



Climate Change in Bloomington

Bloomington League of Women Voters

April 4, 2023



Emma Struss

City of Bloomington's
Sustainability Coordinator

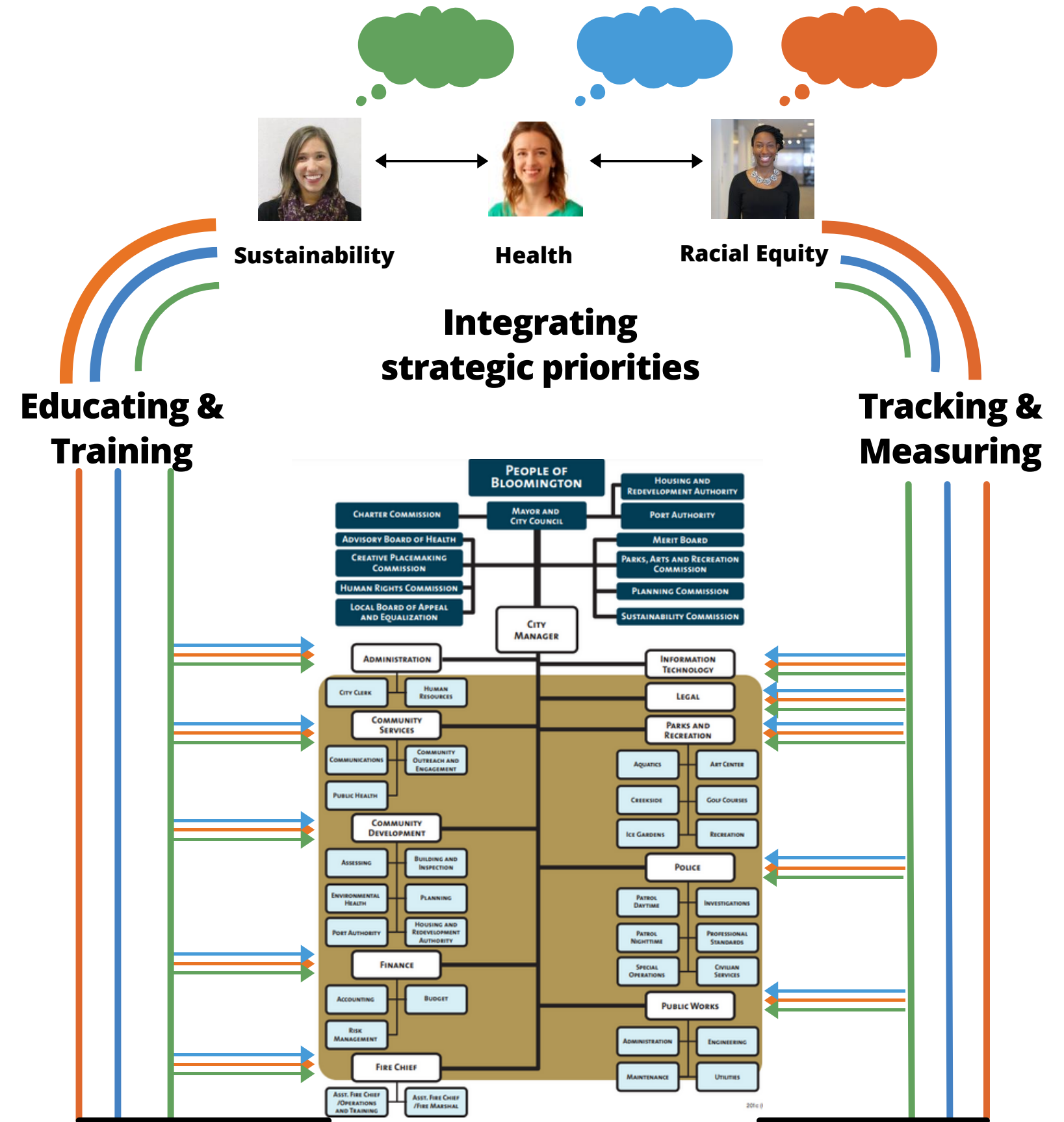
CREATE, LEAD, AND MANAGE CHANGE TO ENSURE SUSTAINABILITY IS EMPHASIZED

SERVE AS EDUCATIONAL AND EXPERT LIASION TO THE PUBLIC, STAFF, AND ELECTED OFFICALS

DEVELOP POLICIES AND PROGRAMS TO REACH SUSTAINABILITY GOALS

BACKGROUND IN ENERGY AND TRANSPORTATION

STAFF LIASON TO THE SUSTAINABILITY COMMISSION



Tonight's Agenda

Part 1: The Situation

- How are we contributing to the problem?
- How will climate change affect us?

Part 2: What can cities do?

- How can we reduce greenhouse gas emissions?
- What has the City done?

Part 3: Next Steps

- 2023 City Sustainability Efforts

Part 4: Discussion

- Q&A

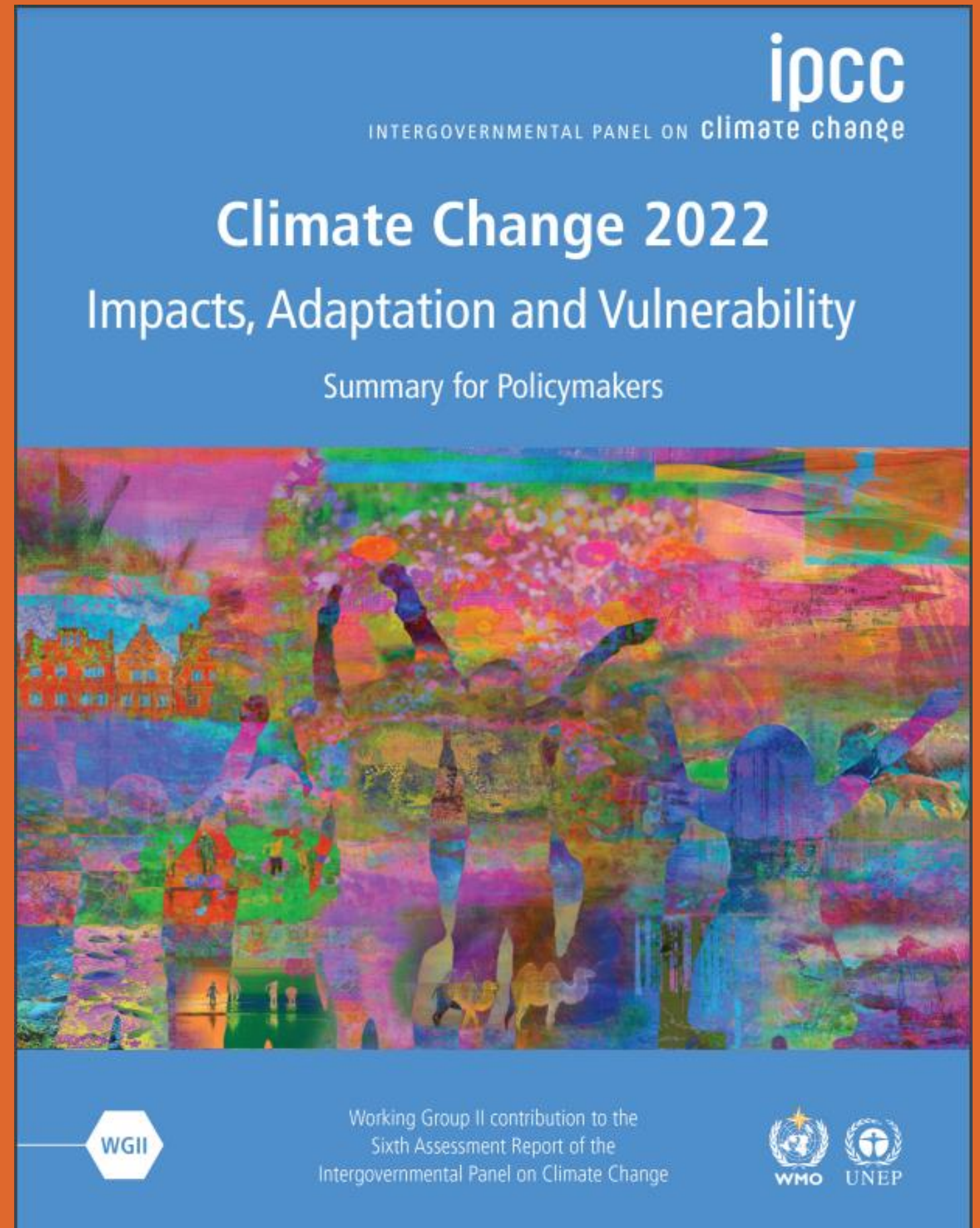
Climate Trivia

Trivia Question 1

"The Earth is now about 1.1°C warmer than it was in the 1800s. We are not on track to meet the Paris Agreement target to keep global temperature from exceeding ____°C above pre-industrial levels. That is considered the upper limit to avoid the worst fallout from climate change." -IPCC

Fill in the blank. What is the temperature?

- a) 1.5
- b) 2.1
- c) 1.3
- d) 2.5



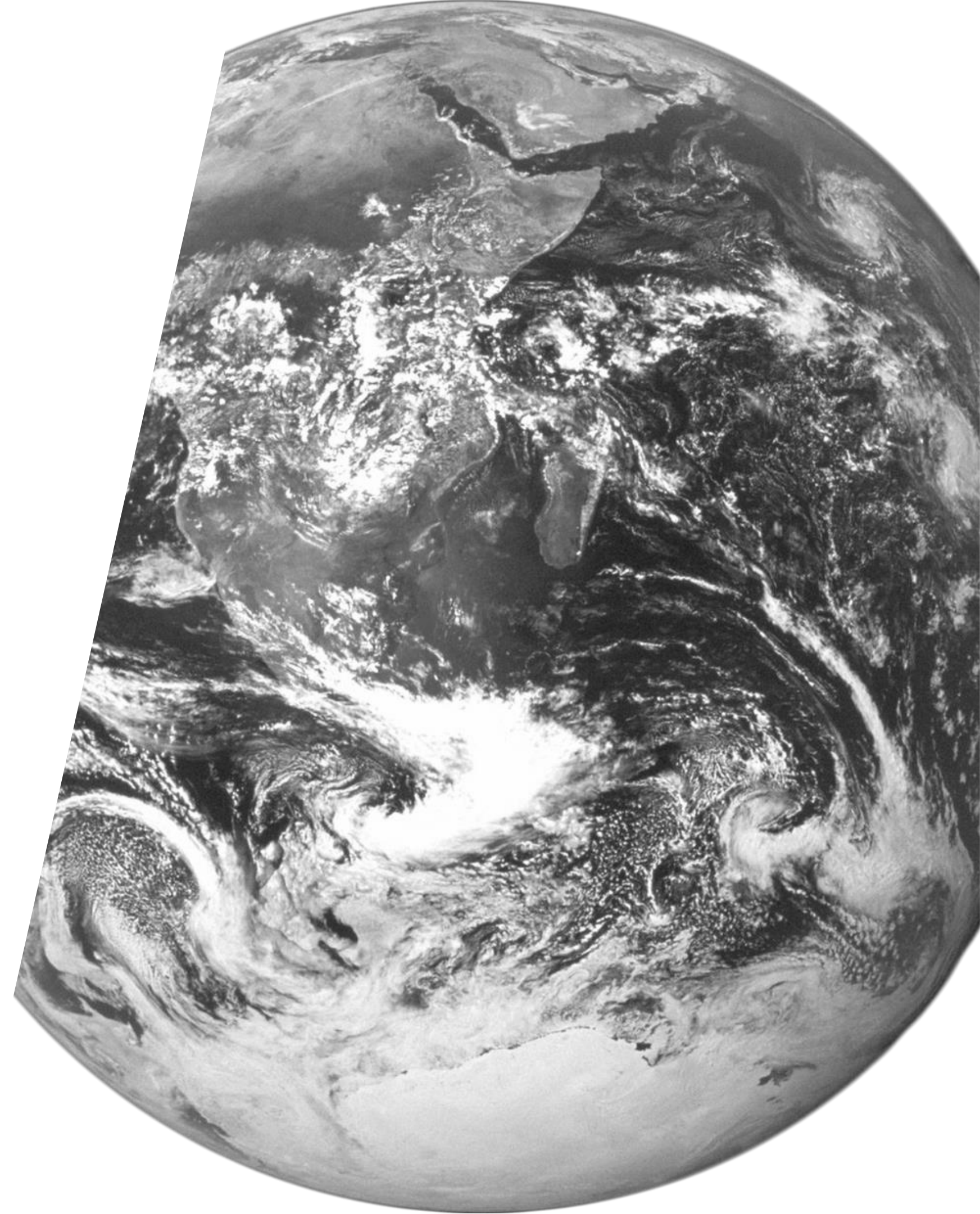
Trivia Question 2

"The report finds that limiting global warming to 1.5°C would require “rapid and far-reaching” transitions in land, energy, industry, buildings, transport, and cities. Global net human-caused emissions of carbon dioxide (CO₂) would need to fall by about 45 percent from 2010 levels by _____, reaching ‘net zero’ around _____. This means that any remaining emissions would need to be balanced by removing CO₂ from the air."

