NATURAL SETTING

DETAILED STRATEGIES

STRATEGY: Defining and Programming Open Space

Open Space… the space between… is cherished by Parkites. A fall day mountain biking over the freshly fallen mosaic of leaves up Armstong trail, a crisp morning cross country ski taking in the views from the stage of Round Valley, or a summer afternoon in Miner's park enjoying an ice cream cone while listening to a local bluegrass band… just to name a few of the enjoyable open space experiences of Park City.

Parkites utilize the open space in town to recreate, commingle, and explore. There are different types of open spaces, from a small pocket park along Main Street to the vast forests with trail systems that create an incredible backdrop to the City. The experiences of open space in Park City are drastically different due to the variety of landscapes, context within the built environment, and natural aspect of the area.

As Park City and the region continue toward build out, the space between is becoming less, narrowed by development pressures. These spaces between play an important role for placemaking and healthy ecosystems. By preserving open space, the community prioritizes protection of the nature while preventing undesired development.

Open space is directly related to the visitor experience and is extremely important to the long term economic viability of Park City as a world class resort town. Park City must work within the Wasatch Back region to maintain a unique place in order to stay competitive within the local and global tourism industry. Preserving the natural context of place within meaningful sequences of regionally distinctive landscapes reinforces the community's connection to the natural setting and brings delight to residents and visitors alike.

Open Space… two words, many applications.

Due to the variety of amenities within open space and within different contexts, it is important that Park City define Open Space in a consistent manner that can be interpreted easily by residents and developers. The first step in defining open space is defining the primary purpose for a parcel of land. Determining primary purpose will involve consideration of existing land use and the most important traits of the land, including:

- Recreational opportunities
- Conservation of wildlife habitat and biodiversity
- Preservation of entry corridors and the community edge
- Connectivity and prevention of fragmentation
- Protection of critical view sheds and vantage points
- Offsetting density within developable areas

A LOOK AT OPEN SPACE TYPOLOGIES APPROPRIATE FOR PARK CITY

Open space should be programmed according to the primary purpose. Generally, open space programs within Park City fall into three categories; protected open space, active open space, and urban open space.

Protected Open Space is the natural and undisturbed areas that contain little or no improvements. Protected Open Space is designated to conserve ecosystem health, wildlife habitat/corridors, view shed corridors, wetlands, and streams. Passive open space preserves and enhances natural areas with a resource protection focus, managing habitat protection areas with non-motorized, on-trail use only areas. Protected open space can be both public or private (with an open space conservation easement or deed restriction), and is typically managed by a natural resource manager for seasonal protection of wildlife areas and habitat restoration.

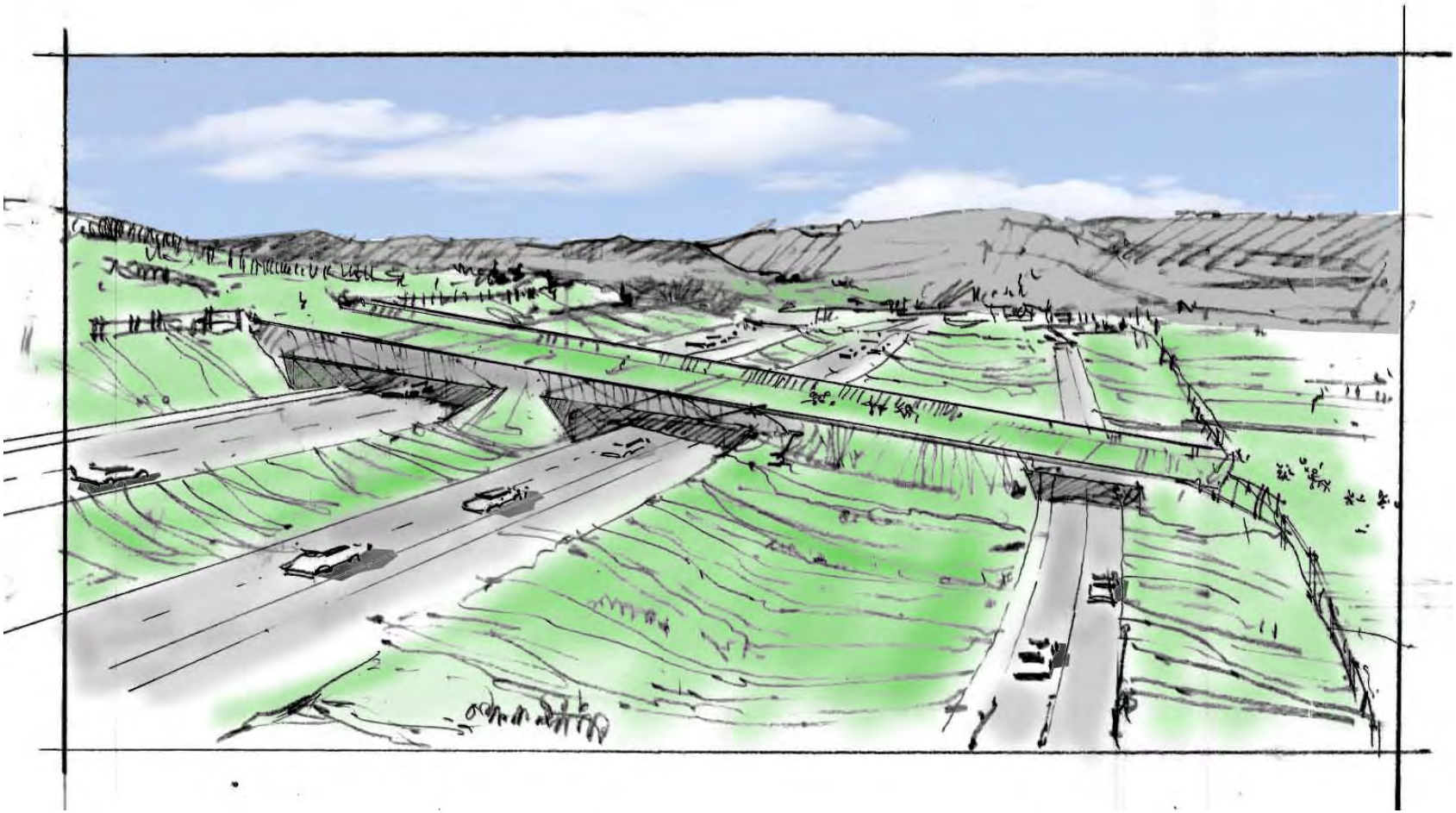
Park – Passive: A passive park is either land that is maintained in its natural or native state with little or no maintenance or is a formal park parcel that has maintenance and irrigation but does not have programmed recreational capabilities. In either scenario these parcels may have benches and trails located within the parcel. The Rail Trail is a good example of a passive park.

Active Open Space includes areas of land that permit recreation uses while preserving the land from structures, streets, and parking lots. Within recreational open space, balance between recreational opportunities (e.g. parks, golf courses, trails, and ski runs), environmentally sensitive lands, and sustainability efforts (conservation and renewable energy) must be planned for and managed.

Park – Active: An active park is land that usually requires significant maintenance and is likely to contain spaces within the park that can be used for various sports activities, such as baseball and soccer fields, volleyball courts, tennis courts, or flat areas which can be used for programmed sporting events, special events and parties. City Park is a classic example of an active park.

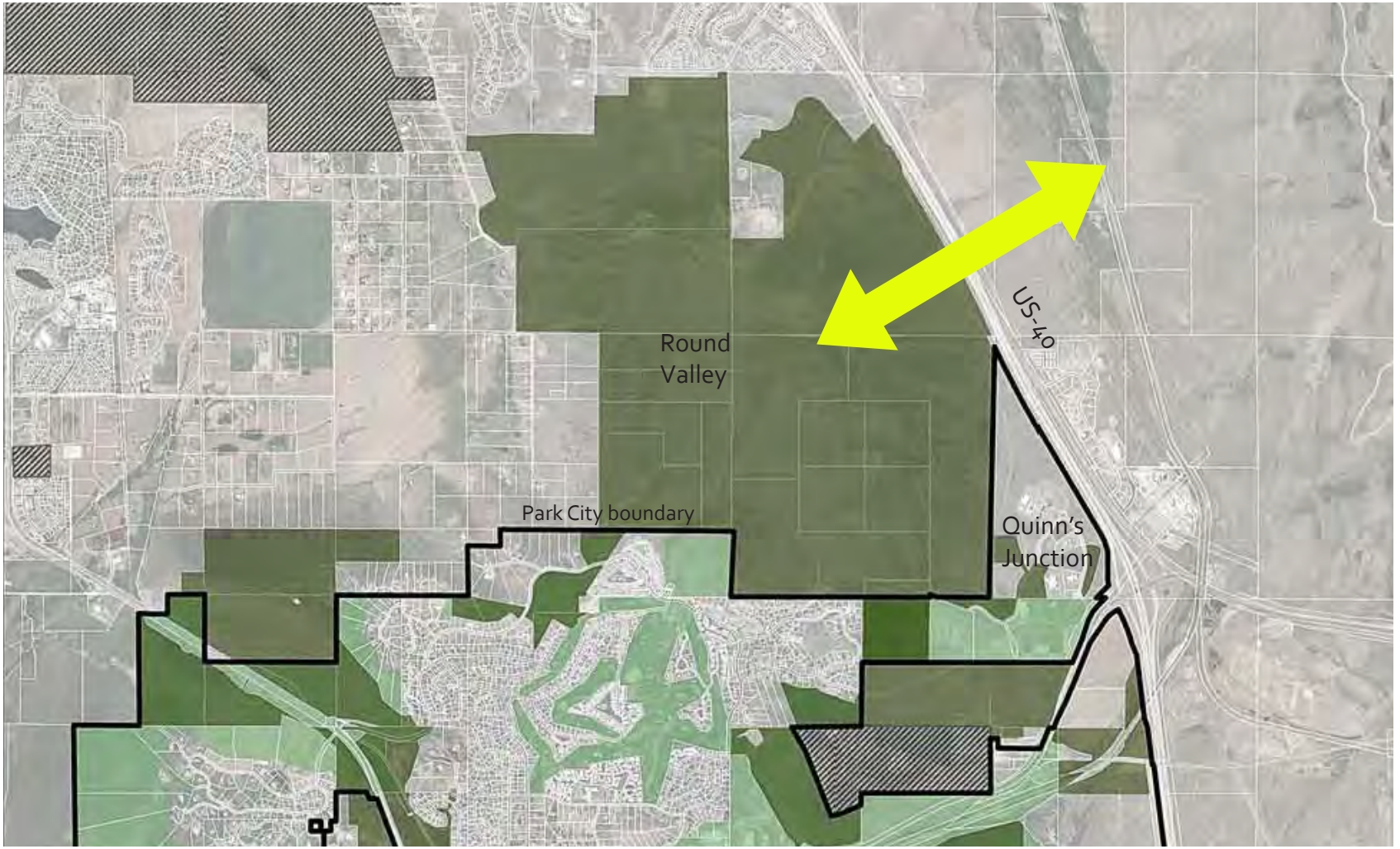
Urban Open Space is landscaped outdoor areas, including plazas, town squares, arcades, forecourts, pocket parks, publicly accessible rooftop gardens, walkways, and necessary public improvements. Urban open space may include partially impermeable surfaces due to the urban context, and a limit on such surfaces within urban open space should be determined within the Land Use Code. This Open Space does not include roads or parking lots (pervious & impervious).

