REIMAGINED MOVE 2040

APPENDIX 10:

ENVIRONMENT

WICHITA AREA METROPOLITAN PLANNING ORGANIZATION

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Transportation & the Natural Environment

Transportation and the natural environment are closely connected. Lands, rivers, and oceans were the first transportation systems people used to get around. Today, fossil fuels found in the earth serve as the primary fuel for cars, trucks, trains, and airplanes. Over time, there has been growing interest in the short- and long-term impacts on the natural environment caused by human systems, including transportation.

The transportation system impacts on the natural environment are diverse and far-reaching across time and space. For example, emissions from motor vehicles combine with hot air temperatures to form ground-level ozone; rain carries spilled car fluids into local rivers and water bodies; trucks and trains carrying hazardous material travel our highways, roads, and rails; and urban development leads to heat island effect, increased storm water runoff, and agricultural land impacts.

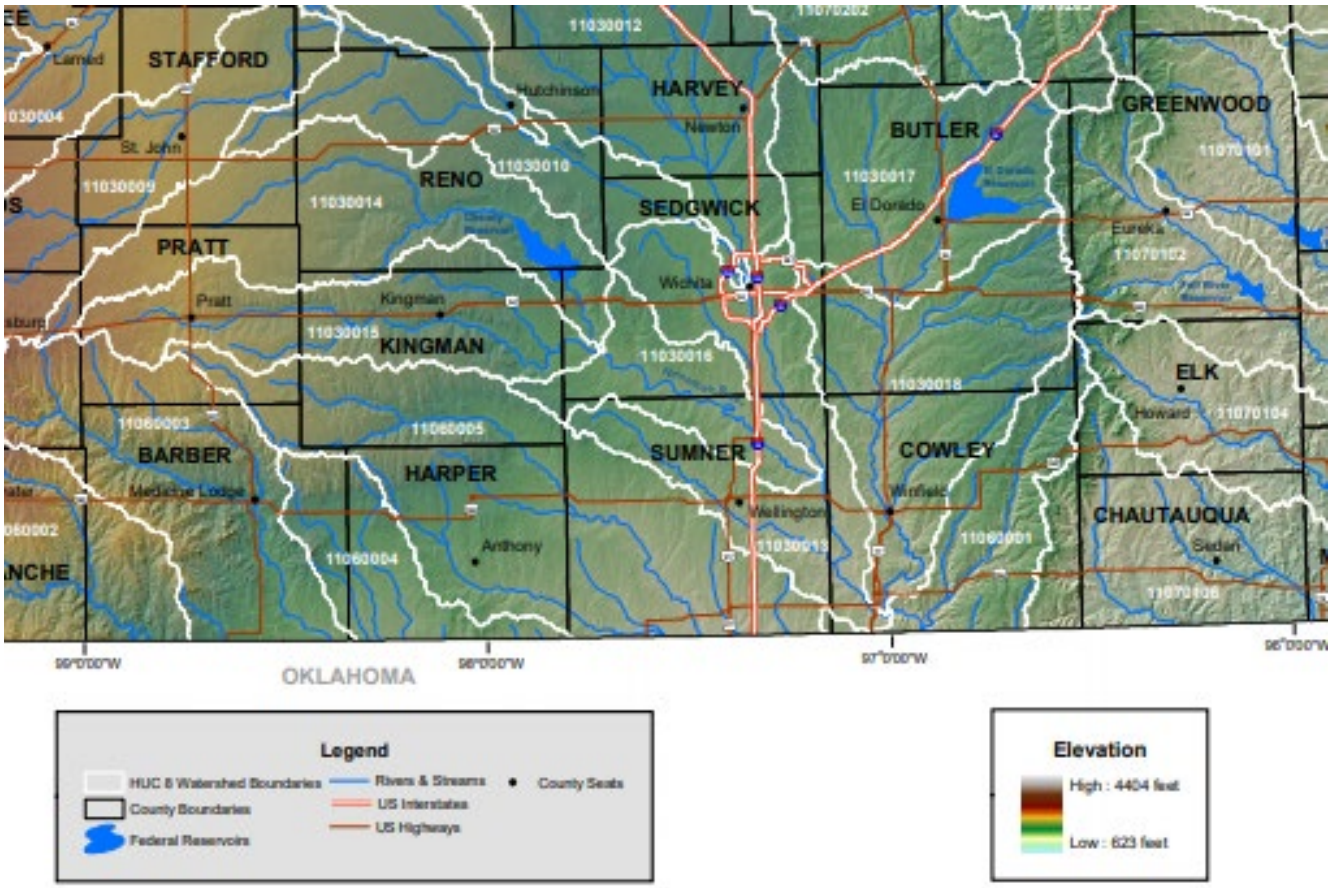
In response to this, federal, state, and local governments have passed laws and regulations to balance the environmental impacts with the needs of other interests. Additionally, there has been growing interest to shift some trips to more environmentally friendly modes, like walking and biking, and in developing alternative fuels.

