

# Chapter 5



GETTING THERE  
TOGETHER



# Protecting Our Health and Environment

We all want to enjoy a sustainable environment and a healthy life, physically and mentally. As Austinites, we enjoy a close connection with nature and have a strong environmental ethos. We appreciate our trails and greenways, lakes and rivers, parks and open spaces. Our environment, and the healthy lifestyle it accommodates, is a core part of what makes Austin special. Austin's urban ecosystem is our community of living things and their interactions with non-living things; our urban ecosystem is rich in natural resources and amenities, but the effects of development and climate change put the health of ourselves and our environment at risk.

Our transportation network has a large impact on our health and environment. Transportation has a significant role in encouraging healthy lifestyles and providing safe access to food, healthcare, and other social resources. Our important air, climate, water, and ecological systems are heavily impacted by our transportation network. The transportation network is just one component of our urban ecosystem, and it must coordinate with other natural and man-made systems to protect and enhance our health and environment.

This chapter lays out the importance of considering the many impacts of mobility on our public health, air and climate, water, and land and ecology systems. From improving access to healthcare, to promoting electric vehicles, from integrating stormwater management into our streets, to pursuing the preservation of open space, it is easy to see how transportation can strengthen and complement our health and environment. By ensuring transportation helps protect people and the environment from long-term effects of a changing climate and population growth, we can become a healthier, more resilient community.



# Policy Summary

## **Public Health**

**Policy 1** Recognize that transportation fatalities and serious injuries are a public health crisis

**Policy 2** Recognize and plan for transportation infrastructure's impact on public health

**Policy 3** Provide infrastructure and programming to encourage active lifestyles and healthy living

**Policy 4** Connect people to food, opportunities for physical activity, and health care using multiple transportation modes

## **Air and Climate**

**Policy 1** Reduce emissions generated by the transportation sector

**Policy 2** Lead by example in reducing ozone and greenhouse gas emissions in the City's fleet

**Policy 3** Choose energy efficient materials and methods in the design, construction, and operation of our transportation network

## **Water and Stormwater**

**Policy 1** Use streets strategically as key components of the city's drainage, drinking water, reclaimed water, and wastewater systems

**Policy 2** Integrate stormwater control measures into the transportation network

**Policy 3** Optimize mobility and water management goals

## **Land and Ecology**

**Policy 1** Avoid, minimize, and mitigate adverse impacts of the transportation network on natural and cultural resources

**Policy 2** Pursue designs that enhance our ecosystem

**Policy 3** Support the Imagine Austin Growth Concept in a way that is sustainable, equitable, and consistent

**Policy 4** Recognize and plan for trees as vital to supporting the transportation network



## Public Health

Our community's health and transportation are strongly linked. A person's health and ability to make healthy choices are directly affected by where they live, work, learn, and play and by how they travel. While transportation systems directly affect our ability to access affordable, healthy food, including community amenities such as grocery stores, and healthcare, having convenient options to travel on foot, by public transportation or by bicycle provides specific health benefits. These mobility choices increase our daily physical activity, helping to prevent and manage chronic diseases like cancer, diabetes and heart disease.

Improving the overall health of our community is achieved through policy, systems, environmental changes, evidence-based programming and interventions that change norms and improve health behaviors. In Travis County, significant health disparities exist for chronic disease, specifically among low-income populations and populations of color. In addition to chronic diseases, these populations are disproportionately affected by traffic fatalities and serious injuries. Focused efforts on neighborhoods and populations experiencing higher disease rates and risk factors, such as obesity and lack of physical activity, are key to improving overall community health.

In addition to providing health benefits to individuals through access to basic needs and physical activity, transportation choices directly affect the environment in which we live. The quality of our air is impacted by the burning of fossil fuels for transportation, which is the largest source of air pollutants in Austin. Pollutants, including ozone, can impact respiratory health, especially for vulnerable populations like seniors, children, and those with lung diseases. Improving access to more sustainable modes of transportation and reducing our reliance on fossil fuels will be important to protecting our health as our population grows.

*"I would love to see Austin's transportation reflect the resident's active lifestyles."*

—Community Member

## Indicators and Targets



**Increase the percent of adults who are considered "active" or "highly active"**



**Increase the access by active modes to and around parks and trails**



**Increase the number of sidewalks, bicycle facilities, and urban trails that are within ZIP codes with disproportionate prevalence of chronic diseases or conditions**



**Increase the safe access by transit and active modes to affordable and culturally competent opportunities for healthy food, including community amenities such as grocery stores**



**Decrease no-show rates at safety-net providers due to difficulty traveling to appointments**

## Public Health Policy 1

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### **Recognize that transportation fatalities and serious injuries are a public health crisis**

