

Infrastructure & Natural Resources

Balanced and functional built and natural systems

GOAL:

Preserve, enhance and integrate natural systems and the built environment to reflect the desired community identity and sustain current and future generations.

Policy Statements:

- 1 Sustainable Site and Building Design:** *Royse City will implement development standards that encourage sustainable site development and building design that reduce energy consumption, improve air quality, and reduce greenhouse gas emissions.*
- 2 Functional and Efficient Infrastructure:** *Royse City will plan, design and maintain infrastructure for transportation, water, and wastewater to maximize capacity of existing systems, supports new development in accordance with the city's Future Land Use and Growth Management Plans, and is financially and environmentally sustainable.*
- 3 Water Resource Conservation:** *Royse City will conserve water resources by expanding education and incentive programs to ensure the city has adequate water supply to meet the long-term needs of the community.*
- 4 Integrated Stormwater Management and Green Infrastructure:** *Royse City will improve soil and water quality, mitigate flooding and erosion issues, and enhance and protect ecosystems by requiring design and use of watershed-scale stormwater management strategies, erosion control plans, and stormwater pollution prevention plans that comply with federal, state, and local regulations.*
- 5 Ecosystem and Habitat Preservation:** *Royse City will conserve, preserve and restore prime farmland, tree canopy and natural habitats with rare vegetation and wildlife, high quality soils, scenic views and unique topography to increase resilience, adaptability, and biological integrity and maintain the community's access to clean air and water, local food, and natural areas.*
- 6 Renewable Energy Supply:** *Royse City will diversify its energy supply, reduce dependence on fossil fuels, improve air quality, and reduce greenhouse gas emissions by increasing the usage of solar power and other renewable sources for city infrastructure, facilities and operations, and encouraging residents and businesses to make renewable energy improvements to their homes, buildings and operations.*
- 7 Recycling and Waste Management:** *Royse City will promote a comprehensive and cost-effective solid waste management program that protects public health and the environment, promotes recycling, reduces the amount of solid waste, and successfully manages and reclaims landfill sites.*

Introduction

Roads, water and wastewater systems, buildings and energy are all vital to our quality of life. At the same time, preservation of natural systems and habitat and improving our use of finite resources is also important. For Royse City to be a resilient, vibrant and attractive community well into the future, we must plan, design and maintain our developed areas and natural environments in a manner where they are functional, efficient, healthy and balanced.

Royse City has both liabilities and opportunities when it comes to our built environment and infrastructure. We have over \$550 million worth of existing street and utility infrastructure over half of which will need to be replaced in the next thirty years to keep it in quality condition. By focusing development in areas with existing infrastructure and excess capacity first, and then building new development incrementally and in a more sustainable pattern, we can use revenue from the new growth to address the older parts of town, and then spread out maintenance needs for newer development over future years in a manner that is more financially viable and environmentally resilient.

Designing our buildings and landscaping to be more energy and water-efficient must also be an emphasis. Industry adopted standards such as LEED for buildings and neighborhood development (LEED-ND), the Institute for Sustainable Infrastructure’s Envision framework and the most current building codes will be used to guide design of new development. The City will look to expand programs related to water conservation, recycling and waste management, and renewable energy.

The other component of Royse City’s infrastructure system is, in fact, naturally occurring. Green infrastructure is the interconnected network of green spaces, waterways and naturalized systems that help maintain ecosystem health, reduce stormwater impact and flooding, improve water quality, and mitigate climatic extremes. Protecting and enhancing the integrity of these systems is essential as we continue to grow – and will help save both lives and money in the long run. Royse City has a large amount of floodplain and associated habitat within our city limits, which we want to embrace and make part of our community’s identity. This chapter delineates nine distinct stormwater management zones, based on drainage patterns, and gives recommendations for preserving and enhancing the health of our green infrastructure systems.

What We’ve Heard from Residents

“Don’t over-grow our ability to provide services.”

“Debt due to life-cycle costs of infrastructure is something that should be taken seriously.”

“What is to be done with main drainage creek past Hidden Creek thru town? (Contact FEMA)”

“Please prioritize taking care of what we have. There are lots of small lanes that aren’t paved, roads and streets that need repaving or potholes filled, moving electrical, etc. lines underground (north of heritage district)”

“Repair the streets. Old streets & the new streets are embarrassment.”

“We have a lot of floodplain and natural open space that other cities don’t have. We should embrace that to make our community stand out.”

“There are drainage issues in downtown and a lot of the neighborhoods.”

Resource Stewardship

SUSTAINABLE SITE AND BUILDING DESIGN

How we design and construct buildings and sites within the city has an impact on the water, energy and infrastructure we need to sustain our community. We should look to partner with developers and contractors to make sure new buildings in the community – especially those owned by the City – are designed and built to be aesthetically pleasing, energy and water-efficient, and safe. There are industry adopted standards such as LEED for buildings and Envision for horizontal infrastructure that provide guidance on how to make our buildings and infrastructure more sustainable. Additionally, we should develop and enforce building codes and provide incentives to encourage existing buildings to be retrofitted and brought up to current standards.

FUNCTIONAL AND EFFICIENT INFRASTRUCTURE

Due to the way Royse City has developed in the past, our road, water and wastewater systems are extremely spread out and inefficient. It is important that we maximize capacity of our existing systems before we extend systems further. This can be done by focusing new development in areas that are already supplied with existing roads and utilities. A significant portion of our existing infrastructure is in need of repair, or will be soon. Fortunately, we are in a much better position than other communities who have built out exclusively in a costly suburban pattern, in that much of our city's area is yet to be developed. Much of the most pressing infrastructure needs are in the older parts of town, which happens to be the types of neighborhoods that are in high demand right now. We can create a “win-win” by prioritizing infrastructure investment in the near-term in these areas and designing it in a manner that elevates the appeal and property values in these neighborhoods.