Image of possible Wildlife Corridor over US 40 - possible location would be from Round Valley (left side of graphic) to the east side of US 40 (right side).

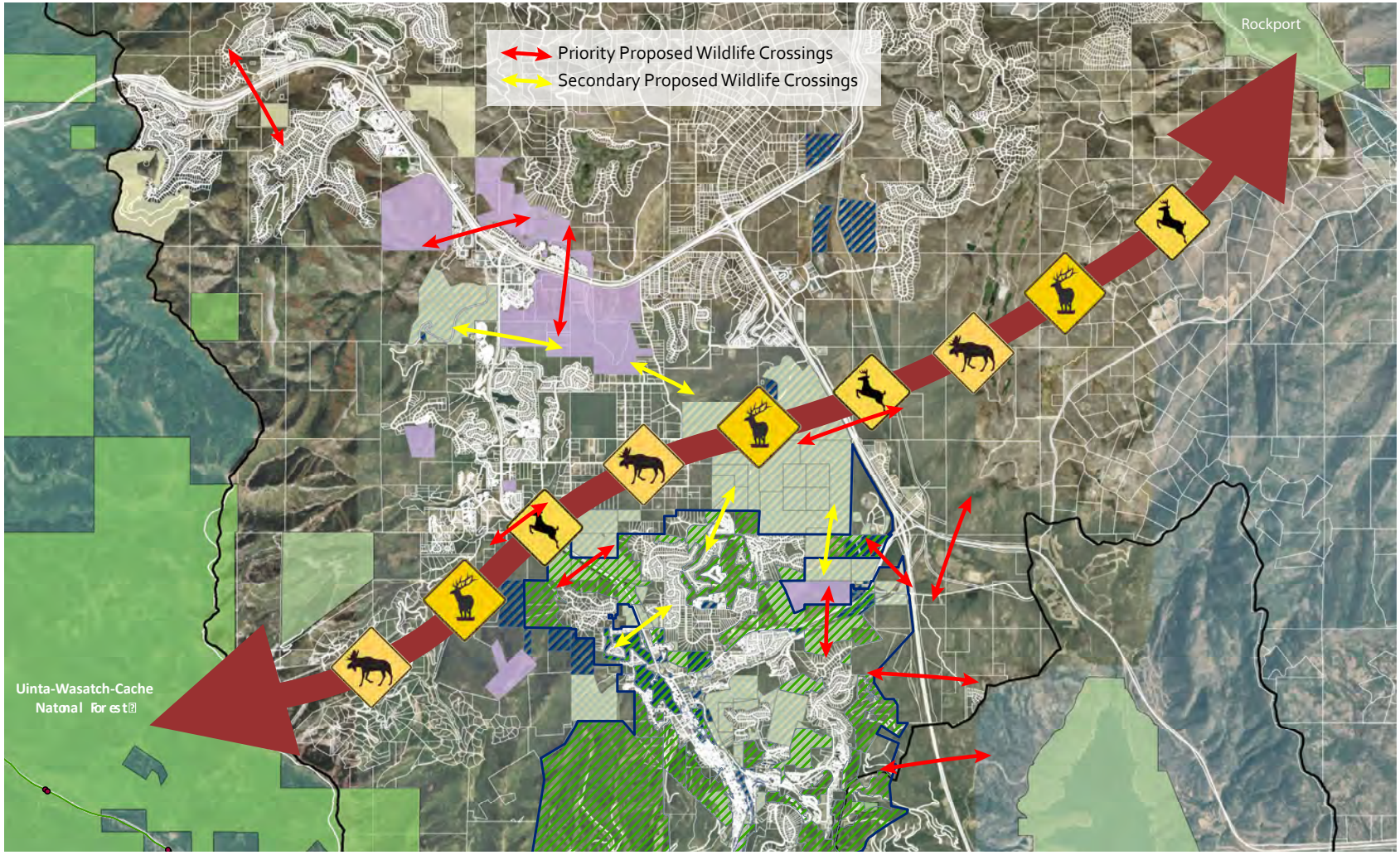


Development and highways have constricted Wildlife Corridors in and around Park City. Future consideration to prioritizing wildlife crossings over busy roadways would compliment many Parkite's concern for protecting the Natural Setting. This image illustrates a view looking north along US 40 with Round Valley noted on the left side. The possible wildlife corridor would extend from the Open Space of Round Valley across US 40 to the fallow land on the east side. This particular site is one of the major deer kill zones as a result of vehicle accidents noted in the Bowen Collins study completed in 2011.

Location map of possible Wildlife Corridor location over US 40 - possible location would be from Round Valley (west side) to the east side of US 40.



This map illustrates, in plan view, the perspective noted on the prior page. The yellow arrow indicates the possible wildlife corridor which would extend from Round Valley to the west across US 40 to the fallow lands on the east side of US 40.



As Park City and Summit County becomes more developed, wildlife corridors and habitat are lost. Future regional planning should consider the remaining wildlife corridors and prevent further loss.








STRATEGY: Protect Biodiversity

Biodiversity is biological diversity – the diversity of living organisms. The field of study goes deeper than just an inventory of species within a set area. Biodiversity observes how the diversity of organisms in an ecosystem influence one another and the entire system. From bacteria unseen by the naked eye, to the millions of ants tunneling under the forest floor, the interaction of species shapes the overall ecosystem health. As each organism performs throughout the day, there is a cause and effect relationship that brings balance, and in some circumstances instability, to the overall ecosystem.

Biologists have been increasingly concerned with biodiversity and the impacts of species decline and extinction. As a population declines, that species' role within the natural system is not fulfilled and the system is changed. Although change and evolution are part of the natural cycle within an ecosystem, as the impacts compound, the overall health of the system is jeopardized. A stressed ecosystem is unable to perform its natural function, including water purification, nutrient replenishment, species reproduction, carbon intake, oxygen production among other consequences.

One example of species decline is the decline of natural pollinators including bees, moths, flies, beetles, wasps, desert bats, hummingbirds, and butterflies within the Intermountain West. These pollinators are critical to the function of terrestrial ecosystems because they support plant reproduction. Without pollinators, plants would not provide food and cover (critical habitat), reproduce, stabilize soils, and serve as buffers to improve water quality. Many plant species depend on pollinators for reproduction (seed production). As a group, pollinators are threatened world-wide by habitat loss, habitat fragmentation, pesticides, disease and parasites.[5] As the population of native plants declines, so will the wildlife that depends on them for food. The impacts are far reaching, including impacts to local communities for agriculture, increased risk of flooding, and decreased water quality.

Humans have the ability to influence biodiversity. As stewards of the land, Parkites can collaborate to protect biodiversity of public and private lands, enhancing wildlife habitat while strengthening ecosystem health. Healthy ecosystems create healthy habitats, not only for wildlife, but for humans as well. Clean air, water, and soils, lead to a legacy of health for future generations.

Noxious Weeds

A noxious weed is an invasive species of plant that has been designated by County or State as one that is injurious to agricultural and/or horticultural crops, natural habitats, ecosystems, and humans or livestock. They must be actively prevented and/or managed on an ongoing basis - the current economic loss as a result of noxious weeds is $20 billion annually in the United States.

