



Conservation and Resiliency Plan

2023



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CHAPTER 1

Introduction



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Context

The Provo community is committed to a healthy future for the city and all who call it home. In a large random sample survey in 2022, residents said the third most important aspect of quality of life was becoming a more environmentally sustainable city (see General Plan Appendix A). When asked where Provo City most needs to improve, becoming a more environmentally sustainable city ranked third highest out of thirteen options. It will take a coordinated effort by Provo City, residents, and community partners to continue working toward that shared goal. Proactive strategies and ongoing commitment will be required to mitigate the negative effects of our changing climate, improve public health, preserve open spaces, wisely use limited resources, and continue the work of building a thriving community for generations to come. The recommendations in this plan paint an aspirational vision for Provo's future. It will be left to future policymakers and staff to balance this vision with the needs and resources of the moment.

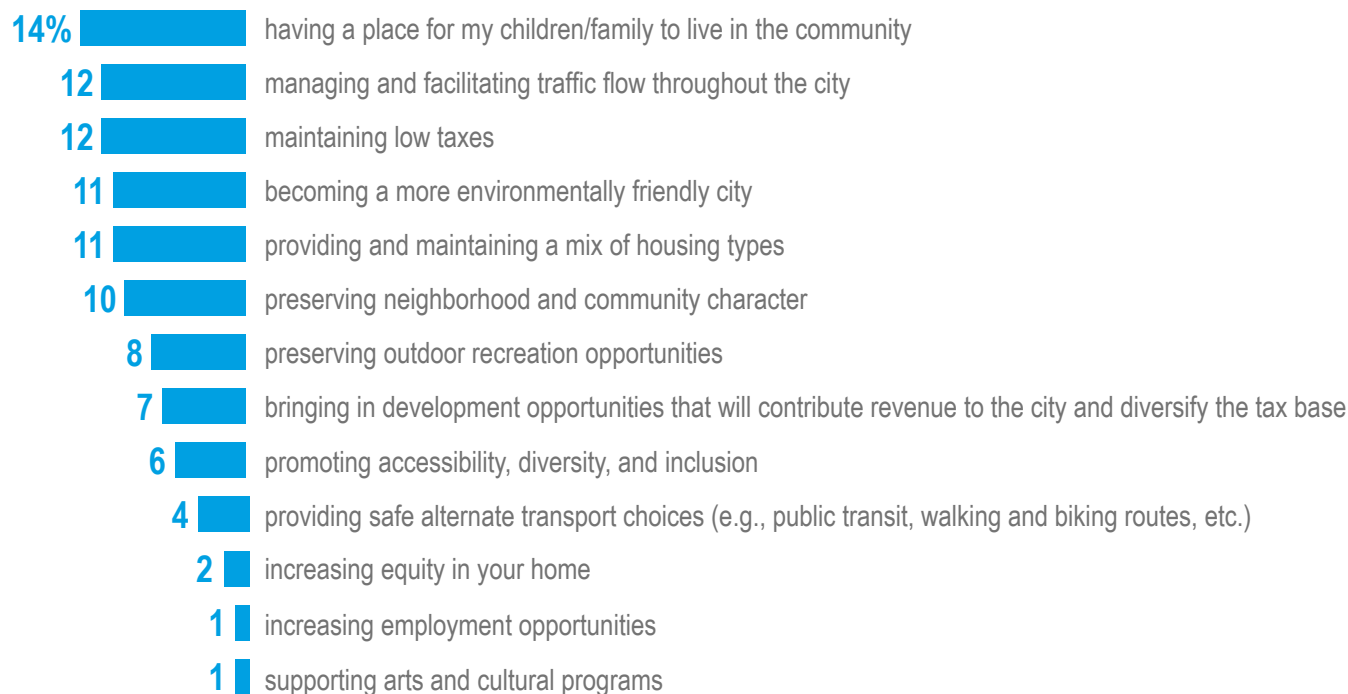
To what extent do you agree or disagree with the following statements about Provo: Provo is an environmentally friendly city.



Thinking about planning for the future of Provo and the aspects of the community you live in, how important are each of the following potential priorities to you personally?

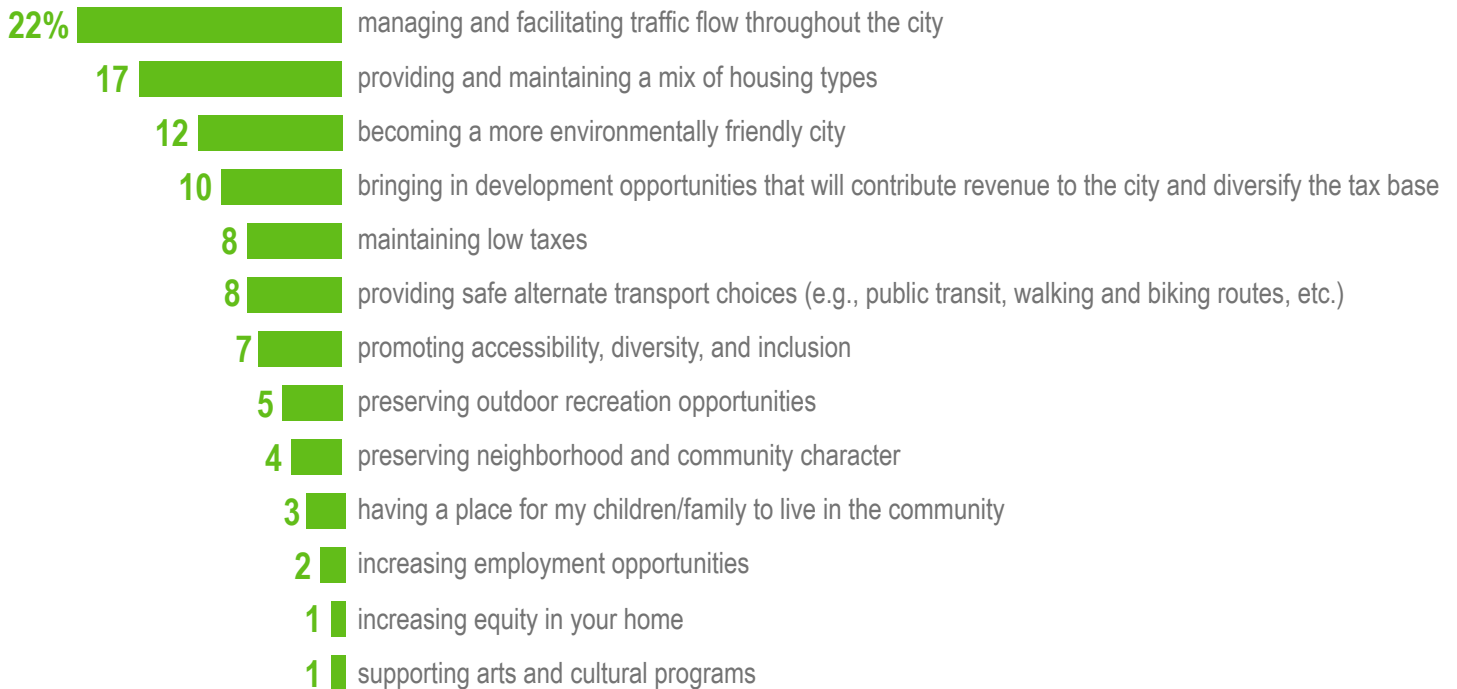


Of the priorities listed below, which is most important to your quality of life?





Of the following items, which do you think Provo City needs to improve most?



This Conservation and Resiliency Plan is the first step towards becoming a regional leader in implementing important measures that will improve the day-to-day lives of current and future residents and businesses. This plan will explore the status of Provo's environmentally sustainable activities by setting out the baselines, 2030 and 2050 targets, and recommendations for each of the eight different elements of environmental sustainability that were determined to be most critical to Provo's future.





What is Conservation and Resiliency?

Environmental, economic, and social elements are often referred to as the “Triple Bottom Line” for sustainability, recognizing that all of these elements are tied to creating a resilient future for the City of Provo. This plan focuses on the environment, although actions taken in environmental arenas will impact the community’s economic and social wellbeing and vice versa.

The recommendations within this plan represent ways in which we can meet the needs of people today without compromising the ability of future generations to live prosperously. Planning with a lens toward conservation and resiliency addresses the social, environmental, and financial resources on which residents and businesses depend daily.



Our Role in the Future

It is critical to act today to ensure a healthy and prosperous future for the next generation of Provo residents. This plan outlines ways in which the City can improve operations and create a cultural shift in how residents engage in everyday activities. This plan will challenge us as a community. Some decisions will be difficult and will require elected officials, residents, businesses, and other members of our community to balance competing visions, interests, and goals. It is the responsibility of the City, the business community, the residents of Provo, and other community partners to move towards these solutions for today’s children and their children that follow.

Coordination with the General Plan

Through the General Plan process, it became evident that conservation and resiliency are core values of the Provo community. The City recognized that a separate, stand-alone plan would allow for specific measures and targets to make a meaningful impact beyond what a General Plan was designed to do. The General Plan process has been efficiently integrated with this plan to align both the process and community input with the vision, values, and priorities that will be used for the Conservation and Resiliency Plan.

GENERAL PLAN VISION STATEMENT

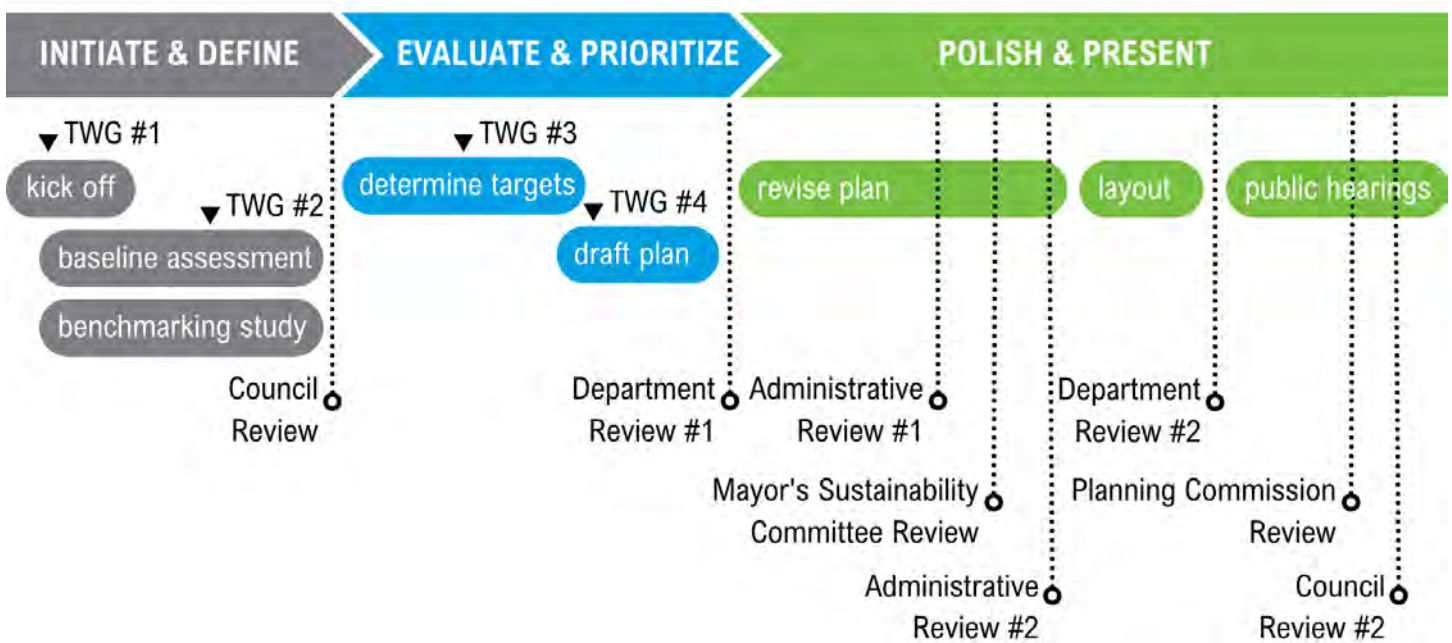
Provo is a regional economic center with access to abundant open space, excellent educational opportunities, and a thriving city where the local culture is celebrated. We are a welcoming community that supports purposeful development of a broad range of housing types, mixed-use retail, recreation, and employment that invites all residents and visitors – new and established – to call Provo home.



