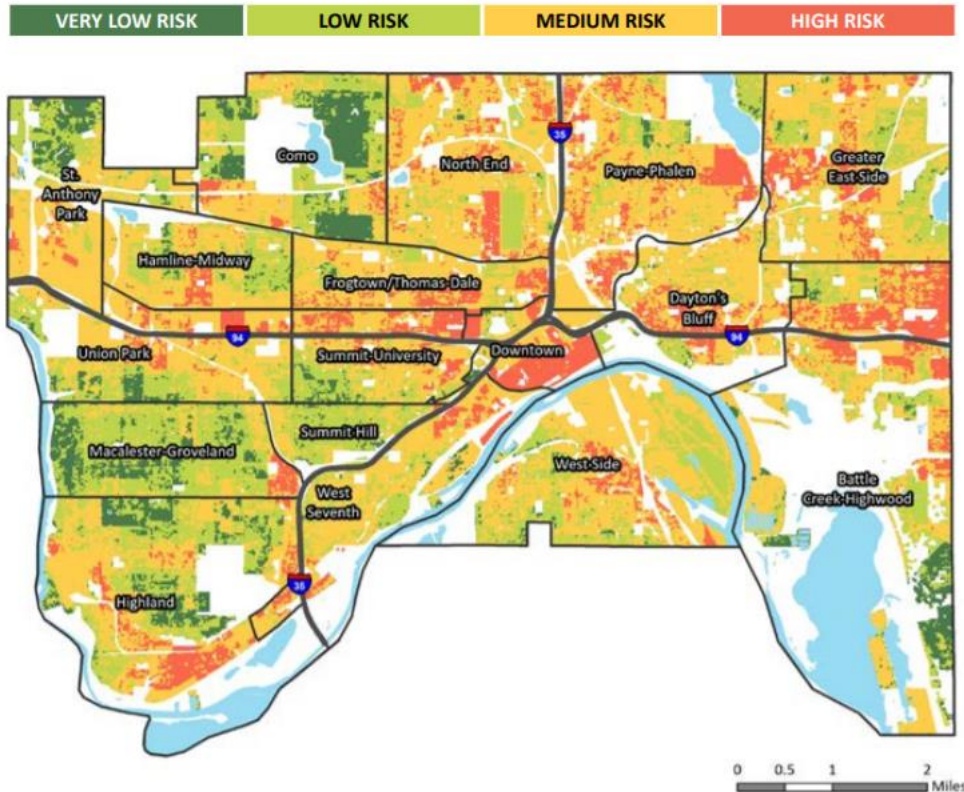
- An estimated 393,000 Minnesotans have asthma
- In 2014, there were 21,800 emergency room visits and 3,400 hospitalizations for asthma
 - \$614.9 million in direct medical expense
- 61 people died of asthma in 2015
- American Indian and African American students are more likely to be diagnosed with asthma
- Hospitalization rates for children in the Twin Cities are 67% higher than children living in Greater Minnesota

Asthma in Minnesota.
Minnesota Department of Health, 11/28/17



St. Paul Climate Action and Resilience Plan

Heat



Map 2. Identifies the relative risk of exposure to extreme heat (very low, low, medium, and high risk) across the city of Saint Paul. This analysis was originally conducted by Saint-Paul Ramsey County through its Climate Change Vulnerability Assessment in 2016.

Tree Canopy Coverage

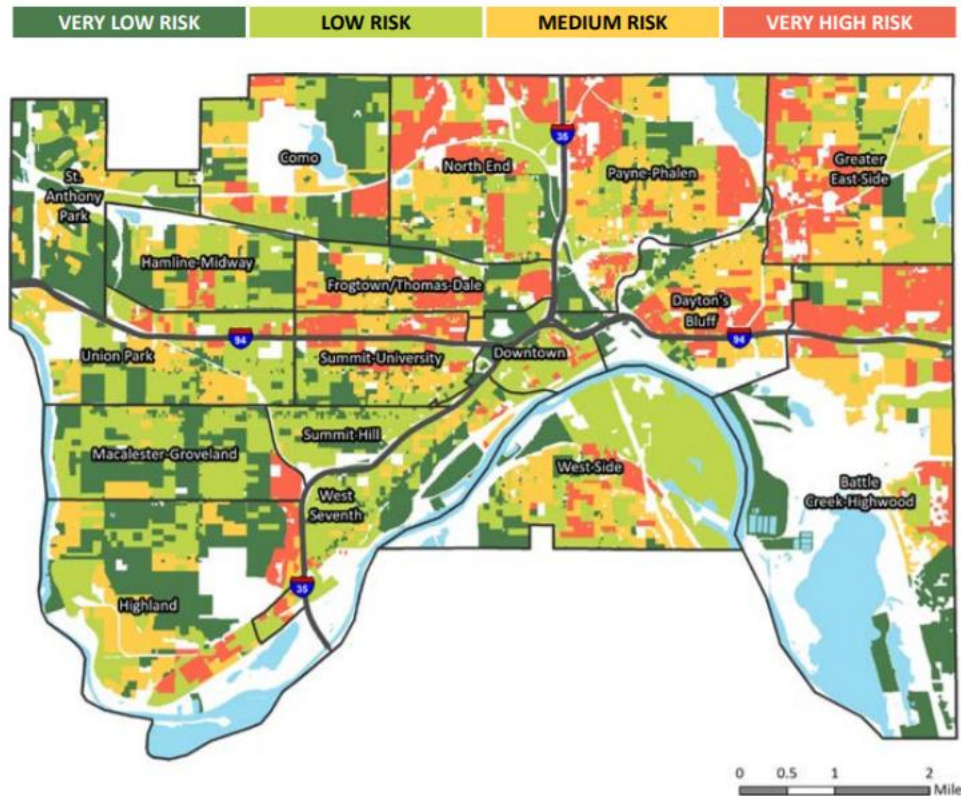


Map 5. Overview of total canopy cover in the City of Saint Paul by ward. Last updated 1/9/2019 by the Saint Paul Forestry Unit.



St. Paul Climate Action and Resilience Plan

Composite



Map 4. Characterizes the composite vulnerability based on the relative risk of exposure to poor air quality, extreme heat, and flooding (very low, low, medium, and high risk), as well as demographic inputs, across the City of Saint Paul. This analysis was originally conducted by Saint Paul-Ramsey County Public Health through its Climate Change Vulnerability Assessment in 2016.

Emerald Ash Borer



Map 6. Locations of individual ash trees across Saint Paul. Last updated 1/9/2019 by the Saint Paul Forestry Unit.



STP: Capital Investment Considerations

- I. Environmental justice – are communities harmed by past/current practices?
 - Placement of urban interstates and highways
 - Inequities of tree canopy coverage
 - Integrate cultural and historical knowledge – design with people
- II. Impact on health and wellness
 - Upstream and at point of use (where and for what are we driving demand?)
 - Opportunities for safe, active alternatives to personal vehicles
- III. Relationship between built and natural infrastructure
 - Shared, stacked green infrastructure
 - Cost-savings from decreased maintenance
 - Co-benefits: shade/cooling, increased longevity, mental health, real estate values, habitat, etc.



Photo Credit: Great Plains Institute, Mural Artist: Sara K. Udvig, Margaret Park



Thank you!

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