

4. Environmental Consequences

This chapter forms the scientific and analytic basis for comparison of the alternatives described in **Chapter 2** of this document. As required by NEPA, this chapter discusses the environmental impacts of the alternatives, including the Preferred Alternative and any unavoidable adverse environmental effects should the Preferred Alternative be implemented (40 C.F.R. 1502.16). Alternatives are discussed in terms of the No-Action, the Preferred Alternative (the Non-Tolled Build Alternative as described in **Chapter 2**), and Tolled Build Alternative. In cases where impacts are generally the same between the Preferred Alternative and the Tolled Build Alternative, they are discussed together. Where they differ on expected impacts, they are discussed separately.

4.1. Land Use

The reasonable alternatives were evaluated for their consistency with local planning objectives, including those set forth in *Transportation 2040* (T2040) and *PLAN 2040: A Comprehensive Plan for Unincorporated Douglas County & the City of Lawrence* (P2040), the area's two long-range land use plans. These documents are discussed in **Chapter 3**.

The Build Alternatives (Tolled and Non-Tolled) have a similar footprint and have the same consistency with local planning objectives, as such, they are discussed together in **Section 4.1.3**.

4.1.1. No-Action Alternative

The two primary local planning documents (*T2040* and *P2040*), represent the collective work of the City of Lawrence and Douglas County planning bodies and are a guide in determining the compatibility of various alternatives with local planning desires and decisions. *T2040*, the City of Lawrence and Douglas County transportation plan, identifies widening of the west leg of the SLT as a future project to reduce existing congestion west of U.S.59 and future congestion along the entire west leg of the SLT. It lists comments from the T2040 public comment period in support of widening the west leg of the SLT to four lanes. The No-Action Alternative does not meet the transportation planning need of reducing congestion.

4.1.2. Build Alternatives

The Build Alternatives will reduce the congestion west of U.S. 59 along the west leg of the SLT by constructing access improvements along the corridor and widening the corridor to four lanes to accommodate the traffic demands of the 2045 design year. The access improvements include:

- Removal of at-grade intersections and construction of directional ramps at I-70 and removal of the toll plazas in coordination with the Kansas Turnpike conversion to AET;
- A new grade-separated interchange at Wakarusa Drive;
- Re-alignment of SLT through the Clinton Parkway area; and
- Reconfiguration of the U.S.59 Interchange.

The alternatives include clearing for a 128-foot typical section and the necessary ROW width for accommodating this section and interchange improvements. The 128-foot section is also set up to allow for future widening to six lanes in the open median.

4.1.3. Summary

The No-Action Alternative would not meet the T2040 goal within the project corridor of reducing the traffic congestion. The Preferred Alternative and the Tolerated Build Alternative would both reduce congestion along the corridor and allow for the possibility of future widening to accommodate increased traffic demand beyond the 2045 design year. Increasing access in combination with improving mobility in the corridor may create future conditions that make adjacent undeveloped property desirable for development.

4.2. Community Resources

This section describes the potential impacts to community resources including neighborhoods, churches, schools, and emergency services (hospitals, fire departments, and police departments). The community resources located within and adjacent to the study area are discussed in **Chapter 3**.

4.2.1. Community Cohesion

The only permanent access change will be to neighborhoods in the vicinity of the Wakarusa Drive/27th Street intersection. As part of the Build Alternatives, the existing at-grade intersection will be converted to a grade-separated service interchange. The removal of the at-grade connection of W 27th Street will increase the safety along the corridor while reducing congestion. The other access changes will be temporary construction impacts while the reconfigured U.S.59 and Clinton Parkway interchanges are being constructed.

No-Action Alternative – the No-Action Alternative will not impact any of the neighborhoods or community resources within or adjacent to the study area.

Build Alternatives – The impacts of the SLT Build Alternatives on community cohesion are related to changes in the physical and social factors that promote a bond among the residents of Lawrence and the surrounding communities. In a broader sense, community cohesion also includes the interactions between Lawrence and the surrounding rural residents who support local businesses, use community services, and participate in the community's social activities. Community cohesion may be described as the product of intangible and only somewhat directly quantifiable forces that contribute to people sharing common neighborhood facilities and services or the sense of place, which can be exhibited in some neighborhoods.

The Build Alternatives would result in permanent changes to the access to residences located north of Clinton Parkway, within the West Lawrence Neighborhood Association, and to residences located along Wakarusa Drive/W 27th Street. The changes would be due to the reconfiguration of the SLT/Clinton Parkway interchange and the SLT/Wakarusa Drive intersection. There is a safety benefit to the community by reconfiguring the SLT/Wakarusa Drive at-grade intersection to an access-controlled interchange. This reconfiguration and removal of the traffic signal at SLT and Wakarusa/ 27th Street helps address one of the high crash incident areas of the corridor.

No other community facilities or neighborhoods in or near the project study area would experience permanent changes in access. As a result, the proposed project would not permanently isolate or create barriers for any portions of the existing community.

4.2.2. Churches and Schools

The No-Action Alternative will not result in adverse impacts to churches or schools in the study area.

There are no churches or schools within the construction limits of the Build Alternatives. The closest church is the Community Bible Church which is located on the north side of N 1464 Road, adjacent to the east side of the Preferred Alternative and Tolloed Build Alternative construction limits. The closest school is One of A Kind preschool located on the north side of W 27th Street, approximately 0.1-mile east of the Build Alternative construction limits.

Impacts to the Community Bible Church and One of A Kind preschool may include temporary access impacts during construction, however, there are multiple available access alternatives with only the access directly from the SLT being temporarily impacted during construction.

Although no mitigation is required for the proposed project, coordination with the churches and schools with access routes to and from the SLT will be performed and any detours will be clearly marked and temporary in nature.

4.2.3. Emergency Services

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 structures.

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

Construction of either Build Alternative would not result in the permanent severing of access to any existing streets or properties. Construction activities would re-align the SLT West Section through the Clinton Parkway area (south of Bob Billings Parkway to north of Wakarusa Drive/27th Street) to remediate the existing curve. Construction would also reconfigure the U.S. 59 interchange and convert the Wakarusa Drive/27th Street at-grade intersection to a grade-separated service interchange.

Construction phasing will be implemented to ensure that emergency response vehicles can maintain access throughout the corridor. 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 of the project. Access to properties along the SLT corridor would 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 SLT corridor could effectively be reduced with construction of the proposed project. The reconfiguration of the U.S. 59 interchange, grade separation of the Wakarusa Drive/27th Street intersection, and remediation of the curve within the Clinton Parkway area will allow emergency vehicles to travel the SLT 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.

4.3. Environmental Justice

To analyze potential EJ impacts, the study team engaged with the community to determine if any self-identified populations existed within or in the proximity to the project corridor, and to determine what impacts EJ populations were concerned about. The study team utilized PIMA (Public Involvement Management Application) to gather input and comments that geo-rectified project comments and concerns with local neighborhoods. The project study team also utilized an Advisory Group that included a cross section of members from the community as another opportunity for EJ populations to make known their concerns regarding potential project impacts.

While no self-identified EJ populations were identified through public outreach activities, the project study team disseminated information to the broader community about potential project impacts, including noise, right-of-way acquisitions, and potential changes in access. While the project team received no correspondence or input from individuals or groups identifying as a minority or low income group member, the study team identified locations within the study area that, according to Census block group data, held potential minority or low-income populations. Utilizing PIMA, the study team did not identify any project comments or concerns regarding impacts from those areas. However, the project study team did receive broader community input with concerns regarding traffic noise.

Minority Populations

Based on the ACS data, Census Block Groups CT 8.01 BG 2 (29.4 percent), CT 10.01 BG 2 (46.9 percent), CT 10.02 BG 2 (29.1 percent), and CT 2.00 BG 6 (28.7 percent) had the potential to contain EJ populations (shown on **Exhibit 3-5**). To assess whether disproportionate impacts would occur to minority populations, the construction limits of the Build Alternatives were overlaid upon the BG boundaries. There will be no direct residential or commercial displacements within the block groups with potential for EJ impacts to minority populations. The potential impacts within the above listed block groups would consist of potential noise and temporary construction impacts. Noise impacts were evaluated for mitigation. No noise barriers were determined to be both feasible and reasonable per KDOT's traffic noise policy. Two of the noise walls in the corridor were determined to not be feasible as they were unable to sufficiently provide a benefit to the impacted receptors. The remaining barriers were determined to be feasible but not reasonable, with a vast majority exceeding the maximum of \$30,000 allotted per benefitted receptor. Based on locations of Census data-identified minority populations, noise impacts would not be disproportionately borne by minority populations.

Low-income Populations

Based on the ACS data, Census Block Groups CT 8.02 BG 1 (24.4%) CT 8.02 BG 2 (67.2%) and CT 9.02 BG 1 (25.9 %) have the potential for low-income EJ populations (shown on **Exhibit 3-6**). Similarly, to assess potential impacts to minority populations, the construction limits of the Build Alternatives were overlaid upon the Census Block Group boundaries. There will be no residential or commercial displacements within the low-income census tracts. Noise impacts were also assessed for potential low-income populations, with noise impacts occurring throughout the corridor. Noise barriers were determined to either be not feasible, or not feasible nor reasonable based on KDOT noise policy. Locations of Census data-identified low-income populations were identified in relation to potential noise impacts, and low-income populations would not be disproportionately impacted by noise.

4.3.1. No-Action Alternative

The No-Action Alternative will have no adverse impacts to environmental justice populations. However, as forecasted future traffic congestion along the SLT corridor is realized, optimum access for environmental justice populations to jobs and employments areas in or near the study area may be compromised.

4.3.2. Preferred Alternative

Based upon the EJ analysis conducted for this project for minority and low-income populations, the project may create noise impacts for those populations. However, the Preferred Alternative will not have disproportionate adverse noise impacts due to widespread SLT corridor noise impacts that are not disproportionately borne by minority or low income populations. Additionally, the project would result in improved access to economic development areas, places of employment, and commercial/retail facilities, improved accessibility and safety, improved bicycle-pedestrian facilities, and an improved transportation system for public transportation facilities for corridor residents.

4.3.3. Tolled Build Alternative

The Tolled Build Alternative would include the requirement for users to pay a “toll” to use the facility. At this time, KDOT and Kansas Turnpike Authority (KTA) assume that any tolled facility that would be implemented in the corridor would be an “express lane” model that would also offer continuously available non-tolled general-purpose lanes. The express lane would charge a toll for use during times of peak congestion. Based on this implementation model, neither the cost of tolls, nor other direct or indirect impacts, would be “predominantly borne” by environmental justice populations due to the availability of non-tolled general purpose lanes. Although the impacts would not be predominantly borne by environmental justice populations, the impact may be greater in magnitude for these populations as well as the potential for denial of reduced user cost benefits associated with reduced congestion.

It is important to note that economic modeling of toll feasibility and payment structures, or additional engineering development of tolling strategies beyond basic express lane concepts has not been conducted by KDOT or KTA. Should tolling of the SLT corridor be considered for implementation in the future, toll feasibility studies will be required to satisfy State of Kansas tolling legislation. Potential environmental justice impacts will be revisited at that time to determine if impacts would still occur, and if necessary, what mitigation may be necessary to reduce and/or offset adverse impacts.

4.4. Economic Impacts

There is commercial property along I-70 and in the vicinity of U.S. 59. The SLT corridor is also used to access communities in nearby Johnson County, Kansas. Ease of movement and convenient access to existing and future commercial and residential development in the surrounding municipalities is vital to the economic success of the area, as efficient travel flow throughout the region will result in time savings, and subsequently, financial savings.

4.4.1. No-Action Alternative

Plan 2040 contains the following economic development vision: “Create a diverse range of employment opportunities by capitalizing on our highly-educated workforce, attracting new employers, encouraging and supporting entrepreneurs, retaining and growing existing business, and maximizing our potential through innovative technology sectors.” If the congestion along the SLT corridor is not addressed, it would lead to inefficient travel along the corridor and could

potentially make it difficult to attract new businesses, increase the cost of product delivery, and make it difficult for customers to easily access businesses.

4.4.2. Build Alternatives

Impacts to existing commercially owned properties along the corridor are anticipated to be minor and no commercial displacements or permanent closure of access would occur.

Economic Impact of Displacements – The proposed project will result in no business displacements and minimal number of residential displacements. As such, the local tax base will not be permanently reduced by either of the Build Alternatives.

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 Build Alternatives are located primarily along the existing alignment, the impact to traffic movements during construction will be limited to locations of access improvements and interchange reconfigurations. The required temporary traffic control at these locations will not cause substantial delays and will not adversely impact any businesses.

Both Build Alternatives will increase jobs in the construction, and related, sectors of the economy while the roadway is under construction. The infusion of construction-related spending will have local and regional impacts as services and products are purchased to build the roadway. The wages paid to construction workers will be partially spent in local businesses.

Economic Development Benefits – 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. The cost of moving people and goods directly affects the cost of doing business.

Construction of either of the SLT Build Alternatives will improve the efficiency of the transportation system in Douglas County. Regional accessibility for local businesses will be enhanced by the additional capacity in the transportation system. It will also promote existing business expansion as well as Douglas County's ability to attract new businesses.

People who chose to live in Douglas County but work in other nearby Kansas counties such as Johnson and Shawnee are important consumers for businesses in Douglas County. An efficient transportation system is key for those who will choose to live in Douglas County and work outside of the county. Improved regional access will allow more people to commute to surrounding areas more successfully. New residents mean additional consumers and taxpayers. New consumers result in the growth of retail businesses and an increase in the tax base providing additional funds for public projects.

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.

4.5. Parks and Recreation and 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.

Construction of the proposed project would impact six Section 4(f) properties; no Section 6(f) properties will be impacted by the proposed project. FHWA has concurred with the eligibility of these properties for protections under Section 4(f). The impacts to Section 4(f) properties would be *de minimis* impacts, meaning the features, attributes, or activities qualifying for protection under Section 4(f) would not be adversely affected by the project. **Table 4-1** summarizes the park/recreational impacts for the Build Alternatives.

Table 4-1: Park and Recreation Impacts

Park or Recreation Use	Park Total Acreage	No-Action Alternative	Tolled Build Alternative Impacts	Preferred Alternative Impacts	Impacts as Percent of Total Acreage
USACE Property	447.5	-	13.4 acres	13.2 acres	3%
Rotary Arboretum	27.7	-	633.8 ft ²	633.8 ft ²	<1%
Youth Sports Complex	88.8	-	5.5 acres	5.5 acres	6%
Eagle Bend Golf Course	532.4	-	5.8 acres	5.8 acres	1%
Kanza Southwind Nature Preserve	19.0	-	14.0 ft ²	14.0 ft ²	<1%
Trails	--	-	33,912.1 ft	31,316.8 ft	--

The impacts within the properties listed in **Table 4-1** are discussed in **Section 4.5.2** and **Section 4.5.3**. Park impacts are displayed on **Exhibit 4-1** and **Exhibit 4-2**.

4.5.1. No-Action Alternative

The No-Action Alternative would not involve construction or ROW acquisition and would not impact the existing parks and recreational areas, or the City's ability to implement future planned improvements or new facilities.

4.5.2. Preferred Alternative

The park impacts of the Preferred Alternative are summarized in **Table 4-1** and discussed below.

USACE Property – The Preferred Alternative would require the permanent acquisition of and temporary impact approximately 13.2 acres of USACE owned property for additional right-of-way and temporary grading, construction staging, and reconstruction of existing roadways. The USACE Property is located along both sides of the SLT with approximately 8.3 acres of impacts occurring on the south side of the Clinton Parkway interchange and approximately 4.9 acres of impacts occurring on a remnant parcel on the north side of the SLT across from the Clinton Lake Softball Complex and the Rotary Arboretum. The impacts to the property on the south side of the Clinton Parkway interchange will contain approximately 1,161 feet of impacts to the SLT Trail and 59 feet of impacts to the Clinton Parkway Trail, both trails are 10-foot wide concrete paths. These impacts are required to reconfigure and reconstruct the Clinton Parkway interchange and will also involve partial reconstruction of E 900th Road. USACE property impacted at this location is used as passive open space and does not contain amenities. The impacts to the USACE remnant parcel on the north side of the SLT are located on vacant property and no developments or amenities will be impacted. These impacts are considered *de minimis* impacts.

Rotary Arboretum – The Preferred Alternative would require the acquisition of approximately 633.8 ft² of property at the southeast corner of the Rotary Arboretum property boundary and will be incorporated into KDOT right of way. The impacts are considered *de minimis* as there would be no impacts to any amenities within the Rotary Arboretum.

Youth Sports Complex – The Preferred Alternative would impact approximately 5.5 acres of undeveloped Youth Sports Complex property through the construction and extension of a drainage diversion channel from West Branch Yankee Tank Creek to the Wakarusa River for flood impact relief. The impacts are anticipated to be considered *de minimis* as there would be no impacts to any of the ball fields or other amenities of the Youth Sports Complex.

Eagle Bend Golf Course – The Preferred Alternative would impact approximately 5.8 acres of Eagle Bend Golf Course property. The impacts would be on undeveloped property on the north side of the Wakarusa River where the extension of an existing drainage pilot channel will be constructed. The impacts are anticipated to be considered *de minimis* as no features, attributes, or activities of the golf course would be adversely affected.

KSNP – The Preferred Alternative would incorporate approximately 14.0 ft² of undeveloped property along the southern border of the KSNP into KDOT right of way. There would be no impacts to any amenities within the KSNP; however, approximately 324.7 feet of mowed paths associated with the KSNP would be impacted by the Preferred Alternative. It is anticipated that the impacts will be considered *de minimis*.

4.5.3. Tolled Build Alternative

The park impacts of the Tolled Build Alternative are summarized in **Table 4-1** and discussed below.