-IPCC

Fill in the blank. What are the years?

- a) 2050, 2100 b) 2030, 2050
- c) 2050, 2080 d) 2100, 2150





Trivia Question 3

Scientists anticipate Bloomington will experience which of the following due to climate change?

- a) more summer heat waves
- b) hotter peak summer temperatures
- c) warmer winters
- d) more extreme rain events
- e) all of the above



Warming, Heat, and Humidity

- ▲ Increased frequency and severity of heat-induced illness.
- ▲ Increased air pollution and reduced air quality.
- ▲ Greater demand for energy use, air conditioning, and community cooling options.
- ▲ Disruption and damage to the transportation system.



Warming Winters

- ▲ Increased freeze thaw cycling.
- ▲ Increased power outages from ice events.
- ▲ Increased risk of tick-borne disease.
- ▲ Increased survival of invasive species.



Extreme Precipitation

- ▲ Increased safety risk from moving or deep water.
- ▲ More frequent property damage.
- ▲ More frequent disruption of traffic corridors.
- ▲ Increased cost of future roadway design and construction.

RESOLUTION NO.

**RESOLUTION DECLARING A CLIMATE EMERGENCY
IN BLOOMINGTON, MINNESOTA**

BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF BLOOMINGTON, MINNESOTA that based on the following, the City of Bloomington declares that a climate emergency threatens our city, region, state, nation, humanity, and the natural world.

WHEREAS, recent scientific research indicates that to achieve the goal of limiting temperature increase to 1.5 degrees Celsius, carbon emissions must be halved by 2030 and reach net zero global emissions by 2050; and

WHEREAS, in the Twin Cities annual average temperatures increased by 3.2° Fahrenheit from 1951 to 2012, and globally we have already reached a temperature increase of nearly 1.1 degrees Celsius (nearly 2 degrees Fahrenheit) as compared to pre-industrial times. The death and destruction already wrought by this level of global warming demonstrate that the Earth is already too hot for safety and justice, as attested by increased and intensifying wildfires, floods, rising seas, diseases, droughts, and extreme weather. In Minnesota, the ten warmest and wettest years ever recorded have all occurred since 1998; and

WHEREAS, in the past year, the City of Bloomington has experienced numerous climate change related impacts, including: a record summer heat wave, dangerous air quality from forest fires where even healthy people were encouraged to remain inside, and city-imposed watering restrictions, making it clear that the climate crisis is affecting us now and will continue to affect future generations; and

WHEREAS, climate change will create new challenges for the City of Bloomington's infrastructure and finances, such as storm water control and rising insurance rates which will threaten the economic vitality of our residents and businesses; and

WHEREAS, over half of Minnesota birds are threatened by climate change, nearly a quarter of species in North and South America risk extinction, natural diversity is essential for humans to thrive, and warming winters are allowing northern migration of pests to Minnesota; and

WHEREAS, the greatest burden from an inadequate response to the climate crisis will be felt by historically marginalized or underserved communities as well as the youngest generation, including the children and grandchildren of the City of Bloomington; and

WHEREAS, in April 2016 world leaders from 175 countries, including the United States, recognized the threat of climate change and the urgent need to combat it by signing the Paris Agreement, agreeing to "pursue efforts to limit the temperature increase to 1.5 degrees Celsius;" and

WHEREAS, the bi-partisan Next Generation Energy Act, passed by the Minnesota State Legislature and signed by then Governor Tim Pawlenty in 2007, committed our State to

Trivia Question 4

What year did the City of Bloomington declare a climate emergency?

a) 2013

b) 2017

c) 2018

d) 2022

e) Photoshop can't fool me! The City hasn't declared one.

Trivia Question 5

How is Bloomington contributing to climate damage?



Trivia Question 6

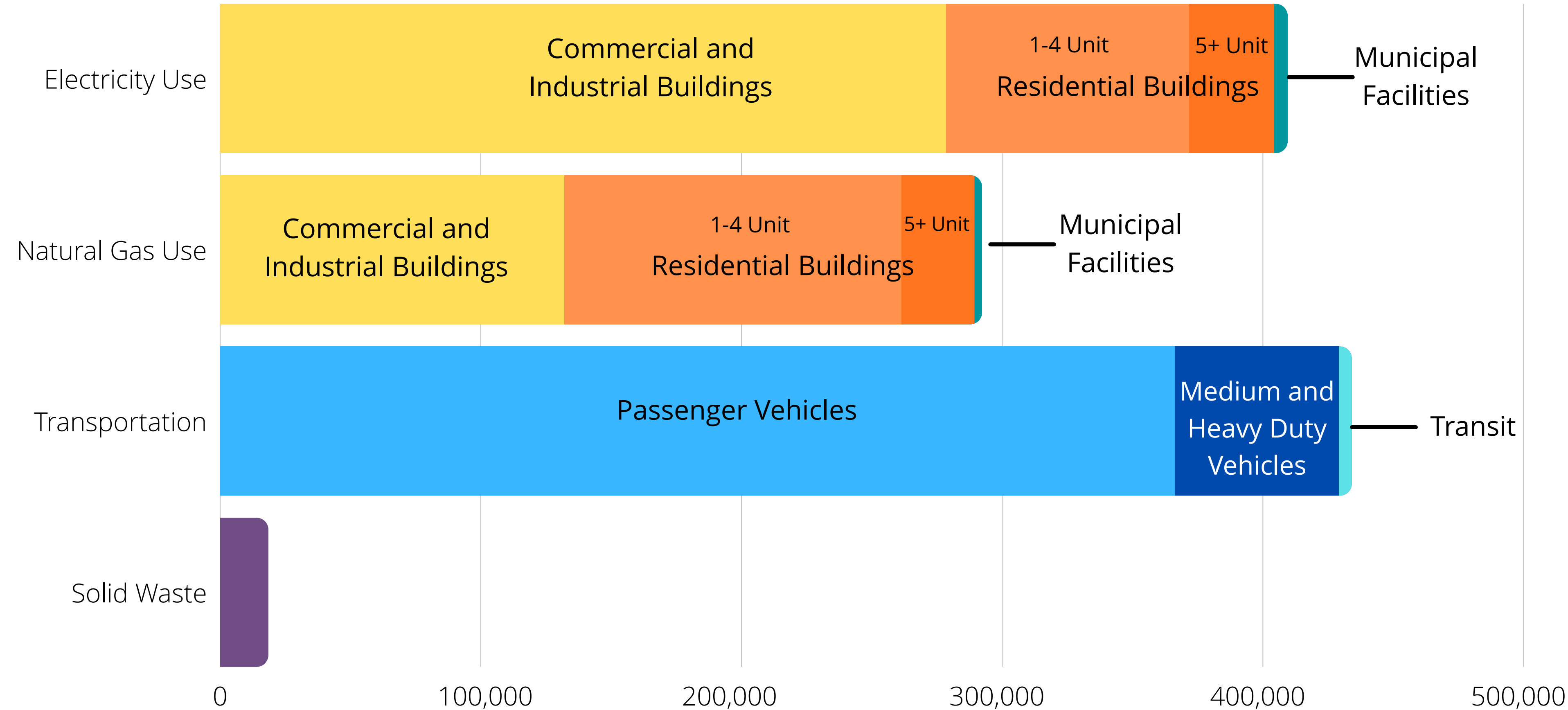
What is the largest source of greenhouse gas emissions in Bloomington?

- a) transportation
- b) solid waste
- c) natural gas & electricity use in buildings



**The largest
sources of
greenhouse
gas emissions
in Bloomington
are...**

Sources of Bloomington's Greenhouse Gas Emissions



Source: CenterPoint Energy, Xcel Energy, [Met Council's Greenhouse Gas Inventory](#), [Regional Indicator Initiative](#)

MTCO2e

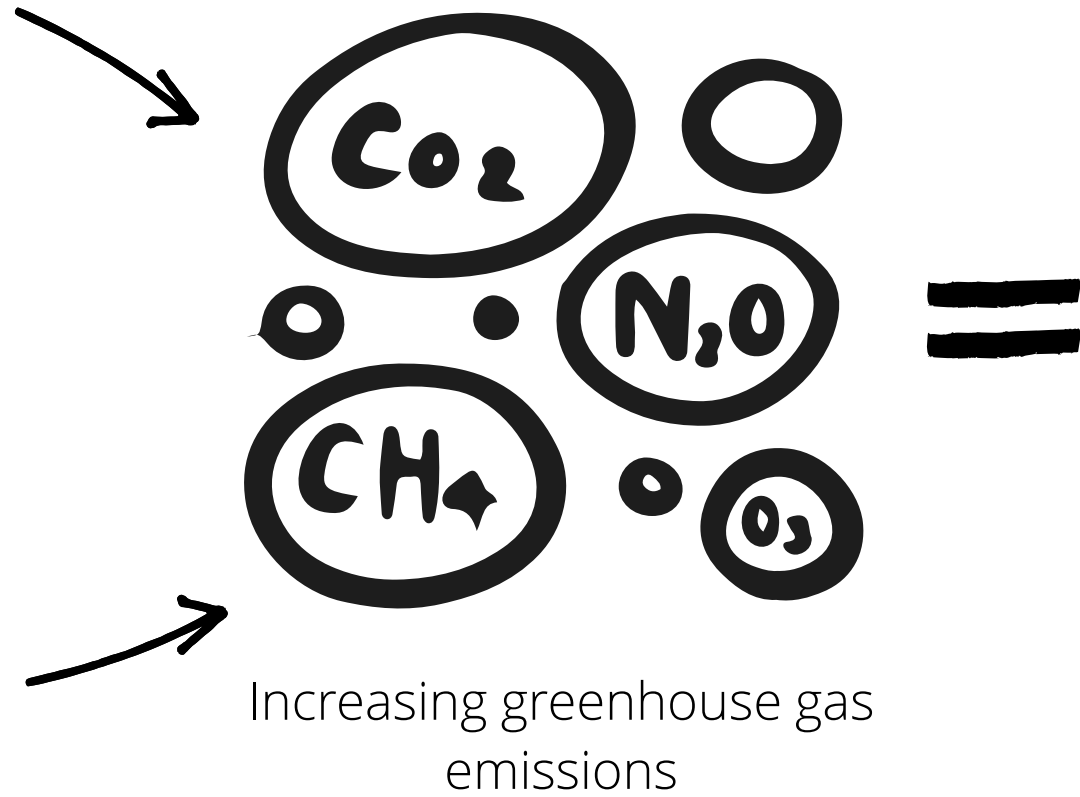
Climate Change



Energy



Transportation



EXTREME HEAT



EXTREME RAIN EVENTS



WARMER WINTERS



How will climate change affect our health?



