3.0 Environmental Analysis

This chapter describes the socioeconomic, cultural, natural, and human environments in the study area that will be affected by the Preferred Alternative in comparison to the No-Build Alternative. Each section below provides a summary of the potential impacts identified and mitigation strategies if necessary.

3.1 Socioeconomic Environment

3.1.1 Land Use

This section describes the existing land use and zoning within the study area. The land use and zoning designations were gathered from existing zoning and land use maps within the comprehensive plans for Johnson County, and the cities of De Soto, Lenexa, and Olathe.

3.1.1.1 Existing Conditions

Existing Land Use

Figure 3-1 identifies the existing land use within and adjacent to the study area. Land uses consist primarily of dedicated ROW, agricultural, commercial, duplex or triplex, government/ public, heavy industrial, light industrial, office, other residential, recreation, single family residential, vacant commercial/ industrial, and vacant residential. There are multiple approved land use planning documents with boundaries within the study area. These planning documents are discussed in more detail below.

Existing Zoning

The study area is located within the municipal limits of De Soto, Lenexa, and Olathe as well as parts of unincorporated Johnson County. Zoning within the study area is a mix of agricultural, business-commercial, business-office, industrial, multi-family residential, multi-use, and single-family residential (**Figure 3-2**). Agricultural, business-commercial and industrial zones are predominantly located near interchanges in the study area.

Future Land Use

Figure 3-3 shows the future land use designations within the study area. Future land uses include commercial, industrial, mixed use, multi-family residential, office, open space, public, ROW, rural, and single family residential.

Land Use Planning Documents and Decisions

A range of land use planning documents have been prepared by city, county, or regional agencies that impact the land use decision-making process for the study area.

Connected KC 2050 (2020)

Connected KC 2050 is the current LRTP for the nine-county Kansas City metropolitan region developed by the MARC. *Connected KC 2050* serves as the Kansas City metro's regional transportation plan and is a blueprint for managing the region's transportation system. Adopted on June 23, 2020, according to MARC, "the plan identifies and sets out a budget for federal transportation funds that the metro area expects to receive over the next three decades." A goal of the plan is to "continue to facilitate integrated land use, transportation and environmental planning in areas with significant pedestrian activity and transit services." The plan also aims to anticipate both positive and negative impacts on land use. *Connected KC 2050* encompasses the entire study area.

City of Lenexa Comprehensive Plan (2016)

The *City of Lenexa Comprehensive Plan* is the guide for the future growth and development for the City of Lenexa. The plan received a major update and was adopted on July 2, 2024. Segments of the study area discussed in the plan are on the north side of K-10 from the City of De Soto boundary in the west near the junction of K-10 and Cedar Creek Road and to the intersection of K-10 and Renner Road. The plan includes both the north and south sides of K-10 from the intersection of K-10 and Renner Road to the intersection of I-435/I-35/K-10.

Future land uses in the study area includes low density residential, suburban density residential, medium density residential, high density residential, public and open space, mixed use, neighborhood commercial center, community commercial center, office/employment center, office/research and development, and business park. An additional plan mentioned in the *City of Lenexa Comprehensive Plan* that includes land uses in the study area is the *Lenexa Trails Alignment Analysis*.

City of Olathe Comprehensive Plan (PlanOlathe, 2021)

The City of Olathe, KS Comprehensive Plan (*PlanOlathe*) was adopted by the City of Olathe in 2010 and updated in 2021. *PlanOlathe* is utilized by the City as a policy guide for future land use and development. The Comprehensive Plan covers information on greenways, corridors, centers, neighborhoods, districts, street hierarchy, transit routes and facilities, natural features, parks and trails, population density, growth in Olathe, zoning, existing land use, surrounding jurisdictions, schools, school districts, sanitary sewer service, water service, public facilities, cultural facilities, and ward boundaries. The Comprehensive Plan includes portions of the study area south of K-10 from approximately Gardner Road in the west to approximately Renner Boulevard in the east.

Additional studies completed by the City of Olathe that include portions of the study area are the *Woodland Road Corridor Plan* (2004) and the *K-7 Corridor Study and Design Guidelines* (2002).

- Existing Land Use Map – The existing land use in the study area includes agriculture/vacant, single family residential, two family residential, commercial, hotel/motel, office, industrial, public/semi-public, park/open space, and ROW.
- Future Land Use (2016) – The Future Land Use Map was updated in 2016 under Ordinance No. 16-16. The goal of the Future Land Use Map is to illustrate the future growth of the City. Future growth areas include space for roads, transit, parks, utilities, and community facilities. Future land use types in the study area include primary greenway, secondary greenway, employment areas, urban mixed-use centers, regional commercial centers, and conventional neighborhoods.

City of De Soto Comprehensive Plan (2022)

The *City of De Soto Comprehensive Plan* was adopted by the Planning Commission and the City Council in 2007 and updated in December 2022. The Comprehensive Plan is utilized by the City as the "foundation of the City's zoning code and all other land use policies and regulations within the City and its exterritorial planning area." The Comprehensive Plan includes portions of the study area in De Soto which includes south of K-10 from Evening Star Road to Edgerton Road and both sides of K-10 from Sunflower Road eastward to just west of where Cedar Creek Road crosses under K-10.

- Plan Update (2022) – The Comprehensive Plan was updated in 2021. The plan update added information on infrastructure investments that occurred between 2007 and 2018, as well as identified strengths, weaknesses, opportunities, and threats for the City of De Soto. Public participation was the main focus of the 2018 update. This included "meetings with the City's Comprehensive Plan Steering Committee and City Staff, a series of focus sessions, several one-on-one stakeholder interviews, and a citizen survey."
- Future Land Use Map (2019) – This map shows recommended future uses of land in De Soto. The uses in the study area include park & open space, public/ semi-public, agricultural, residential low density, residential medium density, multifamily, mixed use, commercial, light industrial, and heavy industrial.

3.1.1.2 Land Use Impacts

Impacts of the No-Build Alternative

The No-Build Alternative would not change the existing land use within the study area. Land uses under the No-Build Alternative would only experience changes if the city, county, or region made modifications to land use planning and zoning within their documented plans, as summarized in **Section 3.1.1.1**.

Impacts of the Preferred Alternative

Under the Preferred Alternative, some existing commercial, agricultural, and residential land uses will change to roadway use where property displacements would occur and where partial property acquisition would be necessary. However, the Preferred

Alternative will be consistent with zoning and the existing and future land uses adjacent to the roadway and would not substantially affect future land use plans. The preliminary design concepts for the Preferred Alternative have been closely coordinated with the cities of De Soto, Lenexa, and Olathe and Johnson County to ensure the proposed improvements and any modified access points and local road connections are in line with adjacent land use needs. Construction of the Preferred Alternative will require property acquisition for ROW and easements. The acquisition of ROW and easements are discussed further in **Section 3.1.7**.

The Preferred Alternative is expected to reduce the congestion along K-10 by widening the corridor to a total of six lanes to accommodate the traffic demands through the 2060 design year. Reducing congestion and improving mobility in the corridor may create future conditions that make adjacent undeveloped property desirable for development. Decisions on any modifications to future land use planning and zoning will be made by the local municipalities.

3.1.2 Neighborhoods and Community Resources

The schools, universities, places of worship, community centers, libraries, hospitals, and emergency response services within and adjacent to the study area are discussed below.

3.1.2.1 Neighborhoods

Numerous neighborhoods and homeowner associations are located within a half mile of the study area. These associations are the building blocks for the surrounding communities, providing opportunities to connect residents and form partnerships with government officials.

3.1.2.2 Schools and Universities

The study area sits within the De Soto, Olathe, Eudora, Blue Valley, and Shawnee Mission school districts. One district office (De Soto Unified School District), one support center (Lone Elm), one activity center (College Boulevard Activity Center), three learning centers (Countryside Learning Center, Career & Technical Campus and Prairie Learning Center) and the following 13 schools are located within a half-mile of the study area (**Figure 3-4**).

- Public Schools
    - Starside Elementary School – 35400 W. 91st Street
    - Rosehill Elementary School – 9801 Rosehill Road
    - Sunflower Elementary School – 8955 Loiret Boulevard
    - Meadow Lane Elementary School – 21880 College Boulevard
    - Manchester Park Elementary School – 9810 Prairie Creek Road
    - Canyon Creek Elementary School – 24001 W. 97th Terrace
    - Lexington Trails Middle School – 8800 Penner Avenue

  - Prairie Trail Middle School – 21600 W. 107th Street
  - De Soto High School – 35000 W. 91st Street
  - Olathe Northwest High School – 21300 College Boulevard
- Colleges and Universities
  - Nazarene Bible College – 17001 Prairie Star Parkway
  - Pittsburg State University, KC Metro Center – 12345 W. 95th Street #204
  - Kansas State University Olathe Center – 22201 W. Innovation Drive

3.1.2.3 Places of Worship

There are 19 places of worship within a half-mile of the study area (**Figure 3-4**).

- Bridge Church – 33490 Lexington Avenue
- Christ Community Church of the Nazarene – 21385 College Boulevard
- Church of Jesus Christ of Latter-day Saints – 21515 W. 101st Street
- Church of the Resurrection West – 24000 W. Valley Parkway
- Cornerstone Community Church – 11184 Lackman Road
- De Soto Baptist Church – 8655 Copeland Way
- Journey Church of Lenexa – 8865 Bourgade Avenue
- Kaw Prairie Community Church – 9421 Meadow View Drive
- Life Church Lenexa – 21001 W. 101st Street
- Midwest Sikh Gurudwara Lenexa – 10050 Marion Street
- Monticello Gospel Assembly – 9200 Hedge Lane Terrace
- New Vision Church of God In Christ – 9609 Pflumm Road
- Nexus Church – 15101 College Boulevard
- Providence Community Church – 10113 Lenexa Drive
- Real Church – 11221 Strang Line Road
- Saint George Serbian Orthodox Church – 11001 Greenwood Street
- St. Paul Catholic Church – 21650 W. 115th Terrace
- United De Soto Methodist Church – 8760 Kill Creek Road
- Unity Church of Overland Park – 10000 Marshall Drive

3.1.2.4 Community Centers and Libraries

There are two libraries and one community center located within a half-mile of the study area (**Figure 3-4**).

- Community Centers
  - Lenexa Community Center – 13420 Oak Street
- Libraries
  - Johnson County Library – Lenexa City Center – 8778 Penrose Lane

3.1.2.5 Cemeteries

There is one cemetery within a half-mile of the study area (**Figure 3-4**).

- De Soto Cemetery – 34500 W. 87th Street

3.1.2.6 Hospitals

There are one hospital and three urgent care clinics within a half-mile of the study area (**Figure 3-4**).

- Hospitals
  - AdventHealth Lenexa – 23401 Prairie Star Parkway
- Urgent Care Clinics
  - Sunflower Medical Group – 9300 Meadow View Drive
  - CareNow Lenexa – 15421 W. 87th Street Parkway
  - Olathe Health College Point – 23450 College Boulevard

3.1.2.7 Emergency Responder Services

There is one police station and eight fire stations located within the study area to respond to emergencies within a half-mile of the study area (**Figure 3-4**).

- Police Stations
  - Lenexa Police Department – 24300 Prairie Star Parkway
- Fire Stations
  - Lenexa Fire Department, Station #1 – 9620 Pflumm Road
  - Lenexa Fire Department, Station #2 – 8725 Lackman Road
  - Lenexa Fire Department, Station #3 – 24000 Prairie Star Parkway
  - Lenexa Fire Department, Station #4 – 10855 Eicher Drive
  - Lenexa Fire Department, Station #5 – 19151 Prairie Star Parkway
  - Northwest Consolidated Fire District, Station #11 – 9745 Kill Creek Road
  - Northwest Consolidated Fire District, Station #13 – 33150 W. 83rd Street
  - Olathe Fire Department, Station #6 – 24200 College Boulevard

3.1.2.8 Neighborhood and Community Resource Impacts

Impacts of the No-Build Alternative

The No-Build Alternative would not impact any of the neighborhoods or community resources within or adjacent to the study area. Under the No-Build Alternative, there would be no construction, therefore, no impacts to existing emergency services or routes. However, emergency response times may be impacted due to congestion along K-10 and the arterial network.

Impacts of the Preferred Alternative

Impacts from the Preferred Alternative on neighborhoods and community resources are related to physical and social factors that promote a bond between residents and their

community. Called community cohesion, this is a product of people sharing common neighborhood facilities and services that creates a sense of place within their neighborhoods. The Preferred Alternative will address congestion issues along K-10 and the adjacent arterial network, having a positive impact on access to community facilities and as a result community cohesion.

No community resources (schools, universities, places of worship, community centers, libraries, hospitals, or emergency services) are located within the construction limits of the Preferred Alternative. Construction of the Preferred Alternative and reduction of congestion will ensure that emergency response vehicles can maintain access throughout the corridor. Any detours during construction will be temporary and limited in duration to the period of time required to construct project improvements. The exact location, timing, and duration of road closures have not been finalized. A traffic management plan will be developed and implemented by the Contractor during the construction phase of the project (**Commitment C-2**). Access to properties will be maintained by phased construction, temporary access roads, or other appropriate means (**Commitment C-3**).

Depending on future development and the location of future community emergency response facilities, emergency response times along the K-10 corridor could be positively impacted with construction of the Preferred Alternative.

3.1.3 Population and Economic Environment

Areas along the K-10 Corridor have shown long-term growth trends in both economic activity and population density. It is anticipated that these trends will continue, placing increasing demands on the existing transportation system.

3.1.3.1 Population

The study area is within the municipal limits of De Soto, Lenexa, and Olathe in Johnson County, as well as portions of unincorporated Johnson County. Population trends in Johnson County and the cities of Lenexa and Olathe show steady growth from 2010 to 2022, as shown in **Table 3-1**. The City of De Soto shows steady growth from 2010 to 2020, population declines by 3.36 percent in 2021, then shows growth in 2022. The average population growth rates in Johnson County, De Soto, Lenexa, and Olathe are 1.25 percent, 1.04 percent, 1.84 percent, and 1.47 percent, respectively, and have consistently exceeded the statewide average annual growth rate of 0.38 percent during the same period.

Table 3-1: Population Trends

Year	State of Kansas		Johnson County		De Soto		Lenexa		Olathe	
	Pop	Growth	Pop	Growth	Pop	Growth	Pop	Growth	Pop	Growth
2010	2,809,329	-	531,228	-	5,553	-	47,089	-	120,775	-

Year	State of Kansas		Johnson County		De Soto		Lenexa		Olathe	
	Pop	Growth	Pop	Growth	Pop	Growth	Pop	Growth	Pop	Growth
2011	2,830,985	0.77%	538,836	1.43%	5,653	1.80%	47,743	1.39%	123,430	2.20%
2012	2,851,183	0.71%	546,046	1.34%	5,730	1.36%	48,300	1.17%	125,902	2.00%
2013	2,868,107	0.59%	552,947	1.26%	5,789	1.03%	48,920	1.28%	128,050	1.71%
2014	2,882,946	0.52%	560,025	1.28%	5,888	1.71%	49,573	1.33%	129,913	1.45%
2015	2,892,987	0.35%	566,814	1.21%	5,941	0.90%	50,412	1.69%	131,508	1.23%
2016	2,898,292	0.18%	572,428	0.99%	5,982	0.69%	51,206	1.58%	132,787	0.97%
2017	2,903,820	0.19%	578,797	1.11%	6,042	1.00%	52,030	1.61%	134,368	1.19%
2018	2,908,776	0.17%	585,502	1.16%	6,138	1.59%	53,051	1.96%	135,986	1.20%
2019	2,910,652	0.06%	591,506	1.03%	6,254	1.89%	54,011	1.81%	137,618	1.20%
2020	2,912,619	0.07%	597,574	1.03%	6,374	1.92%	54,804	1.47%	139,216	1.16%
2021	2,932,099	0.67%	605,154	1.27%	6,160	-3.36%	56,755	3.56%	140,339	0.81%
2022	2,935,922	0.13%	610,742	0.92%	6,248	1.43%	57,497	1.31%	142,114	1.26%

Source: 2022 American Community Survey (ACS) 5-Year Estimate

3.1.3.2 Economy

For purposes of this study, economic activity has been measured using employment statistics and retail sales records. The number of individuals employed provides a direct measure of economic activity, while retail trade represents a substantial portion of the local economy. Since 9.95 percent of the sales tax contributes to the county revenue distribution budget, the strength of retail sales has a direct impact on tax revenues for local governments. According to the Johnson County fiscal year (FY) 2023 Capital and Operating Budgets report, this results in the estimated revenue from sales tax for FY 2022 being approximately $99.85 million.

Employment

Generally, as the number of people employed in a community increases so does economic activity. The employment trend for the cities of Lenexa and Olathe, and Johnson County during the period of 2000 to 2022 was net positive, as shown in **Table 3-2**.

Table 3-2: Employment Trends

Year	Johnson County			Lenexa			Olathe		
	Avg. Annual Employment	Growth	Avg. Annual Growth	Avg. Annual Employment	Growth	Avg. Annual Growth	Avg. Annual Employment	Growth	Avg. Annual Growth
2000	254,515	N/A	N/A	24,003	N/A	N/A	53,012	N/A	N/A
2005	276,214	8.5%	1.7%	26,050	8.5%	1.7%	57,532	8.5%	1.7%
2010	288,721	4.5%	1.3%	26,329	1.1%	1.0%	67,251	16.9%	2.7%
2015	314,557	8.9%	1.6%	29,338	11.4%	1.5%	73,325	9.0%	2.6%
2020	326,260	3.7%	1.4%	31,104	6.0%	1.5%	76,646	4.5%	2.2%
2021	336,251	3.1%	1.5%	32,056	3.1%	1.6%	78,994	3.1%	2.3%
2022	341,465	1.6%	1.6%	32,553	1.6%	1.6%	80,218	1.6%	2.3%
2023	345,048	1.0%	1.5%	32,895	1.0%	1.6%	81,060	1.0%	2.3%

Source: Local Area Unemployment Statistics, Bureau of Labor Statistics Web Site. (https://www.bls.gov/lau/home.htm)
* Average annual growth calculated from the year 2000.

The average annual employment growth between 2000 and 2023 for Lenexa, Olathe, and Johnson County were 1.6 percent, 2.3 percent, and 1.5 percent, respectively. Local average annual growth rates were higher than the 0.4 percent statewide average annual employment growth rate for Kansas during the same period. The greatest increases in employment for Johnson County (8.9 percent) and Lenexa (11.4 percent) occurred between 2010 and 2015 and for Olathe (16.9 percent) between 2005 and 2010. Employment data was not available for De Soto due to its small population size.

The unemployment rate in a community is a measure of the community's economic vitality and a measure of employment opportunities available to residents within the community. The unemployment rate in Johnson County, Lenexa, and Olathe remained relatively low from 2000 to 2023, as shown in **Table 3-3**.

Table 3-3: Unemployment Trends

Year	Johnson County Average Unemployment Rate	Lenexa Average Unemployment Rate	Olathe Average Unemployment Rate
2000	3.0%	3.4%	3.1%
2005	4.6%	5.2%	4.7%
2010	6.0%	7.0%	6.4%
2015	3.4%	3.5%	3.3%
2020	5.1%	5.3%	4.9%
2021	2.7%	2.8%	2.6%

Year	Johnson County Average Unemployment Rate	Lenexa Average Unemployment Rate	Olathe Average Unemployment Rate
2022	2.3%	2.3%	2.2%
2023	2.6%	2.6%	2.4%

Source: Local Area Unemployment Statistics, Bureau of Labor Statistics Web Site. (https://www.bls.gov/lau/home.htm)

The average unemployment rate between 2000 and 2023 for Lenexa, Olathe, and Johnson County was 4.4 percent, 4.1 percent, and 4.1 percent, respectively. All three unemployment rates were lower than the 4.6 percent statewide average over the same period. It is important to note that the increase in unemployment rates for 2020 reflects the effects of the worldwide COVID-19 pandemic.

Retail Sales

The other key measure of economic activity is the volume of retail sales in an area. The volume of retail sales has a direct impact on tax revenues for local governments. Taxable retail sales in Johnson County have been increasing, as shown in **Table 3-4**. The highest growth rate was between 2020 and 2021; however, from 2016 to 2019, the growth rate steadily declined. The growth rate increased slightly in 2019 but saw a drastic decline in 2020 due to the worldwide COVID-19 pandemic. The growth rate drastically increased in 2021 as the economy started to rebound from the COVID-19 pandemic and then slightly decreased in 2022.

Table 3-4: Johnson County Taxable Retail Sales Trend

Year	Nominal Sales (Millions)	Growth Rate
2015	$ 10,760.97	-
2016	$ 10,977.61	2.0%
2017	$ 11,147.85	1.6%
2018	$ 11,267.55	1.1%
2019	$ 11,406.33	1.2%
2020	$ 11,063.15	-3.0%
2021	$ 12,580.77	13.7%
2022	$ 13,851.96	10.1%

Source: Kansas Economy: The Center for Economic Development and Business Research (CEDBR). (https://www.kansaseconomy.org/economic-indicators/retail-sales
Note: CEDBR removed the seasonal variation in the data series to better track the long-term trends in the data.

The K-10 Corridor is an economically significant corridor within the Kansas City region and for the state. The K-10 Corridor connects to Interstates 35, 435, and 70, K-7, and US Highway 59. According to MARC, in the last five years Lenexa has experienced over $1.5 billion in development activity, generating local and state jobs, growth, and tax

revenue. The driving factor behind the economic activity is Lenexa's location along numerous major transportation corridors. De Soto, Kansas is the home of the Astra Enterprise Park, which is expected to create more than 4,000 jobs. The complex is located off K-10, furthering economic development along this corridor. Overall, Johnson County has a growing and diverse economic base that will support growth along the K-10 Corridor.

3.1.3.3 Economic Impacts

Impacts of the No-Build Alternative

If the congestion along the K-10 corridor is not addressed, it could lead to inefficient travel along the corridor and could potentially increase the cost of product delivery and make it difficult for customers to easily access businesses, thereby impacting future economic conditions.

Impacts of the Preferred Alternative

The Preferred Alternative will reduce traffic congestion along K-10 which may create future conditions that make adjacent undeveloped property desirable for development, thereby positively impacting future economic conditions.

Economic Impact of Displacements

Impacts to existing commercially owned properties along the corridor are anticipated to be minor and no commercial displacements or permanent closure of access are expected to occur as a result of construction of the Preferred Alternative. The Preferred Alternative will result in three residential displacements (see **Section 3.1.7.1**). Therefore, the local tax base will not be substantially reduced as a result of the project.

Short-Term Economic Impacts

The primary short-term economic impacts that can result from a roadway construction project are business disruptions caused by temporary traffic control, temporary access revisions, and an increase in construction employment. Since the Preferred Alternative is located along an existing alignment, the impact to traffic movements along arterial roadways during construction will be limited to locations of access improvements and interchange or ramp reconfigurations. The required temporary traffic control at these locations is not anticipated to cause substantial delays or adversely impact any businesses. Along K-10, construction will require temporary lane closures and potentially short-term detours. Any temporary lane closures or detours are not anticipated to cause substantial delays or adversely impact any businesses. Final decisions on the required temporary traffic control and construction methods will be determined during the final design phase of the project.

Economic Development and Benefit

Economic development results in higher wages, new jobs, more job choices, increased activity choices, increased economic stability through economic diversification, and improved public amenities. Economic development includes business startup, expansion, attraction, and retention. An efficient transportation system is a key ingredient for economic development as the cost of moving people and goods directly affects the cost of doing business.

Construction of the Preferred Alternative will improve the efficiency of the transportation system in the cities of De Soto, Lenexa, Olathe, and Johnson County. Regional accessibility for local businesses will be enhanced by the additional capacity in the transportation system. It may also promote existing business expansion as well as Johnson County's ability to attract new businesses.

Improvements to the transportation system that yield increased efficiency and safety serve important public interests. Improved efficiency means shorter and more reliable travel times. This leads to greater productivity in business and enjoyment in recreational activities.

3.1.4 Environmental Justice

All federal agencies must comply with Title VI of the 1964 Civil Rights Act (Title VI) and Executive Order 12898: *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*. Under Title VI and related statutes, each federal agency is required to ensure that no person is excluded from participation in, denied the benefit of, or subjected to discrimination under any program or activity receiving federal financial assistance on the basis of race, color, national origin, age, sex, disability, or religion. Executive Order 12898 states that "…each federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations…."

Pursuant to the Executive Order, the FHWA issued Order 6640.23A, *FHWA Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*. The Secretary of Transportation, along with heads of other federal agencies, signed a Memorandum of Understanding on Environmental Justice (EJ MOU) and Executive Order 12898 confirming the continued importance of identifying and addressing these considerations in agency programs, policies and activities as required by Executive Order 12898.

As part of the EJ MOU, each agency agreed to review and update their Environmental Justice (EJ) strategy as appropriate. The updated strategy relies upon existing authorities for achieving EJ as described by Executive Order 12898, such as NEPA,

Title VI and related statutes, as well as the commitments and focus areas in the EJ MOU.

FHWA issued Order 6640.23A, *FHWA Actions to Address EJ in Minority Populations and Low-Income Populations,* on June 14, 2012. On December 16, 2011, FHWA issued a memorandum titled "Guidance on Environmental Justice and NEPA." The memorandum describes the process involved in addressing EJ during NEPA review, including documentation requirements. This guidance helps FHWA staff and NEPA practitioners ensure compliance with EJ requirements.

FHWA administers its governing statutes to identify and avoid discrimination and disproportionately high and adverse effects on minority populations and/or low-income populations by:

1. Identifying and evaluating environmental, public health, and interrelated social and economic effects of FHWA programs, policies, and activities;
2. Proposing measures to avoid, minimize, and/or mitigate disproportionately high and adverse environmental and public health effects and interrelated social and economic effects, and providing offsetting benefits and opportunities to enhance communities, neighborhoods, and individuals affected by FHWA programs, policies, and activities, where permitted by law and consistent with Executive Order 12898;
3. Considering alternatives to proposed programs, policies, and activities where such alternatives would result in avoiding and/or minimizing disproportionately high and adverse human health or environmental impacts, where permitted by law and consistent with Executive Order 12898; and
4. Providing public involvement opportunities and considering the results thereof, including providing meaningful access to public information concerning the human health or environmental impacts and soliciting input from affected minority populations and low-income populations in considering alternatives during the planning and development of alternatives and decisions.

3.1.4.1 Minority and Low-Income Population Determination Methodology

Utilizing federal law and guidance from FHWA, a methodology was developed to determine the presence of EJ populations within and along the project corridor, which is described in the following sections.

Data Sources

Demographic data from the U.S. Census Bureau's 2018-2022 American Community Survey (ACS) Five-Year Estimates were used to identify the minority and low-income populations at the block group level within the study area.

Minority Populations Methodology

In the Environmental Justice Analysis in the *Connected KC 2050 Plan*, MARC defines a minority population as "any identifiable people of color group who live in geographic proximity. This includes people who are Black/African American, Hispanic or Latino, Asian American, American Indian and Alaskan Native and Native Hawaiian and other Pacific Islander."

To identify the minority populations in the study area, the 2022 ACS 5-Year Estimate block group data within Table B03002 (Hispanic or Latino Origin by Race) was utilized to calculate the minority percentages for the block groups, cities of Lenexa, De Soto, and Olathe, Johnson County, and the state of Kansas. A block group was considered to have a minority population if its minority percentage was greater than or equal to the minority percentage for Johnson County (21.84 percent) or the cities of De Soto (16.97 percent), Lenexa (23.10 percent), or Olathe (24.93 percent). This threshold follows MARC's methodology from their *Connected KC 2050 Plan* EJ analysis but utilizes Johnson County and the cities of De Soto, Lenexa, and Olathe as the communities of comparison (COCs) instead of the MPO eight-county planning area.

Low-Income Populations Methodology

In the EJ Analysis in the *Connected KC 2050 Plan*, MARC defines a low-income population as "people whose median household incomes are at or below 200 percent of the U.S. Department of Health and Human Services (HHS) poverty guidelines."

To identify low-income populations in the study area, the 2022 ACS 5-Year Estimate block group data within Table C17002 (Ratio of Income to Poverty Level in the Past 12 Months) was utilized to calculate the percentage of individuals at or below the poverty level and below 200 percent of the poverty level for the block groups, cities of De Soto, Lenexa, and Olathe, Johnson County, and the state of Kansas. Following MARC's methodology, block groups that met, or exceeded the COC's percentages at either at or below poverty or at or below 200 percent of the poverty level were considered to have low-income populations.