As the city continues to grow and more roads and utility infrastructure is put in, it will be important the the City has a system and tools in place to property track the age, location, type and condition of these facilities. We must take advantage of today's technology and invest in asset management software that can inform and improve our maintenance, planning and capital improvement programs. Finally, it will be important to update our thoroughfare, water and wastewater master plans and to complete a citywide stormwater master plan so they align with the Future Land Use Plan and other recommendations in this plan. The master plans and asset management information can be used together to determine 5-year Capital Improvement Project (CIP) and maintenance programs.

WATER AND ENERGY CONSERVATION

Water and energy are critical resources. In North Texas, we have experienced shortages of both in recent years with the drought of 2013 and rolling blackouts initiated in the summers. North Texas Municipal Water District is in the process of building another reservoir to provide water for the area, which will increase the supply, but if we want to sustain the amount of people projected to move the area, we must also find ways to conserve and reduce the amount of water we consume. As a city, we should adopt and promote policies that encourage water-efficient facilities in homes and buildings, rainwater harvesting, drought-tolerant landscaping, and other methods to conserve water. We should do the same on the energy side, encouraging use of renewable energy sources such as solar and wind to reduce the stress on the electric grid. Solar energy has become more efficient and easier to transport and install, and has therefore gained momentum as a viable alternative energy source. Wind power also has become a popular option and has been made more accessible through third-party providers and smaller turbines or individual units. A combination of good planning and conservation efforts will help ensure adequate supply of these critical resources while keeping water and utility rates at reasonable levels.

WASTE MANAGEMENT

A fundamental method to protect the environment is through solid waste management and recycling programs. Royse City currently has a recycling agreement with Sanitation Solutions, which provides weekly recycling services for all participating Royse City residents (ETJ not included). Items accepted include glass, newspapers and magazines, some plastics, aluminum cans and tin cans. There is room to expand this program by extending the service area to the ETJ areas, increasing the volume per household that can be collected and by expanding the types of items that are accepted.

Protecting Rural Character and Natural Functions



What many residents have said they appreciate about the city is that it has a rural charm that distinguishes it from more built-out communities to the west. For now, Royse City is still predominantly agricultural—but it is clear that growth is coming quickly, and undeveloped lands will not all stay that way.

As we have discussed already, the fact that our city is still in the early growth phase means we have great opportunities to guide the types of development we want in our city (and where we want them). And for now at least, we still have the chance to protect and enhance many of the natural elements that not only make our city beautiful and distinctive, but also keep it functional in terms of water and air quality, flood management, and ecosystem health. As our community grows, it doesn't have to look like every other suburban city in North Texas—we can treat our natural features as an advantage, as elements that lend character and create pleasant surroundings.

The aim of this part of the plan is to identify those important parts of our community's natural systems and to tie them into residents' everyday lives. In large part, this means keeping our green infrastructure healthy and intact, and making it a usable public amenity at the same time.

First, an overview of what we mean by “green infrastructure”:

What is Green Infrastructure?

Green infrastructure is the interconnected network of green spaces, waterways and naturalized systems that, together, help maintain ecosystem health, reduce stormwater impact, improve water quality, and mitigate climatic extremes. Green infrastructure systems provide the most services when preserved at a watershed scale by linking together stream networks, the land adjacent to the streams, conservation areas, parks, and greenways.

This natural network of stream corridors, floodplains, wetlands, water bodies, prairies and woodlands function as an interconnected whole. The system provides multiple critical services for the community and region by absorbing and dispersing stormwater, recharging water sources and moderating flow regimes, preserving water and air quality, providing a variety of useful habitats and maintaining climate adaptability.

Many communities in North Texas did not plan to preserve and protect the function of the natural systems that once were linked throughout the region. Natural systems were frequently considered hindrances to development; consequently, these systems have been encroached upon, disconnected from each other, and in many cases eliminated altogether. Communities that lost these natural systems to development pressure are now trying to replace the functions of flood and water quality management, heat mitigation and air quality enhancement using single-function gray infrastructure at great expense to the community both in direct financial burden and in reduced quality of life.

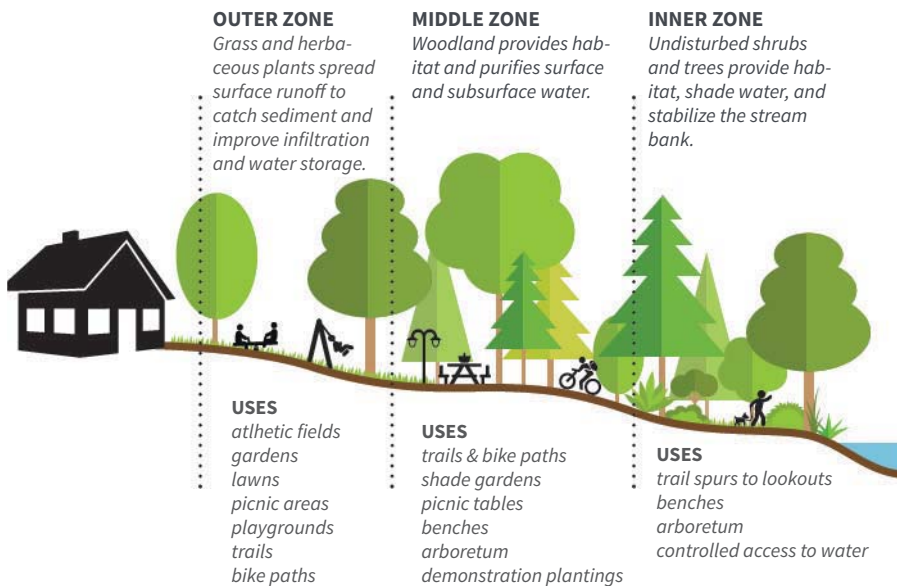
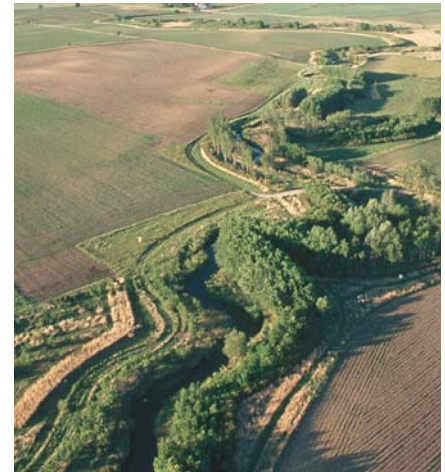
Royse City sits on three distinct subwatersheds (each of which extends beyond

