



Overview

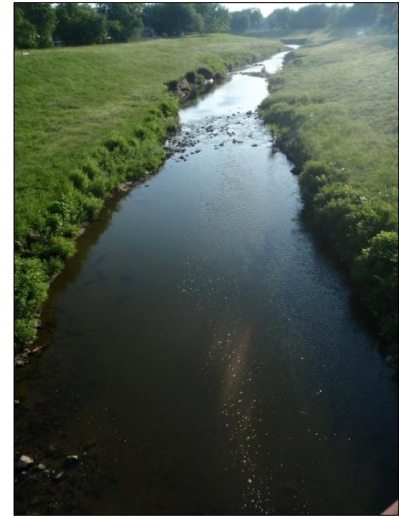
The WAMPO region is rich with environmental resources, including everything from the air we breathe and the water we drink, to the bald eagle and the Hackberry archeological site. These resources enhance the quality of life and livability of the region.

Our activities and what we build, including transportation improvements, can greatly impact the environment. Planning to protect our environmental resources and giving them proper consideration prior to developing transportation projects is important to the sustainability of our environment.

This chapter provides a general overview of the critical natural and historical resources in the WAMPO region that could be impacted by the projects in the MTP 2035. It is important to define these resources, show their function, and identify how they can be impacted by transportation projects. This chapter also discusses potential mitigation strategies to help protect and conserve these resources. Lastly, this chapter will identify emerging environmental issues relevant to the region.

Federal regulations call for an environmental review for transportation projects requiring federal permits or using federal funds. These transportation projects are required to go through an environmental review as part of the **National Environmental Policy Act (NEPA)** process. As such, it is important to address environmental concerns and issues during all phases of transportation projects and policies, including long range transportation planning efforts.

Regional environmental resources that could potentially be impacted by projects and strategies in the MTP 2035 were identified during the development of this plan. The **Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU)** requires a coordinated planning effort. Consultation with environmental resource agencies during plan development was integral to identifying potential impacts.



River Valley

What is NEPA?

The National Environmental Policy Act (NEPA) of 1969 established a national environmental policy focused on determining and mitigating the impacts federal activities have on the environment.

What is SAFETEA-LU?

The Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) is the most recent comprehensive, long-term funding and authorization bill that governs U.S. federal transportation spending.



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Stakeholder Consultation

Coordination letters were sent to 14 local, regional, state, and federal environmental agencies. The letters provided a brief summary of the MTP 2035 project and requested input from the agencies on the plan. The letter requested that the agency contact WAMPO if interested in providing input. Of the 14 agencies that received letters, seven responded. Those that responded were the U.S. Army Corps of Engineers (USACE), Kansas Department of Health and Environment (KDHE), Kansas Department of Wildlife and Parks (KDWP), Kansas Water Office (KWO), U.S. Fish and Wildlife Service (USFWS), U.S. Environmental Protection Agency (EPA), and City of Andover Stormwater Department. All but the USACE was interested in attending a follow-up meeting and providing input on the MTP 2035.

An environmental stakeholder meeting was held on March 31, 2010. Invitations to the meeting were sent to local environmental resources and stormwater departments, Regional Economic Area Partnership (REAP) Water Resources Department, EPA, KDHE, KWO, KDWP, and USFWS. Representatives from five of these agencies attended the meeting; REAP, EPA, KWO, KDHE, and USFWS.

WAMPO has an opportunity to foster coordination and collaboration among the agencies and jurisdictions in the region to achieve mutual goals in transportation and environmental issues on a regional scale. The key regional environmental resources and issues discussed later in this chapter include:



Geese

- Water resources, including floodways, floodplains, streams, wetlands, and regional water quality.
- Plants, fish, and wildlife including threatened and endangered species.
- Historic and archeological resources.

There are many other human environmental resources that could be impacted by transportation related activities. These include:

- Land use and development (**Chapter 5: Land Use and Transportation Connection**).



- Environmental Justice (**Appendix 6: Environmental Justice**).
- Jobs and businesses (**Chapter 4: People, Jobs, and Land Use**).
- Community effects and public health (**Chapter 5: Land Use and Transportation Connection**).
- Farmland (**Chapter 5**).