STRATEGY: Carbon Sinks

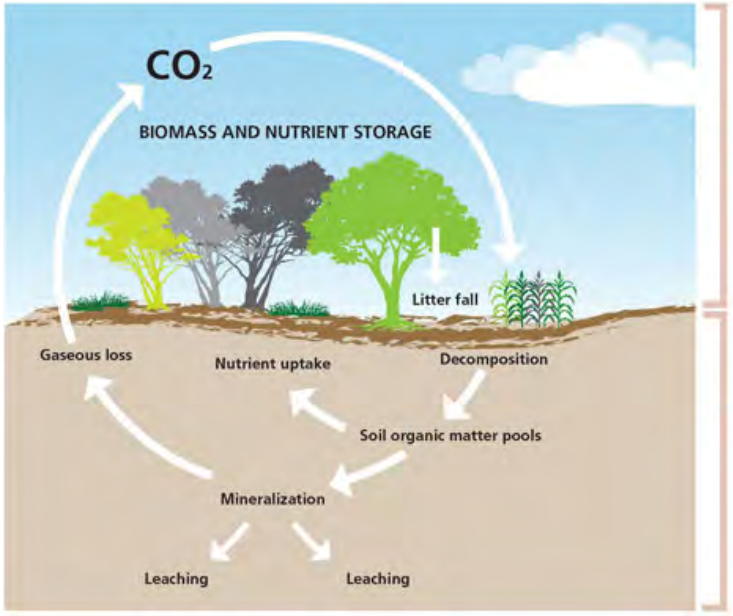
Carbon dioxide is a greenhouse gas which contributes to climate change. It is a Long-Lived Greenhouse Gas (LLGHGs) due to the chemical stability of CO_2 and its ability to persist in the atmosphere for a long period of time (ranging from 10 to 100+ years), so CO_2 emissions have a long-term influence on climate change. Mitigation of LLGHGs is critical due to the long-term impacts.

Forests, parks, agricultural lands and bodies of water serve as carbon sinks by storing greenhouse gas emissions that otherwise contribute to climate change. Within the terrestrial carbon cycle, soils store the largest amount of carbon. Enhancement of soils through preservation of forest land, cropland management, grazing management, and soil restoration are essential to protect the valued function of soils on climate change mitigation. Trees also play a key role in carbon sinks. Trees naturally remove carbon from CO_2 and store it as cellulose in the tree trunk while releasing the oxygen back into the air. It is estimated that a healthy tree stores about 2.6 tons of carbon annually.[6]

Carbon sinks play a crucial role in climate change mitigation decreasing the total emissions released into the earth's atmosphere. Fortunately, carbon sinks can be enhanced in the short-term by policy decisions made on the local, state, and national level.

Such policy decisions may include:

- Adopting urban forestry measures to offset carbon emission through planting new trees.
- Preserve and enhance natural systems that act as carbon sinks.
- Promote sustainable agriculture practices to decrease carbon emissions associated with food production, processing, and transport.
- Offset carbon emissions through carbon credits or allowances.



The more we understand regarding the impacts of increased carbon dioxide in our atmosphere, the more we can do to begin to reduce these impacts. The simple planting of trees can create a carbon sink where some carbon dioxide is sequestered (or held) so that it does not impact our atmosphere. This image illustrates the carbon dioxide cycle.

STRATEGY: Greenhouse Gas Reduction

Park City is dedicated to taking large steps in the next decade toward climate change mitigation. Within the 2009 Park City Community Carbon Footprint and "Road Map for Reduction," a Community Carbon Advisory Board outlined the following vision:

"The Park City community is committed to applying significant effort to combat the causes of climate change and to reduce its greenhouse gas emissions. Reducing our carbon footprint is our responsibility as citizens of the Nation and the world. Working together, using our community spirit, innovation, and environmental passion, we will ensure for future generations the environmental protection, economic prosperity, and quality of life that makes Park City unique."

The board members identified a reduction target goal to reduce Park City's GHG emissions 15 percent (15%) below 2005 levels by 2020, mirroring the goals established by the Western Climate Initiative. Park City's General Plan echoes this Goal. To achieve this reduction target, the Park City community must reduce projected emissions in 2020 to approximately 785,000 tCO_2e. This represents a reduction of 30 percent over projected emissions in 2020.[8]

The Road Map to reduction outlined sixteen (16) GHG reduction objectives under six (6) major influential categories, including: community leadership, transportation and land use, energy use, energy supply, waste reduction or diversion, and carbon offsets. To achieve the objectives and relative reductions, twenty-one (21) priority strategies were recommended within the roadmap. The sixteen (16) objectives and twenty-one (21) priority strategies

Strategies referenced in the Roadmap to Reduction include:

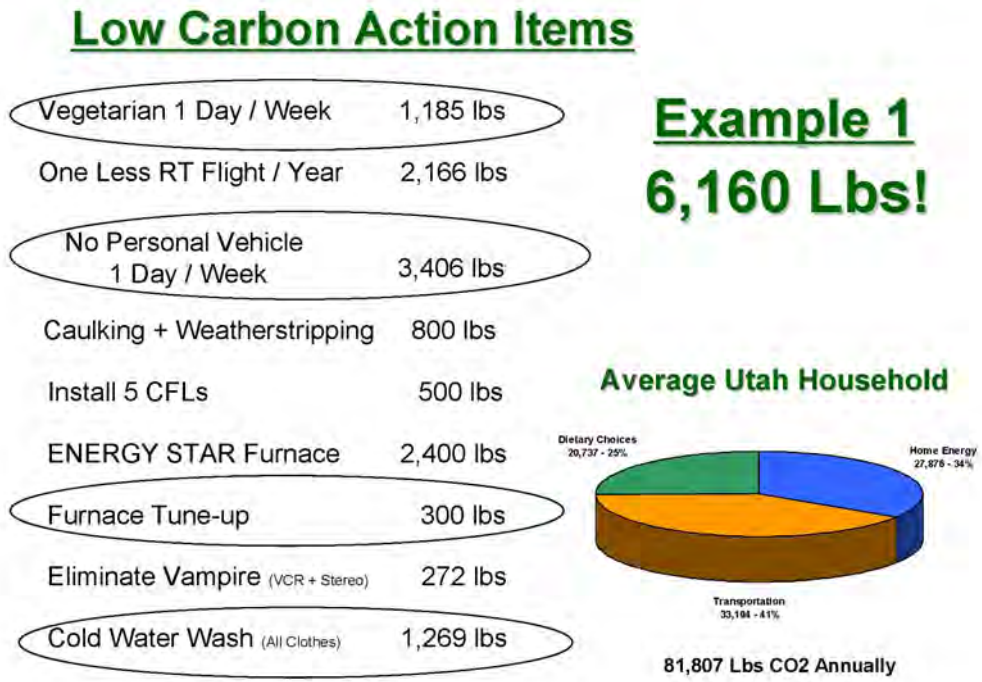
- Improving **energy efficiency** and encouraging **conservation** in homes (including second homeowners) and businesses.
- Encouraging the installation of **distributed renewable energy** systems, primarily solar panels, on homes and businesses.
- Pursuing **large-scale renewable energy** projects with the intent of reducing the CO_2 output of our electricity supply.
- Reducing and/or offsetting the amount of **airline travel** while still retaining a vibrant economy (e.g., encouraging alternative modes of travel, increasing length of visitor stay).
- Expanding **recycling** opportunities while also instituting **"Pay As You Throw"** pricing for waste disposal.
- Increase utilization and scope of **alternative transportation** options including bus transit, car sharing, biking, and walking.

PROTECTION OF THE CITY'S ENVIRONMENTAL RESOURCES WILL HAVE A CALMING EFFECT FOR THE FLORA AND FAUNA...AS WELL AS OUR RESIDENTS

have been included within the General Plan and identified with a snowflake.

A community carbon footprint is the portrait created out of the innumerable minor daily details and priorities of local individuals. Day-to-day decisions related to transportation, energy use, and consumer choices, in addition to long-term considerations for energy supply, all converge to create a single metric: tons CO_2e emitted.

City Staff has also referred to a second local guide toward GHG mitigation, the Save Our Snow Action Plan. Through the two guides it is clear that substantial investment is still required to drive many of the recommended carbon reductions on a community-scale. The above graphic provides a vision of where CO_2 reductions could come from but does not specify who is responsible for driving these improvements.



What is the Low Carbon Diet?

The Low Carbon Diet is a community-based program, and accompanying workbook, that was developed by the Empowerment Institute in Woodstock, NY. The goal of the "diet" is to guide households through a variety of conservation and efficiency measures with the end goal of reducing CO_2 emissions by at least 5,000 lbs. annually per household. The program incorporates numerous methods for reducing emissions, including those related to behavioral change, energy efficiency upgrades, water consumption, waste and recycling, transportation, and dietary choices.

STRATEGY: Greenhouse Gas Reduction (continued)

Who is responsible for leading communty-scale CO_2 reductions?

This is among the most important environmental policy questions in Park City. The Save Our Snow Action Plan makes it clear who will need to *participate* in the process to make it successful: homeowners, renters, businesses, non-profits, utilities, and local government – essentially everyone; however, who is ultimately *responsible* for whether these efforts succeed or fail?

Beginning with the launch of Save Our Snow in 2007, there are numerous examples of citizens participation, in concert with non-profits and other organizations, to support climate change initiatives at the community level. This enthusiasm and base of support must be harnessed in recurring and tangible ways in order drive meaningful reductions of CO_2 on a community-scale.

There are numerous examples of local governments, in concert with other organizations, investing in programs to drive residential and commercial CO_2 reductions. Park City has done this on a small and voluntary scale with programs like the Low Carbon Diet and ParkCityGreen.org. When a supporting organization leads CO_2 reduction efforts, individual participants enjoy the near-term benefits of a smaller carbon footprint (e.g., lower utility bills) while

Save Our Snow – Background Information

Amidst growing concerns about global climate change and its impacts on the local ski industry, community members in Park City, UT banded together to support the Save Our Snow (SOS) initiative. Over 1,500 local citizens attended the first SOS event in 2007 and hundreds more were at SOS II in September 2009 when the ParkCityGreen.org website was launched. A scientific study was conducted to assess the future impacts of climate change in Park City. Under a high emissions scenario, this study forecasted an average local temperature rise of 9 degrees F by 2075. Unabated carbon emissions were projected to cost the Park City region $392 million in annual economic output and over 3,700 lost jobs by 2050.