Green infrastructure provides multiple critical services for the community and region by absorbing and dispersing storm water, recharging water sources and moderating flow regimes, preserving water and air quality, providing a variety of useful habitats and maintaining climate adaptability.

its borders), and within each watershed are a variety of green infrastructure elements that add considerable value to the area through the ecological, environmental and recreational services they provide at limited cost to the community. The major green infrastructure system elements include riparian corridors, floodplain, grassland/prairie, woodland, wetlands and lakes/ponds. Each element provides unique infrastructure services, which are listed below:

RIPARIAN CORRIDORS

- These are the areas that run along stream or river.
- The makeup of their vegetation, wildlife and soil is heavily influenced by the stream’s flow, as floodwaters saturate fertilized surrounding soils and raise the level of the local water table.
- These fertile corridors become densely forested with a lush and diverse understory, and they host a wide variety of aquatic and terrestrial life.
- Healthy, vegetated riparian zones improve water quality by providing natural biofiltration (diminishing erosion and pollution), stabilizing stream banks and maintaining natural levels of stream flow.
- A 100-foot forested buffer on both sides of the stream will generally perform most of the functions that preserve stream health. In general, development should be extremely minimal in riparian zones (see figure below).



RIPARIAN BUFFER ZONES

Riparian zones—the fertile areas running along streams—are sensitive to development, but they can serve a number of recreational uses. Appropriate uses differ for each of the three zones within riparian buffers, with the area closest to the stream being the most restrictive.

FLOODPLAIN

- A relatively flat, low-lying area adjacent to a stream or river that is prone to frequent flooding during high flow events, and is formed over time as floodwaters deposit sediment in layers.
- Floodplains serve as an adjustment mechanism in periods of high water discharge, dissipating the extra flow energy, absorbing sediment and temporarily storing excess water.
- Due to the periodic influx of nutrient-rich sediment, these dynamic areas support especially abundant and diverse ecosystems.
- Where streams are highly confined, streambeds become channelized, and flood flows cannot access the floodplain, resulting in increased (and more severe) flooding elsewhere.
- Maintaining natural, vegetated floodplains—especially upstream—is vital to the health of riparian areas and is an essential part of mitigating the destructive effects of wider flooding.



When protected, floodplains naturally provide retention of flood- and rainwater and absorb sediment.



Blackland prairie is prevalent in upland areas of Royse City that have not been developed.



Woodlands in Royse City are mostly limited to some areas surrounding waterways.



Wetlands are extremely sensitive (and ecologically important) low-lying areas that provide a niche for a variety of species and perform a range of water quality/management services.

GRASSLAND/PRAIRIE

- Much of the undeveloped areas in Royse City outside of the wetland and creek areas is either native grassland or was once native grassland prior to being modified by farming activities.
- Grassland areas provide habitat for song birds, game birds and pollinating insects such as bees, butterflies and ants.
- Native grasslands require very little maintenance because the plant species have adapted to the local growing conditions; drought and widely varying temperatures have little effect on native plant species resilience.
- Native grassland plants have deep root systems that provide soil stabilization and improved soil quality. Grasslands play a role in protecting water resources as they improve water filtration and slow down stormwater runoff. Tall grass prairies are ideal buffers adjacent to the banks of creeks to filter stormwater runoff prior to discharge into the creek and to anchor soils, reducing erosion during flood events.

WOODLAND

- Most of Royse City's limited wooded areas are located along the stream corridors, providing necessary shelter and connectivity for a variety of wildlife.
- Woodlands can foster greater biodiversity and provide recreational and educational opportunities, heat island mitigation, air and water quality improvement and flood reduction.
- Given appropriate distance from streambeds, riparian woodlands can be ideal locations for shaded greenway trails.

WETLANDS

- Wetlands are distinct (and particularly rich) ecosystems where water saturation (either seasonal or permanent) determines the types of plant and animal communities living in the soil and on the surface.
- Wetlands act as natural sponges, absorbing inundations of water and slowly releasing it, thereby reducing the impact of flooding.
- Wetlands that are connected to groundwater systems or aquifers replenish those sources by allowing for slow infiltration, and those that are connected to surface water streams and water bodies assist in maintaining stream flow and water levels.
- Wetlands purify the water that passes through them—by trapping and filtering out the sediment that carries nutrients and pollutants like heavy metals—before it reaches groundwater or surface water sources.

LAKES AND PONDS

- Most of the ponds in Texas (and all of the ponds in Royse City) are the result of human-made dams, constructed to hold water for human use, such as a source of drinking water, stormwater detention, electric power production, water for agricultural purposes, and recreation. Royse City's ponds are all small NRCS ponds.
- These small water bodies support ecosystems whose makeup varies based on size and depth, but the health of these ecosystems can be undermined by polluted water running off from surrounding lands. Fertilizer and pesticide runoff, for example, can affect a pond's natural nutrient cycle, resulting in eutrophication when an excess of nutrients spurs dense plant and algae growth and causes aquatic life to die from lack of oxygen.