Air quality is particularly important to the region and transportation projects. Due to its significance, and the potential changes in standards and regulations, it is discussed in depth in **Chapter 10: Air Quality**.

What Environmental Resources Are in the WAMPO Region?

There are numerous environmental resources within the WAMPO region that should be carefully evaluated when transportation improvements are being developed. It is critical to identify these resources early in the project development process and plan for their protection. The following provides an overview of the environmental resources in the region.



Stream

Water Resources

Water is an important natural resource; it sustains all life, including plants, animals, and people. Water also serves as a mode of transportation (e.g., ferries, cruise ships, and barges) and a form of recreation (e.g., swimming and canoeing). Many of our activities, including transportation improvements, have the potential to impact water quality and resources in the region. Water resources can be affected by transportation improvements at many different stages of the water cycle; from drainage basins and streams, to wetlands and floodplains. An impact at any one of these stages can affect the entire cycle and **ecosystem**.

Drainage Basin

The WAMPO region is in the Lower Arkansas Basin. A basin, or drainage basin, is an area of land that catches water from rain, melting snow, or ice and drains downhill or seeps into a river, stream, ocean, wetland, lake, or groundwater. The basin includes both the streams that carry the water as well as the ground from which water

What is an ecosystem?

A community of plants and animals and the physical environment in which they live.



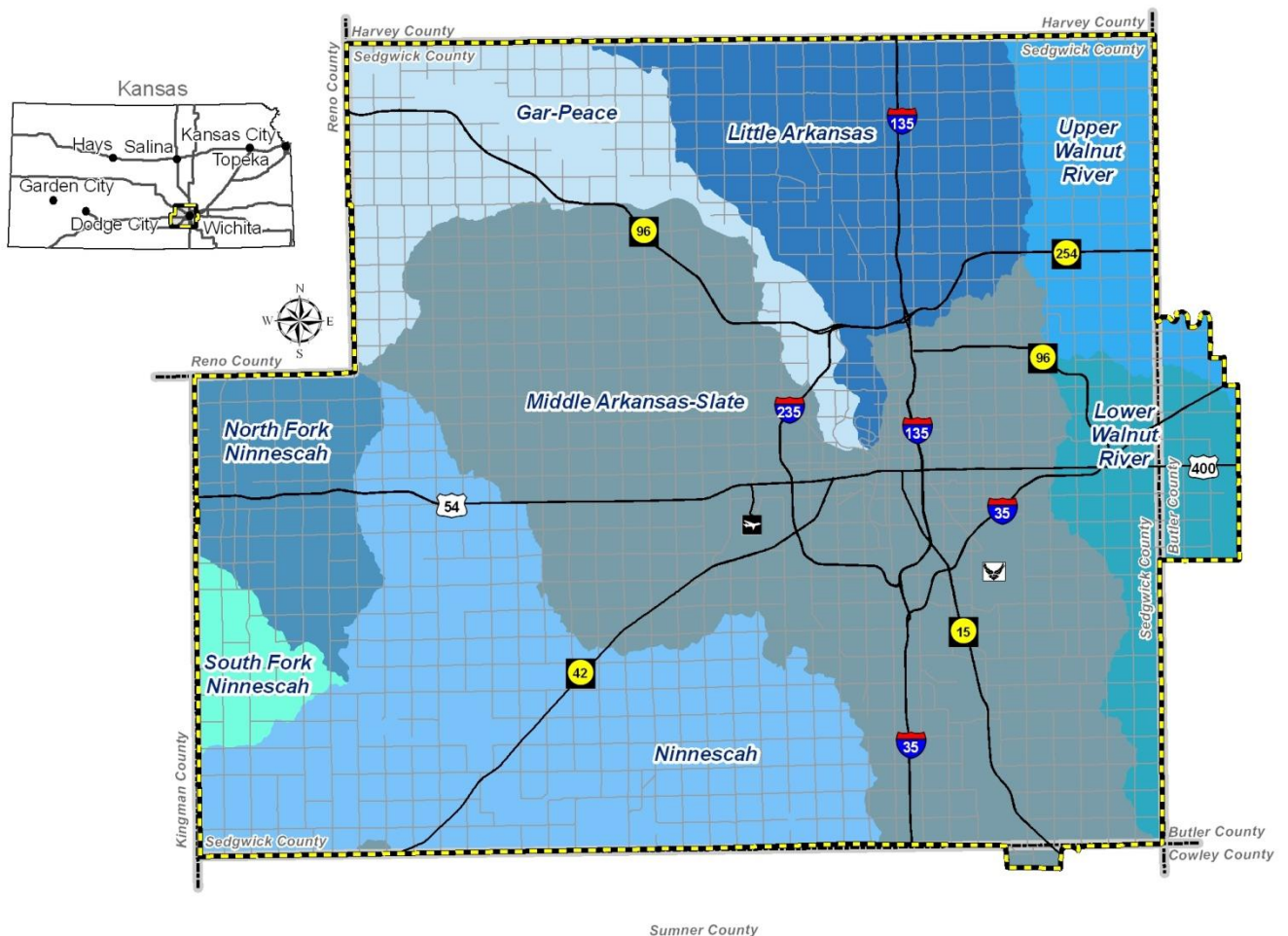
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drains. Basins collect all of the water in an area and drain it to a waterway.