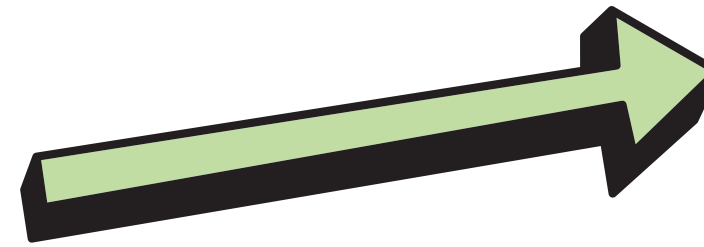
Health Effects



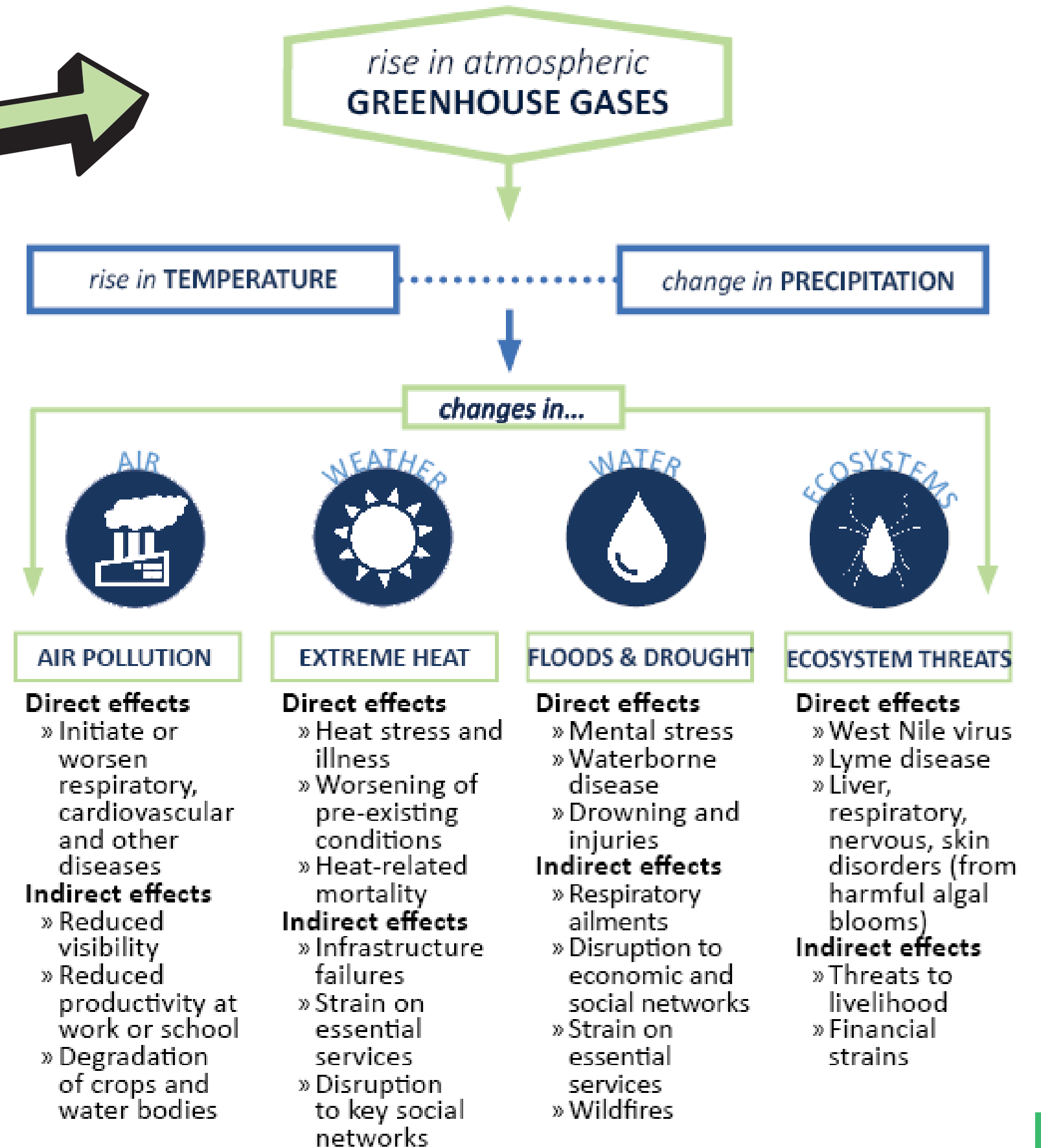
Using Energy



Driving



CHANGES IN OUR ATMOSPHERE LEAD TO HEALTH EFFECTS



Who is most impacted by climate change?

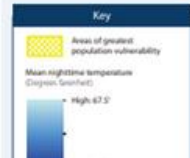


Racial Equity

Extreme heat

Increased temperatures combined with increased humidity will disproportionately affect residents with underlying health conditions, especially those with limited means to adapt.

Figure 6: Heat Island – August Nighttime



Urban heat islands and vulnerable communities

Many urban areas have more concrete and other impermeable surfaces that radiate heat along with less tree canopy and greenspace to mitigate the heat. This creates urban heat islands where the temperature measured can be significantly higher than the official reported temperature. The continued rise of temperatures due to climate change is likely worsening this heat island effect.

Occurrences of daytime extreme heat are projected to increase by 2050. While a couple of degrees may not seem significant, increased temperatures combined with increased humidity will disproportionately affect residents with underlying health conditions, especially those with limited means to adapt.

Areas with those most vulnerable to the effects of extreme temperatures and the urban heat island are shown in the map (Figure 6). The map was developed using average August nighttime mean temperatures from August 2011 to August 2014, which was derived from a study by the University of Minnesota³, overlain with the areas of greatest population vulnerability. Nighttime temperatures are an important factor because our bodies are evolved to cool down

Extreme Heat

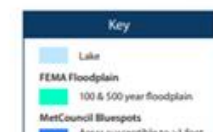
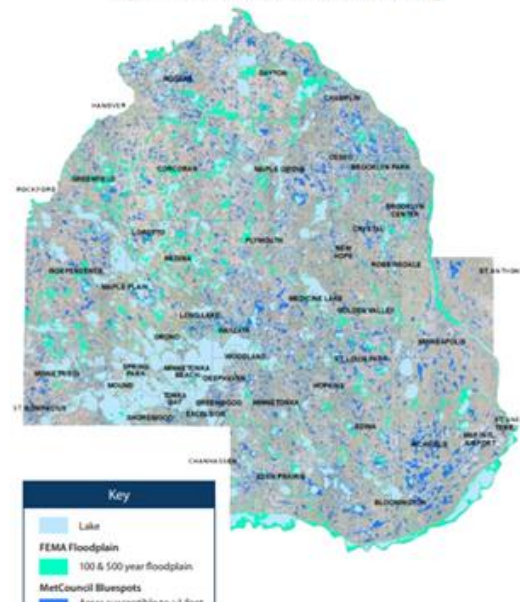
Urban areas with less tree canopy and greenspace and more impervious surfaces that radiate heat create heat islands

Increased stormwater and localized flooding

Surface water impacts are determined by how much and how quickly precipitation falls and by the ability of soils to infiltrate water or the capability of stormwater conveyance systems to drain it away.

This map (Figure 9) depicts the location of 100-year and 500-year floodplains as mapped by FEMA. A 100-year flood is more accurately defined as a flood that has a 1% probability of occurring in any one year. Due to increasing precipitation, the 500-year floodplain is rapidly becoming the new 100-year floodplain. While many FEMA maps take into account storm sewer capacity and soil types, the mapping doesn't present a full picture because it doesn't consider localized flooding. The Minnesota Department of Natural Resources is working to

Figure 9: Areas susceptible to flooding



Flooding

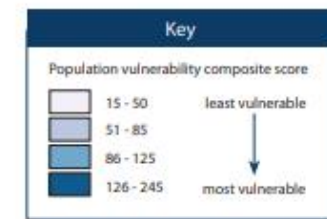
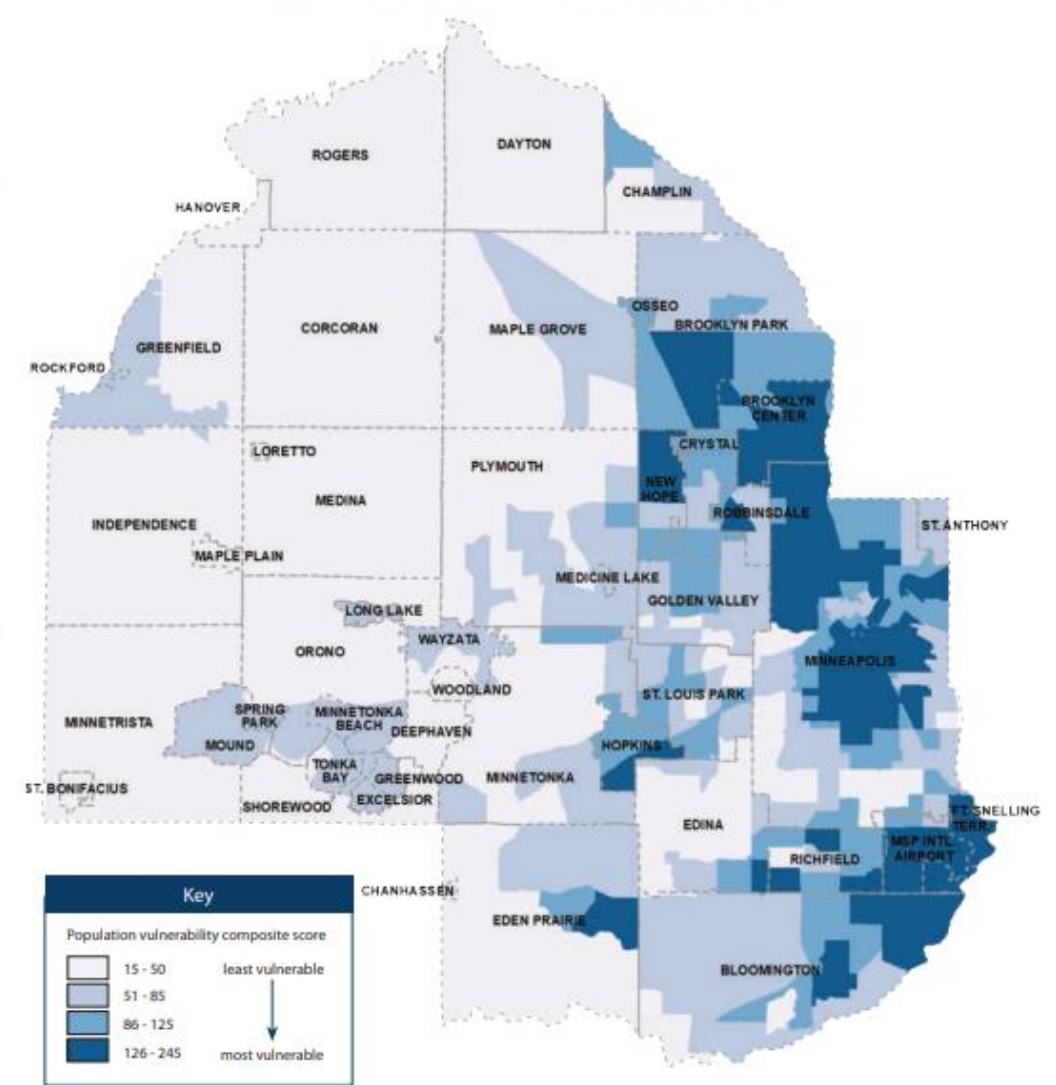
The eastern side of Bloomington has a higher percentage of BIPOC residents and has more areas susceptible to >1 ft of flooding

This map will be used to inform decision-making and help staff determine where to prioritize work to reduce specific vulnerabilities. This dataset can be used as a base layer to which additional program-specific datasets can be overlaid to provide a climate lens on decision-making. This will build on the county's use of a race equity impact tool to create a more robust picture about the impact of a policy, program, or budget decision. Using these tools can help staff and others consider how people of color and other people who are more susceptible to negative climate impacts may benefit or be burdened by those decisions.