Determined not to let their economic and cultural livelihoods melt away, community leaders have banded together to address the local carbon footprint. A "Save Our Snow Action Plan" was completed in April 2010 and acts as a guiding document for carbon reduction strategies. Additionally, the ParkCityGreen.org website continues to see tremendous success. In the first two years after its launch, the site received over 25,000 visits and 92,000 pageviews. The Save Our Snow initiative in Park City, UT is evidence that this community is eager to take local action on carbon emissions and mitigate its impact.

the social and environmental benefits are spread across all citizens and are typically longer term in value. All strategies analyzed as part of the Save Our Snow Action Plan resulted in a net overall financial savings and clear monetary payback. Nevertheless, the up-front costs were often assumed by one entity with the benefits being spread across the whole community.

Park City Municipal Corporation can assist in CO_2 reduction through leading by example in its own operations while also implementing effective policies and funding programs to address CO_2 on a community scale. Additionally, having a voice on broader policy matters at the state and national level is important to encouraging the scale of change needed for issues such as climate change, clean energy development, and long-term social and economic stability.

Since 2007, community leadership and municipal operations have set the "snowball" into motion. It takes an entire community - government, residents, and businesses alike, to reach GHG reduction goals. Each part of the community must work to help the snowball grow, creating a cooling effect on Park City. All efforts small and large have an influence on the end goal of reducing Park City's contribution to climate change. By taking incremental steps to mitigate a global dilemma, we protect our local way of life and ultimately "save our snow".

ROADMAP TO REDUCING PARK CITY'S CARBON FOOTPRINT

#	ROADMAP FOR REDUCTION Strategy Name	Category	Type	Tons CO_2e Reduced in 2020	Feasibility by 2020 (Political, Technical, Implementation, Financial)	General Plan Strategy #
1	Develop community-wide climate challenge: personal, per capita GHG reduction targets, specific challenges (e.g., replace incandescent light bulbs with LEDs)	Community Leadership	Incentive	Medium	Medium	5.26
2	Offer free residential energy audits	Community Leadership	Incentive	Medium	Medium	5.27
3	Provide low- or no-cost commercial building energy, water, and solid waste audits	Community Leadership	Incentive	Medium	High	5.28
4	Develop enhanced Blue Sky program - more renewable energy generation in Park City (premium tier that brings funds back to Park City)	Energy Supply	Action	Medium	Medium	5.29
5	Partner with utilities and state to offer building operator training on energy management for larger businesses	Community Leadership	Education	Medium	High	5.30
6	Target education and incentives at second home owners to reduce energy - e.g., improved occupancy-based controls	Energy Use	Incentive	Medium	High	5.31

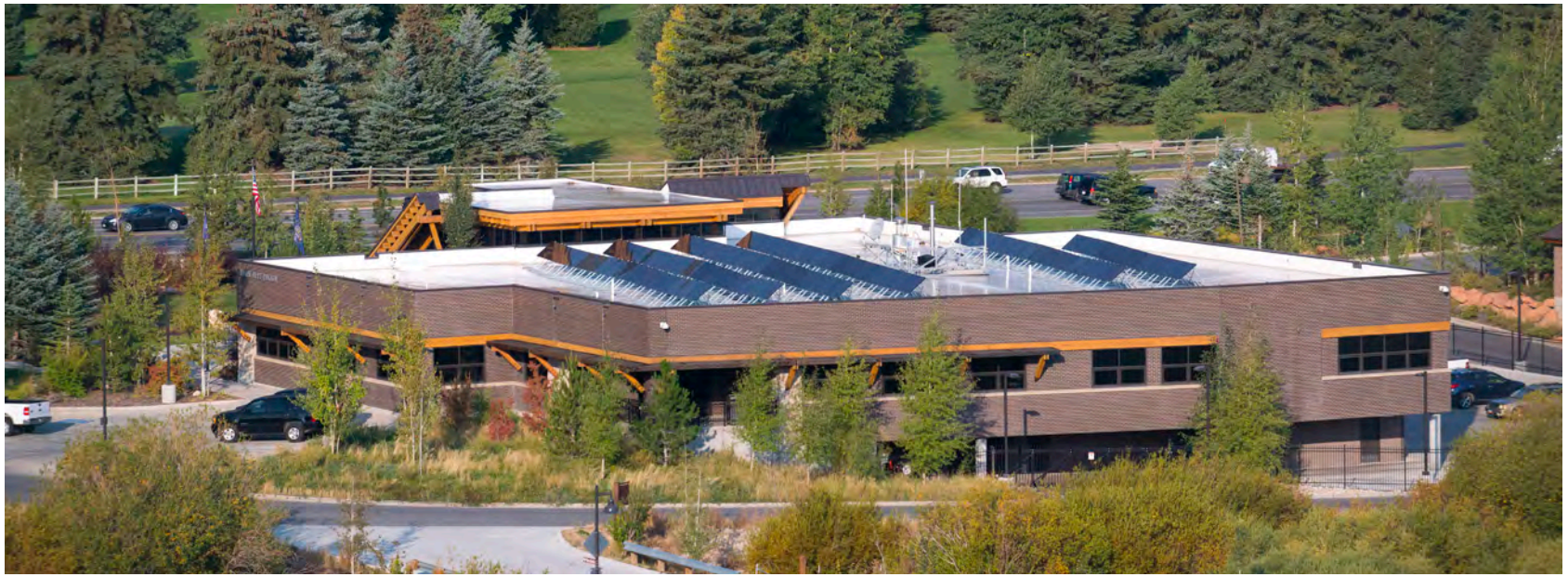
#	ROADMAP FOR REDUCTION Strategy Name	Category	Type	Tons CO_2e Reduced in 2020	Feasibility by 2020 (Political, Technical, Implementation, Financial)	General Plan Strategy #
7	Expand existing utility rebates/ incentives - collaborate with potential funding organizations	Energy Use	Incentive	Medium	Medium	5.32
8	Increase awareness of existing utility rebate programs	Energy Use	Incentive	Low	High	5.33
9	Encourage residential and commercial smart metering - electric meters to provide real-time energy consumption	Energy Use	Action	Medium	Medium	5.34
10	Use community carbon web site to promote neighborhood meetings to discuss ideas and challenges for reducing emissions	Community Leadership	Incentive	Low	High	5.35
11	Pursue direct power purchase options with Rocky Mountain Power for renewable energy	Energy Supply	Action	High	Medium	5.36
12	Incorporate greenhouse gas (GHG) goals into land use planning - evaluate land use impacts on GHG emissions	Transportation and Land Use	Action	Medium	Medium	5.1
13	Work with Rocky Mountain Power to educate and expand the benchmark program that identifies individual energy use on utility bills, carbon web site to compare use of neighbors, neighborhood to encourage conservation	Energy Use	Incentive	Low	Medium	5.37

#	ROADMAP FOR REDUCTION Strategy Name	Category	Type	Tons CO2e Reduced in 2020	Feasibility by 2020 (Political, Technical, Implementation, Financial)	General Plan Strategy #
14	Develop employee outreach programs focused on large employers	Community Leadership	Incentive	Medium	Medium	5.38
15	Expand and develop new tiered rates for energy use	Energy Use	Action	Medium	Medium	5.39
16	Develop community revolving grant/ loan program for energy efficiency projects	Energy Use	Incentive	Low	Medium	5.40
17	Engage largest employers to expand commercial recycling	Waste Reduction and Diversion	Action	Low	High	5.41
18	Encourage Rocky Mountain Power to fund local Smart Grid pilot project	Energy Use	Action	Low	Medium	5.42
19	Provide incentives for participation in green building labeling system for existing, leased, and new buildings (e.g., ENERGY STAR, LEED, Built Green, NAHB, etc.)	Energy Use	Incentive	Low	High	5.43
20	Provide incentives for residential and commercial renewable energy (e.g., tax credits, rebates)	Energy Use	Incentive	Low	Medium	5.44
21	Develop a shared community teleconferencing facility to host meetings therefore encouraging reduced air travel	Transportation and Land Use	Incentive	Medium	Medium	5.45