The General Plan vision and commitments are also driving forces for this plan because a sustainable future is integral to all aspects of social, economic, and environmental decision making and planning in Provo. These guiding principles will also guide the Conservation and Resiliency Plan.

Process

This plan has been developed through a three-phase process in support of the goals of the Provo General Plan. These phases built off one another to ensure a solid understanding of relevant data, input from experts within the community including the Technical Working Group (TWG), market forces, and staff input to create an implementable framework for a resilient future.



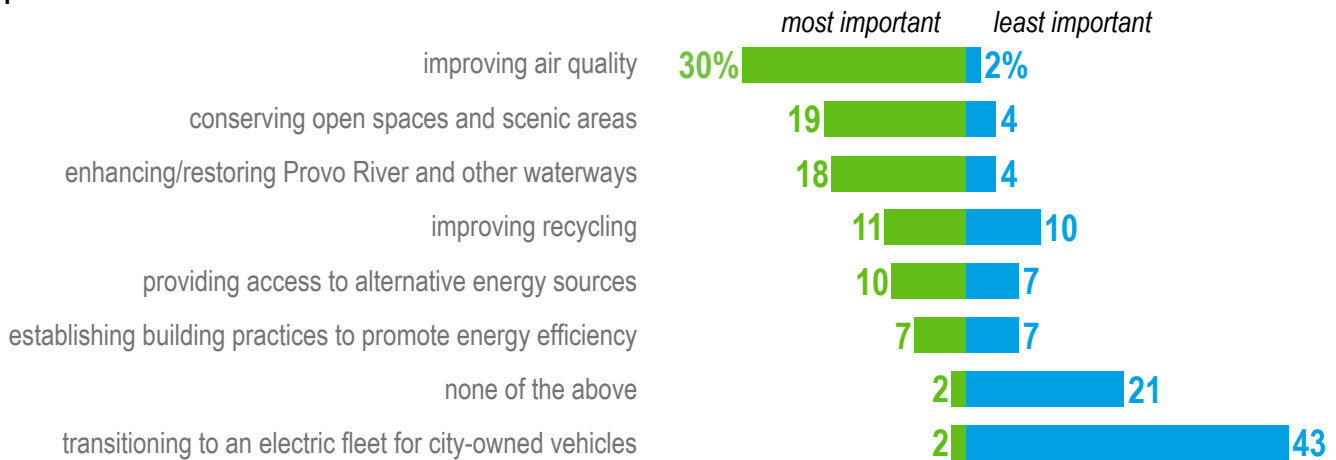
Community Engagement

Surveys

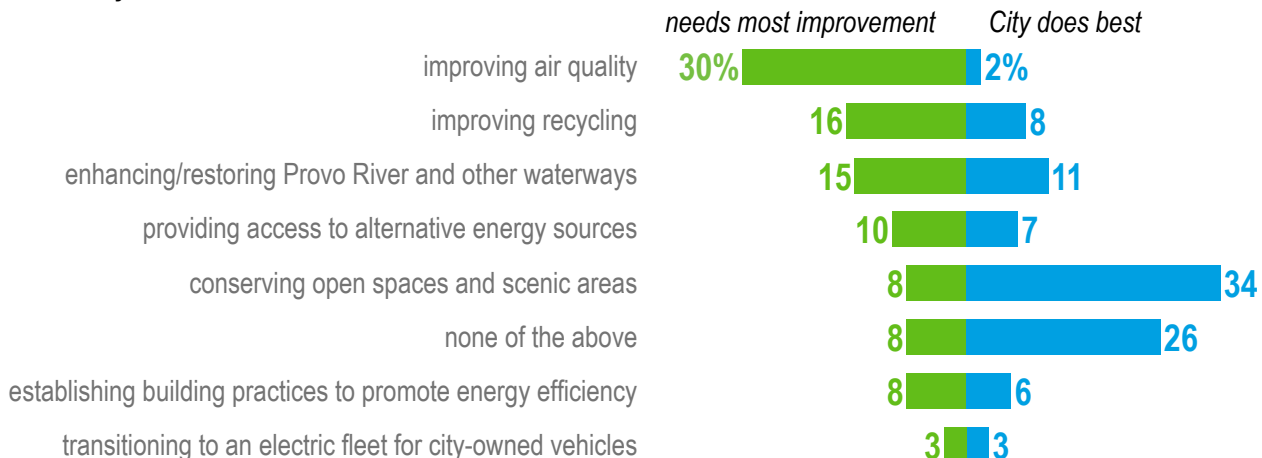
Early engagement activities for the General Plan process delivered feedback from more than 1,500 residents through online surveys and virtual open houses and from more than 70 stakeholders through working and focus groups. Later in the process, an independent, random sample survey was conducted by Y2 Analytics that asked some questions about Provo residents' priorities around sustainability. Excerpts and references can be found throughout this document, and the survey in its entirety can be found in Appendix A of the General Plan.



Of the following aspects of environmental sustainability, which is the most important to your quality of life? Which is the least important?



Of the following aspects of environmental sustainability, which do you think the City needs to improve most? Which do you think the City does best?



Working Group

To help guide this process, a group of experts from the community provided key guidance and direction. The Conservation and Resiliency Plan Technical Working Group met four times over the course of three months to identify the baseline data to be assessed, provide feedback on the appropriate performance indicators and targets, and help staff navigate the nuances within their fields of expertise. The overall strategies and actions within this plan have been developed in close consultation with the relevant City departments.

How to Use this Document

This document was created in association with the Provo General Plan to provide specific strategies towards a more resilient future in Provo. The Conservation and Resiliency Plan acknowledges critical elements, such as economic resiliency and equitable communities; however, these are better addressed within the General Plan. This plan will focus on elements related to environmental resiliency and conservation of local resources.



A Framework for Action

The plan is organized around eight elements that contribute to conservation and resiliency. Each element has a specific target to measure performance followed by strategies and actions.

Element: Elements are key opportunities to achieving a more resilient future in Provo. Many of these elements correspond to goals in the General Plan and to national standards for approaches to environmental sustainability planning.

Key Performance Indicator: Key Performance Indicators (KPIs) are metrics of an aspect of each element. Progress can be tracked over time by comparing a given year against the benchmark. KPIs serve as the basis for the baselines and targets.

Baseline: A baseline is the current measure within Provo of a KPI.

Target: Targets provide a precise, measurable, and time-oriented KPI for achieving the objective of each element.

Implementation and Monitoring

The final chapter provides a framework and next steps towards successful implementation of this plan. The targets in this plan should be measured periodically for progress and assessed every two to five years to review whether targets need to be adjusted and to ensure strategies are being implemented.

To effectively integrate the desired outcomes of this plan into the greater Provo community, additional work will be needed. The challenge will be to turn this static plan into a living one with champions both within City government and among involved residents and businesses. This will require ongoing effort, honest evaluation of progress, celebration of achievements, and allocation of resources aligned with priorities and balanced against other city needs. There will be a natural ebb and flow, but regularly reviewing and updating the KPIs will allow for progress to be maintained and tracked over time.



photo credit: Joe Haynie



CHAPTER 2

Definitions, Baselines, and Targets



photo credit:Carolynn Hojnowski



Introduction to the Eight Elements

This plan will focus on eight elements of environmentally sustainable communities, which are defined in greater detail at the end of this section.

These elements were selected based on feedback from the community, baseline assessments, working group feedback, and comparisons to benchmark communities. While these elements alone do not encompass every factor of sustainable communities, they do provide an achievable framework with understandable actions for the City of Provo that meet the priorities of the community.

This plan will include four pieces for each element: baseline data, aspirational targets for 2030 and 2050, descriptions to provide context and additional information, and specific strategies and actions to make progress toward each target over time.



Strengths Assessment

The first step of this process was to assess strengths and weaknesses as well as current and future needs. The City of Provo has taken tangible steps to becoming a more resilient city, while recognizing that there are inherent characteristics of the city that will both limit and enhance opportunities for greater integration of sustainability moving forward. The existing conditions assessment from the General Plan paints a broad portrait of Provo as a community, while the analysis for this plan focuses more narrowly on characteristics specifically impacting conservation and resiliency outcomes that the City can work to improve over the next 30 years.





Provo's greatest strength has been the commitment of recent elected officials to improving the City's day-to-day functions to become more resilient. The repair and expansion of infrastructure, especially for water, will have generational effects. Provo Power's shift to renewable energy sources and citywide efforts to reduce source emissions, such as the decision to build the new City Hall to produce no emissions, all send clear messages and examples to the rest of the community. Elected officials' efforts to conserve open space, expand residents' access to nature, increase the city's urban tree canopy, and improve air quality by expanding active transit will help to preserve our high quality of life for future generations of Provo residents.

Provo has had a high degree of success coordinating sustainability initiatives under the combined position of Sustainability Coordinator/Long-range Planner. This innovative pairing ensures that sustainability efforts are guided by the City's long-term goals and that long-range plans consider potential environmental impacts. The benefits of the position are detailed in the 2020 Report of the Mayor's Sustainability and Natural Resources Committee (now known as the Citizens' Sustainability Committee), which also contains a host of well-researched and impact-driven suggestions for strategies. The resources provided by this committee are a key strength of the City and, although it is composed of volunteers, its insights and analyses are on par or superior in many cases to those likely to be provided by outside consultants with lesser familiarity with city-specific issues.

In addition, the vesting of operational control of key services with the City allows for Provo to exert significant sustainability measures on these services for citizens. Waste diversion, water provision, and electricity supply are all critical components of conservation and resiliency. Having accountability and responsibility over all of these services enables the City to control these elements with fewer constraints than other municipalities have. Balancing this potential with fiscal responsibility and effective management of resources will remain a challenge, but one that Provo can embrace in shaping its future.

Provo's proximity to and good relationship with local universities, especially Brigham Young University, is another strength. Their expertise and innovations in sustainability practices will be invaluable as the City takes calculated, strategic steps to accommodating growth while preserving quality of life and the natural environment.



Benchmarking

Benchmarking provides insight to help understand how Provo compares to peer communities and identify opportunities to improve. It also serves as a reference point to determine targets that are appropriate and achievable. In selecting benchmarks, City staff and consultant groups looked to communities that have current sustainability, conservation, or resiliency strategies; are of a similar population size; have university influence; and have similar arid/semi-arid climates in mountain regions.

Reno, NV has several demographic similarities to Provo, along with a strong Sustainability and Climate Action Plan produced in 2019. Using the STAR Community framework, this plan outlines ambitious yet achievable goals and strategies developed in conjunction with the city's Master Plan. Since Reno is the fastest warming city in the U.S., the plan focuses on mitigating the public safety risks of increased drought, extreme heat, and wildfires.

Fort Collins, CO also has several demographic similarities and has proven leadership in sustainability. Fort Collins has been at the forefront of municipal sustainability efforts for years through its numerous Climate, Energy, and Waste reports. The City aims to cultivate a sustainable community through frequent monitoring, investment, mitigation, and resiliency.

Tempe, AZ is demographically similar and is a leader in cultivating community partnerships. The City of Tempe created a Climate Action Plan in 2019 and produces an annual sustainability report. This report takes the goals from the Climate Action Plan, measures current progress, and targets future levels of attainment for each goal. Tempe strives to engage the community by involving residents in the planning process and by partnering with Arizona State University.