3.1.4.2 Determination of Minority and Low-Income Populations

This section discusses the minority and low-income populations identified by the project team using the above methodology.

Minority Populations

A block group was considered to have a minority population if its minority percentage was greater than or equal to the minority percentage for Johnson County (21.84 percent). This threshold follows MARC's methodology from their *Connected KC 2050 Plan* EJ analysis but utilizes Johnson County as the COCs instead of the eight-county MPO planning area. **Figure 3-5** displays the block groups with minority populations higher than the COCs within the study area. **Table A-1** in **Appendix C** displays the

population by race and Hispanic ethnicity for each block group in the study area and the COCs. **Table 3-5** identifies the block groups within or adjacent to the study area that meet the threshold for minority EJ populations. There are 11 block groups which meet the threshold for minority EJ populations. These populations are located throughout the study area and are typically located along large corridors such as I-435, I-35, K-10, and K-7. The majority of these populations are located along the study area between K-7 to the west and I-35 to the east, see **Figure 3-5**. The percentages for the State of Kansas (25.78 percent) and the cities of De Soto (16.97 percent), Lenexa (23.10 percent), and Olathe (24.93 percent) are added to the table for reference.

Low-Income Populations

A block group was considered to have a low-income population if its' percent of individuals at or below poverty level, and/or at or below 200 percent of the poverty level, was greater than or equal to the percent of individuals at or below the poverty level and/or at or below 200 percent of the poverty level for Johnson County. Similar to minority population identification thresholds, this threshold for identifying low-income populations follow MARC's methodology from their *Connected KC 2050 Plan* EJ analysis but compares it to Johnson County instead of the eight-county MPO planning area. **Figure 3-6** displays the block groups with low-income populations higher than the COCs. **Table A-2** in **Appendix C** displays the percentages for at or below the poverty level and at or below 200 percent of the poverty level by block groups using the ACS 5-year data. **Table 3-5** below identifies the block groups within or adjacent to the study area that meet the threshold for low-income EJ populations. There are 11 block groups which meet the threshold for low-income EJ populations. Similar to the minority EJ populations discussed above, the low-income EJ populations are found along major roadway corridors between K-7 to the west and I-35 to the east.

Table 3-5: Block Groups with Minority and Low-Income EJ Populations

Census Area	Percent Minority	Percent Below Poverty	Percent Below 200% of Poverty Level	Minority EJ Population	Low Income EJ Population
CT 524.10 BG 5	13.39%	14.13%	32.73%	-	**Yes**
CT 524.15 BG 1	6.76%	1.94%	3.64%	-	-
CT 524.15 BG 2	21.63%	7.10%	16.68%	-	**Yes**
CT 524.17 BG 1	34.52%	9.38%	22.04%	**Yes**	**Yes**
CT 524.22 BG 1	21.47%	4.39%	27.74%	-	**Yes**
CT 524.22 BG 3	24.13%	0.00%	8.38%	**Yes**	-
CT 524.22 BG 4	34.26%	0.00%	8.38%	**Yes**	-
CT 524.23 BG 1	45.68%	38.42%	78.76%	**Yes**	**Yes**
CT 525.05 BG 1	5.08%	9.38%	15.66%	-	**Yes**
CT 525.06 BG 1	21.48%	2.99%	3.07%	-	-

Census Area	Percent Minority	Percent Below Poverty	Percent Below 200% of Poverty Level	Minority EJ Population	Low Income EJ Population
CT 525.07 BG 1	37.33%	14.29%	34.91%	**Yes**	**Yes**
CT 525.07 BG 2	16.45%	4.51%	10.87%	-	-
CT 526.08 BG 1	11.75%	0.00%	3.57%	-	-
CT 526.08 BG 3	32.97%	11.55%	14.38%	**Yes**	**Yes**
CT 526.09 BG 2	36.59%	0.00%	3.12%	**Yes**	-
CT 526.09 BG 3	14.02%	0.00%	0.00%	-	-
CT 527.01 BG 2	23.69%	0.00%	28.55%	**Yes**	**Yes**
CT 527.01 BG 3	19.51%	0.00%	4.31%	-	-
CT 527.01 BG 4	3.80%	0.00%	2.37%	-	-
CT 527.02 BG 1	0.34%	0.00%	6.13%	-	-
CT 527.02 BG 2	26.47%	19.96%	37.62%	**Yes**	**Yes**
CT 528.04 BG 1	5.01%	0.00%	3.61%	-	-
CT 528.04 BG 2	10.21%	0.00%	5.96%	-	-
CT 528.04 BG 3*	3.79%	0.00%	16.59%	-	**Yes**
CT 528.07 BG 2	5.04%	3.97%	3.97%	-	-
CT 528.07 BG 3	1.79%	0.37%	0.74%	-	-
CT 529.10 BG 3	32.76%	3.37%	13.06%	**Yes**	-
CT 530.05 BG 1	30.65%	3.90%	11.67%	**Yes**	-
CT 9800.01 BG 1	0.00%	0.00%	0.00%	-	-
Communities of Comparison					
State of Kansas	25.78%	11.58%	28.29%	-	-
Johnson County	21.84%	5.27%	13.91%	-	-
City of De Soto	16.97%	5.86%	25.58%	-	-
City of Lenexa	23.10%	5.83%	14.24%	-	-
City of Olathe	24.93%	6.08%	15.96%	-	-

Source: 2018-2022 American Community Survey 5-Year Estimates – Ethnicity (Table B03002); Income (Table C17002)
* CT 528.04 BG 3 is a new BG as of 2020 and covers the Cedar Creek area. Although the data shows it as having a low-income EJ population, it is not in a low-income area. It's in a newer housing development that was in one large BG in 2019 without a low-income population (0.87% below poverty and 3.59% below twice the poverty level). When analyzed at the CT level, CT 528.04 does not contain a low-income EJ population.

3.1.4.3 Environmental Justice Impacts

Impacts of the No-Build Alternative

The No-Build Alternative would have no adverse impacts to EJ populations; however, as forecasted future traffic congestion along the K-10 corridor is realized, safe and

reliable access for EJ populations to jobs and employment centers in or near the study area may be affected.

Impacts of the Preferred Alternative

Direct EJ Impacts

There will be three residential displacements, including one with a home-based business "In2GutRs," and no traditional commercial displacements (see **Section 3.1.7.1**) within minority and low-income population block groups identified within the study area. The Preferred Alternative will also result in 24 partial property acquisitions within minority and low-income populations and 31 partial property acquisitions outside of EJ populations. KDOT performed coordination with the homeowners/residents affected by the residential displacements. After the coordination, it was determined that the Preferred Alternative would not have a disproportionate impact on EJ populations. KDOT will also provide compensation and relocation assistance for those residents affected by acquisition and displacement.

The property owners will be compensated for property acquisitions by KDOT and FHWA guidelines and processes for acquisitions. All acquisitions and relocations will be conducted in conformance with the Uniform Relocation Assistance and Real Property Acquisition Act of 1970, as amended by the Surface Transportation Assistance Act of 1987 and 49 Code of Federal Regulations, Part 24. Relocation assistance will be made available as applicable to all persons and businesses without discrimination (**Commitment C-4**). As part of the property acquisition process, KDOT will coordinate with affected property owners and/or tenants to provide information on federal and state acquisition and relocation assistance policies (**Commitment C-5**).

Because the property owners would be compensated and there are replacement properties available in the surrounding area to which the three displaced households could relocate, impacts would be minimized.

To help mitigate the impact of property acquisitions, KDOT will perform targeted outreach to contact the property owners affected by the property acquisition throughout the project. Additionally, the project will result in improved access to economic development areas, places of employment, and commercial/retail facilities, improved accessibility and safety, and improved bicycle-pedestrian facilities.

The Preferred Alternative will not further the historic bisection of EJ communities. Much of the K-10 corridor was undeveloped when the roadway was originally constructed. The Project will benefit communities along the corridor by improving several north-south connections across K-10 including arterial roadway enhancements. The Preferred Alternative also includes the addition of sidewalks with connections to off-street recreational use paths. The sidewalks and additional connections to off-street recreational paths will provide additional opportunities for pedestrians to safely move along the corridor.

3.1.5 Parks and Recreation Section 4(f)/6(f)

The U.S. Department of Transportation (USDOT) refers to publicly owned land from parks, recreation areas and wildlife and waterfowl refuges, or land from historic sites that are listed or potentially eligible for listing on the National Register of Historic Places, as “Section 4(f) properties” because they have special status under the provisions of Section 4(f) of the USDOT Act of 1966 (49 USC Part 303 and 23 CFR Part 774). Section 4(f) states that the Administration may not approve the use of a Section 4(f) property unless a determination is made that:

1. There is no prudent and feasible avoidance alternative to the use of the property and
2. The action includes all possible planning to minimize harm to the property; or if the use of the property, including any measures to minimize harm (avoidance, minimization, mitigation, or enhancement measures) will have a de minimis impact on the Section 4(f) property.

In addition, any public park or recreation land that has used funds from the National Park Service’s (NPS) Land and Water Conservation Fund (LWCF) for acquisition or development is protected under Section 6(f) of the LWCF Act.

For the K-10 Capacity Improvements Project, there are nine parks and 10 recreational facilities within or adjacent to the study area. These resources are shown on **Figure 3-8** and described below, listed from east to west through the study area and grouped by city. It is noted in each section if the park is designated as a Section 4(f) or 6(f) property.

3.1.5.1 Parks

Lenexa, KS

Trafalgar Park – Section 4(f)

Trafalgar Park is a 0.8-acre open space park located east of I-35 and Lenexa Drive between W. 99th Street and Piccadilly Circle. The park contains an open play area and a playground. The playground is geared toward kids ages 5-12 years old. It is located approximately 0.25 miles west of Rosehill Elementary School. Street parking is available surrounding the park.

John McNerney Park – Section 4(f)

John McNerney Park is an approximate 1.5-acre neighborhood park located to the west of I-35 on Pennycross Road. The park contains a basketball court (half court) and a playground. The playground is geared toward kids ages 5-12 years old. Street parking is available in the surrounding neighborhood.

Electric Park – Section 4(f)

Electric Park is approximate 10-acre park located east of I-435 on W. 95th Street. The park contains a basketball court (half court), horseshoe pits, playgrounds, two sand volleyball courts, soccer/flag football/lacrosse fields, trail, grills, and a community garden. The shelter has a capacity of 55 with electricity, lighting, and grills. Parking is available on the north side of the park.

Mill Creek Streamway Park – Section 4(f)

Mill Creek Streamway Park is a linear park located north and south of K-10 between I-435 and K-7. The park contains approximately 17 miles of pedestrian and bicycle trails, three miles of equestrian trails, shelters, and open spaces for jogging, hiking, and picnicking. There are multiple access points and areas for parking. Within the park is the Gary L. Haller Trail, which is 13.8-miles long and connects to Shawnee Mission Park to the north.

The park is listed as having received LWCF funds making it a Section 6(f) resource. Coordination with the Section 6(f) contact for Kansas, the Kansas Department of Wildlife and Parks (KDWP), identified the southern portion of the Section 6(f) boundary ending just north of Shawnee Mission Parkway. Therefore, the portion of Mill Creek Streamway Park within the study area is not a Section 6(f) resource.

Coon Creek Greenway/Trail – Section 4(f)

Coon Creek Greenway is an approximate 40.4-acre park located east of K-7 with 22.6 acres north of Prairie Star Parkway and 17.8 acres south of Prairie Star Parkway. Coon Creek Greenway is heavily wooded and has a paved, walking trail which connects to Black Hoof Park to the north.

Cedar Station Park - Mize Lake – Section 4(f)

Cedar Station Park is an approximately 74-acre park which houses Mize Lake. The park is located west of K-7 and north of K-10 off Canyon Creek Boulevard. Cedar Station Park contains lake access, fishing, and trails. Mize Lake Trail is located within the park and is approximately 0.8 miles long. No official parking is available at Cedar Station Park. The Cedar Station Park completed construction of new amenities and had the ribbon cutting for the newly constructed area on April 30, 2024. New amenities added include a parking lot, small shelters, a playground, seasonal restrooms, and an ADA-compliant trail.

Olathe, KS

Meadowlane Greenway – Section 4(f)

Meadowlane Greenway is approximately 18.6-acres and located south of K-10 on S. Woodland Street. Meadowlane Greenway is a passive park and green space with no amenities.

De Soto, KS

Kill Creek Streamway Park – Section 4(f)

Kill Creek Streamway Park is an approximate 105-acre linear park located south of K-10. Kill Creek Streamway Park consists of two separate segments with a paved, multi-use trail approximately 8.9-miles total, and open spaces for jogging, biking, picnicking, and hiking. Near the W. 95th Street access point for the park, there is a 16-acre off-leash area for dogs. The park is part of Johnson County's effort to create linear parks along major streams in Johnson County. Long term plans for the park include connecting the existing segments and extending the trail from the Kansas River to Gardner, Kansas. Parking is available near the various access points for the park.

Lexington Lake Park – Section 4(f)

Lexington Lake Park is an approximately 465-acre park with a 27-acre lake located north of K-10 and west of De Soto, Kansas. Park amenities include a lake, boating, fishing, picnic areas, shelter, playground, restrooms, 1.5-mile paved multi-use trail, and nine miles of mountain bike/ hiking trails. The 2008 Sunflower Nature Park + Rieke Lake (now Lexington Lake) + Cedar Niles Master Plan identifies recommendations for existing and future parks, including Lexington Lake. Phase 1, completed in 2017, included upgrading park amenities to what is listed above. Phases 2 and 3 include athletic practice fields, additional parking, marina, natural amphitheater, disc golf course, camping sites, cross country course, picnic shelters, and a park maintenance facility. The disc golf course is now open. The new course is rigorous and wooded in places with a few open holes. It is located on the east side of the park and consists of nine holes with two baskets at each hole. The new parking lot contains 15 spaces and is located near the start of the course.

3.1.5.2 Recreation

Resources listed below are not considered to be Section 4(f) resources as they are not publicly owned land from parks, recreation areas, or wildlife and waterfowl refuges, or land from historic sites. These are recreational facilities that are available to the public within or adjacent to the study area.

Lenexa, KS

Elite Gymnastics & Aquatics

This is a privately owned gymnastics and aquatic facility located on the east side of I-35 on W. 108th Street. The gymnasium and pool are open to members Monday through Thursday and Saturdays. Parking is available on-site.

Life Time Lenexa

This is a privately owned athletic country club located south of W. 90th Street adjacent to the west side of Renner Boulevard. Life Time Lenexa is open to members seven days a week. Parking is available on-site.

Falcon Valley Golf Course

This is a privately owned club house and golf course located north of K-10 and west of Mill Creek. The golf course is a championship length nine-hole golf course that stretches from Lone Elm Road to the BNSF railroad tracks located adjacent to the west bank of Mill Creek. It is open seven days a week with applicable entrance fees.

Smiley's Golf Complex

This is a privately owned golf complex located east of K-7 and north of K-10. Smiley's Golf Complex includes a driving range, golf course, and mini golf. It is open seven days a week with applicable entrance fees.

Olathe, KS

Genesis Health Clubs- Olathe Ridgeview

This is a privately owned gym located south of K-10 on W. 106th Street. The Genesis Health Clubs is open to members seven days a week. Parking is available on-site.

Garmin Olathe Soccer Complex

This is a privately owned soccer complex located south of K-10 on W. 106th Street. The Olathe Soccer Complex has nine soccer fields available for use. The complex is used for soccer leagues, tournaments, and field rentals.

College Boulevard Activity Center

College Boulevard Activity Center is owned and operated by the Olathe District Schools. It is located east of K-7 and south of K-10 with access from Lone Elm Road. The activity center is part of Olathe Northwest High School and contains tennis courts, soccer fields, and baseball/softball fields available for public use. Parking is available on-site.

Shadow Glen Golf Club

This is a privately owned golf club located south of K-10 at the Cedar Creek Parkway exit. Shadow Glen Golf Club has an 18-hole Golf Course, eight-acre practice facility, and a clubhouse. It is open seven days a week for members.

De Soto, KS

Oak Country Golf Course

This is a privately owned golf course located east of K-10 on Scott Drive. Oak Country Golf Course includes golf and foot golf courses and a 10-acre lake for fishing. It is open seven days a week with applicable entrance fees.

3.1.5.3 Parks and Recreation Impacts

Impacts of the No-Build Alternative

Since no construction would occur under a No-Build Alternative, the No-Build Alternative would have no impacts to parks or recreational facilities.

Impacts of the Preferred Alternative

The Preferred Alternative will have minor impacts to Mill Creek Streamway Park and the Coon Creek Greenway. The impacts to the designated Section 4(f) properties are expected to be *de minimis* impacts, meaning the features, attributes, or activities qualifying for protection under Section 4(f), such as the recreational aspects of the parks, will not be adversely affected by the project. **Table 3-6** summarizes the park impacts of the Preferred Alternative. Coordination regarding concurrence of the *de minimis* park impacts with FHWA, Johnson County Park and Recreation District (JCPRD) for Mill Creek Streamway Park, and the City of Lenexa for the Coon Creek Greenway was performed by KDOT. Concurrence on the *de minimis* impacts determination was received from JCPRD on 10/03/2024 and the City of Lenexa on June 6, 2024. The Section 4(f) coordination is located in **Appendix D**. If modifications are made to the proposed construction limits for the Preferred Alternative that result in additional impacts to Section 4(f) resources, coordination with the agency with resource jurisdiction, and FHWA will be required to clear the additional impacts. This commitment will be updated once Section 4(f) coordination is completed (**Commitment C-6**).

Table 3-6: Preferred Alternative Park Impacts

Facility	Impact (Acres)	Impact Description
Mill Creek Streamway Park	0.1	The park will be impacted by grading and contouring due to the widening of K-10 and the replacement of the bridges spanning Mill Creek and the BNSF railroad tracks. The only recreation amenity that will be impacted within the park is the Gary L. Haller Trail (see **Section 3.1.6.2**).
Coon Creek Greenway	0.1	The park will be impacted by grading and contouring due to the improvements associated with the reconfiguration of the Prairie Star Parkway/K-7 interchange. No recreational amenities will be impacted.

Note: Park impacts are listed from east to west throughout the K-10 Capacity Improvements corridor.

3.1.6 Bicycle and Pedestrian Facilities

A review of information pertinent to bicycle and pedestrian facilities took into consideration on-street bike lanes, sidewalks, and multi-use recreational trails. This information was used to identify facilities within the study area which are shown on **Figure 3-8**.

3.1.6.1 Bike Routes

There are four roadways within the study area with existing bike routes and three planned bike routes within the study area. The existing and planned bike routes within the study area are located at the following locations:

Existing Bike Routes

- **Bike Lane –** A designated bike lane with separate striping is located on Woodland Road from K-10 to W. 105th Street within the study area. The bike lane continues south along Woodland Road until Northgate Street.
- **Bike Route –** Prairie Star Parkway from K-7 to Ridge Drive. This bike route is a shared roadway route with no bike lane markings.
- **Bike Route –** West Valley Parkway from Cedar Creek Parkway to approximately W. 103rd Terrace. This bike route is a shared roadway route with no bike lane markings.
- **Bike Lane –** A designated bike lane with separate striping is located on W. 91st Street from Sunflower Road to Lexington Ave.
- **Bike Lane** – A designated bike lane with separate striping is located on S. Lone Elm Road. The bike lane has two separate sections that are separated by roadway segments without designated bike lanes or markings.

Planned Bike Routes

- **Bike Route –** There is a planned segment of a bike route which will run along College Boulevard between S. Lone Elm Road to S. Clare Road. The planned segment crosses the study area in the vicinity of K-7. This will be a shared roadway route with no bike lane markings.
- **Bike Route –** There is a planned segment of a bike route which will run along Ridgeview Road between K-10 to E. Santa Fe Street. This bike route will be a shared roadway route with no bike lane markings.
- **Bike Route –** There is a planned segment of a bike route located within the study area which will run along 103rd Street and Pflumm Road. The bike route along 103rd Street will have shared lane markings and along Pflumm Road there will be a buffered bike lane.

Impacts of the No-Build Alternative

Since no construction would occur under the No-Build Alternative, the No-Build Alternative would have no impacts to bike routes.

Impacts of the Preferred Alternative

The Preferred Alternative will temporarily impact approximately 627.7 feet of the Woodland Road bike lane, 942.0 feet of the 91st Street Bike Lane, and 1,926.3 feet of the S. Lone Elm Road Bike Lane. Bike lanes are considered a Section 4(f) property when they are publicly owned and functioning primarily for recreation. The impacts to the Section 4(f) properties will be *de minimis* impacts, meaning the features, attributes, or activities qualifying for protection under Section 4(f) will not be adversely affected by the project. The Woodland Road and 91st Street bike lanes have been determined to be Section 4(f) properties. They are dedicated bike lanes not identified as transportation use by the City of Olathe or the City of De Soto, respectively, therefore, considered to be Section 4(f) properties. The impacted portions of the bike lanes will be replaced in-kind during project construction (**Commitment C-7**).

3.1.6.2 Trails

There are 22 trails located within or adjacent to the study area. Out of the 22 trails, two are regional trails, 19 are local trails, and one is a private trail. The trails are shown on **Figure 3-8**. **Table 3-7** below summarizes the trails within or adjacent to the study area. Trails are listed from east to west of the study area and grouped by the jurisdiction responsible for the trail. The trails are described in more detail below.

Table 3-7: Trails Within or Adjacent to the Study Area

Jurisdiction	Facility	Type	Trail Description
Lenexa	95th Street Trail	Local	Eight-foot-wide shared use path
	Electric Park Trail	Local	Eight-foot-wide pedestrian hike trail
	87th Street Trail	Local	Ten-foot-wide shared use path
	Renner Road Trail	Local	Ten-foot-wide shared use path
	Prairie Star Parkway Trail	Local	Ten-foot-wide shared use path
	Ridgeview Road Trail*	Local	Ten-foot-wide shared use path
	Woodland Road Trail	Local	Ten-foot-wide shared use path
	K-10 Trail	Local	Ten-foot-wide shared use path
	Coon Creek Trail	Local	Ten-foot-wide shared use path
Olathe	Ridgeview Road Trail*	Local	Ten-foot-wide shared use path
	Meadow Lane Trail	Local	Ten-foot-wide shared use path
	107th Street Trail	Local	Ten-foot-wide shared use path
	College Boulevard Trail	Local	Eight-foot-wide shared use path
De Soto	Lexington Ave Trail	Local	Eight-foot-wide shared use path
	91st Street Trail	Local	Eight-foot-wide shared use path
Johnson County Parks and Recreation Department	Gary L. Haller Trail	Regional	Ten-foot-wide shared use path
	Kill Creek Streamway Trail	Regional	Ten-foot-wide shared use path
	Kill Creek Streamway Off Leash Trail	Local	Four-foot-wide pedestrian hike trail
	Lexington Lake Cross Country Course	Local	Six-foot-wide pedestrian hike trail
	Lexington Lake Trail	Local	Ten-foot-wide shared use path
Private	Barrington Park Apartments Trail	Private	Six-foot-wide pedestrian hike trail

Jurisdiction	Facility	Type	Trail Description
Private Cont.	Renner Ridge Corporate Center Trail	Private	Eight-foot-wide shared use path

* Ridgeview Road Trail north of K-10 is under City of Lenexa Jurisdiction and south of K-10 is under City of Olathe Jurisdiction.

City of Lenexa Jurisdiction

95th Street Trail

The 95th Street Trail is a multi-use trail on the north side of W. 95th Street. The trail totals 1.7 miles and is classified as a Shared Use Path by MARC. It consists of a shared use sidewalk eight feet in width on the north side, adjacent to traffic in the westbound lane, and has no recreational facilities. The 95th Street Trail connects to the Prairie Star Parkway and Renner Road trails.

Electric Park Trail

The Electric Park Trail is a multi-use trail within Electric Park. The trail totals 0.5 miles and is classified as a Pedestrian Hike Trail by MARC. Electric Park Trail consists of an eight-foot-wide shared use sidewalk and has a playground and picnic shelter along the trail.

87th Street Trail

The 87th Street Trail is located along the north and south sides of W. 87th Street from Loiret Boulevard to the east and Haven Street to the west. The trail totals 1.3 miles and is classified as a Shared Use Path by MARC. It consists of a 10-foot-wide shared use sidewalk and has no recreational facilities. The W. 87th Street Parkway Trail connects to the Renner Road and Lenexa City Center trails.

Renner Road Trail

The Renner Road Trail is a multi-use trail along Renner Boulevard. The trail totals approximately one mile and is classified as a Shared Use Path by MARC. It consists of a 10-foot-wide shared use sidewalk and has no additional recreational facilities. The Renner Road Trail connects to the Prairie Star Parkway and 95th Street trails to the south and the 87th Street Trail to the north.

Prairie Star Parkway Trail

The Prairie Star Parkway Trail consists of two separate sections along both sides of Prairie Star Parkway. Approximately 2.8 miles of the trail is located along the south side of Prairie Star Parkway from West 60 Park at the west end of Prairie Star Parkway ending at Lone Elm Road to the east. Another approximate 2.1-mile-long section of trail is located along the north side of Prairie Star Parkway from Woodland Road to the west and Renner Boulevard to the east. The Prairie Star Parkway Trail is classified as a Shared Use Path by MARC. The trail consists of a 10-foot-wide shared use sidewalk on the south side and an eight-foot-wide shared use sidewalk on the north side with no

additional recreational facilities. The Prairie Star Parkway trail connects to the Gary L. Haller and Renner Road trails. Sections of the Prairie Star Parkway Trail are designated as part of the American Discovery Trail, which is a cross country trail stretching from Cape Henlopen State Park in Delaware to Ft. Reyes National Seashore in California. The American Discovery Trail is a network of existing trails operated by local, state, and federal agencies. The organization of the trail network as the American Discovery Trail is overseen by the Non-Profit American Discovery Trail Society. It has no specific regulations or protections other than those for the existing trail system that it utilizes.

Ridgeview Road Trail

The Ridgeview Road Trail is a 1.2-mile-long multi-use, hard surface trail. It is classified as a Shared Use Path by MARC. The trail is 10 feet in width and runs adjacent to Ridgeview Road between Prairie Star Parkway to the north and K-10 to the south. The trail connects to the Prairie Star Parkway Trail to the north. Approximately 1.1 miles of the trail, north of K-10, falls under the jurisdiction of the City of Lenexa. Approximately 0.1 miles of the trail south of K-10 falls under the jurisdiction of the City of Olathe.

Woodland Road Trail

The Woodland Road Trail is located along the west side of Woodland Road and is split into two segments. The northern segment is approximately 0.7 miles long and runs south from W. 91st Street. The southern segment is approximately 0.2 miles long and runs north through the Woodland Road/K-10 interchange until it connects with the K-10 Trail. The trail totals 0.9 miles and is classified as a Shared Use Path by MARC. The trail consists of a 10-foot-wide shared use sidewalk and has no additional recreational facilities.

K-10 Trail

The K-10 Trail is a multi-use trail on the north side of K-10 from Woodland Road to Lone Elm Road. The trail totals 1.5 miles and is classified as a Shared Use Path by MARC. It consists of a 10-foot-wide shared use sidewalk and has no additional recreational facilities.

Coon Creek Greenway/Trail

The Coon Creek Greenway/Trail is a multi-use trail which travels north/south and intersects with Prairie Star Parkway. The trail totals 1.1 miles and is classified as a Shared Use Path by MARC, connecting with Black Hoof Park Trail to the north. It consists of a 10-foot-wide shared use sidewalk and has no additional recreational facilities.

City of Olathe Jurisdiction

Meadow Lane Trail

The Meadow Lane Trail is a multi-use trail and is classified as an asphalt trail by the city of Olathe and a Shared Use Path by MARC. The trail is split into two portions. The western portion travels behind two residential developments and is a 1.2-mile-long, 10-foot-wide asphalt trail that connects to the South Lone Elm Road and W. 107th Street trails. The eastern portion is located off W. 106th Street and is a 0.5-mile-long asphalt trail that connects to the Camelot Reserve.

107th Street Trail

The 107th Street Trail is a multi-use 0.5-mile-long trail and is classified as a Shared Use Path by MARC. The trail runs along the south side of 107th Street and consists of a 10-foot-wide shared use sidewalk. It connects to the Meadow Lane and S. Valley Road trails.

S. Lone Elm Road Shared Use Path

The S. Lone Elm Road Shared Use Path is an approximate 1.6-mile-long path on the east side of S. Lone Elm Road. The north end of the path is just south of an access road from S. Lone Elm Road to W. 106th Street and travels south to W. 119th Street.