Watersheds

A watershed is a subset of a drainage basin, but the terms are often used interchangeably. There are eight watersheds covering the WAMPO region, shown in **Exhibit 9.1**. Drainage basins and watersheds are important because they are a large part of the water cycle and system. Anything that affects or pollutes one part of these systems affects the entire system and can alter the environment.

Exhibit 9.1: Watersheds





Streams

Streams are natural bodies of flowing water. Rivers, creeks, brooks, and runs are all streams. A river is simply a large stream, while creeks, brooks, and runs are small streams. Rivers are an essential part of our environment. Plants and animals grow and congregate around them and they can be diverted for flood control, irrigation, power generation, and municipal uses. While there are many streams all across the region, there are five main rivers running through the region:

- Little Arkansas River.
- Arkansas River.
- North Fork Ninnescah River.
- South Fork Ninnescah River.
- Ninnescah River.

The rivers and streams in the WAMPO region are shown on **Exhibit 9.2**.

Wetlands

There are other important water resources in addition to basins and streams. Wetlands are areas of land where water is at or near the surface of the soil for varying periods of time. In the WAMPO region, there are generally only small, spotty areas of wetlands. However, they still provide an important function in the ecosystem and are a concern because of the potential negative impacts that transportation projects can have on them. The majority of wetlands are in the northern portion of the region along the rivers and streams. **Exhibit 9.2** shows the wetlands in the region. Wetlands are important to the ecosystem because they decrease flooding, filter pollutants from surface water, help to recharge groundwater, provide **habitat** for wildlife, and protect the health of basins and watersheds.

What is a stream?

A natural body of flowing water that moves downhill under the influence of gravity in a defined channel. Rivers, creeks, brooks, and runs are all streams.