As part of the overall transportation planning process, it is important to assess any potential environmental impacts associated with the transportation system and, more specifically, with the projects and strategies of WAMPO's long-range Metropolitan Transportation Plan (MTP). This Appendix documents that assessment and also inventories the natural resources in the WAMPO region, summarizes the major environmental issues facing the region, and lists some possible mitigation activities.

Natural Resources Inventory

Water Resources

Eight watersheds cover the WAMPO region; these eight watersheds drain into the Arkansas River, the Cheney Reservoir, the Ninnescah River, and the Walnut River. Along with groundwater, the water in these rivers and reservoir compose the region's water resources. These resources provide the region its drinking water and water for industry, and are provided to users thru local water utilities, rural water districts, and private wells.



Source: *US State Department of Agriculture*

Air Quality

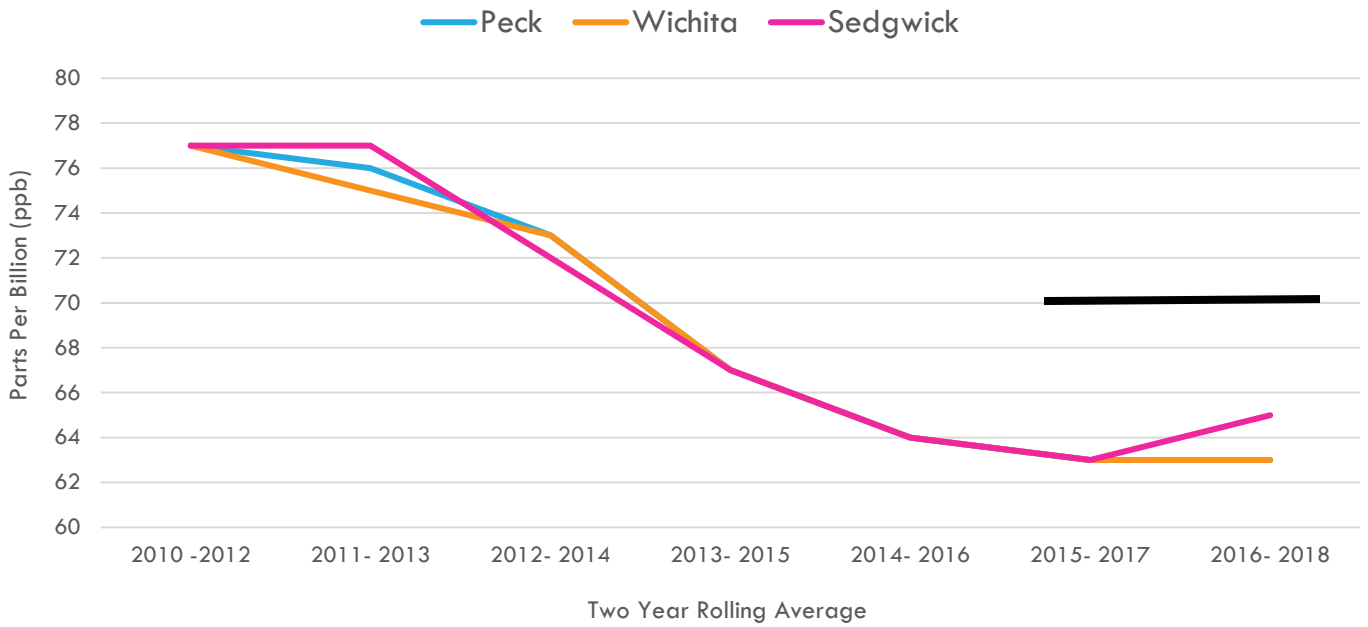
Of all of the monitored air pollutants, the only one that has posed any concern in the WAMPO region has been ground level ozone. Ground level ozone is a major component of smog. Long-term exposure to ground level ozone can irritate the eyes, nose, and lungs, particularly in vulnerable populations, including youth, the elderly, and those with asthma.