Variables included:

- Asthma hospitalization rates
- COPD hospitalization rates
- Households with no vehicle
- Limited English language proficiency
- Median household income
- No high school degree
- People of color
- Population age 5 and under
- Populations below 185% poverty threshold
- Population density
- Population age 65 and older
- Population with any disability
- Renter housing units
- Unemployment rates

Figure 5: Human vulnerability index



Part 2

What can
cities do?



How can we
reduce
greenhouse gas
emissions?





Energy

Energy

What can we do to reduce greenhouse gas emissions?

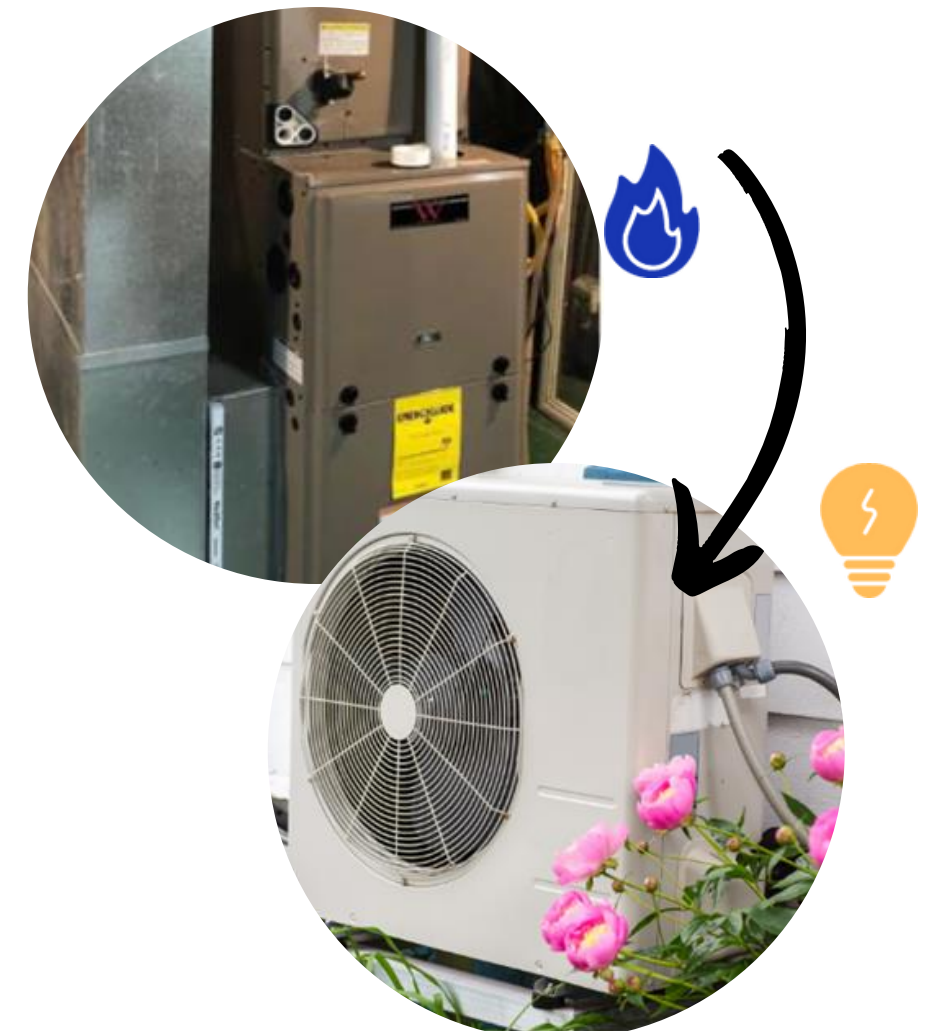
Energy Efficiency



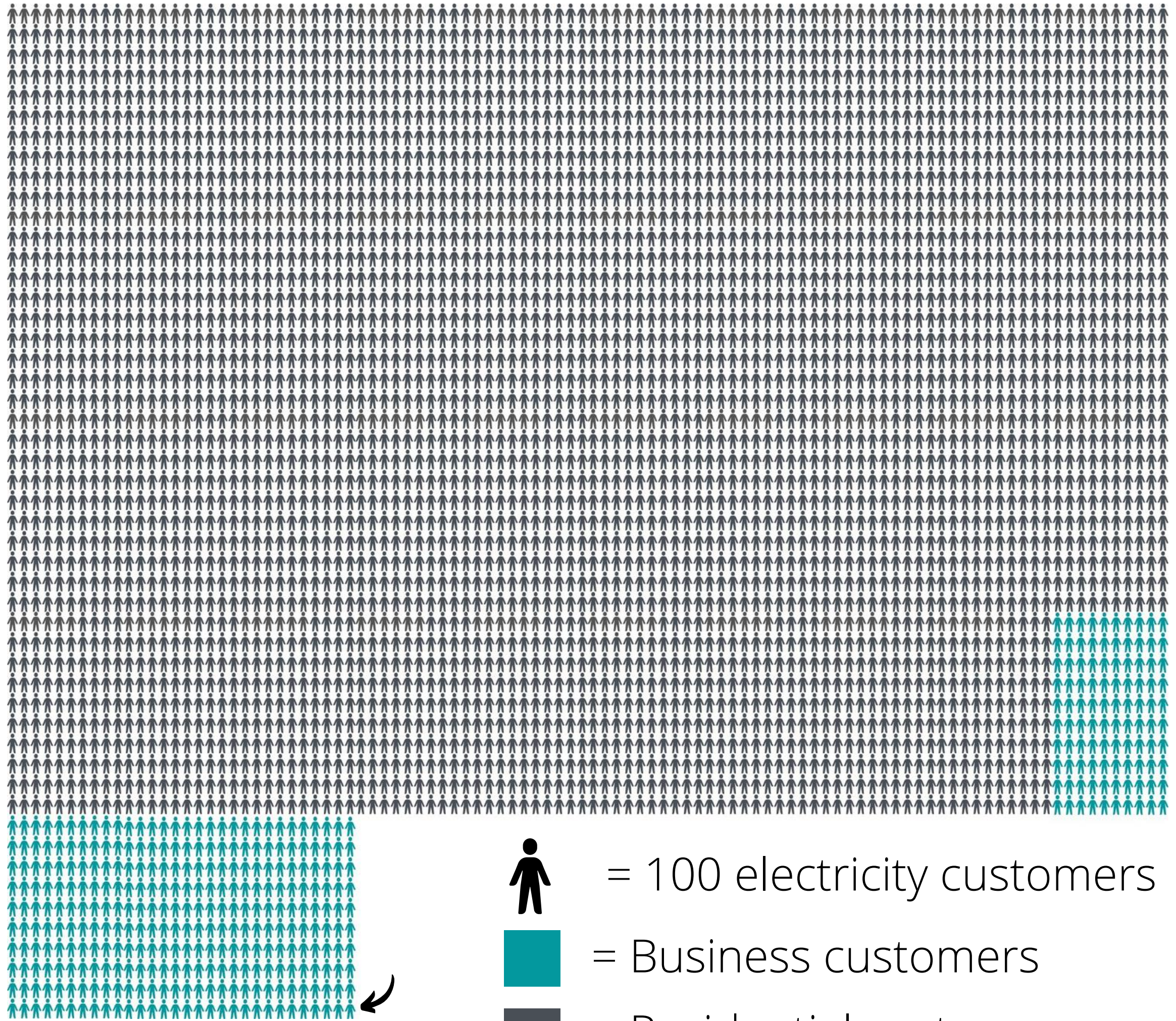
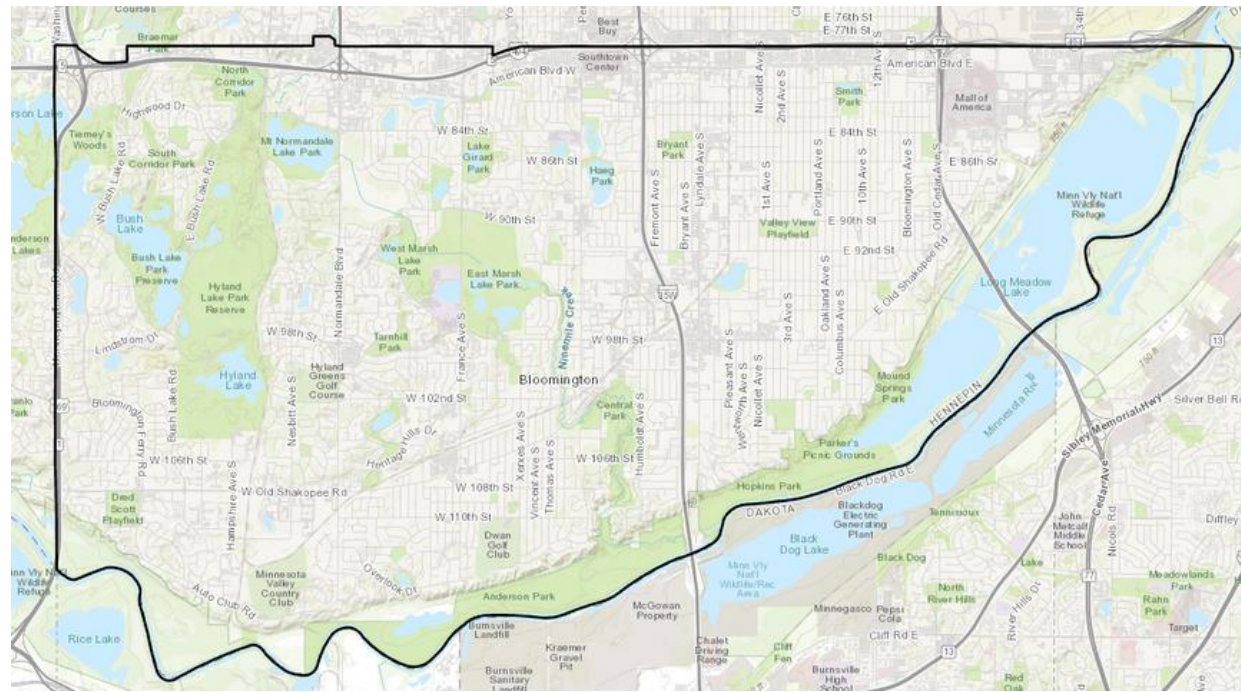
Renewable Energy



Fuel Switching or Electrification



~43,000 Xcel Energy Customers in Bloomington (2020)



