Section 07
Greenspace and Trees

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Greenspace
In Albert Lea

65%
Forest coverage

10%
Estimated Impervious surface coverage

136 acres
Estimated maintained lawn coverage

Greenspace and Trees

Why Greenspace and Trees Are Important

Human activities coupled with natural variations in the carbon cycle, have resulted in a significant increase in the concentration of carbon dioxide (CO_2) and other "greenhouse gases" in the atmosphere, thus causing measurable global warming. Controlling atmospheric CO_2 requires deliberate action that combines reducing emissions and increasing storage, while planning for adaptation to the changes that result. Part of this Climate Action Plan addresses ways that greenspace protection and enhancement is one of Albert Lea's most important avenues for lowering our environmental footprint.

Greenspace, plays a central role in supporting community health, improving air, soil, and water quality, reducing energy use in buildings, and supporting climate -change mitigation. An urban greenspace includes any permeable vegetated surface, public or private, set apart for recreational, aesthetic, or ecosystem services in an otherwise urban environment. It is space set aside for providing life-essential benefits people and other living things obtain from properly-functioning ecosystems. The key benefits and services greenspaces provide include:

- Carbon sequestration: Plants on land convert carbon dioxide into biomass (leaves, stems, etc.) through photosynthesis. If more plants grow in more places, they will remove more CO_2 from the atmosphere.
- Stormwater infiltration and flood mitigation: Greenspace helps protect from flash flooding by absorbing water through roots and slowing down rainwater running off.
- Reduce the urban heat island effect: The more vegetated greenspace we have in Albert Lea, the better the cooling effects. High levels of impervious surfaces (a surface that does not allow water to infiltrate such as pavement and buildings) results in an increased urban heat island effect, which raises the temperature of the near-surface air, buildings, and pavement higher than the surrounding areas.
- Purify and humidify the air: Plants purify the air when they absorb light, carbon dioxide, and water to manufacture sugar.
- Support pollinators: Animal species that pollinate plants, termed pollinators, carry pollen, either accidentally or intentionally, from the male part of a flower to the female part of the same or another flower.

Climate Change Considerations

Climate Hazards

Projected climate change impacts may cause forests and urban trees to experience increased mortality and reduced productivity, more prevalent invasive species and disease all resulting in forest and tree loss, reduction in crop yield. Loss of greenspace, in turn, reduces carbon capture potential of green infrastructure.

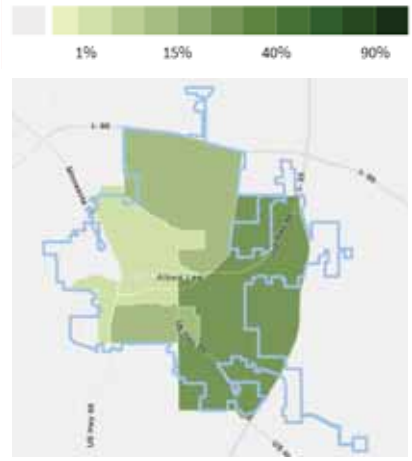
Opportunities

Many strategies within the Greenspace sector can advance community resilience and quality of life. Increased tree canopy, decreased impervious surfaces, and increased utilization of native grasses and plantings can reduce heat island experiences, energy consumption, stormwater runoff, and flood impacts.

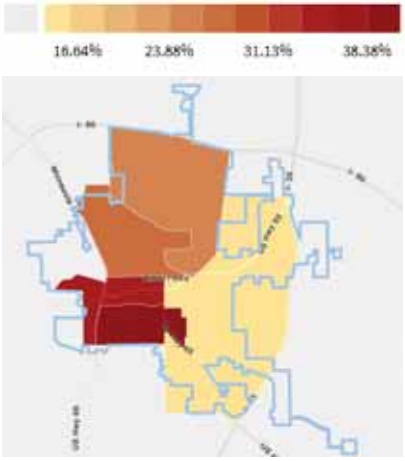
Albert Lea's Micro-Heat Island Contribution

Higher levels of impervious surfaces (pavement and buildings) within a community will increase the micro-heat island impacts of the community. Micro-heat island refers to the phenomenon of higher atmospheric and surface temperatures occurring in developed areas than those experienced in the surrounding areas due to human activities and infrastructure. Increased heat indicies during summer months due to heat island effects effectively raise human discomfort and health risk levels in developed areas, especially during heat waves. Based on a 2006 study done by Minnesota State University and the University of Minnesota, the relationship between impervious surface percentage of a City and the corresponding degree of heat island temperature increase can be understood as a ratio.