College Boulevard Trail

The College Boulevard Trail is a multi-use 3.9-mile-long trail. It is classified as a Shared Use Path by MARC. Two miles of the trail runs along the north side of College Boulevard between S. Woodland Road to the west and Renner Boulevard to the east. A 0.9-mile section of the trail runs along the south side of College Boulevard between S. Lone Elm Road to the west and S. Woodland Road to the east. The remaining one-mile section of trail runs along the north side of College Boulevard between S. Clare Road to the west and K-7 to the east. The trail consists of a 10-foot-wide shared use sidewalk and connects to the Meadow Lane, Gary L. Haller, and Ridgeview Road trails.

City of De Soto Jurisdiction

Lexington Avenue Trail

The Lexington Avenue Trail 2.0-miles-long and is classified as a Shared Use Path by MARC. The Lexington Avenue Trail is designated as part of the American Discovery Trail. The portion of the trail within the study area is eight-feet-wide and begins around Lexington Avenue. The trail then heads north along the east side of Lexington Avenue past the Lexington Trails Middle School where it exits the study area. This trail connects to the 91st Street Trail, which ends on the west side of Lexington Avenue, and to the Kill Creek Streamway Trail to the east.

91st Street Trail

The 91st Street Trail is a multi-use trail on the south side of W. 91st Street. The trail totals one mile and is classified as a Shared Use Path by MARC. It consists of a shared use sidewalk eight feet in width adjacent to traffic in the eastbound lanes and has no recreational facilities. The 91st Street Trail connects to the trails at Lexington Lake to the west and the Lexington Avenue Trail to the east.

Johnson County Park and Recreation District Jurisdiction

Gary L. Haller Trail

The Gary L. Haller Trail, which lies within the Mill Creek Streamway Park, is 13.8 miles long, and is classified as a Shared Use Path by MARC. This trail is 10 feet in width and connects to Shawnee Mission Park to the north. There are various recreational facilities along the trail within Mill Creek Streamway Park. The section of the Gary L. Haller Trail within the study area is designated as part of the American Discovery Trail. The trail crosses the study area below K-10 between Ridgeview Road and Woodland Road.

Kill Creek Streamway Trail

The Kill Creek Streamway Trail, which lies within the Kill Creek Streamway Park, is split into two sections totaling approximately 8.9 miles and is classified as a Shared Use Path by MARC. The northern section of the trail crosses the study area and is approximately three miles long. This trail is 10 feet wide and connects to Lexington Avenue Trail to the north.

Kill Creek Streamway Off Leash Trail

The Kill Creek Streamway Off Leash Trail is located south of K-10 off W. 95th Street. The trail totals approximately 0.7 miles and is classified as a Pedestrian Hike Trail by MARC. It is an unpaved path, four feet in width, and is located within the off-leash dog area of Kill Creak Streamway Park. The Off Leash Trail connects to the Kill Creek Streamway Trail.

Lexington Lake Trail Cross County Course

The Lexington Lake Cross Country Course is located within Lexington Lake Park. The course totals 3.1 miles and is classified as a Pedestrian Hike Trail by MARC. The Lexington Lake Cross Country Course is 10 feet in width, unpaved, and connects to various trails within Lexington Lake Park.

Lexington Lake Trail

The Lexington Lake Trail is a multi-use trail located within Lexington Lake Park. The trail totals 1.5 miles and is classified as a Shared Use Path by MARC. The trail is 10 feet in width, loops around Lexington Lake, and has no additional recreational facilities. The Lexington Lake Trail connects to 91st Street Trail and is crossed by the Lexington Lake Cross Country Course.

Private Jurisdiction

Barrington Park Apartments Trail

The Barrington Park Apartments Trail is located south of I-435 off Hauser Street. The trail totals approximately 0.8 miles and is classified as a Shared Use Path by MARC. It consists of a sidewalk six feet in width, has no additional recreational facilities, and is located adjacent to residential neighborhoods.

Renner Ridge Corporate Center Trail

The Renner Ridge Corporate Center Trail is a multi-use trail that goes through a business park (Renner Ridge Corporate Park). The trail totals one mile and is classified as a Shared Use Path by MARC. It consists of an eight-foot-wide shared use sidewalk and has no additional recreational facilities. The Renner Ridge Corporate Center Trail connects to the bike lane and trail along Prairie Star Parkway. Since the trail is located on privately-owned property and managed by a private agency, it is not considered a Section 4(f) resource.

Impacts of the No-Build Alternative

Since no construction would occur under the No-Build Alternative, the No-Build Alternative would have no trail impacts.

Impacts of the Preferred Alternative

The Preferred Alternative will temporarily impact 12 trails with an impacted length of approximately 13,710 feet. Trails are considered a Section 4(f) property when they are publicly owned and functioning primarily for recreation. The impacts to the Section 4(f) properties will be *de minimis* impacts, meaning the features, attributes, or activities qualifying for protection under Section 4(f) will not be adversely affected by the project. Concurrence on the *de minimis* impacts findings was received from the City of Lenexa on June 6, 2024, the City of Olathe on September 18, 2024, the City of De Soto on June 21, 2024, and Johnson County on 10/03/2024. The Section 4(f) coordination is located in **Appendix D**. All impacts to trails will be temporary. There will be realignments of some trails, but these will be minor and will not impact the use of the trails. The impacted portions will be replaced during project construction (**Commitment C-8**). Approximately 343 feet of the Ridgeview Road Trail lies within the construction limits of the Preferred Alternative; however, the trail will not be impacted as it is carried on a bridge over K-10 and no changes to the Renner Road Bridge will occur as part of the Preferred Alternative. **Table 3-8** summarizes the impacts to trails as a result of constructing the Preferred Alternative.

Table 3-8: Preferred Alternative Trail Impacts

Trail Name	Impact (linear feet)	Impact Description
95th Street Trail	2,118	The trail will be temporarily impacted by grading and contouring improvements to 95th Street west of Loiret Boulevard. These impacts include the re-alignment of the trail slightly to the north (approximately 5 - 10 feet) to accommodate improvements to the 95th Street/I-435 interchange to include the addition of an I-435 southbound off-ramp to 95th Street and an I-435 southbound on-ramp from 95th Street.
Renner Ridge Corporate Center	71	The trail will be impacted by grading and contouring improvements associated with the construction of the 95th Street on-ramp to I-435 southbound. These impacts include reconstructing the impacted portion along the same alignment while allowing the trail to connect to a sidewalk that is being constructed along the south side of 95th Street.
Gary L. Haller Trail	842	The trail will be impacted due to bridge replacement and grading and contouring improvements to K-10 between Woodland Road and Ridgeview Road. The trail will be shifted slightly to the east, approximately eight feet, with no impacts to the overall length of the trail. A detour will be provided to minimize the impacts associated with the temporary closure of the trail and will be coordinated with JCPRD and the public will be notified. Additionally, a temporary structure will be put in place to allow the trail to remain open during much of the project construction (**Commitment C-9**).
Woodland Road Trail	971	The trail will be impacted by grading and contouring associated with the reconfiguration of the Woodland Road/K-10 interchange. These impacts include shifting the section of the trail that runs through the interchange approximately 50 feet to the east to accommodate the interchange reconfiguration. The trail will travel through the center of the interchange and return to the west side of Woodland Road, north of K-10.
K-10 Trail	3,475	The trail will be impacted by grading and contouring improvements associated with widening K-10 between Woodland Road and Lone Elm Road and the construction of the K-10/Lone Elm Road interchange. These impacts include the realignment of the K-10 Trail as it begins to approach Lone Elm Road to accommodate the addition of the K-10 off-ramp to Lone Elm Road and the slight realignment of the section of trail that connects to the Woodland Road Trail.
Meadow Lane Trail	282	The trail will be impacted by grading associated with improvements to S. Lone Elm Road. These impacts will be temporary. The trail will be reconstructed in place after the construction of S. Lone Elm Road improvements are completed.
S. Lone Elm Road Shared Use Path	2,924	The shared use path will be impacted by grading associated with improvements to S. Lone Elm Road. These impacts will be temporary. The shared use path will be reconstructed in place after the construction of S. Lone Elm Road improvements are completed.

Trail Name	Impact (linear feet)	Impact Description
College Boulevard Trail	38	The trail will be impacted by grading associated with the K-7 southbound off-ramp to College Boulevard. These impacts will be temporary. The trail will be reconstructed in place after the construction of the K-7 southbound off-ramp is completed.
Prairie Star Parkway Trail	456	The trail will be impacted by grading and contouring associated with the reconfiguration of the Prairie Star Parkway/K-7 interchange. These impacts include the slight re-alignment of the trail to the south (approximately 5-10 feet) to accommodate the on-ramp to southbound K-7. The trail will also be extended through the interchange and connect to the sidewalk along the north side of Prairie Star Parkway.
Kill Creek Streamway Trail	262	The trail will be temporarily impacted due to the widening of K-10 requiring replacement of the bridges that cross Kill Creek and the trail. The impacts will be minimized and limited to temporary trail closures and no physical impacts. To minimize the impact of construction on trail users, a temporary structure will be put in place to allow the trail to remain open as much as possible during project construction. Any temporary trail closures will be coordinated with JCPRD, will occur overnight, and will be short-term in nature (**Commitment C-10**).
Lexington Avenue Trail	1,391	The trail will be impacted due to grading and contouring associated with the reconfiguration of the Lexington Avenue/K-10 interchange. These impacts include the re-alignment of the trail to the east (approximately 45-50 feet), along the 91st Street roundabout, to accommodate extending the outside lane of the 91st Street roundabout.
91st Street Trail	878	The trail will be impacted due to grading and contouring improvements to 91st Street west of Lexington Avenue. These impacts include the straightening of the trail and a slight horizontal shift (5-10 feet) to sections of the trail.

Note: Trail impacts are listed from east to west throughout the K-10 Capacity Improvements corridor.

The Preferred Alternative will also include the following new or updated Sidewalks:

- New sidewalk along the east side of Evening Star Road and north side of W. 103rd Street.
- West side of Edgerton Road, extending from W. 95th Street through the K-10/Edgerton Road interchange.
- West side and east side of Lexington Avenue extending north from W. 95th Street and connecting to the 91st Street Trail.
- Through the K-10/Cedar Creek Parkway/Canyon Creek Boulevard on the east and west sides of S. Cedar Creek Parkway/Canyon Creek Boulevard.
- North and south sides of Prairie Star Parkway between Monticello Terrace and K-7. This sidewalk acts as a connector for the Prairie Star Parkway Trail through the K-7/Prairie Star Parkway interchange.
- West side of S. Lone Elm Road from the end of the existing sidewalk near Prairie Trail Middle School, through the K-10/Lone Elm Road interchange, to W. 101st Street.

- New trail on the east side of S. Lone Elm Road that connects to the existing shared use path south of K-10, extends through the Lone Elm Road / K-10 interchange, and connects to the relocated K-10 Trail on the north side of K-10.
- West side and east side of Renner Boulevard, traveling through the K-10/Renner Boulevard interchange, ending at W. 103rd Street.
- North side and south side of W. 95th Street from Ridge Drive to Loiret Boulevard.
- East side and west side of Lackman Road from W. 105th Street to W. 101st Terrace.

3.1.7 Right-of-Way and Relocation Potential

The project will require additional ROW along K-10 as well as select arterial streets to construct the Preferred Alternative. ROW acquisition was evaluated within the categories of permanent impacts and temporary impacts due to construction activities. Permanent impacts are those property acquisitions that are necessary for the new alignment of K-10 that will be converted to permanent ROW or a permanent easement. Temporary impacts are those property acquisitions that are needed as temporary construction easements and do not require ROW to be permanently acquired.

Relocation impacts were evaluated within the categories of residential, business, parkland, and cemetery displacements. None of the improvements included in the Preferred Alternative impact cemeteries.

3.1.7.1 Right-of-Way Impacts and Potential Relocations

It is the policy of KDOT that no person be requested to move from their dwelling until at least one comparable replacement dwelling has been made available to that person. A comparable, replacement dwelling is safe, decent, sanitary, and functionally similar to the present dwelling, and within the financial means of the displaced person. The replacement housing must also be open to persons regardless of race, color, religion, or national origin.

A representative of KDOT will assist each displaced person in securing comparable replacement housing and be sensitive to the special needs of any special group of residents. The relocation coordination office will maintain liaison activities with other agencies rendering services useful to persons who must relocate. The occupants of residences are entitled to receive reasonable and necessary moving costs and related expenses for relocating their personal property.

Impacts of the No-Build Alternative

The No-Build Alternative would not require any property acquisition; therefore, it would have no relocation impacts.

Impacts of the Preferred Alternative

The Preferred Alternative will require the acquisition of three residential properties and no commercial properties. The displacements are shown on **Figure 3-8 (Pages 1 & 3 of**

12). The residential displacements and total property acquisitions are summarized below.

- 39365 W. 103rd Street, Eudora, KS 66025 – Residential displacement
- 9315 Lexington Avenue, De Soto, KS 66018 – Residential displacement
- 9313 Lexington Avenue, De Soto, KS 66018 – Residential displacement with home-based business
- Property ID AF221233-2009, De Soto, KS 66018 – Unplatted full property acquisition

Property acquisition for the Preferred Alternative will result in approximately 87.1 acres of new ROW (3.7 acres full property acquisition and 93.1 acres of partial property acquisition), 5.5 acres of permanent easements, and 29.4 acres of temporary easements.

Property owners will be compensated for property acquisitions as determined by KDOT and FHWA guidelines and processes for ROW acquisitions. All ROW acquisitions and relocations will be conducted in conformance with the Uniform Relocation Assistance and Real Property Acquisition Act of 1970, as amended by the Surface Transportation Assistance Act of 1987 and 49 Code of Federal Regulations, Part 24. Relocation assistance will be made available to all persons to be relocated without discrimination (**Commitment C-4**).

3.1.8 Construction and Emergency Routes

This section addresses the potential impacts from construction of the Preferred Alternative on emergency routes and access. It is essential for the health, safety, and general welfare of a community that emergency response vehicles and services have adequate roadway access to all residential, commercial, and industrial properties. K-10 is a vital connection between the southwest region of the Greater Kansas City metro area to Lawrence and I-70.

Impacts of the No-Build Alternative

Under the No-Build Alternative, there would be no new construction, therefore, no direct impacts to existing emergency routes. However, emergency response times may be impacted due to roadway congestion and incidents.

Impacts of the Preferred Alternative

Construction of the Preferred Alternative will not result in the permanent severing of access to any existing streets or properties.

Construction phasing will be implemented to ensure that emergency response vehicles can maintain access throughout the corridor (**Commitment C-11**). Any detours will be temporary and limited in duration to the period of time required to construct project improvements. The exact location, timing, and duration of road closures have not been finalized. A traffic management plan will be developed and implemented during the

construction phase(s) of the project. Access to properties along the K-10 corridor will be maintained by phased construction, temporary access roads, or other appropriate means.

Depending on future development and the location of future community emergency response facilities, emergency response times along the K-10 corridor could effectively be reduced with construction of the proposed project. The interchange reconfigurations and adjacent roadway improvements associated with the Preferred Alternative will allow emergency vehicles to travel the K-10 corridor with reduced congestion and utilize an improved higher speed facility instead of slower moving arterial roadways. Construction of the proposed project will likely provide benefits to emergency response times.

3.1.9 Transportation

The primary roadways within the study area, shown in **Figure 1-1** from **Chapter 1**, are K-10, Evening Star Road, Edgerton Road, Sunflower Road, Lexington Avenue, Kill Creek Road, Corliss Road, Cedar Creek Road, Cedar Creek Parkway, K-7, South Woodland Road, Ridgeview Road, Renner Boulevard, I-435, Lackman Road, Santa Fe Trail Drive, I-35, and Pflumm Road. From I-435 to the study area's western limits at Evening Star Road, K-10 is generally a four-lane divided access-controlled freeway with a grass median.

K-10 runs from I-70 on the west of Lawrence, Kansas east to the eastern edge of the study area in Lenexa and Olathe, Kansas at I-435.

A brief description of the roadways that cross or are crossed by K-10 within the study area are included below:

- Evening Star Road is a two-lane north/south undivided arterial that travels under K-10 with connections via a diamond interchange.
- Edgerton Road is a two-lane north/south undivided arterial that travels under K-10 with connections via a diamond interchange.
- Sunflower Road is a two-lane north/south undivided arterial that travels under K-10.
- Lexington Avenue is a four-lane north/south undivided arterial that travels under K-10 with a folded diamond interchange.
- Kill Creek Road is a two-lane north/south undivided arterial that travels over K-10 with connections via a diamond interchange.
- Corliss Road is a two-lane north/south undivided arterial that travels under K-10.
- Cedar Creek Road is a two-lane north/south undivided arterial that travels under K-10.
- Cedar Creek Parkway, just south of K-10 and Canyon Creek Boulevard just north of K-10, is a north/south two-lane arterial that travels under K-10 with connections via a diamond interchange.
- K-7 is a four-lane north/south divided highway with a clover leaf interchange.

- Woodland Road is a four-lane north/south divided arterial that travels under K-10 with connections via a diamond interchange.
- Ridgeview Road is a four-lane arterial that travels over K-10 with connections via a diverging diamond interchange.
- Renner Boulevard is a four-lane divided arterial that travels under K-10 with a folded diamond interchange.
- I-435 is a six-lane, median separated, north/south interstate.
- Lackman Road is a north/south four-lane divided arterial with access to I-435/I-35/K-10.
- Santa Fe Trail Drive is a north/south two-lane arterial that travels under K-10.
- I-35 is an eight-lane barrier divided north/south interstate.
- Pflumm Road is a two-lane north/south arterial that travels under K-10.

Bus transit service within the study area is provided by RideKC. Five bus routes (**Figure 3-9**) serve the study area, Route 495 (95th Street), Route 510 (K-10 Connector), Route 519 (Olathe Express), Route 563 (Shawnee Express), and Route 595 (Gardener-OP Express).

3.1.9.1 Transportation Impacts

Impacts of the No-Build Alternative

The No-Build Alternative would not have construction related impacts to the existing roadways or transit services within the project vicinity. The No-Build Alternative would not include widening of K-10 or access and interchange improvements needed to address the existing congestion within the K-10 corridor. Traffic volumes along the K-10 corridor are forecasted to increase substantially by 2060 and the No-Build Alternative would not alleviate the resulting congestion or improve safety. Adverse impacts to transportation are likely to occur from increased congestion and increased travel times, decreased safety, and decreased level of service. A full breakdown of 2060 No-Build traffic and safety can be found in **Appendix E**.

Impacts of the Preferred Alternative

The construction of the Preferred Alternative will affect transportation and traffic patterns within the study area. The project improvements include:

- Add an additional travel lane in each direction;
- Reconfigure portions of interchange at K-10 and K-7;
- Reconfigure portions of interchange at K-10 and I-435;
- Reconfigure portions of interchange at I-435 and I-35;
- Reconfigure the interchange at K-7 and Prairie Star Parkway;
- Reconfigure the interchange at Lackman Road and I-435;
- Reconfigure interchanges along K-10 at Evening Star Road, Lexington Avenue, Woodland Road, and Renner Road;

- Additional interchange at Lone Elm Road;
- Improvements to local interchanges and supporting cross streets; and,
- Reconstruction of existing pavement and bridges.

The Preferred Alternative would have temporary construction impacts to bus routes 495, 510, 519, 563, and 595. Bus Route 510 would be impacted for the longest duration as it travels directly on K-10 throughout the entire study area. Any decisions on new or modified bus transit routes would be determined by RideKC as the primary transit provider in the region.

The completion of the Preferred Alternative would result in less congestion and decreased travel times. Transportation system performance will improve from construction of the Preferred Alternative. A full breakdown of 2060 Build (Preferred Alternative) traffic and safety can be found in **Appendix E**.

3.2 Cultural Resources

The Advisory Council on Historic Preservation's (ACHP's) implementing regulations for Section 106 of the National Historic Preservation Act (36 C.F.R. Part 800) requires federal agencies to take into account the effects of their undertakings on historic properties and to provide the ACHP a reasonable opportunity to comment on the undertakings, which in this instance, is the K-10 Capacity Improvements Project. The following sections summarize the coordination and findings for eligible or potentially eligible historic sites or districts, and archaeological sites located in the study area.

3.2.1 Historical Sites and Districts

The initial step in satisfying Section 106 regulations regarding historic properties is to determine if there are any properties listed or eligible for listing on the National Register of Historic Places (NRHP) that may be affected by the proposed project. The National Historic Preservation Act defines a historic property as any prehistoric or historic district, site, building, structure, or object included on, or eligible for inclusion on, the National Register, including artifacts, records, and material remains relating to the district, site, building, structure, or object.

All standing structures at least 50 years old are potentially eligible for listing on the NRHP. A search of the NRHP and the Kansas Historic Register Inventory (KHRI) on April 22, 2024, identified no listed properties within the study area. However, one historic district (Sunflower Village) is adjacent to the study area and contains 156 NRHP contributing resources. The NRHP defines a contributing resource as a building, site, structure, or object adding to the historic significance of a property.

There was a potentially historic barn located at 9200 Kill Creek Road in De Soto, Kansas. The barn, then known as the Earnest Waitzmann Barn, was originally constructed in the 1880s and located approximately seven miles south. It was disassembled by Amish tradesmen from Jamesport, Missouri, and moved in pieces to

the Kill Creek Farm. However, on May 12, 2010, the potentially historic structure was blown down by high storm winds. A new timber frame barn structure was constructed in a similar manner to the previous barn, without the use of nails or metal screws instead maintaining a wood peg construction with mortise and tenon joints. The rebuilt structure was protected by a 99-year lease for the land the barn sits on and continues to be place used by civic groups, church groups, other non-profit organizations, and the community as a place for weddings and other gatherings.

3.2.2 Archaeological Sites

In a letter dated February 28, 2024, KSHS stated that the crossings of Kill Creek, Camp Creek, Cedar Creek, and Mill Creek all have a high potential for archeological deposits. KSHS also noted there are 24 archeological sites recorded within the study area, with several more in close proximity.

3.2.3 Cultural Resource Impacts

Impacts of the No-Build Alternative

Since no construction would occur under the No-Build Alternative, the No-Build Alternative would have no impacts to cultural resources.

Impacts of the Preferred Alternative

Due to the proximity to multiple perennial water sources and the density of archaeological sites within and surrounding the study area, a Phase II archaeological survey will be conducted prior to construction for potentially impacted sites once construction limits and ROW are determined during final design, following the approval of the EA (**Commitment C-12**). KDOT will obtain KSHS Section 106 clearance for architectural and archaeological resources prior to the start of construction of the Preferred Alternative. If changes are made to the Preferred Alternative after Section 106 clearance has been obtained, KDOT will perform additional coordination with the Kansas State Historic Preservation Office (SHPO) to obtain Section 106 clearance for any modifications (**Commitment C-13**).

3.3 Natural Environment

The following sections describe the natural resource features present in the study area and the anticipated effects of the No-Build Alternative and Preferred Alternative.

3.3.1 Farmland

The United States Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS), pursuant to the Farmland Protection Policy Act of 1981 (FPPA), is responsible for evaluating the conversion of prime and unique farmland, and statewide and locally important farmland, to non-agricultural use. Lands subject to the FPPA include lands identified with soils that are prime, unique, or statewide or locally important farmland. The following lands are not covered by the FPPA:

- Lands identified as “urbanized area” (UA) on Census Bureau map
- Land with a “tint overprint” on the USGS topographical map
- Areas that do not contain prime, unique, statewide important, or locally important farmland
- Areas 10 acres or larger without structures
- Land in water storage, including lands that have been acquired or planned for water storage prior to August 5, 1984
- Lands used for national defense purposes during a national emergency
- Private land where no federal funds or technical assistance is utilized

In the 2020 Census Urban Areas Frequently Asked Questions, the U.S. Census Bureau defines urban areas as densely developed territory encompassing residential, commercial, and other nonresidential urban land uses. Each urban area must encompass at least 2,000 housing units or at least 5,000 people. Urban areas are defined primarily based on housing unit density measured at the census block level. The U.S. Census Bureau applies following three housing unit densities during the delineation process:

- Initial urban core: at least 425 housing units per square mile
- Remainder of urban area: at least 200 housing units per square mile
- At least one high-density nucleus of at least 1,275 housing units per square mile required for qualification. This ensures that each urban area contains a high-density nucleus typical of what is expected to be found in an urban area.

Agricultural land can be described in terms of soil types since agricultural productivity is greatly influenced by the land’s soil. Most of the soils within the study area are classified as either Prime Farmland or Farmland of Statewide Importance by the USDA, NRCS. Farmland soil map units within the study area are shown on **Figure 3-10** and include the following:

Prime farmland soil map units:

- 4015 – Chase silt loam, occasionally flooded
- 7050 – Kennebec silt loam, occasionally flooded
- 7170 – Reading silt loam, rarely flooded
- 7251 – Grundy silt loam, 1% to 3% slopes
- 7285 – Ladoga silt loam, 3% to 8% slopes
- 7302 – Martin silty clay loam, 3% to 7% slopes
- 7433 – Morrill loam, 3% to 7% slopes
- 7501 – Pawnee clay loam, 4% to 8% slopes, eroded
- 7525 – Chillicothe silt loam, 2% to 5% slopes
- 8962 – Woodson silt loam, 1% to 3% slopes

Farmland of statewide importance map units:

- 7286 – Ladoga silt loam, 8% to 15% slopes
- 7460 – Oska silty clay loam, 3% to 6% slopes
- 7462 – Oska-Martin silty clay loams, 4% to 8% slopes
- 7535 – Sharpsburg silt loam, 4% to 8% slopes
- 7607 – Sibleyville- Vinland loams, 3% to 7% slopes

The project corridor passes through areas identified as urban according to the U.S. Census Bureau and the FPPA does not apply to those areas. However, the FPPA is applicable to the project corridor not within U.S. Census Bureau designated urban areas. Since it is not within a U.S. Census Bureau designated urban area, the FPPA applies to the study area west of Cedar Creek and to the portion of the study area north of K-10 between Ridgeview Road and Mill Creek. The study area contains approximately 1,343 acres of prime farmland soils and approximately 604 acres of farmland of statewide importance soils.

3.3.1.1 Farmland Impacts

Impacts of the No-Build Alternative

No construction would occur; therefore, the No-Build Alternative would have no farmland impacts.

Impacts of the Preferred Alternative

The Preferred Alternative will require the acquisition of approximately 19.5 acres of farmland soils for ROW with approximately another 1.8 acres required for permanent easements. Prior to construction, KDOT will prepare a Farmland Conversion Impact Rating (FCIR) form and submit it to the NRCS to determine the extent of impacts to prime and other important farmland soils and obtain clearance from the NRCS for farmland impacts (**Commitment C-14**).

3.3.2 Wetlands and Waters of the United States

The U.S. Army Corps of Engineers (USACE) and the U.S. Environmental Protection Agency (EPA) define wetlands as “areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.”

Potential waters of the United States (WOTUS), including wetlands, within the study area were identified by a desktop survey. References used to identify potential wetland sites, streams, and other waterways included the U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) data, U.S Geological Survey (USGS)

National Hydrology Database (NHD) and topographic maps, Kansas Surface Water Register data, and color aerial photography.

NWI Wetlands

Based on the results of the desktop survey, it was determined that there are approximately 21.7 acres of emergent and forested NWI wetlands within the study area, consisting of approximately 8.1 acres of emergent NWI wetlands and 13.6 acres of forested/shrub NWI wetlands. The NWI wetlands are spread along the K-10 Corridor but generally located in the vicinity of streams, ponds, or upland drainage ditches. The wetlands are shown on **Figure 3-8**.

Surface Waters

Review of the Kansas Surface Water Register and NHD data showed that 39 streams, totaling approximately 24.0 miles, are crossed by the project. The streams crossed by the project include Kill Creek, Camp Creek, Cedar Creek, Coon Creek, Mill Creek, and several unnamed tributaries.

Review of the NWI data, NHD data, and aerial imagery identified 73 ponds/lakes within the study area. The identified ponds/lakes range in size from approximately 0.0 acres (1,867.1 ft^2) to 27 acres in size and consist of farm ponds/impoundments, neighborhood ponds, and ponds (and one lake) within parks.

3.3.2.1 Wetlands and Waters of the United States Impacts

Impacts of the No-Build Alternative

Since no construction would occur under the No-Build Alternative, the No-Build Alternative would have no impacts to wetlands or other WOTUS.