Arkansas River

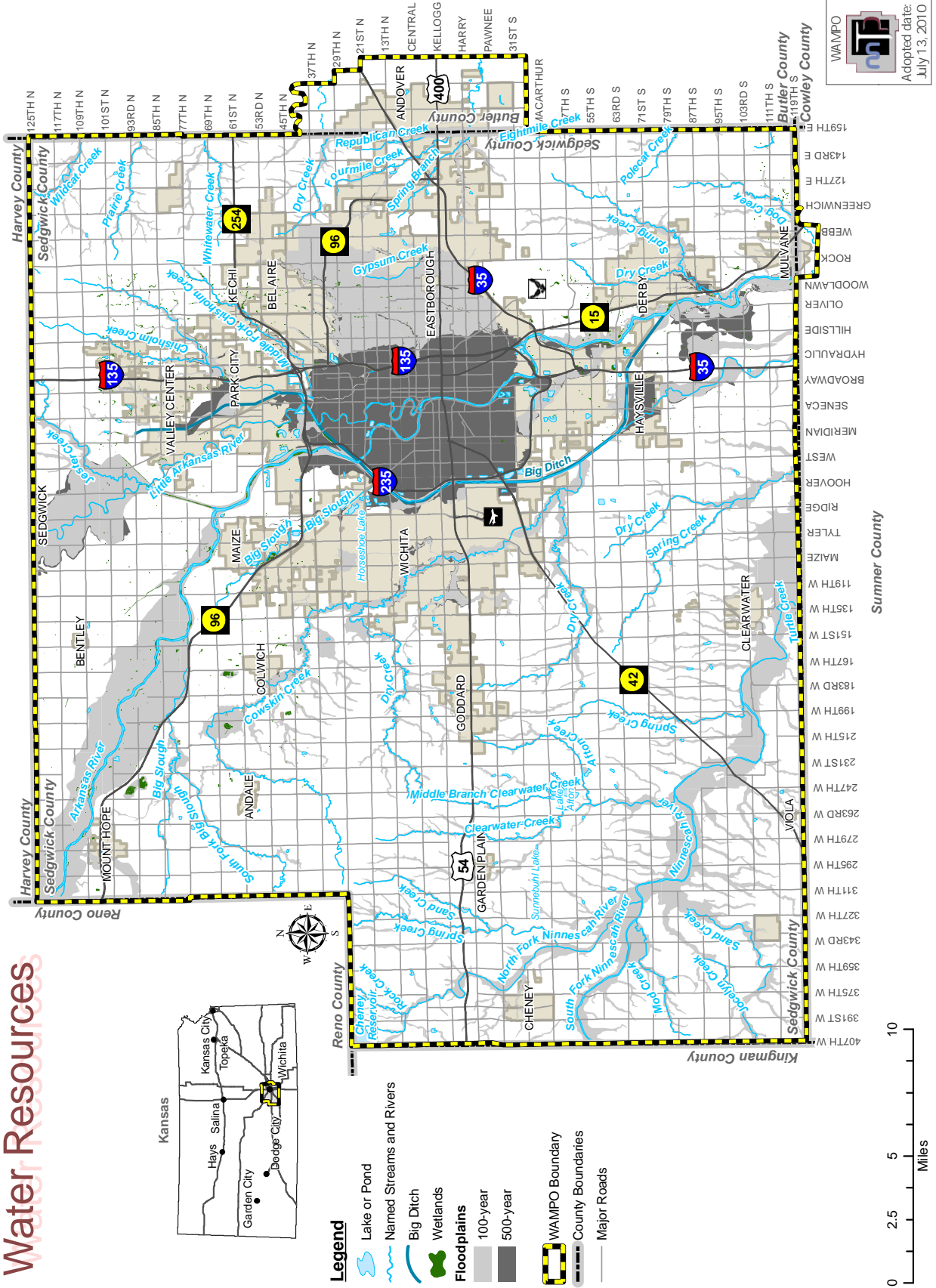
What are habitats?

Surroundings in which something lives. It includes things like temperature, moisture, amount of light, the presence of food, predators, and other organisms.



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Exhibit 9.2 Water Resources

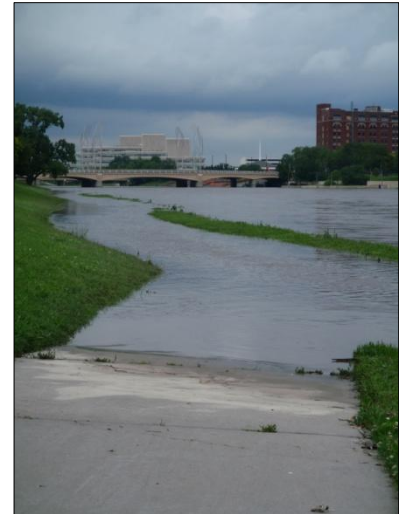




Floodways and Floodplains

Any type of stream or open ditch can overflow its banks and flood nearby lands. The land that is flooded is defined as a floodplain. Floodplains are important water resources because they help reduce the height of floods, and during periods of high water they serve as natural sponges, storing and slowly releasing the water. In addition, many plants that grow in floodplains help improve water quality by filtering out pollutants before they reach the stream.

Generally, the floodplains in the WAMPO region are located along the rivers and creeks. One important floodplain in the region is the Wichita Valley Center Flood Control, commonly referred to as the Big Ditch. This floodplain is protected by a levee system from flooding, which may pose a challenge when developing and constructing transportation projects. The floodplains in the region are shown in **Exhibit 9.2**.



