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Community Resilience & the Comprehensive Plan

Eric Wojchik, Senior Planner
December 13, 2016

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“Stop worrying about missed opportunities and start looking for new ones.”

- I.M. Pei

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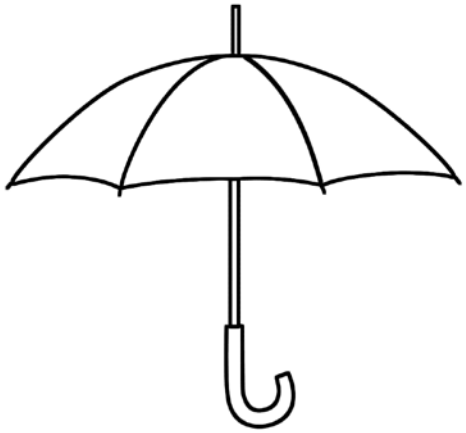
What is the Role of the Comprehensive Plan?

Comprehensive Plan

- Official Controls
  - Zoning Ordinances
  - Subdivision Ordinances
  - Capital Improvement Plan
- Implementation Actions
  - Small Area Studies
  - Feasibility Studies
  - New Programs
  - Update Ordinances



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Community Vision

Existing Conditions

Desired Conditions

Policies & Strategies

Implement & Evaluate

2040 Comprehensive Plan

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Comprehensive Planning Process

Existing Conditions

- Compile Community Baseline Data
- Consider Barriers to Engagement
- Assess Staff & Financial Resources
- Synthesize Information

Desired Conditions

- Community SWOT* Analysis
- Engagement – Public & Political
- Identify Short & Long-term Priorities
- Focus Prioritization

Policies & Strategies

- Vision & Goals
- Policies
- Implementation Strategies
- Evaluation

*Strengths, weaknesses, opportunities, & threats

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Policies & Strategies

Implementation Strategies

Encouragement	Incentives	Regulation	Lead by Example

MINNESOTA LoGoPEP

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From Minnesota's Local Government Project for Energy Planning (LoGoPEP)

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Plan Elements

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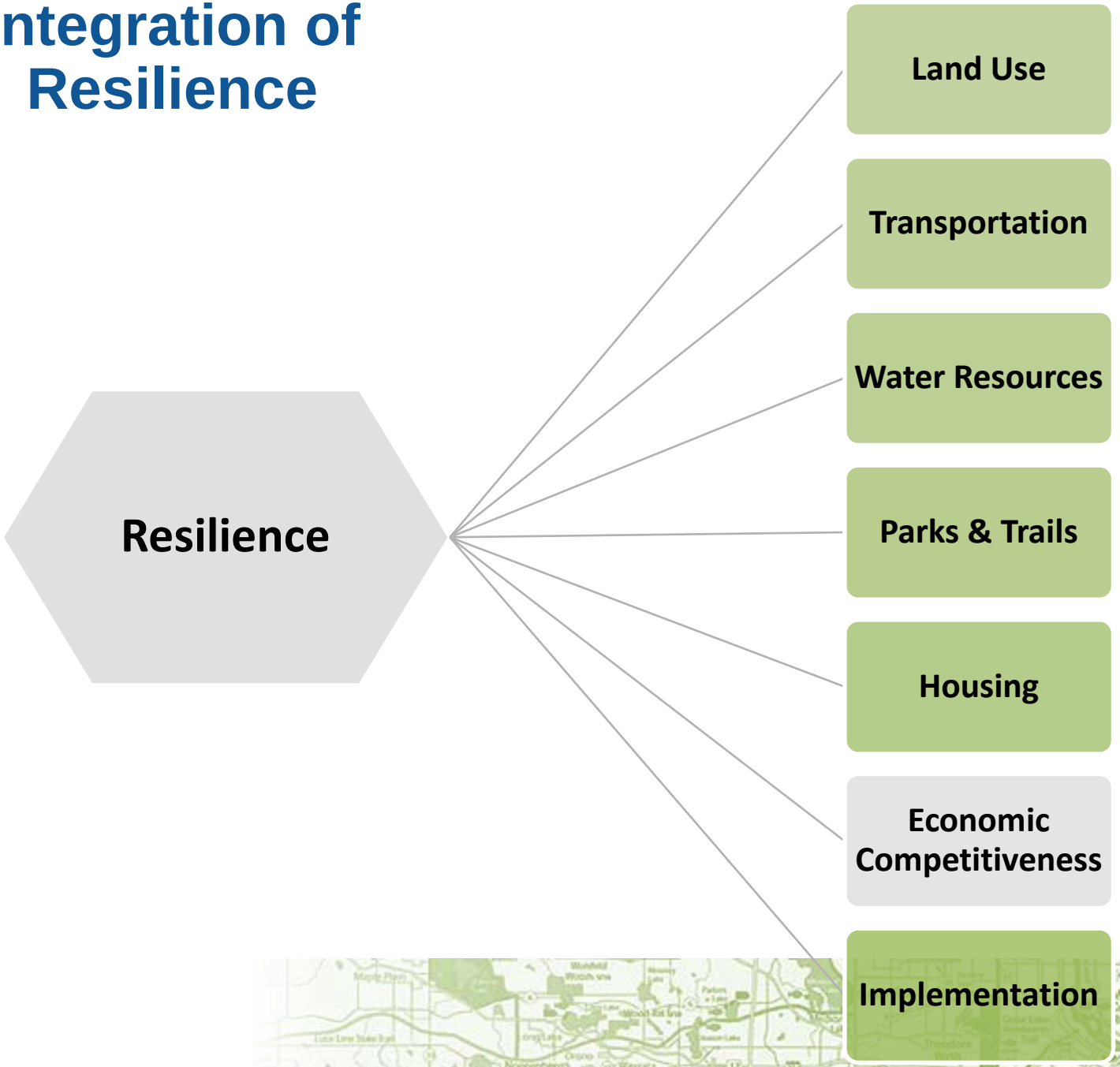
Integration of Resilience



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Strategic Plan Assessment

APPENDIX C: PLAN SCORING MATRIX

BEST PRACTICES FOR PLAN PRINCIPLES	N/A	0	1	2	3	Source
1. LIVABLE BUILT ENVIRONMENT—Ensure that all elements of the built environment, including land use, transportation, housing, energy, and infrastructure, work together to provide sustainable, green places for living, working, and recreation, with a high quality of life.						
1.1. Plan for multimodal transportation.						
1.2. Plan for transit-oriented development.						
1.3. Coordinate regional transportation investments with job clusters.						
1.4. Provide complete streets serving multiple functions.						
1.5. Plan for mixed land-use patterns that are walkable and bikeable.						
1.6. Plan for infill development.						
1.7. Encourage design standards appropriate to the community context.						
1.8. Provide accessible public facilities and spaces.						
1.9. Conserve and reuse historic resources.						
1.10. Implement green building design and energy conservation.						
1.11. Discourage development in hazard zones.						
TOTAL SCORE: 1. LIVABLE BUILT ENVIRONMENT						

N/A = Not applicable; 0 = Not present; 1 = Low achievement; 2 = Medium Achievement; 3 = High Achievement; Source (indicate where in the plan each best practice is discussed)

From APA Sustaining Places: Best Practices for Comprehensive Plans

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Integration of Resilience Planning into the 2040 Comprehensive Plan

How to Succeed

- Establish a staff & City Council resilience lead
- Institutionalize & embed resilience planning
- Source “actionable science” at the local level
- Front-load the process
- Brand the community
- Engage often for buy-in
- Meet in the middle
- Think & plan beyond community boundaries
- Build capacity through partnerships
- Do what you can, not what you ought to
- Be aspirational yet specific
- Consider co-benefits
- Strategically assess/score the Plan to ensure integration