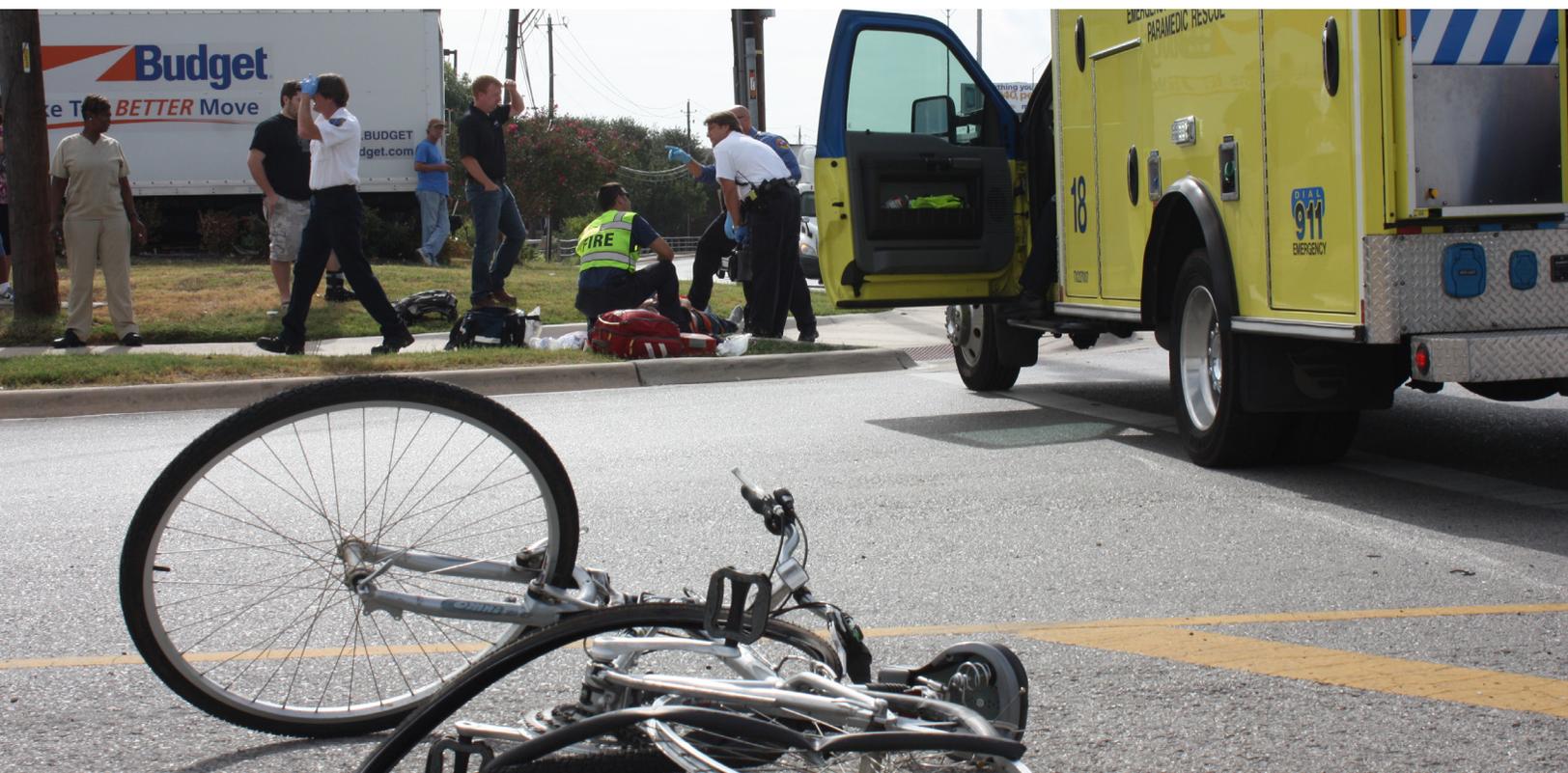
**Holistically address fatalities and serious injuries on the transportation network as a public health issue**

In order to advance our work toward the goal of Vision Zero—zero traffic fatalities and serious injuries—we must recognize the severity and preventable nature of the problem. If a preventable disease killed more than 35,000 people each year in this country, as traffic crashes do, it could be considered an epidemic. Traffic deaths and injuries are a preventable, public health issue. Any traffic death is too many.

On average, more than 70 people lose their lives on Austin's streets each year. For each person killed, six more suffer life-altering injuries and thousands more suffer minor or moderate injuries. Half of these deaths are people walking or riding motorcycles or bicycles, even though these modes only make up about 6.5% of all commuters. A disproportionate number of minority groups and homeless individuals make up these numbers. In addition to the human loss, these injuries and fatal crashes result in more than \$350 million annually in local economic impact. We must tackle this problem through education and outreach, better street design, enforcement against dangerous behaviors, and legislative changes. Recognizing the public health crisis of traffic fatalities is an integral step toward increasing awareness and dedicating the resources needed to reach our goal of Vision Zero.

*“We honor the lives lost or irrevocably altered in traffic crashes by working toward the goal of zero deaths and serious injuries.”*

—2016 Vision Zero Action Plan



## Public Health Policy 2

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### **Recognize and plan for transportation infrastructure's impact on public health**

**Utilize health impact assessments using a health equity lens when planning for major improvements to the transportation network to understand and mitigate effects**

The transportation network affects our physical, social and mental health by influencing our behaviors, such as physical activity, and exposing us to environmental elements, such as traffic safety hazards. In planning future transportation improvements, it is important that we analyze the potential health impacts, such as through health impact assessments. Health impact assessments consider the environment and populations in the area of the improvement and help identify opportunities to maximize positive health effects and minimize potential negative outcomes. Assessments allow us to understand how transportation is affecting various populations to ensure we are providing equitable opportunities for people to have healthy lives.

Health impact assessments should especially focus on areas that have historically been underserved and are disproportionately affected by chronic diseases and adverse health conditions. In addition to populations affected, other factors that should be considered when assessing health impacts include the ability to access basic needs (food, housing, healthcare, education, and other services), available transportation options, and safety concerns. Planning for major transportation improvements, such as corridor preliminary engineering and design work, should incorporate health impact assessments to assess the impacts of the recommended improvements.

### **South Lamar Boulevard Corridor Mobility Report–Health Impact Assessment**

The City is continually working to identify short-, mid-, and long-term transportation improvements for various corridors to enhance multimodal mobility, safety, and quality of life. Recently, a corridor mobility report was completed for the South Lamar corridor. The project included a Health Impact Assessment to help the project team consider public health during the planning process, provide information on the potential health impacts of proposed plans, and develop approaches to evaluate future health outcomes related to the corridor improvements.

In regards to health, the South Lamar corridor has a number of existing assets and barriers. Assets include access to public transportation, increasing density of people and destinations, existing sidewalks and bike lanes along most of the corridor, and a public interested in walking and bicycling within the corridor area, pending infrastructure improvements. Barriers to health include lack of safe crossing opportunities, high road speeds, lack of connectivity from within neighborhoods (particularly to the east), inadequate pedestrian and bicyclist infrastructure, lack of green space and shade, and lack of bicycle parking.

The report included recommendations to make walking and bicycling a safe, convenient, and pleasant choice for those who live, work, shop, and recreate along the corridor. Resulting increases in physical activity and social interactions in the short term can have long-term public health benefits such as reductions in rates of diabetes and heart disease. Improvements related to urban trees and landscaping may have additional health-related benefits such as a reduction in heat-related illnesses. Key health-related recommendations include more street crossing opportunities and enhanced safety at existing street crossings, reduced speed limits, the addition of continuous protected bicycle lanes and wide sidewalks along the length of the corridor, and use of trees and rain gardens.