USACE Property – The Tolloed Build alternative would require the permanent acquisition of and temporary impact approximately 13.4 acres of USACE owned property for additional right-of-way and temporary grading, construction staging, and reconstruction of existing roadways. The USACE Property is located along both sides of the SLT with approximately 8.3 acres of impacts occurring on the south side of the Clinton Parkway interchange and approximately 4.9 acres of impacts occurring on a remnant parcel on the north side of the SLT across from the Clinton Lake Softball Complex and the Rotary Arboretum. The impacts to the property on the south side of the Clinton Parkway interchange will contain approximately 1,161 feet of impacts to the SLT Trail and 59 feet of impacts to the Clinton Parkway Trail, both trails are 10-foot wide concrete paths. These impacts are required to reconfigure and reconstruct the Clinton Parkway interchange and will also involve partial reconstruction of E 900th Road. USACE property impacted at this location is used as passive open space and does not contain amenities. The impacts to the USACE remnant parcel on the north side of the SLT are located on vacant property and no developments or amenities will be impacted. These impacts are considered *de minimis* impacts.

Rotary Arboretum – The Tolloed Build Alternative would require the acquisition of approximately 633.8 ft² of property at the southeast corner of the Rotary Arboretum property boundary and will be incorporated into KDOT right of way. The impacts are considered *de minimis* as there would be no impacts to any amenities within the Rotary Arboretum.

Youth Sports Complex – The Tolloed Build Alternative would impact approximately 5.5 acres of undeveloped Youth Sports Complex property through the construction and extension of a drainage diversion channel from West Branch Yankee Tank Creek to the Wakarusa River for flood impact relief. The impacts are anticipated to be considered *de minimis* as there would be no impacts to any of the ball fields or other amenities of the Youth Sports Complex.

Eagle Bend Golf Course – The Tolloed Build Alternative would impact approximately 5.8 acres of Eagle Bend Golf Course property. The impacts would be on undeveloped property on the north side of the Wakarusa River where the channel improvements of an existing drainage pilot channel will be constructed. The impacts are anticipated to be considered *de minimis* as no features, attributes, or activities of the golf course would be adversely affected.

KSNP – The Tolloed Build Alternative would incorporate approximately 14.0 ft² of undeveloped property along the southern border of the KSNP into KDOT right of way. There would be no impacts to any amenities within the KSNP; however, approximately 324.7 feet of mowed paths associated with the KSNP would be impacted by the Preferred Alternative. It is anticipated that the impacts will be considered *de minimis*.

Although parks will be impacted by the Build Alternatives, the impacts will not adversely affect the characteristics that define these park areas and are considered *de minimis* as there will be no permanent impacts to any amenities within the park boundaries. As noted in **Table 4-1**, less than one percent of the Kanza Southwind Nature Preserve, Eagle Bend Golf Course and the Rotary Arboretum will be impacted. Similarly, approximately six percent of the Youth Sports Complex will be impacted, however the impacted property is located in a linear area at the west property edge and is not used for active recreation activities. Approximately three percent of USACE Clinton Lake project property is impacted, with approximately 4.9 acres of the total impact occurring on the disconnected vacant remnant parcel located north of the SLT. If this property is excluded from consideration, potential impacts total approximately 1.8 percent of USACE property.

The portion of the KSNP trails that may be impacted are located outside the park boundary. The existing bike routes and shared use paths along the SLT corridor that are impacted by project construction will be reconstructed/reconnected during project construction.

FHWA and KDOT coordinated with USACE and the City of Lawrence regarding Section 4(f) *de minimis* eligibility and impacts to the parks. USACE concurred with the *de minimis* impacts to USACE property via letter on March 19, 2021, and the City of Lawrence concurred via letter on March 25, 2021. Both letters of Section 4(f) *de minimis* concurrence can be viewed in **Appendix A**. Comments from the public were solicited via the SEIS public comment period and public hearing regarding the *de minimis* finding. No comments from the public were received.

4.6. Transportation

This section discusses impacts of the No-Action Alternative and the Build Alternatives on the transportation network (roadways and transit services) within the study area. The existing transportation resources are discussed in **Chapter 3**.

Potential impacts on traffic circulation are twofold. Changes to the roadway network can enhance or detract from the ease of accessing a location whether it is a house, a neighborhood or an institution. The other impact that may affect traffic circulation is traffic congestion. Traffic congestion can make it more difficult to access a property or may cause a different route to be taken. In general, increasing the ease of access is considered a benefit.

4.6.1. No-Action Alternative

The No-Action Alternative would not have construction related impacts to the existing roadways or transit services within the project vicinity. The No-Action Alternative would not include access improvements or widening of the SLT or address the existing congestion along the SLT corridor. Traffic volumes are expected to increase substantially by 2045 along the SLT and the No-Action Alternative would not alleviate the resulting future congestion or improve safety. The existing travel patterns would remain and adverse impacts to transportation would be likely to occur as a result of increased congestion and travel times, decreased safety, and decreased level of service. The No-Action Alternative does not change the roadway network and will result in increasing congestion resulting in more traffic circulation impacts than the Build Alternatives.

4.6.2. Build Alternatives

The construction of the Build Alternatives would affect transportation and traffic patterns within the project area. The project improvements would result in newly reconfigured interchanges at I-70, Clinton Parkway, and U.S. 59. The existing at-grade intersection at Wakarusa Drive will be replaced by a grade-separated service interchange.

The Build Alternatives would have temporary construction impacts to Lawrence Transit Bus Route 9 and KU On Wheels Bus Route 29. The impacts would occur along the section of Wakarusa Drive/27th Street that is adjacent to the SLT. The bus stops for both routes are located outside of the construction limits of the Build Alternatives.

Since the Build Alternative alignments will be very similar along the existing SLT corridor, there is not expected to be a substantial difference in traffic circulation impacts. In the long term, the completion of the Build Alternatives would result in better overall access, less congestion, and decreased travel times. With construction of the proposed project, benefits to the transportation

system would be realized. During construction, a traffic circulation and temporary detour plan will be prepared to mitigate effects of the redistribution of traffic.

4.7. Utilities

This section discusses impacts of the No-Action Alternative and the Build Alternatives on the utility resources within the study area. The existing utility resources are discussed in **Chapter 3**.

4.7.1. No-Action Alternative

No impacts to utilities would occur under the No-Action Alternative.

4.7.2. Build Alternatives

The Build Alternatives would have impacts on underground and aboveground utilities. Relocation of some utilities within the corridor would be necessary to accommodate the project improvements. A 16-inch gas transmission line, owned by Southern Star Central Gas Pipeline, that runs through the Clinton Parkway interchange will need to be relocated. The gas line is a high-pressure gas line used for long distance transmission, not distribution to any local residences or businesses. The extent and exact nature of other utility impacts will be determined during the final design phase of the project.

Other impacted utilities would most likely be relocated in the same vicinity of their current location. Coordination with the public and private utility companies will be needed during the design phase to ensure utility service is uninterrupted or only minimally disrupted during utility relocation and construction of the proposed improvements.

4.8. Hazardous Waste

Existing hazardous waste sites discussed in this section could be affected by the proposed project improvements. Releases into the environment may be caused by construction activities resulting in new or additional contamination and possible worker exposure. Potential negative impacts may include, but are not limited to the following:

- Dust from contaminated soils disturbed during earth moving activities, with potential exposure to workers and nearby residents
- Worker contact with hazardous materials or waste unearthed or released during construction
- Unearthing disposal sites and spreading hazardous materials through wind, runoff, etc.
- Displacement of contaminated soils by borrowing or excavating and relocating the materials to fill areas

The likelihood of these impacts occurring is low due to preventative measures taken before and during construction. To the extent possible, known hazardous waste sites will be avoided. Construction-related impacts will be remedied prior to, or as part of, construction of the proposed project. If a previously unknown site is uncovered during construction, measures will be taken, as necessary, to eliminate or minimize adverse environmental consequences.

The hazardous material screening of the reasonable alternatives rated waste sites as having a high, moderate, or low degree of risk to public health. Listed in **Table 4-2** are the hazardous waste sites that will be impacted by each of the build alternatives. A detailed description of each of the sites is provided in **Chapter 3**.

Table 4-2: Potential Hazardous Waste Site Impacts

	Clinton Cove (LUST 1)	Unknown Discharger (Spill 1)	Walthers Oil (Spill 2)
Level of Risk	Low	Low	Low
No-Action Alternative	-	-	-
Preferred Alternative	Adjacent	Within construction limits	Adjacent
Tolled Build Alternative	Adjacent	Within construction limits	Adjacent

Clinton Cove (LUST 1) – This site is located adjacent to the west side of the Clinton Parkway interchange, outside of the construction limits of the Build Alternatives. The LUST incident is considered closed by KDHE; however, any soil excavated during the project should be incorporated back into the direct area or tested and properly remediated.

Unknown Discharger Spill Site (Spill 1) – This site is located along the I-70 corridor, within the construction limits of the Build Alternatives. This spill incident is considered closed by KDHE; however, any soil excavated during the project should be incorporated back into the direct area or tested and properly remediated.

Walthers Oil (Spill 2) – This site is located adjacent to the west side of the Clinton Parkway interchange, outside of the construction limits of the Build Alternatives. This spill incident is considered closed by KDHE; however, any soil excavated during the project should be incorporated back into the direct area or tested and properly remediated.

The No-Action alternative will avoid all hazardous waste sites located in the project study area. The Build Alternatives would have the same potential to impact or be impacted by the same three hazardous waste sites. Due to the low risk of impact associated with the hazardous waste sites identified within the construction limits of the Build Alternatives, it is likely the sites can be remediated and will not pose a major obstacle to construction. In a letter dated October 16, 2018, KDHE recommended that clearance be granted for the proposed project.

4.8.1. Mitigation

Low risk sites will have little impact on the proposed alternatives. The greatest potential impact from these sites will be from the possibility of encountering contaminated soil. Contamination of this type will not subject the project to undue cost or time delays. Any soil excavated in the hazardous waste site locations is to be incorporated back into the direct area or tested and properly remediated. Any remediation will require the coordination and approval of KDHE. The positive impact to the community, if sites such as these are impacted by an alignment, is clean-up of the contamination.

4.9. Cultural Resources

As discussed in **Chapter 3**, the project’s study area includes several properties listed or eligible for listing on the NRHP. These properties are described below.

- **984 N 1800 Rd - Gorrill Farmstead.** This property is listed on the Register of Historic Kansas Places as eligible for listing on the NRHP. A house and several accessory structures from the late 1800's are present on the property and noted for their significance.
- **894 N 1549 Road - Topping Farmstead.** This property is an 1890 Farmstead potentially eligible for listing on the NRHP though no eligibility determination has been completed.
- **568 N 1800 Road – George and Emma Miller House.** This property is eligible for listing on the NRHP. It is an example of a 1920's Craftsman/Bungalow.
- **746 N 1800 Road - The Winter School.** This property is a historic one-room schoolhouse that is a genuine example of a typical rural schoolhouse constructed in 1869. It served the area for 80 years, closing in 1949. The structure is eligible for listing on the NRHP.
- **761 U.S. 40 Highway - J.H. Holke House.** This property was constructed in 1910 and is eligible for listing on the NRHP.

To determine potential impacts to historic properties, the above properties were compared to the construction limits of the Build Alternatives. None of the above historic properties are located within the environmental impact area of either Build Alternative.

In a letter dated October 16, 2018, KSHS stated that a total of five archeological sites were recorded in or near the project study area, none of which were found to be eligible for the NRHP. The letter from KSHS also listed one property, the George and Emma Miller House, as eligible for listing on the NRHP.

4.9.1. No-Action Alternative

The No-Action Alternative will have no impact on any historic properties or other cultural resources identified within the SLT study area.

4.9.2. Build Alternatives

No impacts to any historic properties or other cultural resources identified within the SEIS study area are expected from the Preferred Alternative or the Tolled Build Alternative based on currently available information. To complete the Section 106 process, KDOT will complete a Phase II archeological study of the Preferred Alternative construction footprint during later design phases of the project. Several Tribes have requested or indicated interest in the results of the Phase II archeological study. KDOT and FHWA will continue consultation and coordination with those Tribes as the project progresses to construction and will continue coordination and consultation processes with KSHS. Considerations of avoidance, minimization of impacts, and appropriate mitigation will be included in the study.

4.10. Farmland

Potential impacts to farmland soils associated with the various alternatives have been considered since there is a large amount of agriculture within and adjacent to the study area. Prime Farmland soils and Farmland of Statewide Importance soils were mapped, based on NRCS soil survey information, as shown on **Exhibit 3-13**. The impacts of each alternative were based upon the grading limits for each alternative and are shown in **Table 4-3**.

Table 4-3: Farmland Soil Impacts in Acres

Reasonable Alternative	Prime Farmland	Prime Farmland (If Drained)	Total Prime Farmland	Statewide Importance
No-Action	0	0	0	0
Preferred Alternative	98.6	33.6	132.2	34.0
Tolled Build Alternative	101.2	34.1	135.3	36.1

The NRCS, pursuant to the FPPA, is responsible for evaluating the conversion of prime and unique farmland, and statewide and locally important farmland, to non-agricultural use. Prior to construction, a Farmland Conversion Impact Rating (FCIR) form will be completed to determine the extent of impacts to prime farmland. In September 2001, an FCIR was submitted for the 2002 EIS. After the evaluation, a Total Point value of less than 160 points was received. Since the 2002 EIS, there has been further conversion of agricultural land within the SLT corridor. Due to the prior conversion of agricultural land and the 2001 FCIR form having a Total Point value of less than 160 points, it is anticipated that the Build Alternatives would result with a Total Point value of less than 160 points. According to the FPPA, alternatives that receive a total point score of less than 160 on the form are given a minimal level of consideration for protection and do not require further farmland evaluation.

4.11. Air Quality

Air quality emissions analyses were not required as part of this project. As is discussed in **Chapter 3**, Douglas County is classified as an attainment area by the EPA. 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 in the project area. There will be temporary air quality impacts associated with project construction which are discussed in **Section 4.19.1**.

4.12. Noise

The project area was divided into 15 Noise Sensitive Areas (NSAs) to group noise sensitive receptors influenced by similar noise sources. Receptors within 500 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 and benefits were identified. The NSAs are defined as follows and are shown in **Exhibit 3-14**:

- NSA 1 North of SLT and west of Iowa Street;
- NSA 2: North and east of SLT between approximately Clinton Parkway and the Kanza Southwind Nature Preserve;
- NSA 3: South and west of SLT on either side of W 27th Street;
- NSA 4: North of SLT along Clinton Parkway, between E 965 Road and the Pinnacle Woods Apartments;
- NSA 5: North and east of SLT along Clinton Parkway, west of E 965 Road and south of N 1452 Road;

- NSA 6: South of SLT and east of the Clinton Parkway interchange;
- NSA 7: East of SLT between N 1452 Road and Bob Billings Parkway;
- NSA 8: East of SLT between Bob Billings Parkway and U.S. 40/6th Street;
- NSA 9: West of SLT between Bob Billings Parkway and U.S. 40/6th Street;
- NSA 10: East of SLT between U.S. 40/6th Street and N 1750 Road;
- NSA 11: West of SLT between U.S. 40/6th Street and N 1750 Road;
- NSA 12: East of SLT between N 1750 Road and I-70;
- NSA 13: West of SLT between N 1750 Road and I-70;
- NSA 14: East of SLT and North of I-70; and,
- NSA 15: West of SLT and North of I-70.

4.12.1. Procedure for Predicting Future Noise Levels

Traffic noise emission is composed of several variables, including the number, types, and travel speeds of the vehicles, as well as the geometry of the roadway(s) on which the vehicles travel. Additionally, variables such as weather and intervening topography affect the transmission of traffic noise from the vehicle(s) to noise sensitive receptors.

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 receptor locations in the vicinity of the SLT West Section project.

Traffic noise consists of three primary parts: tire/pavement noise, engine noise, and exhaust noise. Of these sources, tire/pavement noise is typically the most offensive at unimpeded travel speeds. Sporadic traffic noises such as horns, squealing brakes, screeching tires, etc. are considered aberrant and are not included within the predictive model algorithm. Traffic noise is not constant; it varies in time depending upon the number, speed, type, and frequency of vehicles that pass by a given receptor. Furthermore, since traffic noise emissions are different for various types of vehicles, the TNM algorithm distinguishes between the source emissions from the following vehicle types: automobiles, medium trucks, heavy trucks, buses, and motorcycles, as shown in **Table 4-4**. The traffic noise prediction model uses the number and type of vehicles on the planned roadway, vehicle speeds, the physical characteristics of the road (curves, hills, depressions, elevations, etc.), receptor location and height, and, if applicable, barrier type, barrier ground elevation, and barrier segment top elevations.

Table 4-4: Traffic Noise Model (TNM) Vehicle Classification Types

TNM Vehicle Type	Description
Autos	All vehicles with two axles and four tires, including passenger cars and light trucks, weighing 9,900 pounds or less
Medium Trucks	All vehicles having two axles and six tires, weighing between 9,900 and 26,400 pounds
Heavy Trucks	All vehicles having three or more axles, weighing more than 26,400 pounds
Buses	All vehicles designed to carry more than nine passengers
Motorcycles	All vehicles with two or three tires and an open-air driver / passenger compartment

Sources: FHWA Measurement of Highway-Related Noise, § 5.1.3 Vehicle Types.
 FHWA Traffic Monitoring Guide, § 4.1 Classification Schemes

Interior hourly-equivalent noise levels are determined for NAC Category D land uses, such as hospitals, medical facilities and places of worship, by applying building noise reduction factors based on building type and window treatment that can be found in FHWA publication Highway Traffic Noise: Analysis and Abatement Guidance. One NAC Category D receptor (Lawrence Memorial Hospital in NSA 10) is located in the study area.