HUMAN-MADE GREEN INFRASTRUCTURE

Managed systems are designed and constructed to mimic the function of the natural environment. These provide for infiltration, increase evapotranspiration and treat polluted runoff at a much higher cost for implementation and maintenance and with much lower efficiency. These elements are best instituted as retrofits in areas that have encroached upon and eliminated natural systems.

Constructed Ponds

Retention basins are artificial ponds with vegetation along the perimeter, designed to hold water permanently. Stormwater runoff is treated by allowing sediment to settle at the bottom, where algae take up the nutrients and pollutants, resulting in a cleaner water source. They also help protect downstream channels from erosion and reduce flooding. Using large, shallow basins, pathogens in wastewater can be treated entirely through natural processes, requiring only sunlight energy. These ponds are effective (particularly in sunny, temperate areas) and inexpensive to maintain, but they require large amounts of land.

Constructed Wetlands

Given the water filtration effectiveness of natural wetlands, engineers now commonly create artificial wetlands to improve water quality by emulating these natural sediment-removing processes. Using wetland vegetation and soils, more pollutants are trapped and removed from wastewater and stormwater runoff as it flows through the system. This form of urban stormwater treatment tends to be more aesthetically pleasing and less expensive to maintain than typical ‘gray’ infrastructure. Some constructed wetlands also function as wildlife habitat.

Why Green Infrastructure Matters for Roysse City

A well-maintained green infrastructure network provides a region with a host of long-term benefits. Healthy floodplain and riparian zones—combined with artificial systems designed to emulate natural drainage—improve the quality of our water supply by filtering out pollutants, slowing harmful runoff and recharging groundwater sources. This natural system also offers a significant measure of flood protection, as the effects of high flow events are more dispersed. A healthy network of green infrastructure improves overall air quality and lessens heat stress, by acting as a heat and carbon sink. Each of these elements makes an area more resilient and adaptable in the face of climate change, which intensifies local extremes—in Roysse City this means harsher summers and more severe storms—and puts a strain on ecosystems and built environments alike.

Green infrastructure also serves to enhance the aesthetic value and attractiveness of a community (which also offers opportunities for brand building). People enjoy greenery and open spaces, and they are often willing to pay more to be near these areas, increasing the value of land and providing economic benefits to a community. Proximity to greenspace, moreover, has a demonstrably positive impact on physical, social and mental health; helps reduce stress; and provides opportunities for recreation and learning.

DEVELOPMENT AROUND NATURAL AREAS

Maintaining natural systems—and reaping their benefits—means putting constraints on what development can go where. That does not necessarily mean sacrificing growth opportunities, however. Environmentally sensitive areas are not suitable building *on top of*, but in many cases, they are especially desirable areas for building *around*. For example, while a large floodplain means less developable land overall, it can also provide great opportunities for adjacent open space-oriented developments of all kinds. Neighborhoods with easy access to natural areas with trails are in particularly high demand. Commercial or mixed-use developments that incorporate park areas and trail connections have also become more common in the Metroplex.



Constructed ponds help clean the water supply and reduce downstream erosion and flooding.



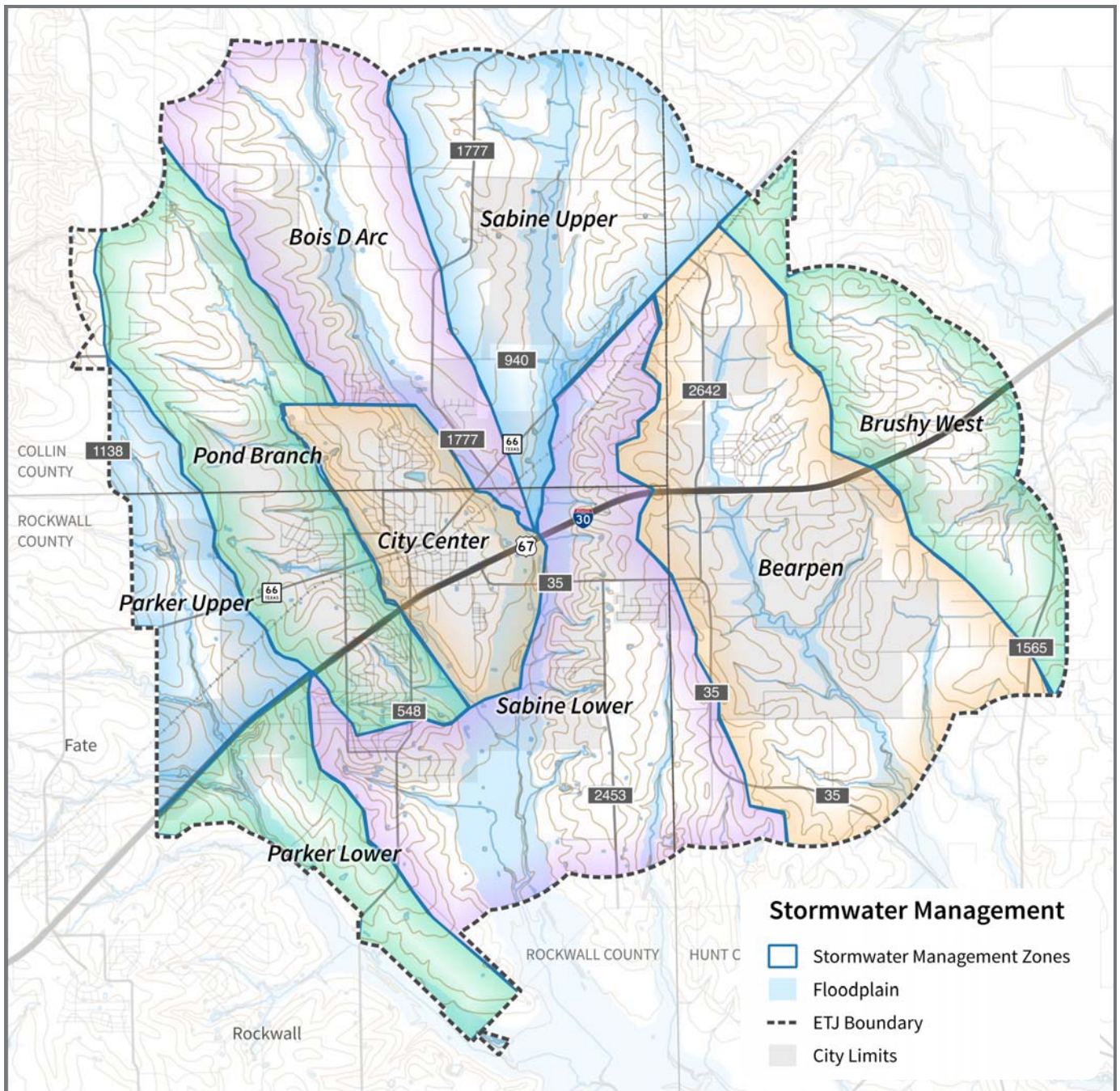
Constructed wetlands emulate the water filtration functions of natural wetlands, and can also create useful habitat.