## Public Health Policy 3

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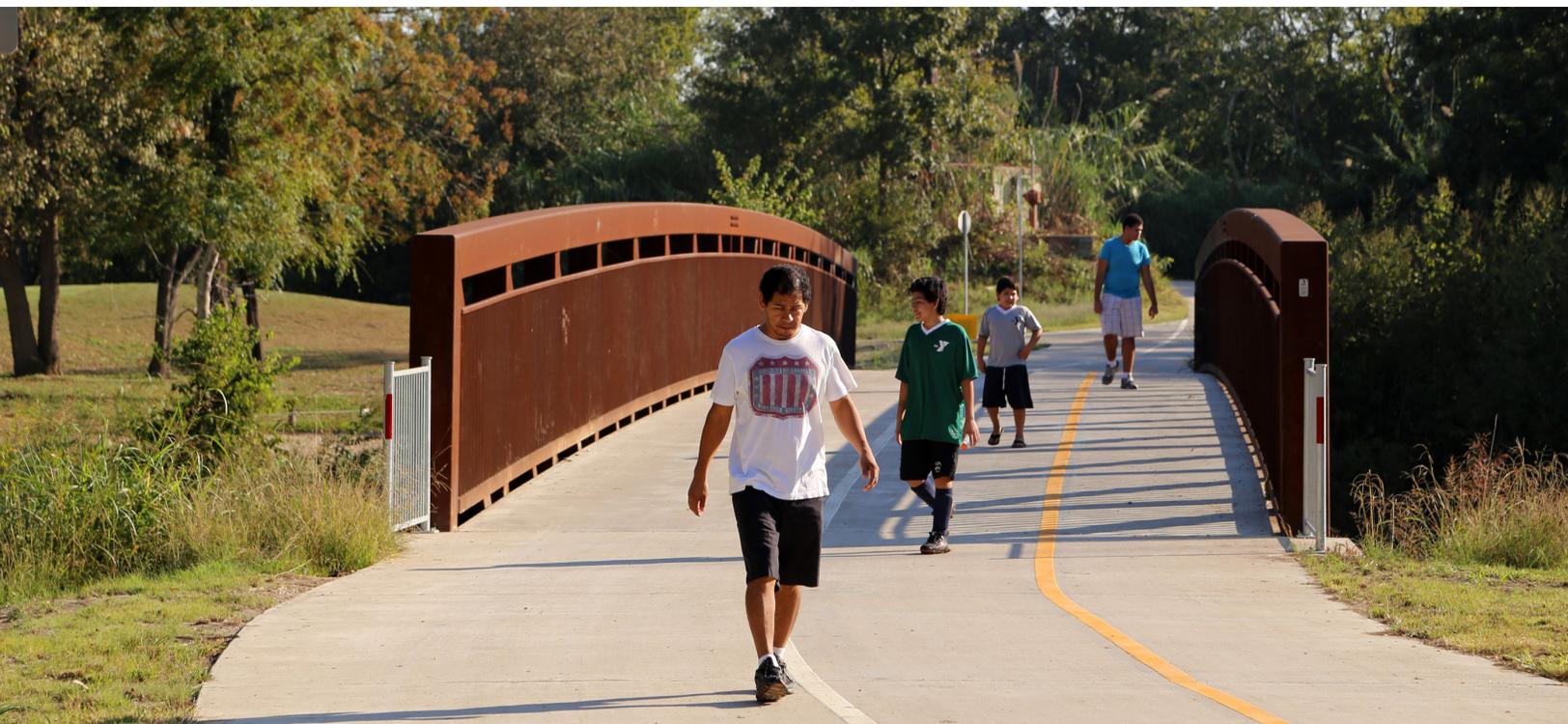
### **Provide infrastructure and programming to encourage active lifestyles and healthy living**

**Recognize active transportation's contribution to preventing and managing chronic diseases and supporting physical and mental well-being for people of all ages and abilities**

Improvements to the built environment, especially those that encourage active lifestyles such as walking and bicycling, have been shown to increase physical activity. For example, sidewalks, trails, protected bicycle lanes, speeding calming devices, expanding public transportation services including times, locations, and connections increase daily physical activity. Additionally, improvements that improve the comfort and safety of active modes, such as street trees and pedestrian lighting, can encourage walking and bicycling.

Because of the disparities in chronic diseases rates in Austin, it is important to focus infrastructure and programming on historically underserved areas and those that are disproportionately affected by chronic disease and adverse health conditions.

Active lifestyles can prevent and manage chronic diseases, such as diabetes, high blood pressure, heart disease, and cancer. We can improve healthy living and promote active lifestyles by providing more programs for culturally appropriate physical activity classes that teach how to bike, walk, or ride the bus, to work or school. Austin's Smart Trips Program is one way we are reaching community members where they live to provide information and training on active transportation options.



## Encouragement Programs for Physical Activity and Active Transportation

Encouragement programs can increase awareness and opportunities for individuals to take up regular physical activity, including walking, bicycling and other forms of physical activity. These programs provide information and support to help individuals reduce barriers to active transportation. They also help people stay motivated and set goals. Such programs help track daily physical activity minutes and provide group leaders for motivation and social support.

The Centers for Disease Control and Prevention recommends 150 minutes of moderate to vigorous physical activity per week. In addition to chronic disease prevention, exercise is known to increase energy and improve memory, sleep, and mood. These programs can be used in flexible locations including neighborhood exercise groups, worksites, etc. In addition to using the built environment, these programs help encourage people to both take up and continue physical activity.

Austin's Walk Texas! ACTIVE AUSTIN 10-Week Challenge is one example of an encouragement program for physical activity. The goal of the program is to help individuals begin and sustain an active lifestyle.

### Program activities/Strategies:

- 10-week physical activity challenge using an activity tracking system
- Orientation sessions and group leader training
- Rewards and incentives

### Program Measures:

- Increased number of individuals participating in physical activity encouragement programs
- Number of physical activity groups and events
- Increase in physical activity by group members



## Public Health Policy 4

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### **Connect people to food, opportunities for physical activity, and health care using multiple transportation modes**

**Develop safe, multimodal transportation options across the community, paying particular attention to efforts that increase affordable food access, opportunities for physical activity, and health care access**

Transportation increases access to opportunities. By increasing choices for how we travel, we can provide the community with more opportunities to meet basic needs, such as accessing affordable, healthy food, including community amenities such as grocery stores, healthcare, and physical activity.

As Austin grows and housing in the central area becomes more expensive, people are moving away to afford housing in areas with limited access to services. This is especially true for low-income populations experiencing the largest health disparities. Thus, we should seek to increase access to service providers where people can be enrolled in and access food assistance, workforce assistance, and childcare. In addition to increasing access, we should continue to support food retail expansion initiatives and mobile healthcare service expansion.