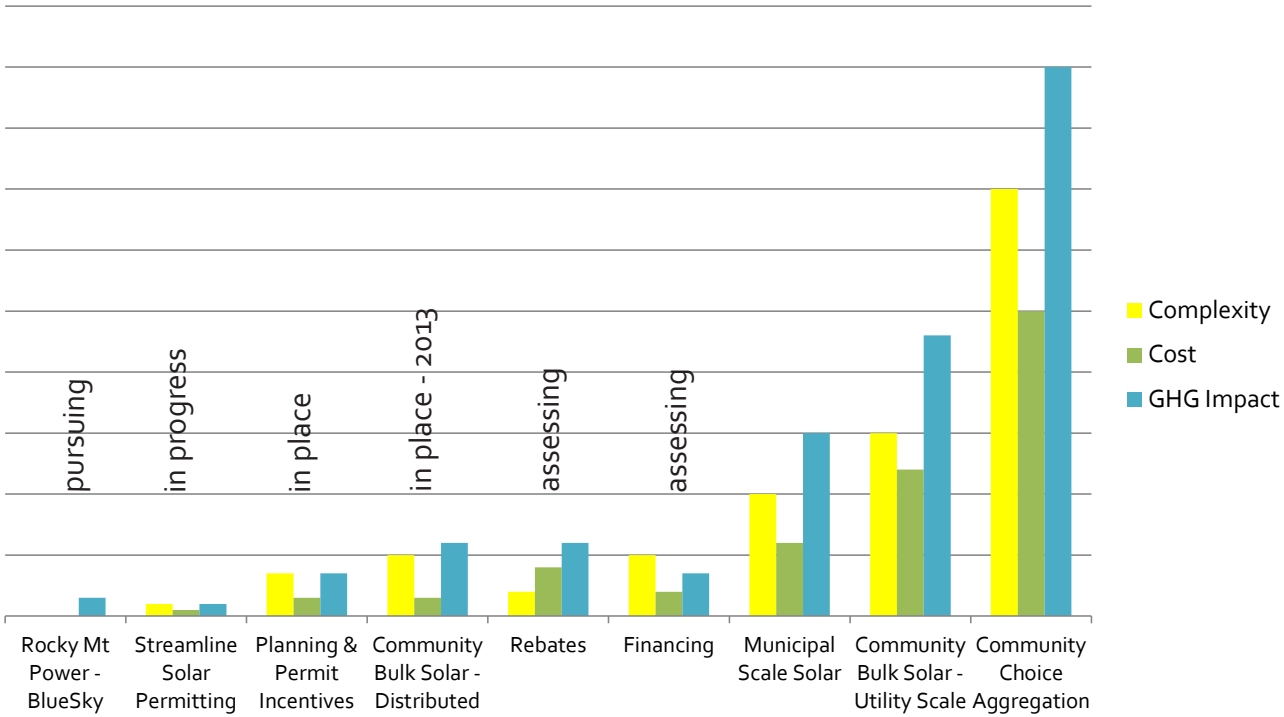
STRATEGY: Decision Making Continuums

The following pages introduce continuums that reflect various options the City could pursue to drive greenhouse gas reductions and other community benefits. Most of the projects would require participation of residents and businesses, in addition to support from Park City Municipal Corporation. The continuums are a subjective tool that conveys cost, complexity, and greenhouse gas factors. While these visuals can assist with policy-making and priorities, an in-depth analysis is recommended for any particular option prior to implementation. The continuums are reflective of information available at this time and will certainly evolve over time.

The Decision Making Continuum is an attempt to prioritize projects. As an organization, PCMC has some lofty aspirations. The goal of the continuum is to subjectively score initiatives by complexity, cost, and environmental impact. The bar graphs are used to help sort initiatives so that Council, Management Team, and Departments can better prioritize initiatives and dedicate the proper level of resources when pursuing initiatives. Additionally, the goal of the continuum is to add some texture to initiatives that are communicated simply.

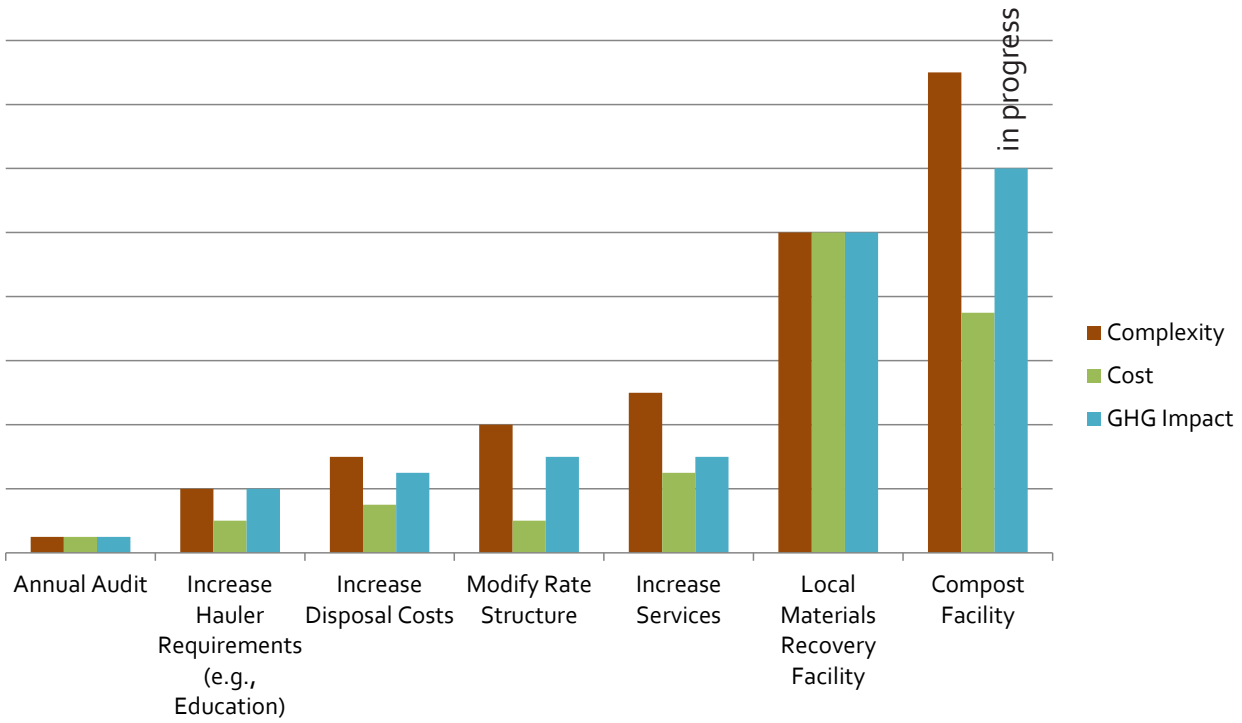


Decision Making Continuum: SOLAR



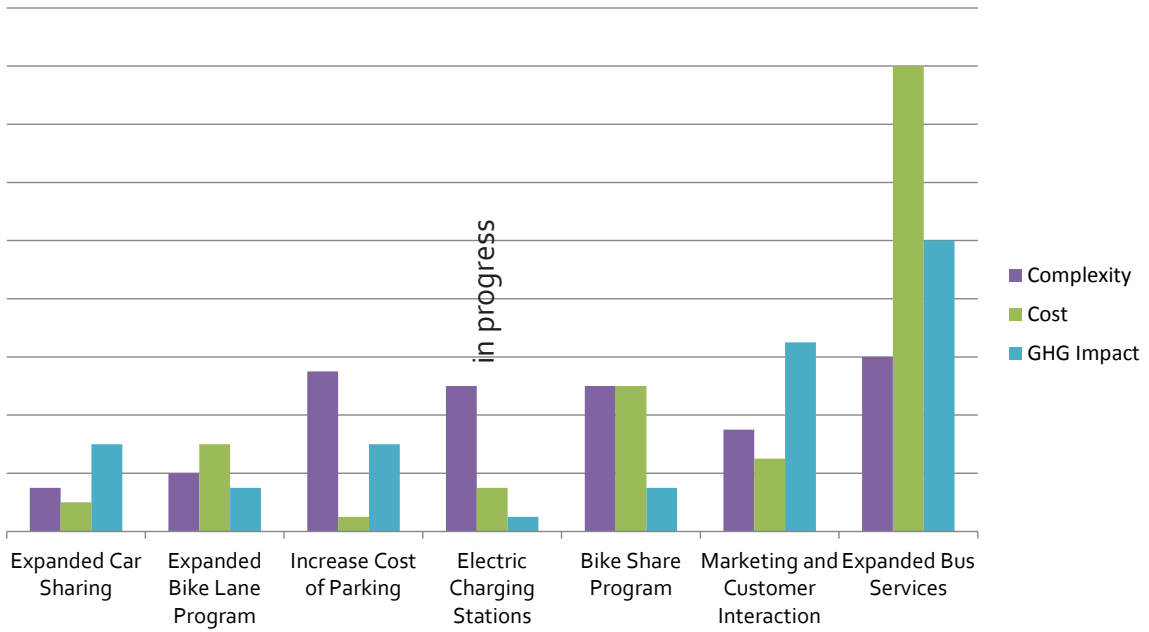
The Decision Making Continuum regarding solar indicates that many approaches to increasing solar photovoltaic panel use are relatively easy and yield a significant impact to Greenhouse Gas emissions. Joining Rocky Mountain Power's Blue Sky program as well as the provision of rebates are quite effective. Other beneficial programs, while more complex to initiate, include Municipal Scale Solar program and other community-wide programs.

Decision Making Continuum: WASTE



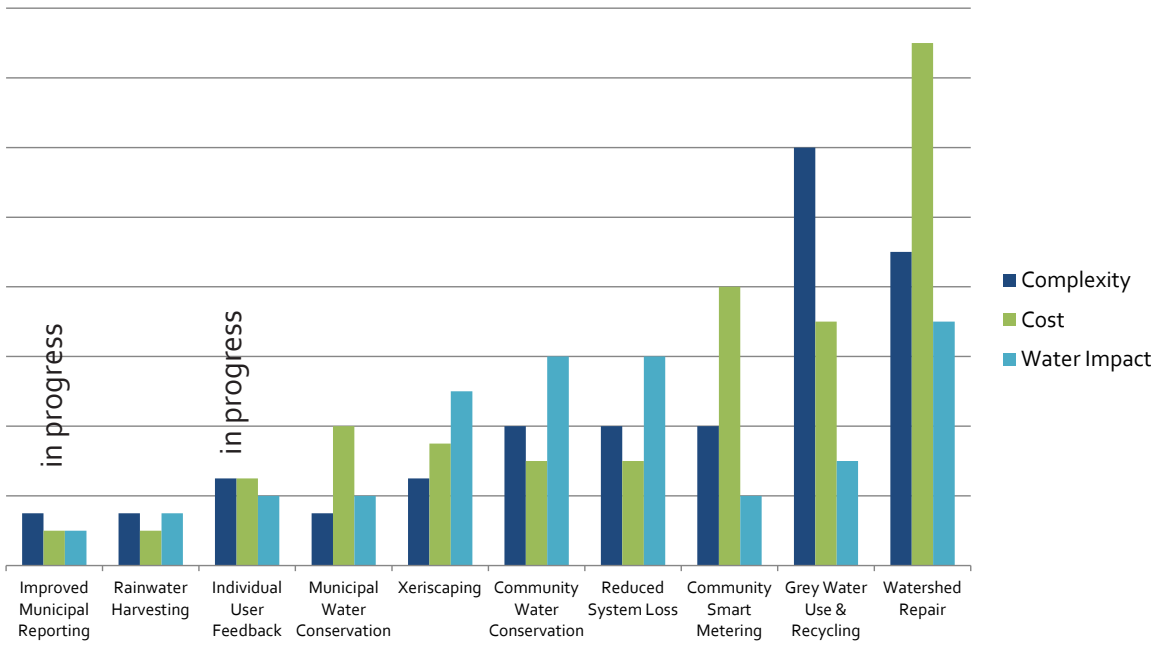
Waste reduction tends to be a much more complex exercise than other environmental initiatives. Based upon this graph, the implementation of a Local Materials Recovery Facility yields an equal return on investment in terms of complexity. The City is already looking into a possible Compost Facility.

