

# Carbon Neutrality Amendment to the Flagstaff 2030 Regional Plan

November 2, 2021

This document details the proposed text revisions for this major plan amendment. The pages to be revised are Regional Plan pages IV-11, IV-12 and X-19.

This document contains several versions of the revised plan pages:

- **Pages 2-4:** The proposed amended pages of the Regional Plan: pages IV-11, IV-12 and X-19 of the Regional Plan, in final formatting.
- **Pages 5-6:** A summary of proposed changes to goals and policies.
- **Pages 7-10:** A comparison document showing the exact proposed changes to the text, via tracked changes.
- **Pages 11-13:** The current Regional Plan pages, prior to any amendment.

## Climate Change and Adaptation

Climate change is disrupting global weather patterns and threatening communities across the world. While climate shifts have occurred in the past, today's climate is changing at a faster rate than ever recorded, due to the high concentration of human-caused greenhouse gas emissions. Changes to the climate system have been noted through observations of increases in global average air and ocean temperatures, widespread melting of snow and ice, and rising global average sea level (Intergovernmental Panel on Climate Change 2019). At the same time, weather patterns have become more extreme, with more intense and longer droughts, more extreme precipitation events, and increased heat waves.

Climate models predict further decreases in annual precipitation and a 5°F increase in the average temperature in Coconino County by 2050 (CLIMAS 2017). The projected increases in temperature and volatility are expected to lead to changes to Flagstaff's regional forests, our vegetation and animal communities, and our community's systems and infrastructure.



*Photo credit: Coconino National Forest*

### Local Climate Change Impacts

Flagstaff and Coconino County have seen warming since the mid-1980's, and will continue to see increased temperatures and aridity, or dryness. Key issues that the Flagstaff region must address include the following:

- Increasing temperatures, particularly an increase in minimum temperatures, or overnight lows;
- An increase in aridity and drought, leading to depleted soil moisture;
- Decreasing water supplies, reductions in annual snowpack, and decreases in snowmelt;
- Increasing risk of wildfire and tree mortality, and an increased frequency and altered timing of flooding;
- Impacts on the region's unique tourism and recreation opportunities and its land use systems, housing, and infrastructure;
- Increased risk to public health and increased vulnerabilities of lower income families, Black communities, Indigenous communities, communities of color, and the elderly, among other vulnerable groups.

### Climate Action: Mitigation, Adaptation and Equity

The Flagstaff region has historically faced climate risks, including forest fires, record high temperatures, snow storms, high winds, flooding, and drought. These events affect every resident, though different communities experience climate change in different ways. As the regional climate changes, these risks will become more severe.

The impact of these changes can be reduced with preventative measures. Flagstaff's climate objectives in mitigation, adaptation and equity were established in the Flagstaff Climate Action and Adaptation Plan (2018) and then updated in the Flagstaff Carbon Neutrality Plan (2021). These documents outline three types of climate action:

- **Mitigation** actions reduce the severity of climate change by decreasing greenhouse gas emissions and limiting their concentration in the atmosphere. The Flagstaff region has the opportunity to help mitigate the changes in climate by reducing emissions from transportation, building energy use, water use, consumption of goods and waste disposal.
- **Adaptation** actions prepare for the effects of climate change by understanding and preparing for the increased potential of wildfire, flooding, drought, and major community change, and then building resilience to short-term hazards and long-term change.
- **Equity** actions reduce the unequal burdens created by climate change. Flagstaff can address climate change in a manner that prioritizes the vulnerable communities most impacted and ensures the costs and benefits of climate adaptation and mitigation are equitably distributed.

At the community level, mitigation investments include efforts to **decrease dependence on cars**, embrace **electric mobility**, produce **clean electricity**, facilitate **fuel switching** in buildings, **reduce building energy use**, improve **sustainable consumption and waste management**, and undertake **carbon dioxide removal**. Adaptation will require building **community resilience** and investing in critical infrastructure such as stormwater and transportation systems, to prepare for increases in volatility, extreme weather events, flooding, wildfires, and community change (2012 City of Flagstaff Resiliency and Preparedness Study). **Equitable systems** investments include initiatives to protect vulnerable residents from the negative impacts of climate change and ensuring all residents can access the benefits of climate action. For the purposes of the Flagstaff Regional Plan, how we develop land will have a significant impact on our greenhouse gas emissions and the mitigation of climate change.