Having affordable options for transportation, like public transportation, allows people to save money on the cost of using and maintaining a car. These savings free up disposable income for food and other needs. Plus, having opportunities for safe active transportation, using sidewalks, bicycle facilities, and urban trails, incorporates physical activity into our daily lives. Walkable commercial and mixed-use districts can catalyze more physical activity when they support active transportation, include a rich mix of amenities and cultural anchors, and are connected to neighborhoods and affordable housing options.

## **Community Health Assessment and Community Health Improvement Plan**

**A community health assessment (CHA) is a systematic examination of a population's health status as well as key assets and challenges to its health. Communities throughout Austin and Travis County collaborate to conduct a CHA every five years to determine the priorities for the three-year Community Health Improvement Plan. Transportation continues to be a factor in community health in Austin, whether it is access to healthcare or opportunities to have healthy lifestyles. This is why it is important for us to continue to participate in the assessment process and the identification of goals, objectives, and action items for the ways transportation infrastructure, services, and programming can contribute to improving community health.**





## Air and Climate

Transportation has a direct relationship with our air and climate, which we must consider as we shape a sustainable mobility future. Austin is experiencing multiple indicators of climate change including higher temperatures, extended periods of drought, increased wildfire risk, and intense rain and flooding. Extreme weather events are projected to increase in frequency. The use of fossil fuels (oil, gasoline, diesel, coal, and natural gas) for energy and transportation creates the greenhouse gases that lead to climate change. In addition to the immediate and obvious impacts of climate change on regional weather, climate change can negatively impact the resiliency of transportation assets. Flooding can cause road closures, transportation network disruptions, and road damage. Wildfires may render roads impassable and create traffic jams resulting from evacuations. There is also the potential for roadway damage resulting from extreme variations in precipitation and soil moisture (i.e. drought followed by heavy rainfall).

*“We need to maximize alternatives to single occupancy vehicles and dramatically reduce carbon emissions.”*

—Community Member

We must consider the impacts of transportation on our air quality and public health. The use of fossil fuels for energy and transportation also produces pollutants, such as nitrogen oxides (NO<sub>x</sub>), volatile organic compounds (VOCs), and particulate matter (PM). Overall, the leading air quality concern in Austin is ground-level ozone (O<sub>3</sub>). Ground-level ozone is not emitted directly into the air but is formed through chemical reactions between emissions of NO<sub>x</sub> and VOCs in the presence of sunlight. These gases react in the ambient, or outdoor, air, and when they interact with sunlight, ozone is formed. Transportation activity is the primary source of ozone precursors, mainly NO<sub>x</sub> emissions. While the region is currently in compliance with federal air quality standards, unhealthy levels of air quality can still be observed during the year. Elevated ozone levels can have a significant impact on human health causing many individuals to experience increased respiratory illnesses. Vulnerable populations, including children, older adults, and those with lung diseases like asthma, are more prone to be affected by increased ozone levels. In Austin, the largest source of air pollutants, including those that acutely affect human health and cause long-term climate change, come from transportation-related activities.

As a major employer and steward of transportation infrastructure and public funds, the City of Austin must continue to act to reduce emissions generated by the transportation sector. Reducing the number of drive-alone trips is key to reducing the use of fossil fuels and reducing negative impacts on regional climate and air quality. When our community travels sustainably—such as by transit, bicycling, walking, carpooling and vanpooling—they preserve Austin’s environment and livability. In cases where people must drive alone, they can adjust their departure time, reduce the length of trips, or use plug-in hybrid and battery electric vehicles to help reduce greenhouse gas emissions and air pollution. Given the broader community impacts of air quality, we must work with regional partners to reduce transportation-related pollutants.

## Indicators and Targets



### Reduce greenhouse gas emissions

*Reach net-zero community-wide greenhouse gas emissions by 2050*



### Reduce average ozone level region-wide

*Reduce average ozone level region-wide by 0.70-1.00 parts-per-billion annually*



### Increase the number of carbon neutral City of Austin facilities, fleets, and operations

*Achieve 100% of City of Austin facilities, fleets, and operations carbon neutral by 2020*



### Increase the amount of electric vehicle charging infrastructure



### Increase the percent of City fleet vehicles that are shared among departments

## *Air and Climate Policy 1*

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### **Reduce emissions generated by the transportation sector**

**Pursue strategies and collaborate with regional partners to reduce ozone and greenhouse gas emissions, including promoting sustainable transportation modes and improving traffic flow**

Being able to reduce our reliance on fossil fuels is key to limiting the transportation sector's effect on ozone and greenhouse gas emissions. The growth and development of a strategically planned transportation network, which accommodates active and sustainable transportation solutions, allows individuals to move away from using vehicles which emit high levels of air pollutants. A compact and connected land development pattern, as presented in *Imagine Austin*, will also allow for this shift to take place. Use of strategies and behavioral changes, such as those seen within the Transportation Demand Management (TDM) Programming subchapter, can also mitigate levels of emissions which we currently observe. A robust electric vehicle charging network will help make clean energy options more attractive than fossil fuels, which will improve air quality measures. Regional partners such as the Capital Area Council of Governments (CAPCOG), the Capital Area Metropolitan Area Planning Organization (CAMPO), Capital Area Rural Transportation System (CARTS), the Texas Department of Transportation (TxDOT), the Central Texas Regional Mobility Authority (CTRMA), and the Capital Metropolitan Transportation Authority (Capital Metro) also play critical roles in alleviating emissions resulting from the transportation sector.