Per FHWA regulation 772.9(d), the predictions documented in this report are based upon the Design Year 2045 Build Alternative traffic volumes resulting in the loudest predicted hourly-equivalent traffic noise levels for each receptor. Base Year 2019 and Design Year 2045 peak hour volumes were obtained from the SLT West Leg SEIS Traffic and Safety Appendix. Both AM and PM peak hours were modeled in all scenarios to predict the loudest hour.

4.12.2. Traffic Noise Impacts

Traffic noise impacts occur when the predicted hourly-equivalent traffic noise levels either: [a] approach or exceed the FHWA NAC (with "approach" defined in the KDOT Noise Policy as reaching one decibel less than the NAC values listed in **Table 4-5**), or [b] substantially exceed the existing noise levels by more than 10 dB. Fifty-two noise impacts were identified in the Base Year 2019 scenario, 71 noise impacts were identified in the 2045 No-Build scenario, and 128 noise impacts were identified in the 2045 Build scenario. Noise impacts for each NSA are discussed below. Base Year 2019, 2045 No-Build, and 2045 Build hourly equivalent traffic noise levels (AM or PM peak, depending on which is the loudest) are listed in **Appendix C**.

Table 4-5: Noise Abatement Criteria

Hourly Equivalent A-Weighted Sound Level (dBA)			
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, amphitheatres, auditoriums, campgrounds, cemeteries, daycare 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 Leq(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 Leq(h) being the hourly value of Leq.
3. Includes undeveloped lands permitted for this activity category.

NSA 1

NSA 1 is on the north side of SLT and west of Iowa Street. There were 52 receptors analyzed in this area, including 50 residences at the Easy Living Manufactured Home Community and two receptors on the SLT Trail. Two predicted noise impacts were identified in the 2045 No-Build scenario and the 2045 Build scenarios, both along the SLT trail.

NSA 2

NSA 2 is located north and east of SLT between approximately Clinton Parkway and the KSNP. Noise impacts were evaluated at 240 receptors, including 236 residences and four trail locations. Of the 236 residences, 100 are located at the Aberdeen Apartments. Because no exterior area of frequent human use exists at the apartments, receptors were modeled at individual patios/balconies, including second floor dwellings. 65 predicted noise impacts were identified in the 2045 No-Build and Build scenarios.

NSA 3

NSA 3 is located south and west of SLT on either side of 27th Street. There are 19 receptors located in NSA 3, all NAC Activity Category C. These locations include the Clinton Lake Youth Sports Complex, the Arboretum/Sports Complex Trail, and the Clinton Lake Softball Complex. No traffic noise impacts were identified at these locations.

NSA 4

NSA 4 is located north of SLT along Clinton Parkway, between E 965 Road and the Pinnacle Woods Apartments. Noise impacts were evaluated at 12 receptors, including two residential receptors and ten NAC Activity Category C receptors. The residential receptors included a single-family home and the Pinnacle Woods Apartments, which was evaluated for impacts at the outdoor pool area. The Activity Category C receptors included the tennis courts at the Genesis Health Clubs and the Clinton Parkway Trail. Six traffic noise impacts were identified in all scenarios, all located along the Clinton Parkway Trail.

NSA 5

NSA 5 is located north and east of SLT along Clinton Parkway, west of E 965 Road and south of N 1452 Road. There were 94 receptors analyzed, including 86 residences and eight receptors along the Clinton Parkway Trail and SLT Trail. Where the Clinton Parkway Trail is being realigned as part of the project, receptors were also relocated to the nearest proposed location. Seven noise impacts were identified in the Base Year 2019 scenario, nine impacts were identified in the 2045 No-Build scenario, and 27 noise impacts were identified in the 2045 Build scenario, including 19 residences and eight trail locations. Of the 19 residential receptors impacted, 14 were approaching the NAC values, three had a substantial increase of more than 10 dB(A) between existing and build, and two met both impact criteria, approaching the NAC values and having a substantial increase.

NSA 6

NSA 6 is located south of SLT and east of the Clinton Parkway interchange. Two receptors were analyzed for noise impacts, both located on the SLT Trail. No noise impacts were identified.

NSA 7

NSA 7 is located east of SLT between N 1452 Road and Bob Billings Parkway. Noise impacts were evaluated at 14 receptors, including 10 single-family homes and four on the SLT Trail. One noise impact was identified in all scenarios, located on the SLT Trail.

NSA 8

NSA 8 is located east of SLT between Bob Billings Parkway and U.S. 40/6th Street. Noise was evaluated at 127 receptors, including 123 residences and four along the SLT Trail. Homes that had been issued a building permit at the time of this study but had not yet been built were included in the analysis. One noise impact was identified in the Base Year 2019 along the SLT Trail. Two noise impacts were identified in the 2045 No-Build, both along the SLT Trail. In the 2045 Build, 14 noise impacts were identified, including two along the SLT Trail and 12 residences.

NSA 9

NSA 9 is located west of SLT between Bob Billings Parkway and U.S. 40/6th Street. Three single-family homes were analyzed. No noise impacts were identified.

NSA 10

NSA 10 is located east of SLT between U.S. 40/6th Street and N 1750 Road. Noise was evaluated at 15 receptors, including two single-family homes, ten locations on trails, one at the Rock Chalk Park Track, one at the Jayhawk Tennis Center, and one at the Lawrence Memorial Hospital, which was analyzed for interior noise impacts. Seven noise impacts were identified in each scenario, all located along the SLT Trail.

NSA 11

NSA 11 is located west of SLT between U.S. 40/6th Street and N 1750 Road. Five single-family homes were analyzed. No noise impacts were identified.

NSA 12

NSA 12 is located east of SLT between 1750 Road and I-70. Four single-family homes were analyzed. No noise impacts were identified.

NSA 13

NSA 13 is located west of SLT between 1750 Road and I-70. Five single-family homes were analyzed. Two noise impacts were identified in the Base Year 2019, four noise impacts were identified in the 2045 No-Build, and three noise impacts were identified in the 2045 Build. It was assumed the single-family home located at 844 N 1750 Road would be relocated in the Build Alternative, and it was not analyzed for noise impacts in that scenario.

NSA 14

NSA 14 is located east of SLT and North of I-70. Seven single-family homes were analyzed. One noise impact was identified in each alternative.

NSA 15

NSA 15 is located west of SLT and North of I-70. Three single-family homes were analyzed as well as one receptor located at the Heritage Baptist Church. Two noise impacts were identified in each alternative, including one at the church and one at a residence.

Summary of Traffic Noise Impacts

As shown in **Table 4-6**, traffic noise is predicted to result in 128 total impacts in the 2045 Design Year Build Alternative.

Table 4-6: Traffic Noise Impact Summary for 2045 Build Alternative

Reason for Noise Impact	Summary of Impacted Receptors By Activity Category							All Activity Categories
	A	B ¹	C	D	E	F ²	G ³	
Based on NAC Criteria Only	0	94	29	0	0	0	0	123
Based on Substantial Increase Criteria Only	0	3	0	0	0	0	0	3
Based on Both Criteria	0	2	0	0	0	0	0	2
TOTAL IMPACTS	0	99	29	0	0	0	0	128
1. ⁶⁵ There are no impact criteria for land use facilities in this activity category and no analysis of noise impacts is required. 2. There are no impact criteria for undeveloped lands, but some noise levels may need to be provided to local officials to aid them in future land use planning efforts.								

4.12.3. 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.

Feasibility criteria specifically include:

- 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 achieve at least a five dB(A) highway traffic noise reduction for 80% of first row impacted receptors and 2/3 of all impacted receptors.

Reasonableness criteria specifically include:

- Noise Reduction Design Goal: The noise barrier must achieve a minimum of ten (10) dB insertion loss for the majority of benefited receptors.
- Cost: A reasonable cost per benefited receptor is \$30,000. This cost is based on actual construction costs evaluated every 5 years. The construction costs are based on unit cost of \$41.00 per square foot. A minimum of seven (7) dB insertion loss per receptor is counted as one benefited receptor. Other receptors not impacted but receiving a benefit are counted in the evaluation (non-impacted benefited receptors).
- Public Approval: Viewpoints of benefited receptors are solicited via a ballot.

4.12.4. Potential for Noise Abatement

Noise barriers were analyzed for every receptor predicted to be impacted in the Preferred Alternative. Depending on the location of the noise impacts, barriers were analyzed in either the AM or the PM peak hour, whichever was determined to be loudest hour. Generally, barriers were analyzed along the shoulder of SLT or near the ROW line depending on the topography of the

area. In certain locations, multiple barriers were analyzed. Generally, only the optimal barrier design, in terms of cost per benefitted receptor, is identified below.

No noise barriers were determined to be both feasible and reasonable per KDOT's current traffic noise policy. Two of the noise walls were determined to not be feasible as they were unable to sufficiently provide a benefit to the impacted receptors. The remaining barriers were determined to be feasible but not reasonable, with a vast majority exceeding the maximum of \$30,000 allotted per benefitted receptor. Additional information on the noise walls can be found in the Noise Study Report located in **Appendix C**.

KDOT and FHWA noted multiple public comments received during the agency and public comment period and Public Hearing regarding the Preferred Alternative and adverse noise impacts to residential areas adjacent to the Preferred Alternative. At the time of approval of the Record of Decision and Final SEIS for this project, KDOT and FHWA are in process of reviewing KDOT's current noise policy. As part of this review, the potential exists for KDOT to make changes to existing noise abatement criteria. Should the current KDOT Noise Policy be changed, KDOT will reassess noise impacts and mitigation for the selected Preferred Alternative during the design phase of the project. Noise mitigation analyses under a new noise policy may result in the construction of noise walls as a reasonable and feasible mitigation strategy for anticipated noise impacts. Should noise barriers become reasonable and feasible, KDOT will continue coordination with affected residential property owners.

4.13. Visual Environment

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 SLT which would have the potential of undesirable views of a substantially 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.

With much of the study area consisting of cultivated crop land which has a moderate visual quality rating, and the low number of visual receptors in these areas, the build alternatives will have a low degree of visual impact. However, the exception is the Tolloed Build Alternative which would have more of a visual impact in the toll collection areas which will require additional overhead gantries for signage and toll collection equipment. These impacts are explained in more detail below.

4.13.1. No-Action Alternative

In the No-Action Alternative, the existing conditions would remain. However, based on traffic projections, congestion on the roadway will 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.

4.13.2. Preferred Alternative

Since most of the residents living near the SLT and I-70 are accustomed to living near a roadway, and the roadway changes would not be a substantial change to the visual environment, the visual impacts of the Preferred Alternative would be minor.

4.13.3. Tolloed Build Alternative

Since most of the residents living near the SLT and I-70 are accustomed to living near a roadway, and the roadway changes would not be a substantial change to the visual environment, the visual impacts of the Tolloed Build Alternative would be minor. The main change from the visual impacts of the Preferred Alternative would be the addition of toll lanes and toll signage/gantries along the SLT corridor. The design and location(s) of the toll collection areas would be determined during the final design phase of the project.

4.13.4. Mitigation

The existing roadway alignment and ROW throughout the 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 in order 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.

4.14. Water Quality

The Wakarusa River and Baker Wetlands are listed on the KDHE 2020 approved 303(d) Impaired Waters list. The parameters of concern for the Wakarusa River are total phosphorous, total suspended solids, biology, and fecal coliform bacteria (*E. coli*). The parameters of concern for the Baker Wetlands are eutrophication, lead, pH, and dissolved oxygen. Road construction can contribute sediment from erosion and could also contribute phosphorous to these waters if the sediment came from fertilized soils.

Direct water quality impacts can result from roadway and bridge runoff as well as construction-related impacts. Construction related impacts could include pollutants such as sedimentation, petroleum products, and nutrients leaching from seeded and mulched bare areas.

In a letter from the KDHE Bureau of Water dated October 16, 2018, the Bureau of Water stated that they had no objection to the proposed project but had the following comment: "Any construction activity which disturbs one acre or more is required to file a National Pollutant Discharge Elimination System (NPDES) permit application for stormwater runoff resulting from construction activities."

4.14.1. No-Action Alternative – Surface and Ground Water

The No-Action Alternative would have no direct impacts on the water quality of surface or groundwater resources in the study area.

4.14.2. Build Alternatives – Surface Water Impacts

The Build Alternatives could have the potential for construction-related impacts to roadside wetlands and roadside ditches that flow into the streams within the study area. Project construction would also require additional bridges and culverts that could impact stream channels.

There is potential for construction related impacts to the Wakarusa River as drainage patterns bring stormwater runoff to the Wakarusa River through overland flow or a series of drainage ditches and channels. The channel of the Wakarusa River could also be directly impacted through a drainage project associated with the Clinton Lake emergency spillway.

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

Overall, the Build Alternatives will have very similar impacts to surface water quality as stream/drainage ditches will be impacted similarly by each alternative.

4.14.3. Build Alternatives – Ground Water Impacts

The Build Alternatives have a similar impact to groundwater and drinking water supplies with no differences noted among the location of the proposed roadways. Pollutants from the construction, operation, and maintenance of all alternatives contribute to loadings of the surface waters, which are a recharge component of local alluvial groundwater in the Wakarusa Floodplain. 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, especially when compared with the pollutant loading in the drainage basin as a whole.

4.14.4. Mitigation

In order to minimize or avoid impacts to surface water quality, KDOT will obtain a NPDES stormwater construction permit and employ their Storm Water Pollution Prevention Plan (SWPPP). This plan utilizes Best Management Practices (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.

BMPs should be followed to reduce impact to groundwater during construction and should also follow recommendations set forth in the total maximum daily loads for the Wakarusa River and Baker Wetlands. BMPs utilizing structural and non-structural systems can effectively minimize the impacts to groundwater quality. Structural BMPs such as detention basins, filters, infiltration basins, grassed swales, 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.

4.14.5. Section 401 Certification Requirement

Prior to issuance of any permit, KDOT will be required to submit certification that implementation of the proposed Project would not cause any surface or ground water in the area of potential effect to violate water quality standards. In the state of Kansas, the Kansas Department of Agriculture – Division of Water Resources provides this certification. If required, a Section 401 Water Quality Certification and adequate mitigation measures where necessary would be completed prior to issuance of a construction permit for any alternative.

4.15. Floodplains

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 Douglas County, the Kansas Department of Agriculture - Division of Water Resources (DWR) has jurisdiction over fill that is placed in a 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 Lawrence City Limits will require a Floodplain Development Permit from the City. The City of Lawrence No-Rise in Floodway and Floodplain ordinance requires that the placement of fill will cause no rise in the base flood elevation and no increase in flood velocities.

All alternatives being considered will have floodplain impacts, except for the No-Action alternative. Floodplain impacts were calculated by utilizing the FEMA FIRMs and NFHL data. **Table 4-7** summarizes the floodplain impacts for each alternative.

Table 4-7: Build Alternative Floodplain Impacts

	No-Action Alternative Area (Acres)	Preferred Alternative Area (Acres)	Tolled Build Alternative Area (Acres)
Floodway	0.0	20.4	21.1
100-Year Floodplain	0.0	115.3	116.3
500-Year Floodplain	0.0	60.9	61.3

4.15.1. No-Action Alternative

The No-Action alternative will have no direct impact on floodplains.

4.15.2. Preferred Alternative

The Preferred Alternative has approximately 0.7 acres fewer floodway impacts, 1.0 acre fewer 100-year floodplain impacts, and 0.4 acres fewer 500-year floodplain impacts than the Tolled Build Alternative. The majority of floodway and floodplain impacts occur between Wakarusa Drive and the U.S. 59 (Iowa Street) interchange.

4.15.3. Tolled Build Alternative

The Tolled Build Alternative has approximately 0.7 acres more floodway impacts, 1.0 acre more 100-year floodplain impacts, and 0.4 acres more 500-year floodplain impacts than the Preferred Alternative. Just like the Preferred Alternative, the majority of floodway and floodplain impacts occur between Wakarusa Drive and the U.S. 59 (Iowa Street) interchange.

In a letter dated October 15, 2018, the DWR noted that any work within a designated stream or within a floodplain will require DWR permitting.

4.15.4. FEMA Certification

KDOT must provide certification to the local FEMA sponsor and DWR that the project complies with FEMA's Flood Insurance Program guidelines.

4.15.5. Mitigation

On January 18, 2017, a meeting was held with representatives from KDOT and the City of Lawrence to discuss the floodplain impacts of the project, the no-rise criteria of the City, and how the floodplain impacts would be addressed during project design. During the meeting the City of Lawrence representatives stated that the City would enforce the no-rise policy for construction that occurs within the city limits.

In order to mitigate impacts of the project, a new culvert is proposed for the West Branch Yankee Tank Creek to deliberately create backwater and force more of the 100-year flow into the diversion channel west of the SLT. The hydraulic modeling in 2017 indicated there is no backwater upstream of the entrance to the overflow channel, no backwater at the Parks and Recreation building, and the adjacent roadway does not overtop for the 100-year flood event. The maximum 100-year event backwater is 0.3 feet. The consensus at the meeting was that this backwater could likely be acceptable, as it is limited to a small area and is intrinsic to the improvements that will decrease the risk of flooding to the ball fields in the park. This effort will require a waiver to be requested with the Floodplain Development Permit application.

Prior to the placement of fill within a FEMA floodplain, a waiver will be requested by KDOT for the backwater at the West Branch Diversion Channel entrance and Floodplain Development Permit applications will be submitted to the appropriate jurisdictions.

4.16. Wetlands

Executive Order 11990 on the Protection of Wetlands directs Federal agencies "to avoid to the extent possible the long- and short-term adverse impacts associated with the destruction or modification of wetlands and to avoid direct or indirect support of new construction in wetlands wherever there is a practicable alternative."