## CLIMATE CHANGE AND ADAPTATION GOALS AND POLICIES

### **Goal E&C.2. Achieve carbon neutrality for the Flagstaff community by 2030.**

Policy E&C.2.1. Encourage the reduction of energy and material consumption.

Policy E&C.2.2. Promote investments that create a connected and efficient community, decrease emissions from transportation and building energy, and strengthen climate resiliency.

Policy E&C.2.3. Review and revise existing regulations, standards, and plans (codes, ordinances, etc.) to reduce community greenhouse gas emissions.

Policy E&C 2.4. Promote developments that help the community achieve carbon neutrality through strategies that reduce the project's emissions from transportation, energy, and consumption.



### **Goal E&C.3. Prepare Flagstaff's community systems and resources to be more resilient to climate change impacts, and address climate change in a manner that prioritizes those most impacted and ensures the costs and benefits of climate adaptation and mitigation are equitably distributed.**

Policy E&C.3.1. Develop and implement a comprehensive and proactive approach to prepare the community for and to minimize the impacts of climate change induced hazards.

Policy E&C.3.2. Review and revise existing regulations, standards, and plans (codes, ordinances, etc.) to reduce the community's vulnerability to climate change impacts and reduce the disproportionate impacts on vulnerable communities.

Policy E&C.3.3. Invest in forest health and watershed protection measures.

Policy E&C.3.4. Increase the region's preparedness for extreme climate events.

Policy E&C.3.5. Improve the ability of vulnerable community members to adapt and thrive amidst the pressures of climate change.

Policy E&C.3.6. Attempt to equitably distribute the burdens and benefits of climate action policies and investments to all segments of the community.

### **Goal E&C.4. Integrate available science into policies governing the use and conservation of Flagstaff's natural resources.**

Policy E&C.4.1. Assess vulnerabilities and risks of Flagstaff's natural resources in the context of anticipated climate changes and resulting changes to Flagstaff's systems.

Policy E&C.4.2. Develop water use policies that attempt to integrate current best projections of climate change effects on the Colorado Plateau's water resources and emphasize conservation.

Corridors serve many roles, and these roles may be understood as:

- Carrier of goods and people – how many, how far, what kind, what means
- Connector of activities – how active, what scale, what purpose, relationships
- Space and Shelter for activities within the public realm – how often, vulnerable, duration, solitude
- Symbol for the understanding of place – identity, purpose, behaviors as it applies to specific roads or corridors, not to classes of corridors.
- Builder and destroyer of city and place – corridors may be perceived as supporting a sense of place, or destroying it.

To fully implement the Regional Plan’s vision for Flagstaff’s roadways a Flagstaff “Streets Master Plan” should be developed to serve as the specific plan that bridges the City’s *Engineering Design Standards and Specifications* and the *Flagstaff Regional Plan*. Until such a Plan is developed, functional classifications for roads and their definitions can be found in the *Engineering Design Standards and Specifications*.



Photo credit: City of Flagstaff

### Corridors in the Regional Transportation Plan

The Regional Transportation Plan (RTP) is a five year planning document developed by the Flagstaff Metropolitan Planning Organization. It is used to identify roadway projects that are eligible for federal funding. Some of the future roads identified on Map 25 are also identified in the RTP, however, these two documents are not required to match. The RTP provides more detail about the stage of planning for each roadway. Some future corridors are considered “conditional roads” in the RTP, which means that further study is required before proceeding with a project. Examples include the Clay Avenue Extension, the US 89 Bypass, the Metz Walk Extension, etc.

## AUTOMOBILE GOALS AND POLICIES

### Goal T.8. Establish a functional, safe, and aesthetic hierarchy of roads and streets.

Policy T.8.1. Promote efficient network connectivity to and within major trade corridors, employment centers, and special districts that enhances the region’s standing as a major economic hub.

Policy T.8.2. Maintain the road and street classification system that is based on context, function, type, use, and visual quality.

Policy T.8.3. Design neighborhood streets using appropriate traffic calming techniques and street widths to sustain quality of life while maintaining traffic safety.

Policy T.8.4. Protect rights-of-way for future transportation corridors.

Policy T.8.5. Support the area’s economic vitality by improving intersection design for freight movements.