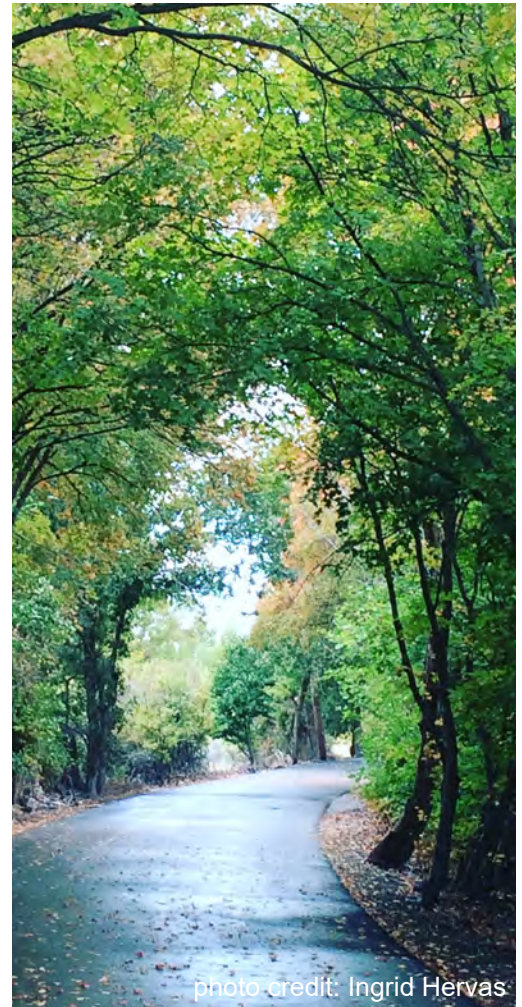


photo credit: Ingrid Hervas

Baseline Data and Key Performance Indicators

Key Performance Indicators (KPIs) are quantifiable indicators of progress, measurements taken at different times that can then be compared against each other to identify trends. These high-level indicators should be easily replicable and accessible for tracking purposes and be based on national best practices to enable ease of comparison. In addition to the KPI baselines, the baseline data gathering process identified other specific data points that have been included in Appendix A. These data points can be used to supplement the KPIs and convey more detailed information on specific topics. They could potentially replace or serve as KPIs if they are deemed more relevant or useful in the future. For this iteration of the plan, they may serve to provide robust answers to stakeholders, act as foundational elements of additional data gathering efforts, and provide options for implementation tracking.

DEFINITIONS, BASELINES, AND TARGETS



Both publicly available and City-generated data were identified that could present an overview of key topics for planning. Owing in part to data availability and in part to being representative of a more typical year given the abnormalities presented by 2020-2022 and the COVID-19 pandemic, 2019 was selected as the baseline year. Wherever practical, metrics were normalized by population count or land area to represent the relative impact of each citizen of Provo. The normalized indicators serve as the basis for the dashboard, with indications of both year-over-year change and impact represented by population counts to help effectively illustrate progress and status over time.

Target Selection

Specific targets were selected through a rigorous process involving baseline data assessment, benchmarking, industry research, and collaboration with relevant City departments. They were created to be attainable as well as ambitious.



photo credit: Mele Tasini



DEFINITIONS

CARBON EMISSIONS

Carbon emissions are expressed as a carbon dioxide equivalent (CO₂e) and include other greenhouse gases like methane, nitrous oxide, and others, which are converted to their equivalent amounts of carbon dioxide. This KPI currently includes energy generation, on-site emissions, and transportation.

AIR QUALITY

The top two sources of air pollution are motor vehicles and buildings. Provo will periodically administer the same survey asking residents about their behaviors that impact air quality. The survey has not yet been administered, and the KPI should be updated once the baseline has been established.

RENEWABLE ENERGY

Provo needs reliable electricity, and shifting to renewable sources can improve health, save money, and create jobs. Examples of renewable energy sources are wind, solar, and hydropower. Provo Power partners with the Utah Municipal Power Agency, a joint action energy provider.

URBAN NATURE

The environment has an impact on local temperature through impervious surfaces and albedo (or reflection). Increasing tree canopy also has numerous environmental and social benefits. Provo's canopy coverage is currently unknown, and the KPI should be updated once the baseline has been established.

WASTE DIVERSION

A circular economy (aided by programs like recycling and green waste) focuses on waste reduction strategies to save money and resources. Contamination from non-recyclable and non-compostable waste greatly increases the costs of operations. The KPI should be updated once the transfer station is complete.

WATER

In a semi-arid environment, water must be managed in a way that minimizes threats of water shortages and maximizes efficient and beneficial uses. Storing water in aquifers can be a key part of a resilient water management plan.

MOBILITY

Transportation is the number one cause of air pollution and carbon emissions in Provo (see Carbon Emissions for an explanation of measurements). This KPI includes 100% of emissions from trips within Provo and 50% of trips that begin or end in Provo. It does not include trips that only pass through the city.

FIRE RISK

As water becomes more of a limited resource and temperatures increase, we must plan to mitigate and reduce the risk of fires. The wildfire risk index is measured as a score of 1-12 based on a series of indicators.

DEFINITIONS, BASELINES, AND TARGETS



BASELINES AND TARGETS

	2019	2030	2050
CARBON EMISSIONS 	16.5 Metric Tons CO2e/Year/Capita	15% Decrease	50% Decrease
AIR QUALITY 	ND Air Quality Behaviors Survey Score	10% Increase	30% Increase
RENEWABLE ENERGY 	33% Renewable Sources	60% Renewable Sources	100% Renewable Sources
URBAN NATURE 	ND Tree Canopy Coverage	15% Increase	20% Increase
WASTE DIVERSION 	33% Contamination Rate	25% Contamination Rate	20% Contamination Rate
WATER 	0 Acre-feet Recharged/Year	10k Acre-feet Recharged/Year	20k Acre-feet Recharged/Year
MOBILITY 	3.5 Metric Tons CO2e/Year/Capita	5% Decrease	15% Decrease
FIRE RISK 	6 Community Wildfire Risk Index	5 Community Wildfire Risk Index	4 Community Wildfire Risk Index



CHAPTER 3

Eight Sustainability Elements

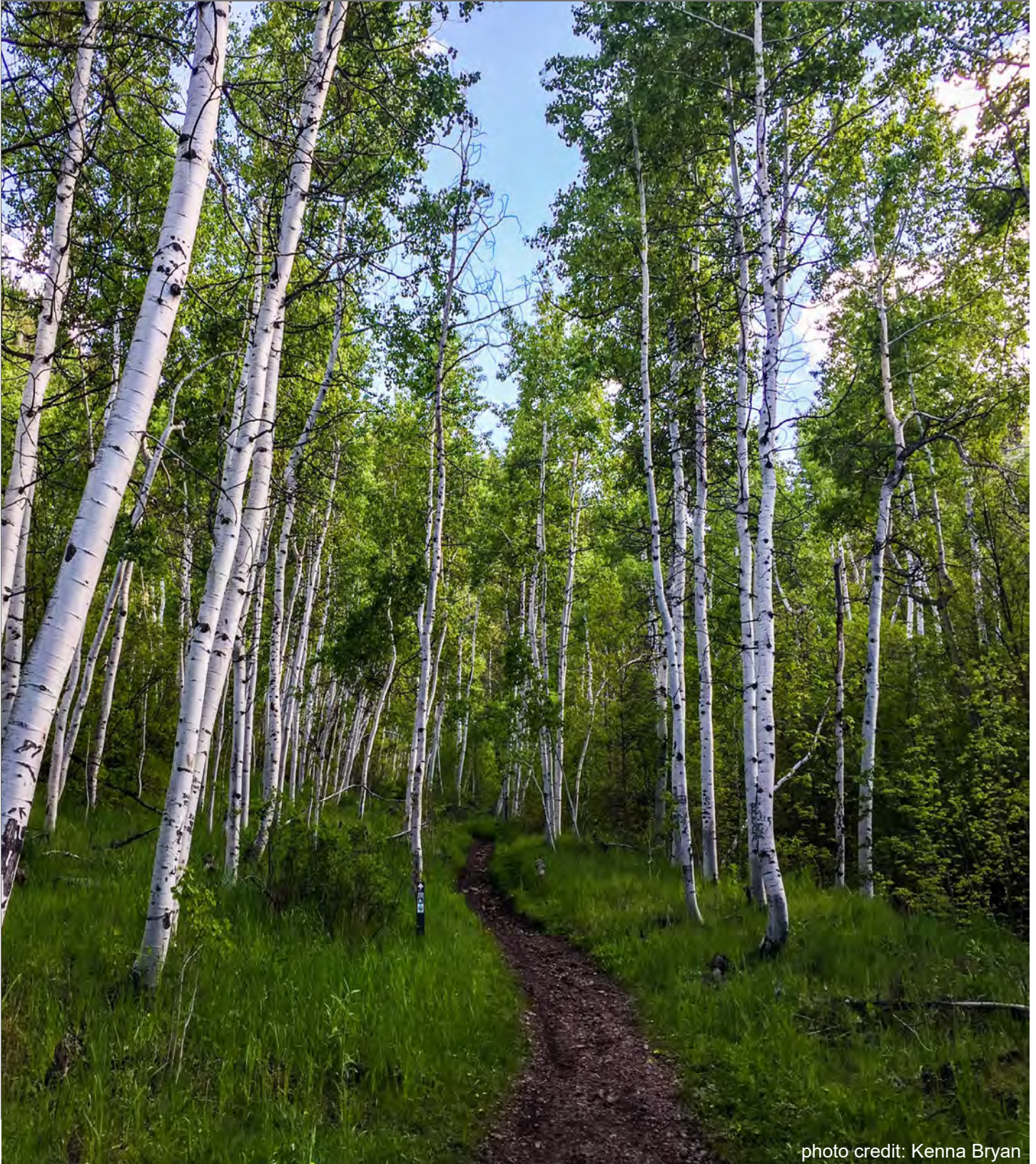


photo credit: Kenna Bryan



Carbon emissions represent the amount of greenhouse gases released from the daily activities of Provo residents and businesses. The largest sources are transportation and energy consumption for buildings, but there are additional sources including landfill gas, agricultural emissions, and wastewater treatment. Carbon dioxide emissions (CO₂) make up the vast majority of greenhouse gases. These gases are released during the combustion of fossil fuels such as coal, oil, and natural gas to produce energy to power buildings and motorized transit.

Buildings have a significant carbon footprint and are large contributors to energy consumption. Each building material has a lifecycle history from raw material extraction, water use, and transportation to building site, construction, and on-site waste. Once complete, building systems require significant energy production throughout their lifecycle of use and maintenance. As the city continues to grow, Provo strongly encourages developers to consider opportunities to make new buildings entirely electric or electric-ready and to build to high-efficiency standards to reduce on-site emissions.

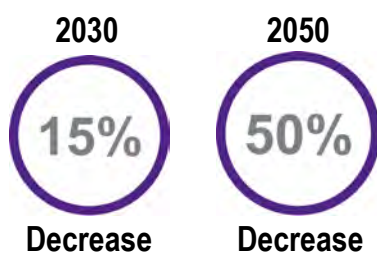
Reducing carbon emissions has significant synergistic benefits when coupled with renewable energy sources, which can be seen as a demand/supply pairing. There is also a financial value to the city and community. For example, due to low market costs, energy efficiency and renewable energy offer significant returns over time. Additionally, in cases such as vehicle electrification, the amount of local air pollutants is effectively nullified, providing better ambient air quality as the power supply includes more and more low-carbon sources. With the continued cost savings trends for electric and energy-efficient construction and transportation, implementing these measures makes strong financial sense for Provo, especially when compared to the unstable and rising costs of fossil fuels.

Baseline



Through the baseline assessment, it was found that Provo currently emits an average of 16.5 metric tons of CO₂ equivalent per person each year. This is lower than the current national average of 18.4 metric tons per person per year; however, there is still much room for improvement. The baseline greenhouse gas emissions form the basis for a full inventory from all sources.

Target



Much of Provo is already built out, and outdated electrical systems in many old homes will make full decarbonization challenging. Because buildings and vehicles are the major sources of emissions in Provo, future policies should prioritize improvements in those areas. Transportation has its own section in this plan, so building energy and performance measures across sustainability metrics also the main focus of this topic since the ongoing operations of buildings, new and old, will continue to be a significant source of carbon emissions.