Floodplain

Waters of the United States

Waters of the United States is a term used in federal regulations that defines all bodies of water regulated by the U.S. Army Corp of Engineers. These typically include all streams, lakes, ponds, and wetlands adjacent to or connected to any of the previously mentioned bodies of water. Projects impacting Waters of the United States through fill or other construction activities require permits from the U.S. Army Corp of Engineers.

Plants, Fish, and Wildlife

Plants, fish, and wildlife play a critical role in a region's ecosystem and are easily impacted when their habitat is affected by human activity, including transportation improvements. The Endangered Species Act of 1973 was passed by the federal government to protect threatened and endangered species and their habitat from extinction.

An endangered species is any plant or animal that is in danger of extinction throughout all, or substantial portions, of its range. A threatened species is any plant or animal that is likely to become endangered within the foreseeable future. Species are designated as threatened or endangered at the state and federal level. The State of Kansas has designated three threatened species and three



Fauna



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What are critical habitats?

Documented areas that provide essential needs and support a self-sustaining population of a listed species. It can also be an area with habitat that is essential for the listed species.

endangered species with **critical habitat** in the WAMPO region, as shown in **Exhibit 9.3**.

Protecting plants, fish, and wildlife populations, including their habitats, are important environmental goals. Each plant and animal adds value to the ecosystem, and it is important to maintain the balance between plants, animals, and people. Transportation projects have the potential to negatively impact critical habitats, which is why it is important to know their location.

Exhibit 9.3: Threatened and Endangered Species (Kansas Designation)

Name (Federal Designation)	Picture	Habitat
Threatened Species		
Arkansas Darter (Candidate)		Shallow, clear, spring-fed streams with sand or sandy-gravel bottoms. Generally found in or near the shore.
Bald Eagle (Threatened)		Large impoundments, marshes, and rivers where fish, waterfowl, or other food supplies are abundant with nearby stands of trees containing some tall mature trees. Winter resident of Kansas.
Eastern Spotted Skunk (None)		Forest edges and upland prairie grasslands, especially where rock outcrops and shrub clumps are present.
Endangered Species		
Arkansas River Shiner (Threatened)		A few stretches of streams within the Lower Arkansas, Salt Fork Arkansas, and Cimarron basins.
Arkansas River Speckled Chub (None)		Shallow channels of permanently flowing streams where currents flow over clean fine sand. Found in the lower Arkansas River and its major tributaries.
Silver Chub (None)		Has been found in the Arkansas River and some of its tributary streams including the Ninnescah River, living on or near the bottom.

Source: Kansas Department of Wildlife and Parks



Historic and Archaeological Resources

Environmental resources also include important elements of the built environment (what we construct) such as historic and archaeological resources. Historic resources are districts, buildings, structures, sites, or objects of historical, aesthetic, cultural, or archaeological importance. Archaeological resources are important physical remains of past human activity.

The WAMPO region has 147 resources listed on the local, Kansas, and/or National Register of Historic Places. The types of historic resources in the region include:

- Districts, such as the Carey House Square Historic District located on the south side of the 500 block of East Douglas.
- Buildings, such as St. Mark's Church located at 19230 W. 29th Street N.
- Bridges, such as the John Mack Bridge located at Pawnee and Broadway.
- Monuments, such as the Belmont Arches located at Central and Belmont.
- Shelters, such as the Tee Shelters at Clapp Golf Course.

The listed historic resources in the WAMPO region are shown on **Exhibit 9.4**.

There are also three archaeological resources in the region listed on the local, Kansas, and/or National Register of Historic Places. The three known archaeological resources in the region are:

- Hackberry Archaeological Site.
- Painted Turtle Archaeological Site.
- Grove Park Archaeological Site.

Historic and archaeological resources are important because they provide a tangible connection to our history and a sense of place. These resources should be protected along with the natural resources in the region.



John Mack Bridge



Historic Carnegie Library



How Can the MTP 2035 Protect and Conserve Environmental Resources?

It is important that the MTP 2035 identify important environmental resources in the region that could be impacted by transportation improvements. The MTP 2035 also includes potential environmental mitigation activities and ways to restore and maintain the important environmental functions that may be affected by the transportation improvements.

How Will the Decisions Made in the MTP 2035 Affect Water Resources?