Policy T.8.6. Maintain the City’s street infrastructure in a cost effective manner to ensure the safety and convenience of all users.



## SUMMARY OF REVISIONS – REGIONAL PLAN TEXT AMENDMENT

Pages IV-11, IV-12, and X-19

This section summarizes the proposed text revisions for this major plan amendment.

### Climate Change and Adaptation pages: IV-11 and IV-12

#### Revisions to goal two and associated policies

##### Goal: E&C.2

**Current:** Reduce greenhouse gas emissions

**Proposed revision:** Achieve **carbon neutrality for the Flagstaff community by 2030.**

##### Policy E&C.2.1

**Current:** Policy E&C.2.1. Encourage the reduction of all energy consumption, especially fossil-fuel generated energy, in public, commercial, industrial and residential sectors.

**Proposed revision:** Policy E&C.2.1. Encourage the reduction of **energy and material consumption.**

##### Policy E&C.2.2

**Current:** Promote investments that strengthen climate resiliency

**Proposed revision:** Promote investments that **create a more connected and efficient community, decrease emissions from transportation and building energy, and strengthen climate resiliency.**

##### **NEW** Policy E&C.2.3

**Review and revise existing regulations, standards, and plans (codes, ordinances, etc.) to reduce community greenhouse gas emissions.**

##### **NEW** Policy E&C.2.4

**Promote developments that help the community achieve carbon neutrality through strategies that reduce the project's emissions from transportation, energy, and consumption.**

#### Revisions to goal three and associated policies

##### Goal E&C.3

**Current:** Strengthen community and natural environment resiliency through climate adaptation efforts.

**Proposed revision:** **Prepare Flagstaff's community systems and resources to be more resilient to climate change impacts, and address climate change in a manner that prioritizes those most impacted and ensures the costs and benefits of climate adaptation and mitigation are equitably distributed.**

### Policy E&C.3.2

**Current:** Review and revise existing regulations, standards, and plans (codes, ordinances, etc.) to reduce the community's vulnerability to climate change impacts.

**Proposed revision:** Review and revise existing regulations, standards, and plans (codes, ordinances, etc.) to reduce the community's vulnerability to climate change impacts **and reduce the disproportionate impacts on vulnerable communities.**

### **NEW** Policy E&C.3.5

**Improve the ability of vulnerable community members to adapt and thrive amidst the pressures of climate change.**

### **NEW** Policy E&C.3.6:

**Attempt to equitably distribute the burdens and benefits of climate action policies and investments to all segments of the community.**

## Revisions to goal four and associated policies

### Policy E&C.4.1

**Current:** Assess vulnerabilities and risks of Flagstaff's natural resources

**Proposed revision:** Assess vulnerabilities and risks of Flagstaff's natural resources **in the context of anticipated climate changes and resulting changes to Flagstaff's systems.**

In addition, a revision is proposed for policy T.8.1, in the Transportation Chapter.

### Policy T.8.1:

**Current:** Promote efficient transportation connectivity to major trade corridors, employment centers, and special districts that enhances the region's standing as a major economic hub.

**Proposed revision:** Promote efficient **network** connectivity to **and within** major trade corridors, employment centers, and special districts that enhances the region's standing as a major economic hub.

# TRACKED CHANGES – REGIONAL PLAN TEXT AMENDMENT

Pages IV-11 and IV-12

## Climate Change and Adaptation

Climate change is disrupting global weather patterns and threatening communities across the world. While climate shifts have occurred in the past, today's climate is changing at a faster rate than ever recorded, due to the high concentration of human-caused greenhouse gas emissions.

Changes to the climate system have been noted through observations of increases in global average air and ocean temperatures, widespread melting of snow and ice, and rising global average sea level (Intergovernmental Panel on Climate Change ~~2007~~2019). At the same time, weather patterns have become more extreme, with more intense and longer droughts, more extreme precipitation events, and increased heat waves.