During evaluation of impacts, measures to avoid wetland losses have been carefully considered. Avoidance of wetland impacts is not a practical alternative for this project. All the reasonable alternatives identified will result in some wetland losses. Therefore, selection of an alternative that minimizes and mitigates long and short-term wetland losses is an important consideration.

In 2015, a desktop survey was conducted using USGS topographic maps, NWI maps, NRCS soil survey maps, NHD data, and color aerial photography. A meeting with the USACE was held onsite on June 2, 2015, to identify jurisdictional wetlands (noted as Field Verified Wetlands). The onsite

meeting included a visual observation for wetlands, however no formal wetland delineations were performed.

At the initiation of the SEIS in 2018, additional study area was identified and KDOT screened this additional area using a desktop survey with current versions of USGS topographic maps, NWI maps, NHD data, and color aerial photography. There was no site investigation or delineations performed to verify the presence/absence of the NWI wetland data.

All the alternatives being studied have some wetland impacts, except for the No-Action Alternative. **Table 4-8** describes the wetlands impacted by the proposed project and **Table 4-9** summarizes the wetland impacts for each Build Alternative. **Exhibit 4-3** and **Exhibit 4-4** show the impacted wetlands associated with each Build Alternative.

Table 4-8: Types of Impacted Wetlands

Potential Wetland Site ID	NWI Mapped Designation	NWI Wetland	2015 Field Verified Wetland	Wetland Type
W1	PEM1C	X		Palustrine Emergent
W2*	PABFh*	X	X	Palustrine Emergent
W3	PEM1C	X		Palustrine Emergent
W4**	PABFh**	X	X	Palustrine Emergent
W5	PFOA	X		Palustrine Forested/Shrub
W6	PEM1C	x		Palustrine Emergent
W7	PFOA	X		Palustrine Forested/Shrub
W8	PFOA	X		Palustrine Forested/Shrub
W9	PEM1C	X		Palustrine Emergent
W10	PEM1Cx	X		Palustrine Emergent
W11	PFOA	X		Palustrine Forested/Shrub
W12	PFOA	X		Palustrine Emergent
W13	PEM1Cx	X		Palustrine Emergent
W14	PSSCx		X	Palustrine Forested/Shrub
W15	PEM1Cx	X	X	Palustrine Emergent
W16			X	Palustrine Emergent
W17			X	Palustrine Emergent
W18	PSSCx		X	Palustrine Forested/Shrub
W19			X	Palustrine Emergent
W20			X	Palustrine Emergent
W21	PFOA	X		Palustrine Forested/Shrub
W22	PEM1Cx	X		Palustrine Emergent
W23	PFOA	X		Palustrine Forested/Shrub
W24	PEM1Cx	X		Palustrine Emergent
W25	PFOA	X		Palustrine Forested/Shrub

* 2015 field verified wetland (W 2) is shown as a pond on the current aerial photo.

** 2015 field verified wetland (W 4) is shown as a pond in the NWI data and on the current aerial photo.

Table 4-9: Build Alternative NWI Wetland Impacts

Potential Wetland Site ID	No Action Alternative Area	Preferred Alternative Area	Tolled Build Alternative Area
W1	-	49.1 ft ²	49.1 ft ²
W2*	-	-	-
W3	-	0.3 acres	0.1 acres
W4**	-	2.1 acres	2.1 acres
W5	-	0.3 acres	0.3 acres
W6	-	0.3 acres	0.3 acres
W7	-	0.4 acres	0.4 acres
W8	-	0.1 acres	0.2 acres
W9	-	0.2 acres	0.2 acres
W10	-	0.3 acres	0.3 acres
W11	-	0.2 acres	0.2 acres
W12	-	0.1 acres	0.1 acres
W13	-	1.9 acres	1.9 acres
W14	-	0.3 acres	0.3 acres
W15	-	8.6 acres	8.6 acres
W16	-	22.9 acres	22.9 acres
W17	-	15.5 acres	15.5 acres
W18	-	-	-
W19	-	4.7 acres	4.8 acres
W20	-	9.2 acres	9.8 acres
W21	-	0.4 acres	0.5 acres
W22	-	0.3 acres	0.3 acres
W23	-	363.3 ft ²	363.3 ft ²
W24	-	0.1 acres	0.1 acres
W25	-	8.7 ft ²	8.7 ft ²
Total Impact	0.00	68.1 acres	68.9 acres

* 2015 field verified wetland (W 2) is shown as a pond on the current aerial photo.

** 2015 field verified wetland (W 4) is shown as a pond in the NWI data and on the current aerial photo.

4.16.1. Wetland Mitigation

The No-Action Alternative would not impact any wetlands, therefore, would not require wetland mitigation.

The Build Alternatives would impact similar amounts of wetlands which would result in no substantial differences to wetland mitigation. Wetland mitigation is proposed to take place through the purchase of credits from a mitigation bank or in-lieu fee program. On-site mitigation is not a viable option due to the lack of available appropriate land within the project study area. KDOT will perform formal wetlands, stream, and pond delineations during the design phase of the project. Detailed investigations will focus on areas of impact as determined by preliminary engineering grading and construction limits. Considerations of avoidance, minimization of impacts, and mitigation will be included in the investigation documentation. Section 404 and 401 (Clean Water Act) permits from USACE will be obtained prior to construction of the Preferred Alternative.

4.16.2. Summary

The No-Action Alternative would avoid all NWI wetlands in the project study area. As can be seen in **Table 4-9**, the Preferred Alternative has the least amount of NWI wetland impacts. There is approximately 0.8 acres of NWI wetland impacts separating the two build alternatives. Due to the amount of NWI wetland impacts, the difference in the cost of purchasing mitigation bank/In-Lieu Fee credits is not anticipated to be substantial.

4.17. *Natural Resources and Biological Communities*

Impacts to the terrestrial (upland and riparian woodlands) and aquatic (streams and ponds/lakes) resources and communities described in **Chapter 3** are summarized in **Table 4-10**. Impacts to areas of Mead's Milkweed habitat (derived from KBS data) are indicated as the number of potential sites impacted. The KBS's data only identifies general locations and does not include detailed boundaries that could be used for impact area calculations.

Stream impacts include crossings associated with each alternative and the total stream length that will be modified by culverts or stream relocations. Streams that will be bridged are counted as a crossing but are not included in the length quantities since bridging a stream will have minimal impact on stream length. Bridge crossings will impact riparian woodlands. Those impacts are included under the riparian woodland category. The only stream that will be bridged is the portion of Yankee Tank Creek that flows into the Wakarusa River.

The ponds impacted by the Build Alternatives are located along the I-70 corridor with the largest pond (4.91 acres) located north of I-70 near the toll plaza.

Table 4-10: Natural Resources Impacts

Reasonable Alternative	Terrestrial Communities		Aquatic Communities			
	Riparian Woodland (Acres)	Upland Woodland (Acres)	Stream Crossings ¹ No.	Length (Feet)	Ponds/Lakes ² No.	Size (Acres)
No-Action Alternative	0	0	0	0	0	0
Preferred Alternative	4.7	26.7	12	12,006.9	2	5.2
Tolled Build Alternative	5.0	27.7	12	12,605.2	2	5.2

1. Source: USGS NHD data;
 2. Source: USGS NHD data, NWI data, and aerial photography.

4.17.1. No-Action Alternative

The No-Action Alternative would have no impacts to woodlands, Mead’s milkweed, streams, or ponds and lakes.

4.17.2. Build Alternatives

As summarized in **Table 4-10**, the Preferred Alternative will impact approximately 0.3 acres fewer riparian woodlands and 1.0 acres fewer upland woodlands, resulting in 1.3 acres fewer overall woodland impacts than the Tolled Build Alternative. The woodland impacts are shown on **Exhibit 4-5** and **Exhibit 4-6**.

The Preferred Alternative will have approximately 598 feet of stream impacts less than the Tolled Build Alternative. The stream impacts were calculated by measuring the length of NHD stream data within the construction limits of each Build Alternative, then subtracting the width of streams being bridged. The resulting stream impacts represents a worst-case scenario. Stream impacts are shown on **Exhibit 4-3** and **Exhibit 4-4**.

There would be no difference in pond impacts between the Preferred Alternative and the Tolled Build Alternative. The pond impacts are shown on **Exhibit 4-3** and **Exhibit 4-4**.

4.18. Threatened and Endangered Species

Threatened and endangered species are protected under the Endangered Species Act of 1973, as amended (ESA) (16USC 1531et 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. This section discusses impacts of the No-Action Alternative and the Build Alternatives on the threatened and endangered species identified in **Section 3.18**.

4.18.1. No-Action Alternative

The No-Action Alternative would have no direct impacts to critical habitat of federal or state listed threatened or endangered species.

4.18.2. Build Alternatives

Both Build Alternatives would have impacts to the Wakarusa River channel which is listed by KDWPT as critical habitat for the state endangered Mucket Mussel. A small portion of the Wakarusa River will be impacted from improvements to the pilot channel that connects the Clinton

Lake spillway to the Wakarusa River. The improvements to the pilot channel will address the West Branch Yankee Tank Creek (WBYTC) flooding west of the SLT. The existing pilot channel has a documented history of erosion issues and repairs at the location where the pilot channel enters the Wakarusa River. The current outlet into the Wakarusa River from the shotcrete lined pilot channel is approximately ten feet above the flow line. The force of the turbulence caused by the water discharging ten feet above the channel has caused instability and headcutting at the current outlet. The proposed solution would address the existing erosion issues and widen the pilot channel to accommodate diversion from WBYTC of excess flow occurring in flood events. The bank stabilization includes longitudinal peaked stone toe protection to stabilize the bank of the Wakarusa River and will cause impacts below the ordinary high-water mark in order to create a stable outlet. The impacts would occur along an approximate 163-foot section of the Wakarusa River.

Although Douglas County is within the probable range of the Mucket Mussel, the online KDWPT species profile indicates the Mucket Mussel is currently only known from two locations along the Marais des Cygnes River in Miami and Franklin counties. Coordination will be conducted as part of the Section 404 permit process with the KDWPT prior to construction regarding the work to be performed within the Wakarusa River to minimize impacts to the Mucket Mussel and its critical habitat.

Although the Build Alternatives will not impact areas that have been known to contain the federally threatened Mead's Milkweed, the areas of Mead's Milkweed habitat will be investigated and coordination with the USFWS will be performed to minimize potential impacts to the plant or its habitat prior to construction.

The Preferred Alternative would impact approximately 29.8 acres of potential habitat for the federally threatened Northern Long-eared Bat (NLEB). The Tolled Build Alternative would impact approximately 31.1 acres of potential NLEB habitat. Prior to construction, a bat habitat survey will be conducted, and the results submitted to the USFWS. To minimize potential impacts to the NLEB, tree clearing would take place between November 1 and March 31, outside of the NLEB roosting period.

In an email dated November 10, 2020, KDWPT noted that "Results of our review indicate there will be no significant impacts to crucial wildlife habitats; therefore, no special mitigation measures are recommended. The project will not impact any public recreational areas, nor could we document any potential impacts to currently-listed threatened or endangered species or species in need of conservation. No Department of Wildlife, Parks, and Tourism permits or special authorizations will be needed if construction is started within one year, and no design changes are made in the project plans." KDWPT also provided the following comments and general recommendations:

- Consult with the U.S. Fish and Wildlife Service Ecological Services Field Office in Manhattan, KS.
- Minimize all bank or instream activity, particularly during general fish spawning season (March 1 – Aug. 31).
- Incorporate principles of low impact development (LID), such as permeable asphalt pavement, porous concrete, swales, bioretention, or raingardens.
- Implement and maintain standard erosion-control Best-Management-Practices during all aspects of construction by installing sediment barriers (wattles, filter logs, rock ditch

checks, mulching, or any combination of these) across the entire construction area to prevent sediment and spoil from entering aquatic systems. Barriers should be maintained at high functioning capacity until construction is completed and vegetation is established.

- Reseed disturbed areas with native warm-season grasses, forbs, and trees.

In a response letter from the USFWS dated November 8, 2018, USFWS had no specific comments related to T&E species and critical habitat in the project area.

4.19. Construction Impacts

KDOT has developed a series of Standard Specifications for State Road and Bridge Construction, which include, but are not limited to air, noise, and water pollution control measures to minimize construction impacts. These Standard Specifications also include traffic control and safety measures. KDOT will implement these Standard Specifications and all current special provisions on the SLT project.

4.19.1. Air

During construction of the project, construction methods and operations will be conducted in accordance with KDOT and KDHE regulations, particularly concerning batch plant operations and clearing and grubbing functions.

In a letter dated November 2, 2018, the KDHE Bureau of Air stated that “if a commercial building has to be demolished or two or more residential buildings with the same owner, it would require asbestos inspections, notifications and possible abatements. There is no fugitive dust regulations in the state of Kansas but excess dust from road construction could generate complaints.”

Measures will be taken to reduce fugitive dust and other emissions generated during construction. Emissions from construction equipment would be controlled in accordance with emission standards prescribed under state and federal regulations. Materials resulting from clearing and grubbing, demolition, or other operations, with the exception of materials to be retained, would be removed from the project, burned, or otherwise disposed of by the contractor. Any burning, when permitted, would be conducted in accordance with applicable local laws and state regulations.

Normal construction procedures may cause temporary reductions in air quality. Construction permit and contract conditions will require adherence to standard dust control measures for cleared areas during construction; using air curtain destructors if tree burning is permitted on site. Additionally, burning of construction debris will be prohibited and requirements to properly dispose of all such material off site will be included.

No adverse long-term effect on air quality will occur since unique construction procedures are not expected and construction activities will be temporary in nature.

4.19.2. Noise

The major construction elements of this project are expected to be clearing, earth moving, hauling, grading, paving and bridge construction. General construction noise impacts for passersby and those individuals living or working near the project can be expected particularly from clearing, earth moving, and paving operations. Considering the short-term nature of construction noise, the impacts are not expected to be substantial.

4.19.3. Water Resources

Construction activities can impact water resources both directly and indirectly. Stormwater runoff is addressed by the KDOT's SWPPP, which will be used to address this concern during construction. The KDHE has noted that nutrients can leach from the project into streams and adjacent water bodies. Private wells on the KDOT ROW will be located, mapped and protected until closure by KDOT. All underground storage tanks within the corridor ROW will be identified and disposed of in a proper manner during construction of the project. Where the selected alternative crosses floodways and rivers, special conditions to minimize the potential for ground water contamination will be undertaken.

The KDHE has stated that BMPs should be utilized to reduce impacts to the aquatic environment to a minimal level. These BMPs include grading and seeding of disturbed areas, minimizing disturbances to the stream banks and riparian zones, and undertaking all necessary precautions to prevent petroleum products from entering streams. Pollution control measures, both temporary and permanent, will be enacted under the project specifications.

Stream crossings and surface water runoff will be impacted by construction activities for this project. KDOT's SWPPP will be employed during construction. Stormwater erosion control will be a primary environmental concern during construction and will be monitored according to the requirements of the KDOT standards and specifications. Nutrients leaching from hydroseeding/mulching of bare areas must be controlled. Potential water contaminants will be controlled during construction of any bridge over waterways.

No substantial adverse impacts to water resources are expected with the temporary or permanent pollution control measures that will be enacted under the job construction specifications.

4.19.4. Traffic Congestion

To the extent practicable, traffic will be maintained during construction. Additionally, local traffic will be maintained in areas where connecting roadways are affected by construction. Any required detours will be accomplished according to KDOT standard plans and specifications.

4.20. Irreversible and Irretrievable Commitment of Resources Associated with the Preferred Alternative

The construction and operation of any of the Build Alternatives would entail, in varying degrees, an irreversible and irretrievable commitment of natural, physical, human, and fiscal resources. Land, structures, money, manpower, construction materials, and energy resources would all be committed to project implementation. In addition to these quantifiable resources, a commitment of amenity resources that reflect the value of a community to its residents is often a cost of transportation to adjacent landowners. At the same time, it is a benefit to the traveling public.

The money, time and transportation user hardship related to the anticipated higher rate of collisions associated with the No-Action alternative would be irretrievable. The cost and time associated with the decreasing level of service for both auto and truck traffic would also result in irretrievable commitment of resources.

Land acquired for constructing the proposed project is considered to be an irreversible commitment during the time period the land is used for transportation purposes. ROW

requirements would convert land from residential, agricultural, commercial and natural environmental uses.

Large amounts of fossil fuel, labor and transportation construction materials such as steel, cement, aggregate and asphalt material would be required. Additionally, considerable labor and natural resources are used in fabricating and preparing construction materials. Those resources are generally not retrievable, but their use will not have a substantial adverse effect on continued availability. Labor and funds are not retrievable, once spent, they are gone, regardless of their magnitude.

The commitment of all these resources is to a large part predicated on the basic concept that transportation systems contribute to health, safety, and welfare of local, county, and state residents as well as those traveling from other parts of the country.

4.21. Relationship Between Short-Term Uses Versus Long-Term Productivity

All transportation projects require the short-term commitment of some resources found in the existing environment. These short-term commitments might include loss of access to community assets during construction or other disruptions such as noise and visual impacts related to construction activities. While these short-term consequences of a project may be frustrating to endure, the long-term productivity yielded by these consequences is an important consideration. If a short-term investment, commitment or disruption yields substantial long-term productivity gains, then it is often a worthwhile sacrifice for the public good. The following section evaluates the short-term consequences of this project against its long-term benefits. It also assesses the long-term costs or consequences of implementing this project.

4.21.1. No-Action Alternative

The No-Action Alternative would avoid all of the short-term and localized construction impacts. The projected traffic growth for the length of the project would further reduce the operation of existing SLT, resulting in reduced traffic safety and mobility.