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Resources

LOCAL PLANNING HANDBOOK

http://metrocouncil.org/Handbook.aspx

PlanIt

http://www.metrocouncil.org/Handbook/PlanIt.aspx

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Integrating Sustainability and Resiliency Planning in the City Comprehensive Plan

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Conference

December 13, 2016

Brett Emmons - EOR

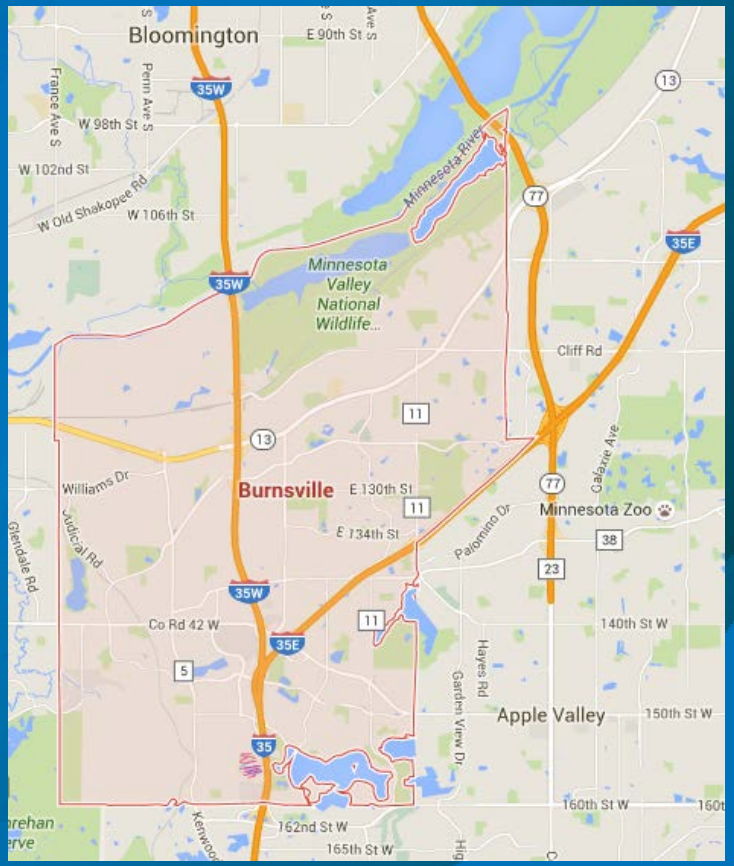
Sue Bast – City of Burnsville

Mark Koegler - HKGi

Burnsville

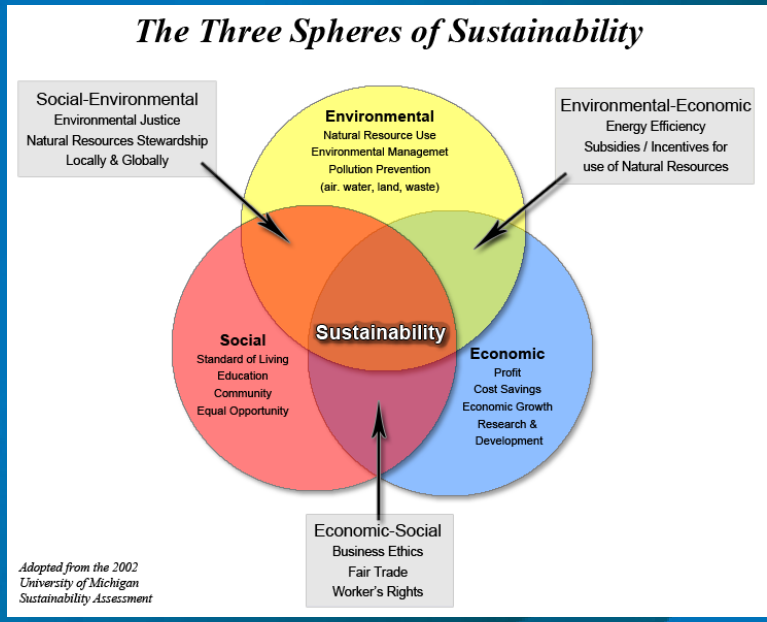
City of Burnsville

- City of Burnsville
- Located just south of the Minnesota River
- Population: 61,434
- 76 Parks
- WMI Landfill
- Black Dog Xcel energy
- Minnesota Valley Wildlife Refuge



Sustainability & Resiliency in City of Burnsville

- Sustainability Guide Plan
- Sustainability Team
- Policies
- Sustainability Coordinator
- Resiliency
- Indicators
- Awards/Certifications



Sustainability Guide Plan

- Two year sustainability review process including input from a broad base of experts and stakeholders
- Developed 14 priority areas of sustainability termed Best Practice Areas
- In 2009 Burnsville City Council adopted the Sustainability Guide Plan
- PNRC to provide a forum for community input into the Sustainability Guide Plan

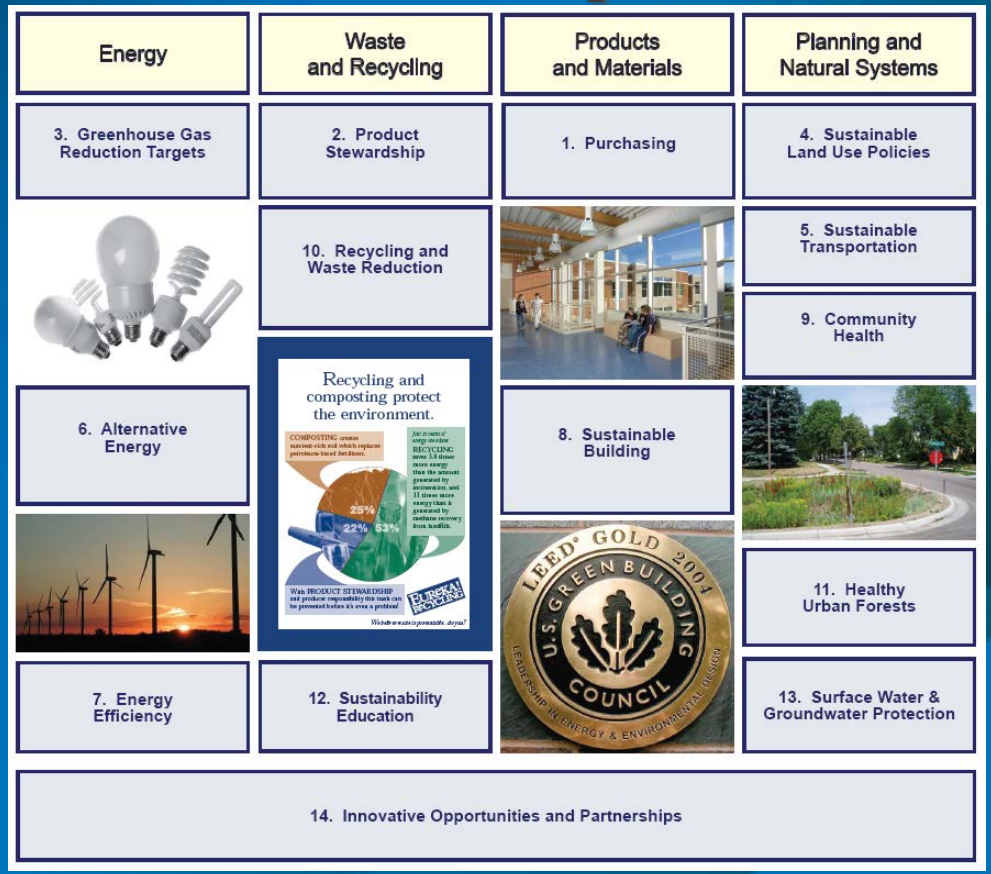
Best Practice Area Groups

Energy
- 3. Greenhouse Gas Reductions
- 6. Alternative Energy
- 7. Energy Efficiency