~~Many~~ Climate models predict further decreases in annual precipitation and increased temperatures a 5°F increase ~~for~~ in the average temperature in Coconino County by 2050 ~~our region, which in turn~~ (CLIMAS 2017). The projected increases in temperature and volatility are likely expected to lead to result in changes to Flagstaff's regional forests, our vegetation and animal communities, and our community's systems and infrastructure, ~~as well as declines in agricultural productivity and food security.~~

### Local Climate Change Impacts

~~Recent warming in the Southwest has resulted in declines in spring snowpack and Colorado River flow.~~ Flagstaff and Coconino County have seen warming since the mid-1980's, and will continue to see increased temperatures and aridity, or dryness. Key issues that ~~the Southwest, including~~ the Flagstaff region, must address include the following:

- Increasing temperatures, particularly an increase in minimum temperatures, or overnight lows;
- An increase in aridity and drought, leading to dDepleted soil moisture;
- Decreasing water supplies, ;Rreductions in annual snowpack, and decreases in snowmelt;
- ~~Depleted soil moisture;~~
- Increasing temperature, drought,Increasing risk of wildfire and, tree mortality, and invasive species and an; increased frequency and altered timing of flooding;
- Impacts on the region's unique tourism and recreation opportunities; ~~and its land use systems, housing, and infrastructure;~~Increasing risks to cities and agriculture from a changing climate
- Increased risk to public health and increased vulnerabilities of ~~the~~ lower income families, Black communities, Indigenous communities, communities of color, ,poor, and the elderly, among other vulnerable groups.

## Climate ~~Action:Adaptation and~~ Mitigation, Adaptation and Equity

The Flagstaff region has historically faced climate risks, including forest fires, record warminghigh temperatures, snow storms, high winds, flooding, and drought. These events affect every resident, ~~and although different communities experience climate change in different ways. As~~ the regional climate changes, these risks will become more ~~frequent and~~ severe.

~~The effects-impact~~ of these ~~extreme events may changes can~~ be ~~lessened-reduced~~ with preventative measures. Flagstaff's climate objectives in mitigation, adaptation and equity were established in the Flagstaff Climate Action and Adaptation Plan (2018) and then updated in the Flagstaff Carbon Neutrality Plan (2021). These documents outline three types of climate action:

- Mitigation of these risks refers to reducingactions reduce the severity of climate change by decreasing greenhouse gas emissions and limiting their concentration in the atmosphere. The Flagstaff region has the opportunity to help mitigate the changes in climate, ~~and by reducing emissions from transportation, building energy use, water use, consumption of goods and waste disposal.~~
- Adaptation actions prepare for simultaneously be ready for its-the effects of climate change by understanding and preparing for the increased potential of wildfire, flooding, drought, and major community change, other effects of climate change and then building resilience to preparing for such-short term hazards and -long-term change. Individual preparation measures could include preparing our homes for potential fire, implementing stormwater management best practices, and becoming more water efficient. Personal home or business investments in water conservation and stormwater collection, energy efficiencies, walking, biking, bus riding, recycling, re-using, and sharing also contribute to mitigating climate change.
- Equity actions reduce the unequal burdens created by climate change. Flagstaff can address climate change in a manner that prioritizes the vulnerable communities most impacted and ensures the costs and benefits of climate adaptation and mitigation are equitably distributed.

At the community level, mitigation investments include investing in critical public infrastructure such as reclaimed water, conservation, and stormwater collection; efficient; use of energy resources self-reliance on transportation options; food production and the ability to generate energy by means other than fossil fuels; efforts to decrease dependence on cars, embrace electric mobility, produce clean electricity, facilitate fuel switching in buildings, reduce building energy use, improve sustainable consumption and waste management and undertake carbon dioxide removal. Adaptation will require building community resilience and investing in critical infrastructure such as stormwater and transportation systems, to prepare for increases in volatility, and protecting and preparing the community for extreme weather events, flooding, wildfires, and community change other natural and human-caused hazards are examples of large-scale preparation (refer to the 2012 City of Flagstaff Resiliency and Preparedness Study) (2012). Equitable systems investments include initiatives to protect vulnerable residents from the negative impacts of climate change and ensuring all residents can access the benefits of climate action. For the purposes of the Flagstaff Regional Plan, how we develop land will have a

significant impact on our ~~reduction of~~ greenhouse gas emissions and the mitigation of climate change.

## CLIMATE CHANGE AND ADAPTATION GOALS AND POLICIES

**Goal E&C.2. ~~Reduce greenhouse gas emissions~~ Achieve carbon neutrality for the Flagstaff community by 2030.**

Policy E&C.2.1. Encourage the reduction of all energy and material consumption, ~~especially fossil fuel generated energy, in public, commercial, industrial, and residential sectors.~~

Policy E&C.2.2. Promote investments that create a more connected and efficient community, decrease emissions from transportation and building energy, and strengthen climate resiliency.