Ground level ozone also damages vegetation, including crops. Unlike many other types of pollution, ozone is generally not emitted directly. Instead, it is formed when nitrogen oxides (NOx) combine with volatile organic compounds (VOC) in the presence of sunlight. NOx and VOC are therefore ozone precursors. NOx comes

primarily from various types of combustion; everything from large power plants to internal combustion engines to wood-burning stoves. Motor vehicles, solvents, industrial processes, and gasoline vapors emit VOCs. It is estimated that between 50% and 70% of all VOCs and NOx emitted come from cars, trucks, and other motor vehicles traveling on roads.

As shown on the following chart, over the last several years, the region's ozone level has remained below the regulatory limit (70 to 75 ppb), and will continue to be monitored

Figure 1. Regional Ozone Levels



Oil and Gas Deposits

With the discovery of the El Dorado field near Wichita in 1915, Kansas became known as a significant oil-producing state. The WAMPO region is one of several parts of the State that contribute to the state's production of natural gas and crude oil.

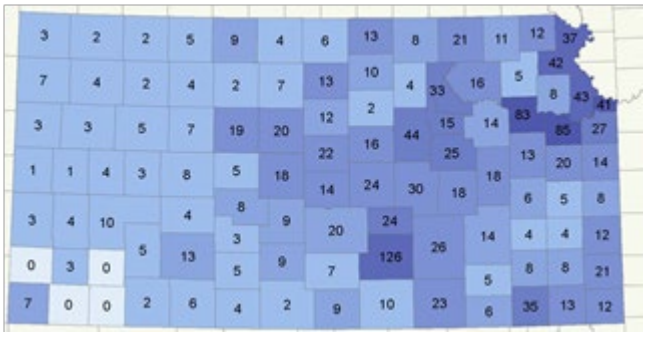
Figure 2. Sedgwick County Oil & Gas Production

Year	Oil			Gas		
	Production (bbls)	Wells	Cumulative (bbls)	Production (mcf)	Wells	Cumulative (mcf)
1995	235,123	206	105,589,803	9,562	3	3,898,873
2000	156,542	133	106,550,972	19,871	4	4,012,933
2005	125,104	125	107,246,696	23,189	4	4,132,493
2010	129,088	127	107,887,622	11,293	4	4,212,261
2015	139,416	126	108,642,874	17,543	4	4,294,529
2019	94,140	110	109,108,330	12,138	4	4,353,554

Source: *KS Geological Society (www.kgs.ku.edu/PRS/County/rs/sedgwick.html). Updated through 10-2019. Note: bbls is barrels; mcf is 1000 cubic feet.*

Historically Significant Places

The WAMPO region has a proud heritage of buildings, districts, and sites that have been preserved and listed on the Wichita, State of Kansas, or National Registers of Historic Places. Within the City of Wichita, there are over 600 structures that are individually listed or properties within a historic district and three individual archeological sites.



National Registry of Historic Places Map of Kansas

Native Plants and Wildlife

The WAMPO region is part of the Grassland Biome ecosystem, specifically one of the "mixed prairie" type, where both tall grass and short grass prairie grasses thrive. Similar to other communities, urban development and agricultural production lands replaced the native prairie for the most part. As development occurred and transformed the extent and quality of native habitat, wildlife species had to adapt and many species dwindled in numbers. In response to dwindling numbers, the Endangered Species Act was put into place to protect the habitat for species in danger of extinction.