Waste and Recycling
- 2. Product Stewardship
- 10. Recycling and Waste Reduction
- 12. Sustainability Education (ARROW)

Products and Materials
- 1. Environmentally Preferable Purchasing
- 5. Sustainable Transportation

Planning and Natural Systems
- 4. Sustainable Land Use Policies
- 8. Sustainable Building Practices
- 9. Community Health
- 11. Healthy Urban Forests
- 13. Surface & Groundwater Resources



The Process

Step 1	Step 2	Step 3	Step 4
Review Existing Plans	Conduct Energy Audit for City Hall	Hold Series of Meetings to Review BPAs with Staff	Conduct Focused Training Session

Step 5	Step 6	Step 7	Step 8
Develop Implementation Strategies, Performance Indicators and Implementation Cost Estimates	Develop Overall Implementation Strategy	Hold Draft Strategy Review Meeting with Staff	Present Sustainability Plan to the City Council

Plan Overview

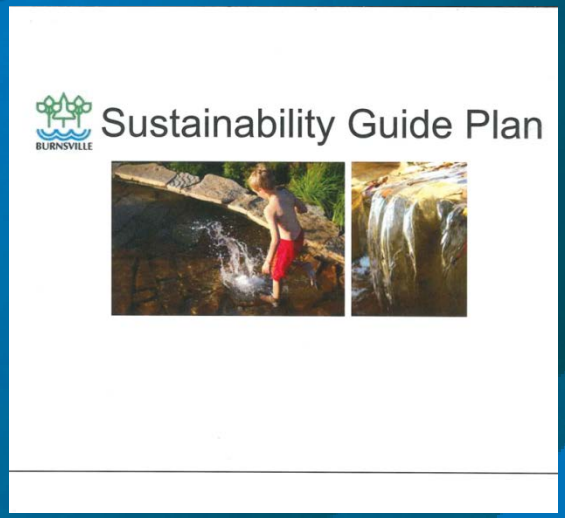
Sustainability in the City of Burnsville ensures city operations are aligned so that the people, environment, and finances of Burnsville are supported over the long term.

Plan is aligned to the City Council adopted guiding principle:

The City of Burnsville will promote development that maintains or enhances economic opportunity and community well-being while protecting and restoring the natural environment upon which people and economies depend. Sustainability meets the needs of the present without compromising the ability of future generations to meet their own needs.

Plan Overview

- Sustainability Guide Plan outlines in each of the 14 Best Practice Areas
  - Guiding strategies
  - Specific short-term and long-term action items
  - Performance indicators to measure progress
  - Implementation strategy to guide the city in the implementation of the full plan.



Energy

- Focus of Energy BPAs
  - Leveraging efficient and renewable technologies to reduce the energy costs and carbon footprint of city operations
  - Best Practice Areas
    - 3 – Greenhouse Gas Reductions
    - 6 – Renewable Energy
    - 7 – Energy Efficiency

Energy

- Sustainability Strategies
  - BPA 3 – Greenhouse Gas Reductions
    - Reduce City Carbon Emissions
  - BPA 6 – Renewable Energy
    - Utilize Solar Energy
    - Utilize Biofuels and Hybrid Technologies
    - Utilize Geothermal Systems
    - Evaluate Wind Energy Potential
  - BPA 7 – Energy Efficiency
    - Increase Energy Efficiency of City Buildings

Energy

- Recommended Initial Action Plan
  - BPA 3 – Greenhouse Gas Reductions
    - Establish CO2 emission tracking procedure with annual reporting to gather baseline data
      - $1,500
      - To provide understanding of city status and progress
  - BPA 6 – Renewable Energy
    - Install a solar thermal domestic hot water system on City Hall
      - $25,000
      - To provide 50-75% of hot water usage
      - 8 year to 10 year average payback period
    - Purchase Wellspring wind energy
      - $6,000 for City Hall
      - To dramatically reduce CO2 emissions
  - BPA 7 – Energy Efficiency
    - Implement recommendations of City Hall Energy Audit
      - $2,400 - $55,000 depending on project
      - To reduce energy use expenditure
      - 2 year to 9 year payback period depending on project

Implementing Sustainability

- Seem Daunting?
  - Implementation will spread out to all departments
  - Change in mindset and actions so that sustainability becomes the way things are done

Implementing Sustainability

- How could this be applied?
  - Highlight the Ice Center as an initial showcase
    - Signage and tours highlighting the:
      - Geothermal heating system
      - Energy efficient lighting
      - Visible and comprehensive recycling
      - Low water use landscaping
      - Onsite stormwater management

  - Ensure that development in the Minnesota River Quadrant is designed for sustainability from the ground up
    - Plan for or require:
      - Geothermal district heating system using quarry lake
      - All buildings follow sustainable building guidelines (LEED or B3)
      - Land use design considers transit, trail connectivity, stormwater, urban forests, natural corridors

Sustainability Team

- Develop and implement projects that address City of Burnsville's Sustainability Guide Plan strategies, establish sustainable practices for our organization and raise the sustainability awareness of employees

- Facilitate effective sustainability networking between all departments and other groups

Sustainability Policies

- Sustainable Infrastructure Policy
- Environmentally Preferable Purchasing Policy
- Emerald Ash Borer Management Plan ($2.8 million)

Sustainability Coordinator

- Point person for sustainable ideas
- Keep updated on new concerns and issues
- Bring topics and training to Sustainability Team
- Research and write policies
- Produce Sustainability Updates

Resiliency

- *Climate Mitigation:* Reducing greenhouse gas emissions to **limit magnitude or progression of climate change (sustainability)**
- *Climate Adaptation:* Developing/implementing strategies, initiatives and measures to help human and natural systems address climate change impacts
- *Climate Resiliency*: Planning tool for communities to understand and prepare for climate-related events. Resiliency incorporates both mitigation and adaptation into city functions and operations

Weather vs Climate

- The difference between weather and climate is a measure of time. Weather is what conditions of the atmosphere are over a short period of time, and climate is how the atmosphere "behaves" over relatively long periods of time.

City of Burnsville Resiliency Activities

- Adopted the Atlas 14 Rainfall Distribution standards
- Received a Blue Star Award/Certification for stormwater management practices
- Adopted EAB Plan with a replacement tree diversity guideline “10 – 20 – 30”
- Planning an emergency preparedness plan in conjunction with Dakota County. Includes a threats/vulnerability analysis
- Developed Climate Resiliency Insert for Bulletin

Climate Resiliency Workshop

- Grant from the MPCA
- September 24, 2015
- Increase climate resilience of communities
- Improve understanding of climate changing impacts for communities
- Identify key areas of vulnerability in city services

Climate Resiliency Insert

- Impacts of climate change
- Resiliency tips
- Emergency preparedness kit
- Vulnerability survey

Burnsville

2016

Climate Resiliency GUIDE

City of Burnsville | 100 Civic Center Parkway | www.burnsville.org/sustainability | 952-895-4400

Pledge to Become Climate Resilient!

Climate Resiliency is the practice of dealing with challenges and impacts on the community that may result from climate change. This guide outlines current weather changes already observed in the Twin Cities, and provides steps you can take to be more climate resilient!