Policy E&C.2.3. Review and revise existing regulations, standards, and plans (codes, ordinances, etc.) to reduce community greenhouse gas emissions.

Policy E&C 2.4. Promote developments that help the community achieve carbon neutrality through strategies that reduce the project's emissions from transportation, energy, and consumption.

**Goal E&C.3. ~~Prepare Flagstaff's Strengthen community systems and resources to be more resilient to climate change impacts natural environment resiliency through climate adaptation efforts~~ and address climate change in a manner that prioritizes those most impacted and ensures the costs and benefits of climate adaptation and mitigation are equitably distributed.**

Policy E&C.3.1. Develop and implement a comprehensive and proactive approach to prepare the community for and to minimize the impacts of climate change induced hazards.

Policy E&C.3.2. Review and revise existing regulations, standards, and plans (codes, ordinances, etc.) to reduce the community's vulnerability to climate change impacts and reduce the disproportionate impacts on vulnerable communities.

Policy E&C.3.3. Invest in forest health and watershed protection measures.

Policy E&C.3.4. Increase the region's preparedness for extreme climate events.

Policy E&C.3.5. Improve the ability of vulnerable community members to adapt and thrive amidst the pressures of climate change.

Policy E&C.3.6. Attempt to equitably distribute the burdens and benefits of climate action policies and investments to all segments of the community.

**Goal E&C. 4. Integrate available science into policies governing the use and conservation of Flagstaff's natural resources.**

Policy E&C. 4.1. Assess vulnerabilities and risks of Flagstaff’s natural resources in the context of anticipated climate changes and resulting changes to Flagstaff’s systems.

Policy E&C. 4.2. Develop water use policies that attempt to integrate current best projections of climate change effects on the Colorado Plateau’s water resources and emphasize conservation.

---

## TRACKED CHANGES – REGIONAL PLAN TEXT AMENDMENT

Pages X-19

### Transportation Policy T.8.1 Revision

#### Tracked Changes:

Policy T.8.1. Promote efficient transportation-network connectivity to and within major trade corridors, employment centers, and special districts that enhances the region’s standing as a major economic hub.

## Climate Change and Adaptation

Changes to the climate system have been noted through observations of increases in global average air and ocean temperatures, widespread melting of snow and ice, and rising global average sea level (Intergovernmental Panel on Climate Change 2007). At the same time, weather patterns have become more extreme, with more intense and longer droughts, more extreme precipitation events, and increased heat waves. Many climate models predict further decreases in annual precipitation and increased temperatures for our region, which in turn are likely to result in changes to our vegetation and animal communities, as well as declines in agricultural productivity and food security.

### Local Climate Change Impacts

Recent warming in the Southwest has resulted in declines in spring snowpack and Colorado River flow. Key issues that the Southwest, including the Flagstaff region, must address include the following:

- Decreasing water supplies
- Reduction in annual snowpack and decrease in snowmelt
- Depleted soil moisture
- Increasing temperature, drought, wildfire, tree mortality, and invasive species
- Increased frequency and altered timing of flooding
- Impacts on the region's unique tourism and recreation opportunities
- Increasing risks to cities and agriculture from a changing climate
- Increased vulnerabilities of the lower income, poor, and elderly.

### Climate Adaptation and Mitigation

The region has historically faced climate risks, including forest fires, record warming, snow storms, high winds, flooding, and drought. These events affect every resident, and as the regional climate changes, these risks will become more frequent and severe. The effects of these extreme events may be lessened with preventative measures.

Mitigation of these risks refers to reducing the severity of climate change by decreasing greenhouse gas emissions and limiting their concentration in the atmosphere. The Flagstaff region has the opportunity to help mitigate the changes in climate, and simultaneously be ready for its effects by understanding the potential of wildfire, flooding, drought, and other effects of climate change and then preparing for such hazards. Individual preparation measures could include preparing our homes for potential fire, implementing stormwater management best practices, and becoming more water efficient. Personal home or business investments in water conservation and stormwater collection, energy efficiencies, walking, biking, bus-riding, recycling, re-using, and sharing also contribute to mitigating climate change.