Impacts of the Preferred Alternative

WOTUS, including wetlands, waterways, lakes, natural ponds, and impoundments, are regulated by the USACE under Section 404 of the Clean Water Act (CWA), which requires a permit to authorize the discharge of dredged or fill material into waters of the U.S. (33 U.S. Code § 1344). Executive Order 11990, Protection of Wetlands, directs federal agencies (including FHWA) to implement “no net loss” measures for wetlands (42 Federal Register 26951). These no net loss measures include a phased approach to wetland avoidance, then minimization of impacts if wetlands cannot be avoided, and finally mitigation of unavoidable impacts.

NWI Wetland Impacts

The Preferred Alternative will impact a total of approximately 1.5 acres of emergent (1.2 acres) and forested (0.3 acres) NWI wetlands (**Table 3-9**).

Table 3-9: Preferred Alternative NWI Wetland Impacts

Potential Wetland Site ID	NWI Attributes	Wetland Type	Size	Impact
W-1	PFOA	Forested/Shrub	1.1 acres	0.1 acres
W-2	PEM1C	Emergent	0.4 acres	0.1 acres
W-3	PFOA	Forested/Shrub	0.5 acres	0.0 acres (457.5 ft^2)
W-4	PFOA	Forested/Shrub	1.5 acres	0.0 acres (1,358.9 ft^2)
W-5	PFOA	Forested/Shrub	5.3 acres	0.0 acres (969.2 ft^2)
W-6	PEM1C	Emergent	0.7 acres	0.0 acres (1,627.4 ft^2)
W-7	PFOA	Forested/Shrub	1.5 acres	0.0 acres (551.5 ft^2)
W-8	PFOA	Forested/Shrub	5.5 acres	0.0 acres (1,059.8 ft^2)
W-9	PFOA	Forested/Shrub	2.2 acres	0.0 acres (2,144.6 ft^2)
W-10	PEM1Ah	Emergent	0.2 acres	0.1 acres
W-11	PFOA	Forested/Shrub	16.9 acres	0.1 acres
W-12	PFOA	Forested/Shrub	1.2 acres	0.0 acres (1,237.4 ft^2)
W-13	PEM1C	Emergent	0.8 acres	0.3 acres
W-14	PEM1C	Emergent	1.7 acres	0.3 acres
W-15	PEM1C	Emergent	0.7 acres	0.4 acres
W-16	PFOA	Forested/Shrub	0.7 acres	0.0 acres (858.5 ft^2)

NHD Stream and Pond Impacts

The Preferred Alternative will impact approximately 24,135 feet of NHD streams and 2.5 acres of ponds. **Table 3-10** summarizes the Preferred Alternative stream impacts.

Table 3-10: Preferred Alternative Stream Impacts

Stream	Name	Impact (Linear Feet)
S-1	Unnamed Tributary to Captain Creek	77.1
S-2	Unnamed Tributary to Kansas River	2,483.7
S-3	Unnamed Tributary to Kansas River	0.0
S-4	Unnamed Tributary to Kansas River	238.3
S-5	Unnamed Tributary to Kansas River	0.0
S-6	Unnamed Tributary to Kansas River	1,672.8
S-7	Unnamed Tributary to Kansas River	198.2
S-8	Unnamed Tributary to Hanson Creek	567.1

Stream	Name	Impact (Linear Feet)
S-9	Hanson Creek	0.0
S-10	Kill Creek	270.8
S-11	Unnamed Tributary to Kill Creek	500.6
S-12	Unnamed Tributary to Kill Creek	346.5
S-13	Unnamed Tributary to Kill Creek	184.0
S-14	Unnamed Tributary to Cedar Creek	171.6
S-15	Camp Creek	162.8
S-16	Unnamed Tributary to Camp Creek	0.0
S-17	Cedar Creek	307.4
S-18	Unnamed Tributary to Cedar Creek	0.0
S-19	Unnamed Tributary to Cedar Creek	158.2
S-20	Unnamed Tributary to Cedar Creek	0.0
S-21	Unnamed Tributary to Cedar Creek	0.0
S-22	Unnamed Tributary to Cedar Creek	563.7
S-23	Unnamed Tributary to Cedar Creek	1,904.5
S-24	Unnamed Tributary to Cedar Creek	989.5
S-25	Unnamed Tributary to Cedar Creek	0.0
S-26	Unnamed Tributary to Cedar Creek	0.0
S-27	Unnamed Tributary to Coon Creek	1,431.6
S-28	Unnamed Tributary to Coon Creek	1,123.7
S-29	Unnamed Tributary to Coon Creek	0.0
S-30	Coon Creek	697.8
S-31	Unnamed Tributary to Mill Creek	984.6
S-32	Mill Creek	705.9
S-33	Unnamed Tributary to Mill Creek	4,293.9
S-34	Unnamed Tributary to Mill Creek	769.5
S-35	Unnamed Tributary to Mill Creek	0.0
S-36	Unnamed Tributary to Mill Creek	527.2
S-37	Unnamed Tributary to Mill Creek	1,102.3
S-38	Unnamed Tributary to Mill Creek	1,137.1

Stream	Name	Impact (Linear Feet)
S-39	Unnamed Tributary to Mill Creek	562.7

* Stream impacts shown are the length of the stream within the construction limits of the Preferred Alternative. Actual impacts will be identified during final design and are anticipated to be less than those identified in Table 3-10.

KDOT will perform a delineation of wetlands, streams, and ponds within the construction limits of the Preferred Alternative to determine impacts to WOTUS (**Commitment C-15**). KDOT will obtain the USACE Section 404 permit prior to construction. If changes to the Preferred Alternative are made after the USACE Section 404 permit is obtained, KDOT will revise and resubmit the Section 404 permit application to the USACE for approval (**Commitment C-16**).

3.3.2.2 Mitigation

Mitigation for impacts to WOTUS, including wetlands, is proposed to be completed through purchasing credits at wetland and stream mitigation banks or in-lieu fee programs as directed by the USACE (**Commitment C-17**). The amount of wetland and stream credits needed for project impacts will be determined during the USACE Section 404 permitting process as the project approaches final design.

3.3.3 Water Quality

Section 303(d) of the CWA requires states to identify all water bodies where state water quality standards are not being met. Kansas water quality is governed by the Kansas Surface Water Quality Standards administered by the Kansas Department of Health and Environment (KDHE). The KDHE maintains a Kansas Section 303(d) Impaired Waters list which was reviewed to determine if any surface waters within the study area contained impairments that require a Total Maximum Daily Load (TMDL). In the *Methodology for the Evaluation and Development of the 2022 Section 303(D) List of Impaired Waterbodies for Kansas* (*Methodology 2022*), KDHE states that "a TMDL refers to the 'total maximum daily load' of a pollutant that achieves compliance with a water quality standard, therefore a TMDL is essentially a regulatory tool which caps the allowable pollutant load to a water body and a planning tool which directs and guides practices that will bring a water body into compliance with the applicable water quality standard."

The below sections discuss those surface waters within the study area that were listed on the Impaired Waters list and provides a description of the groundwater in the vicinity of the study area.

3.3.3.1 Surface Water Quality

The study area lies within, and is drained by, the Lower Kansas 8-digit hydrologic unit code (HUC 8) subbasin of the Kansas Lower Republican River Basin and the Lower Missouri-Crooked HUC 8 subbasin of the Missouri River Basin. Surface waters within the study area include Kill Creek, Hanson Creek, Camp Creek, Cedar Creek, Coon Creek, Mill Creek, unnamed tributaries, and 73 ponds (**Figure 3-8**). The water quality of

these resources varies depending upon such factors as water permanence, presence or absence of in-flowing streams, surrounding vegetation, and surrounding land use.

Five waters within the study area, Kill Creek, Hanson Creek, Camp Creek, Cedar Creek, and Mill Creek, are identified on the KDHE 2022 approved 303(d) Impaired Waters list. **Table 3-11** summarizes the impairments and impaired uses for each stream.

Table 3-11: Study Area Section 303(d) Waters

Section 303(d) Water	Impaired Uses	Impairments*	Impairments with a TMDL*
Kill Creek	Aquatic Life	ATZ, TP	TP
	Domestic Water Supply	ATZ	
	Primary Contact Recreation	EC	EC
Hanson Creek	Aquatic Life	ATZ, TP	TP
	Domestic Water Supply	ATZ	
	Secondary Contact Recreation	EC	EC
Camp Creek	Aquatic Life	BI, TP, TSS	BI, TP
	Secondary Contact Recreation	EC	EC
Cedar Creek	Aquatic Life	TP	TP
	Domestic Water Supply	NO_3	NO_3
	Primary Contact Recreation	EC	EC
Mill Creek	Aquatic Life	BI, TP	BI, TP
	Domestic Water Supply	CL	CL
	Primary Contact Recreation	EC	EC

* ATZ – Atrazine; TP – Total Phosphorus; EC – Escherichia coli (E. coli); BI – Biology; TSS – Total Suspended Solids; NO_3 – Nitrates; CL - Chloride

KDHE maintains the Kansas Surface Water Register where the Department rates streams in the state relative to eight designated beneficial uses which include aquatic life, contact recreation, domestic water supply, food procurement, ground water recharge, industrial water supply, irrigation, and livestock watering. The current Kansas Surface Water Register dated February 18, 2021, lists Kill Creek, Hanson Creek, Cedar Creek, and Mill Creek as sources for the eight designated beneficial uses cited above. Camp Creek is listed as a source for all the beneficial uses cited above except for domestic water supply, ground water recharge, and industrial water supply.

None of the waterways in the study area are listed as an Outstanding National or State Resource Water.

3.3.3.2 Ground Water Quality

A review of the Kansas Geological Survey's (KGS) Water Well Completion (WWC5) database indicates that wells within the study area have static water depths generally from two to 30 feet with low estimated yields of 1.5 to nine gallons per minute (gpm). One well has a static water depth of 100 feet and an estimated yield of five gpm.

Facilities within the study area are served by a reliable municipal water supply system which obtains water from wells within Johnson County in the Kansas River valley. All sources are located outside of the study area.

3.3.3.3 Water Quality Impacts

Impacts of the No-Build Alternative

Since no construction would occur under the No-Build Alternative, the No-Build Alternative would have no direct impacts on water quality of surface or groundwater resources in the study area.

Impacts of the Preferred Alternative

Surface Water Quality Impacts

As shown in **Table 3-10** and **Figure 3-8**, the Preferred Alternative will impact approximately 24,150 linear feet of streams. The Preferred Alternative could have the potential for construction-related water quality impacts to roadside wetlands and roadside ditches that flow into the streams within the study area. Project construction may also require additional bridges and culverts that could temporarily impact the water quality within the stream channels.

There is potential for construction related water quality impacts to Kill Creek, Hanson Creek, Camp Creek, Cedar Creek, and Mill Creek as drainage patterns bring stormwater runoff to their channels through overland flow or a series of drainage ditches and channels.

Potential operation and maintenance related impacts to water quality could include pollutants such as sediment, petroleum products, coolants, rubber debris, metals, and de-icing minerals/chemicals.

The Preferred Alternative will require a Stream Obstruction permit from the Kansas Department of Agriculture – Division of Water Resources (DWR) for the impacts within stream channels. KDOT will obtain the initial permit. If any changes to the stream impacts occur after the Stream Obstruction permit is obtained, KDOT will coordinate with the DWR to obtain additional clearance (**Commitment C-18**).

Groundwater Impacts

Pollutants from the construction, operation, and maintenance of the Preferred Alternative will contribute to loadings of the surface waters, which are a recharge component of local alluvial groundwater. Most of the surface loading is flushed during initial high flows associated with precipitation events, with very little being left for infiltration to the groundwater.

Stormwater Management

The KDHE is responsible for administering the National Pollutant Discharge Elimination System (NPDES) to protect waters of the State from sediment and other contaminants. Any project that disturbs greater than one acre from construction activities requires a stormwater permit from the KDHE. To obtain a stormwater permit, a Notice of Intent (NOI) form must be submitted at least 60 days prior to the start of construction. The primary requirement of the stormwater permit is the development and implementation of a Stormwater Pollution Prevention Plan (SWPPP). The SWPPP must specify the "Best Management Practices" (BMPs) to be employed and what controls will be implemented to minimize the contamination of stormwater runoff associated with construction activity.

The major considerations for potential water quality impacts are: sedimentation; contamination from street surface runoffs; agents for weed, insect, and rodent control; contamination from chemical or other toxic material spills; and groundwater pollution. Sediment loads in rivers, streams, and wetlands can have an impact on drinking water quality and on aquatic animals by limiting oxygen absorption and covering eggs.

Sedimentation may result from bridge and drainage facility construction and by erosion from project construction. Standard engineering practices (BMPs) of mitigation, i.e., temporary erosion, sediment, and water pollution control, should prove to be adequate to minimize sedimentation and water quality impacts.

3.3.3.4 Mitigation

To mitigate or minimize impacts associated with additional impervious areas, detention basins near the K-10/I-435 interchange will be regraded, and an additional detention basin will be constructed in the southeast quadrant of the Evening Star Road and 103rd Street intersection. A further analysis will be conducted during the final design phase to determine if additional stormwater detention is needed.

To minimize or avoid impacts to surface water quality, the Contractor will submit an NOI to obtain the NPDES stormwater construction permit. The Contractor will abide by the NPDES Permit and develop a SWPPP. This plan utilizes BMPs such as: seeding disturbed areas as soon as possible; installing ditch checks and silt fences at the outset of construction; minimizing disturbances to stream banks and riparian zones; and taking all necessary precautions to prevent petroleum products from entering streams or wetlands. The Contractor will be responsible for the monitoring of the BMPs and updating the SWPPP as necessary during project construction (**Commitment C-19**).

Prior to construction of the Preferred Alternative, the Contractor will obtain land disturbance permits from the cities of De Soto, Lenexa, and Olathe (**Commitment C-20**). The land disturbance permits from the aforementioned municipalities will act alongside the KDHE NPDES stormwater construction permit to protect the water quality within the study area.

The Contractor will follow BMPs to reduce impact to groundwater during construction and will also follow recommendations set forth in the total maximum daily loads for Kill Creek, Hanson Creek, Camp Creek, Cedar Creek, and Mill Creek (**Commitment C-21**). BMPs utilizing structural and non-structural systems can effectively minimize the impacts to groundwater quality. Structural BMPs such as detention basins, infiltration trenches, grassed swales, bioretention and constructed wetlands utilize mechanical removal of pollutants. Other non-structural BMPs such as street sweeping, debris and litter removal, and control of fertilizer, herbicide, and pesticide use can control sources pollutant sources. Best practice use and control of de-icing materials and methods can also reduce pollutant load.

3.3.3.5 Section 401 Certification Requirement

Prior to construction, KDOT will obtain certification that implementation of the proposed project will not cause any surface or ground water in the area of potential effect to violate water quality standards (**Commitment C-22**). In the state of Kansas, the KDHE provides this certification, and it is permitted along with the USACE Section 404 permit. Section 401 Water Quality Certification and adequate mitigation measures will be obtained by KDOT prior to construction. The Contractor will follow all conditions of the 401 Water Quality Certification. If there are any changes to the wetland or stream impacts after the Water Quality Certification is received, KDOT will coordinate with the KDHE to ensure the revised impacts still meet the water quality certification requirements (**Commitment C-23**).

3.3.4 Floodplains

Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRMs) and National Flood Hazard Layer (NFHL) data showing mapped 100-year floodplains are available for Johnson County (**Figure 3-8**) and were reviewed to identify regulated floodways and floodplains within the study area. According to the FIRM and NFHL data, the study area contains mapped 100-year floodplains (268.1 acres) and regulated floodways (260.1 acres). The study area encompasses portions of the floodways and floodplains of unnamed tributaries to the Kansas River, Kill Creek and one of its unnamed tributaries, Hanson Creek (FEMA calls this stream Kill Creek Tributary C), Camp Creek, Cedar Creek and two of its unnamed tributaries, and Mill Creek and two of its unnamed tributaries.

Executive Order 11988 on Floodplain Management directs federal agencies “to avoid to the extent possible the long- and short-term adverse impacts associated with the

occupancy and modification of floodplains and to avoid direct or indirect support of floodplain development wherever there is a practicable alternative."

In Johnson County, the Kansas Division of Water Resources (DWR) has jurisdiction over fill that is placed in a regulatory floodplain to an average height greater than one foot above the existing ground for streams with a drainage area over 640 acres. Fills that meet this definition would require a Floodplain Fills permit from the DWR. Fills with drainage acreage under 640 acres, but greater than 240 acres and occurring in a mapped FEMA floodplain, also require a Floodplain Fill permit from DWR. Regulations require that a floodplain fill should not have an unreasonable effect on adjacent landowners, adverse to the public interest and environmental concerns, or lack required environmental mitigation.

Fill placed in a FEMA floodplain within the De Soto, Lenexa, or Olathe municipal limits will also require a Floodplain Development Permit from the local city jurisdictions.

3.3.4.1 Floodplain Impacts

Impacts of the No-Build Alternative

No construction would occur under the No-Build Alternative; therefore, the No-Build Alternative would have no direct impacts to FEMA floodplains within the study area.

Impacts of the Preferred Alternative

Construction of the Preferred Alternative will occur within approximately 9.1 acres of floodway and 15.5 acres of 100-year floodplain. The floodways and floodplains within the construction limits of the Preferred Alternative are associated with Hanson Creek, Kill Creek, Cedar Creek, Mill Creek, and unnamed tributaries.

Since construction will occur within special flood hazard areas, floodplain permits from DWR and the local city jurisdictions will be required.

During the final design phase, prior to construction, KDOT will obtain the DWR Floodplain Fills permit. If there are any changes to the floodplain impacts after the permit is obtained, KDOT will coordinate with the DWR to revise the initial permit (**Commitment C-24**).

During the final design phase, prior to construction, KDOT will obtain the floodplain development permits from the local jurisdictions (Cities of De Soto, Lenexa, and Olathe). If there are any changes to the floodplain impacts after the permits are obtained, KDOT will coordinate with the local jurisdictions to revise the initial permit (**Commitment C-25**).

If the FEMA floodway is modified or there is an increase in the FEMA water surface, KDOT will obtain a Conditional Letter of Map Revision (CLOMR) from FEMA which comments on whether the Preferred Alternative, if built as proposed, would meet minimum National Flood Insurance Program (NFIP) standards. KDOT would also obtain

a Letter of Map Revision from FEMA which officially revises the current NFIP map to show changes to floodplains, regulatory floodways, or flood elevations (**Commitment C-26**).

3.3.4.2 Mitigation

Structures will be designed and constructed along the corridor to minimize any floodplain and/or floodway impacts. Overbank grading may also be used if necessary to eliminate impacts. The location and size of the structures and grading will be determined during the final design phase of the project.

3.3.5 Natural Habitats and Threatened and Endangered Species

The study area is located in the Glaciated Region and Osage Cuestas physiographic regions of Kansas. The Glaciated Region is bounded by the Kansas and Blue Rivers and contains rounded hills and broad valleys with glacial deposits of quartzite on some of the hills. The Osage Cuestas is a hill-plain, broad-terraced panorama with a large supply of limestone rock.

The study area is also located in the Osage Cuestas subregion of the Central Irregular Plains ecoregion. The Osage Cuestas subregion is mostly comprised of a combination of tallgrass prairie and oak-hickory woodlands in eastern Kansas. The study area is mostly within the Lower Kansas HUC 8 with the western terminus of the study area (I-435/I-35/K-10 interchange) being located within the Lower Missouri-Crooked HUC 8. The natural habitats (terrestrial and aquatic resources) are shown on **Figure 3-8**.

3.3.5.1 Terrestrial Resources

The dominant vegetation within the study area is primarily grasses within the ROW with woodland vegetation (shrubs and trees) along the stream corridors and within parks/greenways.

3.3.5.2 Urban Woodland Vegetation

The urban woodland vegetation within the study area creates habitat diversity and provides food and cover for wildlife. The woodlands are located throughout the K-10 Corridor, but generally in the greenways, parks, and adjacent to streams and are shown on **Figure 3-8**.

3.3.5.3 Aquatic Communities

Streams

The primary streams within the study area are Kill Creek, Hanson Creek, Camp Creek, Cedar Creek, Coon Creek, and Mill Creek. Other streams in the study area include unnamed tributaries to the above-mentioned streams and two unnamed tributaries to the Kansas River.

Lakes

The only lake within the study area is Lexington Lake. Lexington Lake is approximately 27 acres in size and is located within Lexington Lake Park on the north side of K-10 in De Soto, Kansas.

Ponds

There are 73 ponds within the study area. The smallest pond is approximately 0.0 acres (1,867.1 ft^2) and the largest pond is approximately 20.6 acres in size. These ponds are located throughout the corridor on both sides of K-10. The ponds are shown on **Figure 3-8**.

3.3.5.4 Threatened and Endangered Species

Both the KDWP and the USFWS utilize the Kansas Biological Survey (KBS) Natural Heritage Database and their special studies to evaluate the presence or absence of species of concern in a given area. The database includes Federal and State threatened and endangered species, species in need of conservation, and rare species. Federally listed threatened and endangered species are subject to the protection afforded under Section 7 of the Endangered Species Act of 1973, as amended (ESA) (16USC 1531 et seq.). The ESA provides protection of animal and plant species that have been determined to be in population decline and are in jeopardy of becoming extinct.

A search of the online KBS Natural Resource Planner (NRP), accessed on December 27, 2023, showed three buffered locations within the study area that contained records of Mead's Milkweed. The buffered locations encompass three square miles and are derived from the KDWP Natural Heritage Program data. The data from the NRP is not the result of comprehensive surveys and does not represent a definitive statement on the presence or absence of a protected species.

The State of Kansas also maintains a state listing of threatened and endangered species, which are protected by the Kansas Nongame and Endangered Species Conservation Act of 1975. The KDWP and USFWS Information for Planning and Consultation (IPaC) websites were visited on September 17, 2024, to obtain lists of the state and federally protected species that are known or likely to occur in Johnson County. **Table 3-12** shows protected species within Johnson County and identifies if there is any designated critical habitat (DCH) within the study area for each of the listed species. Kansas Administrative Regulations define critical habitat as either of the following:

"Specific geographic areas supporting a population of a listed species and including physical or biological features that are essential to the conservation of the species and require special management or protection; or specific geographic areas not documented as currently supporting a population of a listed species but deemed essential for the conservation of the listed species by the secretary."

The USFWS and the KDWP list a combined 19 threatened or endangered species for Johnson County. There is no DCH defined within the study area. The federal (USFWS) and state (KDWP) listed threatened and endangered species for Johnson County are shown in **Table 3-12**.

Table 3-12: Johnson County Federal & State Listed Threated & Endangered Species

Common Name	Scientific Name	Federal Status[1]	State Status[2]	Critical Habitat w/in Study Area
Plants				
Mead's Milkweed	*Asclepias meadii*	Threatened	Not Listed	None
Western Prairie Fringed Orchid	*Platanthera praeclara*	Threatened	Not Listed	None
Invertebrates				
American Burying Beetle	*Nicrophorus americanus*	Not Listed	Endangered	None
Monarch Butterfly	*Danaus plexippus*	Candidate	Not Listed	None
Western Regal Fritillary	*Argynnis idalia occidentalis*	Proposed Threatened	Not Listed	None
Fishes				
Flathead Chub	*Platygobio gracilis*	Not Listed	Threatened	None
Pallid Sturgeon	*Scaphirhynchus albus*	Endangered	Endangered	None
Plains Minnow	*Hybognathus placitus*	Not Listed	Threatened	None
Shoal Chub	*Macrhybopsis hyostoma*	Not Listed	Threatened	None
Sicklefin Chub	*Macrhybopsis meeki*	Not Listed	Endangered	None
Silver Chub	*Macrhybopsis storeriana*	Not Listed	Endangered	None
Sturgeon Chub	*Macrhybopsis gelida*	Not Listed	Threatened	None
Topeka Shiner	*Notropis topeka*	Not Listed	Threatened	None
Western Silvery Minnow	*Hybognathus argyritis*	Not Listed	Threatened	None
Birds				
Least Tern	*Sternula antillarum*	Not Listed	Endangered	None

Common Name	Scientific Name	Federal Status[1]	State Status[2]	Critical Habitat w/in Study Area
Piping Plover	*Charadrius melodus*	Not Listed	Threatened	None
Snowy Plover	*Charadrius alexandrinus*	Not Listed	Threatened	None
Mammals				
Eastern Spotted Skunk	*Spilogale putorius*	Not Listed	Threatened	None
Northern Long-Eared Bat	*Myotis septentrionalis*	Endangered	Not Listed	None
Tricolored Bat	*Perimyotis subflavus*	Proposed Endangered	Not Listed	None

1: Source - https://ipac.ecosphere.fws.gov/location/2KBMGSPU7VGIFKVTY5TZV7TLMI/resources
2: Source - https://ksoutdoors.com/Services/Threatened-and-Endangered-Wildlife/List-of-all-Kansas-Counties/Johnson

Although the endangered Pallid Sturgeon is listed for Johnson County, its habitat (the Kansas River) is not within the study area. As such, the project will have no effect on the Pallid Sturgeon or its habitat.

Suitable habitat for the other listed fish species mostly consists of large sandy rivers, rivers with relatively deep water with sluggish flows and silty substrate, or small prairie streams with high water quality and cool temperatures and is not present within the study area.

Suitable habitat for the listed bird species includes barren areas near water such as sand bars in rivers and shores of large impoundments and sparsely vegetated shallow wetlands adjacent to or within streams, neither of which was identified during the preliminary project walk through in 2023 or from aerial photography searches of the study area.

The Spotted Skunk prefers forest edges and upland prairie grasslands, especially with the presence of rock outcrops and shrub clumps. Although a native prairie exists within the study area, it is not associated with shrubby vegetation or rock outcrops. The farming practices and urban area along the K-10 corridor do not provide suitable habit for the Eastern Spotted Skunk.

The Northern Long-eared Bat (NLEB) is listed as endangered by the USFWS. The study area is located within the NLEB range and also within the NLEB White Nose Syndrome Buffer Zone. NLEBs spend the winter hibernating in caves and mines, called hibernacula. They use areas in various sized caves or mines with constant temperatures, high humidity, and no air currents. In the *Range-Wide Indiana Bat & Northern Long-Eared Bat Survey Guidelines* (March 2024), the USFWS describes the habitat requirements of the NLEB as follows:

> *Suitable summer habitat for the NLEB consists of a wide variety of forested/wooded habitats where they roost, forage, and travel. Although they may*

also traverse habitat adjacent and interspersed with forest habitat, such as emergent wetlands and field edges, they are predominately found in forest/wooded habitat. This includes forests and woodlots containing potential roosts (i.e., live trees and/or snags ≥3 inches diameter at breast height (dbh) that have exfoliating bark, cracks, crevices, and/or cavities), as well as linear features such as fencerows, riparian forests, and other wooded corridors. These wooded areas may be dense or loose aggregates of trees with variable amounts of canopy closure. NLEBs are nocturnal foragers and use hawking (catching insects in flight) and gleaning (picking insects from surfaces) behaviors in conjunction with passive acoustic cues. NLEB often prefer intact mixed-type forests with small gaps (i.e., forest trails, small roads, or forest-covered creeks) in forest with sparse or medium vegetation for foraging and commuting rather than fragmented habitat or areas that have been clear cut. Individual trees may be considered suitable habitat when they exhibit characteristics of suitable roost trees and are within 1,000 feet of other forested/wooded habitat. The NLEB has also been observed roosting (although to a lesser degree than forested habitat) in human-made structures, such as buildings, barns, bridges, and bat houses; therefore, these structures should also be considered potential summer habitat. Trees found in highly-developed urban areas (e.g., street trees, downtown areas) are extremely unlikely to be suitable habitat.

Wooded areas and scattered trees exist within the study area, as well as bridges that have the potential for acting as roosting structures for NLEBs. The wooded areas also provide potentially suitable habitat for the proposed endangered tricolored bat.

Although the Bald Eagle is not a listed threatened or endangered species, it is still afforded protection by the federal government under the Bald and Golden Eagle Protection Act (BGEPA) and the Migratory Bird Treaty Act (MBTA).

The BGEPA provides for the protection of Bald and Golden Eagles by prohibiting the taking, possession, and commerce of such birds, except under certain specified conditions. The habitat within the study area largely consists of maintained ROW with forested/shrub areas in parks and around the streams. The stream corridors are narrow with smaller tree species, except for the Camp Creek and Cedar Creek, which are in close proximity to residential areas. During an on-site preliminary project walk through in 2023, no Bald or Golden Eagle nests were observed. Due to no nests being observed within the study area, the project would not result in the taking of trees serving as nesting trees of Bald or Golden Eagles.