Impacts of Climate Change

Climate resiliency efforts are being undertaken at local, state, national and international levels to address areas that will likely be impacted by climate change. Some of these impacts include:

Hotter Summers

According to the Minnesota State Climatology Office, Minnesota's annual temperatures have increased at an average rate of .23 degrees F per decade since 1895, but at a much faster rate of .45 degrees F per decade since 1970. Although much of this warming has occurred during winter, summertime lows are also getting warmer. This makes it more difficult to stay cool, and increases the potential for heat-related impacts. The most up-to-date climate projections indicate that Minnesota can expect several more days per year with temperatures above 95 degrees by the middle of the century.

Excessive heat is more likely to affect populations in northern latitudes, where people are less prepared to cope. The body's cooling mechanisms are less effective when air temperature is higher than body temperature, and humidity is high.

Stay hydrated during extreme heat.

1. **Heat Exhaustion & Heat Stroke:** Symptoms include headaches, dizziness, irritability, fatigue and loss of coordination. Heat stroke becomes a medical emergency when the victim experiences disorientation or delusions, unconsciousness or seizures. It can injure the liver and lead to kidney failure or death.
   Prevention/Tips: *Reduce physical activity in the heat before experiencing symptoms. Hydrate with water or other non-alcoholic fluids. Check on vulnerable populations such as children, the sick and the elderly. Do not leave children and pets alone in cars for any amount of time. Cool off with water spray, a lake or pool. Spend time in air-conditioned locations such as malls and libraries. Use fans and open windows to circulate air if there is no air conditioning, but do not direct the flow of portable electric fans toward yourself when room temperatures are hotter than 90 degrees F. If you experience severe symptoms, get medical attention.*

Stay indoors if air quality is low.

2. **Heat Cramps:** Symptoms include painful muscle spasms in the arms, shoulders and legs caused by extreme heat.
   Prevention/Tips: *Rest. Drink plenty of fluids that have electrolytes and salt. Seek immediate medical care if you experience severe symptoms.*
3. **Respiratory & Cardiovascular Disease:** Pre-existing cardiovascular and respiratory diseases, including asthma, pneumonia and influenza are aggravated by heat.
   Prevention/Tips: *Stay indoors if air quality is low.*
4. **Heat Rash:** Symptoms include flushed, pale or clammy skin caused by blocked sweat ducts.
   Prevention/Tips: *Keep cool. Avoid over-dressing. Wear breathable, light clothing.*

Take the Climate Resilient Community Survey

To help the City better understand the needs of our community when it comes to climate resiliency, please take our short survey. Your answers will help us better prepare to help you in a time of need!

www.burnsville.org/climatesurvey

Climate Resiliency Guide 2016

Sustainability Dashboard

City Of Burnsville

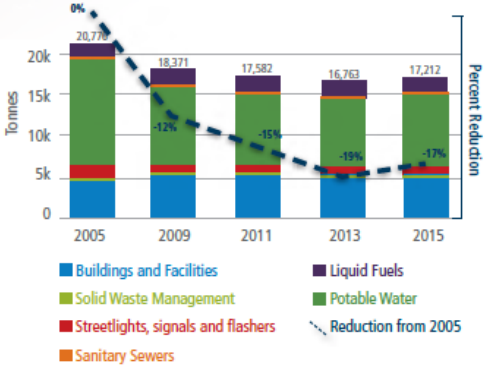
SUSTAINABILITY UPDATE FOR 2015

The City of Burnsville promotes development that maintains or enhances economic opportunity and community well-being while protecting and restoring the natural environment upon which people and economies depend. Sustainability meets the needs of the present without compromising the ability of future generations to meet their own needs.

Greenhouse Gas Reduction

The City of Burnsville set a goal of reducing GHG emissions that is in line with the Minnesota Next Generation Energy Act of 2007. The Act established nationally aggressive statewide greenhouse gas reduction goals, using 2005 as a baseline, of 15% by 2015, 30% by 2025, and 80% by 2050. The City of Burnsville exceeded the 2015 goal of a 15% reduction. Emissions for city operations in 2015 were 4,000 tonnes lower than in 2005, a 17% decrease.

Greenhouse Gas Emissions by Fuel and Waste Sources, 2005 to 2015



ENERGY EFFICIENCY

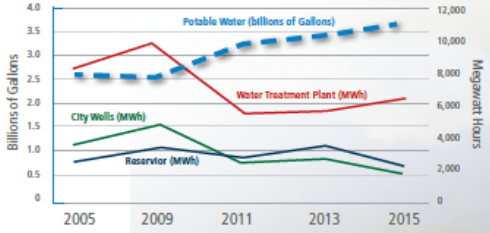
City Property Conservation Measures

Obsolete and worn-out equipment is being replaced with the most energy efficient equipment available. The return on investment for the equipment varies from six months to three years. In 2015, the city received $21,805 in rebates on a total investment of $156,592. Projected savings over 10 years, from 2012 to 2022, is more than $330,000.

	2012	2013	2014	2015	Total
Light fixtures replaced or permanently removed	142	841	327	412	1,722
Annual kilowatt hours saved	91,423	171,834	77,587	115,276	456,120
Annual cost savings	$6,763	$13,459	$5,613	$11,103	$36,938

Production and Distribution of Potable Water

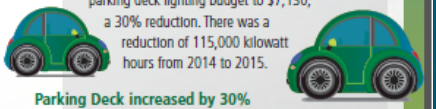
The Water Treatment Plant, with the wells, pumps and reservoirs necessary to produce potable water, is the largest single consumer of energy (predominantly electricity) and source of GHG emissions. The City's Water Treatment Plant expansion in mid-2009 enabled it to increase its production of potable water by 25% in 2011. By making substantial facility upgrades and utilizing energy efficient equipment, the amount of electricity required at the plant decreased.



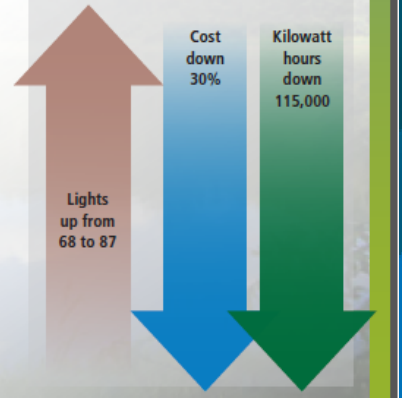
Case Study

Heart of the City Parking Deck

In 2014 the City of Burnsville enlarged the parking deck at the Heart of the City by 30%. Originally, there were 68 lights at the parking deck and the cost to light the deck annually was $10,110. In late 2014 the 68 lights were updated to LED lights and an additional 19 LED lights were added to the expanded parking area. Even with a substantial increase in lighting fixtures and parking space, the change to LED technology reduced the total parking deck lighting budget to $7,130, a 30% reduction. There was a reduction of 115,000 kilowatt hours from 2014 to 2015.



Parking Deck increased by 30%



Burnsville

Sustainability Dashboard

City Of Burnsville

SUSTAINABILITY UPDATE FOR 2015

SUSTAINABILITY ACTION

City of Burnsville awarded MN GreenStep 1, 2, 3, and now Step 4

Minnesota GreenStep Cities is a voluntary challenge, assistance and recognition program to help cities achieve their sustainability and quality-of-life goals. Launched in 2010, the program had three levels of recognition for city actions, now it has four.

Step 1: City council commits to work on implementing sustainability best practices through a city resolution.

Step 2: Implementation of 8 best practices.

Step 3: Implementation 16 best practices and completion of a handful of specific high-impact actions.

Step 4: Beginning in 2016 the GreenStep program challenges cities to measure and report – with numbers – the aggregate, quantitative results of taking multiple actions. Called city performance metrics (or sustainability indicators), these Step 4 measures attempt to present to community members the 'state of sustainability' achieved by a city.