= 100 electricity customers

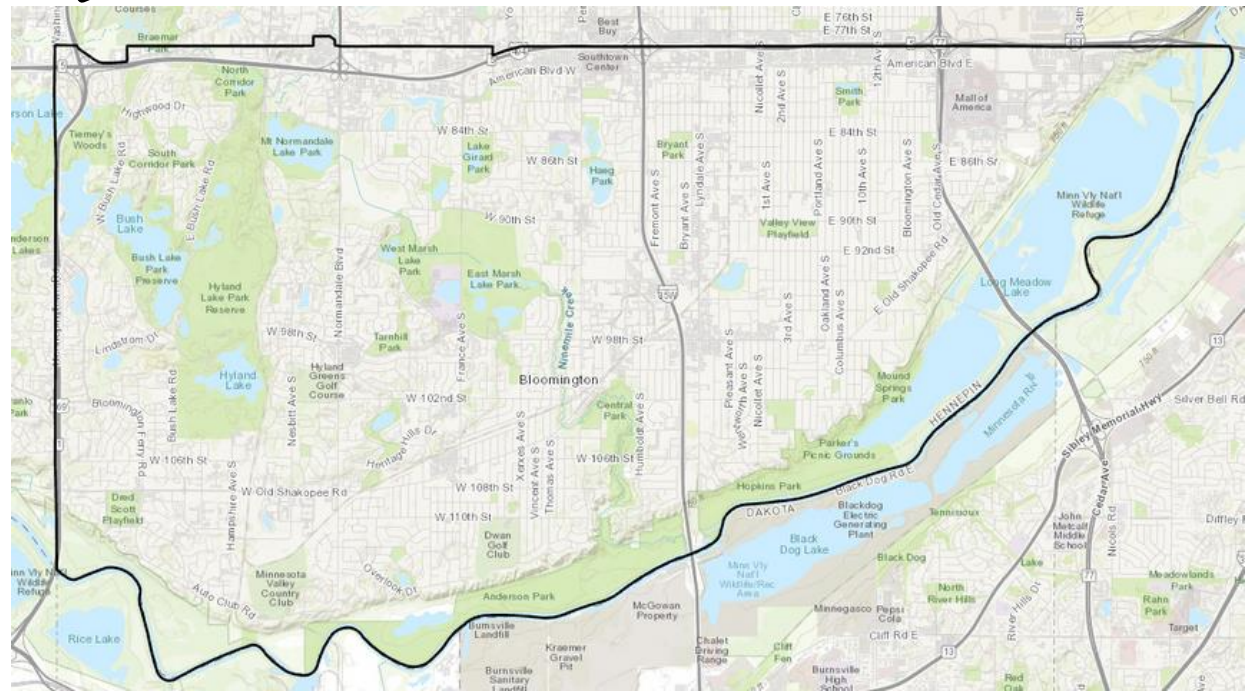





= Business customers

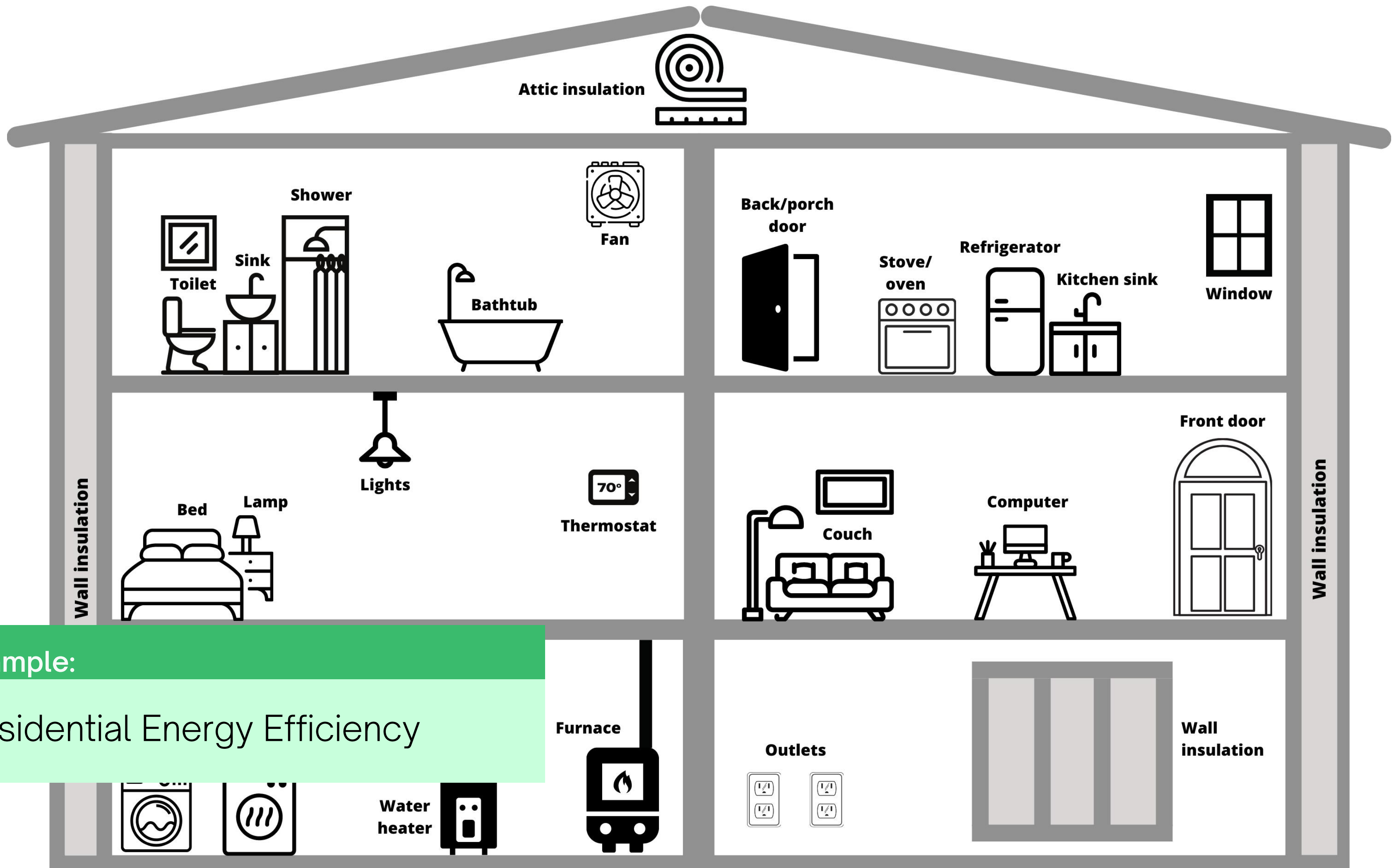


= Residential customers

~30,475 CenterPoint Energy Customers in Bloomington (2020)



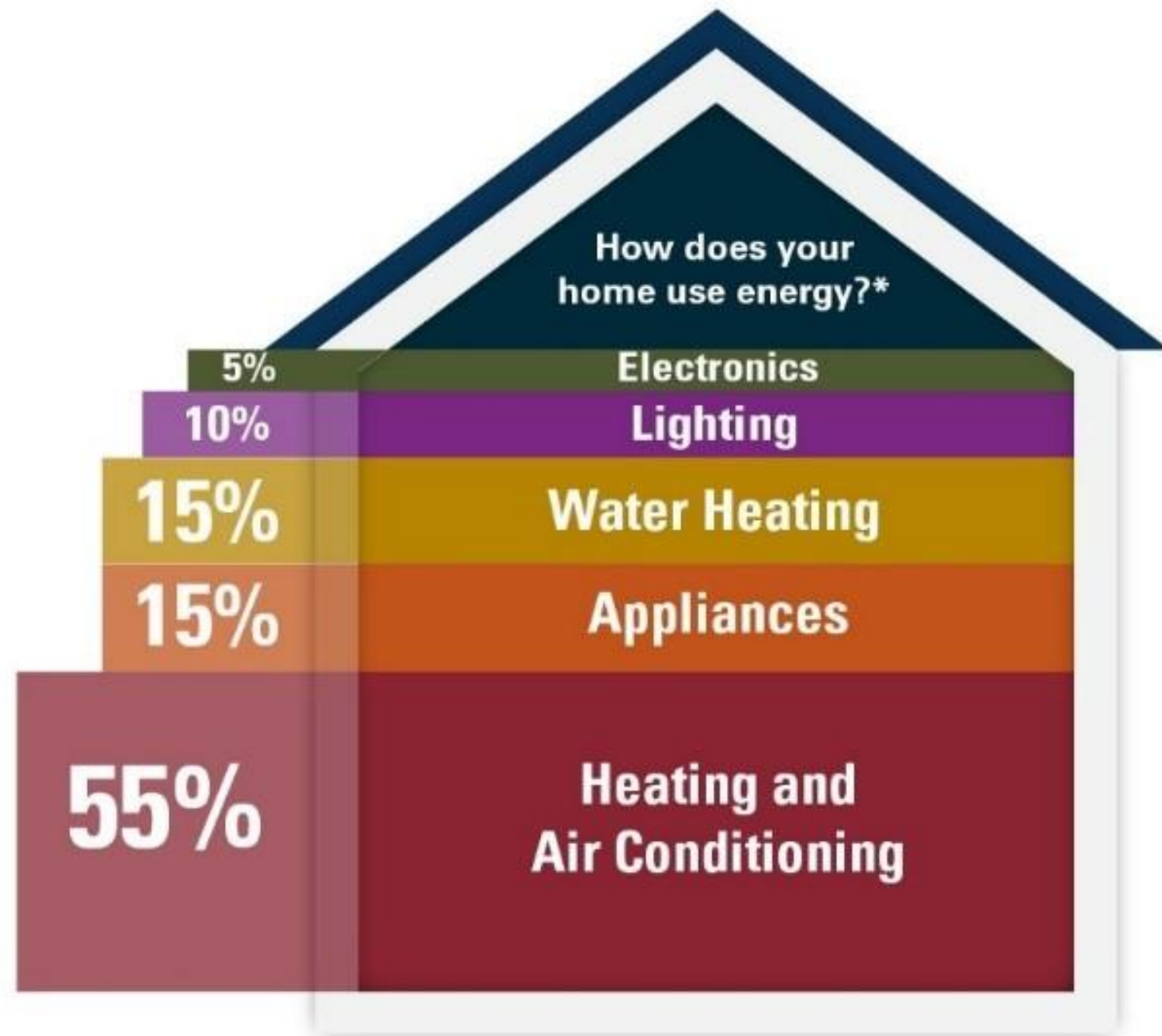
-  = 100 natural gas customers
-  = Business customers
-  = Residential customers



Example:

Residential Energy Efficiency

Energy Efficiency Opportunities

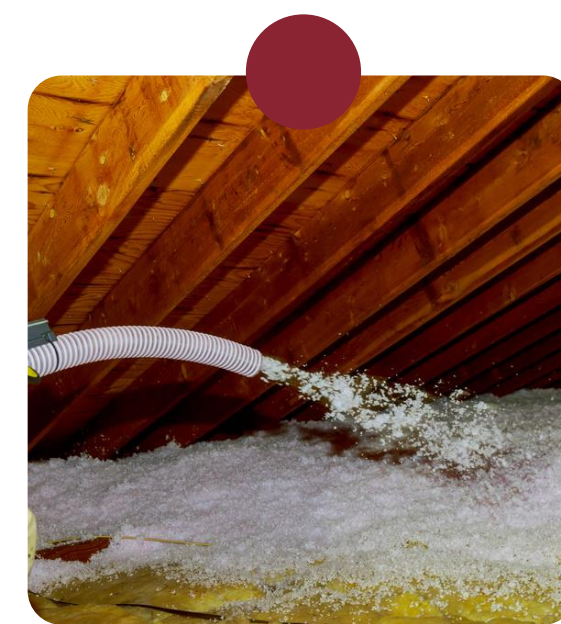


* Minnesota Department of Commerce Division of Energy Resources, Home Energy Guide, 2018