Benefits of Green Infrastructure

Beyond their importance to wildlife populations, healthy green infrastructure systems generate a host of benefits for the community and the region:

- Water quality
- Flood protection
- Air quality
- Heat island mitigation
- Resilience
- Aesthetic value (community attractiveness and brand-building)
- Financial savings (from not impairing water flow)
- Economic competitiveness
- Enhanced quality of life



Stormwater Management Zones

The City is divided into nine stormwater management zones to facilitate and encourage the implementation of appropriate stormwater management practices that are complimentary of existing and future land uses. These zones were created based on subwatersheds locations within the subwatersheds (eg. upstream, downstream). One exception is the City Center stormwater management zone, which is located within multiple subwatersheds.

1. UPPER PARKER CREEK

1,388 acres

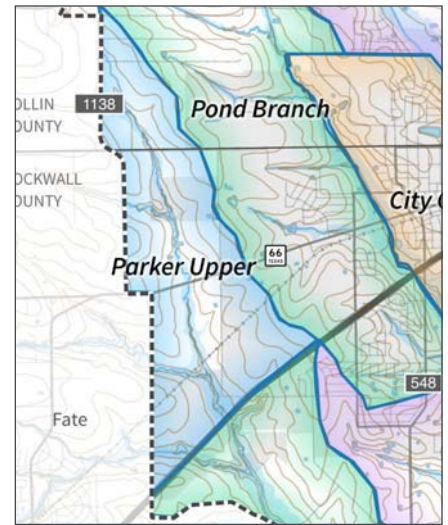
Major Waterbodies: Parker Creek, Parker Creek Tributaries 10, 8, and 1

FEMA floodplain Zone AE elevations established for Parker Creek and Parker Creek Tributary 1

Future Land Uses: Suburban Mixed Use and Urban Village

Recommendations:

- Utilize available hydrologic models to strategically locate regional stormwater management sites adjacent to established floodplain boundaries to improve downstream flooding conditions and manage stormwater discharges from future developments to minimize hydromodification due to development.
- Integrate green infrastructure corridors to reduce hydromodification due to development between regional stormwater management sites, within the established floodplain, along railroad right of way, and connected to existing and future developments.



2. LOWER PARKER CREEK

1,262 acres

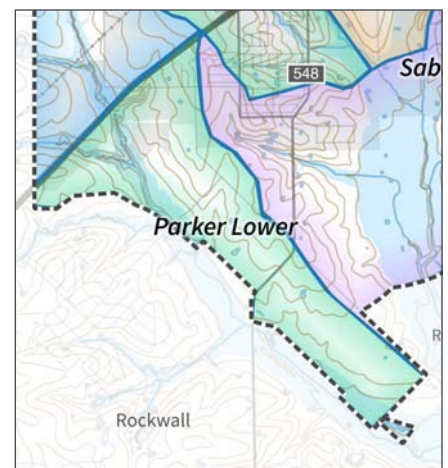
Major Waterbodies: Parker Creek, Parker Creek Tributary 1

FEMA floodplain Zone AE elevations established for Parker Creek and Parker Creek Tributary 1

Future Land Uses: Suburban Neighborhood, Suburban Mixed Use, and Urban Village

Recommendations

- Investigate potential for regional storm water management amenity along west side of Parker Creek within urban village future land use area to minimize hydromodification due to development.
- Integrate green infrastructure corridors to reduce hydromodification due to development within the established floodplain and connected to existing and within future developments.