97.6% of housing is within ¾ mile of transit routes

99.9% of housing is within ½ mile of parkland

The average MPG for city-owned gasoline fleet is 24.9 mpg

Environmentally preferable purchasing policy enacted

Green Team of employees from all departments

For more information on the MN GreenStep program and Burnsville's performance metrics go to http://greenstep.pca.state.mn.us/steps.cfm

Healthy Urban Forests

For the past three years, the City has been implementing its plan to deal with the invasive species, the Emerald Ash Borer (EAB). EAB, which will kill every unprotected ash tree in the city, is the most destructive and economically costly forest insect ever to invade North America.[1] The City's EAB Management Plan incorporates the most cost-effective and environmentally sound strategies by preemptively removing low-quality public ash trees (40% of the ash trees) and protecting the high-quality trees (60% of the ash trees). Compared to the outdated strategy that relied solely on tree removal and replacement to manage the infestation, studies have shown that the City's science-based approach can lower public costs over a 20-year study period by 40% while preserving twice the economic and environmental benefits.[2]

[1] Aukema JE, Leung B, Kovacs K, Chivers C, Britton KO, et al. (2011). "Economic Impacts of Non-Native Forest Insects in the Continental United States," PLoS ONE, 6(9): e24587. doi: 10.1371/journal.pone.0024587, http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0024587

[2] A Proposal to Create the Minnesota Ash Tree Preservation Program, Jeffrey M. Hafner and J. Michael Orange, September 2014.

What's Next?

COMPREHENSIVE PLAN

Burnsville's long-range plan for development, redevelopment, parks, public utilities, transportation, natural resources, city facilities, housing, youth and neighborhoods incorporates sustainability into each area to provide guidance for through the year 2040. The Comprehensive Plan establishes the foundation for community development and sets the stage for future improvements.

FLEET MANAGEMENT SYSTEM

The new Fleet Management System fully integrates the fleet maintenance software, fueling system and GPS tracking system. It allows the City to increase Fleet efficiencies, improve the productivity by tracking the usage of vehicles, and get the necessary information to right size the fleet. It also will reduce fuel usage and emissions by monitoring vehicle condition, limiting idle time and monitoring vehicle usage.

WATER METER READERS

The Automated Meter Infrastructure (AMI) will allow the City to better analyze water sold versus water pumped from the Quarry and ground water wells. Meter readings will be transmitted daily with alarm parameters set so we can immediately spot properties with issues. This will help conserve water.

COMMUNITY SOLAR GARDENS

The City Council approved awarding twelve contracts for solar energy production with community solar garden developers for approximately 47% of the energy provided to City of Burnsville facilities by Xcel Energy. Developers are working with Xcel Energy and hope to be producing solar energy in the 4th quarter of 2016.

17.00 x 11.00 in

Burnsville

Integrating Resilience into Comprehensive Plans

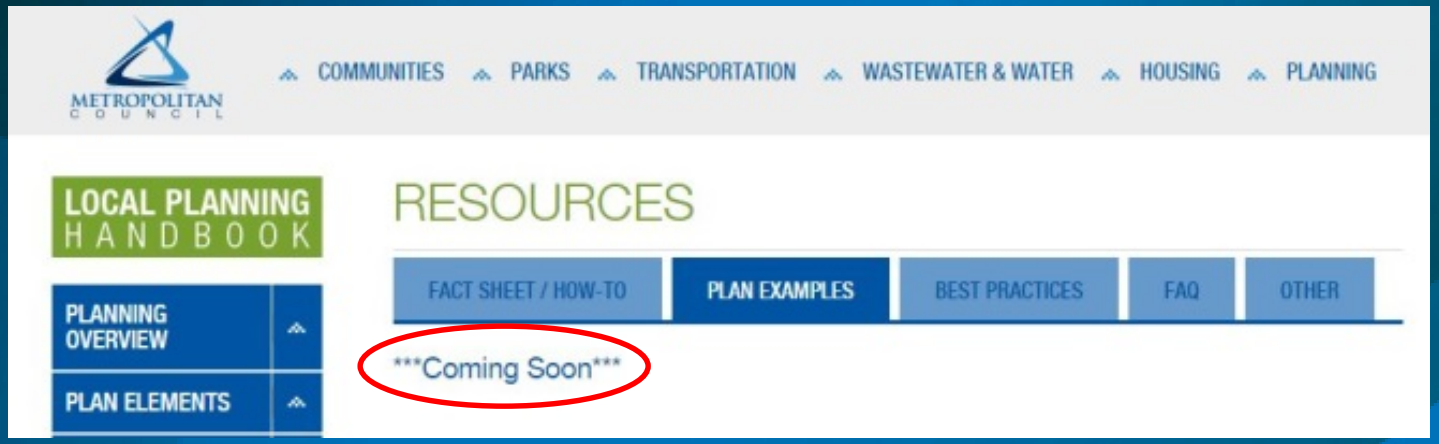
Two Approaches

1. Create a separate chapter in the plan

2. Resiliency is interwoven throughout the plan

Example Plan

- *Add existing plan example here – when available!*



Preferred Approach

- Overwhelming choice so far is to weave resiliency/sustainability throughout the plan.
- Approach chosen for the Burnsville Comprehensive Plan

References and Benchmarks

- Existing Sustainability (Resilience) Plans, Policies, Strategies, Programs, etc.
- Green Step Cities Program – 29 best practices, 175 unique actions.
- Resiliency Action List – comprehensive listing of resilient design criteria.