Air conditioning



Attic Insulation & Air Sealing



Heating System



Storm Windows



Wall Insulation



Water Heater



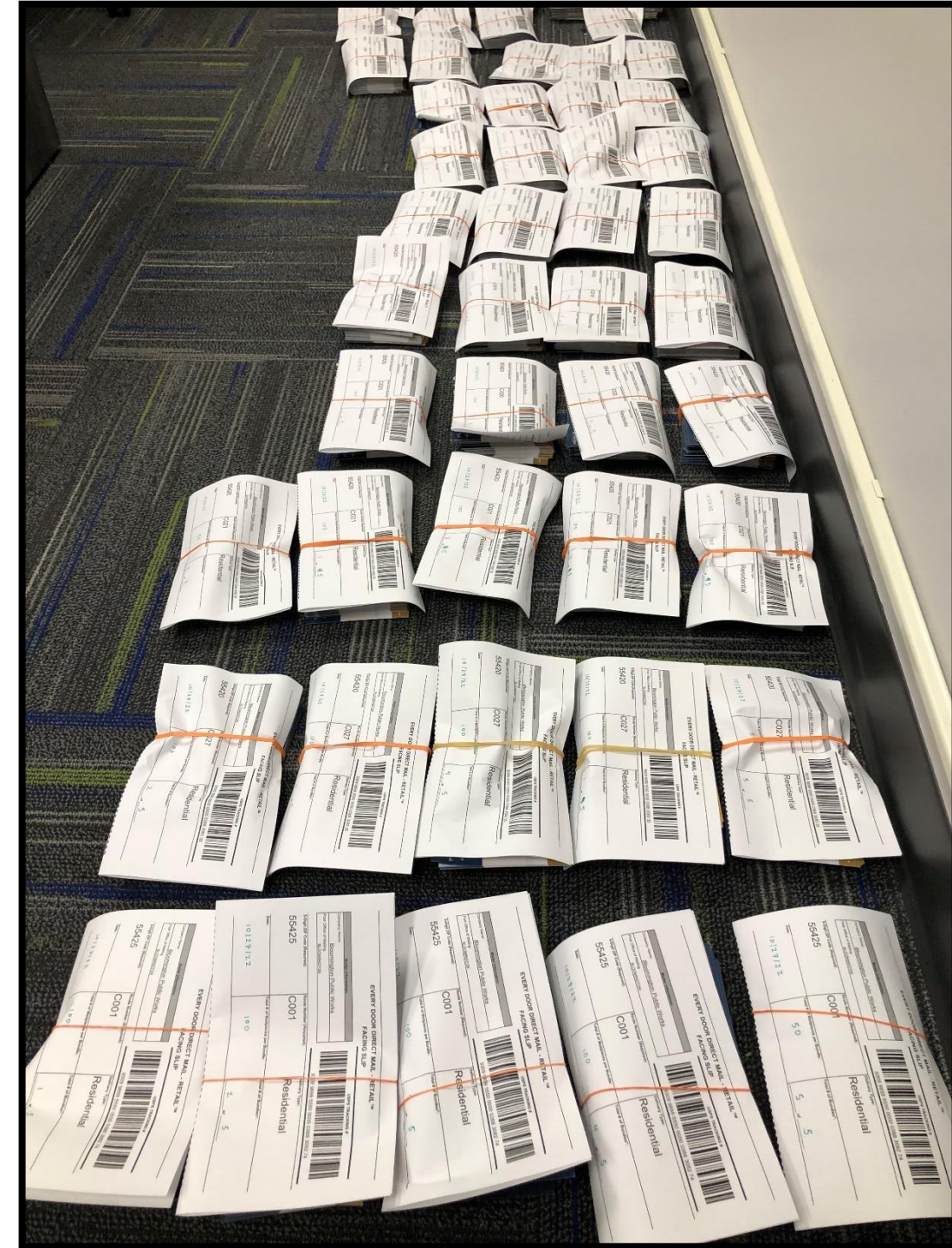
Connector

Resource Provider

Policy Maker

Role Model

Connector



Resource Provider

Ready to save on your energy bills?

One convenient Home Energy Squad® visit is your answer to years of energy savings. We offer two home visit options:

For homes built after 2000, mobile homes, condos, and renters – Only \$35 (normally \$70)

Energy Saver Visit
We'll come to your home and:

- Install energy-saving materials such as: LED lightbulbs, door and attic hatch weather stripping, programmable or smart thermostat, and high-efficiency water fixtures.
- Assess and adjust the water heater temperature.
- Plan next steps.



For older homes – Only \$50 (normally \$100)

Energy Planner Visit
In addition to what we offer above, during this visit option we will come to your home and also help:






- Perform a blower door test to measure your home for air leaks.
- Complete an insulation inspection of your attic and walls using an infrared camera.*
*Weather dependent

Service area is limited to where crews are available. Other restrictions may apply.

Our help doesn't end at the visit!
If your home could use larger home improvements, our energy advisors will help you connect with qualified contractors and rebates.



Home Energy Squad is provided by CenterPoint Energy and Xcel Energy, delivered by the Center for Energy and Environment, a local nonprofit, and supported by the City of Bloomington.



HOUSING AND REDEVELOPMENT AUTHORITY
IN AND FOR THE CITY OF BLOOMINGTON

HOME IMPROVEMENT LOAN PROGRAM

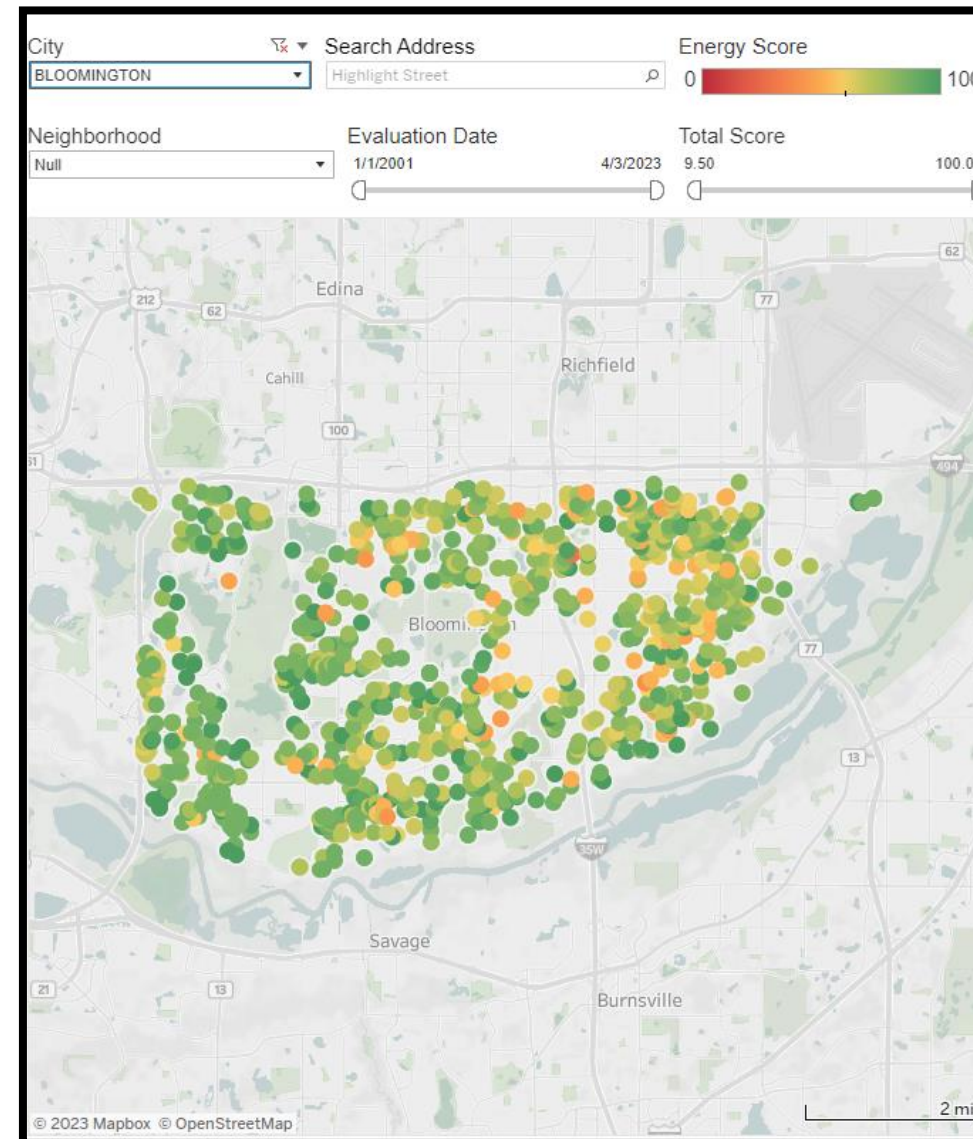



BLM.MN/LOANS

Policy Maker

§ 14.523.01 ENERGY DISCLOSURE REQUIREMENTS.

- (a) *Purpose.* The Council finds the following:
- (1) Climate change disproportionately harms BIPOC (Black, Indigenous, and People of Color) communities.
 - (2) Bloomington's Energy Action Plan outlines a goal of reducing greenhouse gas emissions by 75% by 2035.
 - (3) Residential units account for 30% of Bloomington's energy-related greenhouse gas emissions and 44% of community-wide natural gas use.
 - (4) Improving existing buildings through energy efficiency upgrades is one of the most cost-effective ways to achieve the city's greenhouse gas emission goal.
 - (5) Eighty-nine percent of Bloomington's single-family homes were built before there was an energy code requiring insulation in homes.
 - (6) Approximately one in five households living in owner-occupied single-family homes experience a high-energy burden.
 - (7) Weatherization can provide health benefits by modifying the indoor environmental conditions of a home.
 - (8) Energy disclosure at the time of sale brings awareness, resources, and value to home energy improvements.
- (b) *Energy disclosure report.* An energy disclosure report must be generated and disclosed in accordance with §§ 14.523 and 14.524 and include the following information:
- (1) The energy disclosure report must provide an energy asset rating that includes information on the following structural and mechanical assets:
 - (A) *Attic insulation.* R-value of insulation, calculated based on industry standards for insulation type and number of inches, recorded for each attic area in the home, including square footage of that area.
 - (B) *Wall insulation.* R-value of insulation, calculated based on industry standards for insulation type and number of inches, plus the square footage of exterior walls. For homes built before 1980 insulation levels must be visually verified by drilling and capping a single hole in an exterior wall, or utilizing an existing hole from a previous evaluation. An invoice with scope of work from a licensed contractor showing installation of wall insulation, or other reasonable forms of proof, as determined by the Building Official, may also be used as an alternative for compliance with this portion of the report. If other technologies for determining wall insulation R-value are approved by the Building Official they may also be used.
 - (C) *Heating system efficiency.* Heating system type, AFUE, venting and age.
 - (D) *Window efficiency.* Window type, and presence of any single pane windows with no storm windows or broken windows.
 - (E) *Water heaters.* Fuel type, venting type, and age.
 - (F) *Air conditioning.* Type and age.
 - (2) The energy disclosure report must provide recommendations to improve the energy asset rating of the home.
 - (A) Recommendations must be expected to have a simple payback of ten years or less.
 - (B) Recommendations must be prioritized based on energy savings potential and cost effectiveness.
 - (C) Recommendations must include information on the expected cost and savings of the project, based on city approved methodology.
 - (3) The energy disclosure report must identify next steps.
 - (A) The report must sequence recommended actions so that next steps are clear and easy to understand.
 - (B) The report must include information about who to contact with questions.
- (c) *Exceptions.* The energy disclosure report requirement may be satisfied by a time-of-sale of housing evaluation that included an energy disclosure report or an energy audit that included an energy asset rating within the last five years. An energy certification approved by the Building Official will also qualify. The asset rating and audit report or certification must be disclosed in accordance with § 14.523 and this Division C.
- (d) *Appeals.*
- (1) *Insulation inspection appeals.* Any owner of property or other person directly and personally affected by the insulation inspection of a property, either personally or through their representative, can make an appeal to the Building Official. The Building Official will have authority to hear and decide all insulation inspection appeals.
 - (2) *Insulation inspection appeal process.* Insulation inspection appeals must be made by written notice filed with the Building Official within five days from the date of the initial inspection. The notice of appeal must contain a concise statement of the grounds for the appeal and will be accompanied by a fee of \$100. The Building Official has the authority to summarily grant the appeal and to waive the appeal fee. The insulation inspection will not be required if the Building Official determines





Energy Disclosure Report


How it Works
The energy score measures your home's energy efficiency. Higher-scoring homes are efficient. Energy efficiency makes homes more comfortable, lowers energy bills, and can lead to 2%–6% greater resale value.**
This report lists practical and cost-effective energy improvements that produce significant energy savings.
Financing and rebates are available. The City of Bloomington and CenterPoint Energy have options to help with upfront costs.
Need more information or advice? Contact the free Energy Advisor service at 651-328-6225 or energydisclosure@mncee.org.