### **2019-2023 Regional Air Quality Plan**

**This plan is intended to guide efforts within the Austin-Round Rock Metropolitan Statistical Area (MSA) to maintain and improve air quality from 2019-2023. This is the fifth voluntary regional air quality plan adopted for the region; previous plans included the 2002 1-Hour Ozone Flex Plan, the 2004 Early Action Compact (EAC) State Implementation Plan (SIP), the 2008 8-Hour Ozone Flex Plan (8-O3 Flex), and the 2013 Ozone Advance Program (OAP) Action Plan. This plan is designed to accomplish two goals:**

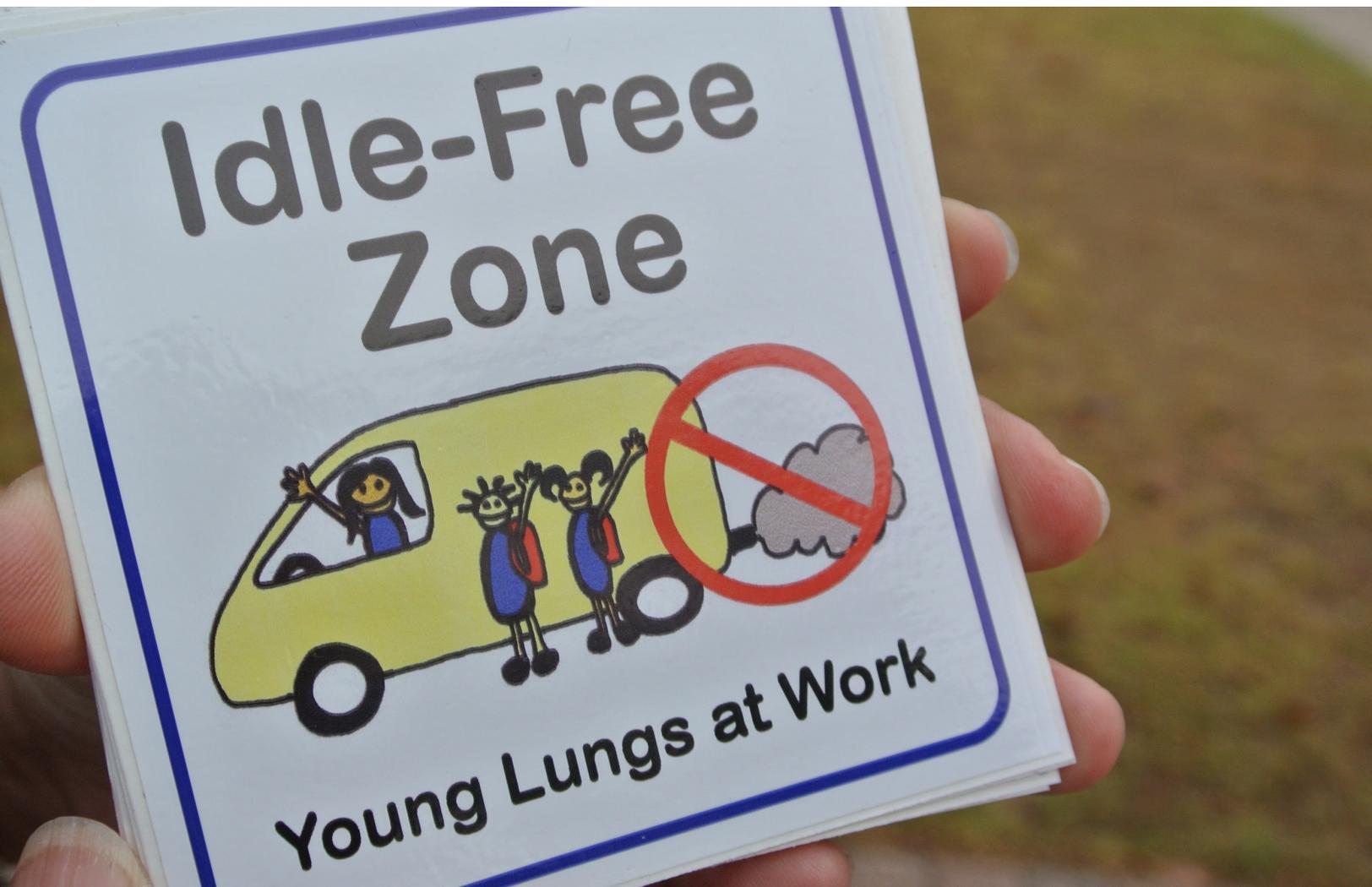
- 1. Maximize the probability of compliance with the National Ambient Air Quality Standards (NAAQS) region-wide; and**
- 2. Minimize the health and environmental impacts of regional air pollution.**

## Air and Climate Policy 2

### **Lead by example in reducing ozone and greenhouse gas emissions in the City's fleet**

**Focus on acquiring and using the cleanest vehicles appropriate for the job, consolidating trips, and implementing other strategies that reduce ozone precursors and greenhouse gas emissions**

As an organization, the City of Austin can influence a community shift away from fossil fuels by setting an example to follow. The City of Austin's Fleet Services Department has made a commitment to incorporate a mix of battery-electric and hybrid-electric vehicles into the fleet. Our fleet electrification plan calls for 330 battery electric vehicles by 2020. Moving forward, the City of Austin will evaluate and improve fleet and fuel efficiencies, focus on using the cleanest vehicle appropriate for the jobs, consolidate trips, and set policies for fleet usage that reduce nitrogen oxide (NOx) emissions. These efforts will require pursuit of grant funding for retrofitting, repowering, and replacing older equipment when appropriate. As an organization, we should seek out new strategies which improve climate and air quality and continue to take an active role in local and regional planning initiatives.



## *Air and Climate Policy 3*

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### **Choose energy efficient materials and methods in the design, construction, and operation of our transportation network**

#### **Use materials and methods that conserve energy, limit waste, and support the Net-Zero Community Climate Goals**

Our transportation network's infrastructure must support the viability and reliability of different transportation choices. For the development and construction of transportation-related infrastructure to be environmentally sustainable, its operational life-cycle analysis must be energy efficient and use environmentally sustainable materials. We can also encourage contractors and partner agencies to use environmentally sensitive construction equipment and practices. We must also support Net-Zero Community Climate Goals, as expressed in the Austin Community Climate Plan, when planning transportation infrastructure investments. After all, a sustainable transportation network must incorporate strategies to limit waste, conserve energy, and ultimately be environmentally sustainable to keep our community healthy and moving.

### **Austin Community Climate Plan**

**The Austin Community Climate Plan identifies over 130 actions to reduce greenhouse gas emissions from the energy, transportation, and materials and waste sectors. In Travis County, approximately 35% of community-wide greenhouse gas emissions come from the transportation sector, and nearly 95% of the transportation-related greenhouse gas emissions in Travis County are from on-road vehicles (cars and trucks).**





## Water and Stormwater

Austin lies in the heart of North America’s “Flash Flood Alley” and has experienced historic flood events over the last several years. Austin has also recently experienced historic droughts that threaten our water supply. There are numerous connections between the mobility, stormwater, drinking water, reclaimed water, and wastewater systems. For example, the transportation network is not only designed for mobility, but also serves to convey stormwater to drainage infrastructure and transport users safely over waterways. In some locations, the street network serves as the primary drainage network. Similarly, the pipes that carry our drinking water, reclaimed water, and wastewater throughout the city are often buried below our streets and sidewalks. Given this degree of overlap, enhancements to one component must consider the needs of the system as a whole.