Incorporate Current Plans

BURNSVILLE

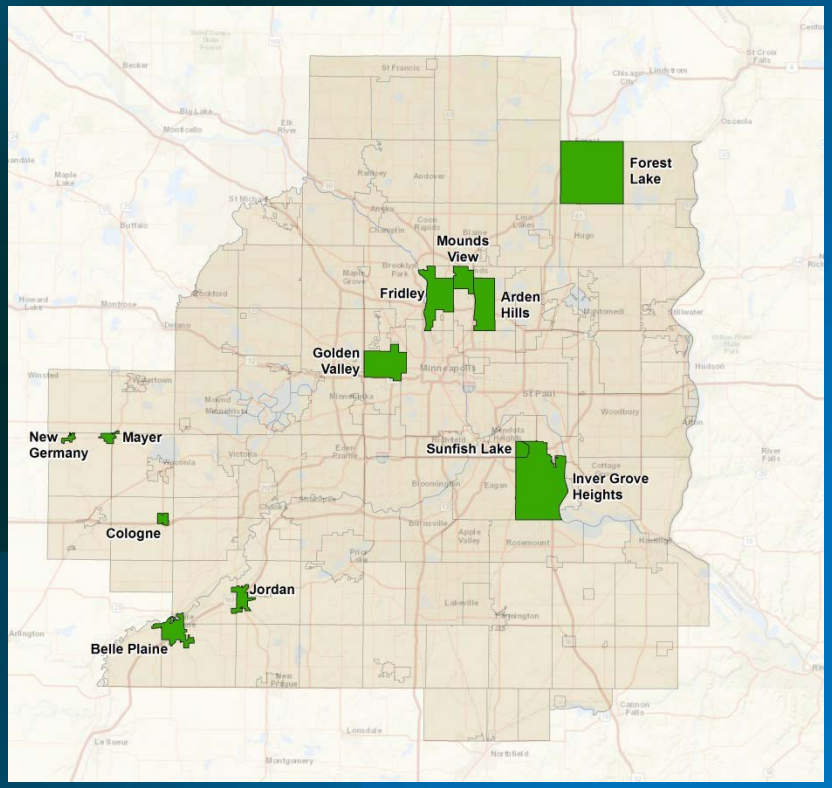
Sustainability Guide Plan

Burnsville

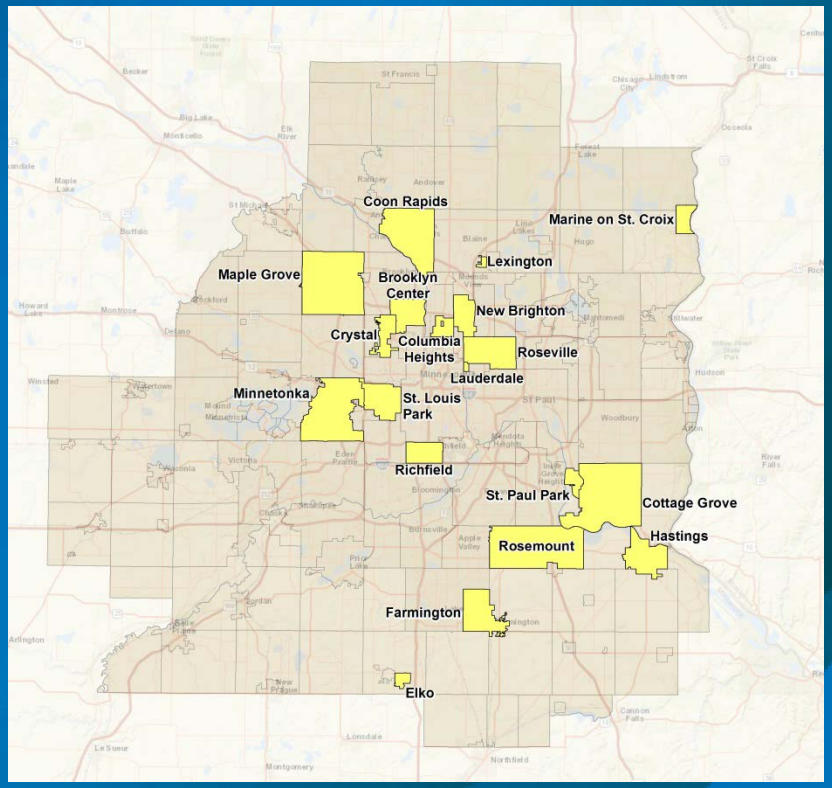
Green Step Cities

- Twenty-nine best practice areas related to:
  - Transportation
  - Buildings and Lighting
  - Environmental Management
  - Land Use
  - Economic and Community Development