4.21.2. Build Alternatives

Short-term effects of the Build Alternatives include localized disruption during construction, such as excessive noise levels, increased air pollution, and rerouting of traffic. Additional effects would include the displacement and relocation of families and businesses.

To be weighed against these short-term factors are long-term effects resulting either directly or indirectly from the project, which can be considered relatively permanent. The proposed project has been planned to function through a planning period ending in 2045. In actuality, the service life of the project will be much longer.

ROW acquisition would reduce the long-term productivity of local lands required for project implementation. Similarly, a long-term commitment of certain natural resources would result from project construction. Most of the land required to construct the proposed project is presently agricultural, with some forested. The conversion of land uses would remove some areas from agricultural production. The induced development that may occur along intersecting arterial streets would be subject to existing development controls by both the City of Lawrence and

Douglas County. These development controls would include zoning, subdivision, and floodplain ordinances.

Long-term productivity would be increased because of the economic stimuli resulting from the increase in access to the study area and region. The SLT serves as an essential link between the Kansas City Metropolitan Area, Lawrence, Topeka, and points west. By widening the western portion of the SLT to four lanes to match the existing capacity of the SLT east of U.S. 59, there would be less congestion and increased safety throughout the project corridor.

4.22. ROW and Relocation Impacts

ROW impacts were evaluated within the categories of permanent impacts and temporary impacts. Permanent impacts are those property acquisitions that are necessary for the new alignment or will be converted to permanent ROW. Temporary impacts are those property acquisitions that are needed as temporary construction easements.

Relocation Impacts were evaluated within the categories of residential, business, parkland, and cemetery displacements. None of the alignments contained in this study impact cemeteries. The No-Action Alternative would not require any property acquisition, therefore, would have no relocation impacts.

It is the policy of KDOT that no person be requested to move from his or her 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 would 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 would 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 in relocating their personal property.

Data from the Wichita State University's Center for Real Estate (CRE) shows that as of May 2020 there were 252 active home sale listings in the City of Lawrence. The median listing price was \$319,900. The average price for new listings in May 2020 was \$274,165 with the average contract price being \$265,408.

4.22.1. No-Action Alternative

The No-Action Alternative would not involve construction or ROW acquisition and would not have any displacements.

4.22.2. Build Alternatives

The access improvements and widening the SLT from two lanes to four lanes would require the total acquisition of three properties for both Build Alternatives, and partial acquisition of other property along the SLT. Property acquisitions are associated with the construction of new interchanges at Clinton Parkway and U.S.59.

The Build Alternatives would have three potential residential displacements and no commercial displacements. These displacements are located as follows: one residence is located in the northwest quadrant of the SLT overpass over north 1750 Road (844 N 1750 Road), one residence is located in the northeast quadrant of the SLT overpass over north 1750 Road (878 N 1750 Road), and the other residence is located in the northeast quadrant of the Clinton Parkway/SLT interchange at 1412 E 902 Road.

The ROW acquisition for the Build Alternatives would result in approximately 212.0 acres of partial takings and 26.6 acres of full takings in agricultural zoned areas. At this stage of design, construction easements are estimated to require the use of approximately 12.1 acres of agricultural zoned property.

4.22.3. Summary

Table 4-11 summarizes the relocation of impacts and farm severances of the alternatives under consideration. The No-Action Alternative results in no relocations. The Build Alternatives would result in the same potential relocations.

Table 4-11: Property Acquisitions and Potential Displacements

Property Acquisition	No-Action Alternative	Build Alternatives
Potential Residential Displacements	0	3
Partial Taking - ROW Acquisitions	0	24 Parcels (96.2 acres)
Full Taking - ROW Acquisitions	0	3 Parcels (28.7 acres)
Temporary Easements*	0	14 Parcels (13.9 acres)
Partial ROW in Agricultural Zoned Parcels	0	17 Parcels (90.3 acres)
Full takings in Agricultural Zoned Parcels	0	2 Parcels (26.6 acres)
Temporary Easements in Agricultural Zoned Parcels	0	6 Parcels (12.1 acres)

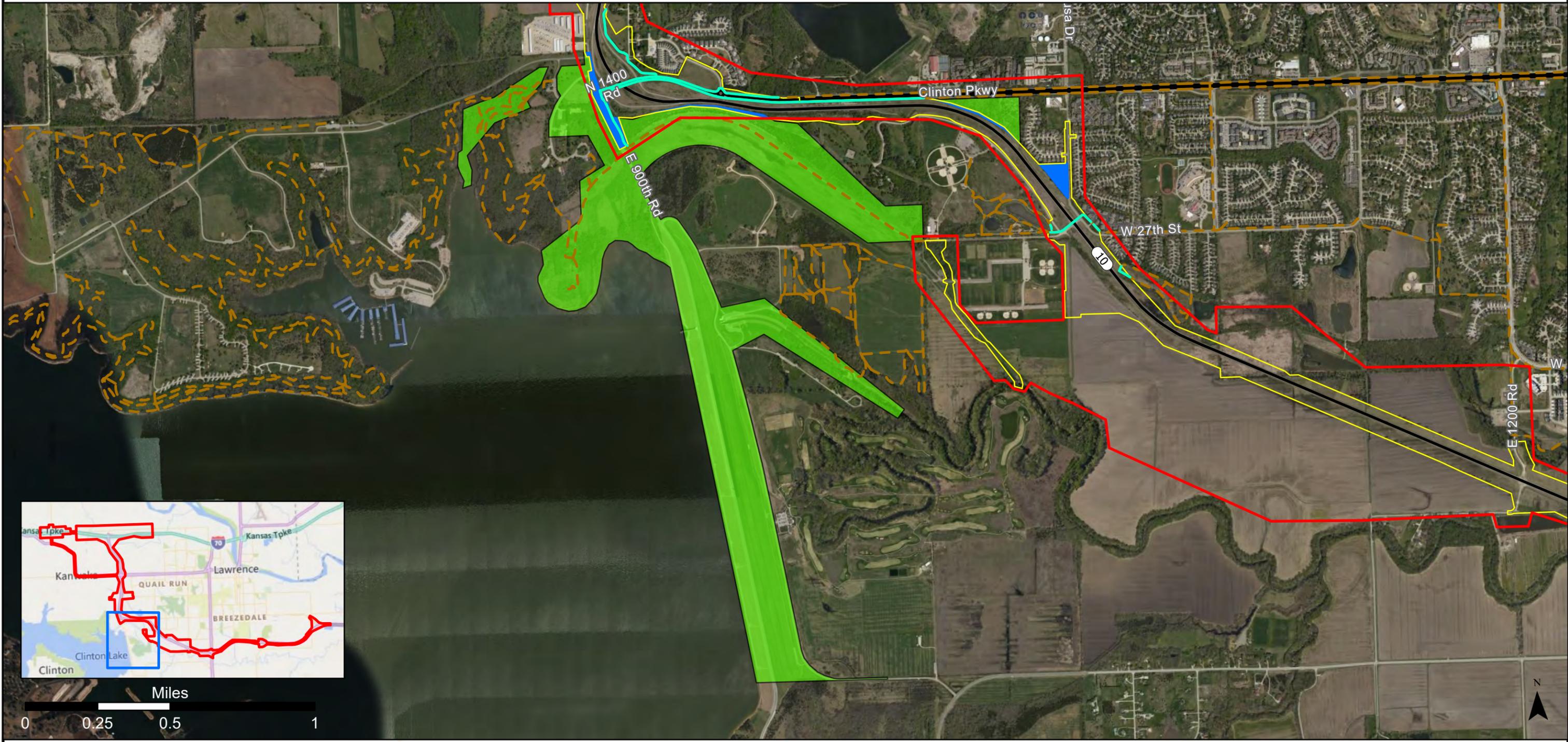
*The Build Alternatives will require temporary construction easements. The easements listed in **Table 4-11** are estimations, the full extent and location of the temporary easements will be determined during the final design phase.

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 would 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, effective April 1989. Relocation assistance will be made available to all persons to be relocated without discrimination.

4.23. Energy Impacts

Energy consumption related to highway projects includes construction and vehicle operation energy consumption. Construction energy consumption involves the manufacture of raw materials and equipment needed to build and maintain the highway. Operational energy consumption includes the fuel used by vehicles traveling the roadway. The vehicle types, roadway grades, and other geometric characteristics, speed, congestion, and other factors affect fuel usage.

The No-Action Alternative would require the least construction energy. Construction energy would be fairly similar in either of the Build Alternatives. Energy consumption saved because of the newer pavement, uniform travel speed, and decrease in accidents as a result of either of the Build Alternatives would help offset the energy consumption required for construction.



- SEIS Study Area
- Construction Limits
- USACE Property
- Park Impacts
- Trails
- Trail Impacts

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- SEIS Study Area
- Construction Limits
- Clinton Lake Outlet Park
- Clinton Lake Softball Complex
- Eagle Bend Golf Course
- Mutt Run
- Rotary Arboretum
- Sesquicentennial Point
- Youth Sports Complex
- Park Impacts
- Trail Impacts
- Trails

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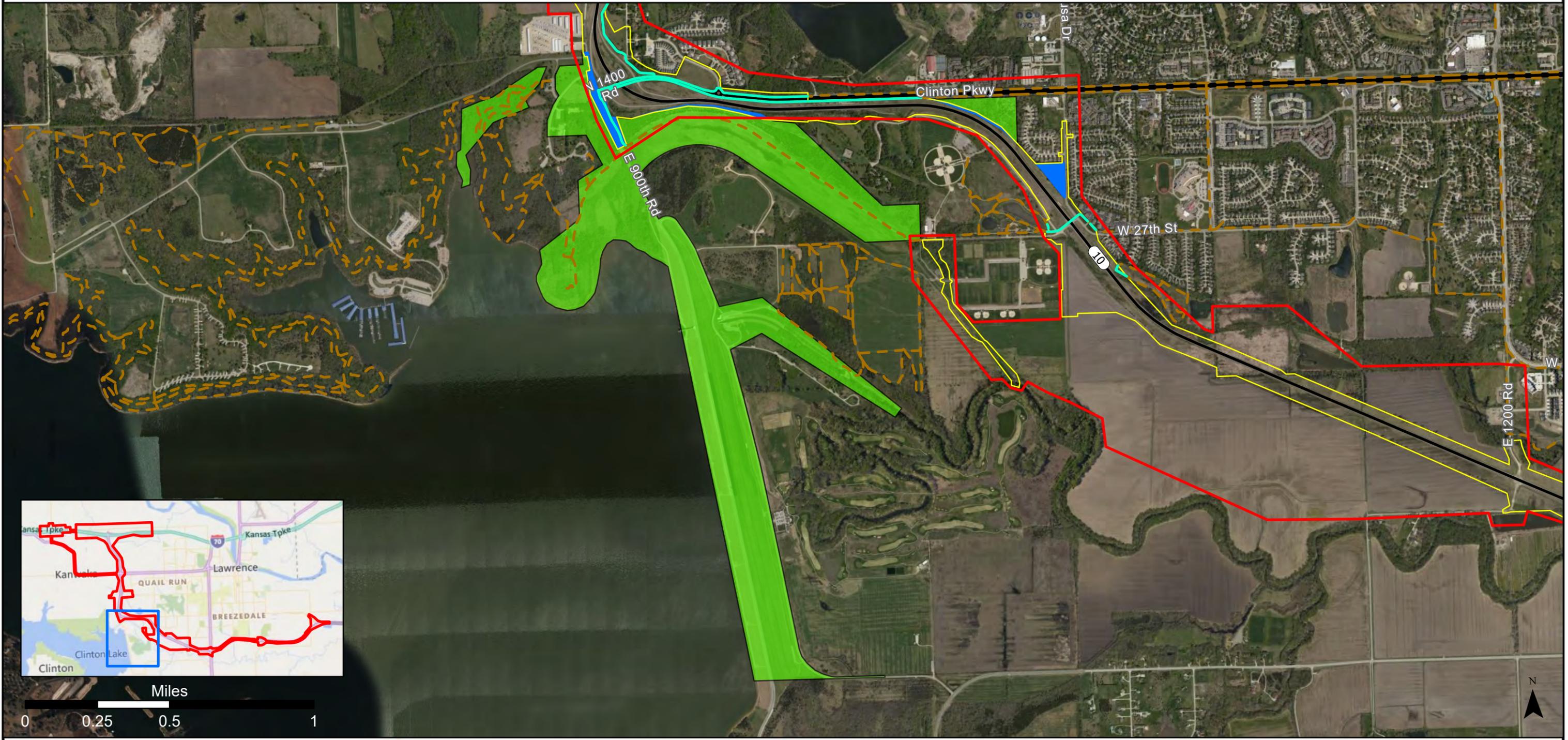




- SEIS Study Area
- Construction Limits
- Kanza Southwind Nature Preserve
- Park Impacts
- Trails
- Trail Impacts

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- SEIS Study Area
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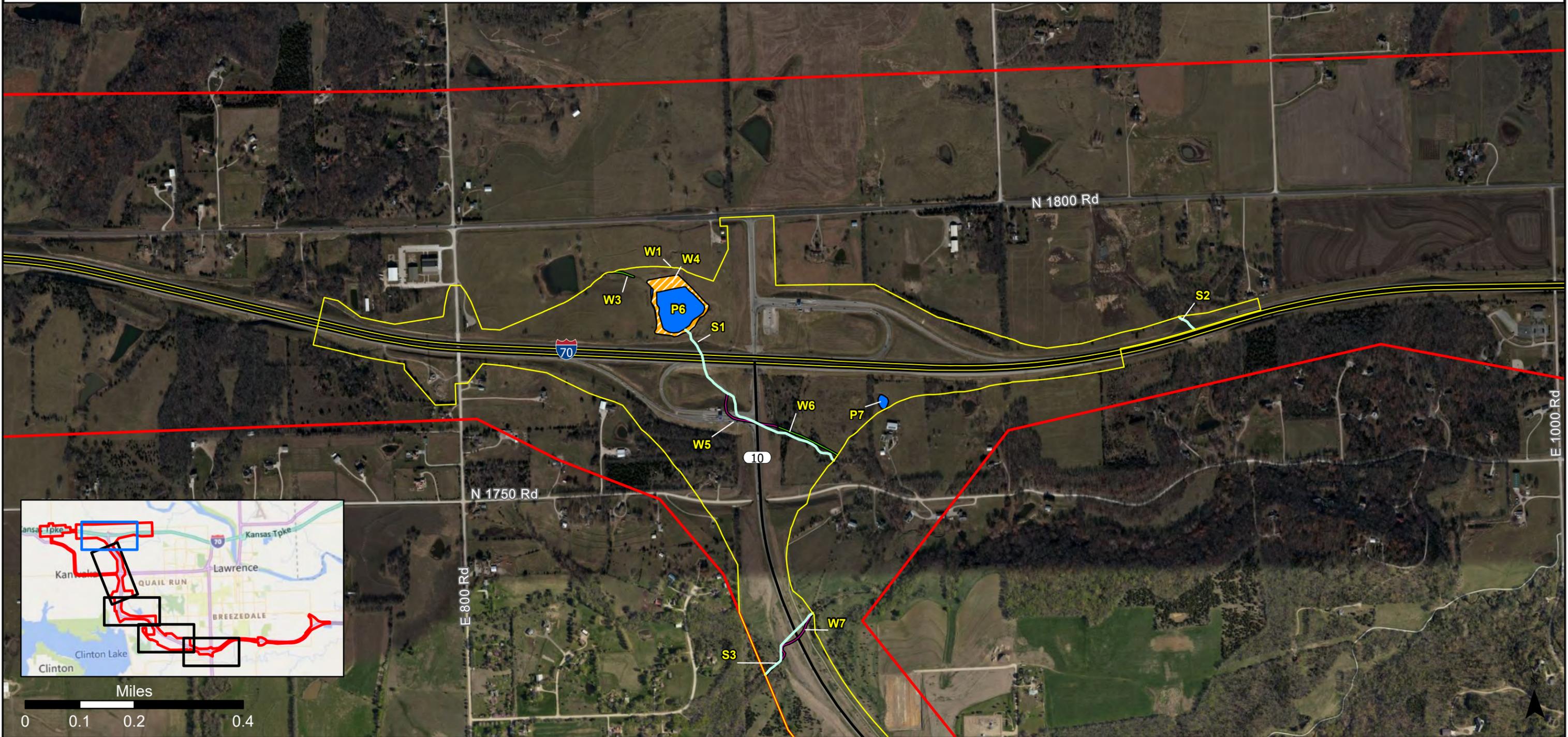