The MBTA makes it unlawful to pursue, hunt, take, capture or kill; attempt to take, capture or kill; possess, offer to or sell, barter, purchase, deliver or cause to be shipped, exported, imported, transported, carried or received any migratory bird, part, nest, egg or product, manufactured or not. Provisions are in place for the protection of migratory birds, parts, nests, eggs, or products. Under the MBTA, “migratory birds” essentially

includes all birds native to the U.S. and the regulations pertain to any time of the year, not just during migration.

Since the Preferred Alternative will require tree removal, conservation measures to minimize the potential impacts to migratory birds will need to be implemented. The conservation measures include tree clearing outside of the migratory bird nesting season (generally March 1st to September 15th) or conducting nest surveys prior to clearing to avoid injuries to eggs or nestlings. Prior to construction, bridges will also be checked for potential nests. Based on the above conservation measures, impacts to migratory birds will be minimal. The Contractor will be responsible for inspecting each bridge, prior to beginning any bridge construction, to ensure there are no active nests. If active nests are present, the Contractor will coordinate with KDOT prior to beginning construction (**Commitment C-27**).

3.3.5.5 Natural Habitat and Threatened and Endangered Species Impacts

Impacts of the No-Build Alternative

No construction would occur under the No-Build Alternative; therefore, the No-Build Alternative would have no impact on natural habitats or threatened and endangered species.

Impacts of the Preferred Alternative

The Preferred Alternative will impact approximately 51.3 acres of shrubby and forested habitat, approximately 24,150 linear feet of streams, and approximately 2.5 acres of ponds. Stream impacts are conservatively estimated as the length of NHD streams within the impact area of the Preferred Alternative. The actual impacts for permitting will be calculated during the final design phase of the project by KDOT.

The Preferred Alternative will have no impacts to State-listed species or the Pallid Sturgeon due to lack of suitable habitat within the construction limits and a No Effect determination is appropriate.

Due to tree clearing associated with the Preferred Alternative, unless otherwise specified by the USFWS, KDOT will perform a bat habitat survey within the construction limits of the Preferred Alternative and will not clear trees during the active season for the NLEB and Tricolored Bat (April 1st to November 15th) (**Commitment C-28**).

Since there have been records of Mead's Milkweed within one-square mile of the study area, a survey for Mead's Milkweed will be conducted within the construction limits of the Preferred Alternative prior to the start of construction (**Commitment C-29**).

The K-10 corridor lies within the path of migration for Monarch Butterflies. To minimize potential impacts to the Monarch Butterfly and its habitat, herbaceous areas disturbed during project construction that need to be replanted will be reseeded with a native seed mix containing milkweed species (**Commitment C-30**).

With the above conservation conditions for the bat and plant species, a “May Affect but not likely to Adversely Affect” determination is warranted for the NLEB, Tricolored Bat, and Mead’s Milkweed. KDOT will coordinate with the USFWS and KDWP to receive threatened and endangered species clearance prior to the start of construction. If changes are made to the Preferred Alternative after threatened and endangered species clearance is received, KDOT will coordinate the changes to the USFWS and KDWP to obtain clearance for any modifications (**Commitment C-31**). To maintain current presence/absence information for listed species, KDOT will coordinate with the USFWS every 90 days during construction (**Commitment C-32**).

3.4 Physical Environment

The following sections describe the physical environment features present in the study area including air quality and greenhouse gas emissions, noise, visual features, hazardous material sites, and utilities.

3.4.1 Air Quality and Greenhouse Gas Emissions

The EPA uses the term “attainment area” to describe those areas where air quality meets health standards for particular airborne pollutants. Johnson County is currently classified by the EPA as an attainment area for all six criteria pollutants comprising the National Ambient Air Quality Standards (NAAQS). The NAAQS were established by the EPA as required by the Federal Clean Air Act (CAA).

The CAA, as amended by the Clean Air Act Amendments of 1990, and other rules and regulations, such as the Control of Hazardous Air Pollutants from Mobile Sources rule promulgated by the EPA, specifies environmental policies and regulations to promote and ensure acceptable air quality. These policies and regulations were adopted in the Final Conformity Rule (40 CFR Parts 51 and 93). The EPA delegates authority to the KDHE for monitoring and enforcing air quality regulations in Kansas.

The CAA defines conformity as the following:

> “Conformity to an implementation plan’s purpose of eliminating or reducing the severity and number of violations of the NAAQS and achieving expeditious attainment of such standards; and that such activities will not:
>
> - Cause or contribute to any new violation of any NAAQS in any area;
> - Increase the frequency or severity of any existing violation of any standard in any area; or
> - Delay timely attainment of any standard or any required interim emission reductions or other milestones in any area.”

The Federal Clean Air Act Amendments of 1990 require states to adopt the NAAQS. These standards were established to limit the amount of sulfur dioxide (SO_2), particulates (PM10 and PM2.5), carbon monoxide (CO), ozone (O_3), nitrogen dioxide (NO_2) and lead (Pb) in the air.

3.4.1.1 Air Quality and Greenhouse Gas Emissions Impacts

Air quality emissions analyses were not required as part of this project. Johnson County, Kansas is classified as an attainment area by the EPA for five criteria pollutants and a maintenance area for ozone pollutants. Because the project involves the widening of an existing roadway rather than the development of a route that did not previously exist, it will have a negligible impact on air quality standards and greenhouse gas emissions in the study area. There will be temporary air quality impacts associated with project construction which are discussed in **Section 3.1.8**.

Impacts of the No-Build Alternative

The No-Build Alternative will serve approximately the same amount of traffic volume in comparison to the Preferred Alternative; however, the No-Build Alternative will have increased travel times. As a result, it is anticipated vehicle emissions will be worse under the No-Build.

Impacts of the Preferred Alternative

Construction of the Preferred Alternative is anticipated to provide an air quality benefit over the No-Build Alternative for the 2060 design year. The benefits can be seen in reduction of travel times and improvement of on/off-ramp exit queues, resulting in shorter idle time and a reduction of greenhouse gas emissions. Data to determine the approximate change in emissions for the study area was collected in the form of vehicle hours travelled (VHT). A lower VHT in the study area correlates with lower emissions because vehicles are spending less time on the road and, therefore, less time idling in traffic congestion. More traffic and idling has been correlated with more emissions. Daily VHT estimates were taken during peak AM and PM hours for the 2060 build vs no-build scenarios and show a 40% decrease in VHT as shown in **Table 3-13**.

Table 3-13: Daily VHT Estimates

Scenario	Daily Estimate (Hours)
Current (2023)	48,260
Future (2060) No-Build	143,189
Future (2060) Build	86,144

Source: HNTB VISSIM Models

The Preferred Alternative will also improve sidewalks and bicycle accommodations along the corridor which would provide improved alternative transportation methods.

To minimize the temporary air quality impacts during construction, emissions from construction equipment will be controlled in accordance with emission standards prescribed under state and federal regulations (**Commitment C-33**).

3.4.2 Traffic Noise

This section summarizes the traffic noise study that is being performed in accordance with FHWA standards and regulations (23 CFR Part 772) and KDOT's *Highway Traffic*

Noise Analysis and Abatement Policy and Procedures. The full noise study is included as **Appendix H** for reference.

3.4.2.1 Traffic Noise Methodology

Traffic noise is most commonly measured in "A-weighted" decibels (dBA). An A-weighted decibel corresponds to the manner in which the human ear perceives noise at different frequencies. Since traffic noise is generated by passing vehicles and traffic volumes generally fluctuate, an hourly equivalent sound level, or $L_{eq(h)}$, is used to measure traffic noise. The $L_{eq(h)}$ is the constant, average sound level that contains the same amount of sound energy over the time period as does the varying levels of actual traffic noise.

The study area was divided into 22 separate Noise Sensitive Areas (NSAs) to group receptors influenced by similar noise sources. Receptors within approximately 800 feet of the project were generally included. Beyond this distance, noise impacts and any benefits provided by noise abatement are not anticipated. In certain locations, receptors were modeled further out to ensure all impacts were identified.

2,417 noise sensitive receptors were identified within the NSAs. The NSAs are defined as follows and are shown in **Figure 3-11**:

- NSA 1: West of Evening Star Road
- NSA 2: North of K-10, east and west of Edgerton Road
- NSA 3: South of K-10 between Edgerton Road and Lexington Avenue
- NSA 4: North of K-10 near Lexington Avenue
- NSA 5: South of K-10 between Lexington Avenue and Kill Creek Road
- NSA 6: North of K-10 between Lexington Avenue and Kill Creek Road
- NSA 7: South of K-10 between Kill Creek Road and Cedar Creek Road
- NSA 8: North of K-10, east of Kill Creek Road
- NSA 9: North of K-10, west of Cedar Creek Road
- NSA 10: South of K-10, west of Cedar Creek Parkway
- NSA 11: North of K-10 at Canyon Creek Boulevard
- NSA 12: South of K-10, west of K-7
- NSA 13: North of K-10 between K-7 and Lone Elm Road
- NSA 14: North of K-10 between Lone Elm Road and Woodland Road
- NSA 15: South of K-10 between Lone Elm Road and Woodland Road
- NSA 16: South of K-10 between Woodland Road and Ridgeview Road
- NSA 17: North of K-10 between Woodland Road and Ridgeview Road
- NSA 18: West of I-435 between 95th Street and 87th Street
- NSA 19: East of I-435 between 95th Street and 87th Street
- NSA 20: South of I-435, east of Pflumm Road
- NSA 21: East of I-35 between I-435 and 95th Street

- NSA 22: West of I-35 between 98th Street and 95th Street

In accordance with FHWA requirements, detailed computer models were created using the FHWA TNM 2.5 software. The computer models were validated to within acceptable tolerances of field-measured traffic noise data and were used to predict loudest-hour equivalent traffic noise levels for noise sensitive receptors in the vicinity of the K-10 Capacity Improvements project.

3.4.2.2 Existing Conditions

The majority (more than 95%) of the noise sensitive receptors are residential, which fall under Activity Category B in FHWA's Noise Abatement Criteria (NAC). Other noise sensitive receptors analyzed for impacts included schools, parks, trails, active sport areas, restaurants, places of worship, and daycare centers.

FHWA and KDOT define a noise impact as occurring when either noise levels approach (within 1 dB) or exceed NAC or future noise levels substantially exceed (10 dB or more) existing noise levels. NAC for Activity Categories B and C correlates to an $L_{eq(h)}$ of 67 dBA. **Table 3-16** summarizes the NAC by activity category. In the existing condition, the worst hourly noise levels approach or exceed the NAC at 375 receptors.

Peak hourly noise levels are analyzed at all noise sensitive receptors for the No-Build and Preferred Alternative. Wherever noise impacts are identified in the Preferred Alternative, abatement is considered and analyzed using the Feasibility and Reasonableness Criteria set forth in KDOT's Noise Policy.

3.4.2.3 Traffic Noise Impacts

This section discusses the noise impacts associated with the No-Build Alternative and the Preferred Alternative. Vehicle noise is a combination of noise produced by the engine, exhaust, and tires. Heavier traffic volumes, higher speeds, and a greater number of trucks all increase the loudness of traffic noise. Traffic noise impacts occur when the predicted noise levels approach or exceed the NAC (with "approach" defined in the KDOT Noise Policy as reaching one decibel less than the NAC values listed in **Table 3-14**) or when the predicted noise levels substantially (greater than a 10 dB increase) exceed the existing noise level. 375 noise impacts were identified under the existing (2023) conditions, 430 noise impacts were identified for the No-Build Alternative (2060 design year), and 539 noise impacts were identified for the Preferred Alternative (2060 design year). Noise impacts for each NSA are summarized in **Table 3-15**. All but three Preferred Alternative impacts identified were due to noise levels approaching the NAC value. Three locations are predicted to have a substantial increase in noise levels. Detailed information on the noise impacts can be found in the Noise Study Report located in **Appendix H**.

Table 3-14: Noise Abatement Criteria

Hourly Equivalent A Weighted Sound Level (decibels (dB(A)))			
Activity Category	**Activity Criteria[1] $L_{eq(h)}$[2]**	**Evaluation Location**	**Activity Description**
A	57	Exterior	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B[3]	67	Exterior	Residential.
C[3]	67	Exterior	Active sport areas, amphitheaters, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreation areas, Section 4(f) sites, schools, television studios, trails, and trail crossings.
D	52	Interior	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios.
E[3]	72	Exterior	Hotels, motels, offices, restaurants/bars, and other developed lands, properties or activities not included in A-D or F.
F	--	--	Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical), and warehousing.
G	--	--	Undeveloped lands that are not permitted.

1. The $L_{eq(h)}$ Activity Criteria values are for impact determination only and are not design standards for noise abatement measures.
2. The equivalent steady-state sound level which in a stated period of time contains the same acoustic energy as the time-varying sound level during the same time period, with $L_{eq(h)}$ being the hourly value of L_{eq}.
3. Includes undeveloped lands permitted for this activity category.

Table 3-15: Summary of Traffic Noise Impacts

		Number of Impacted Receptors		
NSA	**Total Receptors**	**Existing (2023)**	**No Build Alternative Design Year (2060)**	**Preferred Alternative Design Year (2060)**
1	8	0	0	0
2	26	0	0	0
3	24	0	0	2
4	85	0	0	0
5	12	1	5	6
6	38	1	2	3
7	34	0	1	1
8	31	0	0	1
9	4	0	0	1
10	104	0	1	5
11	253	24	42	65
12	1	0	0	0

NSA	Total Receptors	Number of Impacted Receptors		
		Existing (2023)	No Build Alternative Design Year (2060)	Preferred Alternative Design Year (2060)
13	31	4	5	6
14	125	14	15	22
15	36	1	1	7
16	30	10	14	27
17	129	56	56	97
18	286	59	66	67
19	563	162	174	180
20	68	0	3	0
21	463	30	32	37
22	66	13	13	12

3.4.2.4 Noise Abatement Criteria

FHWA and KDOT require that feasible and reasonable noise abatement measures be considered and evaluated for the benefit of all predicted build-condition traffic noise impacts. Feasibility and reasonableness are distinct and separate considerations. Feasibility is the combination of acoustical and engineering factors considered in the evaluation of a noise barrier, such as topography, access, drainage, safety, and maintenance. Reasonableness is the consideration of the social, economic, and environmental factors considered in the evaluation of a noise barrier. The KDOT Noise Policy was used to determine whether noise abatement would be feasible and reasonable for impacted receptors.

Feasibility criteria includes:

- Safety: The noise barrier shall not excessively restrict sight distances, restrict drainage, or exacerbate potential flooding.
- Maintenance: Access is needed to both sides of the barrier.
- Acoustic Considerations: An acoustically feasible noise barrier must have a minimum of three first row impacted receptors and must achieve at least a five dB(A) highway traffic noise reduction for 80 percent of first row impacted receptors.

Reasonableness criteria includes:

- Noise Reduction Design Goal: The noise barrier must achieve a minimum of seven (7) decibel reduction for the majority of benefited receptors or a minimum of an eight (8) decibel reduction for at least one impacted Activity Category B receptor that would benefit from a noise barrier. The KDOT Noise Policy defines a benefited receptor as one that would receive at least a five (5) decibel reduction from a noise abatement measure.

- Cost Effectiveness: The KDOT Noise Policy determines cost effectiveness in terms of square feet of noise barrier. A reasonable wall is considered one that has a maximum of 1,200 square feet of wall per benefited receptor.
- Public Approval: Viewpoints of benefited receptors are solicited via a ballot. Owners and tenants at non-owner-occupied residences are each given the opportunity to vote. A noise barrier shall be permitted when the majority of the eligible votes indicate approval of the barrier.

See **Appendix H** for more information on the feasibility and reasonableness criteria utilized for this project.

3.4.2.5 Potential for Noise Abatement

The potential for noise barriers was analyzed for every receptor predicted to be impacted in the Preferred Alternative. Generally, the barriers were analyzed along the shoulder of K-10 or near the ROW line depending on the topography of the area.

Five noise barriers were determined to be preliminarily feasible and reasonable based on the available information and will benefit 661 receptors. Final decision on the feasibility and reasonableness of installing noise barriers should be made during final design and upon completion of the public involvement process (**Commitment C-34**). Additional information on the noise walls can be found in the Noise Study Report located in **Appendix H**.

3.4.3 Visual

The study area is located in the Glaciated Region and Osage Cuestas physiographic regions of Kansas. The Glaciated Region contains rounded hills and broad valleys with glacial deposits of quartzite on some of the hills. The Osage Cuestas is a hill-plain, broad-terraced panorama the eastern slopes of the hills being steeper than the western slopes.

The visual environment within the study area can be divided along the K-10 Corridor at the K-7/K-10 interchange. The visual environment to the east of K-7 consists mostly of urban/residential areas, scattered woodland, a riparian zone along Mill Creek, and scattered agricultural fields, parks, greenways, and open space. The visual environment to the west of K-7 consists of gently rolling fields used as agricultural grassland, large expanses of woodlands, riparian zones along the streams, and scattered residential areas. There are scattered ponds and NWI wetland areas throughout the K-10 Corridor. Visual resources are identified on **Figure 3-12**.

3.4.3.1 Visual Quality Rating

The study area can be divided into discrete units each having consistent visual characteristics and providing a uniform visual experience. These units can be thought of as “outdoor rooms,” each having a unique, internally consistent character and use. The boundaries of these visual environments occur where the visual character changes. The

strongest manifestations of visual boundaries are topography (landforms) and landscape components (trees, water, open areas, developed land, etc.).

In order to assign a visual quality rating, the visually distinct areas within the study area were separated into “visual assessment units.” Visual assessment units were determined by analyzing the topography of the area and studying the major landscape components by use of onsite observations and aerial photography. The quality of the visual environment can be defined using the attributes of vividness, intactness, and unity. These are defined as:

- Vividness: the relative strength of the image
- Intactness: the visual integrity of the natural man-made landscape and its freedom from encroaching elements
- Unity: the overall visual harmony of a composition and the degree to which the various elements combine in a coherent manner

The study area was divided into the following visual assessment units:

1. West of K-10/K-7 Interchange
2. East of K-10/K-7 Interchange

The relative quality of the visual assessment units is rated on a scale of low, moderately low, moderate, moderately high or high and is presented in **Table 3-16**. A low visual quality rating represents a less attractive view from the road as compared to a high visual quality rating.

Table 3-16: Visual Quality Rating

Visual Assessment Unit	Visual Quality Rating
West of K-10/K-7 Interchange	Moderate to Moderately High
East of K-10/K-7 Interchange	Moderately Low to Moderate

3.4.3.2 Notable Visual Resources

The most notable visual resources within the study area are the woodland areas, Kill Creek, Cedar Creek, Mill Creek, and the rural landscape and open space (**Figure 3-12**). Each of these areas possess a moderate or moderately high degree of visual quality.

Woodland Areas

Woodland areas possess a moderately high degree of visual quality and are located throughout the study area. Most woodland areas are located west of K-7, and are mostly associated with streams, parks, or greenways. Although these areas are scattered within the study area, they provide vertical visual elements in a predominantly flat landscape.

Kill Creek

Kill Creek possesses a moderately high degree of visual quality. The stream is characterized within the study area by an approximate 35- to 45-foot-wide meandering stream channel with a wooded riparian fringe. The stream is crossed by K-10 and flows into the Kansas River.

Cedar Creek

Cedar Creek possesses a moderately high degree of visual quality. The creek is characterized within the study area by an approximate 35- to 65-foot-wide meandering stream channel with a wooded riparian fringe. The stream is crossed by K-10 and flows into the Kansas River.

Mill Creek

Mill Creek possesses a moderately high degree of visual quality and is characterized within the study area by an approximate 35-foot-wide meandering stream channel with a wooded riparian fringe. The stream is crossed by K-10 and flows into the Kansas River.

Rural Landscape and Open Space

Rural landscape and open space areas along the K-10 Corridor, west of K-7, consist of rolling grasslands, scattered ponds, and wood lots. These elements combine to give this area a moderately high visual quality rating.

3.4.3.3 Viewers

Visual impacts can vary substantially through a study area since landscape elements can vary in their degree of visual quality and in viewer concern. There are two distinct categories of views: 1) a view of the road, which represents individuals (visual receptors) that can observe the roadway from an adjacent vantage point or who would have desirable views interrupted by the road, and 2) a view from the road which represents viewers who are users of the proposed facility.

3.4.3.4 Visual Environment Impacts

In highway projects, visual quality impacts are determined by the degree of change that will occur in the visual environment as a result of building a new highway facility. Areas that possess a high degree of visual quality may be more sensitive to change in the visual environment than areas that possess a low or moderate degree of visual quality.

The degree in change of visual quality is also related to viewer response, or how individuals who can see the roadway from an adjacent vantage point respond to the change in view. The most sensitive visual receptors are those individuals located in the vicinity of the existing K-10 corridor which would have the potential of undesirable views of a wider road.

The other category of viewer is the user of the roadway that responds to views from the road. Since the proposed project consists of widening an existing road, it is anticipated that views from the roadway will have a minimal change and a minimal impact to the visual environment within the study area.

Impacts of the No-Build Alternative

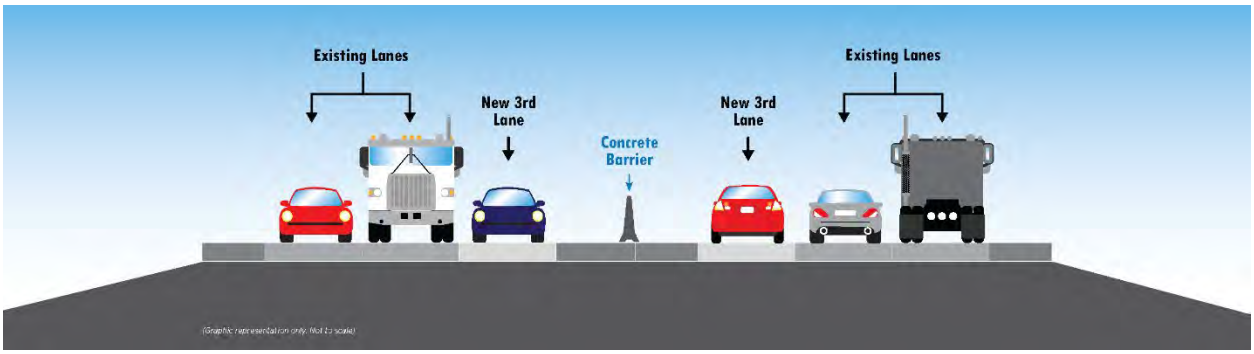
The No-Build Alternative would have no direct impacts to the visual environment of the study area. However, based on traffic projections, congestion on the roadway will continue to increase, which can be considered a visual impact. Since the residents living near the road are already experiencing views of the existing traffic, the visual impacts would be minor.

Impacts of the Preferred Alternative

Approximately half of the Preferred Alternative is within an urban area which has a moderately low to moderate visual quality rating. The portion of the study area west of K-7 is more rural in nature and has a moderately high visual quality rating. However, with the low number of visual receptors within the rural areas, there will be a low degree of visual impact.

Since most of the residents living along the K-10 corridor are accustomed to living near a roadway, and the roadway changes will not be a substantial change to the visual environment, the visual impacts of the Preferred Alternative will be minor. The main change from the visual impacts of the Preferred Alternative will be the addition of one lane in each direction along K-10, and reconfigured interchanges. **Figure 3-14** below illustrates the typical section of the Preferred Alternative.

Figure 3-14: Preferred Alternative Typical Section



3.4.3.5 Mitigation

The existing roadway alignment and ROW throughout the K-10 corridor will allow the additional lanes to be easily integrated with the existing environment. In areas where existing bridges would need to be modified, extended, or rebuilt, they could be designed to mimic the existing structure and blend in with the surroundings to minimize impacts.

Visual impacts can be minimized in fill areas by revegetating soil slopes with native plants. In areas where the roadway is visible to sensitive visual receptors, landscaping with evergreen trees and native deciduous trees, shrubs, grasses, and wildflowers could help to screen and soften the views of the road.

3.4.4 Hazardous Material Sites

The identification of potential hazardous material site locations within the study area was completed through a review of regulatory environmental program records, aerial photography, and a visual survey from publicly accessible ROWs. Regulatory program records reviewed include the EPA Envirofacts Database and the KDHE databases.

The search identified four closed leaking underground storage tank (LUST) sites; 10 facilities with underground storage tanks (UST) and/or aboveground storage tanks (AST) currently in use; two closed solid waste facilities; one closed dry cleaner facility; one remediated superfund site; Identified Sites List facilities; one wastewater treatment facility; and 25 locations of spills that have been closed by KDHE. Hazardous material sites within the study area can be seen on **Figure 3-8**.

3.4.4.1 Hazardous Material Site Impacts

Impacts of the No-Build Alternative

No construction would occur under the No-Build Alternative; therefore, the No-Build Alternative would have no direct impacts to hazardous material sites within the study area.

Impacts of the Preferred Alternative

There are no reported active spills of LUST sites located within the construction limits of the Preferred Alternative. In a letter dated January 2, 2024, KDHE identified one active and resolved project associated with the Sunflower Army Ammunition Plant site. However, those sites are located outside of the study area and will not be impacted by the Preferred Alternative. Since the Sunflower Army Ammunition Plant site is in close proximity to the proposed location of a detention basin, coordination was initiated with the USACE on April 9, 2024. In an email dated April 23, 2024, the USACE stated that they “do not see any reason why this activity will impact the Army’s cleanup of the former Sunflower Army Ammunition Plant.”

KDHE also stated that no contaminated dry cleaner or Superfund sites were identified within the vicinity of the project. KDHE did identify numerous active storage tank facilities within the vicinity of the project. However, the only active storage tanks within the construction limits are associated with gas stations and will not be impacted by the Preferred Alternative.

If a previously unknown hazardous material site is uncovered during construction, KDHE will be consulted and measures will be taken, as necessary, to eliminate or minimize adverse environmental consequences (**Commitment C-35**).

To minimize the risk of impacts from hazardous products during construction, temporary storage facilities for petroleum products, other fuels, and chemicals will be located and protected to prevent accidental spills from entering the streams within the project vicinity. Petroleum products will be stored outside of the floodplain (**Commitment C-36**).

Prior to construction, all borrow and waste sites will be identified and all environmental clearances, approvals, and permits for use of all borrow and/or waste sites will be obtained (**Commitment C-37**).

3.4.4.2 Mitigation

Since there are no active hazardous material sites other than currently in-use storage tanks associated with gas stations, no hazardous material mitigation is necessary at this time.

3.4.5 Utilities

Electrical services within the study area are provided by Evergy Kansas Central and Evergy Kansas Metro, INC. WaterOne, the City of Olathe, and the City of De Soto provide water service within the project vicinity. Johnson County Wastewater, the City of Olathe, and the City of De Soto provide sewer lines within the project vicinity. In addition, there are two cell towers within or adjacent to the study area. Other utilities within the study area include resources from the following providers:

- Gas: Atmos Energy and Kansas Gas;
- Telephone: AT&T, Spectrum;
- Television: Google Fiber, AT&T, CCI, Xfinity, Spectrum, DIRECTV, and Dish; and
- High-Speed Internet: Google Fiber, Spectrum, AT&T, Zoom Fiber, RG Fiber, Consolidated Communications, DIRECTV, and Dish.

Figure 3-13 displays select utilities within the study area.

3.4.5.1 Utility Impacts

This section discusses impacts of the No-Build Alternative and Preferred Alternative on the utility resources within the study area.

Impacts of the No-Build Alternative

No construction would occur under the No-Build Alternative; therefore, the No-Build Alternative would have no direct impacts to utilities within the study area.

Impacts of the Preferred Alternative

The Preferred Alternative will have impacts on underground and above-ground utilities. Relocation of some utilities within the corridor would be necessary to accommodate the project improvements. The extent and exact nature of other utility impacts will be determined during later design phases of the project.

Most impacted utilities will be relocated in the same vicinity of their current location. Coordination with the public and private utility companies will be required during the design phase to ensure utility service is uninterrupted or only minimally disrupted during utility relocation and construction of the Preferred Alternative (**Commitment C-38**).

3.5 Cumulative and Indirect Effects

The CEQ defines cumulative impacts as the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively substantial actions taking place over a period of time (40 C.F.R. § 1508.7).

The CEQ defines indirect effects as impacts caused by the action and are later in time or farther removed in distance but are still reasonably foreseeable. Indirect effects may include growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems. (40 CFR § 1508.8).

Cumulative impacts associated with the construction of the proposed project include those impacts resulting from the construction of projects located in the vicinity of the K-10 Capacity Improvements study area. The following projects were considered when assessing potential cumulative and indirect impacts.