In the WAMPO region, there are four species with "threatened" designation, and five species with "endangered" designation. Of those, five have critical habitat (lands and waters that are designated habitat and special protections are in place) in Kansas.

Designated critical habitat in the WAMPO region includes the Arkansas River, the Ninnescah River, and its North Fork and South Fork, and drainage basins of the Cowskin Creek and Big Slough creek.

Threatened Species

- Plains Minnow
- Eastern spotted skunk
- Piping plover
- Snowy plover

Endangered Species

- Arkansas River shiner
- Silver chub
- Peppered chub
- Whooping crane
- Least tern

Photo Credit: Kansas Department of Wildlife, Parks & Tourism
From left to right: Whooping Crane, Spotted Skunk, Piping Plover, and Plains Minnow

Several additional species are listed on the State's list of "Species in Need of Conservation," which may be found by clicking HERE or visiting www.ksoutdoors.com.

Regional Environmental Issues

Similar to other metropolitan areas, there are many long-standing environmental issues facing the WAMPO region. The priority issues are listed below. Due to their long-standing nature, ongoing monitoring, research, public education and remediation/mitigation are taking place on these issues.

- Natural disasters:
  The WAMPO region is located in "Tornado Alley," a large area that covers parts of South Dakota, Nebraska, Kansas, Oklahoma, and Texas that are more likely for tornadoes. Several large, damaging tornadoes have hit the region over the years, including one in 1991 that hit Haysville, Wichita, and Andover, and another in 1999 that devastated Haysville.

- Ground – level Ozone
  Ozone season runs April thru October, when temperatures are high and southern winds are strong. High temperatures mix with emissions from motor vehicles to form ground-level ozone; ozone levels in the region have flirted with exceeding the allowable standard over the last several years, but have not exceeded the standard to date.

- Storm water Drainage, Overland Flooding, and Groundwater Intrusion
  Natural features, including the area's relative flatness, its floodplains associated with the Arkansas River and the Ninnescah River, and the prevalence of basements make overland storm water drainage and groundwater intrusion particularly challenging problems in the region.

- Hazardous Waste

Groundwater and soil contamination associated with industries in the early to middle part of the 20th century exist at three sites in the region. These areas are currently being remediated to standards.

- Agricultural Chemicals Runoff
  It is common practice to use herbicides, pesticides, and fertilizer in modern-day agricultural operations, residential lawns, and commercial turf management; and rain carries these chemicals to surrounding water bodies and groundwater. When unnatural levels of fertilizer runoff take place, harmful algae blooms occur and lead to unsafe water bodies.

- Private Water and Sewer Systems
  Private drinking water wells, irrigation wells, and septic systems are often found in rural residential areas located in unincorporated areas. Local regulations require testing prior to purchase of the property, and then individual homeowners are responsible for upkeep and testing.

- Preservation
  There are several current local initiatives aimed at preserving native plant species and historical buildings and sites in the region.

- Earthquakes
  Over the last few years, earthquake frequency has increased across northern Oklahoma and south central Kansas. Scientists continue to study the causes and impacts.

- Invasive Plants and Animals
  Zebra mussels, bush honeysuckles, Johnson grass, red cedars, and many other plants have been introduced to the region and threaten native species, crops, and landscapes.

- Climate change
  Like many other communities, climate change is an emerging issue in the WAMPO region too. Changes in historical climate trends, such as warmer winters and droughts that are more frequent, impact farmers and are a general concern.

Natural Resource Agency Consultation

As part of the planning process, WAMPO solicited and received input from environmental stakeholders, resource agencies, and environmental experts in the region. Stakeholders and experts were consulted as to the completeness of the environmental issues list, and resource agencies and experts were asked to review the draft plan, proposed projects, and proposed mitigation activities. No feedback was provided.

Stakeholder Groups

- Transportation Advisory Committee
- Citizen's Climate Lobby—Wichita Chapter
- Kansas Chapter of the Sierra Club—Southwind Group
- Individual residents expressing interest in environmental issues

Partners

- University of Kansas School of Medicine Population Health Department

- Kansas Department of Health and Environment
- City of Wichita Environmental Health Division
- U.S. Fish and Wildlife Service
- Environmental Protection Agency
- United States Corps of Engineers

Environmental Assessment

The importance of assessing potential environmental impacts associated with the transportation system as a whole as well as with the selected *REIMAGINED* MOVE 2040 MTP is the first step in the overall project planning and development process. This assessment is the first opportunity for potential environmental impacts associated with any particular project to be considered, as well as any mitigation activities.