- SEIS Study Area
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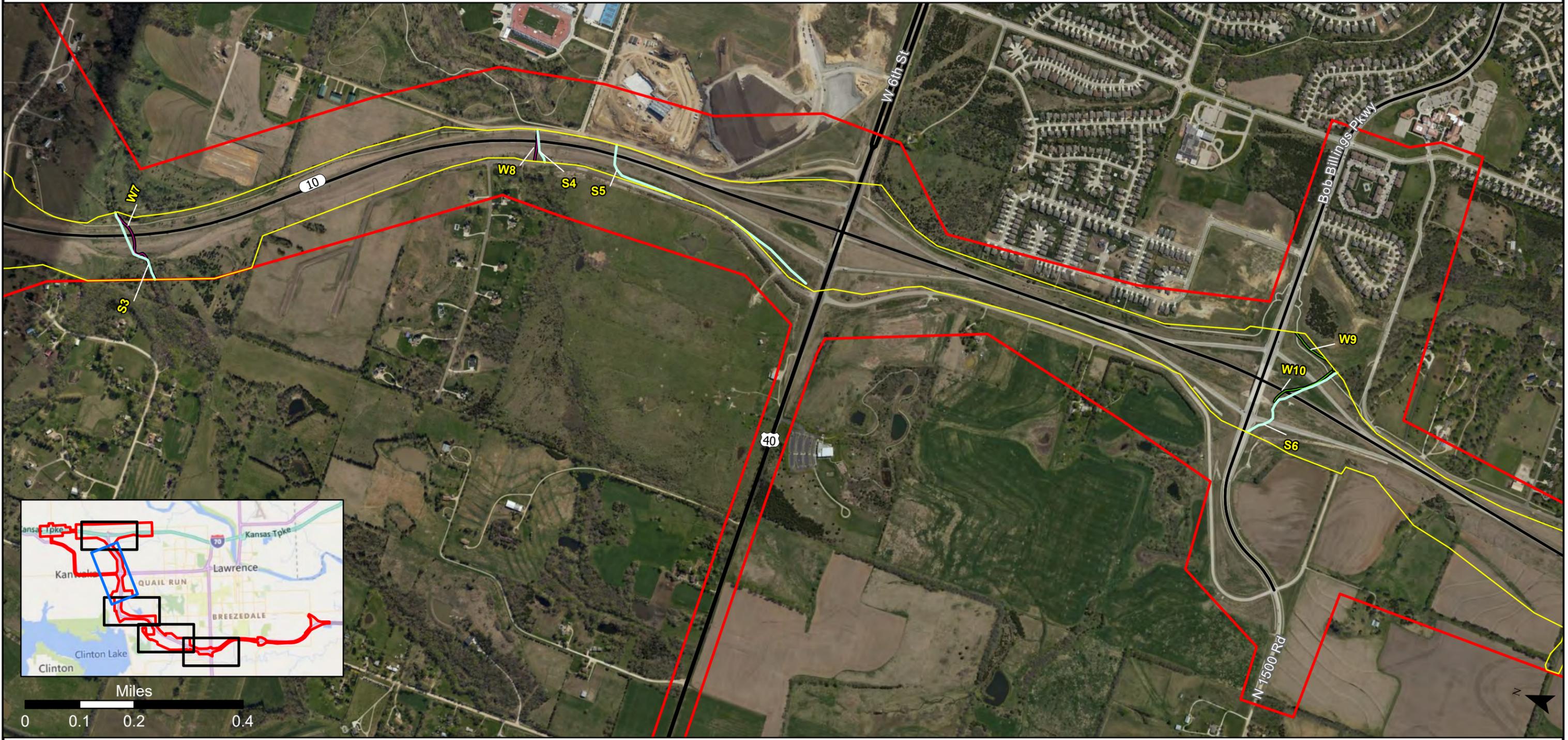


- | | | |
|----------------------|---|----------------|
| SEIS Study Area | Wetland Impacts | Baker Wetlands |
| Construction Limits | 2015 Field Verified - 40-50% Emergent Wetland | |
| NHD - Stream Impacts | 2015 Field Verified - Emergent Wetland | |
| Pond Impacts | NWI - Freshwater Emergent Wetland | |
| | NWI - Freshwater Forested/Shrub Wetland | |

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* Only areas with water resource impacts shown

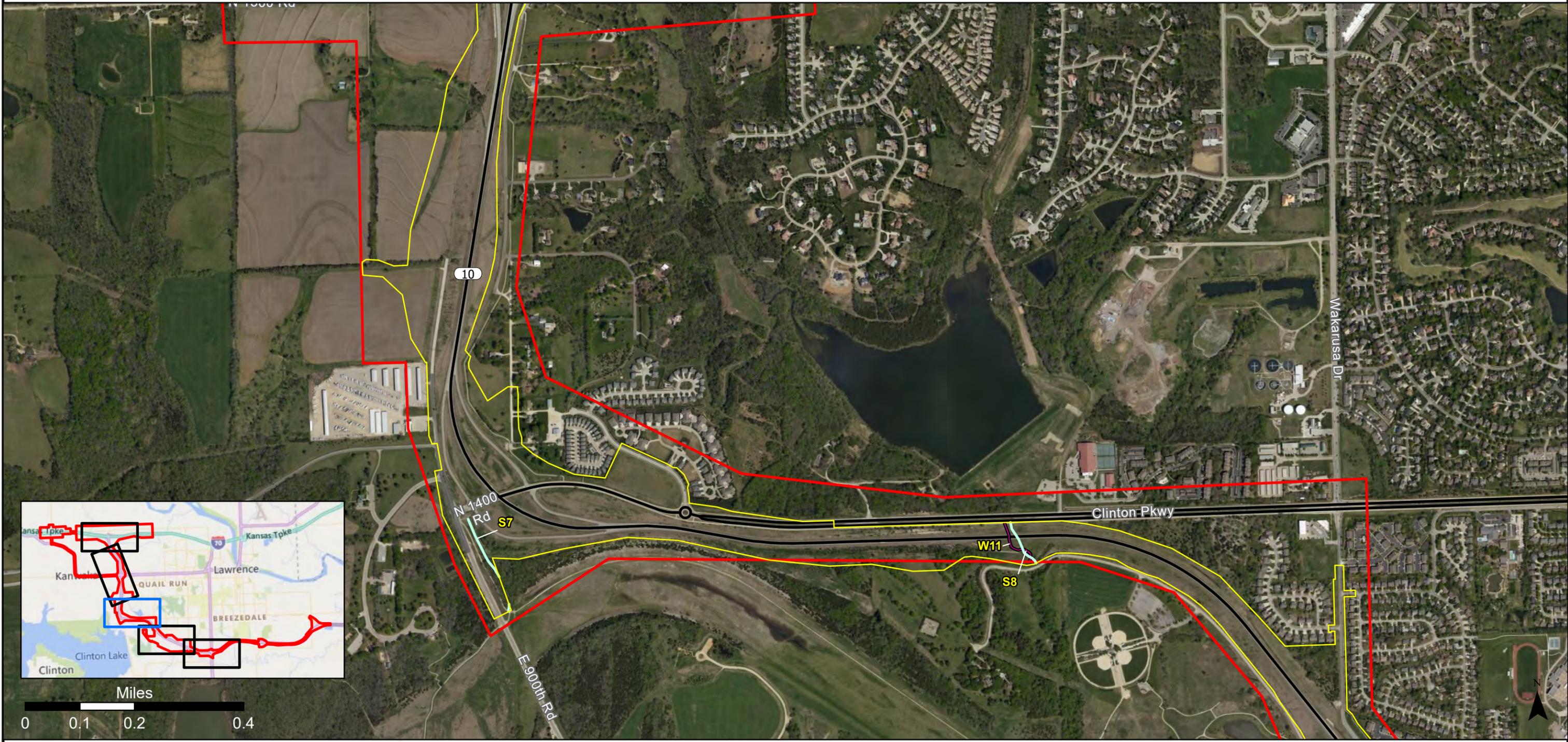


- SEIS Study Area
- Construction Limits
- NHD - Stream Impacts
- Pond Impacts
- Wetland Impacts**
- 2015 Field Verified - 40-50% Emergent Wetland
- 2015 Field Verified - Emergent Wetland
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- Baker Wetlands

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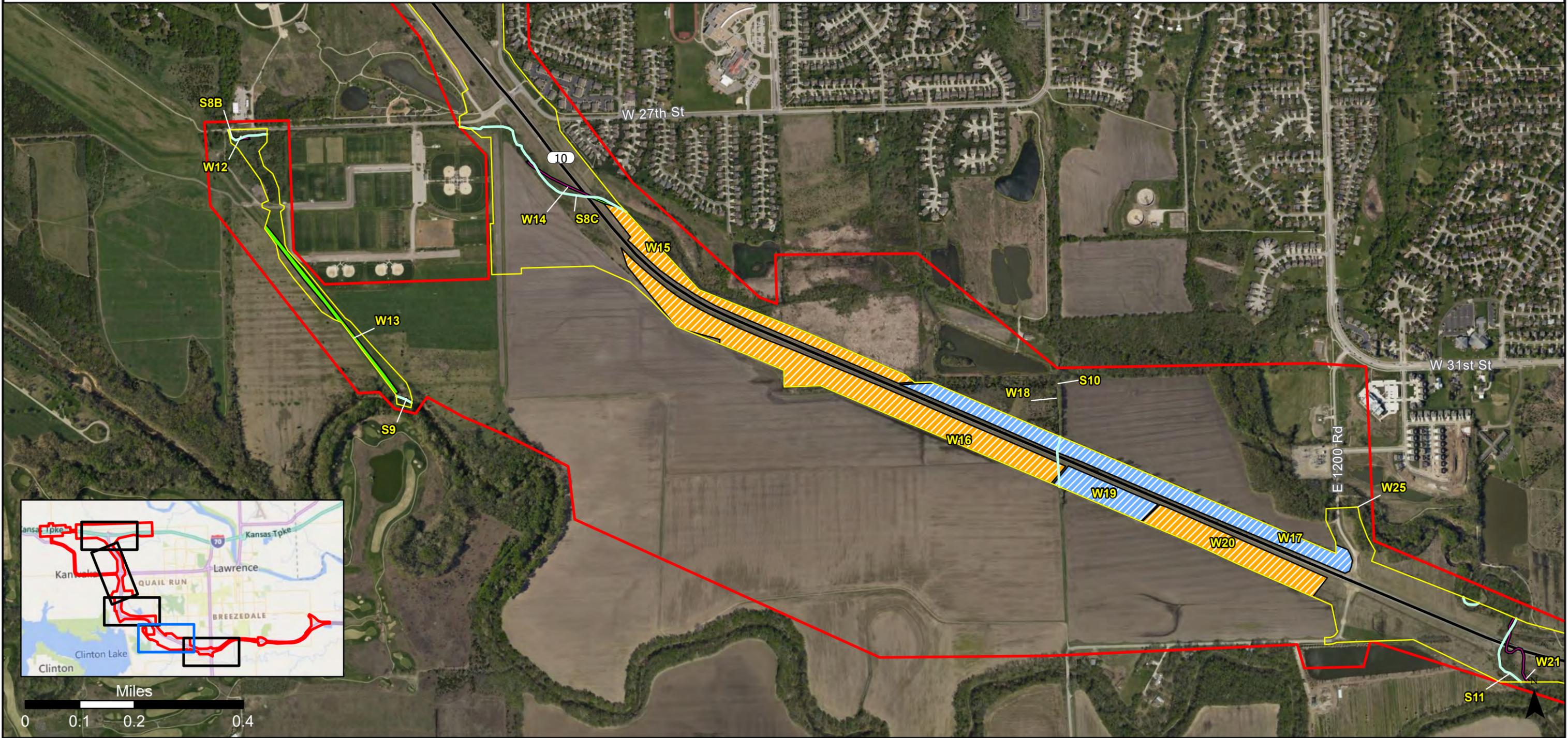


SEIS Study Area	Wetland Impacts	Baker Wetlands
Construction Limits	2015 Field Verified - 40-50% Emergent Wetland	
NHD - Stream Impacts	2015 Field Verified - Emergent Wetland	
Pond Impacts	NWI - Freshwater Emergent Wetland	
	NWI - Freshwater Forested/Shrub Wetland	

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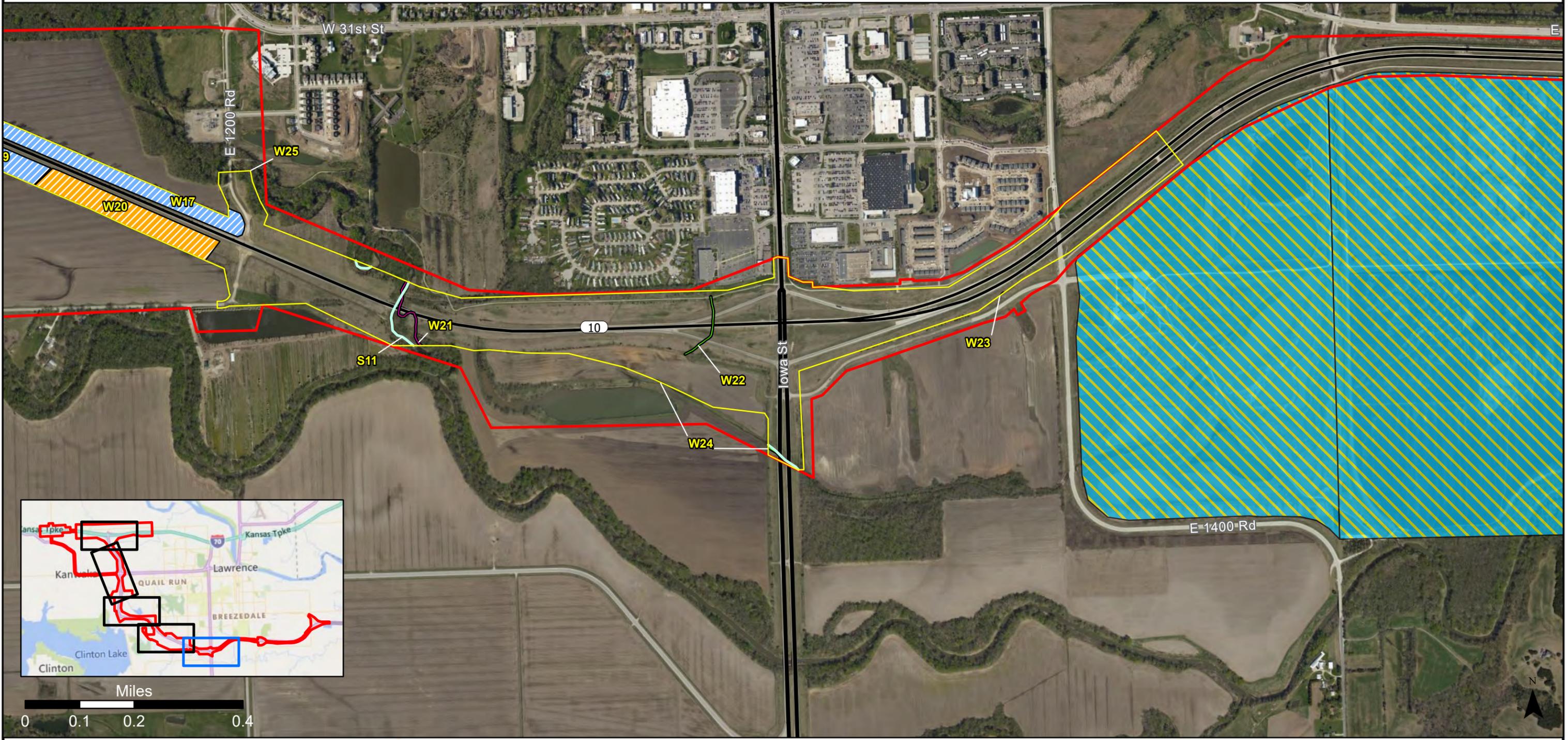
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Baker Wetlands

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KDOT # 10-23 KA-3634-01



* Only areas with water resource impacts shown



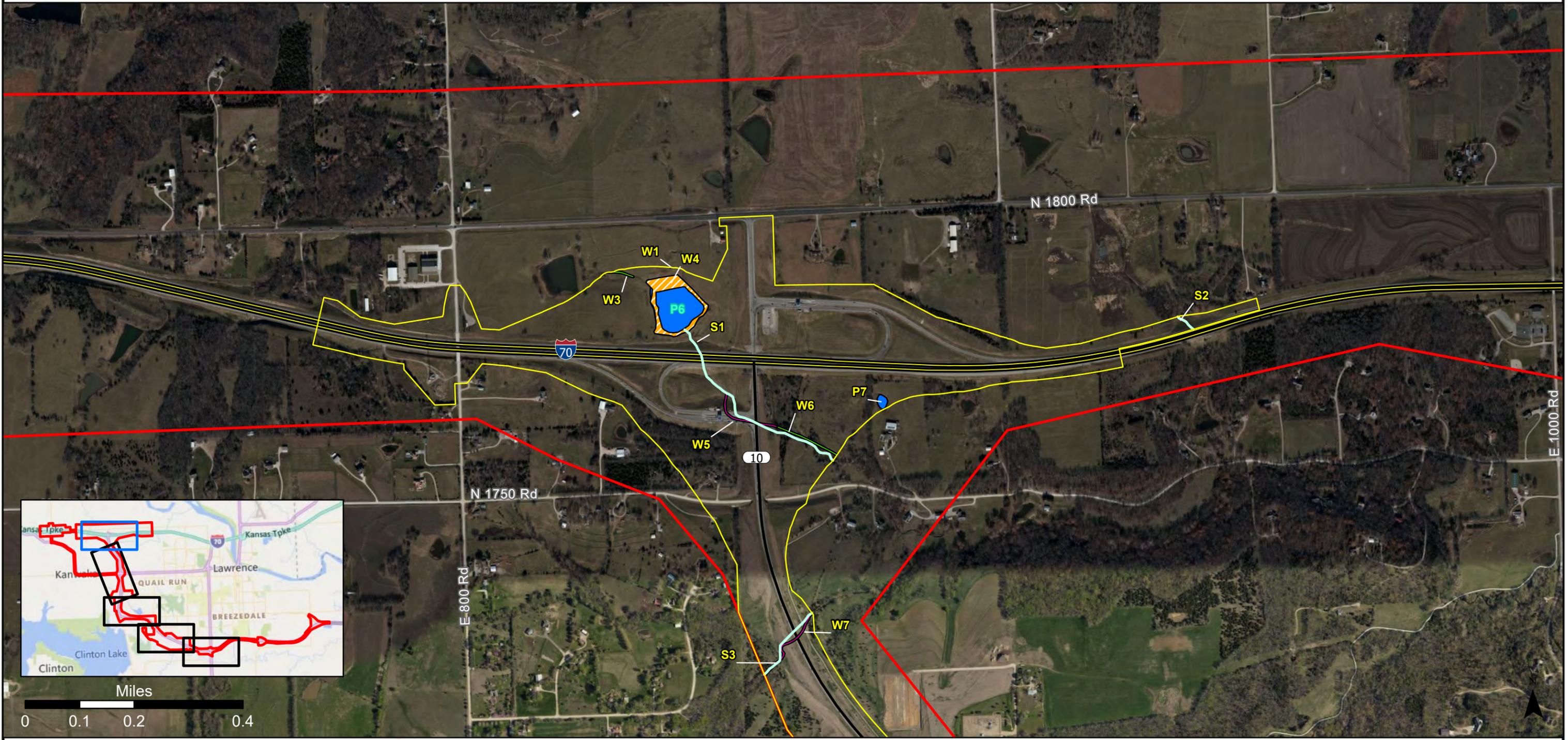
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Baker Wetlands