3.5.1 Land Use

The predominant land use within the study area, other than ROW, is vacant land and single-family residential uses. Industrial uses dominate the eastern area as the highway goes into Lenexa and intersects with I-435. Other uses include agriculture, commercial, park, office, multi-family residential, public/semi-public, multi-primary, and utility. Proposed property acquisitions associated with the Preferred Alternative will likely result in excess property that can be redeveloped or consolidated for additional opportunities for development. Any new property development will need to be consistent with City of Olathe, Lenexa, or De Soto land use plans and zoning ordinances and any future land use plan in effect at the time. Future land use development and changes throughout the K-10 corridor will be guided by the cities future land use plans and zoning ordinances.

3.5.2 Population and Economic Development

The study area is within the municipal limits of De Soto, Lenexa, and Olathe in Johnson County, as well as portions of unincorporated Johnson County. Areas along the K-10 Corridor have shown long-term growth trends in both economic activity and population density. It is anticipated that these trends will continue, placing increasing demands on the existing transportation system. Population trends in Johnson County and the cities of Lenexa and Olathe showed steady growth from 2010 to 2022. The City of De Soto showed steady growth from 2010 to 2020, population declined by 3.36 percent in 2021,

then showed growth in 2022. The increase in population in Johnson County consistently exceeded the statewide average annual growth rate for this period. Since 2000, Johnson County experienced low unemployment rates, a positive annual growth in employment, and positive growth in taxable retail sales. The proposed project is expected to facilitate Johnson County's population and economic activity trends to continue and is not expected to adversely impact foreseeable future trends.

3.5.3 Farmland

Although the study area is located along the edge of the cities of Lenexa, De Soto, and Olathe as well as unincorporated Johnson County, only 3.5 percent of the land within the study area is currently used for agricultural purposes. Based on urban growth trends, city and county planning forecasts, and the proposed project occurring within the boundaries of the urban growth area, agricultural land use is likely to be converted to other uses within the study area in the future.

3.5.4 Wetlands and Waters of the United States

Desktop investigations identified approximately 22.1 acres of wetlands within the study area. Wetlands are generally located in the vicinity of streams and ponds, or in upland drainage ditches and are spread throughout the corridor. There are also 39 streams crossed by the project.

Wetland mitigation bank credit purchases or in-lieu fees will be utilized as mitigation for expected wetland impacts and other WOTUS impacts. It is expected that no net loss of wetlands will occur as a result of the proposed project.

3.5.5 Natural Habitats

The dominant vegetation within the study area is primarily grasses within the ROW with woodland vegetation (shrubs and trees) along the stream corridors and within parks/greenways. Woodlands within the study area are mostly scattered remnant stands of timber remaining from previous alterations associated with agricultural uses and urbanization. Riparian woodlands are primarily located along Mill Creek, Camp Creek, and Cedar Creek and scattered locations along smaller unnamed tributaries located within the floodplain.

The proposed project will not substantially contribute to the foreseeable cumulative future degradation of upland or floodplain natural resources. The proposed project will not substantially impact aquatic resources, nor will it substantially contribute to foreseeable cumulative future impacts to these resources.

3.5.6 Summary and Actions by Others

Connected KC 2050 shows three projects within one mile of the study area that are planned to occur during the same timeframe as the proposed project. The following projects are currently planned within or adjacent to the study area:

- Johnson County Combined Regional Bikeway Network and MetroGreen Trail System – An estimated 1,713 miles of unimproved regional bikeway corridors (roadway corridors) and 917 miles of unimproved MetroGreen trails remain to complete these regional networks, some of which cross through the K-10 study area. The design of these facilities will vary from shared lane bikeways, dedicated bike lanes/protected bike lanes, cycle tracks to share use pathways.
- New Four-Lane Road: Clare Road from Prairie Star Parkway to K-10 – System expansion to provide facilities for all road users through the addition of traffic lanes, sidewalks, and mixed-use trails.
- New Four Lane Road: Prairie Star Parkway from Canyon Creek Boulevard to K-10 Highway – System expansion to provide facilities for all road users through the addition of traffic lanes, sidewalks, and mixed-use trails.

Of the three projects, two are connected directly to the project and would likely produce the highest cumulative impacts to the study area through the addition of two new roads and interchanges with K-10 (Clare Road and Prairie Star Parkway). These extensions are independent of this project and will be constructed by others. Should the Clare Road and Prairie Star Parkway extensions be constructed and connected to a new K-10 interchange, it would likely open additional property in the vicinity for development. This may result in the conversion of existing agricultural property into residential, commercial, or industrial property depending on the current zoning at the time.

In addition, the following projects within the study area are planned according to the Metro Area TIP:

- K-7 improvements south of K-10 to Harold Road.

3.6 Streamlined Resource Summary

Table 3-17 summarizes the impacts of the Preferred Alternative to the resources discussed in this EA.

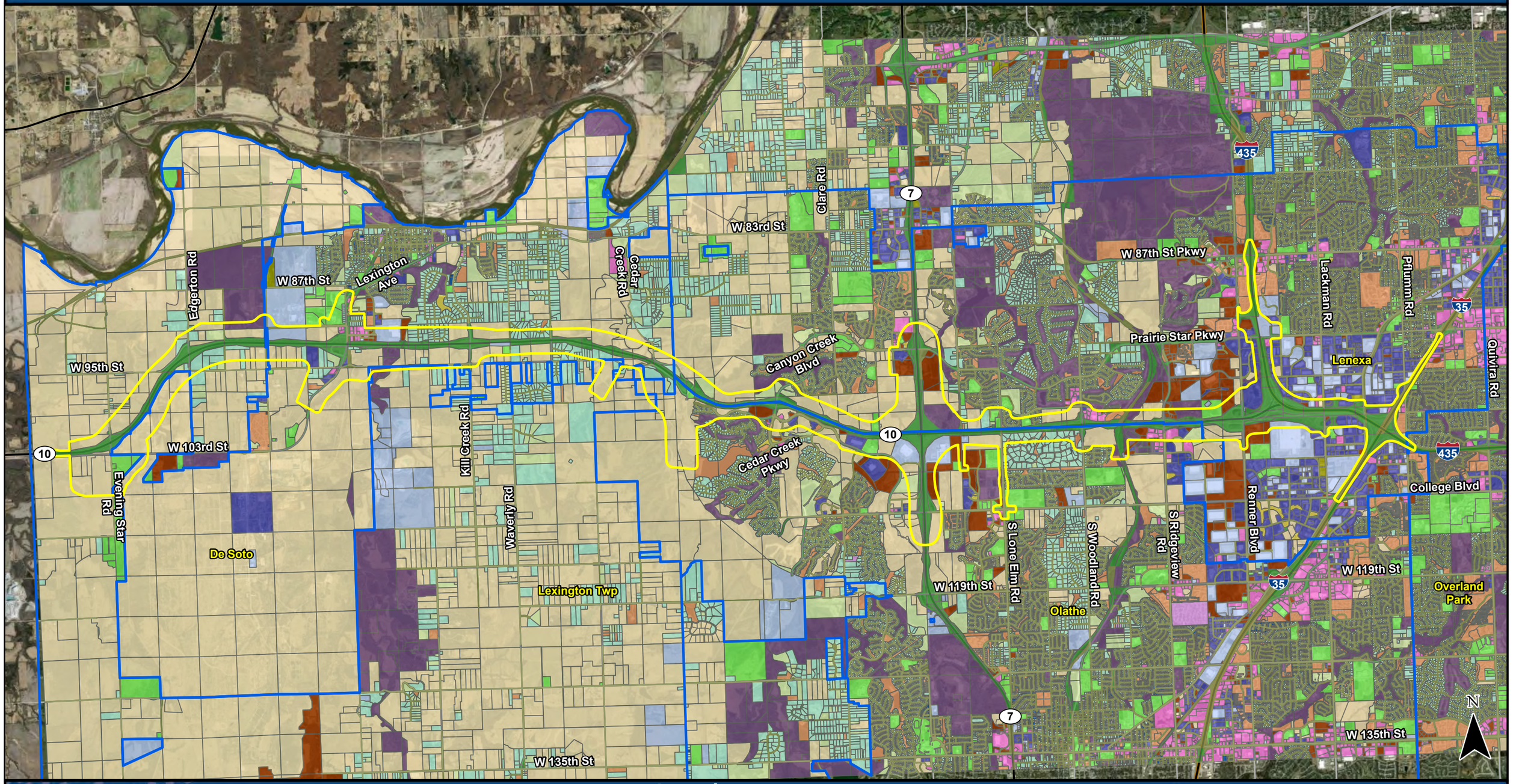
Table 3-17: Summary of Impacts

Resource	Measure	No Build Alternative	Preferred Alternative
Places of Worship and Schools	Quantity	0	0
Community Resources (Police, Fire, Libraries, Hospitals)	Quantity	0	0
Environmental Justice Impacts (Displacements in EJ Areas)	Quantity	0	3
Economic	Positive / Negative Impacts	Negative	Positive
Park and Recreation Areas	Quantity and acres	0	2 parks 0.2 acres
Bike Routes	Quantity and linear feet	0	3 bike lanes 3,496 feet

Resource	Measure	No Build Alternative	Preferred Alternative
Trails	Quantity and linear feet	0	12 trails 13,708
Historical Sites or Districts	Quantity	0	0
Archaeological Sites	Quantity	0	TBD
Section 4(f) Properties	Quantity and type	0	15
Section 6(f) Properties	Quantity and type	0	0
ROW and Permanent Easement Acquisitions	Acres	0	ROW – 87.1 Easement – 5.5
Displacements	Quantity and type	0	Residential – 3 Commercial – 1
Farmland Soil Impacts	Acres	0	21.3
Wetland Impacts	Acres	0	1.5
Stream Impacts	Linear feet	0	24,135
Floodway Impacts	Acres	0	9.1
100-year Floodplain Impacts	Acres	0	15.5
500-year Floodplain Impacts	Acres	0	0
Woodland Vegetation	Acres	0	51.3
Noise Impacts (2060 Design Year)	Number of sensitive receptors with impacts	430	539
Contaminated and Regulated Material Sites	Quantity and type	0	0

Existing Land Use

Figure 3-1



K-10 Capacity Improvements

KDOT # 10-46 KA-6549-01

0 1 2 Miles

Legend

- Study Area
- City Boundary

Existing Land Use

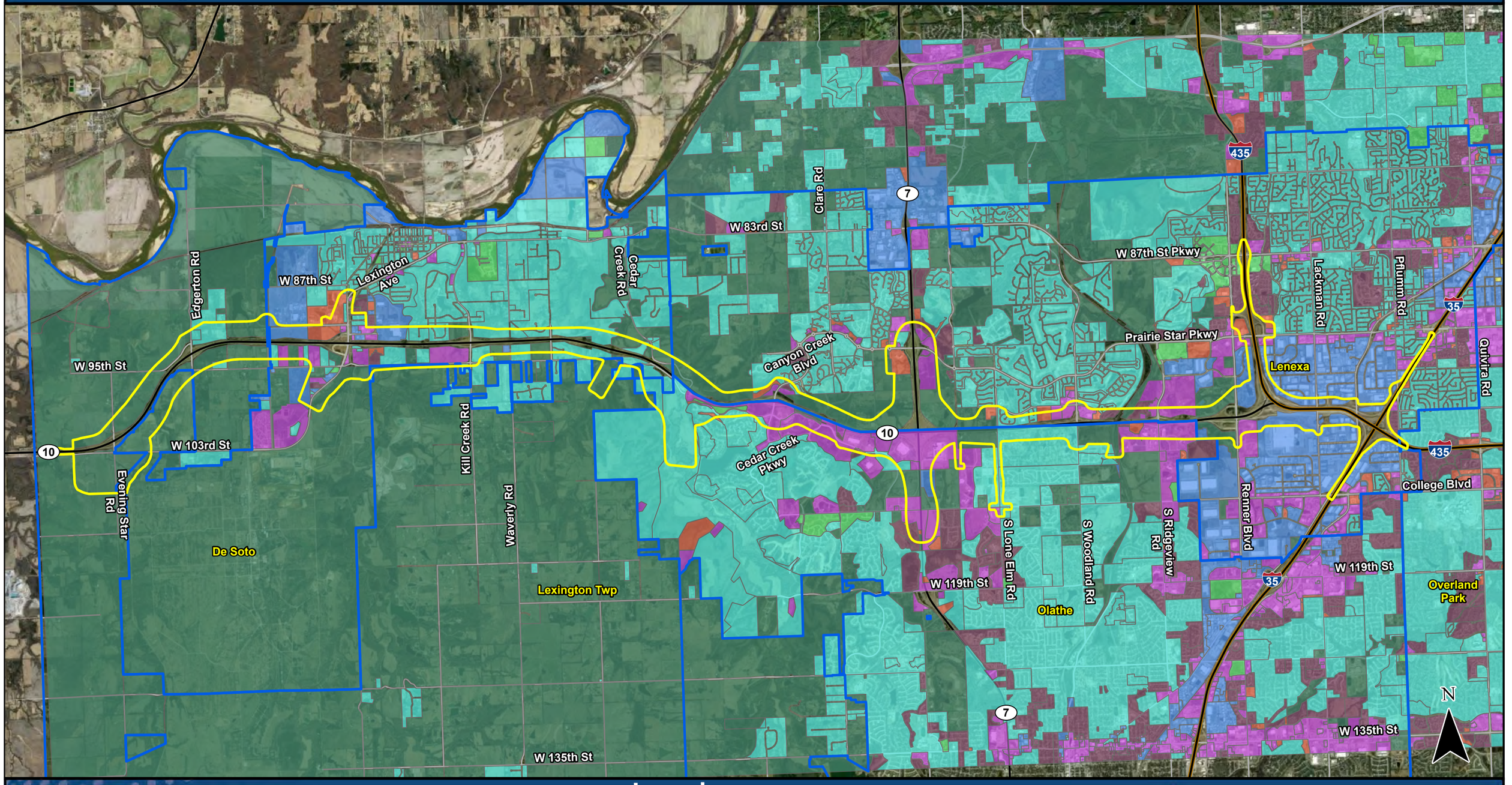
- Unassigned or ROW
- Agricultural
- Commercial
- Duplex or Triplex
- Govt./Public
- Heavy Industrial
- Lake
- Light Industrial
- Mobile Home
- Office
- Other Residential
- Recreation
- ROW
- Single Family Residential
- Vac. Comm./Indus.
- Vaccant Residential

K-10 CORRIDOR

Kansas Department of Transportation

Existing Zoning

Figure 3-2



K-10 Capacity Improvements

KDOT # 10-46 KA-6549-01

0 1 2 Miles

Legend

- Study Area
- City Boundary

Zoning

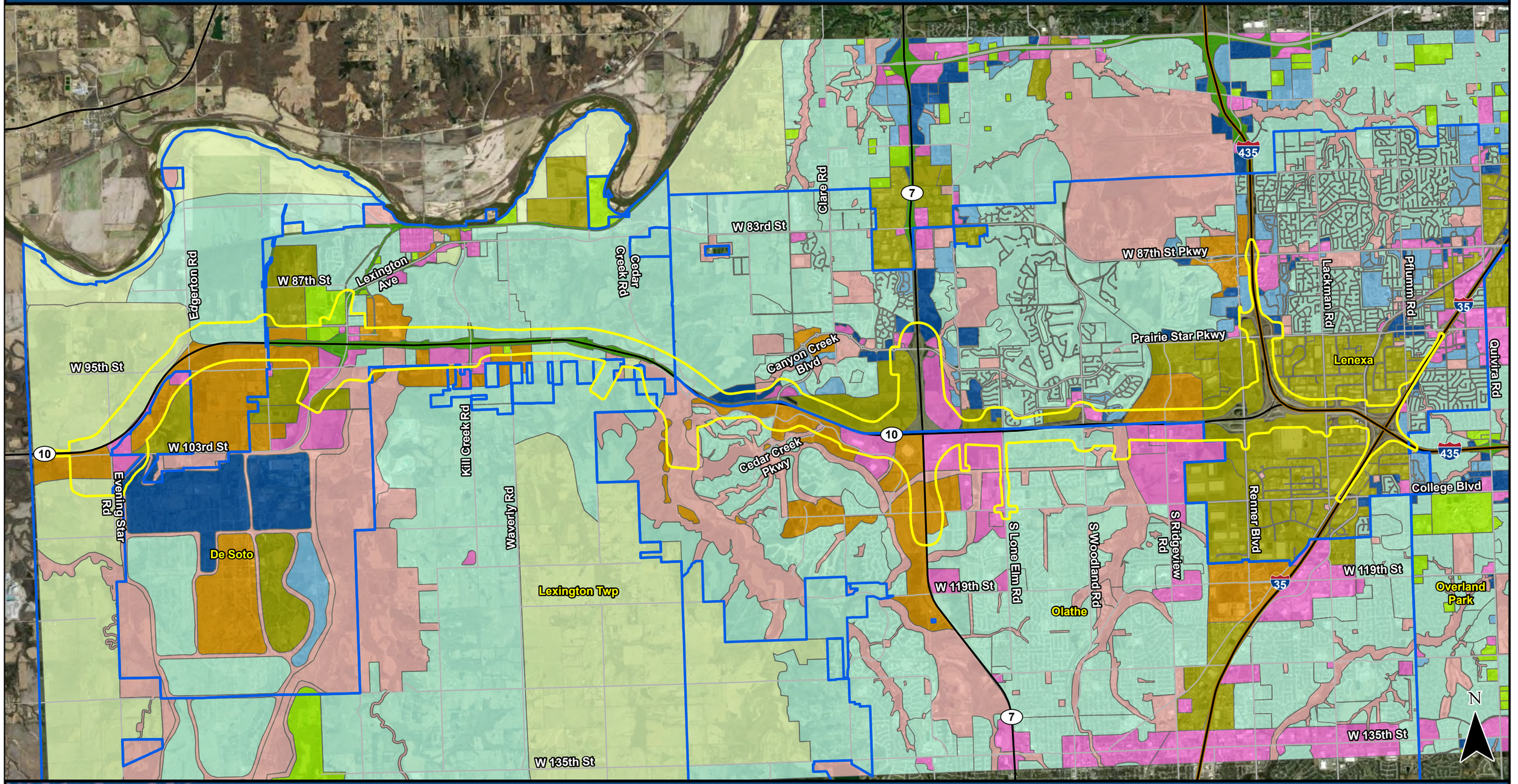
- Agricultural
- Business-Commercial
- Business-Office
- Civic/Parks
- Industrial
- Multi-Family Residential
- Multi-Use
- Single-Family Residential

K10 CORRIDOR

Kansas Department of Transportation

Future Land Use

Figure 3-3



Legend

K-10 Capacity Improvements
KDOT # 10-46 KA-6549-01

0 1 2 Miles

- Study Area
- City Boundary

Future Land Use

- Commercial
- Industrial
- Mixed Use
- Multi Family Residential
- Office
- Open Space
- Public
- ROW
- Rural
- Single Family Residential

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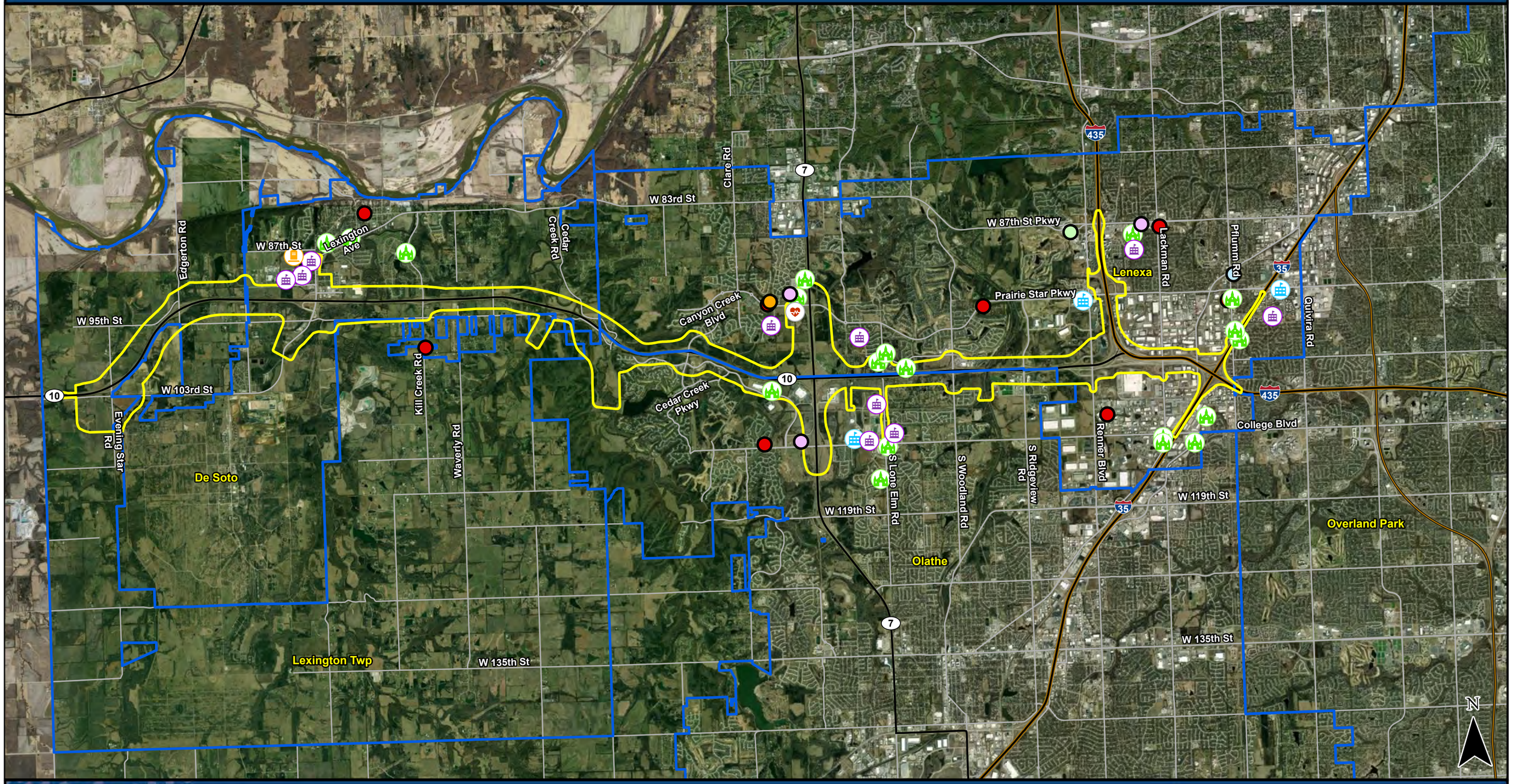
Kansas Department of Transportation

Community Resources

Figure 3-4



K-10 Capacity Improvements

KDOT # 10-46 KA-6549-01

0 1 2 Miles

Legend

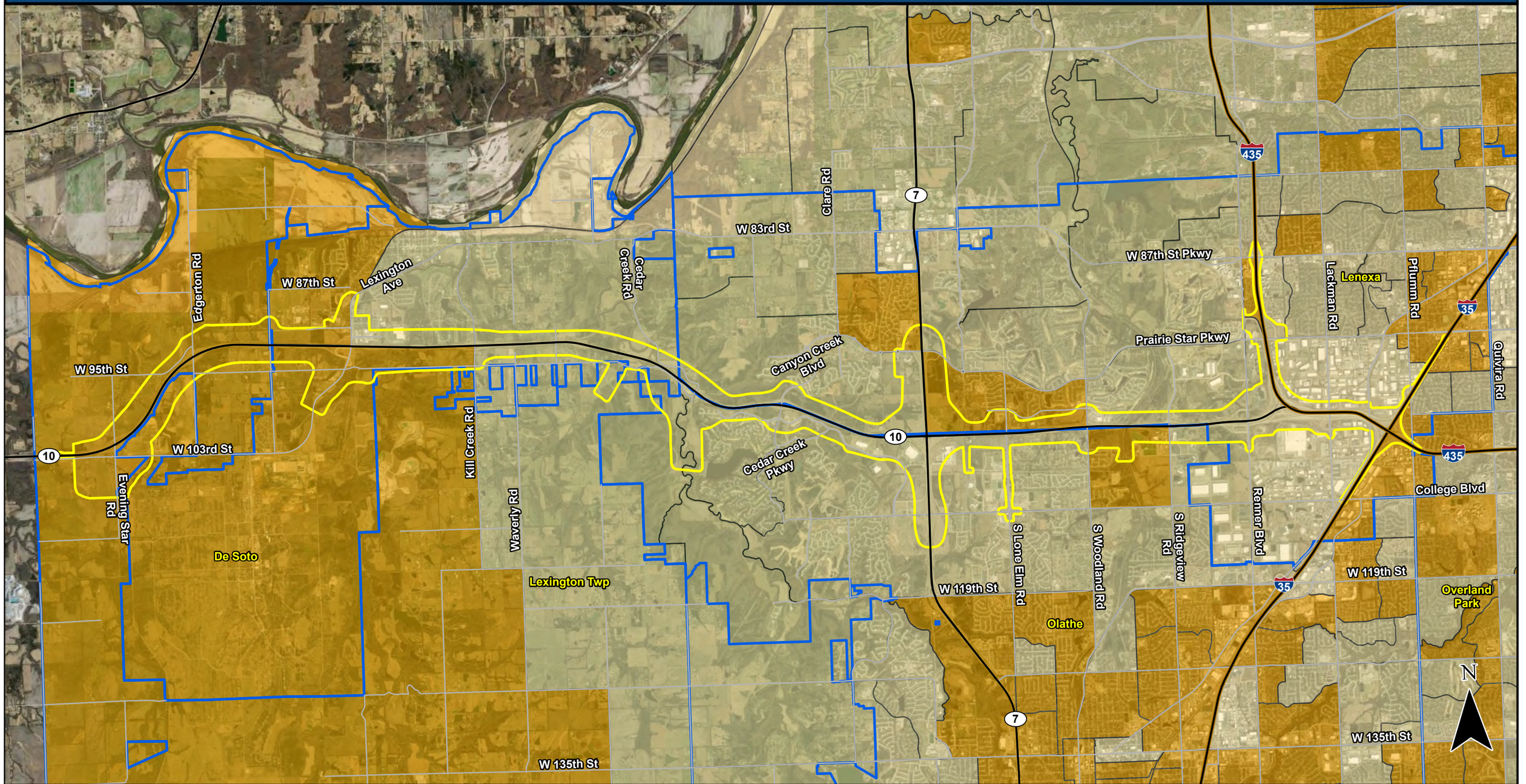
- Study Area
- City Boundary
- Cemeteries
- Public Schools
- College and Universities
- Hospitals
- Places of Worship
- Community Center
- Fire Stations
- Police Stations
- Urgent Care Clinics
- Libraries