What Does This KPI Measure?

CO₂e emissions represent the amount of greenhouse gases released from the daily activities of Provo residents and businesses. The largest sources are transportation and fossil fuel use in buildings and houses. For more information about emissions from transportation, see the Mobility section of this document.

Why This Matters

The reduction of our energy use and shifting towards more strategic energy use are central to reducing carbon emissions. Energy efficiency and renewable energy sources can help decrease air pollution by reducing the output of greenhouse gases, which can also improve public health and air quality as well as reduce energy costs. Reducing emissions through electric and energy-efficient buildings, appliances, and transportation is therefore the key strategy. In addition, reducing waste generation by capturing CO₂ before it enters the atmosphere can help to offset impacts at the source once the technology develops further. Shifting towards renewable and low-carbon sources such as wind, solar, hydropower, and geothermal power will support a long-term solution for the future.

Useful Links and Learning

[Inventory of U.S. Greenhouse Gas Emissions and Sinks](#) | US EPA

[Environmental Insights Data \(Provo\)](#) | Google



photo credit: Will Wickert



Goals

For the full list of goals and strategies, see Chapter 4 Implementation Matrix.

1. Increase the efficiency of commercial buildings.

- 1a. Consider promoting the Utah C-PACE program to enable supportive financing mechanism for private energy efficiency and renewable energy projects.
- 1b. Consider encouraging regular energy disclosure for commercial buildings over time.

2. Adopt voluntary stretch code standards for Zero-Emissions Buildings.

- 2a. Collaborate with other municipalities to determine targets that are consistent across borders and appropriate for Provo, as much as possible.
- 2b. Explore and adopt incentives to encourage the application of the voluntary codes.

3. Develop a comprehensive Greenhouse Gas (GHG) Inventory and identify significant emissions sources.

- 3a. Utilize national benchmarking such as Google's Environmental Insight Explorer (or similar) for largest emissions sources and sponsor a complete greenhouse gas inventory to identify additional sources and provide a complete greenhouse gas picture for Provo.
- 3b. Consider joining Local Governments for Sustainability (ICLEI) or the Urban Sustainability Directors Network (USDN) for ongoing carbon emissions support and inventory development.
- 3c. Catalog sources and related opportunities from the inventory to either integrate strategies into the Conservation and Resiliency Plan or create a Pollution Reduction Plan.

4. Investigate carbon capture projects for City-owned facilities and land.

- 4a. Investigate the potential for methane capture programs and carbon sequestration.
- 4b. Align conservation easement requirements with the potential to include and encourage carbon offset projects.



Ozone, particulate matter, and other pollutants in the air can have harmful effects on the health of people and animals. Emissions from vehicles and buildings are the major contributors, followed to a lesser degree by emissions from wood-burning stoves, construction sites, yard tools, and industries. Poor air quality can cause chronic bronchitis, asthma attacks, decreased lung function, coughing, painful breathing, premature births, cardiac and neurological problems, and heart attacks, as well as a variety of environmental impacts like acidification of lakes and streams and nutrient depletion in soils.

Particulate matter that is 2.5 microns wide or less (PM_{2.5}) and ozone are the primary air pollutants in Utah. In the winter, inversion traps PM_{2.5} in a visible layer near the ground. In the summer, intense sunlight and higher temperatures break volatile organic compounds (VOCs) down into ozone, which is not visible but is extremely hazardous. The World Health Organization's Global Air Quality Guidelines state that there is no safe level of air pollution.

With increased temperatures causing vegetation to dry out across the Western U.S., wildfires are becoming more and more frequent. The smoke from these fires negatively impacts air quality in Utah County. It is important to note that while following the recommendations in this plan will improve air quality, it will be increasingly challenging to achieve lower Air Quality Index (AQI) scores as wildfires increase in the region. However, the decreasing AQI scores and number of unhealthy (red or orange) days over time show that despite increasing populations and higher risks of wildfire, improvement is possible.

Average AQI in Provo by Decade

1980's	1990's	2000's	2010's
63	50	51	48

Number of Unhealthy AQI Days

2017	2018	2019	2020
11	25	0	5

Baseline

2023



**Air Quality Behaviors
Survey Score**

Rather than using regional metrics like the AQI or readings from local monitors, which can be thrown off by forces outside of Provo such as wildfires, it was decided that this plan should focus on tracking actions within the city. This primarily means educating residents and business owners and empowering them to make decisions and technological upgrades to reduce emissions from their homes, travel, and businesses. These efforts should be made in tandem with improvements in City operations.

Target

2030



Increase

2050



Increase

The Air Quality Behaviors Survey should be readministered to track progress. By continuing to reduce emissions, Provo will be able to achieve even cleaner air quality in the coming decades.

What Does This KPI Measure?

A survey will be administered to establish a baseline, and the results to questions will be aggregated into a single number to create the score for the KPI. Questions can be weighted as appropriate to give more impact to behaviors that have greater effects. The survey will ask residents about behaviors that impact air quality, such as burning wood, gas vs. electric appliances, methods of transportation, etc. The same survey will be issued again in 2030 and 2050.

Why This Matters

Air quality is an essential element of public health. When air quality reaches an AQI of 151-200, it is considered unhealthy, and even moderately unhealthy days of 101-150 can be hazardous for children and those with respiratory issues. Although Provo's average AQI is within the acceptable range, there are significant spikes in particle pollution during the winter due to inversion and in the summer due to wildfires and ozone pollution, which is created when emissions from vehicles and other sources react in sunlight. Both of these seasonal pollution spikes cause major threats to public health.

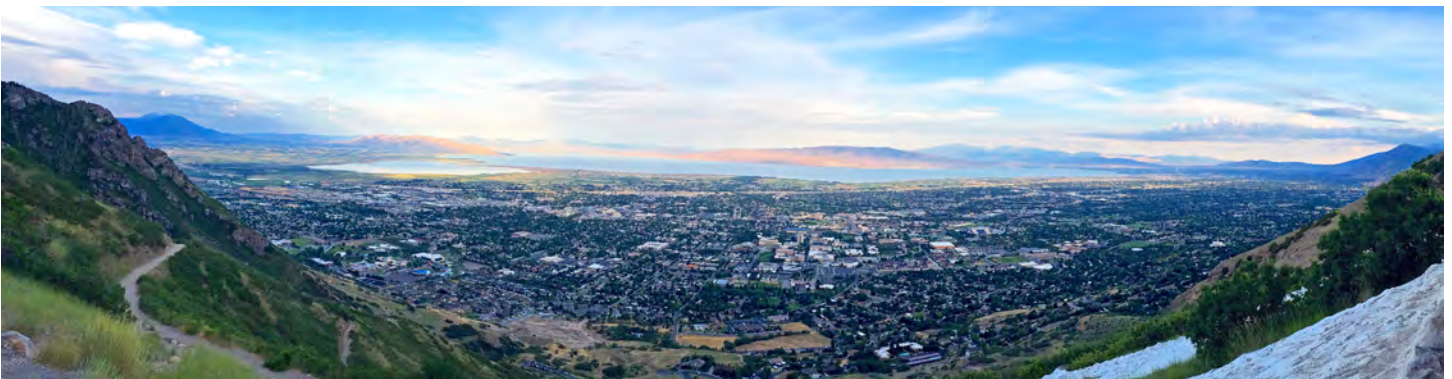
Continued efforts to improve air quality are essential, especially since the population of the valley is expected to increase significantly in the coming years. Having the right infrastructure and policies in place will help to prevent worsening air pollution levels that can come with that growth. Provo Power is already making an important contribution by giving incentives for installing heat pumps in buildings, offering rebates for exchanging gas-powered yard tools for electric ones, and installing more electric vehicle charging stations. In addition, higher standards for building insulation could reduce emissions, east-west synchronization of traffic lights could reduce idling, and alerting residents on orange and red air days could help to encourage mitigation efforts (e.g., driving less or trip-chaining, working remotely, not burning wood, etc.). A public awareness campaign will be an important part of these efforts.

Useful Links and Learning

[Purple Realtime Air Quality Map \(Provo\)](#)

[Air Quality Index Report](#) | US EPA

[Utah Division of Air Quality](#)



Goals

For the full list of goals and strategies, see Chapter 4 Implementation Matrix.

1. Increase air quality monitoring capacity.

- 1a. Consider deploying additional air quality monitors citywide on municipal buildings, ideally ones that measure ozone as well as PM2.5, and share information with the public.

2. Reduce emissions from vehicles.

- 2a. Consider implementing and strengthening no-idle regulations and educating the public, including more signage in common locations for idling.
- 2b. Increase the number of publicly available EV charging stations.
- 2c. Review code to identify any opportunities to encourage and incentivize installation of charging stations for existing projects, including allowing exemptions from reasonable constraints.

3. Reduce emissions from buildings and encourage improved indoor air quality.

- 3a. Consider expanding the GreenXChange rebate program.
- 3b. Put together education materials (e.g., video, website) for residents about how they can improve air quality at home.
- 3c. Consider incentives for developers to install zero-emissions HVAC systems in new builds.



Communities need reliable sources of affordable energy to keep city networks running. With increasing costs of fossil fuels, alternative energy sources are key to a successful future. As a member of the Utah Municipal Power Agency, Provo has already begun making great strides in the transition away from carbon-based energy. Maintaining this momentum and continuing to expand the infrastructure for renewable energy sources will be one of the most critical steps Provo can take toward building a more sustainable future.

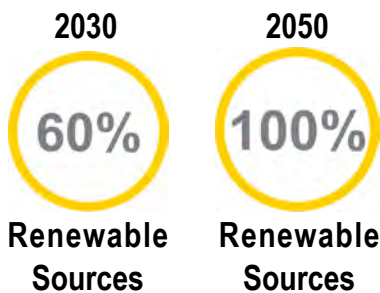
Renewable energy is closely related to carbon emissions and air quality and could be seen as the supply side of that equation. As more residents rely on electricity rather than on-site fossil fuels for their homes, appliances, and vehicles (demand), their electricity should come from a source that is also free of fossil fuels, such as hydro, wind, and solar (supply). Making more sustainable decisions both at the source and on-site in our homes and businesses will have a dramatic effect on air quality.

Baseline



The concept of renewable energy is wide enough to recognize the contributions of all low-carbon energy sources. Although it is anticipated that Provo will predominantly rely on solar, wind, and hydroelectric energy, Provo Power will monitor developments in other fields to identify reliable, safe, cost-effective sources of energy.

Target



The baseline assessment found that in 2019, Provo produced 33% of its energy from low-carbon sources. This is slightly below the national average of 39.5% but well above Utah's average of 14%. Like many other municipalities, Provo Power is aiming for a target of 100% by 2050. Provo Power has also set an interim target of 60% by 2030.

What Does This KPI Measure?

This KPI measures the percentage of the source energy used to provide electricity to Provo residents and businesses that comes from renewable sources.

Why This Matters

Renewable energy sources like solar, wind, and hydropower generate electricity without producing harmful greenhouse gas emissions. Additionally, their market prices can also be more stable than fossil fuel prices. A diversified portfolio of renewable energy sources will improve air quality, reduce carbon emissions, and help Provo stay resilient.

Useful Links and Learning

[Provo Power](#)

[Integrated Resource Plan FY2022-FY2041](#) | Utah Municipal Power Agency

[RenewChoice](#) | Utah Municipal Power Agency and Provo Power

[United States Green Building Council](#)

[Green Buildings at the EPA](#) | US EPA





Goals

For the full list of goals and strategies, see Chapter 4 Implementation Matrix.

1. Support Provo Power in meeting low-/zero-carbon targets.

- 1a. Support Provo Power in the acquisition of additional low- and zero-carbon fuel supplies.
- 1b. Investigate utility-scale renewable energy project partnerships using City land to accelerate low- and zero-carbon project development.