Home Profile
Location: 8900 NEWTON AVE S BLOOMINGTON, MN 55431
Year built: 1956
House sq. ft.: 1,040
Number of stories: 1
Visit date: 2/9/23

Energy Score

Your home: **65** points

84 Average Bloomington Energy Score



Home Energy Summary
Completing energy improvements with more improvement points will make a greater difference in your home's overall energy efficiency. Homes earn energy badges for completed improvements. To learn more, visit mncee.org/TOS or contact a free Energy Advisor.

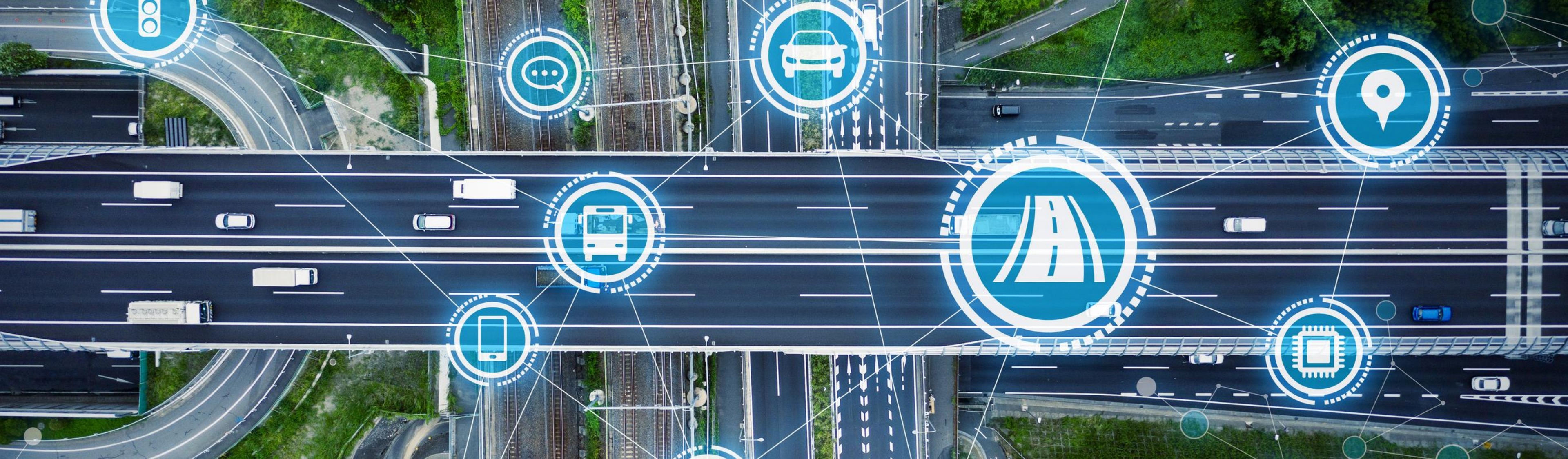
Energy Improvements (by priority)	Improvement Points	Typical Cost	Utility Rebate	Yearly Bill Savings	
Wall Insulation	Insulate your exterior walls	20	\$1,950–\$2,200	Up to \$500	\$200–\$400
Heating System	Upgrade your furnace when it's 20 years old	13	\$3,500–\$6,000	Up to \$500	\$150–\$300
Attic Insulation	Energy Badge earned! Your home has efficient attic insulation	2	—	—	—
Storm Windows	All single-pane windows have storm windows.	—	—	—	—

651-328-6225 | energydisclosure@mncee.org | mncee.org/TOS

cee+ Center for Energy and Environment

Role Model





Transportation



Walking



Scooters



Bicycle



Ride Sharing Service
e.g. Lyft, Uber



Electric Motorcycle



Electric Bike



Bus



Telework



Light rail



Car Share
e.g. Hour Car



Electric Vehicle



Carpooling



Freight



City Fleet



Cargo Bike



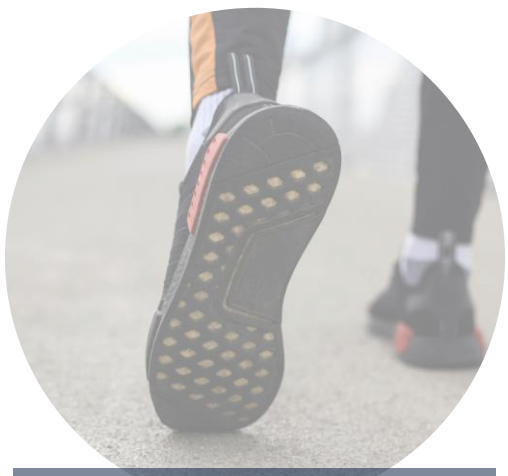
Wheelchair



Internal Combustion
Engine (ICE) Vehicle



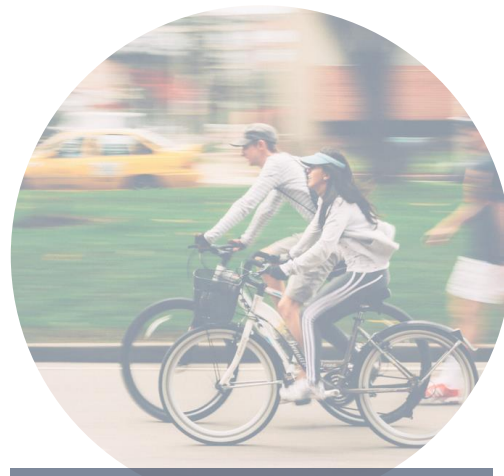
Metro Mobility



Walking



Scooters



Bicycle



Ride Sharing Service
e.g. Lyft, Uber



Electric Motorcycle



Electric Bike



Bus



Telework



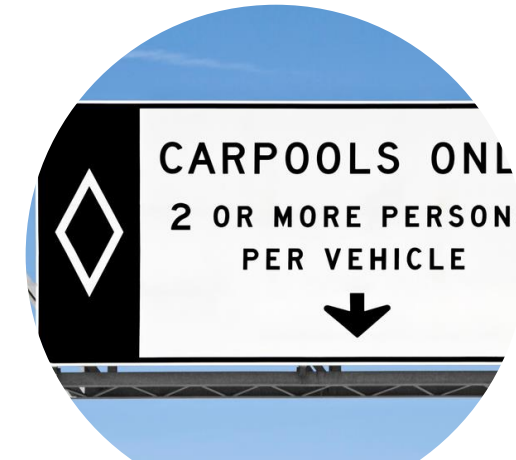
Light rail



Car Share
e.g. Hour Car



Electric Vehicle



Carpooling



Freight



City Fleet



Cargo Bike



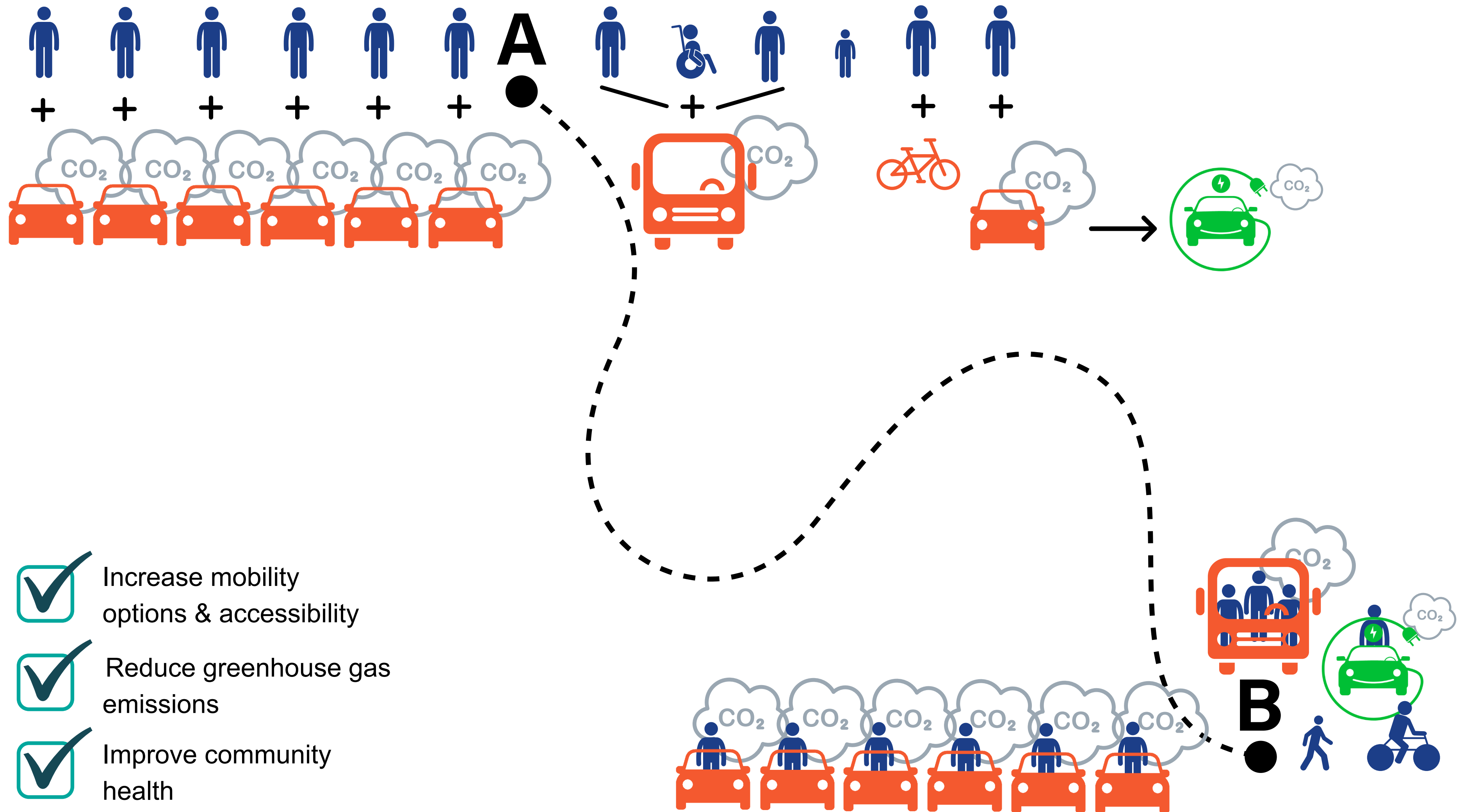
Wheelchair



Internal Combustion
Engine (ICE) Vehicle



Metro Mobility



Increase mobility options & accessibility

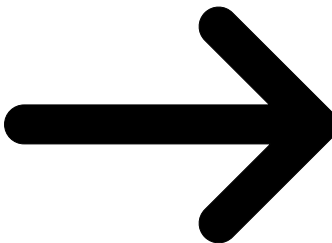
Reduce greenhouse gas emissions

Improve community health

Transportation

What can we do to reduce greenhouse gas emissions?