Decision Making Continuum: TRANSPORTATION



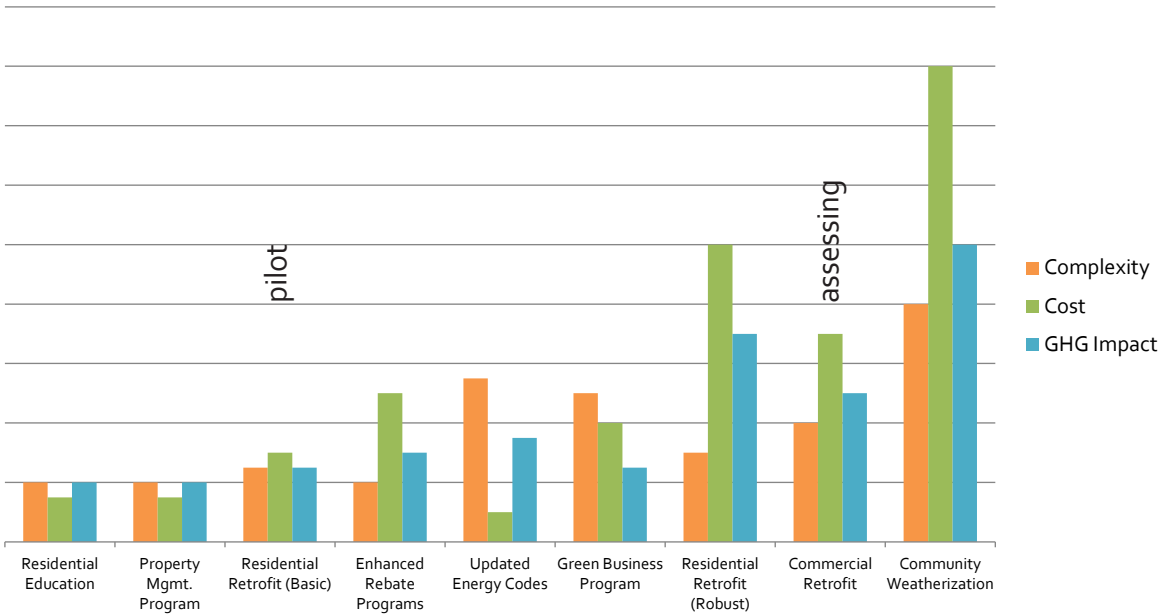
The City is already considering the implementation of Electric Charging Stations; a very complex undertaking in terms of reduction of Greenhouse Gas emissions realized. A real opportunity for improved efficiencies, and reduction in emissions, lies in Marketing and Customer Interaction and Car Sharing. The real gains to be realized in reducing emissions relative to transportation will be in the provision of alternative modes for both residents and visitors alike. Future City Councils may want to consider disincentiving the single occupancy vehicle in certain zones within the City limits.

Decision Making Continuum: WATER



The City is currently looking at Improved Municipal Reporting and Individual Use Feedback to better understand opportunities for water use reductions. Similar to the other environmental challenges, the real opportunities here exist in improved landscaping techniques by a majority of the residents; the utilization of Xeriscaping (using drought tolerant plants and native material). In addition, Reduced System Loss in the water infrastructure system is something that the City Water Department is analyzing.

Decision Making Continuum: ENERGY EFFICIENCY AND CONSERVATION



Opportunities for Energy Conservation and Efficiency exist in both the Residential and Commercial Retrofit markets; the opportunity to work with individuals and business owners who have an interest in improving their house/business structure's energy efficiency. Almost all of the program affiliated with energy efficiency are more costly than the results they provide; however such improvements to our structures will be essential to curb wasteful energy consumption in the future. Energy savings derived from a retrofit are as tangible as decreased use (conservation) of our energy resources.

STRATEGY: Greening the Regulations

Municipal codes which regulate building standards, energy conservation, and land use practices set the minimum standards for development. These regulations influence trends that have a collective impact on a community's carbon footprint, air quality, and conservation practices. Cities are taking a fresh look at their codes and implementing revisions to change the direction of threatening trends.

There are 4 essential steps to making a regulating code sustainable:

1. Audit the existing code and identify regulations that interfere with reaching environmental goals.

2. Measure the community carbon footprint and identify those areas in which Park City could make the greatest strides in reduction. (This work was done in 2009.)

3. Revise the code removing obstacles and apply new strategies.

4. Measure progress through monitoring indicators for GHG reductions.

Cleaning House: Key Questions for a Climate Change Audit

Does the code allow higher density development where appropriate? Does it encourage good design in such developments so that they fit in well with surrounding neighborhoods? Does the code encourage the provision of amenities - e.g., parks, open space, landscaping, to enhance livability as well as the prospects for local acceptance of higher-density development?

Does the code allow for different housing choices, including townhouses, duplexes, triplexes, and accessory units, on smaller lots?

Does the code permit mixed land uses - e.g., upper-floor housing and/or offices above street-level shops?

Do policies support the market for, and development of, local retail and other services in "20-minute" neighborhoods?

Does the code require excessive front and side yard setbacks?

Does the code encourage well-designed, compatible infill and redevelopment in centers, such as downtowns, Main Street areas, or designated town centers? Or does it undercut the economic vitality of centers by zoning for more commercial space than the local economy can absorb - especially in outlying areas?

Do parking policies contribute to the fragmentation of an otherwise walkable, compact center? Is the parking supply well-managed? Priced Right?

Does the code encourage pedestrian-friendly development and design, such as street-level shops with display windows and buildings that come up to the sidewalk instead of standing behind an asphalt moat?

Do local policies encourage the construction of workforce housing near job centers? Is there a good jobs-to-housing ratio in the community?

Are narrower streets allowed in residential neighborhoods? Or are unnecessarily wide streets required?

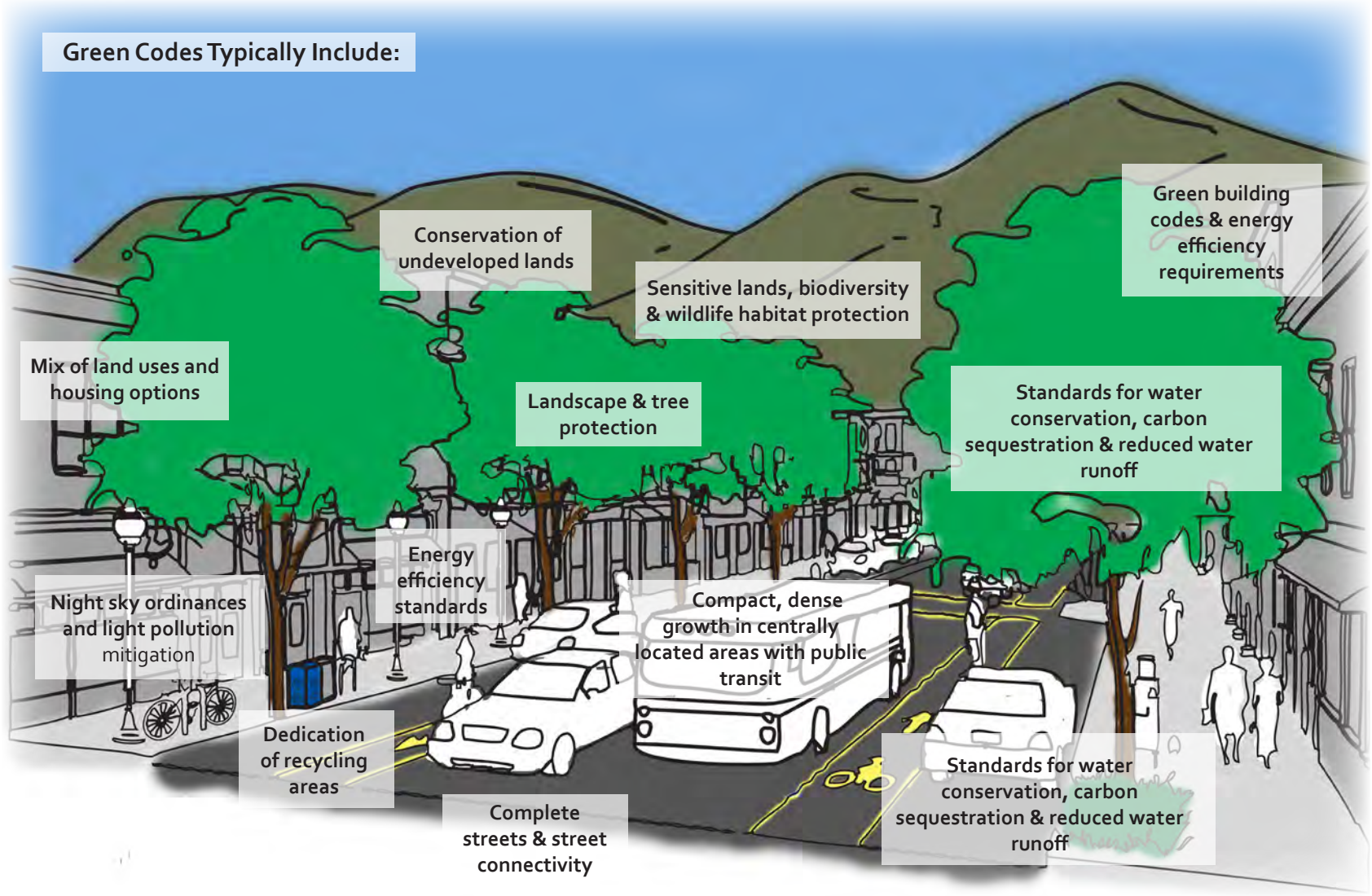
Must new streets be connected to other streets? Or does the code impair connectivity by allowing too many dead ends and/or culs-de-sac?