3. POND BRANCH

3,023 acres

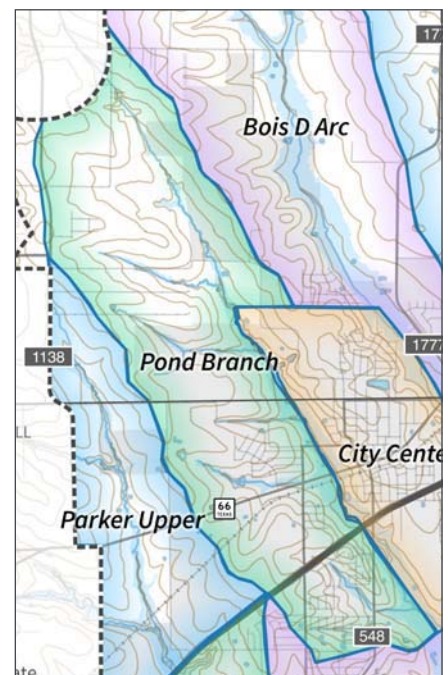
Major Waterbodies: Pond Branch, Pond Branch Tributaries 2, 3, and 4

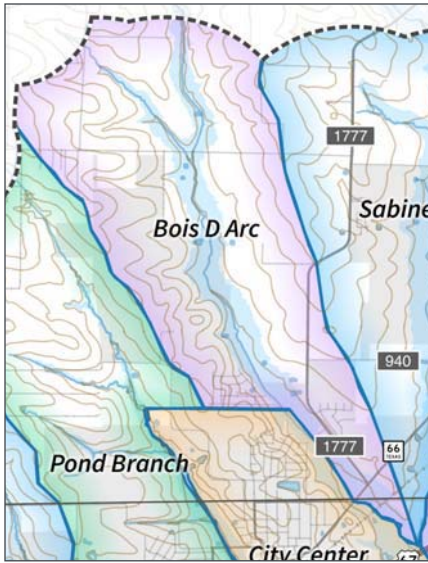
FEMA floodplain Zone AE elevations established for Pond Branch south of Birch Street.

Future Land Uses: Suburban Neighborhood, Highway R/O/C, Traditional Mixed Use, Suburban Mixed Use, and Rural Estates

Recommendations

- Utilize and expand available hydrologic models to strategically locate regional stormwater management sites adjacent to established floodplain boundaries to improve downstream flooding conditions and manage stormwater discharges from future developments to minimize hydromodification due to development.
- Integrate green infrastructure corridors to reduce hydromodification due to development within the established floodplain and connected to existing and within future developments.





4. BOIS D'ARC

2,883 acres

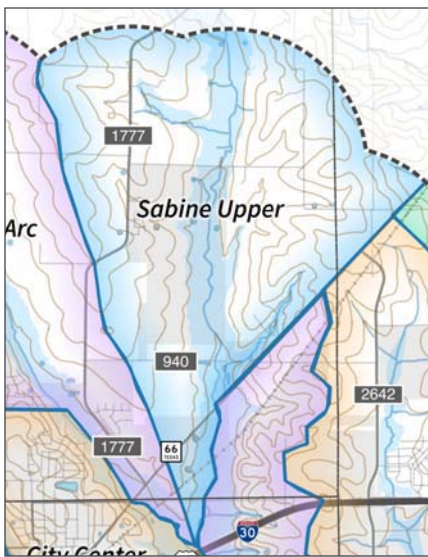
Major Waterbodies: Bois D'Arc

FEMA floodplain Zone AE elevations established for Bois D'Arc downstream of Lincoln Drive and Fair Oaks Lane.

Future Land Uses: Suburban Mixed Use, Traditional Mixed Use, and Conservation.

Recommendations

- Utilize and expand available hydrologic models to strategically locate regional stormwater management sites adjacent to established floodplain boundaries on east and west side of Bois D'Arc north of Lincoln Drive to improve downstream flooding conditions and manage stormwater discharges from future developments to minimize hydromodification due to development.
- Integrate green infrastructure corridors to reduce hydromodification due to development within the established floodplain and connected to existing and within future developments.



5. SABINE UPPER

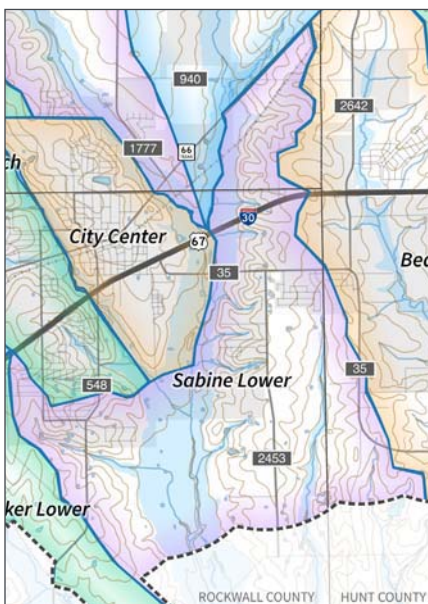
3,310 acres

Major Waterbodies: Sabine Creek and Unnamed Tributaries

Future Land Uses: Suburban Mixed Use and Urban Village

Recommendations

- Develop hydrologic and hydraulic models for Sabine Creek north of railroad to establish floodplain and floodway boundaries. Utilize models to strategically locate regional stormwater management sites adjacent to established floodplain boundaries on east and west side of Sabine Creek north of County Road 940 to improve downstream flooding conditions and manage stormwater discharges from future developments to minimize hydromodification due to development.
- Integrate green infrastructure corridors to reduce hydromodification due to development within the established floodplain and connected to existing and within future developments.



6. SABINE LOWER

4,366 acres

Major Waterbodies: Sabine Creek, Pond Branch, South Fork Sabine Creek Tributary 3, Sabine Creek Tributaries 1 – 7.

FEMA floodplain Zone AE elevations established for Sabine Creek south of railroad and Pond Branch. Develop hydrologic and hydraulic models for Sabine Creek Tributaries and South Fork Sabine Creek Tributary 3 to establish floodplain and floodway boundaries.

Future Land Uses: Suburban Neighborhood, Suburban Mixed Use, Highway ROC, Park/Open Space, and Business/Industrial Park.

Recommendation

- Integrate green infrastructure corridors to reduce hydromodification due to development within the established floodplain and connected to existing and within future developments.