*“Protect the creeks, water, and ecosystem.”*

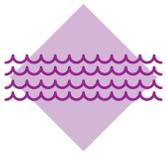
—Community Member

The interaction between our water systems (drinking water, reclaimed water, wastewater, and stormwater) and transportation systems is complex. Transportation infrastructure and operations can negatively impact stormwater, drinking water, reclaimed water, and wastewater systems, if not managed or mitigated by design. For stormwater systems, this impact is primarily related to the impervious cover and changes in natural drainage patterns associated with transportation infrastructure projects. Impervious cover is any surface that prevents the infiltration of water into the ground. If stormwater is not properly managed, the increased volume and velocity of runoff from streets can contribute to erosion and flooding and impair water quality by carrying pollutants into Austin’s creeks.

Conversely, water systems infrastructure can also negatively impact the transportation network. Many of Austin’s streams are eroding near transportation infrastructure, especially in older areas of the city where development occurred before protective regulations were put in place. Excessive streambank erosion not only threatens stream stability, water quality, and aquatic ecosystems, but also impacts the reliability of the transportation and water systems, as seen in 2018 with the closure of the Shoal Creek Trail due to erosion. If rainfall overwhelms the drainage system, bridges and roadways can become flooded and impassable, potentially posing a safety risk to the public and first-responders. Finally, maintenance to our drinking water, reclaimed water, wastewater, and drainage infrastructure can damage infrastructure and disrupt transportation operations. When utility lines need to be serviced or expanded, our transportation network must temporarily close, affecting our ability to get where we need to go.

The development of our transportation network must also consider the continued protection and enhancement of our water resources. Working to a sustainable transportation future requires considering the important functions our streets and other public rights of way serve in supplying us with safe, reliable water and protecting our creeks, lakes, and aquifers.

## Indicators and Targets



**Reduce the risk of flooding on all roads and road crossings in the 100-year floodplain, including provision of adequate warning at dangerous crossings**



**Reduce the danger of street flooding created by substandard storm drains**



**Reduce the number of eroding stream banks that threaten roadways and trails**



**Reduce pollutant loads in all creeks to the maximum extent possible**

## Water and Stormwater Policy 1

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### **Use streets strategically as key components of the city's drainage, drinking water, reclaimed water, and wastewater systems**

**Design and develop transportation infrastructure and rights of way to provide clean, safe, reliable water, effectively manage and convey stormwater runoff, and prevent or mitigate flood risk and erosion problems**

Beyond just moving people, our streets also serve as critical drainage infrastructure and are home to the utilities that collect stormwater and distribute water to homes, schools, and businesses. Streets are designed to channel stormwater into storm drain pipes beneath our streets, where it is then conveyed to the creeks. If streets are not designed with this drainage function in mind, the runoff from our streets can contribute to nuisance ponding, erosion, and flooding and impair water quality by carrying pollutants into Austin's creeks. The design of a street can also affect how stormwater is able to flow through our city, especially where transportation infrastructure crosses creek systems. The construction and maintenance of bridges and culverts require holistic approaches that work with natural systems while enhancing the safety and mobility of our transportation network.

Austin can be more strategic in integrating our drinking water, reclaimed water, wastewater, stormwater, and transportation systems by effectively coordinating infrastructure improvement projects to identify potential opportunities for mutually beneficial partnerships as well as potential technical obstacles. We should also optimize the placement of utilities within our right of way to allow for utility servicing and reduce the impact of related closures on mobility. By applying various tools to each transportation project based on context, we can better manage our water and stormwater systems and increase the sustainability and resiliency of our urban ecosystems.



## Land Conservation in Transportation Infrastructure Projects

Austin Transportation, working with the Watershed Protection Department, is actively engaging and collaborating with regional peer transportation agencies to enhance the environmental protections and improve stormwater management practices for major transportation projects.

These partnerships are built on a shared understanding of our responsibilities to protect sensitive environmental resources. The new joint environmental approach emphasizes working together, and includes important collaborative elements such as establishing a single point of contact to review stormwater management and environmental protection practices. Important environmental protections, such as allowing stormwater management and environmental protection planning to guide the design of transportation planning, elevated performance standards for transportation construction, increased environmental mitigation during projects, and expanded analysis and inspection of ecological resources such as trees are big steps towards protecting our environment and achieving our ecological goals.



*“Easy access, environmentally friendly, quick, efficient, affordable transportation is what any leading city should strive for.”*

–Community Member

## *Water and Stormwater Policy 2*

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### ***Integrate stormwater control measures into the transportation network***

**Use stormwater infrastructure strategically throughout the transportation network to protect water quality and stream health, and to improve the urban environment by integrating nature into the city**

Transportation infrastructure makes up a large portion of Austin's impervious cover. When rainwater falls on impervious surfaces such as roadways and parking lots, it picks up contaminants from the roadway surface which can have a significant impact on the water quality of Austin's creeks. Effective stormwater control measures are one way to protect creek health and reduce the risk of flooding and erosion. The integration of stormwater control measures including flood detention ponds and water quality controls, such as biofiltration ponds, porous pavement, and rain gardens, needs to be considered with the development of Austin's transportation network.

In addition to improving stream health, integrating stormwater control measures into the transportation network can also improve reliability, mobility, and public safety outcomes. Stormwater control measures can enhance system reliability by reducing localized street flooding caused by undersized drainage infrastructure. Stormwater strategies can also enhance the streetscape for non-motorized transportation users by incorporating the natural world into our urban environment and serving as traffic calming measures. For example, rain gardens can be incorporated into curb extensions that protrude into the street, slowing traffic while also slowing and infiltrating runoff. Maximizing the natural function of our transportation network also fulfills an intrinsic need we have to be surrounded by the natural world, and helps us be more in tune with the ecosystem we live in.



## Todd Lane Greenroads Project

The Todd Lane improvement project added 6.8 acres of new and redeveloped impervious cover to Austin's existing transportation network. In order to mitigate the impacts of this impervious cover and to comply with City code, the City of Austin worked to develop a water quality control strategy for the Todd Lane project.