Electrification



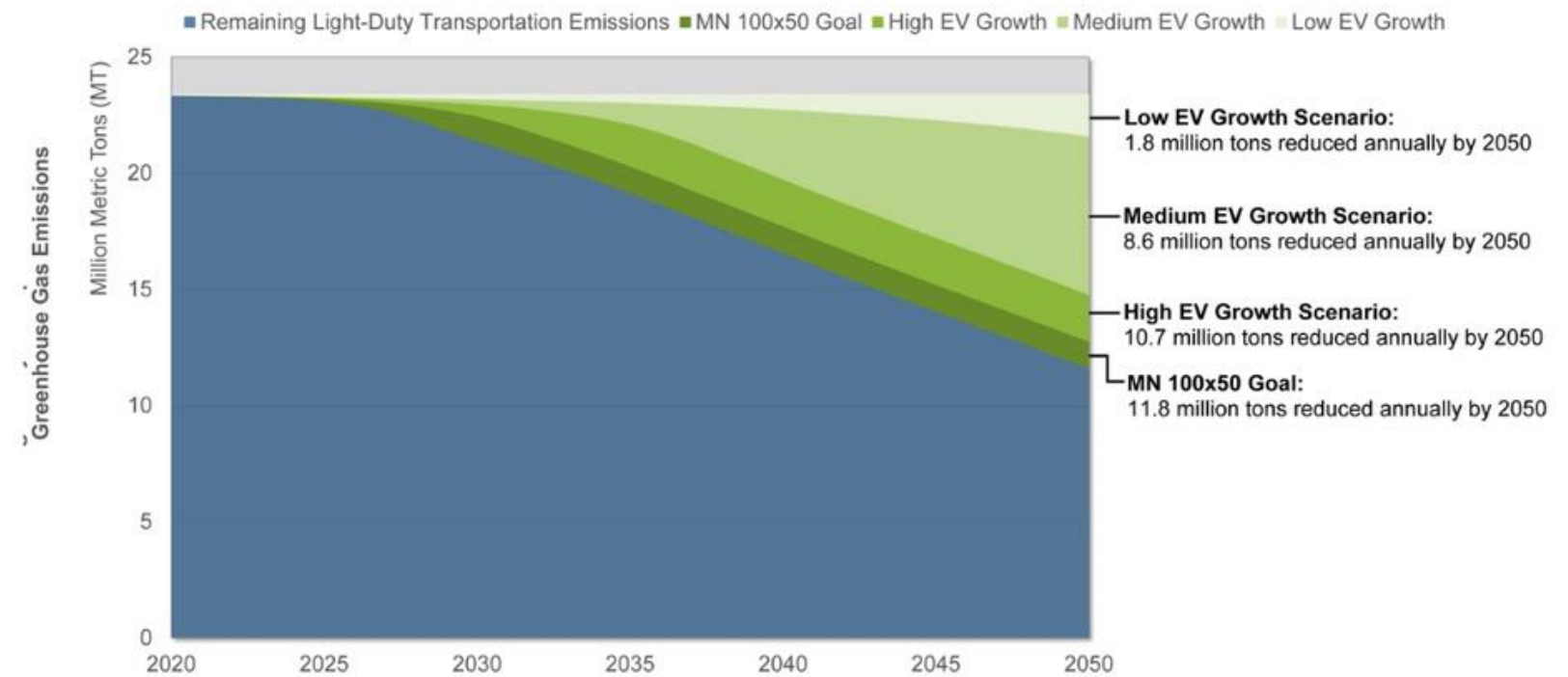
Providing Alternatives to Driving Alone



Amount of space required to transport the same number of passengers by car, bus, or bicycle.
Event info at www.facebook.com/Urban.Ambassadors - Photos by www.tobinbennett.com
(Des Moines, Iowa - August 2010)

Both electric vehicles and increasing low-carbon transportation options are needed.

Annual Emissions Reductions by EV Sales Growth Scenario under Minnesota Average Grid Mix



Source: Modeled greenhouse gas emission reduction at various degrees of EV adoption, calculated by the Great Plains Institute. Scenario EV sales forecasts are based on both historic sales trends and the "Annual Energy Outlook 2020 | Table 2. Energy Consumption by Sector and Source," US Energy Information Administration, <https://www.eia.gov/outlooks/aeo/data/browser/#/?id=2-AEO2020&cases=ref2020&sourcekey=0>, which forecasts electricity consumption in the transportation sector.

Connector

Resource Provider

Policy Maker

Role Model

Connector

The screenshot shows the homepage of the Connector website. At the top left, there is a logo for "Commuter Services" featuring icons for a bus, bicycle, car, train, and pedestrian. To the right of the logo, the text reads "Outreach program of I-494 Corridor Commission". Below this is a navigation menu with the following items: Home, 494 Corridor Commission, About, Employers, Commuters, Construction updates, and Contact Us. The main content area is a collage of six images: 1. A blue box with the text "Win an Earth Friendly Swag Bag" and a map of the Twin Cities area with icons for various transit modes. 2. A woman smiling while working at a desk with a laptop, with a "TWIN CITIES Telework by Commuter Services" logo below. 3. A man wearing a helmet riding a bicycle. 4. A white Metro Transit bus with the number 970 and "METRO TRANSIT" on its destination sign. 5. The rear of a red car with a "MINNESOTA CARPOOL Motorworks MPA" license plate. 6. A woman smiling and holding a red travel mug.

Resource Provider



Policy Maker

The purpose of Transportation Demand Management (TDM) is to promote more efficient utilization of existing transportation facilities, reduce traffic congestion and mobile source pollution, and to ensure that new developments are designed in ways to maximize the potential for alternative transportation usage. TDM is a combination of services, incentives, facilities and actions that reduce single occupancy vehicle (SOV) trips to help relieve traffic congestion, allow parking flexibility and reduce air pollution.

2009 § 21.301.09
TRANSPORTATION
DEMAND
MANAGEMENT (TDM)

(a) Purpose. To accommodate and promote electric vehicle charging throughout the city promoting the health, safety and general welfare of the community and preventing adverse impacts in the installation and use of electric vehicle chargers.

2019 § 21.302.14
ELECTRIC VEHICLE
CHARGING
STANDARDS

a) Purpose and intent. The city recognizes the health, safety, welfare and aesthetic value of providing parking standards in the community. The provisions of this section are intended to:
(Note: it lists 11 items)

2019 § 21.301.06
PARKING AND
LOADING

(h) Shared vehicles. that are not rented or loaned are prohibited from the right-of-way and subject to removal by the city unless located in a dock or designated area. Commercial providers must obtain an obstruction permit for docked or dockless subject to the requirements of this section and following conditions of approval.

2020 UPDATE TO:
§
17.68 PERMIT
REQUIRED.

Part 3

Next Steps

What is happening this year?





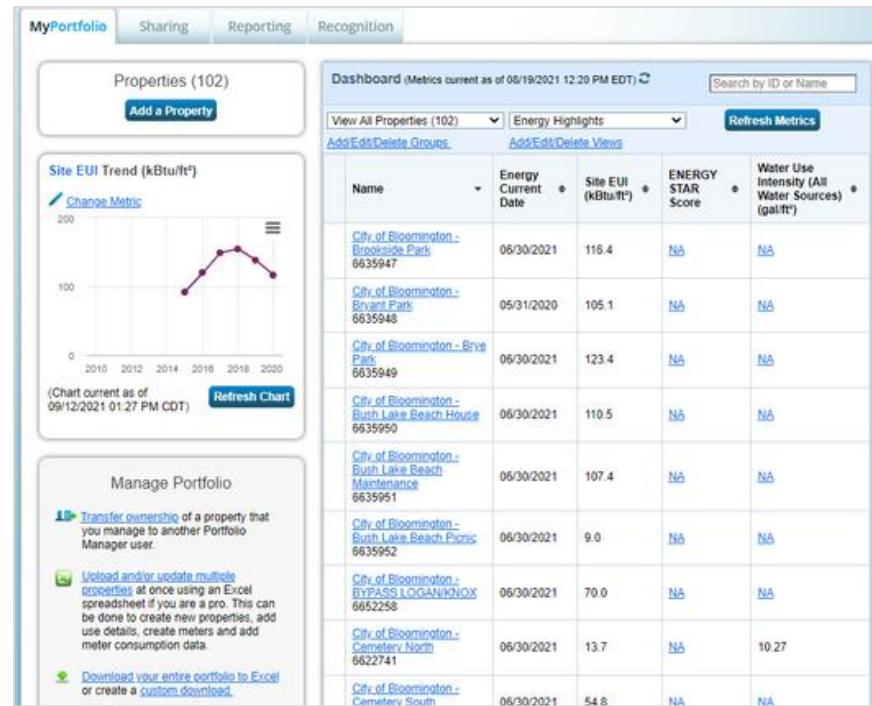
**Quantitative Goal
Setting**



**EV Infrastructure
Study**



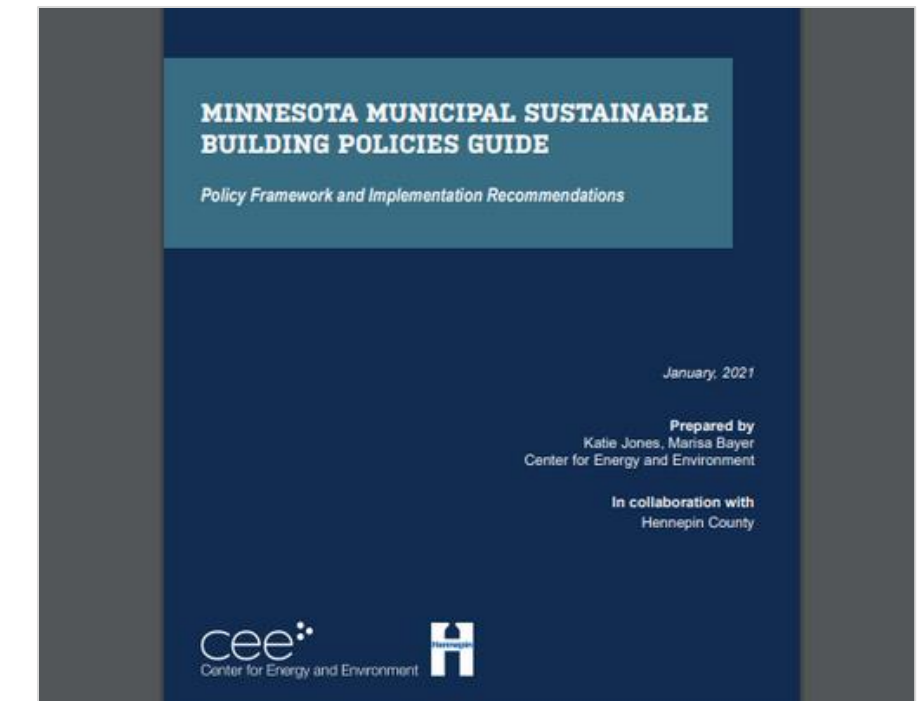
**Active
Transportation Plan**



Energy Benchmarking



Researching Renewable Energy Options for City facilities



Sustainable Building Policy for City Facilities



Large Building Benchmarking

REQUIREMENTS	STATUS	REQUIREMENTS	STATUS
Roof Insulation R Value IECC: C402.2.1	Green	Economizer IECC: C403.3.1	Green
Above Grade Wall Insulation IECC: C402.2.3	Yellow	Demand Controlled Ventilation IECC: C403.2.5.1	Red
Window U value IECC: Table C402.3, Sec C402.3.3 & C402.3.4, (C303.1.3)	Green	Energy Recovery Ventilation IECC: C403.2.6	Green
Window Area & Orientation IECC: C402.3.1	Green	Boiler & Chiller System Control IECC: C403.A.3.4	Green
Slab Edge Insulation IECC: C402.2.6	Green	Variable Flow Pump Control IECC: C403.A.3.4	Green
Automatic Lighting Shutoff IECC: C405.2.2.2 & C405.2.2.1	Red	Duct Sealing IECC: C403.2.7	Green
Daylight Zone Control IECC: C405.2.2.3.1, C405.2.2.3.2 & C202	Red	Supply Air Temperature Reset IECC: C403.A.5.4	Green
Multilevel Lighting Control IECC: C405.2.1.2	Red	Fan Motor Sizing vs bhp IECC: C403.2.10.2 & C403.2.10	Green
Interior Lighting Power Density IECC: C405.5	Green	Pool Cover IECC: C404.7.3	Green
Conductor Sizing IECC: C405.8	Yellow	HVAC Commissioning IECC: C408.2	Yellow
Lighting System Functional Testing IECC: C408.3	Red	Low Leakage Intake and Exhaust Dampers IECC: C402.A.5	Green
		Additional Energy Efficiency Package (3 Options) IECC: C406	Green

Status Legend:
■ Code requirement met
■ Not enough information to determine/ensure
■ Code requirement not met
■ Not required for this project

Community Codes Support Program



Residential Energy Engagement

Part 4

Discussion

Q&A



Emma Struss

estruss@bloomingtonmn.gov

Thank you
for your time!