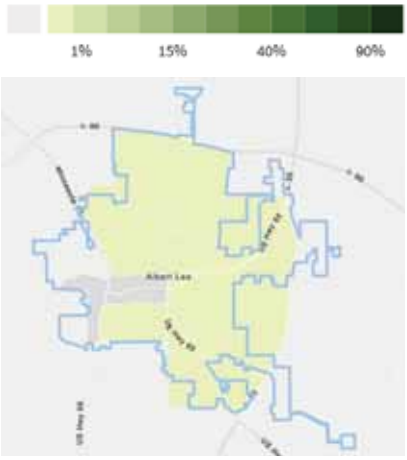
Croplands and Grasslands
City-wide by Census Tract



Developed land
City-wide by Census Tract



Forest Coverage
City-wide by Census Tract



Equity Considerations

- Lower income neighborhoods and neighborhoods with higher proportions of people of color regularly have lower tree canopy coverage, and the environmental, economic, and quality of life benefits trees support than more affluent neighborhoods.
- "Heat islands" and "micro heat islands" are built up areas that are hotter than other nearby areas. This is caused by lack of adequate greenspace and healthy tree canopy coverage combined with too many hard surfaces like roads, parking lots, and hard building surfaces. Frequently neighborhoods with higher vulnerable populations have the highest heat island impacts.

Strategies Supporting Sector Goals

As indicated in the introduction, the Climate Action Plan is intended to be a 9 year plan to be updated at the completion of that time. Consequently, the goals and strategies outlined in this section are intended to be achieved by 2030 (or earlier) unless otherwise noted.

Implementation of actions are anticipated to be initiated over 3 phases: phase 1 within 1-2 years, phase 2 within 2-7 years, and phase 3 within 4-8 years of CAP approval.

1. **Strategy GT-1**: Increase Tree Cover and Diversity, achieve a city-wide Tree Canopy coverage increase of 10% by 2030.
2. **Strategy GT-2**: Increase beneficial uses of lawn spaces including use of native species and pollinator restorations, rain gardens, and vegetable garden areas with a targeted conversion of 5% of city-wide lawn coverage to pollinator restoration coverage.
3. **Strategy GT-3**: Reduce Micro-Heat Island Effect through City-Wide impervious surface reduction of 5% by 2030.
4. **Strategy GT-4:** Protect and sustain greenspaces, urban tree canopy, and wildland ecosystems, enhancing their resilience to climate change impacts.

1 Strategy GT 1:

Increase Tree Cover and Diversity, achieve a city-wide Tree Canopy coverage increase of 10% by 2030.

	Actions	Implementation Phase
GT-1-1	Conduct a Citywide Ground Cover and Heat Island Assessment. Assessment should include tree canopy, light-colored impervious surface, dark-colored impervious surface, grassland, and water coverage by census tract. Study should include heat island impact study to identify areas of high heat island contribution and impact. Findings of tree coverage, benefits, heat island impacts, and opportunities should be overlapped with vulnerable population mapping from the City's Climate Vulnerability Assessment. Assessment to establish tree canopy and heat island mitigation goals by census tract. See https://palebluedot.llc/tree-canopy-assessments	1
GT-1-2	Plant shade trees to limit the need for indoor cooling and reduce temperatures at parks, playgrounds, and other outdoor spaces. Collaborate with School District to include school properties.	1
GT-1-3	Explore a partnership with the County, Chamber of Commerce, and others to establish a program to plant trees at targeted locations such as businesses, low income residential districts, or streets with significant street tree needs. Program can include a mechanism for tree donations, volunteer tree planting, tree plant awards, and tree banking opportunities. Looking into Arbor Day Foundation, Tree City USA	1
GT-1-4	Establish an implementation master plan with schedule, budget, and prioritized actions following the completion and recommendations of the City's Citywide Ground Cover and Heat Island Assessment	2
GT-1-5	Replanting tree loss, and Ash tree replacement for EAB management, at 150% or more of replacement with improved diversity.	2
GT-1-6	The City will explore a program to give away trees on an annual basis for residents to plant on their property. Potential program concept: grow seedlings and give to homeowners once per year, or sell at a discount 200+ per year.	2
GT-1-7	Create a tree preservation ordinance with reasonable exceptions that support the CAP tree canopy coverage and heat island mitigation goals. Ordinance should reflect projected climate changes and impacts on tree species.	2
GT-1-8	Create additional incentives for tree planting, particularly in prioritized areas within the City as established by the Citywide Ground Cover and Heat Island Assessment.	2

2 Strategy GT 2:

Increase beneficial uses of lawn spaces including use of native species and pollinator restorations, rain gardens, and vegetable garden areas with a targeted conversion of 5% of city-wide lawn coverage to pollinator restoration coverage.