Does the code encourage buildings in new subdivisions to be oriented to the south to capture solar heat?

Does the code encourage tree planting to reduce heat-island effect in parking lots and elsewhere?

EPA SMART CODE

Components of a Green Code



STRATEGY: Climate Adaptation

The Intergovernmental Panel on Climate Change (IPCC) is an international organization that was formed by the World Meteorological Organization (WMO) and the United Nations Environment Programme (UNEP) in 1988. The IPCC studies atmospheric data, meteorological data and climate scenarios to model projections of future trends. The IPCC 2007 Summary for Policy Makers found that there is scientific evidence that humans are the greatest contributors to recent climate change. On a global scale, the IPCC is forecasting regional disruptions including droughts, flooding, thawing permafrost, stronger storms, sea-level rise, wildfires, heat waves, and other weather and climate effects on the natural and built environments. [1]

Impacts of Climate Change on the Intermountain West[5]		
	Projections	Anticipated Impacts
Temperature	●Projection for 2025 = + 1.5 – 3.5°F ●Projection for 2100 = +5- 8° F	● Longer growing season ●Fewer frost days ●More heat waves ●More water shortages
Precipitation	●Potential decrease in annual precipitation in southern portion. ●Small increase in the northern portion. ●Shift in pattern to more frequent heavy precipitation events, separated by longer dry spells.	● Greater water shortages ●Increased flooding events ●Shifts in snow pack
Snowpack and Stream Flow	● Lower and mid elevation mountains will have a reduction in natural snowpack and snowfall in the early and late winter. ● An earlier and less intense average spring runoff	● Greater water shortages ● Loss in winter recreation

Scientists believe that many effects of human-induced climate change are already locked in because of the volume of greenhouse gases (GHG) previously emitted into the atmosphere. The IPCC 2007 Summary for Policy Makers also noted "both past and future anthropogenic carbon dioxide emissions will continue to contribute to warming and sea-level rise for more than a millennium, due to the time scales required for removal of this gas from the atmosphere." On the bright side, the rate and volume of future GHG emissions can be reduced, therefore slowing and lessening the extent of dangerous impacts on ecosystems, communities and human health.

Climate change is expected to affect the Intermountain West with drought, heat waves, diminished mountain snowpack, earlier snowmelt, catastrophic wildfires, and other disruptions to natural processes and wildlife habitat.[9] Less snow depth, reduced snow coverage and more precipitation falling as rain (instead of snow) has already been observed in Utah during recent decades.[10] These trends are expected to greatly diminish future snowpack levels, even among some climate models which predict higher average annual precipitation for the Park City area. A 2009 analysis of climate impacts on the Park City area ski industry forecasted up to $392 million in lost annual economic output and 3,717 lost jobs under a high GHG emissions scenario.[11] This analysis did not include the economic impacts of other anticipated changes related to warming such as disruptions to water availability and infrastructure. Park City is implementing a two prong approach toward climate change by pursuing both *mitigation* and *adaptation* measures. Mitigation includes preventative actions to decrease greenhouse gas emissions through everyday policy and decision making.

PROJECTED BASE AREA SNOW DEPTHS AT PARK CITY MOUNTAIN RESORT IN 2050

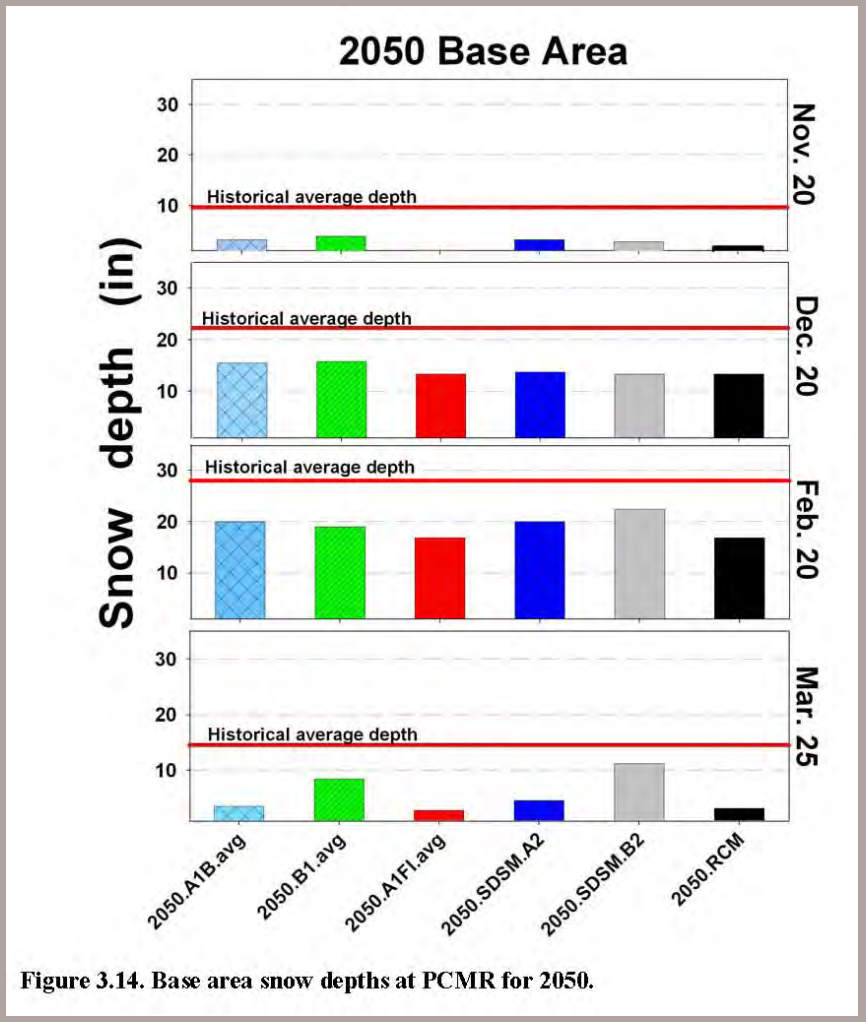
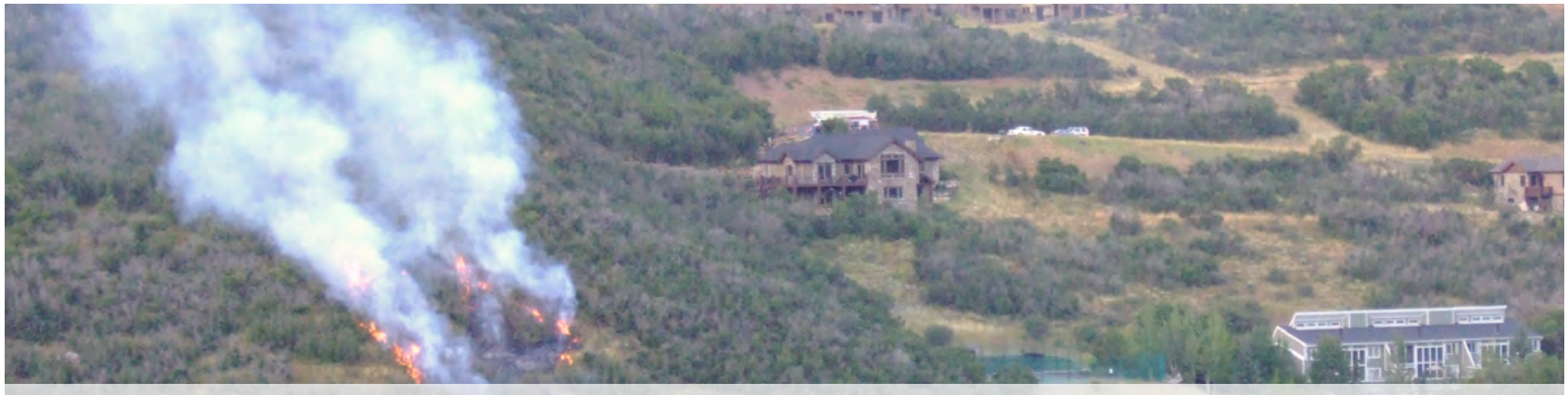


Figure 3.14. Base area snow depths at PCMR for 2050.

STRATEGY: Climate Adaptation (continued)



Adaptation strategies promote decisions and polices that decrease risk to vulnerable infrastructure and populations, including humans, wildlife and plant species. Communities have the ability to adapt by forecasting probable impacts that will occur regardless of the extent to which GHG emissions are mitigated. Park City shall implement adaptation strategies to enhance the City's resiliency to the future impacts of climate change.