K10 CORRIDOR

Kansas Department of Transportation

Minority Populations

Figure 3-5



K-10 Capacity Improvements

KDOT # 10-46 KA-6549-01

0 1 2 Miles

Legend

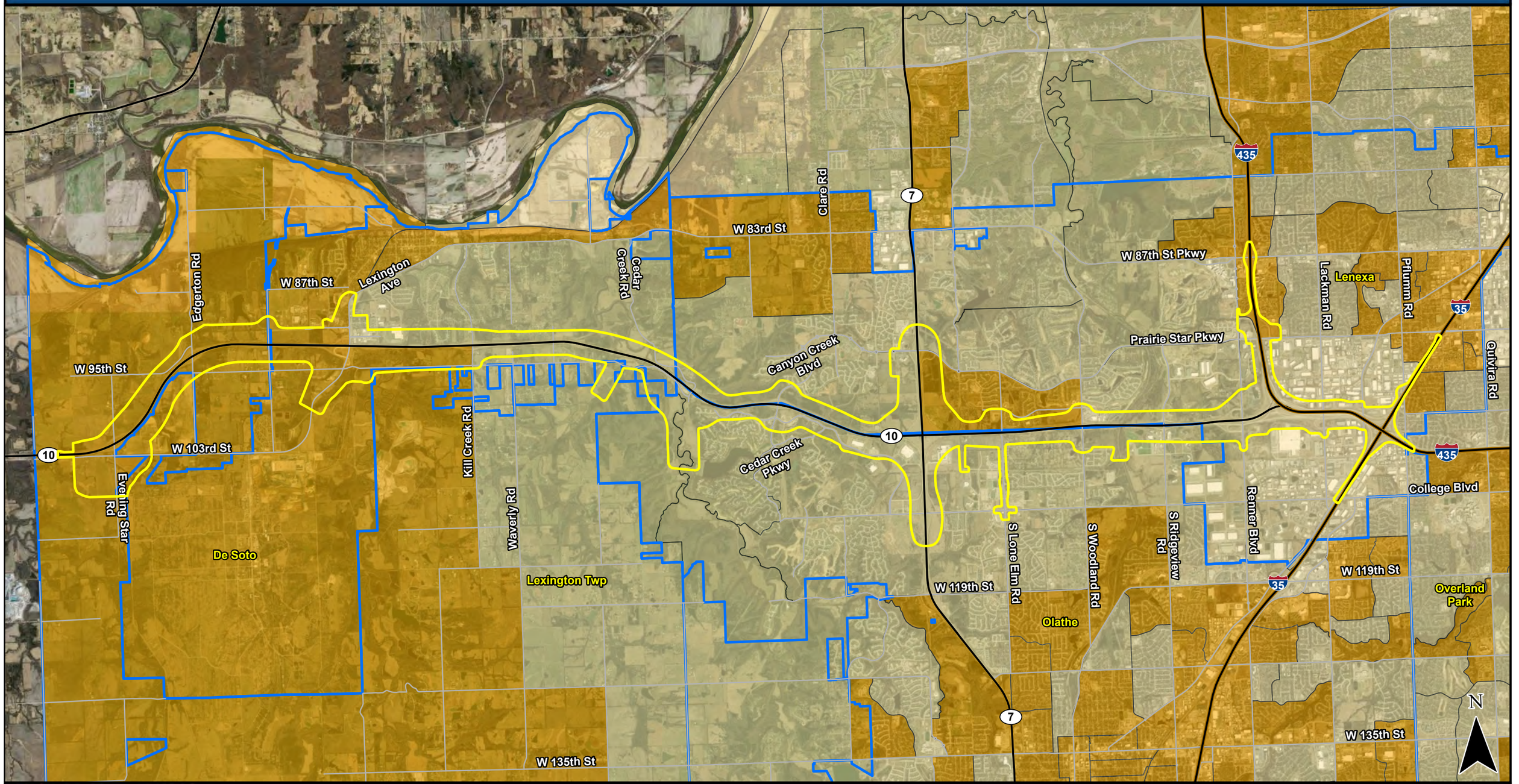
- Study Area
- City Boundary
- Block Groups without Minority Populations
- Block Groups with Minority Populations

K10 CORRIDOR

Kansas Department of Transportation

Low Income Populations

Figure 3-6



K-10 Capacity Improvements

KDOT # 10-46 KA-6549-01

0 1 2 Miles

Legend

- Study Area
- City Boundary
- Block Groups without Low Income Populations
- Block Groups with Low Income Populations

K10 CORRIDOR

Kansas Department of Transportation

Environmental Justice Population Noise Impacts

Figure 3-7

NSA 1:
8 Residential Receptors

NSA 2:
22 Park Receptors
4 Residential Receptors

NSA 3:
1 Active Sports Area Receptors
23 Residential Receptors

NSA 4:
80 Residential Receptors
2 Restaurant Receptors
3 School Receptors

NSA 5:
6 Park Receptors
6 Residential Receptors

NSA 6:
11 Park Receptors
27 Residential Receptors

NSA 7:
34 Residential Receptors

NSA 8:
31 Residential Receptors

NSA 9:
4 Residential Receptors

NSA 10:
12 Active Sports Area Receptors
1 Day Care Receptors
90 Residential Receptors
1 Restaurant Receptors

NSA 11:
253 Residential Receptors

NSA 12:
1 Residential Receptors

NSA 13:
24 Active Sports Area Receptors
1 Church Receptors
6 Residential Receptors

NSA 14:
1 Church Receptors
119 Residential Receptors
5 Trail Receptors

NSA 15:
36 Residential Receptors

NSA 16:
28 Active Sports Area Receptors
1 Residential Receptors
1 Trail Receptors

NSA 17:
129 Residential Receptors

NSA 18:
286 Residential Receptors

NSA 19:
563 Residential Receptors

NSA 20:
68 Residential Receptors

NSA 21:
463 Residential Receptors

NSA 22:
66 Residential Receptors

10 7 435 35

N

K-10 Capacity Improvements

KDOT # 10-46 KA-6549-01

0 1 2 Miles

Legend

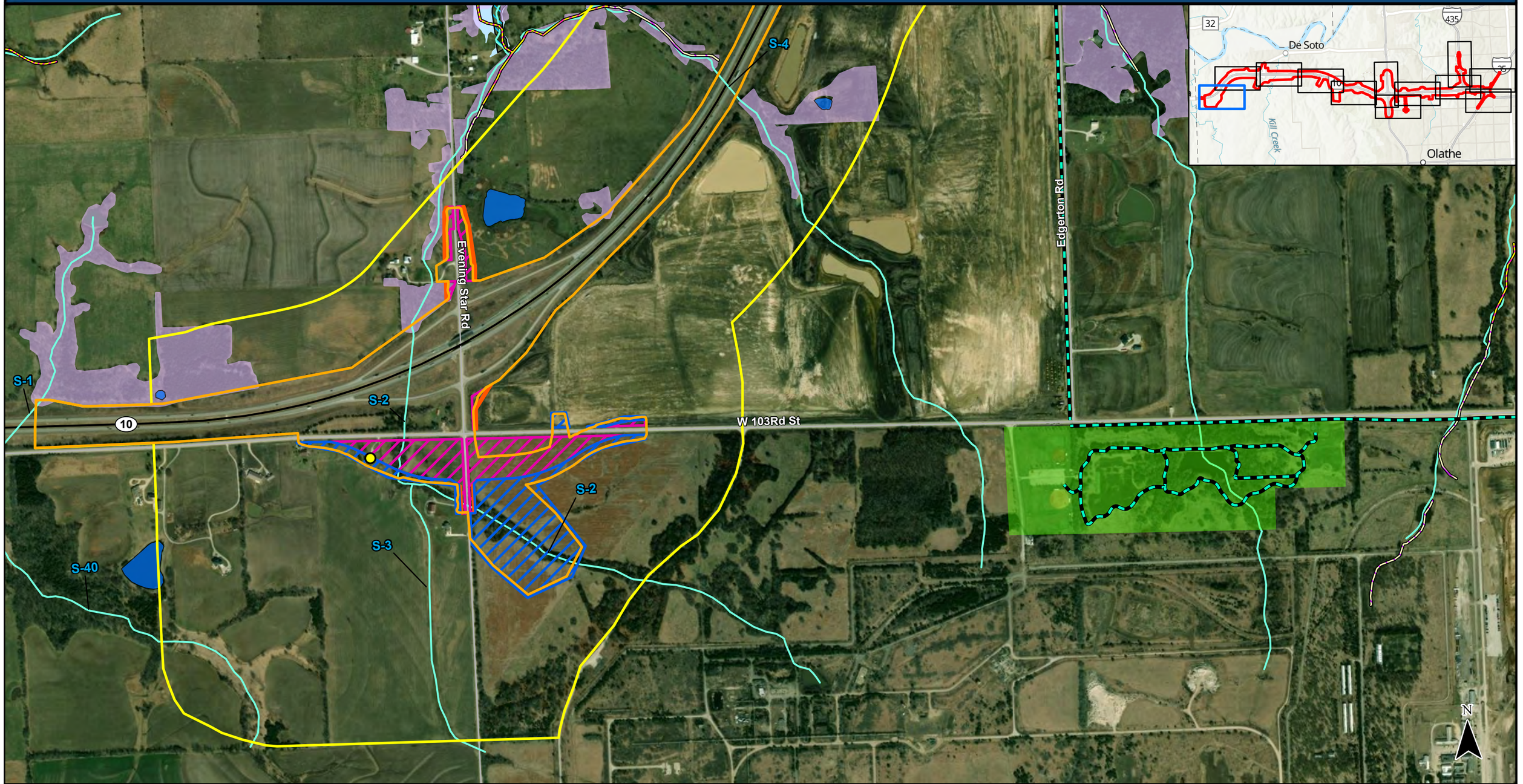
- Study Area
- Noise Sensitive Area
- Block Groups with Minority EJ Populations
- Block Groups with Low-income EJ Populations

K-10 CORRIDOR

Kansas Department of Transportation

Preferred Alternative Impacts

Figure 3-8



Legend

- Study Area
- Construction Limits
- New Right-of-Way
- Permanent Easement
- Temporary Easement
- Displacements
- NWI Emergent Wetland
- NWI Forested/ Shrub Wetland
- Floodway
- 100-Year Floodplain
- Lakes/Ponds
- Woodland Areas
- Parks
- Trails
- Bike Routes
- NHD Streams
- Drycleaner - Closed
- Identified Site List Sites
- LUST - Closed
- Solid Waste -- Dumps
- Solid Waste -- Regulated Facilities
- Spill Location - Closed
- In-Use Storage Tanks
- Wastewater Treatment

K-10 Capacity Improvements

KDOT # 10-46 KA-6549-01

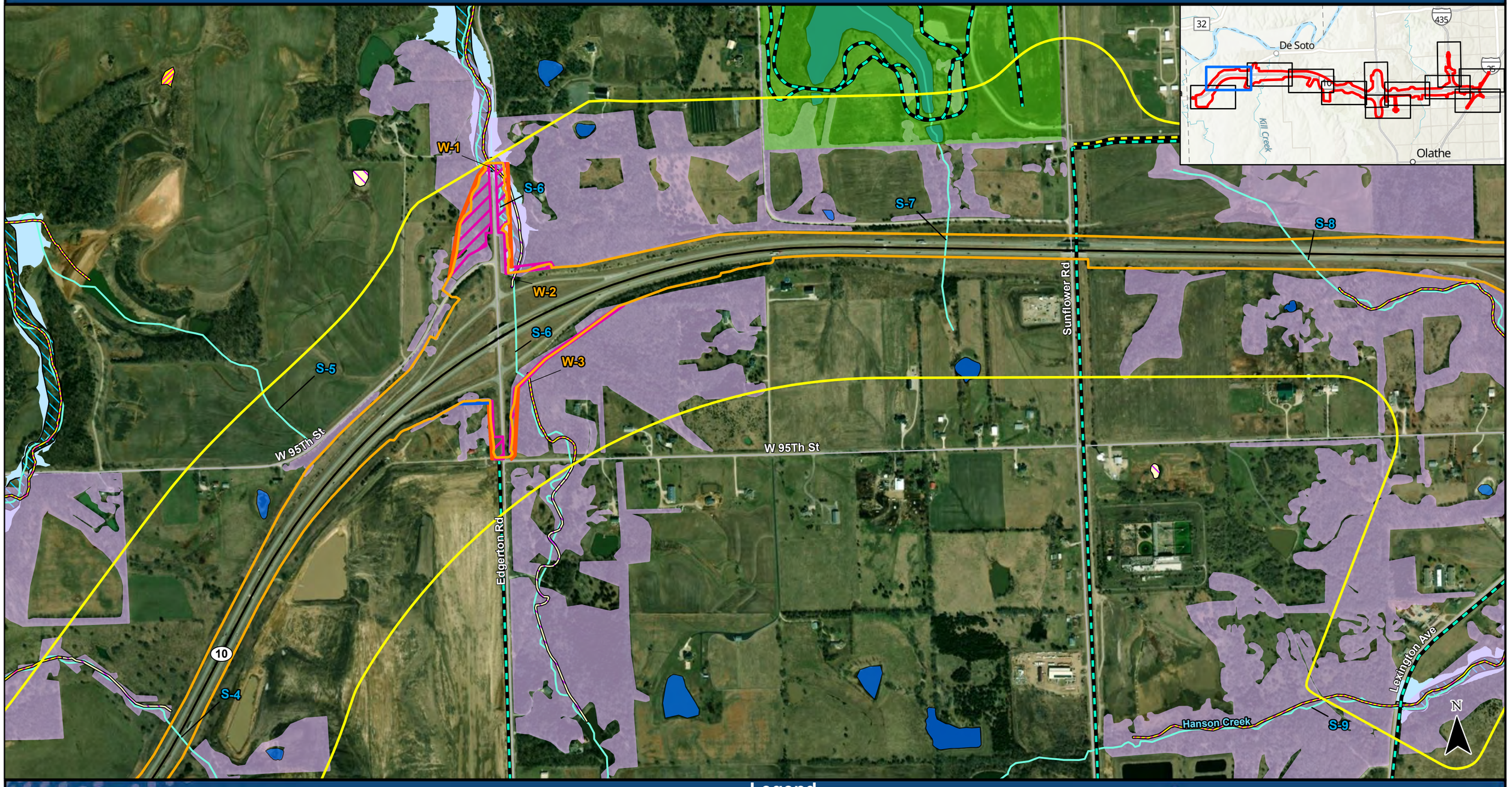
0 0.15 0.3 Miles

K10 CORRIDOR

Kansas Department of Transportation

Preferred Alternative Impacts

Figure 3-8



Legend

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- Temporary Easement
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K-10 Capacity Improvements

KDOT # 10-46 KA-6549-01

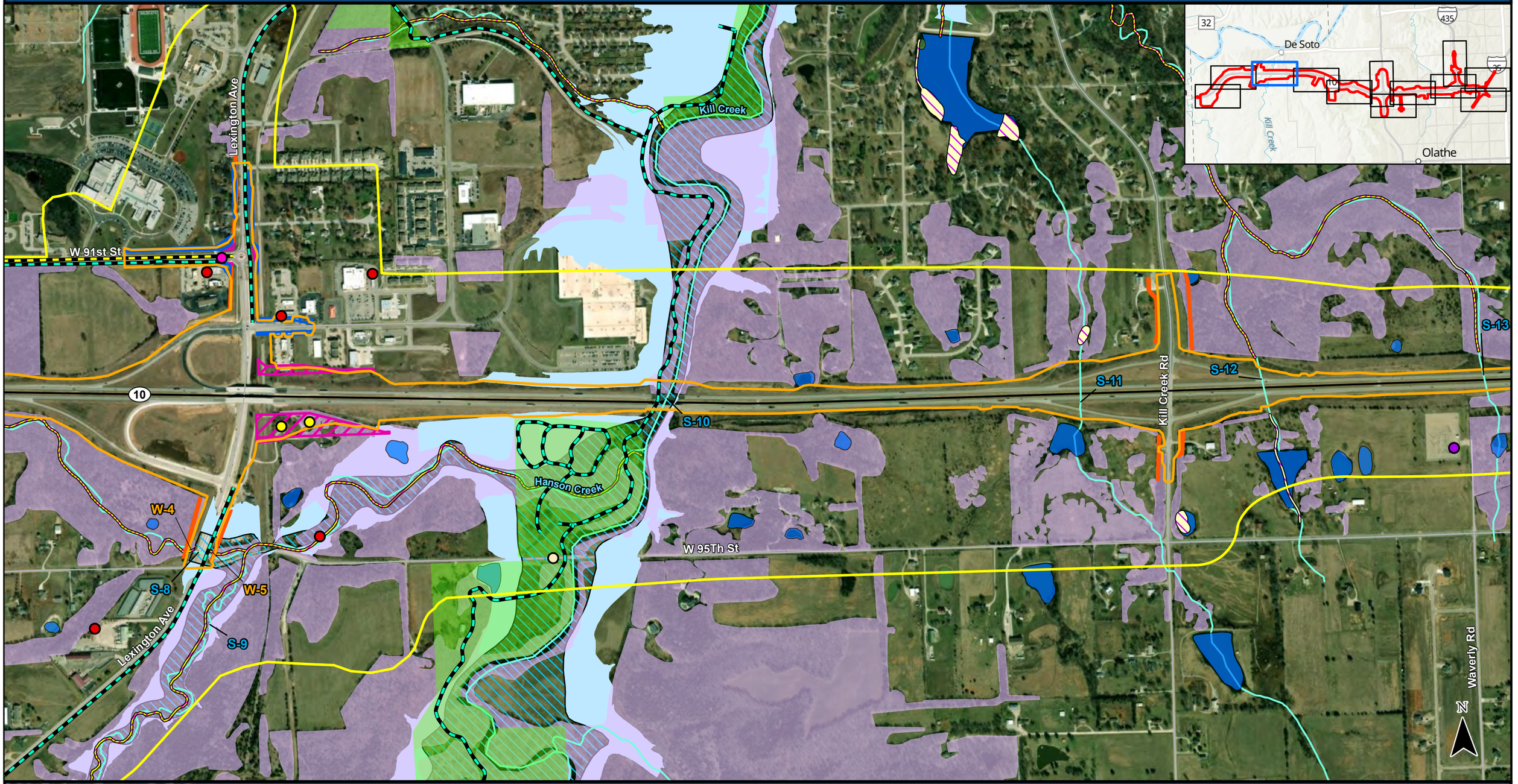
0 0.15 0.3 Miles

K10 CORRIDOR

Kansas Department of Transportation

Preferred Alternative Impacts

Figure 3-8



K-10 Capacity Improvements

KDOT # 10-46 KA-6549-01

0 0.15 0.3 Miles

Legend

- Study Area
- Construction Limits
- New Right-of-Way
- Permanent Easement
- Temporary Easement
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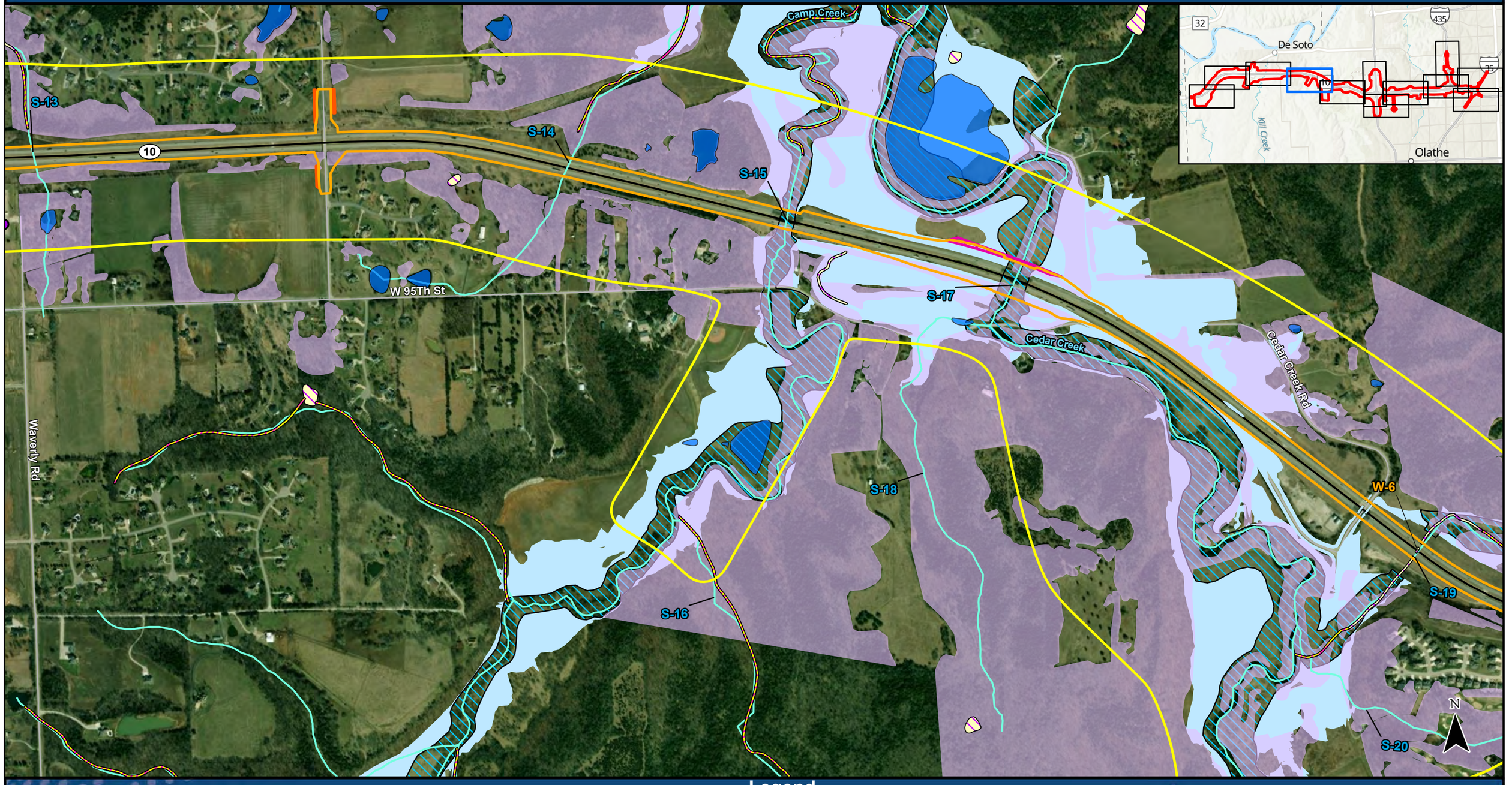
K10 CORRIDOR

Kansas Department of Transportation

Preferred Alternative Impacts

Figure 3-8



Legend

K-10 Capacity Improvements
KDOT # 10-46 KA-6549-01

0 0.15 0.3 Miles

- Study Area
- Construction Limits
- New Right-of-Way
- Permanent Easement
- Temporary Easement
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K10 CORRIDOR

Kansas Department of Transportation

Preferred Alternative Impacts

Figure 3-8

K-10 Capacity Improvements

KDOT # 10-46 KA-6549-01

0 0.15 0.3 Miles

Legend

- Study Area
- Construction Limits
- New Right-of-Way
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- Temporary Easement
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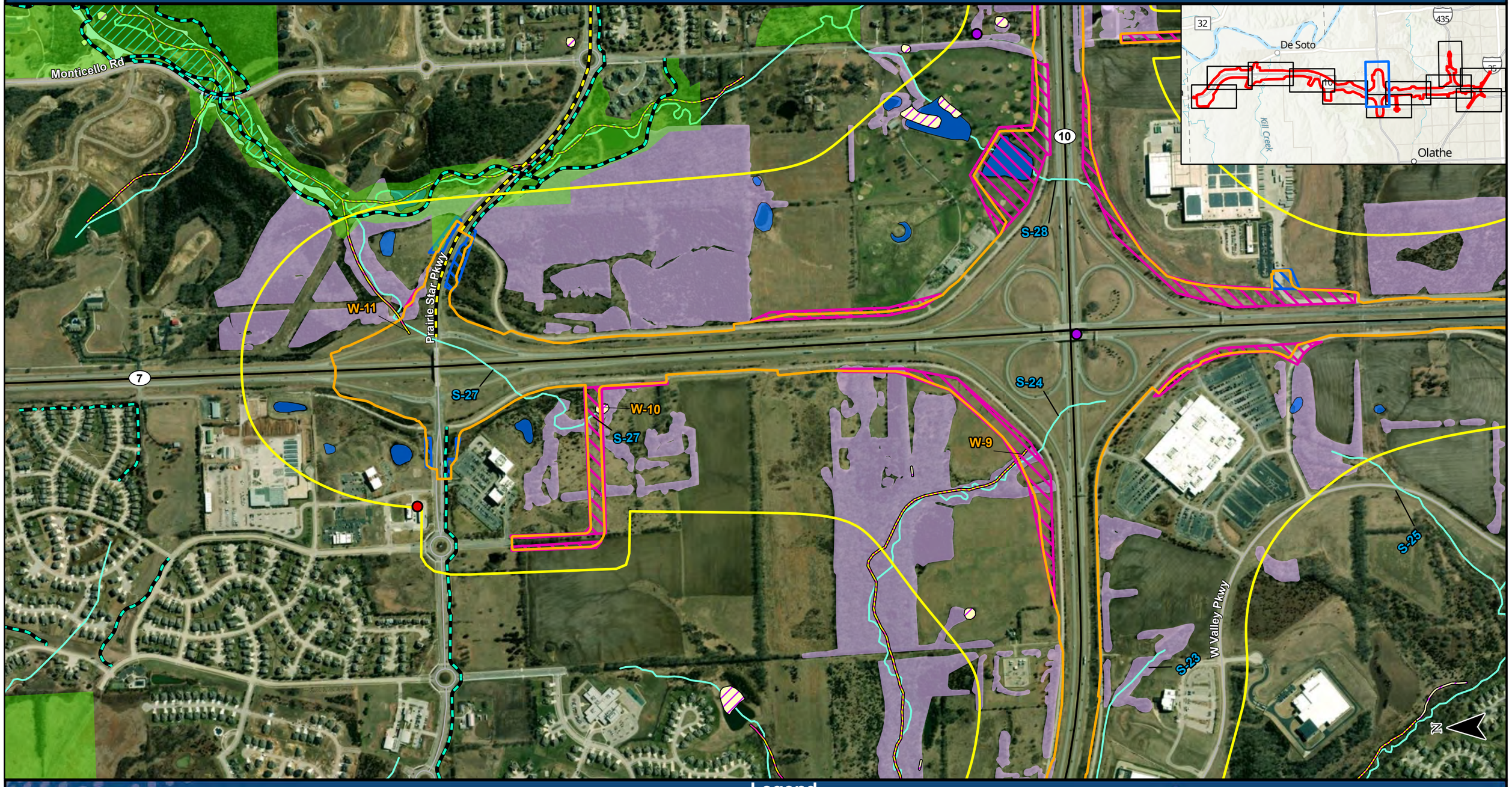
K10 CORRIDOR

Kansas Department of Transportation

Preferred Alternative Impacts

Figure 3-8



Legend

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- Construction Limits
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- Permanent Easement
- Temporary Easement
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K-10 Capacity Improvements