GreenStep Cities

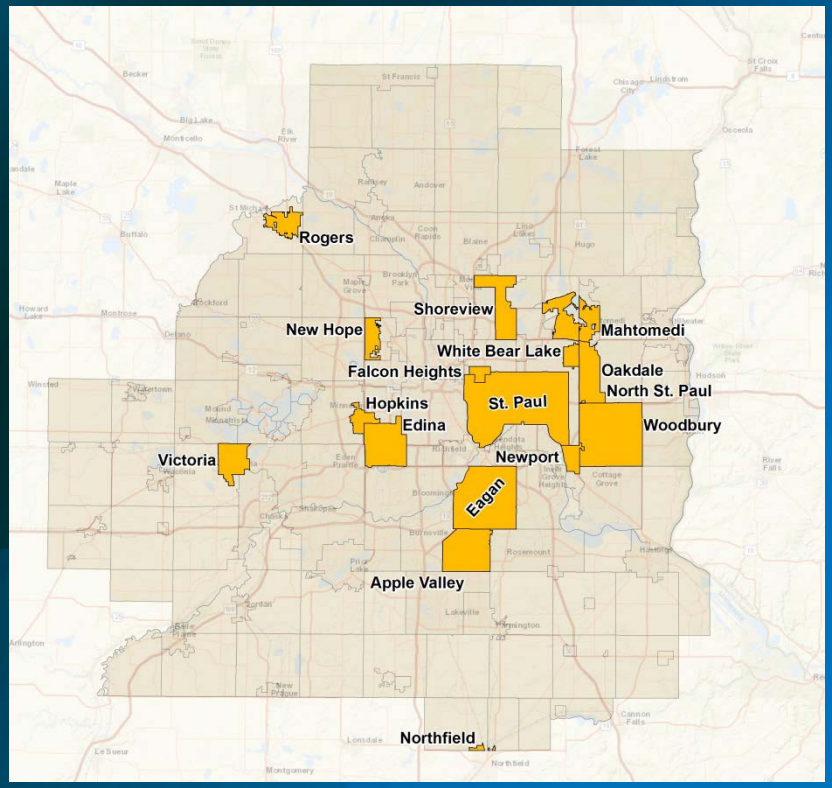


Step 1 Cities

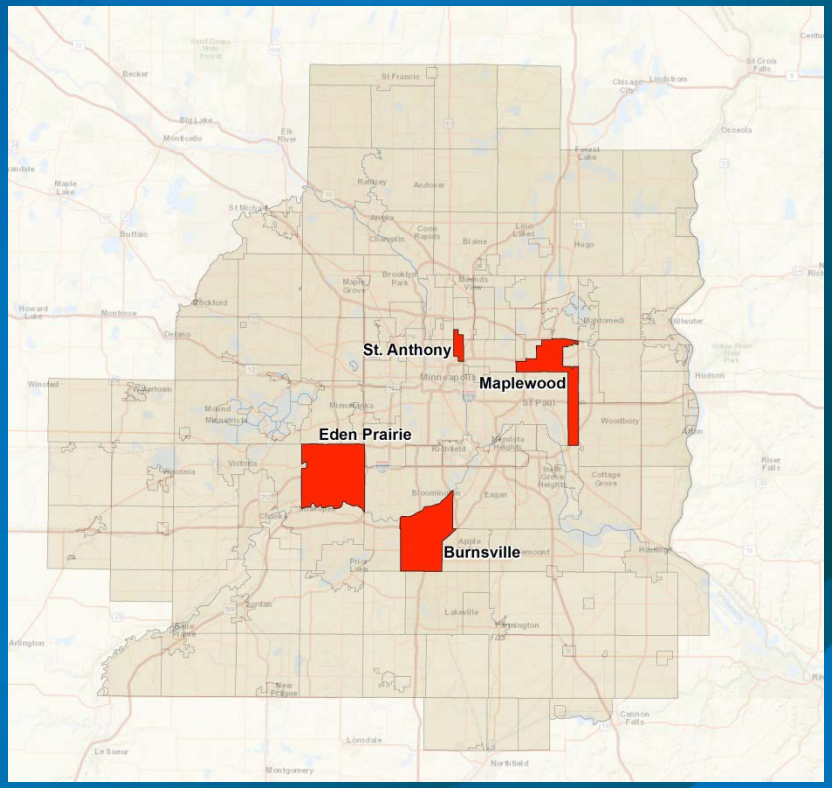


Step 2 Cities

GreenStep Cities

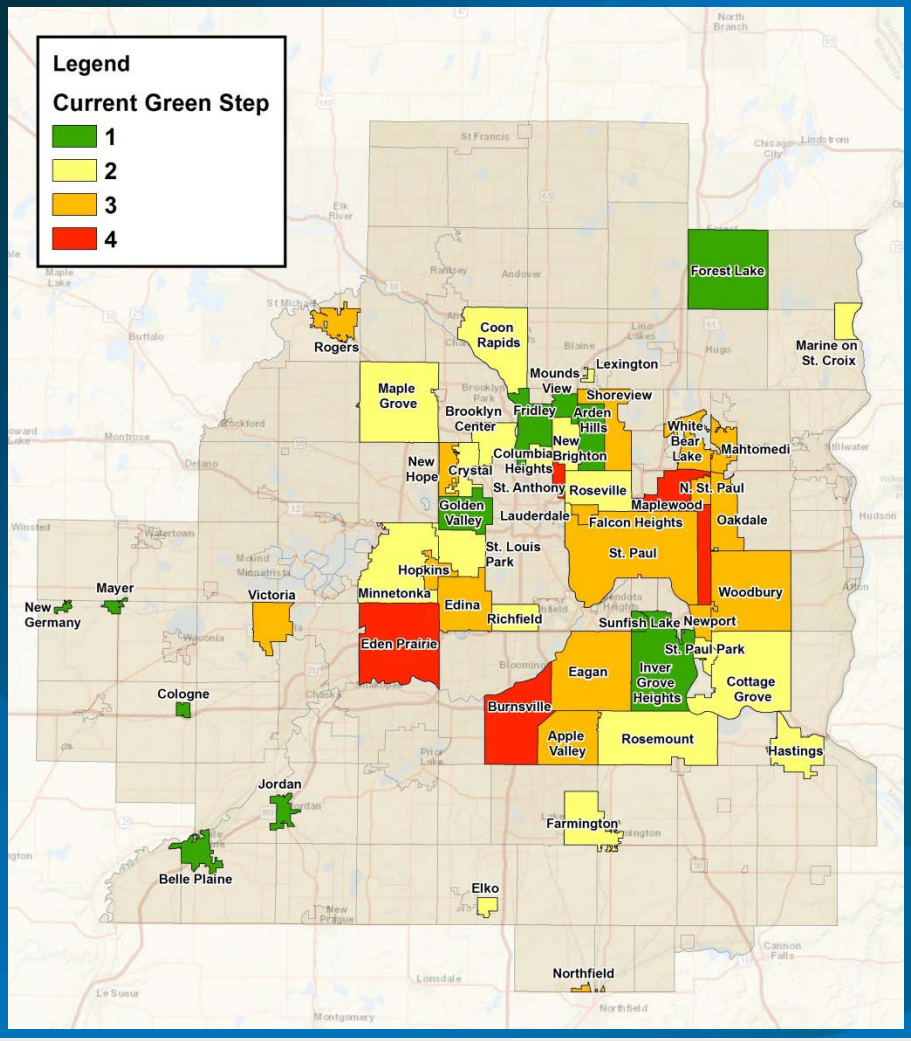


Step 3 Cities



Step 4 Cities

GreenStep Cities



Applying GreenStep Practices

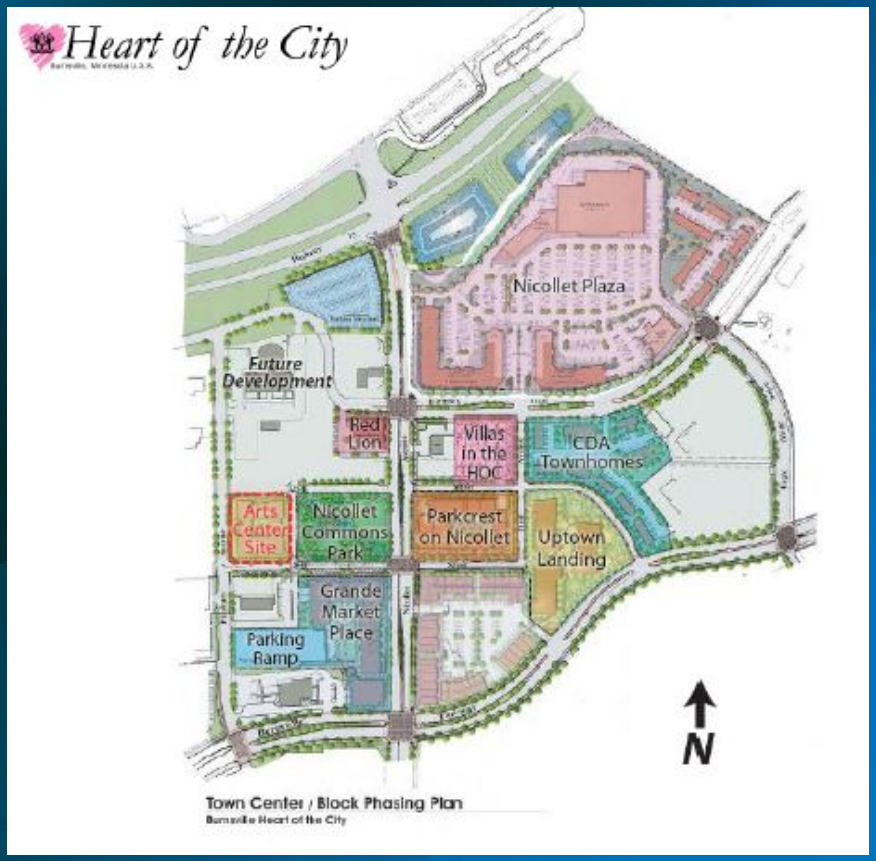
Plan Chapters

- Community Overview
- Future Land Use
- Redevelopment
- Economic Development
- Housing
- Neighborhoods
- Youth
- Natural Resources
- Transportation
- City Services and Facilities
- Water Resources
- Implementation