*Photo credit: Coconino National Forest*



*Photo credit: Arizona Daily Sun*

At the community level, investing in critical public infrastructure such as reclaimed water, conservation, and stormwater collection; efficient use of energy resources; self-reliance on transportation options; food production and the ability to generate energy by means other than fossil fuels; and protecting and preparing the community for extreme weather events, flooding, wildfires, and other natural and human-caused hazards are examples of large-scale preparation (refer to the City of Flagstaff *Resiliency and Preparedness Study* (2012)).

For the purposes of the Flagstaff Regional Plan, how we develop land will have an impact on our reduction of greenhouse gas emissions and mitigation of climate change.



Photo credit: City of Flagstaff

## CLIMATE CHANGE AND ADAPTATION GOALS AND POLICIES



### **Goal E&C.2. Reduce greenhouse gas emissions.**

Policy E&C.2.1. Encourage the reduction of all energy consumption, especially fossil-fuel generated energy, in public, commercial, industrial, and residential sectors.

Policy E&C.2.2. Promote investments that strengthen climate resiliency.

### **Goal E&C.3. Strengthen community and natural environment resiliency through climate adaptation efforts.**

Policy E&C.3.1. Develop and implement a comprehensive and proactive approach to prepare the community for and to minimize the impacts of climate change induced hazards.

Policy E&C.3.2. Review and revise existing regulations, standards, and plans (codes, ordinances, etc.) to reduce the community's vulnerability to climate change impacts.

Policy E&C.3.3. Invest in forest health and watershed protection measures.

Policy E&C.3.4. Increase the region's preparedness for extreme climate events.

### **Goal E&C.4. Integrate available science into policies governing the use and conservation of Flagstaff's natural resources.**

Policy E&C.4.1. Assess vulnerabilities and risks of Flagstaff's natural resources.

Policy E&C.4.2. Develop water use policies that attempt to integrate current best projections of climate change effects on the Colorado Plateau's water resources and emphasize conservation.

Corridors serve many roles, and these roles may be understood as:

- Carrier of goods and people – how many, how far, what kind, what means
- Connector of activities – how active, what scale, what purpose, relationships
- Space and Shelter for activities within the public realm – how often, vulnerable, duration, solitude
- Symbol for the understanding of place – identity, purpose, behaviors as it applies to specific roads or corridors, not to classes of corridors.
- Builder and destroyer of city and place – corridors may be perceived as supporting a sense of place, or destroying it.

To fully implement the Regional Plan’s vision for Flagstaff’s roadways a Flagstaff “Streets Master Plan” should be developed to serve as the specific plan that bridges the City’s *Engineering Design Standards and Specifications* and the *Flagstaff Regional Plan*. Until such a Plan is developed, functional classifications for roads and their definitions can be found in the *Engineering Design Standards and Specifications*.



Photo credit: City of Flagstaff

### Corridors in the Regional Transportation Plan

The Regional Transportation Plan (RTP) is a five year planning document developed by the Flagstaff Metropolitan Planning Organization. It is used to identify roadway projects that are eligible for federal funding. Some of the future roads identified on Map 25 are also identified in the RTP, however, these two documents are not required to match. The RTP provides more detail about the stage of planning for each roadway. Some future corridors are considered “conditional roads” in the RTP, which means that further study is required before proceeding with a project. Examples include the Clay Avenue Extension, the US 89 Bypass, the Metz Walk Extension, etc.

## AUTOMOBILE GOALS AND POLICIES

### Goal T.8. Establish a functional, safe, and aesthetic hierarchy of roads and streets.

Policy T.8.1. Promote efficient transportation connectivity to major trade corridors, employment centers, and special districts that enhances the region’s standing as a major economic hub.

Policy T.8.2. Maintain the road and street classification system that is based on context, function, type, use, and visual quality.

Policy T.8.3. Design neighborhood streets using appropriate traffic calming techniques and street widths to sustain quality of life while maintaining traffic safety.

Policy T.8.4. Protect rights-of-way for future transportation corridors.

Policy T.8.5. Support the area’s economic vitality by improving intersection design for freight movements.

Policy T.8.6. Maintain the City’s street infrastructure in a cost effective manner to ensure the safety and convenience of all users.