7. BEARPEN CREEK

4,944 acres

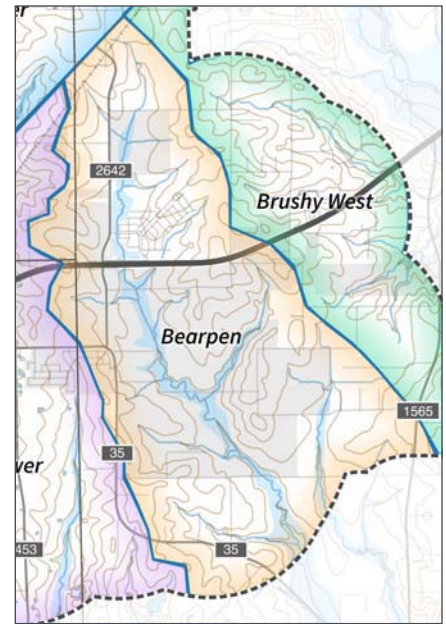
Major Waterbodies: Bearpen Creek and unnamed tributaries of Bearpen Creek.

FEMA floodplain Zone AE elevations established for Bearpen Creek south of County Road 2652.

Future Land Uses: Suburban Mixed Use, Traditional Mixed Use, Highway ROC and Rural Estates

Recommendations

- Utilize and expand available hydrologic models to strategically locate regional stormwater management sites adjacent to established floodplain boundaries on east and west side of Bearpen Creek within the Highway ROC area along Interstate 30 and north to Highway 66 to improve downstream flooding conditions and manage stormwater discharges from future developments.
- Integrate green infrastructure corridors to reduce hydromodification due to development within the established floodplain and connected to existing and within future developments.



8. BRUSHY WEST

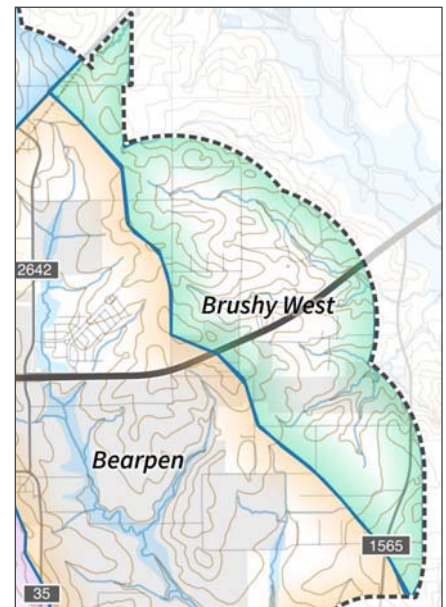
2,309 acres

Major Waterbodies: Multiple tributaries of Brushy Creek, Payne Creek Tributary 2

Future Land Uses: Suburban Mixed Use, Rural Estates, and Highway R/O/C

Recommendations

- Develop hydrologic and hydraulic models for Payne Creek and Brushy Creek tributaries to establish floodplain and floodway boundaries.
- Integrate green infrastructure corridors and low impact development retrofit and development strategies to reduce hydromodification due to development within the established floodplain and connect to existing and within future developments.



9. CITY CENTER

1,559 acres

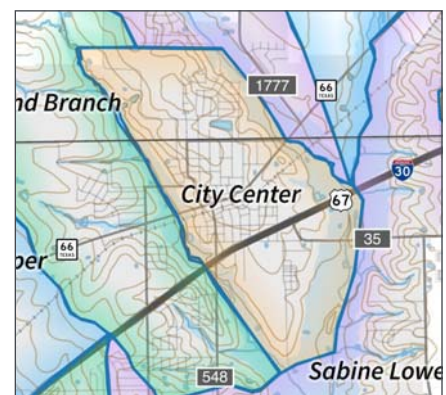
Major Waterbodies: Pond Branch, Bois D Arc Creek, and Sabine Creek

FEMA floodplain Zone AE elevations established for all creeks around City Center

Future Land Uses: Traditional Mixed Use, Suburban Neighborhood, Town Center, Urban Village, and Park/Open Space

Recommendations

- Utilize and expand available hydrologic models to strategically locate regional stormwater management sites adjacent to established floodplain boundaries on east side of Pond Branch to improve downstream flooding conditions and manage stormwater discharges from future developments.
- Integrate green infrastructure corridors and low impact development retrofit and development strategies to reduce hydromodification due to development within the established floodplain and connect to existing and within future developments.



General Recommendations for All Zones

INFORM THE PUBLIC

1. Identify the stormwater management zones with signage that notes the watershed location.
2. Inform community that surface water runoff becomes part of the water supply.

RESTORE DAMAGED RIPARIAN CORRIDORS

1. Create needs inventory.
2. Identify priority restoration areas and develop restoration plans.
3. Identify synergies with other open space initiatives.
4. Identify project partnerships.
5. Develop funding strategies.
6. Design and construct.

RETROFIT LAKES FOR ENHANCED STORMWATER MANAGEMENT

1. Evaluate existing capacity and conditions of lakes.
2. Establish risk levels to inform prioritization.
3. Property owner engagement.
4. Develop retrofit concept plans.
5. Prioritize retrofits.
6. Design and construct.

ESTABLISH STREAM BUFFER AREAS

1. Develop buffer establishment criteria and incentives.
2. Identify critical areas for buffer establishment.
3. Identify synergies with other open space initiatives.
4. Finalize buffer recommendations for selected streams and explore development ordinance updates.

RETROFIT STORMWATER INFRASTRUCTURE

1. Create needs inventory.
2. Identify priority retrofit projects with maximum life cycle water quality and quantity service benefits to expenditures ratio.

CREATE STACKED-FUNCTION STORMWATER MANAGEMENT AREAS

1. Identify open space areas amenable to provide for recreational use, storm water management for existing and future development.
2. Integrate preliminary investigation of potential shared stormwater management areas during development planning process.