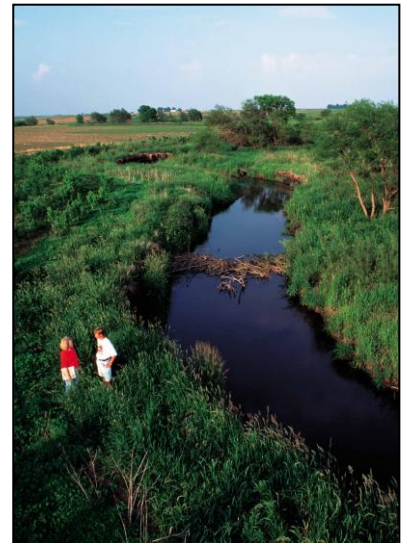
The projects included in the MTP 2035 have the potential to affect the water resources previously discussed. This, in turn, can affect the water quality in the WAMPO region. Impacts to water quality could include effects from construction and demolition activities such as the movement of sediment and pollutants into the stream system. Applying best management practices could minimize the water quality impacts. For example, installation and maintenance of **siltation barriers** downhill of any proposed excavation or clearing can minimize sediment and pollutants entering the stream system. Construction activities should also comply with local regulations.

Impacts to water quality could also occur from improvements that result in more paved surfaces, such as a new road or a road widening project. Increased pavement, such as asphalt and concrete, creates impervious surfaces that cannot absorb water. They can result in greater stormwater run-off into the surrounding water resources because water does not have a chance to seep into the ground. This run-off can carry fuel, oil, and debris from the road surface. The use of stream buffers, which filter pollutants out of stormwater run-off, or the use of **alternative paving surfaces** for sidewalks and trails could reduce the amount of run-off and minimize impacts to water quality.

Indirect effects on water resources and quality can also result from the exposure of water resources to airborne particulates and combustion gases from traffic. This is

What are siltation barriers?

A means of trapping silt or soil particles from being carried, usually by run-off or flowing water, into water resources.



Vegetative Stream Buffer
(Source: NRCS)

What are alternative paving surfaces?

Surfaces that allow varying amounts of water to pass through them and be absorbed in the ground.



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another reason air quality issues are so important. Air quality mitigation strategies are discussed in **Chapter 10**.

How Will the Decisions Made in the MTP 2035 Affect Floodways and Floodplains?

The projects in the MTP 2035 have the potential to affect the floodways and floodplains in the WAMPO region when they encroach on floodway boundaries or fill in floodplains. Effects to floodways occur when channel bottoms are paved, channel sides are filled-in, or water courses are straightened to accommodate a transportation project. Effects to floodplains occur when construction materials, bridge piers, or roads are built in them.

Transportation projects can also increase the amount of stormwater run-off by increasing the amount of paved surfaces. All of these changes increase the elevation, force, locations, and damaging power of flood water.

The effects on floodways can be avoided by appropriate design and verified through hydraulic modeling during design phases of individual projects. More specific mitigation strategies could include:

- Building bridges in sensitive areas instead of laying pavement directly onto the ground.
- Constructing stormwater detention basins to control the rate of water discharge.
- **Daylighting streams** instead of channeling into underground culvert pipes.
- Replacing or restoring wetlands.
- Putting material into one area of a floodway and taking it out of a different area.

How Will the Decisions Made in the MTP 2035 Affect Plants, Fish, and Wildlife?

Projects included in the MTP 2035 have the potential to affect plants, fish, and wildlife in the WAMPO region. The most likely impacts from a transportation improvement project to plants, fish, and wildlife is the loss of habitat or division of habitat. The loss or division of habitat occurs from clearing and grading activities during the construction of a project. Mitigation strategies could include:



83rd Street S. Bridge Over Arkansas River



Flooded Path

What are daylighted streams?

A stream with a channel that has been restored to its original channel or diverted into a new channel instead of underground in pipes.



- Selective cutting and clearing of trees.
- Bridging sensitive areas instead of laying pavement directly onto the ground.
- Replacing or restoring forested areas.
- Replacing or restoring wetlands.
- Providing wildlife crossings and fish passages.

How Will the Decisions Made in the MTP 2035 Affect Historic and Archeological Resources?