2. Empower residents to access low-/zero-carbon energy options.

- 2a. Consider expanding the Shared Solar Program and other RenewChoice programs in Provo.
- 2b. Support legislation to allow for large- and medium-scale solar farms in and around Provo as appropriate.
- 2c. Increase education and awareness for residential and commercial solar programs.
- 2d. Consider a shared battery program.

3. Couple energy storage with renewable energy for resiliency.

- 3a. Explore utilizing battery storage systems to power critical needs at Provo Power substation sites and couple with renewable energy where feasible. Implement according to financial feasibility.
- 3b. Encourage backup storage with cost-of-service-appropriate rates.



As Provo's population increases, preserving open spaces and agricultural lands becomes ever more important. Open spaces and natural areas contribute greatly to Provo residents' core value of access to recreation and natural beauty. Nature – from trees to parks to recreation areas – improves public health, lowers the ambient temperature, and offsets carbon emissions. Provo's urban parks play a critical role in maintaining healthy local ecosystems by improving the air we breathe, creating vegetative buffers to development, cooling summer temperatures, protecting groundwater, preserving habitat for wildlife, preventing flooding by slowing storm runoff, and providing a place for children and families to connect with nature. Park and recreation facilities provide access to the natural environment for all Provo residents and visitors. Recreation programs encourage participation in outdoor physical activities that enhance mental and physical health, and Provo residents place a high value on their neighborhood parks. All of these strengthen a shared sense of community and value for the local environment.

Many of Provo's parks are connected by an extensive trail network consisting of 61 miles of improved pathways, providing alternative transportation options and further connecting people with these community environmental benefits. As of 2020, Provo has 491 acres of urban parks, including a combination of neighborhood, community, and regional sites. Based on population growth projections, a goal has been set to add 135 acres by 2030 to maintain the level of service standards. Provo can buffer the effects of urban conditions and enhance the quality of life of its residents by continuing to thoughtfully locate and maintain public parks, natural areas, and trails throughout the city and in the surrounding mountains in partnership with other governments and agencies.

Baseline

2019



**Tree Canopy
Coverage**

Urban nature is a broad concept that addresses the interconnected network of natural spaces in an urban environment. Although Provo does not currently measure tree canopy coverage, the Council, staff, and experts in the Technical Working Group agreed that this was the best metric, and the City should begin tracking it. Gathering accurate baseline data after the adoption of this plan will be a necessary first step.

Target

2030



Coverage

2050



Coverage

These percentages should be interpreted as the amount of land in Provo covered by tree canopies, not as an increase in the baseline. Many urban foresters recommend a minimum target of 15% tree canopy for desert and semi-arid cities.



What Does This KPI Measure?

This KPI measures the amount of Provo City that is covered by tree canopies. Gathering tree canopy data allows for a good sense of a wide swath of other correlating environment data without necessarily needing to collect all of these metrics individually. For instance, a higher tree canopy density usually results in a smaller heat island effect and fewer impervious surfaces.

Should Provo determine that another metric more accurately captures the City's goals in this area, a wide array of publicly available environmental data can be sourced from LANDSAT and NLCD (National Land Cover Database) data and maps, National Wetlands Inventory, and EPA Envirofacts.

Why This Matters

Strategies to protect and conserve natural areas vary from protecting wetlands and waterways, to creating conservation areas, to increasing trees and greenways in urban areas. Increasing access to natural assets increases overall community health while also positively contributing to air quality and lowering heat island effects. Green spaces and trees should be strategically located across the city to prevent urban heat islands in low-income and industrial areas. The species of trees should also be suited to Utah County's semi-arid climate, such as those listed in Provo City's Tree Selection Guide.

Useful Links and Learning

[Parks and Recreation Master Plan](#) | Provo City

[Trails Plan](#) | Provo City

[Provo Parks](#)

[City of Provo Tree Selection Guide & Tour](#) | Provo City

[Utah Community Forest Council](#)

[Arbor Day Foundation](#)

[American Forests](#)



photo credit: Aubrey Odom



Goals

For the full list of goals and strategies, see Chapter 4 Implementation Matrix.

1. Inventory the current tree canopy percentage.

- 1a. Determine current percentage of tree coverage based on national best practices.
- 1b. Review the 15% target based on the updated baseline.
- 1c. Monitor the success of newly planted trees and work to increase the number that survive each year.

2. Develop an Urban Forestry Master Plan.

- 2a. Develop an Urban Forestry Plan that addresses increasing tree health and tree planting specifications.
- 2b. Prioritize tree plantings in areas of the city that are in greatest need of trees and biodiversity.

3. Encourage the planting of regionally appropriate trees on private properties.

- 3a. Coordinate with local biologists and arborists to host seasonal gardening classes for the community.
- 3b. Use the City's website and social media platforms to encourage regionally appropriate tree plantings.

4. Increase and preserve open space as appropriate.

- 4a. Continue to preserve agricultural land through conservation easements and selling of development rights as appropriate.

5. Create a sustainable tree watering plan.

- 5a. Ensure that the proper watering infrastructure is in place prior to tree plantings.
- 5b. Wherever possible, ensure that non-potable water is used for tree watering.
- 5c. Implement a non-potable water use/reuse strategy within the Urban Forestry Master Plan for street trees.



According to the EPA, in 2018 the average person generated 4.9 pounds of waste per day, most of which goes to landfills. As populations increase, landfills reach capacity, require additional space, and become increasingly costly to maintain and manage. The reduction of waste entering the waste stream and the reuse of materials (i.e., a circular economy) can help to save valuable land and economic resources.

Provo offers home recycling and green waste bins, community recycling bins, and a compost yard where residents can bring green waste and pick up inexpensive organic compost. Although these services are strong assets for both environmental quality and quality of life, high contamination rates increase their operating costs and reduce their potential benefits. The City's efforts would be best spent on increasing participation in waste diversion programs and educating the public to reduce contamination rates. Staff should also continue to monitor the global recycling market to minimize costs and maximize benefits.

Baseline



Waste disposal and contamination rates came from Provo Public Works, which does not gather all the solid waste in the city. Multifamily housing, commercial residential properties, and HOAs that utilize frontload and roll-off containers are serviced by third-party waste hauling companies and are therefore not metrics currently captured by the City. Furthermore, recyclable materials are combined with other cities' recycling prior to being hauled to Salt Lake City for sorting and processing, so it will be difficult to obtain recycling-specific contamination rates until the transfer station will be completed in 2025.

Target



Provo currently diverts 29% of waste from the landfill to more sustainable waste management sources like recycling and composting. The biggest challenge for recycling in Provo is contamination, or residents putting non-recyclable materials in recycling bins. In order to reach the goal of reducing contamination rates to 20% by 2050, the City will need to continue to educate residents about proper recycling best practices and composting options.

What Does This KPI Measure?

A higher contamination rate means more non-recyclable and non-compostable items are being put into recycling and composting. This means that City pays shipping on contaminants twice – once to go the transfer station or compost yard and then again to go to the landfill. Some items, especially liquids, contaminate recyclable items with which they come in contact. Others, such as shredded paper, can get stuck in the belt at the transfer station and cause facility-wide delays.

Why This Matters

Waste negatively impacts the environment and comes with significant costs. There are several methods to alleviate the issues. A waste audit can help to identify inefficiencies, missed opportunities for diversion, and associated costs. The first line of impact is overall reduction of waste on the part of all community members. Pay as you throw, composting, and product selection programs create a culture of awareness within the community. Municipalities can manage waste through diversion, safe disposal practices, and addressing e-waste and hazardous waste disposal.

Useful Links and Learning

[Provo Public Works Sanitation](#)

[National Overview: Facts and Figures on Materials, Wastes and Recycling](#) | US EPA





Goals

For the full list of goals and strategies, see Chapter 4 Implementation Matrix.

1. Review the targets once the transfer station is complete.

- 1a. Review and adjust the targets if needed once the City can accurately determine its contamination rate.

2. Reduce contamination rates for current and new users.

- 2a. Create and implement a strategy to decrease recycling contamination rates.

3. Increase the number of single-family, multifamily, and commercial buildings that use the City's recycling and compost services.

- 3a. Promote composting and recycling options to increase the number of residential and commercial buildings that recycle.

4. Increase proper household hazardous waste disposal.

- 4a. Promote household hazardous disposal and the year-round drop-off site.

5. Increase participation in the green waste program.

- 5a. Implement citywide informationals and training regarding waste reduction.
- 5b. Consider an ordinance to allow commercial businesses to apply for grants or rebates if they are able to achieve a predetermined target diversion rate.



Clean, accessible water is key to community prosperity – from reliable drinking sources to clean water for local wildlife. Water is becoming an increasingly scarce resource in the West as population increases, changes in weather patterns are impacting surface waters, changes in water conveyance and place of use limit groundwater recharge, and water use drains aquifers faster than they can recharge naturally. Water conservation can be approached in a three-point strategy: water use reduction, water reuse, and source management (conjunctive management).

In 2021, Provo residents used an average of 162 gallons per person per day. This already exceeds Utah’s goal to reduce water use in the central region to an average of 179 gallons per person per day by 2030 and even the stretch goal “with all aggressive policy options” of 167 gallons. Further reductions, especially through strategic outdoor use, could benefit the city.

Provo is giving new attention to reusing gray water (water that already has been used domestically, commercially, and industrially) and teaching residents how they can reuse water at home. Provo’s new wastewater treatment center has been designed with reuse in mind, and the City should continue to actively watch for opportunities to reuse water.

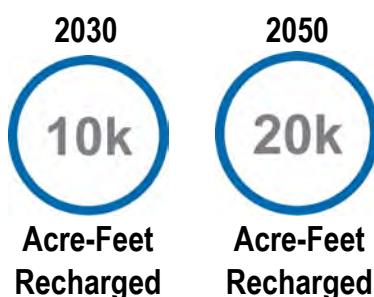
Replenishing Provo’s aquifers through aquifer storage and recovery (ASR) will be a foundational piece of securing water for future use. Groundwater is subject to less evaporation than surface water storage like reservoirs, and so will be ever more critical as average temperatures continue to rise across the region.

Baseline



ASR is a strategy for water storage where a community discharges water into an aquifer in order to be able to withdraw it from the ground years or even decades later. An aquifer is a highly permeable area underground (e.g., porous rock or sediment) that retains a high volume of water. Aquifers occur naturally but can be drained and refilled by human efforts. Aquifers also do not have the same negative impacts of dams and reservoirs, can be closer to urban areas, and prevent the evaporation of groundwater which otherwise negatively impacts runoff and local ecosystems.

Target



Although Provo will continue to address water reuse and reduction, recharging local aquifers will be the City’s primary goal. Provo has set ambitious targets to work toward water security for future residents and help the city meet whatever challenges arise.

What Does This KPI Measure?

This KPI measures the volume of water that Provo puts into aquifers annually. The volume is measured in acre-feet, or the amount of water needed to cover one acre to a depth of one foot (1 acre-foot = 325,851 gallons).

It should be noted that Utah measures water use by the amount diverted, regardless of how much water is put back into natural systems. Future discussions about water should be mindful of the difference between water consumed (consumptive use) and water used or diverted, a portion of which will likely be treated and returned (nonconsumptive use).

Why This Matters

Water reuse and conjunctive use are the most resilient long-term strategies for managing the water used in Provo and for helping Provo become more climate-resilient in the future. Efforts to secure water resources for future use should be paired with best practices for wisely using that water, including reducing per capita use (gallons per person per year) and finding ways to return more diverted water back into natural systems.

Useful Links and Learning

[Provo Public Works Water Resources](#)

[Provo Public Works Storm Water](#)

[Utah Division of Water Resource](#)

[Conjunctive Management of Surface and Ground Water in Utah](#) | Utah State Water Plan

[Utah State University Center for Water-Efficient Landscaping](#)

[Graywater Systems](#) | Utah State University Extension Sustainability



photo credit: Kim Ashby

Goals

For the full list of goals and strategies, see Chapter 4 Implementation Matrix.

1. Consider ways to expand the use of water-efficient appliances.

- 1a. Consider installing water-efficient appliances in all new City buildings.
- 1b. Establish education programs and consider establishing or promoting grants and rebates for residential and commercial businesses who invest in efficient appliances.