In 2011, Park City participated in a regional adaptation effort that included municipalities from Tucson, Flagstaff, Las Vegas, Salt Lake City, Boulder County, Fort Collins, and Denver known as the Regional Climate Adaptation Planning Alliance. The group's networking efforts culminated in a formal report by ICLEI titled "Report on Climate Change and Planning Frameworks for the Intermountain West". One of the key reasons to engage in climate change adaptation is the co-benefits for climate mitigation and local sustainability efforts that a local government has already adopted. One commonly cited example is water conservation activities that advance carbon mitigation activities, by saving energy and resources, but also result in a more resilient and adaptive community.

The following are recommended strategies for climate adaptation from the 2011 ICLEI report:

- Information Sharing: Creation of a regional platform for ongoing dialogue among regional partners to continually improve understanding of shared climate change risks and capitalize on regional adaptation opportunities
- Adopt Climate Change Adaptation Plans or integrate climate change adaptation efforts into existing plans

"There is a 'no regrets approach' to much climate change work. Reducing GHG emissions also reduces pollution; further, if these emissions reductions are achieved through green building development and reductions in vehicle-miles-traveled, there are economically measurable savings in energy expenses and traveler convenience. A more compact urban form has the potential to reduce both GHG emissions and infrastructure costs. A public safety program that enhances climate resiliency can also protect property and persons from existing threats. Building a bridge with greater clearance above a coastal estuary accounts for both future sea-level rise and current storm surge potential and may have environmental benefits as well. If these sorts of actions are undertaken to address potential climate change impacts or to reduce its effects, they will have collateral benefits regardless of the future state of the climate."

American Planning Association, 2012

STRATEGY: Local Food Production

Agricultural lands in the United States have continued to decrease over the years. From 1982 to 2007, over 23 million acres of agricultural land in the United States have been converted to developed land. Within the State of Utah, 301,300 acres of agricultural land was converted to developed land during the same period.[13] In Park City, there is a scarcity of agricultural lands. This can be attributed to the short growing season, industrial history (environmental pollution), and high land values. There are currently two farms within the City limits, the McPolin Farm and the Franklin Richards farm. Both are visible along the SR-224 Entry Corridor and primarily raise hay for feed.

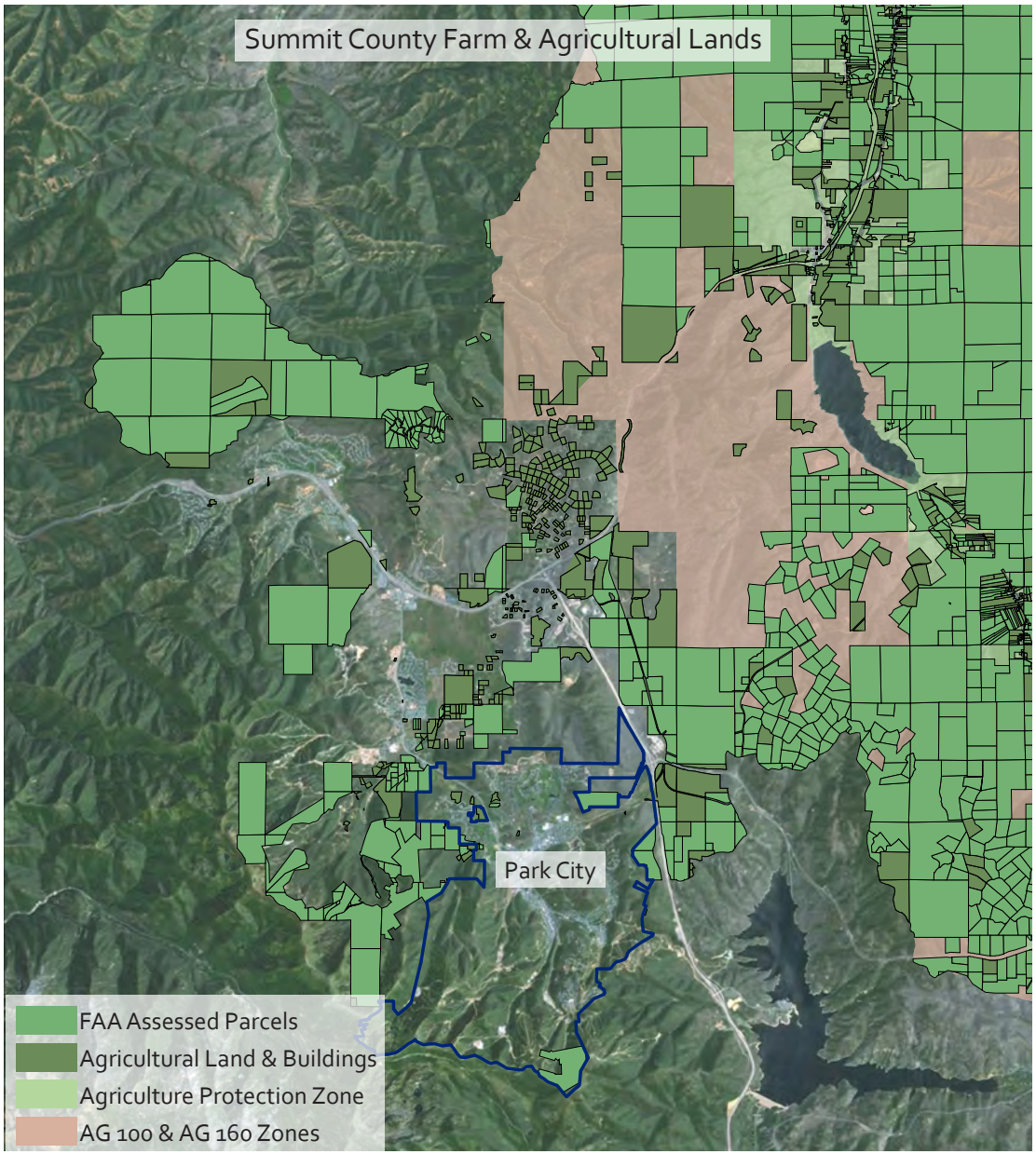
On a regional scale, fruits and vegetables are primarily grown in the lower elevations, with livestock grazing and hay productions along the Wasatch Back; however, the majority of produce consumed in Utah must be imported from outside of the State. Food production on the global market requires shipping, packaging, and refrigeration which contribute to the degradation of air quality and GHG emissions.

The following strategies may be adopted by Park City to promote sustainable food production and support the local economy:

- Encourage community gardens within subdivisions and in existing platted neighborhoods.
- Support regional agriculture by allowing farmers markets and farm stands in designated areas of the City.
- Implement a regional Transfer of Development Rights (TDR) program as a method to conserve existing agriculture within the Wasatch Back Region.
- Consider small scale livestock in residential areas with strict mitigation requirements.
- Use taxation strategies to discourage the conversion of agricultural land to other uses.
- Discourage the extension of urban services into agricultural areas.
- Agricultural preservation should be separated from open space preservation to protect commercially viable farms which incidentally provide open space amenities.
- Adopt right-to-farm provisions/protection in agricultural land preservation programs, plans and policies.

Benefits of Community Gardens

- ✓ Provides a catalyst for neighborhood and community development.
- ✓ Stimulates social, multi-generational Interaction.
- ✓ Encourages Self-Reliance.
- ✓ Beautifies Neighborhoods.
- ✓ Produces Nutritious Food.
- ✓ Reduces Family Food Budgets.
- ✓ Conserves Resources.
- ✓ Opportunity for recreation, exercise, therapy, and education.
- ✓ Preserves Green Space.
- ✓ Creates income opportunities and economic development.



There are a number of ways agricultural land is classified by the County:

FAA Farmland: The Utah Farmland Assessment Act (FAA) allows certain agricultural lands to be taxed based on the value of their produce instead of the value of their property. This program allows farmers to continue operating, despite rising property values.

Agricultural Land & Buildings: This is a classification assigned by the Summit County Assessor and includes any parcels on which agricultural activities occur, ranging from any agricultural land that does not qualify as FAA farmland to single-family parcels with horses.

Agricultural Protection Zone: This is a zoning type under the Eastern Summit County Development Code. It is intended to promote and preserve the use of land for commercial agriculture in the County and limits residential development. Some forms of agriculture are not allowed in this zone.

Agriculture-Grazing 100 & 160: These zones allow for more development than the Agricultural Protection, but still aim to conserve lands for agriculture, livestock and/or timber production. AG-160 zoning also seeks to protect sensitive areas.

STRATEGY: Daylighting Creeks in Urban Settings

Not so long ago, Silver Creek wound its way through Park City, separating the hustle and bustle of Main Street from the Marsac Mines. Pollutants, such as mining tailings, however, quickly diminished the health of the natural creek, and the stream was soon renamed "Poison Creek" to prevent locals from drinking its water. As Swede Alley developed, the stream was diverted underground where it currently flows through a pipe beneath the roadway. Uncovering this babbling brook would improve the overall aesthetics of Swede Alley, creating development opportunities for plazas and open space along the vegetated creek bed. Much like other municipalities, the City would not restore the original creek bed but rather introduce a new path for the stream that accommodates neighborhood needs along Swede Alley. To keep the water moving, thus preventing stagnant water and mosquitos, the water could be filtered through a water feature at the new Brew Pub Plaza.

This photo of Silver Creek running behind Marriot Summit Watch and along Deer Valley Drive is an excellent example of a small creek's positive impacts upon the built environment. The creek provides a central focus point for the pathway that follows alongside it. This image also includes the City's "Shoe Tree" in an area known locally as Shoe Tree Park.

"We never know the worth of water till the well is dry."

Thomas Fuller, *Gnomologia*

Sweede Alley
Poison Creek/Storm Drain

The blue line shown on this aerial image of Swede Alley depicts the location of the currently buried Silver Creek.