Historic preservation is the effort to protect and conserve specific types of buildings, districts, bridges, sites, monuments, and other objects. In the past, historic preservation and transportation planning have been at odds more times than not. However, **Section 4(f)** of the Department of Transportation Act of 1966 and other laws since have worked to bridge that gap. SAFETEA-LU requires that historic preservation issues be taken into consideration during transportation planning and early project development.

The projects included in the MTP 2035 have the potential to affect historic and archaeological resources in the WAMPO region. Potential short-term effects associated with project construction could include noise and vibrations. Potential impacts to historic and archaeological resources could also include more adverse impacts, such as:

- Destruction of or damage to all or part of the resource.
- Removal of the resource from its original historic location.
- Change to the character or physical feature of the resource or its **environs**.
- New visual or audible elements that diminish the integrity of the resource's historic significance.

When developing projects, mitigation strategies should be used to help avoid and minimize potential damage to the historic or archaeological resources. Potential mitigation strategies include:

- Minimize noise impacts with sound barriers.



Wildlife Underpass (Source: FHWA)

What is Section 4(f)?

Section 4(f) of the Department of Transportation Act of 1966 states that no transportation project should be approved which requires the use of any publicly owned land from a public park, recreation area, wildlife and waterfowl refuge, or any historic site unless there is no feasible or prudent alternative.



Wichita-Sedgwick County Historical Museum

What are environs?

The neighborhood (generally 1 ½ blocks) around a historic site.



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- Use **Context Sensitive Solutions** in project development.

What are Context Sensitive Solutions?

Approaches to transportation planning that involve all stakeholders working to plan transportation facilities that fit their setting.



Noise Wall on US-54/400 (Kellogg)

How Will the Decisions Made in the MTP 2035 Affect Noise Levels?

The MTP 2035 projects have the potential to change noise levels for properties adjacent to them. Possible noise impacts resulting from the MTP 2035 projects will depend on three factors:

- The volume of traffic.
- The speed of the traffic.
- The number of trucks in the traffic flow.

Projects resulting in heavier traffic volumes, higher speeds, and/or a greater numbers of trucks on the road will increase noise. The noise is typically produced from a vehicle's engine, exhaust, and tires. Any condition, such as a steep incline, that causes heavy use of motor engines will also increase vehicle noise levels along the road.

Airports and rail facilities contribute to the overall noise level at various locations. Increased air service, as discussed in **Section 6.5: Aviation**, can add to the noise level for surrounding properties. Additional or relocated rail lines result in similar increases in noise levels for certain locations.

The MTP 2035 projects may be required to complete noise studies as part of the NEPA process. These noise studies will likely include the use of the latest version of the FHWA's Traffic Noise Prediction Model (TNM). The computer model could identify the anticipated future noise levels with the proposed improvements and allow comparison of the results with existing conditions. The TNM could also be used to model the effectiveness of noise abatement measures such as noise walls. Projects may also need to be evaluated for temporary construction noise impacts.

National Environmental Policy Act

This chapter does not discuss the impacts of specific individual projects on environmental resources. Individual



projects will go through a separate, more detailed environmental review as part of the NEPA compliance process only if they receive federal funds or require federal action. **Exhibit 9.5** provides an overview of the NEPA process. As a part of the NEPA compliance process, additional environmental resources not discussed in this chapter will need to be reviewed for impacts including:

- Soils.
- Ground cover.
- Parks and public lands.
- Schools and other community facilities.
- Potential contaminated sites.
- Farmland.
- Relocations of homes and businesses.
- Effects on land use.
- Economic effects.
- Visual effects.