**South Lawrence Trafficway
Supplemental Environmental
Impact Statement
KDOT # 10-23 KA-3634-01**

* Only areas with water resource impacts shown





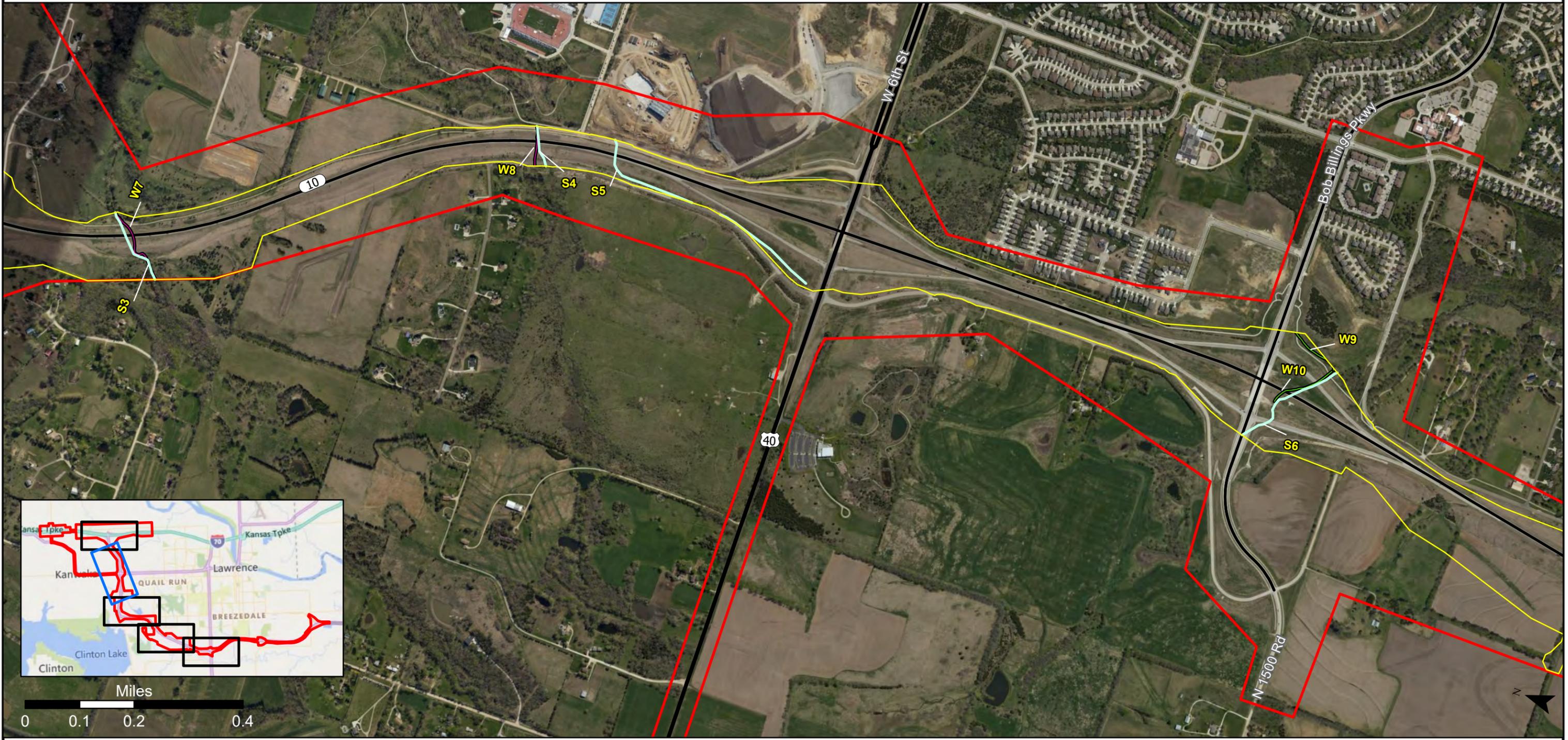
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Baker Wetlands

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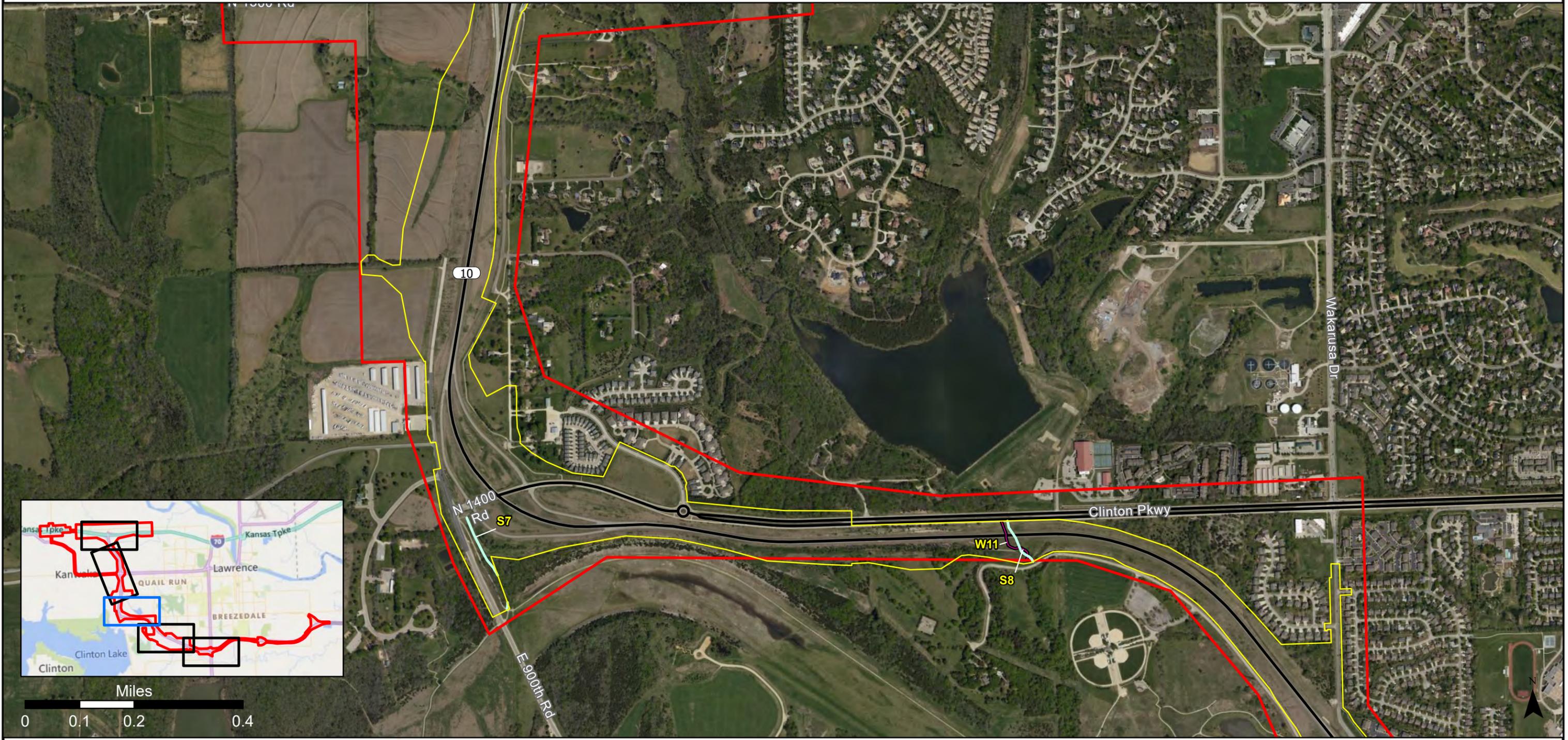


- SEIS Study Area
- Construction Limits
- NHD - Stream Impacts
- Pond Impacts
- Wetland Impacts**
- 2015 Field Verified - 40-50% Emergent Wetland
- 2015 Field Verified - Emergent Wetland
- NWI - Freshwater Emergent Wetland
- NWI - Freshwater Forested/Shrub Wetland
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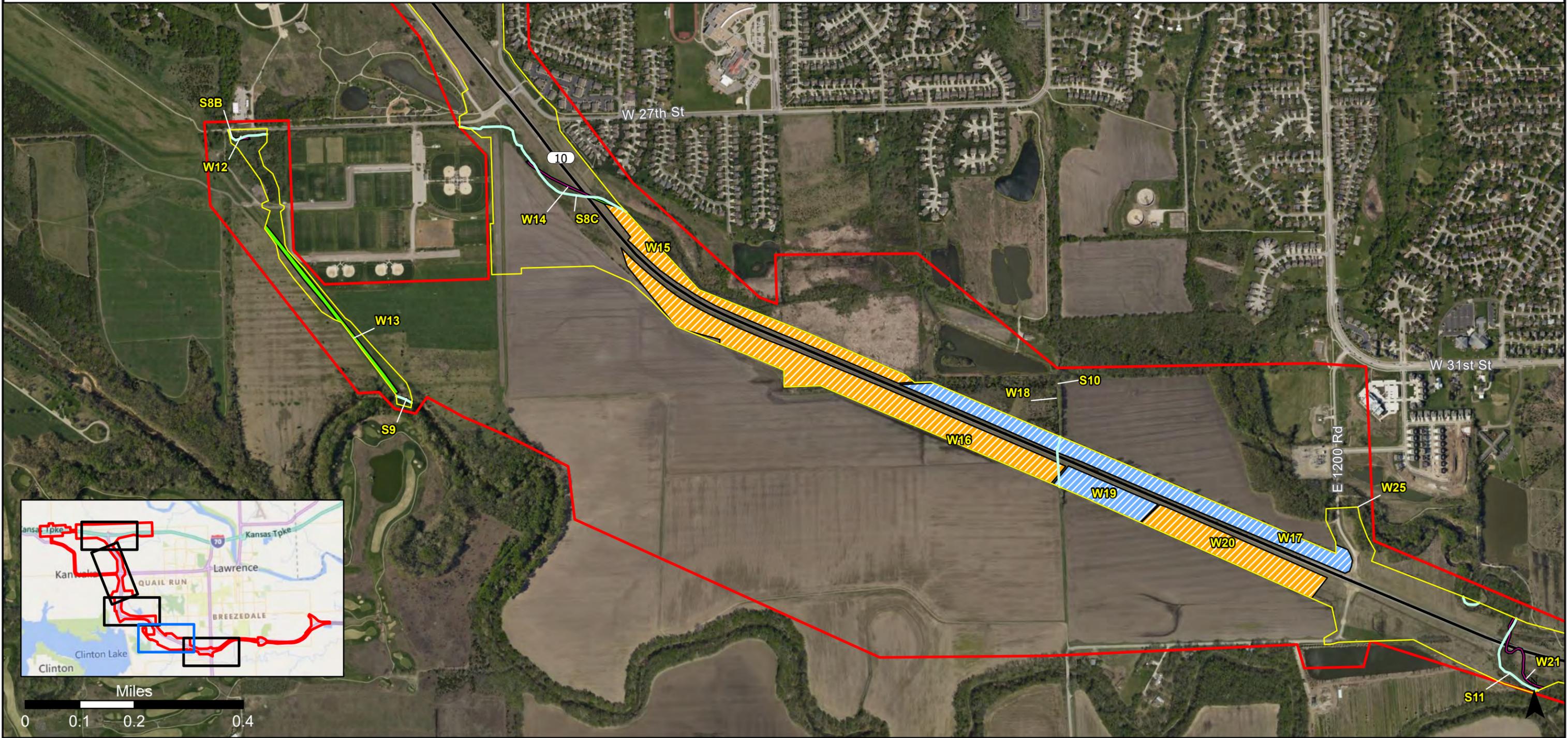


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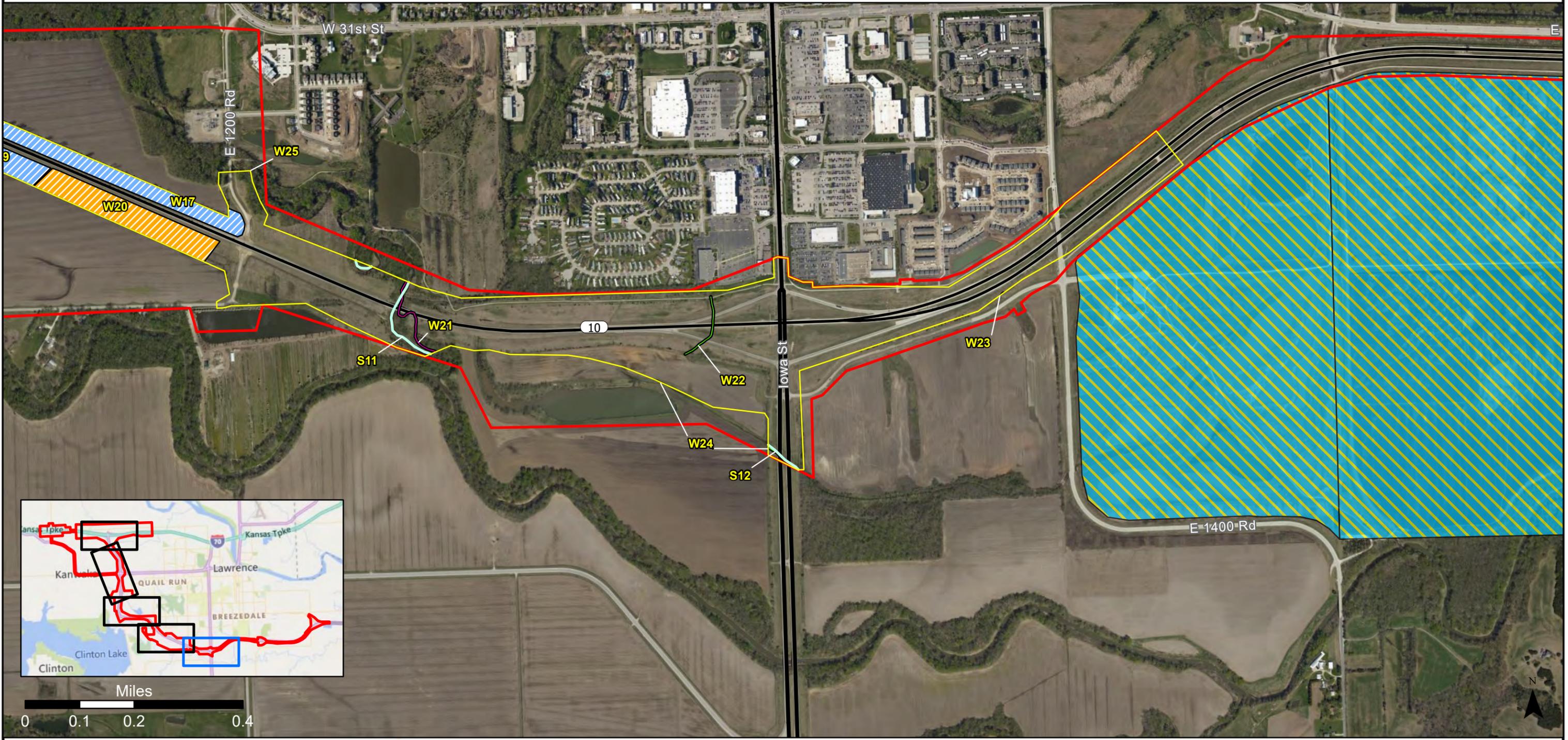