In the City of Austin, development projects are required to capture a minimum volume of stormwater runoff for water quality treatment and to release the treated volume within 48 hours. Traditionally, this requirement has been met with a single, end-of-pipe, water quality control. For the Todd Lane project, however, multiple green stormwater infrastructure controls were implemented, including seven rain gardens and two partial sedimentation/biofiltration ponds. The rain gardens and biofiltration ponds capture, filter, and help infiltrate stormwater into the soil. They also remove pollutants including suspended particles, oil, heavy metals, and other chemicals, and enhance the baseflow to the nearby Country Club West and Williamson Creeks.

Todd Lane is Austin's first completed Greenroads Project and achieved a silver certification by Greenroads Project standards. This international rating system measures and manages the sustainability of transportation projects by providing a third-party assessment to ensure that projects save money, water, energy, and reduce carbon footprints. The Todd Lane improvement project met these goals by incorporating numerous sustainable features, while also improving pedestrian, bicyclist, and motorist safety. Notably, the Todd Lane improvement project was the first in the United States to receive the maximum Greenroads Project score for Runoff Flow Control and Runoff Quality.



## Water and Stormwater Policy 3

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### **Optimize mobility and water management goals**

**Coordinate the development of regulations and criteria that impact mobility, drinking water, wastewater, reclaimed water, and stormwater to optimize the benefits to multiple goals and objectives**

Because of the high level of interconnectedness between mobility, drinking water, reclaimed water, wastewater, and stormwater systems, many different City of Austin departments must pursue a collaborative approach to reviewing engineering and design decisions. Although review activities are primarily the responsibility of the Development Services Department, other departments assist in the process. The Watershed Protection and Public Works departments, Austin Water, Austin Transportation, Austin Fire, and Austin Energy all contribute to the coordination of development review. Each department contributes expertise during the review process, but we must work toward more proactive coordination during the project prioritization and design phases, while also incorporating community concerns and desires.

Another avenue for optimizing mobility and water management goals is through the coordination of code and criteria manuals across the various disciplines that utilize rights of way. Much like how an integrated design process makes large-scale construction projects more cost-effective, timely, and viable, a similar approach can be taken to the codes that govern mobility. Code and criteria manuals provide rules, design criteria, and guidelines for development, including mobility, water, wastewater, and stormwater infrastructure. For example, the Drainage Criteria Manual establishes standards for the design and construction of drainage systems within Austin. Similarly, the Transportation Criteria Manual presents guidelines and criteria to provide the foundation for engineering design decisions of our transportation network. Because of the need to incorporate stormwater control measures into street development and the fact that a large portion of our drainage and water distribution system is contained within our streets, the Environmental Criteria Manual, Drainage Criteria Manual, Utilities Criteria Manual, and Transportation Criteria Manual must all be aligned to optimize outcomes for each discipline.







## Land and Ecology

Austin is known for being environmentally conscious and we celebrate our distinct ecosystems and the abundance of biodiversity they provide. Our natural and cultural resources are an ingrained part of who we are as a community. Protecting and supporting these resources requires conscious effort in all that we do. While the primary focus of this plan is to improve mobility within Austin, we recognize transportation’s potentially adverse impacts on our environment. It also has the potential to support, enhance, and provide access to these unique ecological assets.

Austin is located at the intersection of four physical geographic regions: the Edwards Plateau (known as the “Hill Country”), the Rolling Prairie, the Blackland Prairie, and the Colorado River Terraces. The city contains a variety of terrains, soils, habitats, flora, and fauna due to its location in this transitional zone. While much of Austin is urbanized, some of Central Texas’ most fertile soils are located in and around Austin. The amount of open space and agricultural land in Travis County is shrinking as Austin grows and develops, which puts a strain on our water quality and wildlife. Many endangered species of birds, salamanders, and invertebrates call Austin home. Other animals, such as the Mexican free-tailed bats that roost under the Congress Avenue Bridge and countless species of birds that migrate through Austin each year along the Central Flyway for North America, are perennial visitors to our city.

Transportation infrastructure can impact our ecological resources, disturb habitat, reduce biodiversity, and increase impervious cover. These impacts can be avoided, minimized, or mitigated through careful design and construction. On the other hand, our public rights of way along streets, medians, sidewalks, and urban trails can positively contribute to our urban ecosystem. Considered as a whole, these areas represent the city’s most significant landholding and they directly affect our public space while also connecting us to neighborhoods, parks, and open spaces. Green Streets, an important element of the City’s Complete Streets policy, incorporate landscape features and stormwater controls to enhance design, mitigate the heat that is absorbed and reflected by paved surfaces and other urban features, improve air and water quality, and conserve our ecological resources. With thoughtful design, such as increasing tree canopy coverage, our transportation network can not only avoid harm to our landscape and ecosystem but enhance it and provide access to it for the benefit of all.

*“Adding trees to intersections for shade will make the choice of not to drive much easier.”*

—Community Member

## Indicators and Targets



**Increase tree canopy along the transportation network**



**Increase the amount of open space preserved through transportation project mitigation**



**Increase the access to cultural resources**

## Land and Ecology Policy 1

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### **Avoid, minimize, and mitigate adverse impacts of the transportation network on natural and cultural resources**

#### **Lessen negative impacts to natural and cultural resources of site selection, design, construction, operation, and maintenance of our transportation infrastructure**

Our transportation network is essential to getting people where they want and need to go, but it has the potential to harm the natural and cultural resources that help make Austin a great place to be. Natural resources include many of the things we immediately think of when we think of the environment: greenbelts, our trees, parks and preserve lands, the Colorado River, and our creeks, ponds, and springs. While cultural resources may not necessarily be classified as “nature,” they are still important to our sense of community identity and hold special meaning. Historic places and buildings, cemeteries, and iconic landmarks can all be cultural resources and must be upheld through historic preservation initiatives. By considering the impacts transportation decisions have on our environment, we can avoid or minimize harm and better practice long-term stewardship of our resources.

Thinking of the environment before the onset of construction could mean choosing an alignment for a sidewalk that avoids sensitive environmental areas, like the critical root zone of a heritage tree. In some cases, no option will entirely be able to avoid impacts to natural or cultural resources, but the mobility needs of Austinites will still call for a solution. In these cases, transportation decisions and designs should minimize the amount and severity of any impacts. Further mitigation might be required as well to help protect and sustain our valuable resources. The environmental impact of decisions and projects will always be considered. Environmental sustainability and responsible resource management will be integrated as we work to achieve our mobility goals.