2. Promote the wise use of water by residents and Provo City.

- 2a. Create an education program/campaign to increase community awareness of water use and reuse.
- 2b. Promote water-wise landscaping for all City projects and properties as appropriate.
- 2c. Install smart controllers on all City irrigation systems as finances permit.
- 2d. Regularly evaluate water tier rates.

3. Educate property owners about their water use and encourage reducing waste.

- 3a. Promote services that show owners their water use each month.
- 3b. Consider creating incentives for residents who reduce and maintain water usage, especially during drought periods and summer months, while emphasizing tree and soil health.

4. Increase the appropriate use of non-potable and gray water.

- 4a. Support the development and preservation of non-potable/reuse water systems for uses such as landscaping and parks irrigation.
- 4b. Encourage residents to use rain barrels to supplement irrigation needs.



Transportation of people and goods is an integral part of our daily life, yet it has significant social and environmental impacts from vehicular traffic, stormwater runoff, heat islands, housing, and the loss of habitat to roadways. The majority of commercial transportation in Provo passes through the city on state roads and private rail lines over which the City has limited influence. Provo's mobility strategies should therefore focus on transportation that begins and/or ends in Provo and uses City infrastructure.

The gasoline-powered engines in most vehicles emit CO₂ and other greenhouse gasses as well as volatile organic compounds (VOCs) that break down into ozone. Motor vehicles are the greatest contributor to air pollution in Utah. According to the Utah Department of Environmental Quality, motor vehicle emissions made up 42% of air pollution in the state in 2019.

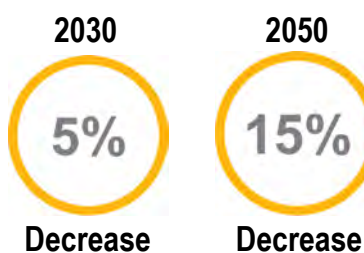
Automobiles will still likely remain the main transportation option for most residents, but even expanded road infrastructure cannot support Provo's anticipated population growth. Because citizens have expressed significant concerns about growing traffic problems as our population increases, it would be wise to work to provide robust infrastructure for and access to a wide variety of transportation options in order to avoid overburdening any one system. The City should also be strategic about multi-modal transportation systems to avoid disproportionately impacting any areas of the city or demographic groups, to the extent possible with financial and spatial constraints. The eventual expansion of transportation options for all members of the community will improve the safety, health, and social cohesion of the city and its residents. Barriers to transportation access include monetary costs, time costs, location, and physical ability. All of these elements should be included in future discussions about expanding access to a variety of transportation alternatives.

Baseline



This baseline only includes trips that originate and/or terminate in Provo. It also includes automobiles, walking, cycling, and buses. Although some of these modes do not produce any emissions, tracking the mode split can help the City create strategies and policies to reduce emissions, improve air quality, make transit more accessible, and prevent overburdening road infrastructure. For comparison, transportation emissions from Utah County in 2019 were 3.6 CO₂e/year/capita.

Target



This KPI reflects decreases in emissions due to a variety of shifts like diversifying modes of transit, having more electric and high-efficiency vehicles on the road, streamlining bottlenecks at east-west connections, and reducing idling. Because the vast majority of trips taken and miles traveled in Provo are by car, the City will see the greatest success if efforts are focused on reducing single-occupancy vehicle trips, making other transportation options more attainable and attractive, and helping cars move efficiently through our road network.

What Does This KPI Measure?

This KPI measures emissions from transportation per capita in Provo, using 2019 as a baseline. As in the Carbon Emissions element, transportation emissions (including carbon dioxide, methane, nitrous oxide, and others) are converted to their equivalent amounts of carbon dioxide and expressed as a carbon dioxide equivalent (CO₂e).

Through traffic is not currently included in city transport emissions calculations. In line with the Global Protocol for Community-Scale Greenhouse Gas Emission Inventories reporting standards, Google follows an origin-destination split, apportioning half of a given trip's emissions to the area where the trip began and 50% to where it ended (i.e. 50% for transboundary trips, and 100% for internal trips).

Long-range pass-through trips are considered to be produced by push/pull factors outside a pass-through city's control. City governments have fewer policy levers to influence reduction compared with short-range trips. The intention is thus to ensure fairer greenhouse gas accounting for cities like Provo that see a lot of traffic pass through without necessarily stopping.

Why This Matters

Automotive traffic is the greatest contributor to air pollution in Utah. Making progress on this element will be critical for success in the Carbon Emissions and Air Quality elements. Additionally, reducing single-occupant vehicle trips is central to successful multimodal transportation networks. Improving planning for all travel options and building community support for all modes of travel will not only have an impact on air quality, but also make it less likely for any one transit system to become overburdened as Provo's population continues to increase.

Useful Links and Learning

[Environmental Insights Data \(Provo\)](#) | Google

[Transportation Master Plan \(2020\)](#) | Provo City

[Bicycle Master Plan \(2013\)](#) | Provo City

[Vehicle Miles Traveled Per Capita](#) | US Department of Transportation

[Traffic Statistics](#) | Utah Department of Transportation



Goals

For the full list of goals and strategies, see Chapter 4 Implementation Matrix.

1. Track overall mode split and refine transportation KPI.

- 1a. Work with MAG and Google to refine the CO2e from transportation metric for national comparability.
- 1b. Track usage of various transportation modes.

2. Implement travel demand management strategies.

- 2a. Consider parking management districts and paid parking where it makes sense.
- 2b. Consider partnering with Utah TravelWise to implement strategies to reduce vehicle miles traveled.

3. Work toward maximizing access to different transportation options for all members of the community.

- 3a. Collaborate with UTA to expand access to public transportation in low-income and underserved communities.
- 3b. Collaborate with UTA to incentivize and possibly subsidize public transportation access for low-income residents.
- 3c. Consider expanding transit options on macro and micro levels.

4. Promote the use of mass transit.

- 4a. Incentivize Provo employees to use mass transit or alternative transportation.
- 4b. Coordinate with UTA to incentivize local businesses to use mass-transit or alternative transportation.



Wildfires are becoming more and more prominent when discussing a community's overall health, natural resources, and hazard preparedness. Unfortunately, as average temperatures and periods of drought increase, wildfires will only increase in numbers and ferocity. Ensuring that proactive wildfire mitigation efforts and investments are made now can help ensure that Provo will be on the leading edge of protecting lives and property when wildfires occur. Provo's fire strategies should focus on prevention and mitigation – especially educating residents – and ensuring the Fire Department has

trained emergency service teams with adequate resources.

Baseline

2019



Fire Risk
Score

The Fire Risk overall rating was obtained using the City's Community Preparedness Wildfire Plan, the Utah Wildfire Risk Assessment Portal (UtWRAP), and Communities at Risk data provided by the Utah Division of Forestry, Fire and State Lands.

Target

2030



Fire Risk
Score

2050



Fire Risk
Score

On a scale of 1-12, the average fire risk for communities in Utah is 9. Since Provo is already doing well in this category, moderate targets of a 5 by 2030 and a 4 by 2050 were selected. Reducing the amount of hazardous fuels, especially near the built environment, will continue to be one of the best ways to meet these targets.

What Does This KPI Measure?

Factors that play into the Fire Risk Score include fire occurrence (number of fires in the area), fuel hazard (fuel conditions of surrounding landscape), values protected (human and economic value within the community and surrounding landscape), and protection capabilities (insurance services organization [ISO] rating for the community).



Why This Matters

Fire risk is one of the greatest threats to human life and property in Provo. Taking preventative measures now is key to reducing overall harmful impacts. By annually updating the Community Wildfire Preparedness Plan and including evacuation information and mitigation efforts, citizens and emergency services will be able to stay up to date on one of the most prevalent issues facing the city today.

Useful Links and Learning

[Provo Fire and Rescue](#)

[Utah Wildfire Risk Assessment Portal](#) | Utah Forestry, Fire and State Lands

[Utah Fire Sense](#)



photo credit: Morgan Bassett

Goals

For the full list of goals and strategies, see Chapter 4 Implementation Matrix.

1. Limit new development in areas with high fire risk.

- 1a. Identify highest risk areas and discourage development in these areas.

2. Continue to decrease fuels in and around high and extreme risk areas.

- 2a. Identify hazardous areas requiring mitigation.
- 2b. Set aside funds in the annual budget to allow for fuel reduction efforts as necessary and appropriate.

3. Implement wildfire protection and prevention measures.

- 3a. Consider a City ordinance for increasing defensible space around residences and businesses in high- and extreme-risk areas.
- 3b. Adopt fire-safe construction standards in wildland-urban interface areas.
- 3c. Provide community members with fire prevention materials in high- and extreme-risk areas.
- 3d. Consider a city ordinance for vacant lots within the Wildland Urban Interface that are determined to be high and extreme risk to the surrounding homes, watershed, and infrastructure.

4. Update the Community Wildfire Preparedness Plan and educate residents.

- 4a. Annually update the plan and make it publicly available on the City's website.
- 4b. Include summary outline of evacuation plans that can be accessed on the City's website.
- 4c. Establish yearly wildfire preventative maintenance goals.
- 4d. Educate residents and businesses on the dangers of wildfires and how to prepare for wildfire season.



CHAPTER 4

Implementation Matrix





Introduction

Provo has always been an ambitious, driven city and a regional leader in innovation. In keeping with that pioneering heritage, the targets and strategies in this plan are bold. They will challenge us, they will inspire us, and they will require collaboration with our many community partners.

These targets should not be seen as a checklist, to-do list, or as a binding list of policies, but rather as an extension of the rest of this long-term visioning document. Like the rest of the General Plan, the targets and strategies were developed based on input received from Provo residents across the city. However, these targets also look beyond Provo's borders. They are ambitious targets not only for Provo but also for the region. They send a clear message to our community partners about how we want to grow as a city and as a regional hub. As we look into the future, reaching some of these targets will depend on the continuing development of technologies that will make them possible.

Implementation and Partnerships

How to Get Involved

This plan will require active participation from a variety of stakeholders. One of the defining features of a successful plan is built in redundancy and partnership, so collaboration between departments and with community partners will be critical. Collaboration efforts should be made not only on active projects but also when strategizing and determining what actions will have the greatest impact while most wisely using City resources. Support could come in the form of staff time, shared information and expertise, funding, or political and legislative support. Every reasonable effort should be made to maintain open communication between departments and to build good relationships with community partners.

Sustainability Coordinator

The Sustainability Coordinator will work collaboratively with City staff, department leads, the Sustainability and Natural Resources Committee, the business community, and the public to design, organize, and promote effective sustainability initiatives. The role will lead in educating the community about sustainability, coordinating effective initiatives, and reporting regularly in collaboration with City departments. This position will make recommendations during the budget process, collaboratively create work plans with department leaders, and track progress through the Key Performance Indicators and whatever other metrics and initiatives the City deems significant at the time. The Sustainability Coordinator will serve as a collaborating and facilitating role to different positions and departments.



photo credit: Brigham Young University
Sustainability Office



The Sustainability Coordinator's Responsibilities include:

- Lead and prioritize programs and projects, collaboratively creating work plans with department leaders pertaining to different areas of the plan;
- Establish and lead a system for tracking performance progress;
- Monitor sustainability best practices of peer cities and make recommendations for new sustainability programming and modifications to existing programs;
- Support and coordinate between departments as appropriate in relation to implementing sustainability programs;
- Research and identify grants and other funding opportunities in support of sustainability efforts and make recommendations during the City budget process;
- Lead promotional and educational materials for brochures, displays, guides, and training materials; and
- Coordinate updates to the City's sustainability webpage.