KDOT # 10-46 KA-6549-01

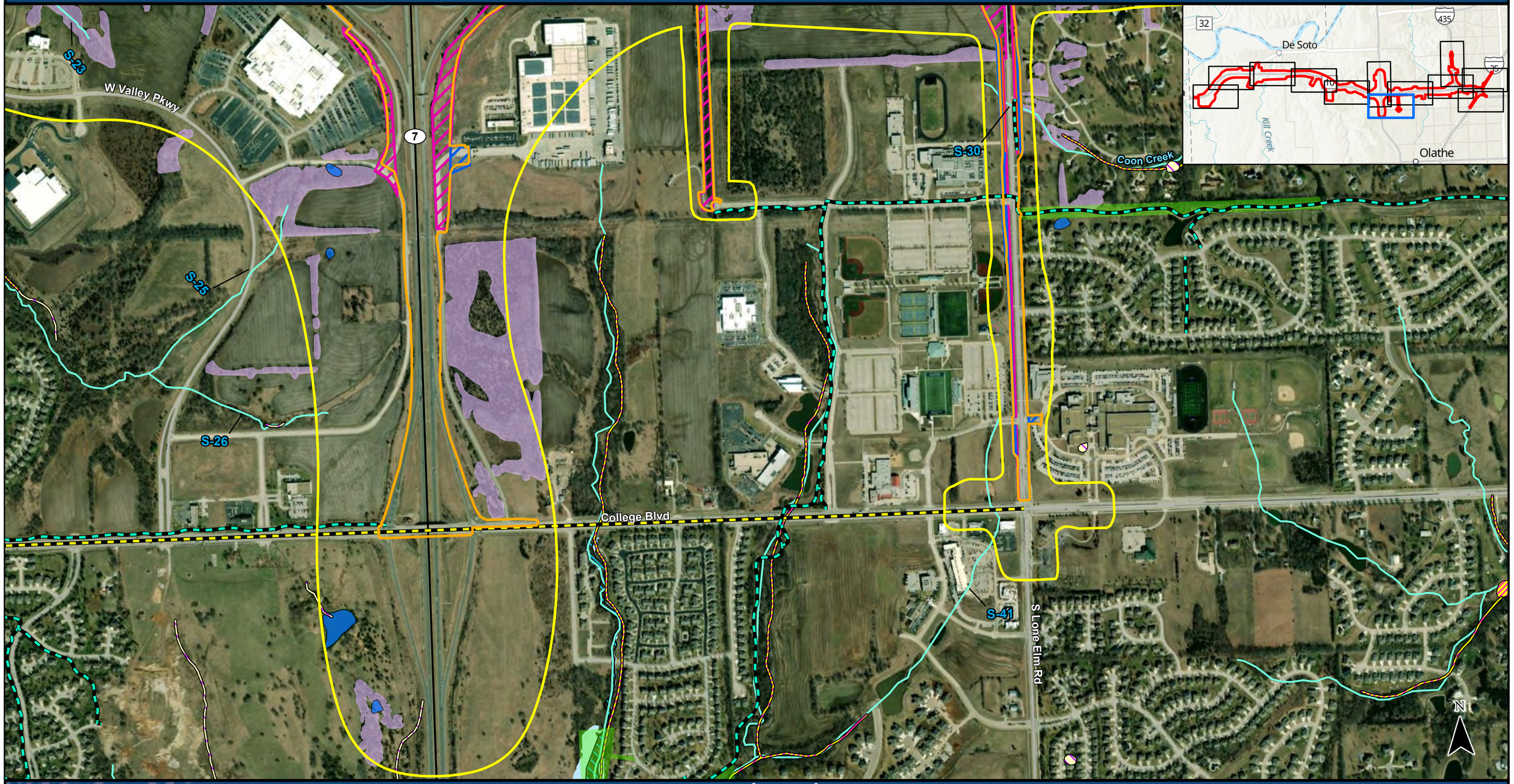
0 0.15 0.3 Miles

K-10 CORRIDOR

Kansas Department of Transportation

Preferred Alternative Impacts

Figure 3-8



K-10 Capacity Improvements

KDOT # 10-46 KA-6549-01

0 0.15 0.3 Miles

Legend

- Study Area
- Construction Limits
- New Right-of-Way
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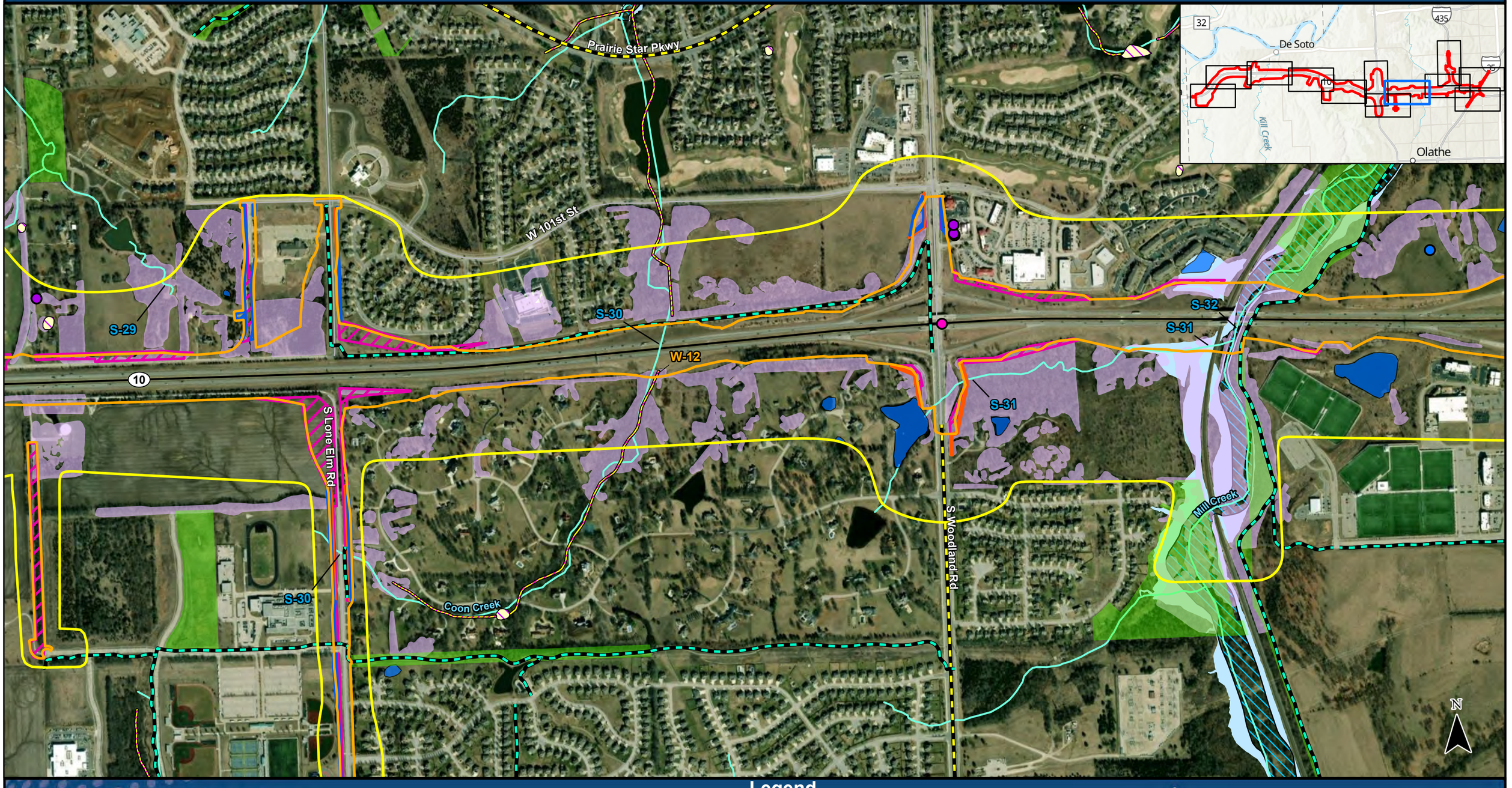
- In-Use Storage Tanks
- Wastewater Treatment

K10 CORRIDOR

Kansas Department of Transportation

Preferred Alternative Impacts

Figure 3-8



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- Wastewater Treatment

K-10 Capacity Improvements

KDOT # 10-46 KA-6549-01

0 0.15 0.3 Miles

K10 CORRIDOR

Kansas Department of Transportation

Preferred Alternative Impacts

Figure 3-8

Legend

- Study Area
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K-10 Capacity Improvements

KDOT # 10-46 KA-6549-01

0 0.15 0.3 Miles

K-10 CORRIDOR

Kansas Department of Transportation

Preferred Alternative Impacts

Figure 3-8

Legend

- Study Area
- Construction Limits
- New Right-of-Way
- Permanent Easement
- Temporary Easement
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- In-Use Storage Tanks
- Wastewater Treatment

K-10 Capacity Improvements

KDOT # 10-46 KA-6549-01

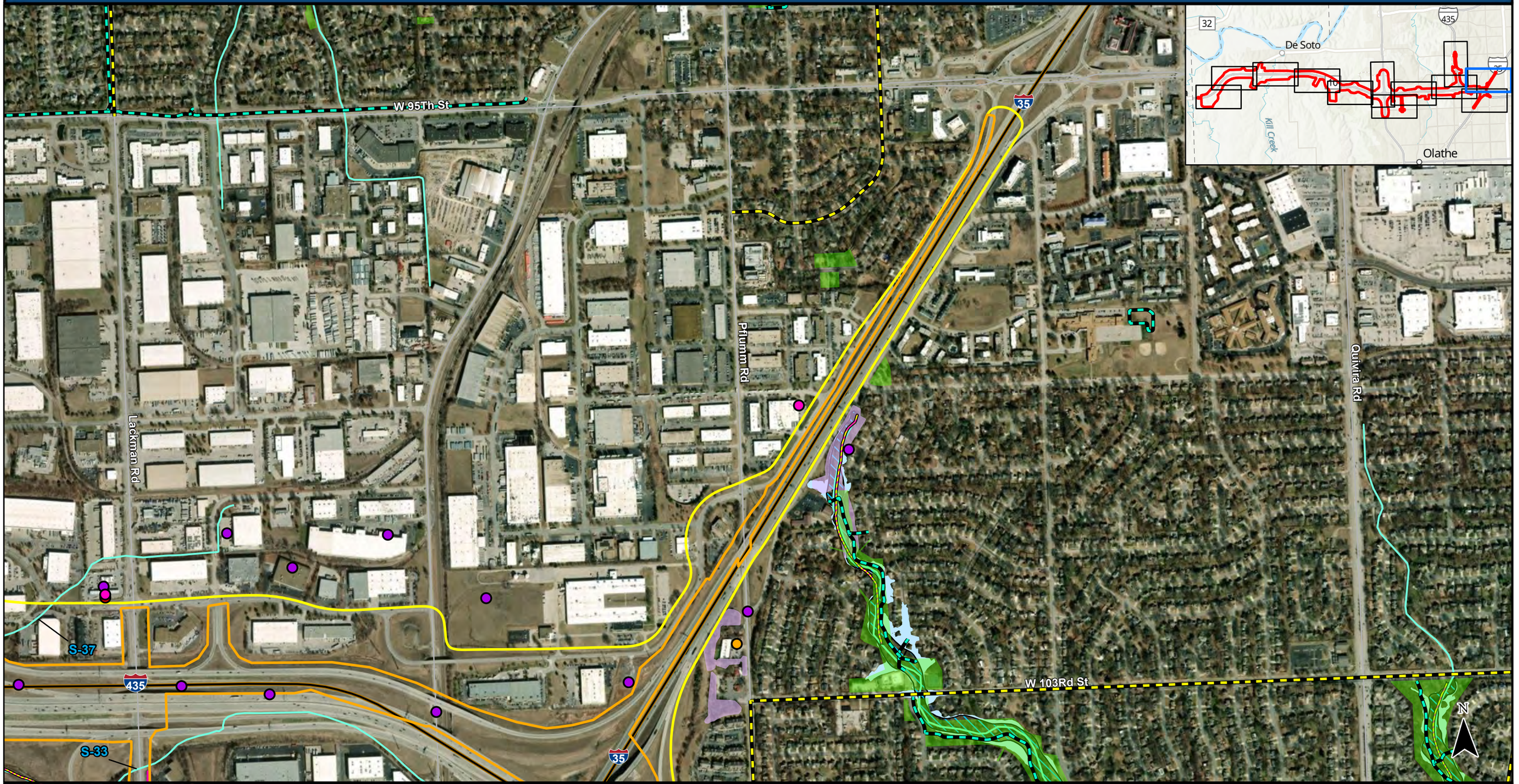
0 0.15 0.3 Miles

K10 CORRIDOR

Kansas Department of Transportation

Preferred Alternative Impacts

Figure 3-8



Legend

- Study Area
- Construction Limits
- New Right-of-Way
- Permanent Easement
- Temporary Easement
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K-10 Capacity Improvements

KDOT # 10-46 KA-6549-01

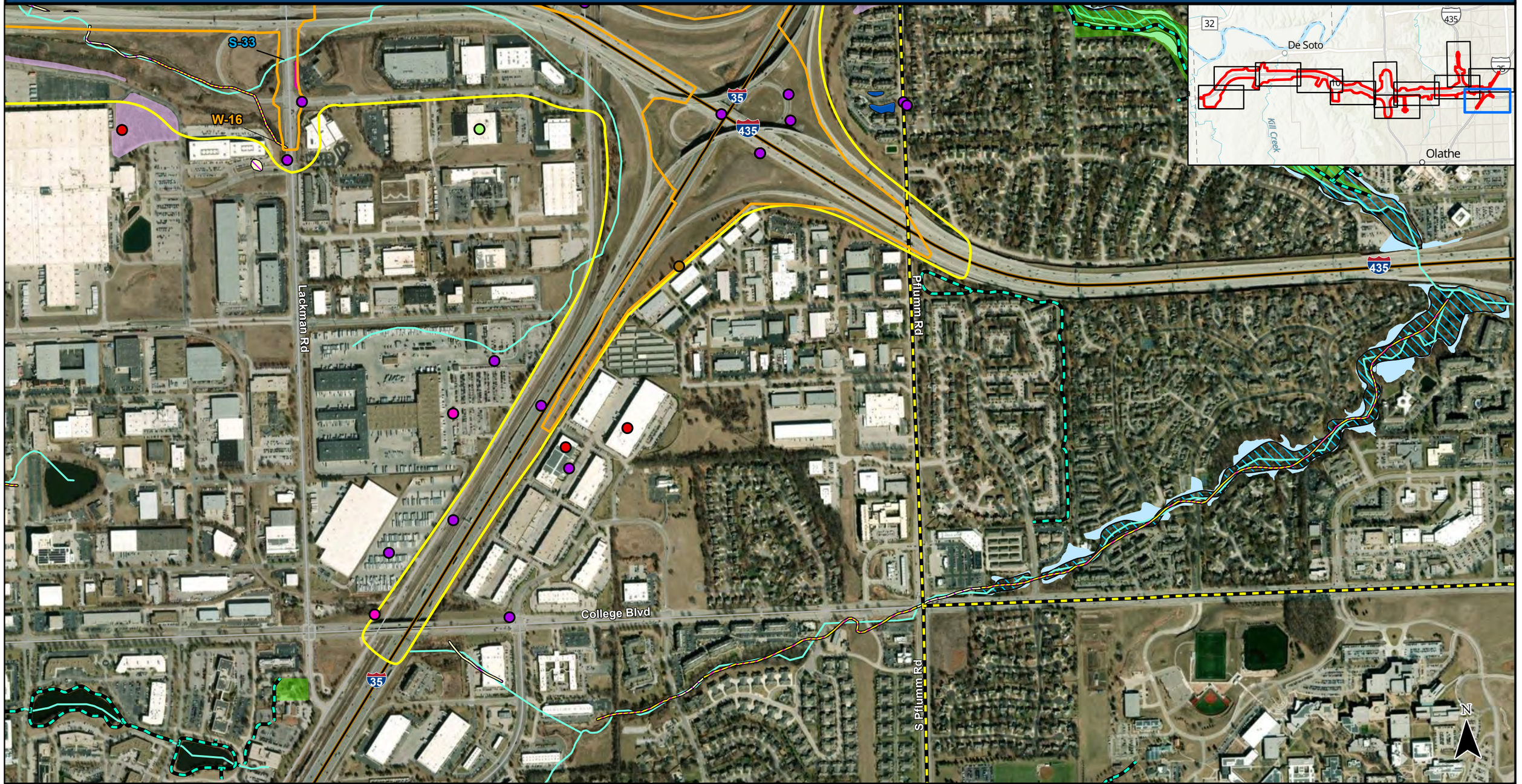
0 0.15 0.3 Miles

K10 CORRIDOR

Kansas Department of Transportation

Preferred Alternative Impacts

Figure 3-8



Legend

- Study Area
- Construction Limits
- New Right-of-Way
- Permanent Easement
- Temporary Easement
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- In-Use Storage Tanks
- Wastewater Treatment

K-10 Capacity Improvements

KDOT # 10-46 KA-6549-01

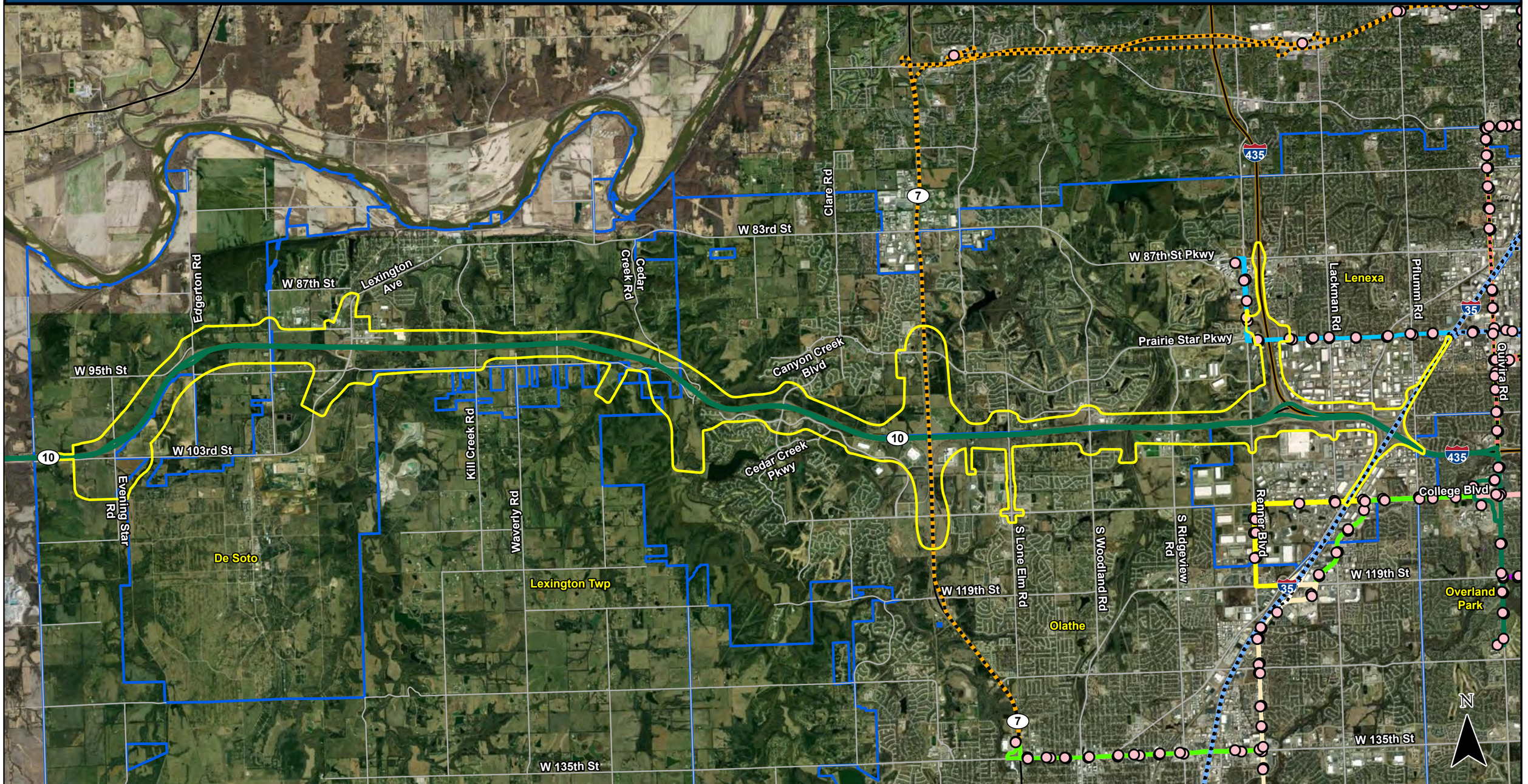
0 0.15 0.3 Miles

K10 CORRIDOR

Kansas Department of Transportation

Transit Routes and Stops

Figure 3-9



Legend

- Study Area
- City Boundary
- Bus Route 401
- Bus Route 402
- Bus Route 403
- Bus Route 435
- Bus Route 475
- Bus Route 495
- Bus Route 510
- Bus Route 519
- Bus Route 520
- Bus Route 563
- Bus Route 595
- Bus Stops

K-10 Capacity Improvements

KDOT # 10-46 KA-6549-01

0 1 2 Miles

K10 CORRIDOR

Kansas Department of Transportation

Farmland Soils

Figure 3-10

W 95th St
W 87th St
Lexington Ave
Edgerton Rd
Cedar Creek Rd
Clare Rd
W 83rd St
Canyon Creek Blvd
W 87th St Pkwy
Prairie Star Pkwy
Lackman Rd
Pflumm Rd
Lenexa
Quivira Rd
435
35
7
10
W 103rd St
Evening Star Rd
De Soto
Kill Creek Rd
Waverly Rd
Lexington Twp
Cedar Creek Pkwy
S Lone Elm Rd
S Woodland Rd
S Ridgeview Rd
Renner Blvd
College Blvd
W 119th St
Olathe
Overland Park
W 135th St
N

Legend

- Study Area
- City Boundary
- U.S. Census Urbanized Area
- Prime Farmland Soils
- Farmland of Statewide Importance Soils

K-10 Capacity Improvements

KDOT # 10-46 KA-6549-01

0 1 2 Miles

K10 CORRIDOR

Kansas Department of Transportation

Noise Sensitive Areas

Figure 3-11

NSA 1:
8 Residential Receptors

NSA 2:
22 Park Receptors
4 Residential Receptors

NSA 3:
1 Active Sports Area Receptors
23 Residential Receptors

NSA 4:
80 Residential Receptors
2 Restaurant Receptors
3 School Receptors

NSA 5:
6 Park Receptors
6 Residential Receptors

NSA 6:
11 Park Receptors
27 Residential Receptors

NSA 7:
34 Residential Receptors

NSA 8:
31 Residential Receptors

NSA 9:
4 Residential Receptors

NSA 10:
12 Active Sports Area Receptors
1 Day Care Receptors
90 Residential Receptors
1 Restaurant Receptors

NSA 11:
253 Residential Receptors

NSA 12:
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NSA 13:
24 Active Sports Area Receptors
1 Church Receptors
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5 Trail Receptors

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563 Residential Receptors

NSA 20:
68 Residential Receptors

NSA 21:
463 Residential Receptors

NSA 22:
66 Residential Receptors

10 7 435 35

N

K-10 Capacity Improvements

KDOT # 10-46 KA-6549-01

0 1 2 Miles

Legend

Study Area

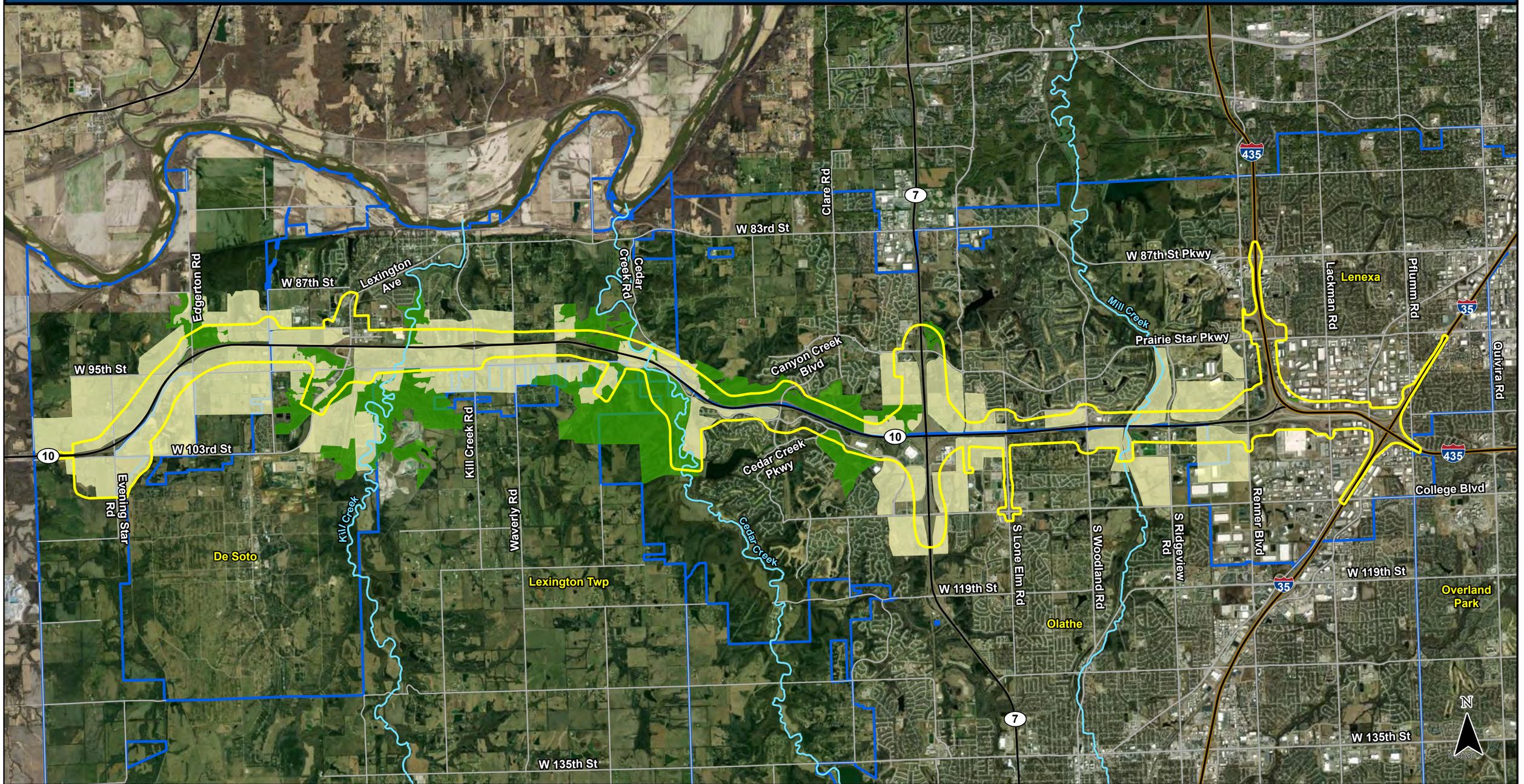
Noise Sensitive Area

K10 CORRIDOR

Kansas Department of Transportation

Visual Resources

Figure 3-12



K-10 Capacity Improvements

KDOT # 10-46 KA-6549-01

Legend

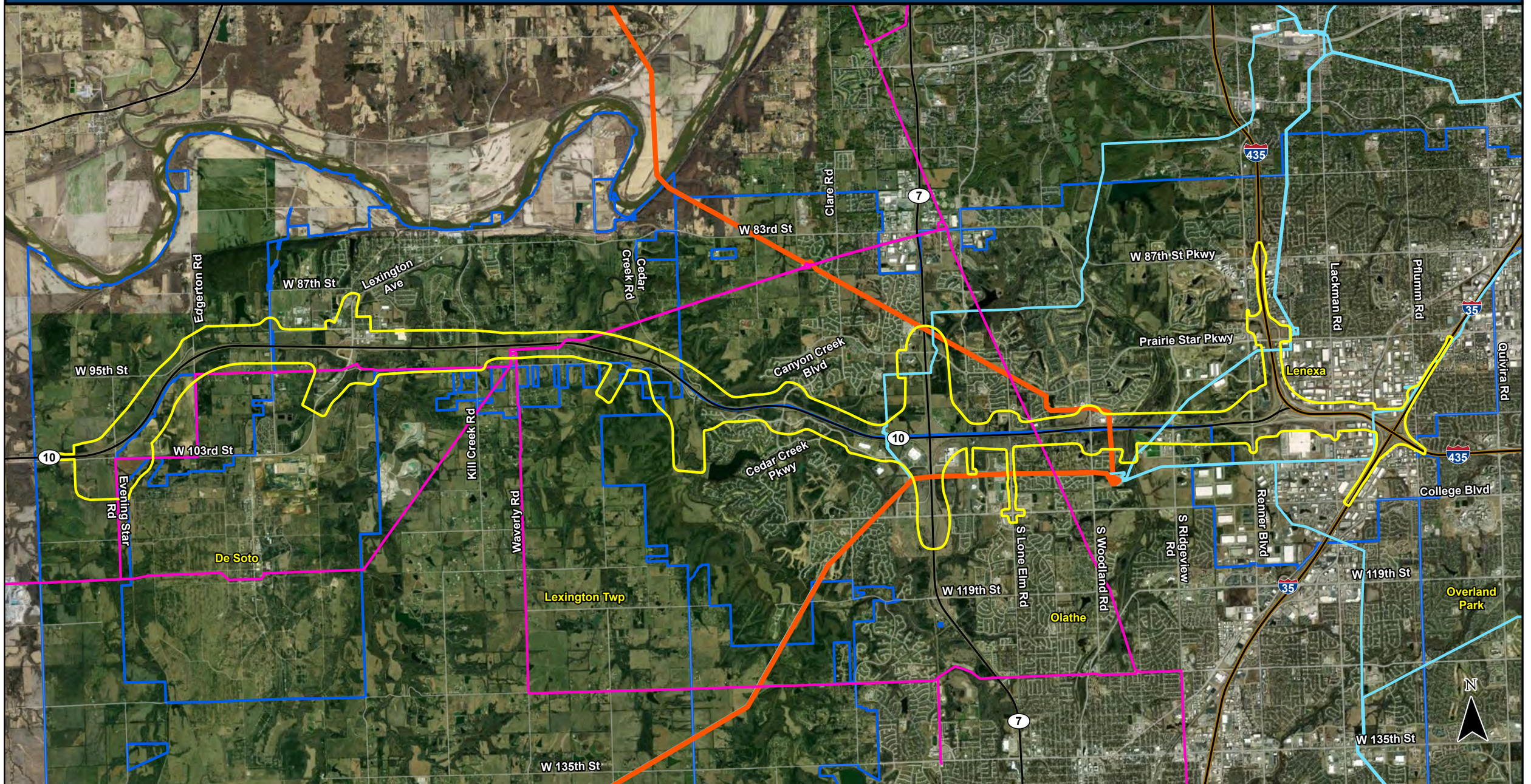
- Study Area
- City Boundary
- Woodland Area
- Rural Landscape
- Streams

K-10 CORRIDOR

Kansas Department of Transportation

Utilities

Figure 3-13



K-10 Capacity Improvements

KDOT # 10-46 KA-6549-01

0 1 2 Miles

Legend

- Study Area
- City Boundary
- 69 Volt Electric Transmission Line
- 115 Volt Electric Transmission Line
- 161 Volt Electric Transmission Line
- 345 Volt Electric Transmission Line

K10 CORRIDOR

Kansas Department of Transportation