	Actions	Implementation Phase
GT-2-1	Create a policy requiring the use of native plants in landscaping at City-owned properties unless a data-driven case can be made that such use is not appropriate.	1
GT-2-2	Establish a policy and incentives to assist homeowners by covering some of the cost of converting traditional lawns by planting pollinator friendly food gardens, permaculture, wildflowers, clover or native grasses in an effort to slow the collapse of the state's bee population. (http://m.startribune.com/program-pays-minnesota-homeowners-to-let-their-lawn-go-to-the-bees/510593382/)	1
GT-2-3	Complete a Land Conversion Opportunity Study. Analyze public and private property for unused turf and impervious areas, and create a Ground Cover Conversion Implementation plan by census tract to convert identified areas to native grasslands, wetlands, shrub, and forested areas. Identify incentive opportunities and establish an outreach campaign.	1
GT-2-4	Install roadside climate-adaptive native vegetation that creates effective barriers to prevent drifting of air pollutants to adjacent schools, residences, and parks. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6060415/	2
GT-2-5	Conduct a greenspace and preservation equity assessment to evaluate greenspace citywide and determine potential needs for expansion, purchase and preservation of greenspace based on quantified equity, environmental, economic benefits, and Return on Investment based on life cycle costs of greenspace property ownership. Coordinate assessment with findings of the Citywide Ground Cover and Heat Island Assessment and Urban Forest Management Plan.	2
GT-2-6	Review city ordinances on lawns, explore opportunities to encourage lawn alternatives, consider set-backs and signage areas for native installations.	2
GT-2-7	Increase use and promotion of "no mow areas" with plantings of appropriate heights to ensure safety and visibility along roads and parking lots.	3
GT 2-8	Develop a list of invasive non-native plants commonly used in landscaping and proven to seriously reduce diversity of native plants and wildlife. Adjunct to this list, provide native alternatives to each non-native species. Publicize this list widely and encourage plant nurseries and landscapers to provide the native alternatives	2

3 Strategy GT 3:

Reduce Micro-Heat Island Effect through City-Wide impervious surface reduction of 5% by 2030.

	Actions	Implementation Phase
GT-3-1	Research, evaluate and pilot porous paving, de-paving, vegetation and/or more reflective surfaces in parking areas to reduce and cool impervious surfaces, particularly in urban heat island areas with populations most vulnerable to heat. Explore partnership opportunities with local multi-family property owners (particularly low income communities), local businesses or institutions for pilot projects as well as research and development	1
GT-3-2	Develop a performance based ordinance requiring tree planting within parking lots. Ordinance should establish a specific goal of percentage of pavement to be shaded by trees. Explore partnering with local business to create a pilot project to illustrate new ordinance requirements and benefits.	1
GT-3-3	Conduct an Impervious Surface Conversion plan. Plan to provide particular focus on reduction of impervious surface coverage within neighborhoods with the highest existing coverages based on Citywide Ground Cover and Heat Island Assessment.	1
GT-3-4	Develop a policy that requires all housing and commercial development projects receiving City funding, PUD approval, and/or Conditional Use Permitting to implement commercial scale heat island mitigation strategies including cool surfaces, solar-friendly landscape shading strategies, impervious surface reduction, and breeze capture.	2
GT-3-5	Create a "Living Streets" policy (Living Streets combines the concepts of complete streets and green streets, and also puts additional focus on quality of life aspects for City residents) to guide current and future street construction, reconstruction, and maintenance projects within the City.	2
GT-3-6	Create pilot project to demonstrate Greenroof technology and benefits	2
GT-3-7	Partner with utilities to develop an education and rebate program to encourage green/ cool roofs	2

4 Strategy GT 4:

Protect and sustain greenspaces, urban tree canopy, and wildland ecosystems, enhancing their resilience to climate change impacts.

	Actions	Implementation Phase
GT-4-1	Establish and effectively manage native-habitat corridors along trails (Parks) and utility easement areas to restore and maintain landscape connectivity.	1
GT-4-2	Assemble a Climate Adaptive Tree Species list for City tree planting and replacement guidance ensuring species diversity and climate adaptive capacities. Distribute and promote list for public use as well.	1
GT-4-3	Manage publicly-owned natural areas to enhance and maintain diverse native landscape communities. Implementation should prioritize areas of high impact and vulnerability.	1
GT-4-4	Require soil profile rebuilding at all building project sites or compacted soil conditions to reduce erosion and runoff contaminated with fertilizers, increase soil carbon stores and support long-term soil building (https://www.urbanforestry.frec.vt.edu/SRES/)	2
GT-4-5	Preserve existing forested areas through practices that re-purpose already developed areas, such as establishing codes that retain minimum canopy cover on new developments and minimize removal of native soil, ground cover, and shrubs.	2

What You Can Do

You can support the goals of the Greenspace and Trees section of the Albert Lea Climate Action Plan as an individual, household, or a business. Here are just a few things you can do:

- Plant a rain garden with native plantings to absorb storm water and replenish our aquifers.
- Plant trees in your yard to provide shade and cooling in summer heat. Select trees suited for the changing climate of Albert Lea.
- Replace your lawn and landscape with drought-resistant, native or well-adapted, non-invasive plants.
- Make your backyard a Certified Wildlife Habitat with the National Wildlife Federation. www.nwf.org/garden-for-wildlife/certify
- Remove pavement and increase permeable surfaces. De-pave areas wherever possible to encourage stormwater infiltration onsite.
- Install bioswales/rain gardens or rainwater diversion systems to reduce impact on the stormwater system.
- Install a Green Roof (living roof) to reduce your energy consumption. Decrease heat island impacts, and reduce stormwater runoff.