Transportation System

On a system level, many activities are already taking place to mitigate environmental impacts associated with overall land development and the transportation system that serves it. For example, KDOT routinely seeds native plants and grasses along highway rights of way, and newer, cleaner burning vehicles are replacing older, less efficient vehicles. Other candidate mitigation activities to consider include:

- Green infrastructure and building construction, such as rainwater harvesting, permeable pavements, and bioswales.
- Mixed land uses and travel modes to enable walkable and bikeable access to groceries, schools, churches and other destinations.
- Invest in a sustainable, multi-modal transportation system.

Natural Disaster Resiliency

Photo Credit: Travis Heying, the Wichita Eagle
https://www.kansas.com/news/weather/article230948998.html

The WAMPO region has a long history of tornadoes, hail, strong winds, temperature swings, and other weather phenomena. This varied and unpredictable weather patterns have shaped an increasingly resilient and prepared system of emergency responders and transportation system resources.

Emergency responders in the region engage in ongoing training and preparedness exercises to learn and implement best practices when responding to a variety of emergencies and natural disasters.

The Wichita Traffic Management Center, WICHway, assists first responders and the public with responding to incidents on the area's highways using technology and a coordinated dispatch center.

For the WAMPO region natural disaster resiliency in practice is a combination mitigation measures that include the regional resources, responder and system preparedness and a highway and road network with plenty of capacity to absorb additional traffic should a portion of the system be damaged.

REIMAGINED MOVE 2040 Projects

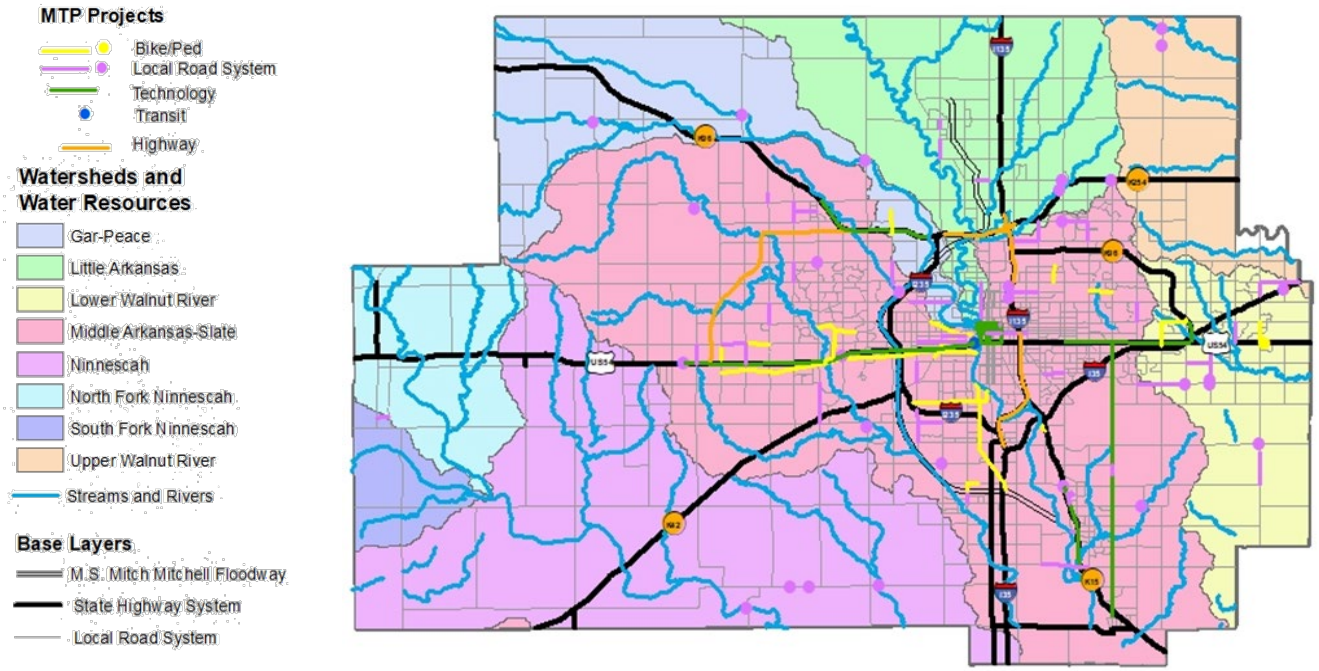
The majority of the *REIMAGINED* MOVE 2040 projects fall into the categories of modernization or rehabilitation of existing roads, highways, and bridges, and, as such, do not involve disturbing previously undisturbed land and causing subsequent impacts on environmental resources. However, there are some MTP projects that involve constructing new roadways. As part of the overall project development processes for these projects, studies should be completed to assess their potential to cause environmental impacts on water resources, oil and gas deposits, and native plants and wildlife, as well as propose specific mitigation activities. Possible mitigation strategies for such projects include:

<u>Water Resources</u>

Mitigation strategies for protecting water resources 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.

Figure 3. Water Resource Overlay with MTP Projects



Oil and Gas Deposits

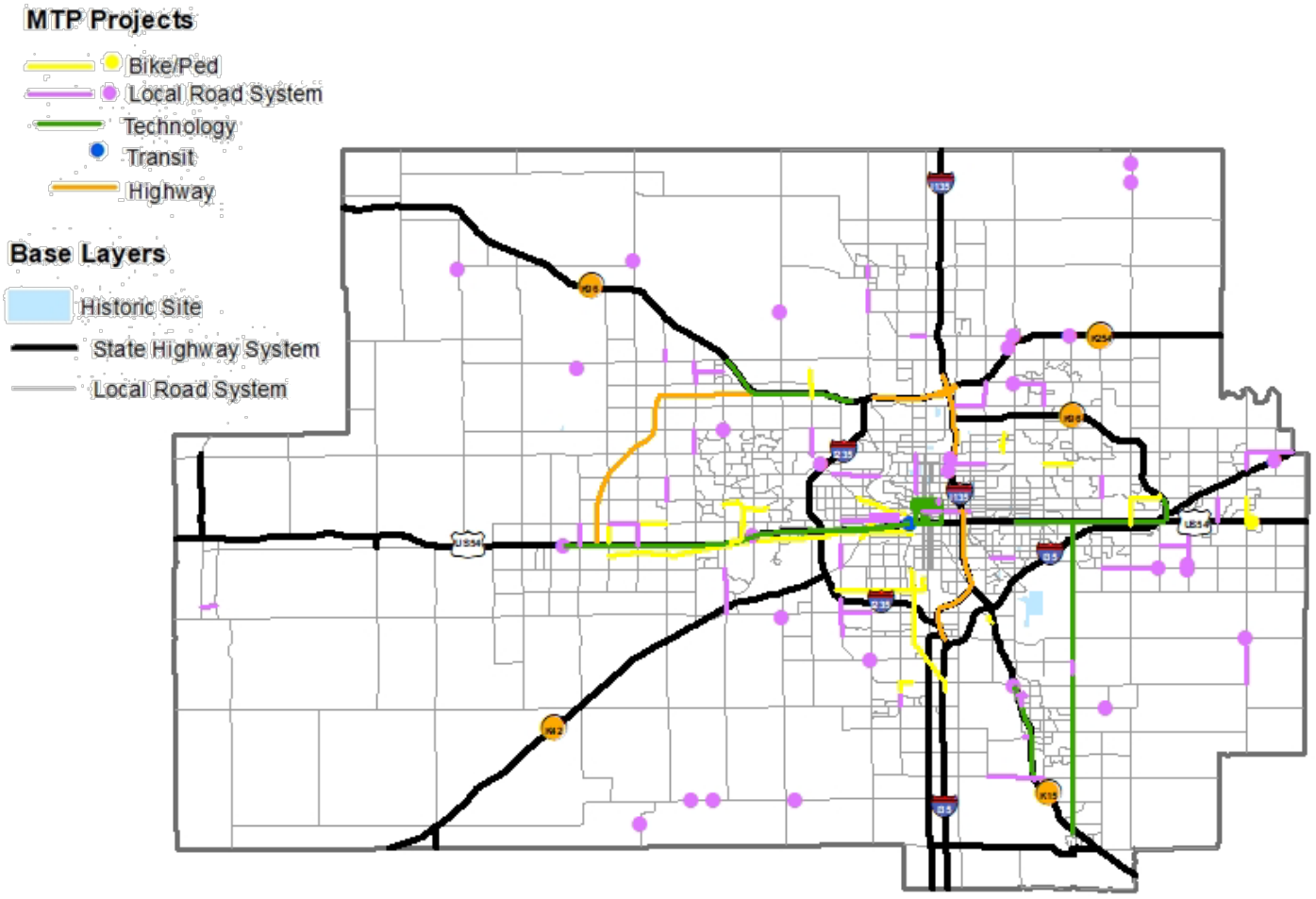
The 95th Street Corridor improvement project runs thru an active oil-producing field located alongside the Arkansas River. Mitigation strategies could include:

- Design the corridor around the largest deposits
- Extend piping to under the road bed
- Relocate existing pumping wells, if any

Historically Significant Places

No proposed projects would affect existing historic sites, landmarks, districts, or archeological sites.

Figure 4. Historic Sites with MTP Projects



Native Plants and Wildlife

Mitigation strategies for protecting critical habitat could include:

- Selective cutting and clearing of trees.
- Bridging sensitive areas instead of laying pavement directly onto the ground.
- Replacing or restoring riparian areas.
- Replacing or restoring wetlands.

- Providing wildlife crossings and fish passages.

Ongoing Environmental Assessment Processes

As projects move thru the planning and project development processes, they will go thru several environmental reviews to ensure the project does not violate any federal, state, or local environmental regulations. During these processes, projects are reviewed for legal compliance, and mitigation activities are often required as part of the permitting and reviewing process.

Kansas Department of Transportation (KDOT)

As part of its role as the Federal Highway Administration (FHWA) funding administrator for the State of Kansas, the Kansas Department of Transportation carries out the National Environmental Policy Act (NEPA) compliance process for every project funded with federal funding provided thru an FHWA program. The KDOT Environmental Clearance Process includes review by various state and federal agencies to ensure compliance with the Clean Air Act, the Clean Water Act, and the Endangered Species Act. Projects are not able to move forward to construction until environmental clearance is granted.

Local Municipalities

Cities and counties in the WAMPO region have enacted zoning, subdivision, and overall land development regulations and processes. These processes include a long-range comprehensive land use plan that sets the long-term vision and footprint of future land development, zoning ordinances that govern the use, look, and feel of development, and other specific ordinances that govern development in certain areas. For example, Sedgwick County has enacted a zoning overlay, which limits new development across the proposed Northwest Bypass corridor.

Related Regulations

Other regulations enacted by local governments, the state government, and federal agencies govern many other environmental issues, including, but not limited to, runoff from construction sites, hazardous waste transport, private well testing, emissions permits, pollutant discharge, and stormwater.

Conclusion

The WAMPO region is a mid-western, metropolitan area surrounded by rural lands in agricultural production, and faces similar environmental issues as neighboring metropolitan areas—agricultural chemical run-off concerns, invasive species, habitat protection, and stormwater drainage.

Suburban and rural land development is predominate in the region, and, as such, the transportation system was built, and is currently maintained, to support that type of development form.

The transportation system contributes too many environmental issues faced by the region, namely ground level ozone, overland flooding, and habitat protection.

Many on-gong regulatory processes are in place to monitor and mitigate these issues.

Impact Findings

Possible environmental impacts associated with the specific projects in the MTP plan are limited to two projects—the Northwest Bypass and the 95th Street Corridor project.

Both projects are new roadways, and as such pose possible impacts associated with developing currently undeveloped land, such as habitat disruption.

As these projects move forward, the existing regulatory processes will be in place to ensure appropriate mitigation activities are implemented to ensure compliance with local, federal, and state environmental laws.