ESTABLISH COMPLIMENTARY STORMWATER DEVELOPMENT CRITERIA

1. Identify barriers to utilization of shared open space for both recreation and stormwater management purposes.
2. Facilitate discussions between government entities to establish common goals for stormwater management.

Policies and Actions

The following policy statements will be used to guide decisions related to our city's built infrastructure (streets, water, sanitary sewer, and stormwater) systems and natural resource management. The priority action items are what the city should focus on in the next few years in order to get the big things right.

1

Sustainable Site and Building Design

Royse City will implement building codes and development standards that encourage sustainable site development and building design that reduce energy consumption, improve air quality, and reduce greenhouse gas emissions.

Priority Action Items

- 1 Utilize LEED, LEED-ND, Sustainable Sites, Envision, STAR and other sustainable design guidelines in the siting, design and operations of all municipal facilities.
- 2 Review and update existing building codes and provide incentives for developers to incorporate sustainable design elements such as: solar energy, natural lighting, reflective roofs or green roofs, low volatile organic compounds (VOCs) materials and ventilation, HVAC energy performance and efficiency systems, on-site renewable energy, waste minimization, and water reclamation and conservation.
- 3 Conduct an energy efficiency audit of existing municipal facilities and develop a plan to address inefficiencies.

2

Functional and Efficient Infrastructure Systems

Royse City will plan, design and maintain infrastructure for transportation, water, wastewater and drainage in a manner that maximizes capacity of existing systems, supports new development in accordance with the city's Future Land Use and Growth Management Plans, and is financially and environmentally sustainable.

Priority Action Items

- 1 When extending utility infrastructure to serve new development, partner with developers to size and construct lines to serve the anticipated future buildout.
- 2 Utilize LEED, LEED-ND, Sustainable Sites, Envision, STAR and other sustainable design guidelines in the siting, design and operations of all municipal infrastructure and facilities.
- 3 Conduct an infrastructure audit to document the location, size, and condition of existing streets, water, wastewater and drainage facilities.
- 4 Develop a GIS database and pavement management system for infrastructure asset management.
- 5 Update the city's Water and Wastewater Master Plans and Impact Fees to reflect the Future Land Use Plan and growth management strategies and recommendations in this Plan.

Priority Action Items

- 6 Develop a 5-Year Capital Improvement Program (CIP) that prioritizes infrastructure investments to align with maintenance needs and recommendations in this Plan.

3

Water Resource Conservation

Royse City will conserve water resources by expanding education and incentive programs to ensure the city has adequate water supply to meet the long-term domestic, economic, and recreational needs of the community.

Priority Action Items

- 1 Assume a regional leadership role regarding water issues and partner with North Texas Municipal Water District (NTMWD) and its member organizations to educate the community and encourage more efficient water use and conservation.
- 2 Apply adopted water conservation measures even during periods of adequate supply, not just during droughts.
- 3 Incentivize the use of rainwater harvesting, green infrastructure and appropriately designed landscape and soil materials to reduce the use of water for outdoor irrigation of private landscapes and public spaces.

4

Integrated Stormwater Management and Green Infrastructure

Royse City will improve soil and water quality, mitigate flooding and erosion issues, and enhance and protect biodiversity and ecosystems by requiring design and use of watershed-scale stormwater management strategies, erosion control plans, and stormwater pollution prevention plans that comply with federal, state, and local regulations.

Priority Action Items

- 1 Prepare a citywide Stormwater Master Plan that delineates major watersheds and subwatersheds, locates priority areas for regional detention, and prioritizes watersheds for more detailed study and project development.
- 2 Establish a Stormwater Utility Fee to be dedicated for future stormwater management and flood control projects.
- 3 Prepare a detailed watershed study and project recommendations for the watershed encompassing Town Center.
- 4 Adopt and implement an appropriately designed version of NCTCOG's integrated stormwater management (iSWM) ordinance and associated criteria.
- 5 Identify opportunities to partner with the school district, non-profits and other organizations to create green infrastructure demonstration projects.

5

Ecosystem and Habitat Preservation

Royse City will conserve, preserve and restore prime farmland, tree canopy and natural habitats with rare vegetation and wildlife, high quality soils, scenic views and unique topography to increase resilience, adaptability, and biological integrity and maintain the community's access to clean air and water, local food, and natural areas.

Priority Action Items

- 1 Partner with NCTCOG to identify and map the ecological assets and natural characteristics of the community.
- 2 Partner with land owners to implement conservation easements and other preservation and conservation strategies to limit or prevent development in critical habitat areas and the rural perimeter of the city.

6

Renewable Energy Supply

Royse City will diversify its energy supply, reduce dependence on fossil fuels, improve air quality, and reduce greenhouse gas emissions by increasing the usage of solar power and other renewable sources for city infrastructure, facilities and operations, and encouraging residents and businesses to make renewable energy improvements to their homes, buildings and operations.

Priority Action Items

- 1 Promote and incentivize residents and businesses to retrofit existing buildings and properties with renewable energy improvements.
- 2 Develop a strategy and timeline to replace city vehicles with alternative fuel technology vehicles.

7

Recycling and Waste Management

Royse City will promote a comprehensive and cost-effective solid waste management program that protects public health and the environment, promotes recycling, reduces the amount of solid waste, and successfully manages and reclaims landfill sites.

Priority Action Items

- 1 Promote and incentivize residents and businesses to implement recommended waste management practices.
- 2 Adhere to the North Central Texas Regional Compost Program in conjunction with North Texas Municipal Water District.
- 3 Partner with schools to develop an environmental education program that gets kids involved in city's sustainability initiatives.