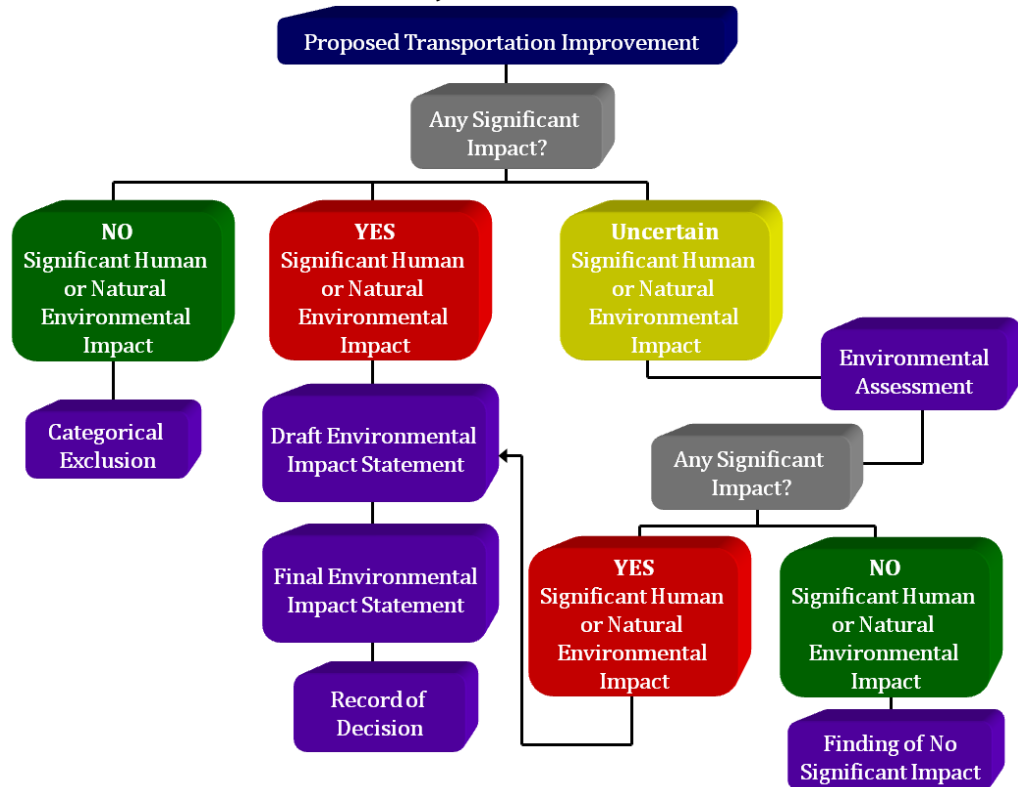
Grove Park

These resources are not discussed in this chapter because they typically are more localized; this chapter focuses on the regional environmental resources and issues. At the time of NEPA review, mitigation activities to address the environmental concerns associated with specific projects will be identified.



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Exhibit 9.5: NEPA Federal Project Review Process



What Are Some Emerging Environmental Issues?

Although the MTP 2035 is a long range plan, this chapter focuses on identifying current environmental resources and issues. It is important to keep in mind emerging environmental issues since these issues may become relevant as projects listed in the MTP 2035 are being implemented over the next 25 years.

Urban Development

Over the last several years, federal transportation policies have increasingly required metropolitan transportation planning efforts to consider the environmental impacts of the transportation system. They have also directed metropolitan transportation plans to link planned transportation improvements to local economic development and land use plans. The overlap of these two requirements indicates the realization that some environmental impacts are occurring from the way the built environment is constructed.



Fauna



In the WAMPO region, the built environment primarily consists of **suburban development**. The environmental effects of suburbanization include plant and animal habitat loss, high levels of energy consumption, and increased stormwater run-off. Some policy experts think that federal transportation dollars could increasingly be tied to how planned transportation improvements encourage a different form of the built environment. There may be increased funding for projects focusing on higher density developments and less conversion of agricultural land to residential and business uses.

New Threatened or Endangered Species

With the expansion of suburban development, natural habitat is being lost. Deer and skunks are living in our backyards because we have developed in their natural habitat. This can lead to declining populations of species. If populations decline too far, they can become threatened or endangered. Additional threatened and endangered species becomes a real possibility.

Summary

While the WAMPO region is rich with environmental resources, the protection and conservation of those resources should remain a high priority in order to maintain a high quality of life in the region. Natural and historic resources are important to protect because they sustain life, keep the natural cycle of life in balance, and provide a sense of place.

Growth and development of the economy, built environment, and transportation network are important to the region. It is important to balance these goals with the protection of environmental resources. Keeping environmental issues and concerns at the forefront of transportation planning and as a priority will help balance these issues and maintain a high quality of life in the WAMPO region.

What is suburban development?

A form of land development, characterized by mostly residential uses, that typically occurs at the outskirts of a city or town.



Stream near Edgemoor and Waterman