Sustainability Committees

Provo's Employee Sustainability Committee, the Mayor's Sustainability, and a volunteer Citizens' Sustainability Committee serve as advocates of the goals in this plan. The Sustainability Coordinator will work to align the roles and responsibilities of these committees and serve as both a lead role and liaison. Additional coordination may be needed beyond these groups to ensure successful outcomes. The current structure of these committees could be reviewed to include more local business owners, university partners, and other stakeholders impacted or needed to support the goals of this plan.



photo credit: Christina Bartholomew



Coordination with General Plan Elements

The goals of the General Plan align with the goals in this plan. Transportation goals in the General Plan call for multimodal options to reduce vehicle trips. Economic development goals recognize the importance of enhancing commercial and retail businesses to achieve overall community wellbeing. Open space goals support the preservation and improvement of parks, trails, and conservation areas to contribute towards tree canopy goals. Resource management goals support assessing water systems, promoting wise water use, strategically managing solid waste, increasing the urban tree canopy, conserving energy and using renewable energy sources, empowering employees to implement energy and cost saving measures, and ongoing efforts to educate Provo residents about environmental sustainability and empower them to make sustainable decisions in their own lives.

The implementation table is organized by the eight plan elements. Each element includes actions (goals) followed by methods to achieve these actions.

Action outlines steps needed to implement the strategy through programs, initiatives, policies, projects, or tasks.

Partnerships identifies key players needed to lead or coordinate actions.

Impact measures the relative potential magnitude of these actions towards overall goals.

Cost measures relative potential funding needed from low (\$) to high (\$\$\$).

Timing includes short-range projects (1-3 years), medium range projects (3-10) years and long-range projects (10 years and beyond) to achieve the targets.

Priority helps identify good places to begin, either because they are “quick wins” or because they are predicted to have a greater impact.



A Note About Estimates

Estimates of impact, cost, timing, and priority are relative estimates at the time the plan was adopted and should be kept flexible to allow staff to seize new opportunities as they emerge.

Goals that have an estimated high impact, low cost, and short timing could be considered “quick wins” and good places to begin taking action.



Carbon Emissions

ACTION	PARTNERSHIP	IMPACT	COST	TIMING	PRIORITY
1. Increase the efficiency of commercial buildings.					
1a. Consider promoting the Utah C-PACE program to enable supportive financing mechanism for private energy efficiency and renewable energy projects.	Sustainability Coordinator, Development Services, Sustainability Committee, Council, Development Community	High	\$\$\$	Medium-Long	Medium
1b. Consider encouraging regular energy disclosure for commercial buildings over time.					
2. Adopt voluntary stretch code standards for Zero-Emissions Buildings.					
2a. Collaborate with other municipalities to determine targets that are consistent across borders and appropriate for Provo, as much as possible.	Sustainability Coordinator, Development Services, Administration, Council	High	\$-\$\$\$	Short	High
2b. Explore and adopt incentives to encourage the application of the voluntary codes.					
3. Develop a comprehensive Greenhouse Gas (GHG) Inventory and identify significant emissions sources.					
3a. Utilize national benchmarking such as Google's Environmental Insight Explorer (or similar) for largest emissions sources and sponsor a complete GHG inventory to identify additional sources and provide a complete GHG picture for Provo.	Sustainability Coordinator, Administration, Council	High	\$	Short-Medium	High
3b. Consider joining ICLEI (Local Governments for Sustainability) or the Urban Sustainability Directors Network (USDN) for ongoing carbon emissions support and inventory development.					
3c. Catalog sources and related opportunities from the inventory to either integrate strategies into the Conservation and Resiliency Plan or create a Pollution Reduction Plan.					
4. Investigate carbon capture projects for City-owned facilities and land.					
4a. Investigate the potential for methane capture programs and carbon sequestration.	Provo Power, Public Works, Development Services, Administration	High	\$\$\$	Short-Medium	High
4b. Align conservation easement requirements with the potential to include and encourage carbon offset projects.					



Air Quality

ACTION	PARTNERSHIP	IMPACT	COST	TIMING	PRIORITY
1. Increase air quality monitoring capacity.					
1a. Consider deploying additional air quality monitors citywide on municipal buildings, ideally ones that measure ozone as well as PM2.5, and share information with the public.	Sustainability Coordinator, Administration, Council, Universities	High	\$\$\$	Short	Low
2. Reduce emissions from vehicles.					
2a. Consider implementing and strengthening no-idle regulations and educating the public, including more signage in common locations for idling.	Sustainability Coordinator, Provo Power, Media Services, Development Community, Business Community, UTA, MAG	Medium	\$	Medium	Medium
2b. Increase the number of publicly available EV charging stations.					
2c. Review code to identify any opportunities to encourage and incentivize installation of charging stations for existing projects, including allowing exemptions from reasonable constraints.					
3. Reduce emissions from buildings and encourage improved indoor air quality.					
3a. Consider expanding the GreenXChange rebate program.	Council, Administration, Sustainability Coordinator, Provo Power, UMPA, Media Services, Development Services	Medium	\$-\$	Short-Medium	Medium
3b. Put together education materials (e.g., video, website) for residents about how they can improve air quality at home.					
3c. Consider incentives for developers to install zero-emissions HVAC systems in new builds.					



Renewable Energy

ACTION	PARTNERSHIP	IMPACT	COST	TIMING	PRIORITY
1. Support Provo Power in meeting low-/zero-carbon targets.					
1a. Support Provo Power in the acquisition of additional low- and zero-carbon fuel supplies.	Administration, Provo Power, UMPA	High	\$\$\$	Short-Long	High
1b. Investigate utility-scale renewable energy project partnerships using City land to accelerate low- and zero-carbon project development.					
2. Empower residents to access low-/zero-carbon energy options.					
2a. Consider expanding the Shared Solar Program and other RenewChoice programs in Provo.	Sustainability Coordinator, Development Services, Administration, Council	Medium	\$	Short	High
2b. Support legislation to allow for large- and medium-scale solar farms in and around Provo as appropriate.					
2c Increase education and awareness for residential and commercial solar programs.					
2d. Consider a shared battery program.					
3. Couple energy storage with renewable energy for resiliency.					
3a. Explore utilizing battery storage systems to power critical needs at Provo Power substation sites and couple with renewable energy where feasible. Implement according to financial feasibility.	Sustainability Coordinator, Provo Power, UMPA	High	\$\$\$	Medium	Medium
3b. Encourage backup storage with cost-of-service-appropriate rates.					



Urban Nature

ACTION	PARTNERSHIP	IMPACT	COST	TIMING	PRIORITY
1. Inventory the current tree canopy percentage.					
1a. Determine current percentage of tree coverage based on national best practices.	Sustainability Coordinator, GIS, Urban Forester, Universities	High	\$	Short	Medium
1b. Review the 15% target based on the updated baseline.					
1c. Monitor the success of newly planted trees and work to increase the number that survive each year.					
2. Develop an Urban Forestry Master Plan.					
2a. Develop an Urban Forestry Plan that addresses increasing tree health and tree planting specifications.	Sustainability Coordinator, Development Services, Parks and Recreation, Public Works	Medium	\$\$	Short-Medium	Medium
2b. Prioritize tree plantings in areas of the city that are in greatest need of trees and biodiversity.					
3. Encourage the planting of regionally appropriate trees on private properties.					
3a. Coordinate with local biologists and arborists to host seasonal gardening classes for the community.	Sustainability Coordinator, Provo Power, Parks and Recreation, Media Services, Universities	Low	\$	Short	Medium
3b. Use the City's website and social media platforms to encourage regionally appropriate tree plantings.					
4. Increase and preserve open space as appropriate.					
4a. Continue to preserve agricultural land through conservation easements and selling of development rights as appropriate.	Sustainability Coordinator, Development Services, Parks and Recreation, Agricultural Commission, Council	High	\$\$\$	Long	High
5. Create a sustainable tree watering plan.					
5a. Ensure that the proper watering infrastructure is in place prior to tree plantings.	Provo Power, Public Works, Development Services, Administration	High	\$\$	Short	High
5b. Wherever possible, ensure that non-potable water is used for tree watering.					
5c. Implement a non-potable water use/reuse strategy within the Urban Forestry Master Plan for street trees.					



Waste Diversion

ACTION	PARTNERSHIP	IMPACT	COST	TIMING	PRIORITY
1. Review the targets once the transfer station is complete.					
1a. Review and adjust the targets if needed once the City can accurately determine its contamination rate.	Sustainability Coordinator, Public Works	Low	\$	Short	High
2. Reduce contamination rates for current and new users.					
2a. Create and implement a strategy to decrease recycling contamination rates.	Sustainability Coordinator, Public Works, Sustainability Committee, Media Services	High	\$\$	Short-Medium	High
3. Increase the number of single-family, multifamily, and commercial buildings that use the City's recycling and compost services.					
3a. Promote composting and recycling options to increase the number of residential and commercial buildings that recycle.	Sustainability Coordinator, Public Works, Sustainability Committee	Medium	\$\$	Short-Medium	Medium
4. Increase proper household hazardous waste disposal.					
4a. Promote household hazardous disposal and the year-round drop off site.	Sustainability Coordinator, Public Works, Sustainability Committee	Low	\$\$	Short	Medium
5. Increase participation in the green waste program.					
5a. Implement citywide informationals and training regarding waste reduction.	Public Works, Sustainability Coordinator, Sustainability Committee, Media Services, Business Community	Medium	\$	Short	Medium
5b. Consider an ordinance to allow commercial businesses to apply for grants or rebates if they are able to achieve a predetermined target diversion rate.					

IMPLEMENTATION MATRIX



Water

ACTION	PARTNERSHIP	IMPACT	COST	TIMING	PRIORITY
1. Consider ways to expand the use of water-efficient appliances.					
1a. Consider installing water-efficient appliances in all new City buildings.	Sustainability Coordinator, Facilities, Public Works, Administration, Sustainability Committee	Medium	\$\$	Short-Medium	Medium
1b. Establish education programs and consider establishing or promoting grants and rebates for residential and commercial businesses who invest in efficient appliances.					
2. Promote the wise use of water by residents and Provo City.					
2a. Create an education program/campaign to increase community awareness of water use and reuse.	Sustainability Coordinator, Public Works, Parks and Recreation, Media Services, Sustainability Committee	High	\$	Short	High
2b. Promote water-wise landscaping for all City projects and properties as appropriate.					
2c. Install smart controllers on all City irrigation systems as finances permit.					
2d. Regularly evaluate water tier rates.					
3. Educate property owners about their water use and encourage reducing waste.					
3a. Promote services that show owners their water use each month.	Sustainability Coordinator, Public Works, Customer Service, Media Services, Sustainability Committee	High	\$\$	Medium	Medium
3b. Consider creating incentives for residents who reduce and maintain water usage, especially during drought periods and summer months, while emphasizing tree and soil health.					
4. Increase the appropriate use of non-potable and gray water.					
4a. Support the development and preservation of non-potable/reuse water systems for uses such as landscaping and parks irrigation.	Public Works, Parks, Recreation, Sustainability Committee	High	\$\$	Long	Medium
4b. Encourage residents to use rain barrels to supplement irrigation needs.					