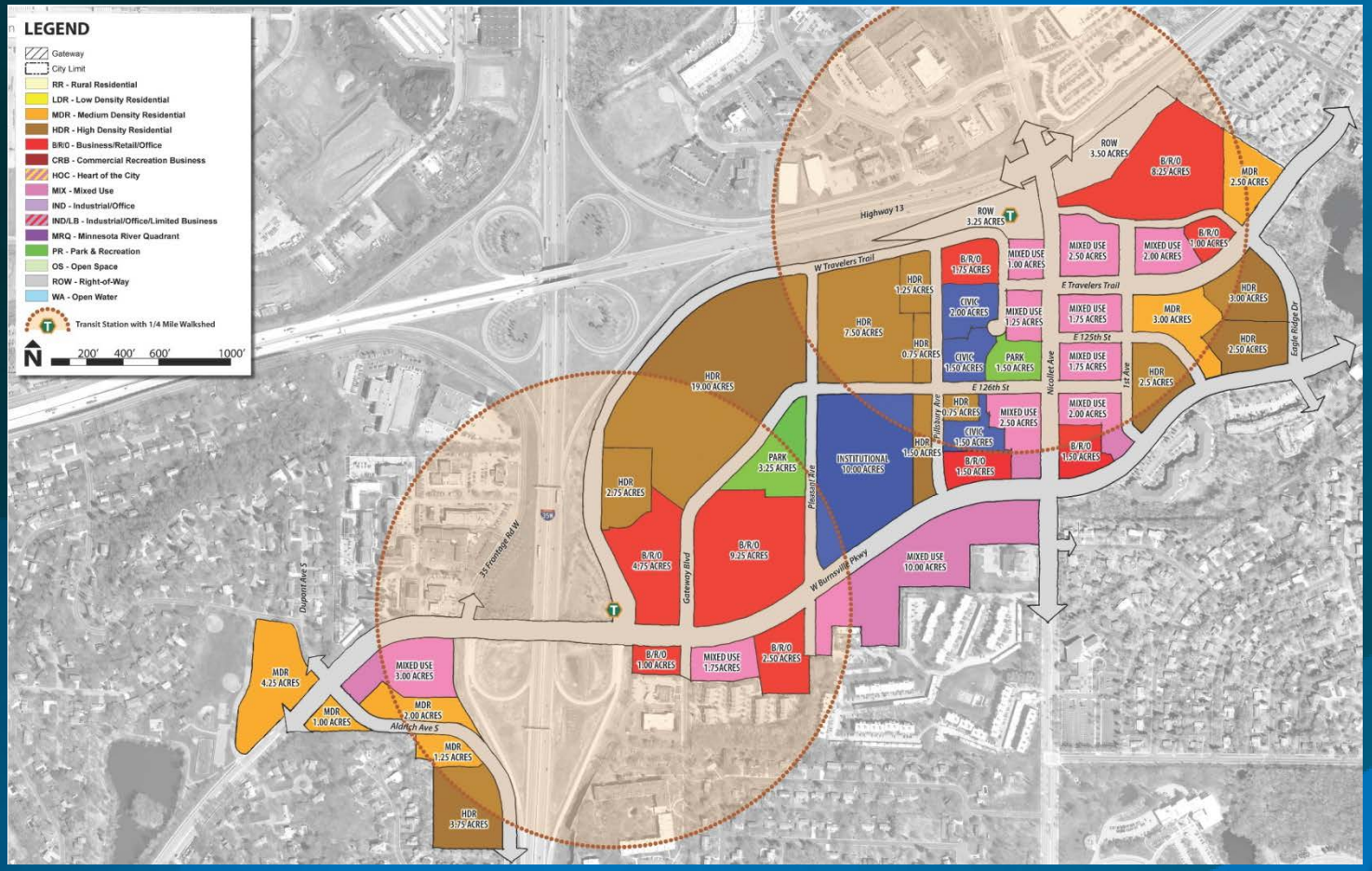
Best Practices

- Transportation
- Buildings and Lighting
- Environmental Management
- Land Use
- Economic and Community Development

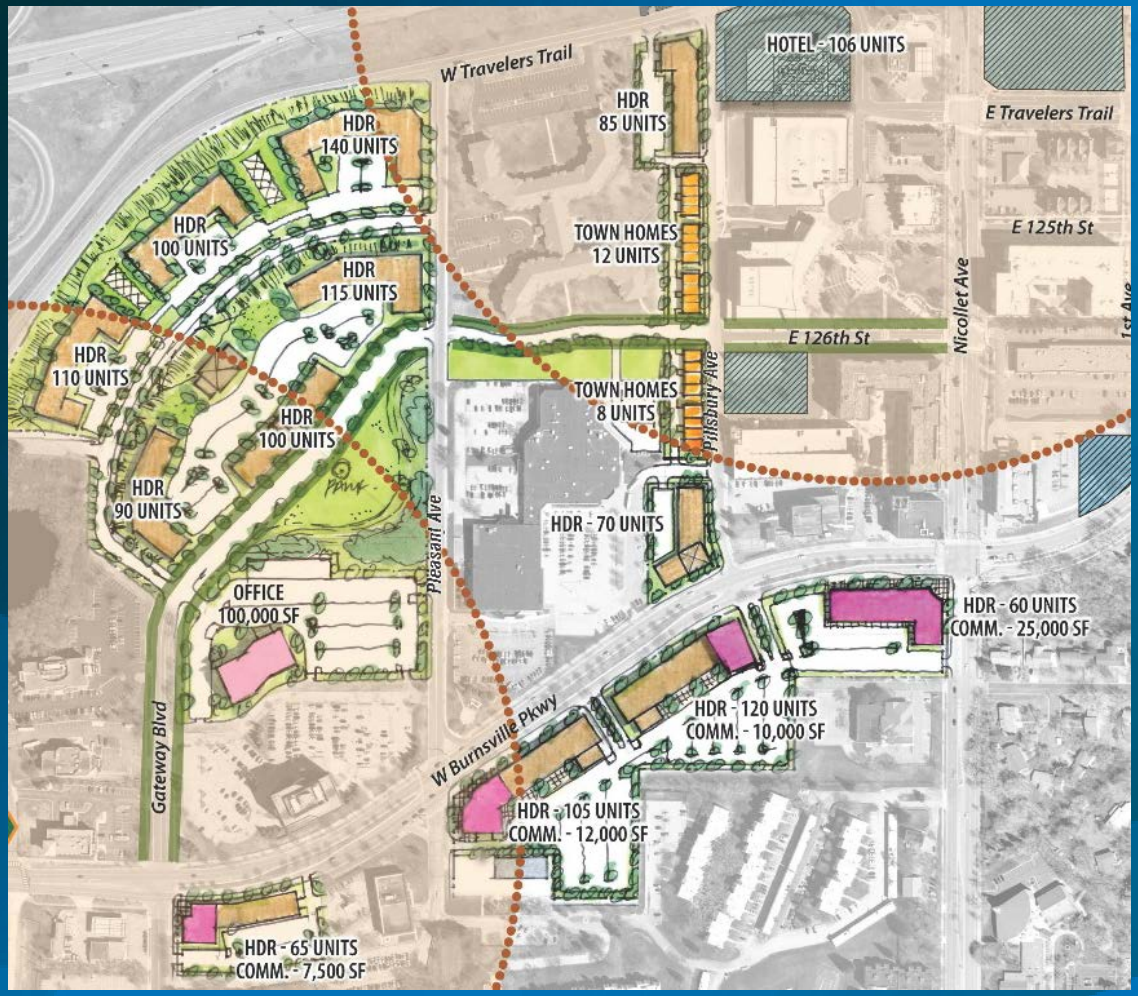
Example – Heart of the City



HOC - 2040 Plan



HOC – 2040 Plan



Applying Best Practice to HOC

- Efficient Buildings
- New Green Buildings
- Efficient Outdoor Lighting
- Building Redevelopment
- Efficient City Growth
- Mixed Uses
- Mobility Options
- Demand-side Travel Planning
- Stormwater Management
- Parks and Trails
- Surface Water Quality
- Business Synergies

Resiliency Action List

RELi RESILIENCY ACTION LIST (FULL)

REFERENCE BRIEF

For Communities, Buildings, Homes + Infrastructure

Pilot V1.1

An Action List + Strategic Resource Incorporated into the Green + Resilient Property Underwriting Standards

For Field Interpretation

C3 Living Design . Capital Markets Partnership . AREA Research . University of Minnesota Arch8561

MAY 2015 | ORIGIN AUG 2014

RELi ACTION LIST C3LivingDesign.org / RELi

S	C	Poly-Credit 2	Community Connectivity: Walkability, Public Transit, Non-motorized Transit	TBD	Y	LEED V4
S		Credit 2.1	Surrounding Density + Diverse Uses (Option 1. Surrounding Density)	TBD		LEED NC V4
S		Credit 2.2	Access to Quality Transit	TBD		LEED NC V4
S		Credit 2.3	Bicycle Facilities	TBD		LEED NC V4
S		Credit 2.4	Reduced Parking Footprint	TBD		LEED NC V4
	C	Credit 2.5	Preferred Location	TBD		LEED NC V4
	C	Credit 2.6	Access to Quality Transit	TBD		LEED NC V4
	C	Credit 2.7	Bicycle Facilities	TBD		LEED NC V4
	C	Credit 2.8	Walkable Streets	TBD		LEED ND V4
	C	Credit 2.9	Compact Development	TBD		LEED ND V4
	C	Credit 2.10	Connected and Open Community: Surrounding Connectivity (Case 1.)	TBD		LEED ND V4
	C	Credit 2.11	Connected and Open Community: Internal Connectivity (Case 2.)	TBD		LEED ND V4
S	C	Poly-Credit 3	Community Connectivity: Mixed-Use Commercial, Housing + Public / Community Space	TBD	Y	LEED | RELi
S	C	Credit 3.1	Surrounding Density + Diverse Uses (LEED NC, Option 2. Diverse Uses)	TBD		LEED V4
S	C	Credit 3.2	Surrounding Density + Diverse Uses (RELi Resilient Use Categories)	TBD		RELi

“Resilience is all about being able to overcome the unexpected. Sustainability is about survival. The goal of resilience is to thrive.”

Jamais Cascio

Thank You

PlanIt

Questions?

METROPOLITAN COUNCIL