### **City of Austin Conservation Lands**

The City of Austin manages three types of conservation lands. These lands are managed by different departments and serve different purposes.

- **Nature Preserve Lands:** There are currently 15 different nature preserves in the City. There are two types of primary preserves: the Edwards Plateau and Texas Blackland Prairie. The lands that compose these preserves are spread across the City, and they compose almost 20,000 acres. These lands are managed by the Parks and Recreation Department.
- **Water Quality Protection Lands:** These lands contribute to or are part of Austin’s water supply. Water Quality Protection Lands are either fully-owned by the City or the City has purchased conservation easements to protect the land from development. There are currently about 26,000 acres of Water Quality Protection Lands, and these lands are overseen by Austin Water.
- **Balcones Canyonlands Preserve:** Different tracts of land across Austin comprise the Balcones Canyonlands Preserve. The City of Austin and Travis County jointly manage the Preserve, which has a goal of setting aside over 30,000 acres as habitat for endangered species and species of concern. The City currently manages almost 14,000 acres in the Balcones Canyonlands Preserve. Austin Water and the Parks and Recreation Department manage the Preserve, depending on the tract of land.

## Land and Ecology Policy 2

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### **Pursue designs that enhance our ecosystem**

#### **Embrace opportunities with partner agencies to provide multiple ecosystem services that enhance the beauty and resiliency of our environment**

Our mobility infrastructure can greatly enhance the beauty and resiliency of our community. The integration of nature into our mobility infrastructure can also be utilized to support sustainable development goals such as disaster resiliency efforts, community health, and environmental considerations. Along with our transportation partner agencies, such as the TxDOT, CTRMA, and Travis County, we can embrace new opportunities to strengthen our landscape as part of transportation projects.

Projects that incorporate more native vegetation into our public rights of way are one way to give back to our local ecosystem, and it is important to integrate trees in the urban environment. Other measures that reduce erosion and flooding along roadways, and even help positively impact these concerns, should be incorporated throughout the design of our transportation network. Another strategy to enhance our ecosystem could be to preserve land elsewhere in the Austin area as apart of the cost of a transportation infrastructure project through an environmentally sensitive area.

The benefits of natural ecosystems, while not always easily quantifiable, should be considered alongside mobility benefits when making transportation decisions. When planning our projects, we should aim to leave the environment better than we found it. New innovations in design, construction techniques and materials, and operations should be pursued when they can help us move towards a better, more beautiful, and more resilient transportation network and ecosystem.



## *Land and Ecology Policy 3*

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### **Support the Imagine Austin Growth Concept in a way that is sustainable, equitable, and consistent**

**Retrofit and expand the transportation network within the context and constraints of our environment to further our social, environmental, equity, and economic goals**

The vision set forward in Imagine Austin directs us to become a compact and connected community. As part of the comprehensive plan, the Imagine Austin Growth Concept Map was created to illustrate how we want to accommodate new people, jobs, and transportation infrastructure with open spaces and environmental resources. It was developed with extensive public involvement and was informed by existing development patterns, planned projects, and neighborhood and small area plans. Key features of the Growth Concept Map include activity centers and corridors, which are compact and walkable places that allow people to reside, work, shop, access services, and engage in recreational activities, all without traveling far distances.

Our transportation network is one factor that guides where new development occurs in Austin. When we retrofit, reconstruct, or expand the transportation network, we must always be sensitive to the constraints of our environment. Projects that occur in sensitive environmental areas, like the Edwards Aquifer contributing zone, recharge zone, or the transition zone will require exceptional attention to water quality in their design.

Similarly, it is important that the transportation network does not direct our growth in an inequitable way. Transportation network expansion or enhancement in areas inconsistent with our Growth Concept could encourage growth in a way that negatively affects affordability and contributes to sprawl. We will consider both the microscale of the local ecosystem and the macroscale of the health of the wider Austin ecosystem, and couple equity with the environment to further not only our mobility goals, but other social, environmental, equity, and economic goals.



## Land and Ecology Policy 4

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### **Recognize and plan for trees as vital to supporting the transportation network**

#### **Provide and maintain trees in public rights of way to encourage active transportation modes, supply shade, protect pedestrians, and provide other ecosystem benefits**

We know that a key to enhancing both the health of the environment and the health of our community lies in our urban forest. The urban forest plays an integral role in Austin's health and vitality by providing social, ecological, and economic benefits to the community and by enhancing our quality of life. Austin's Urban Forest Plan, Complete Streets policy, Climate Action Plan, and other documents offer guidance to us when we plan for trees. For people moving around Austin, trees provide beauty, shade, and act as buffers to help protect slower and more vulnerable transportation users such from conflicts with larger and faster vehicles. These benefits can help us reach our mobility goals by encouraging active forms of transportation, improving our choices for comfortable ways to get around, and increasing the sustainability of our transportation network and community as a whole.

Providing trees in public rights of way along streets, sidewalks, and urban trails is an important tool towards making our community more bicycle- and pedestrian-friendly. The Transportation Criteria Manual provides technical guidance on where, how, and which trees should be planted as part of transportation projects. Careful planning and integration of trees, other green infrastructure, and shade devices throughout the transportation network is also required. For example, in dense urban areas there might not be sufficient soil volume for trees to thrive without additional measures being taken.

Thoughtful landscape and street design are necessary to ensure existing and new trees are incorporated into our transportation network without reducing safety or mobility. Trees can reduce sightlines and visibility or be crash hazards if not properly planned for, placed, and maintained. Tree roots can also cause issues for underground utilities in public rights of way or increase cracking and shifting of sidewalks and urban trails, sometimes causing obstructions or inaccessibility. Additionally, while trees provide us with shade in the day, without proper consideration of tree placement and pedestrian-scale lighting, they can also block out street lights at night. We should strive for balance in design when considering whether to avoid or move trees and in how to mitigate impacts.

Trees and other green infrastructure also need their own maintenance. Clear responsibilities and programs for care need to accompany any investment in our urban forest. The benefits that trees and other vegetation provide our ecosystem and community are astounding. We must ensure our transportation network integrates and supports trees as they are not just beneficial for the environment, but for our entire community.