Mobility

ACTION	PARTNERSHIP	IMPACT	COST	TIMING	PRIORITY
1. Track overall mode split and refine transportation KPI.					
1a. Work with MAG and Google to refine the CO2e from transportation metric for national comparability. 1b. Track usage of various transportation modes.	Sustainability Coordinator, Public Works, TMAC, UTA, MAG, UDOT, Google	Low	\$	Short	Medium
2. Implement travel demand management strategies.					
2a. Consider parking management districts and paid parking where it makes sense. 2b. Consider partnering with Utah TravelWise to implement strategies to reduce vehicle miles traveled.	Sustainability Coordinator, Public Works, TMAC, Administration, Council	Low	\$\$	Medium	High
3. Work toward maximizing access to different transportation options for all members of the community.					
3a. Collaborate with UTA to expand access to public transportation in low-income and underserved communities. 3b. Collaborate with UTA to incentivize and possibly subsidize public transportation access for low-income residents. 3c. Consider expanding transit options on macro and micro levels.	Sustainability Coordinator, Public Works, Administration, TMAC, UTA	Medium	\$\$\$	Short-Medium	Medium
4. Promote the use of mass transit.					
4a. Incentivize Provo employees to use mass transit or alternative transportation. 4b. Coordinate with UTA to incentivize local businesses to use mass-transit or alternative transportation.	Sustainability Coordinator, Provo Power, Development Community, Business Community, UTA, MAG	Medium	\$\$	Medium	Medium



Fire Risk

ACTION	PARTNERSHIP	IMPACT	COST	TIMING	PRIORITY
1. Limit new development in areas with high fire risk.					
1a. Identify highest risk areas and discourage development in these areas.	Fire, Public Works, Development Services, Parks and Recreation	High	\$\$	Short	Medium
2. Continue to decrease fuels in and around high and extreme risk areas.					
2a. Identify hazardous areas requiring mitigation.	Fire, Parks and Recreation, Public Works, Council	High	\$\$	Short	High
2b. Set aside funds in the annual budget to allow for fuel reduction efforts as necessary and appropriate.					
3. Implement wildfire protection and prevention measures.					
3a. Consider a City ordinance for increasing defensible space around residences and businesses in high- and extreme-risk areas.	Fire, Parks and Recreation, Development Services, Administration, Council	High	\$\$	Medium	Medium
3b. Adopt fire-safe construction standards in wildland-urban interface areas.					
3c. Provide community members with fire prevention materials in high- and extreme-risk areas.					
3d. Consider a city ordinance for vacant lots within the Wildland Urban Interface that are determined to be high and extreme risk to the surrounding homes, watershed, and infrastructure.					
4. Update the Community Wildfire Preparedness Plan and educate residents.					
4a. Annually update the plan and make it publicly available on the City's website.	Fire, Media Services, MAG	High	\$	Short	High
4b. Include summary outline of evacuation plans that can be accessed on the City's website.					
4c. Establish yearly wildfire preventative maintenance goals.					
4d. Educate residents and businesses on the dangers of wildfires and how to prepare for wildfire season.					

APPENDIX A

2019 Benchmarking Studies



photo credit: Justin Soderquist

APPENDIX A: BENCHMARKING STUDIES



Table A1: Characteristics of Benchmarking Communities

COMMUNITY	PROVO, UT	FORT COLLINS,	TEMPE, AZ	RENO, NV
Population	116,594	174,081	203,923	514,000
Growth since 2000 (%)	10.30%	32%	23%	41%
University Town	Yes	Yes	Yes	Yes
Median Age	23.6	29.3	29.5	35.8
Median Income	\$15,450	\$29,477	\$30,221	\$31,399
Characteristics	Brigham Young University, largest city in Utah County	Colorado State University	Arizona State University	University of Nevada Reno
Geographic Assets	Provo River, Utah Lake, Wasatch Front	Poudre River, Proximity to the Front Range	Salt River, Proximity to Phoenix, arid climate	Truckee River, Sierra Nevada, proximity to Tahoe, arid climate
Existing Sustainability Actions	Website, Sustainability Committees	Climate Action Plan, Sustainability Department, Energy Policy, Road to Zero Waste Plan	Climate Action Plan	Sustainability and Climate Action Plan
Sustainability Plan Framework	N/A	STAR	LEED	STAR
Density (Pop/Sq Mile)	2,798	3,044	5,101	2,451

Table A2: Comparison of Targets from Benchmarking Communities

TARGET CATEGORY	PROVO, UT	FORT COLLINS,	TEMPE, AZ	RENO, NV
Carbon Emissions	15% decrease in carbon emissions by 2030 50% decrease by 2050	80% decrease in GHG emissions by 2030 Carbon neutral by 2050	80% decrease in GHG emissions by 2050 Carbon neutral by 2060	80% decrease in GHG emissions by 2050
Renewable Energy	60% renewable by 2030 100% renewable by 2050	100% renewable by 2030 5% from local renewable sources by 2030	100% renewable by 2035	80% renewable by 2050
Waste Diversion	25% contamination rate by 2030 20% contamination rate by 2050	75% diversion rate by 2020 Zero waste by 2030	25% solid waste diversion by 2020	50% increase in recycling rate by 2025 Zero waste by 2050
Water	10k acre-feet recharged per year by 2030 20k acre-feet recharged per year by 2050	130 gallons per capita per day by 2030	110 gal per capita per day	100% water source protection

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APPENDIX A: BENCHMARKING STUDIES



Table A2: Comparison of Targets from Benchmarking Communities, cont.

TARGET CATEGORY	PROVO, UT	FORT COLLINS,	TEMPE, AZ	RENO, NV
Urban Nature	15% increase in urban tree canopy coverage by 2040 20% urban tree canopy coverage by 2040	No target found	25% urban tree canopy coverage by 2040	10% urban tree canopy coverage by 2036
City Operations	N/A	Increase electric vehicle fleet	Carbon neutrality by 2050	80% decrease in municipal GHG emissions by 2050
Other	10% increase in air quality behavior survey score by 2030, 30% increase by 2050 5% decrease in metric tons CO ₂ e per year per capita by 2030, 15% by 2050 Community Wildfire Risk Index score of 5 by 2030 and 4 by 2050	At least 85% of recycled material is actually recycled (no target year)	80% satisfaction with transit system by 2024	25% increase in green buildings by 2025



APPENDIX B

Supplemental Baseline Data

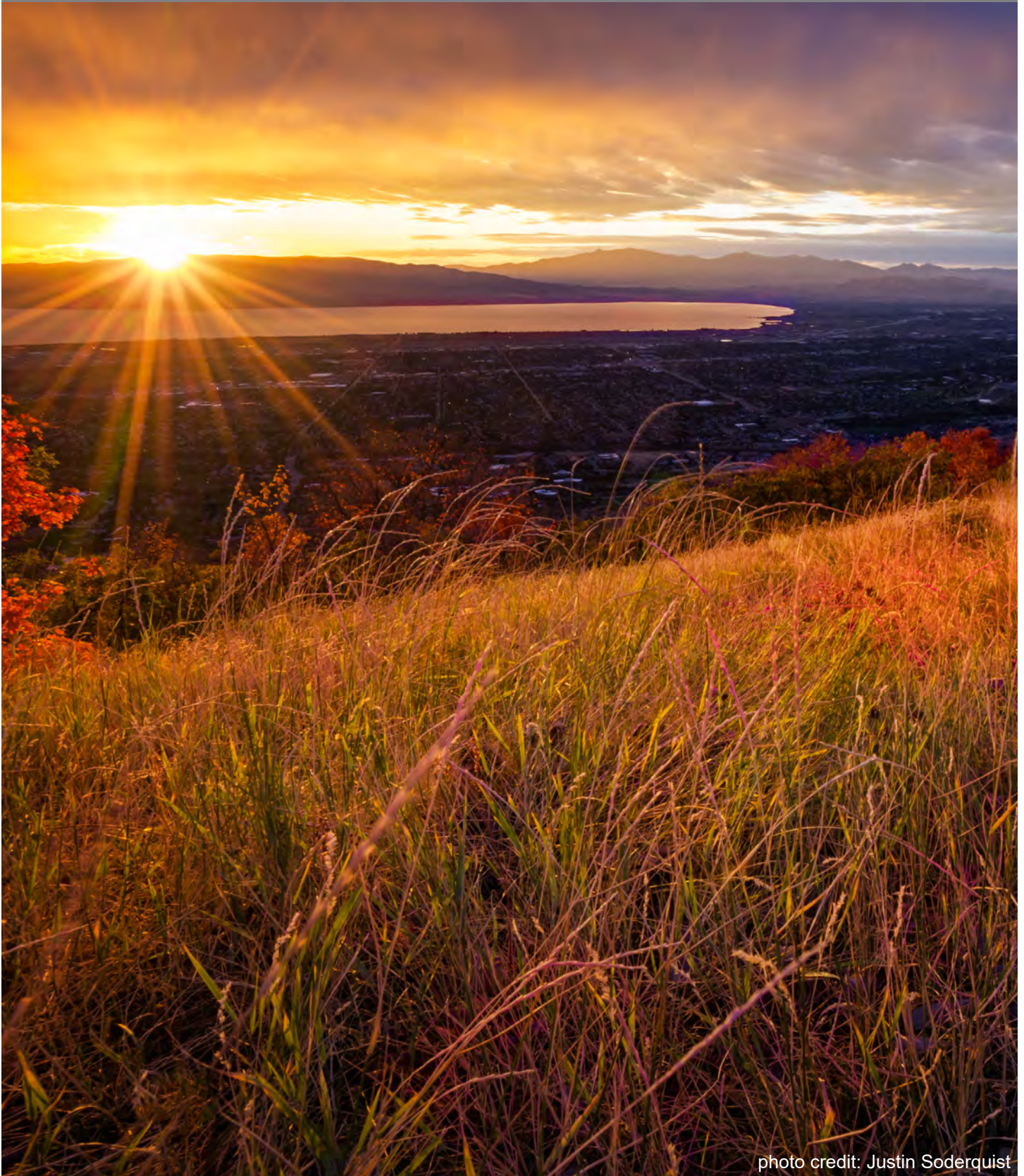


photo credit: Justin Soderquist

APPENDIX B: SUPPLEMENTAL BASELINE DATA



The following tables present key data from the assessment for consideration in plan development moving forward.

Table B1: Recommended Key Performance Indicators

CRITERIA	TOPIC	2019 METRIC	UNIT
Median AQI*	Air Quality	46	Days
Registered LEED Projects*	Built Environment	9	-
GINI Index*	Economic	0.46	-
Resource Mix (% Low Carbon)	Energy Source, Efficiency, Usage	33	%
100 Year Flood (# of Buildings)	Flood Event Preparedness	48	-
Total GHG Emissions*	Carbon Footprint / Greenhouse Gas Emissions	1,053,127	mt CO ₂ e
Average Evening Ambient Surface Temperature Deviation from Average	Human Comfort	40	% of Provo City
Residents within a ½ Mile of a Park / Open Space	Human Health	86,106	people
EV Charging Stations*	Land Use Patterns	16	dual units
Vehicle Miles Traveled / Day (Mountainland Association of Governments, Public Works)*	Mobility	1,668,047	-
Tree Canopy	Natural Environment Health	Pending	
Municipal Solid Waste Diversion Rate*	Waste Disposal & Diversion	26	%
Total Community Water Consumption*	Water Quality, Supply, Usage	6.9	billion gal
Total Overall Risk Rating	Wildland Fire Preparedness	6	-

* Indicates that the KPI is also a LEED for Cities and Communities criterion

Table B2: Supplemental Performance Metrics

CRITERIA	TOPIC	2019 METRIC	UNIT
Energy Consumption*	Energy Source, Efficiency, Usage	798,581	MWh
Daily Transit Boardings (Provo City)	Mobility	16,058	-
Internal Trips as % of Total Trips	Mobility	35	%
Bikes Lanes	Mobility	48.90	miles
Trails	Mobility	58.26	miles
Total Municipal Solid Waste Generated*	Waste Disposal & Diversion	22,304.75	tons
Total Recycle Materials Recycled	Waste Disposal & Diversion	2,595	tons
Total Green Waste Collected	Waste Disposal & Diversion	5,271	tons
Total Available Supply Broken Down by Sources	Water Quality, Supply, Usage	8.42	billion gal
Total AOI for Moderate Wildfire Threat	Wildland Fire Preparedness	22,895	acres

* Indicates that the KPI is also a LEED for Cities and Communities criterion

APPENDIX B: SUPPLEMENTAL BASELINE DATA



Table B3: Additional LEED for Cities and Communities Metrics

CRITERIA	TOPIC	2019 METRIC	UNIT
AQI Unhealthy for Sensitive Group Days	Air Quality	1	day
Unemployment Rate	Economic	4.5	%
Median Household Income in the Last 12 Months	Economic	53,864	\$
Median Gross Rent of a Household Income	Economic	32.3	%
High School Graduate or Higher	Demographics / Quality of Life	96	%
Bachelor's Degree or Higher	Demographics / Quality of Life	45	%
Violent Crime	Demographics / Quality of Life	135	year



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