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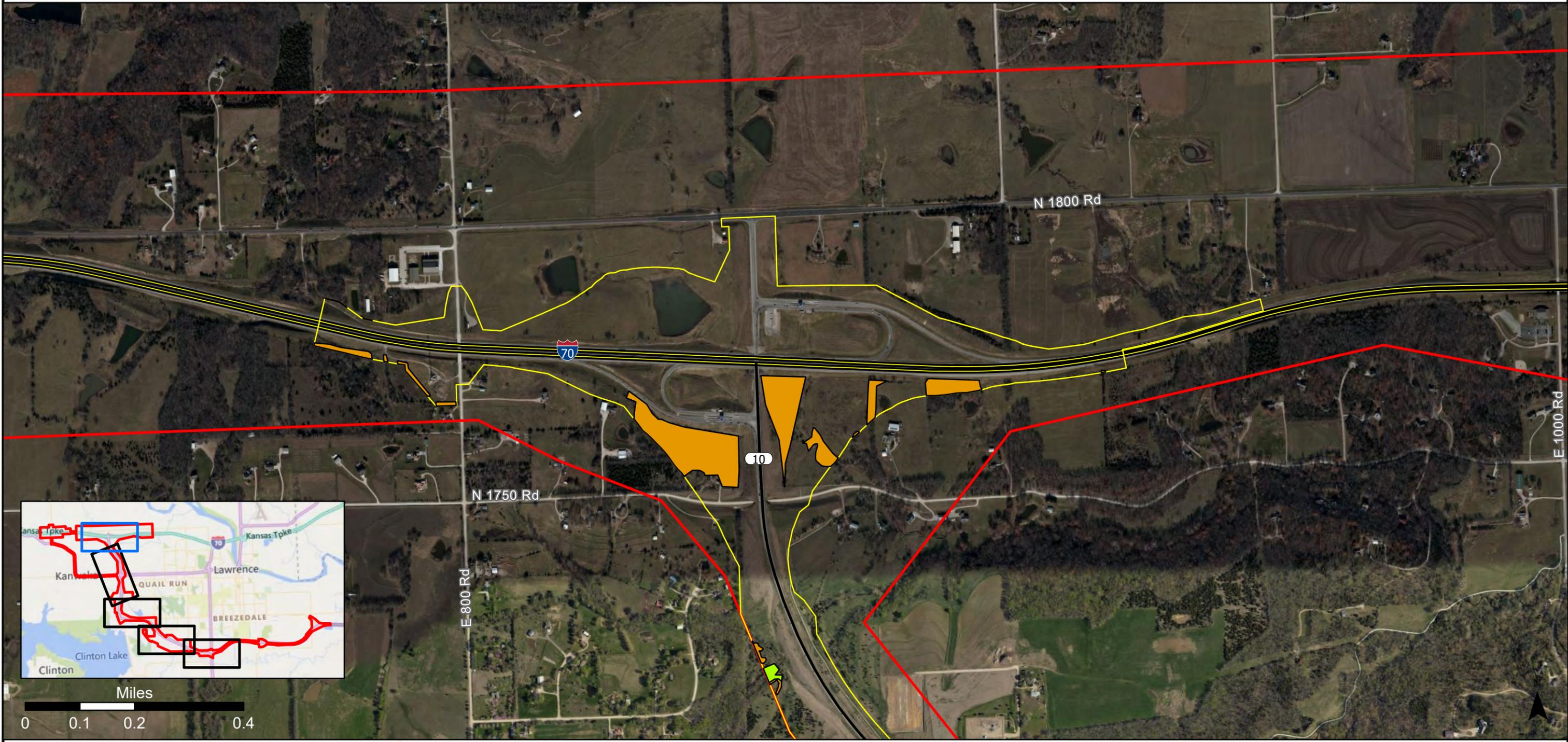


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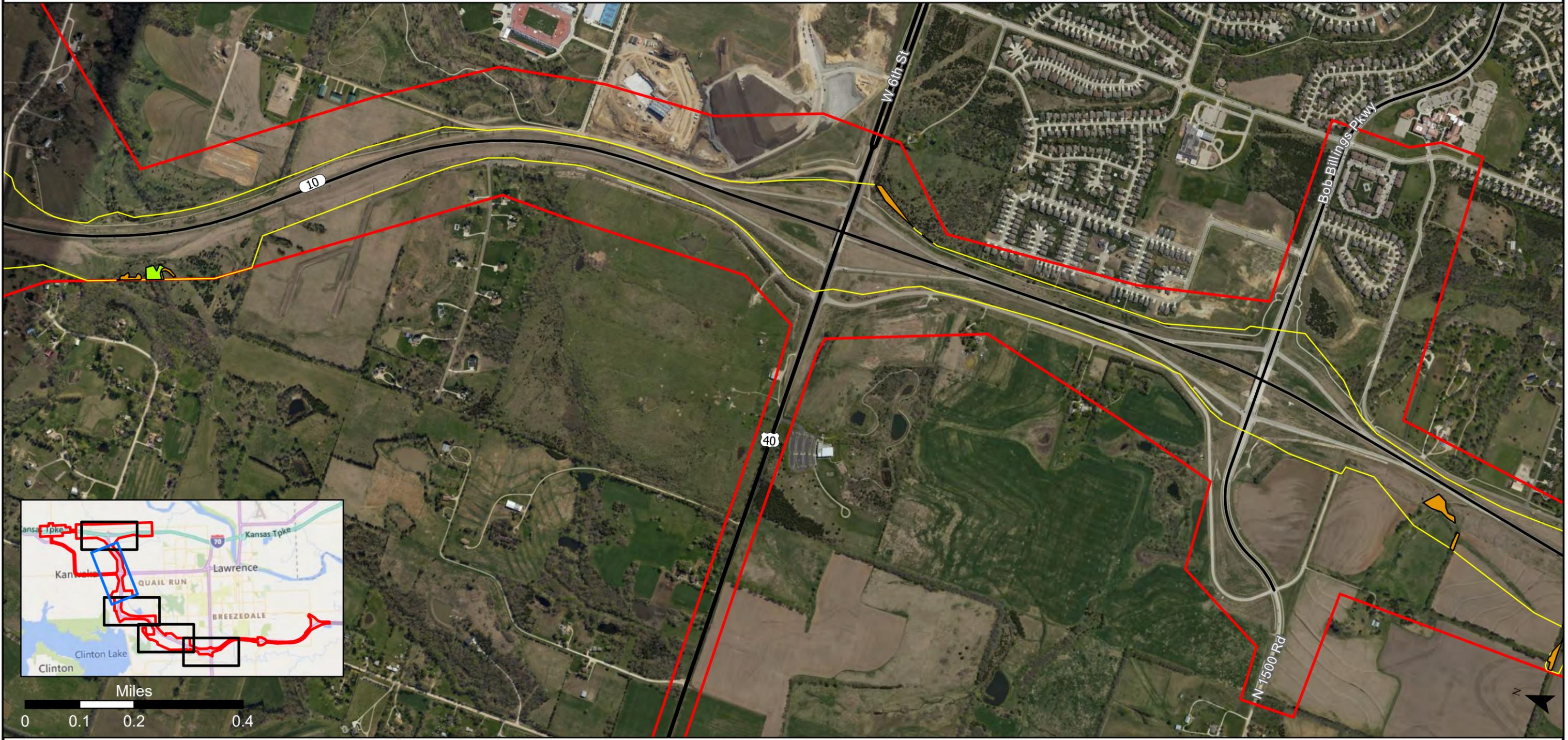
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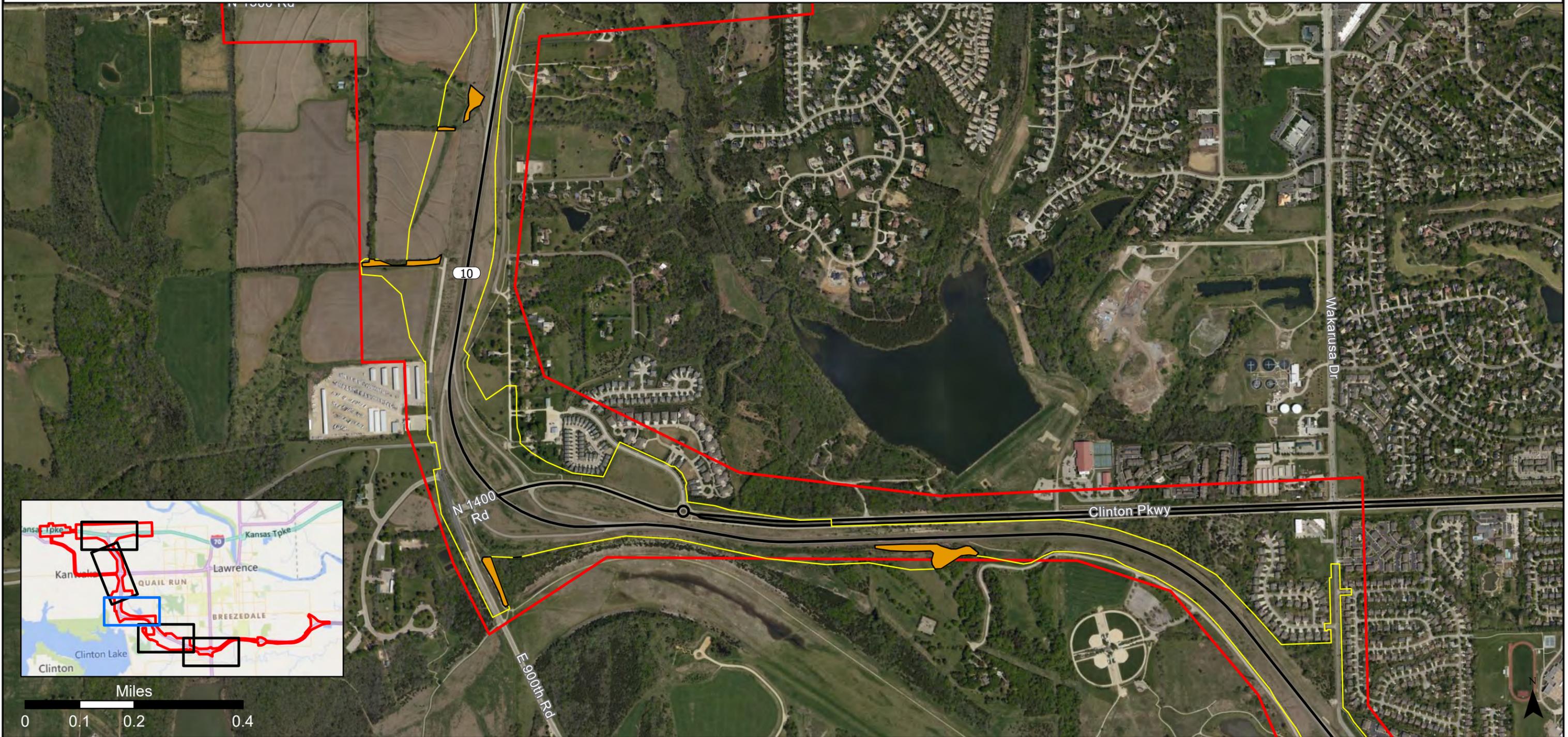




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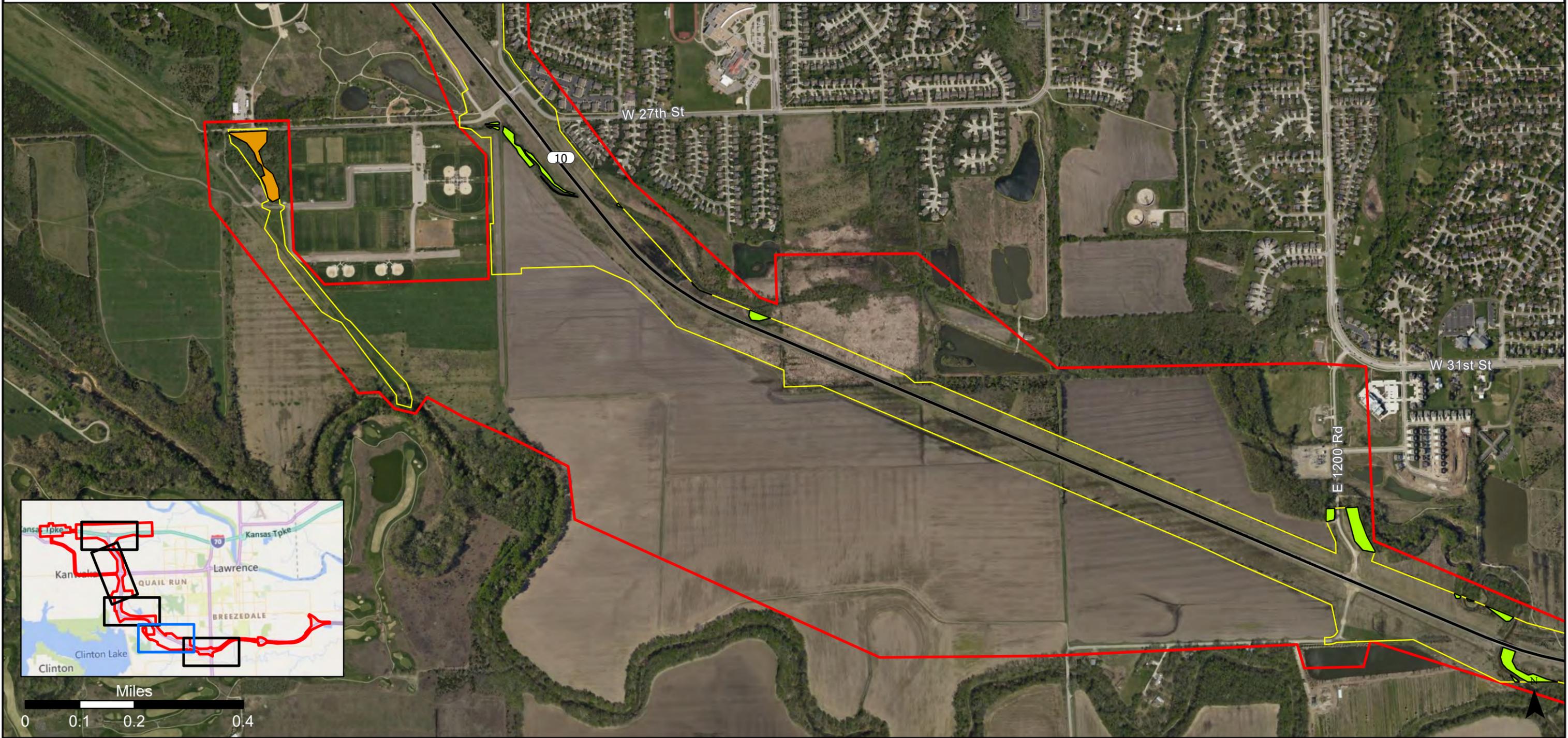




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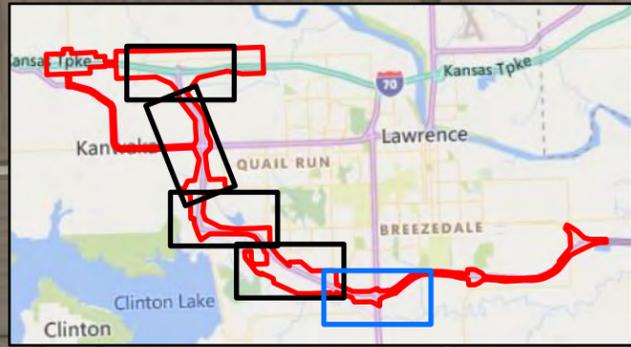
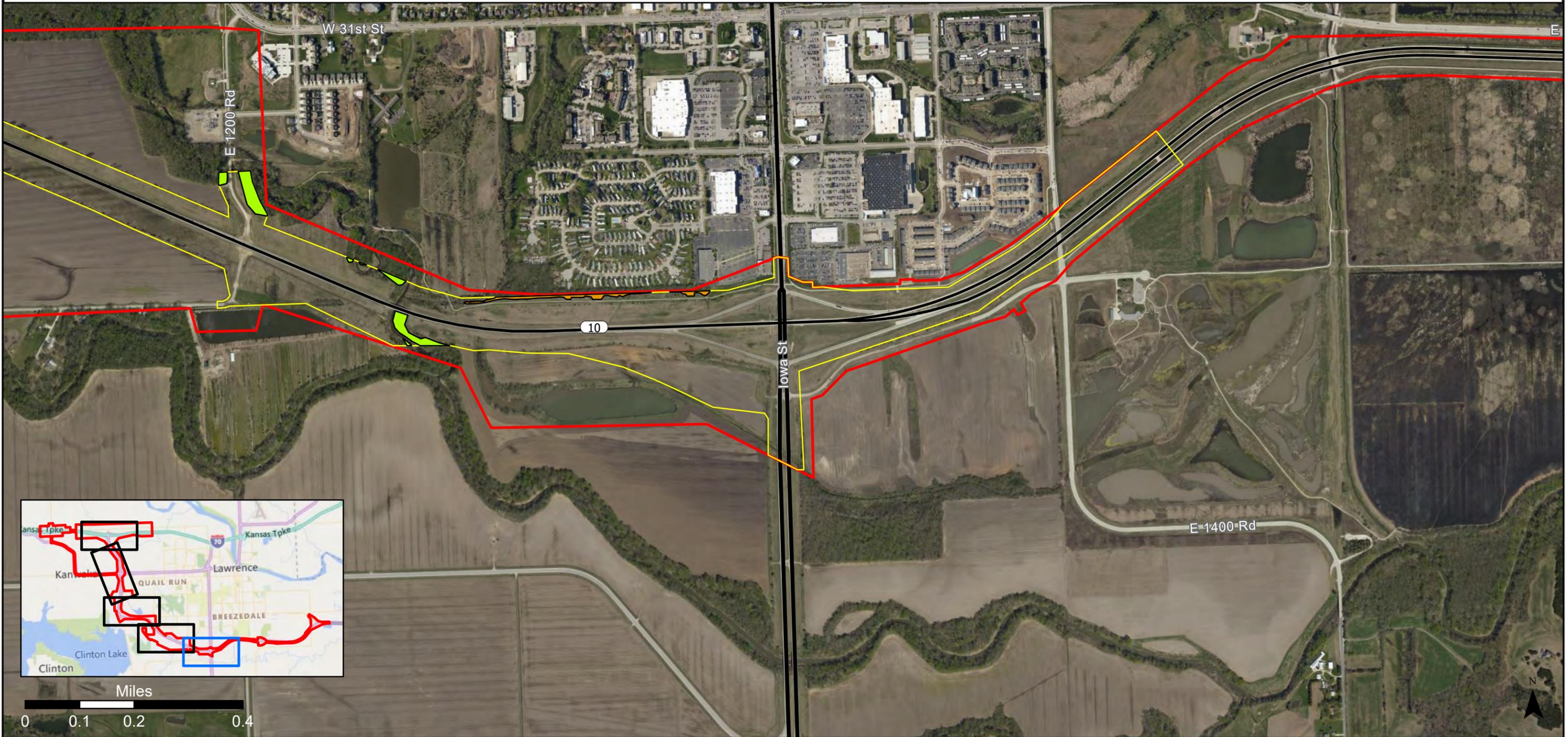




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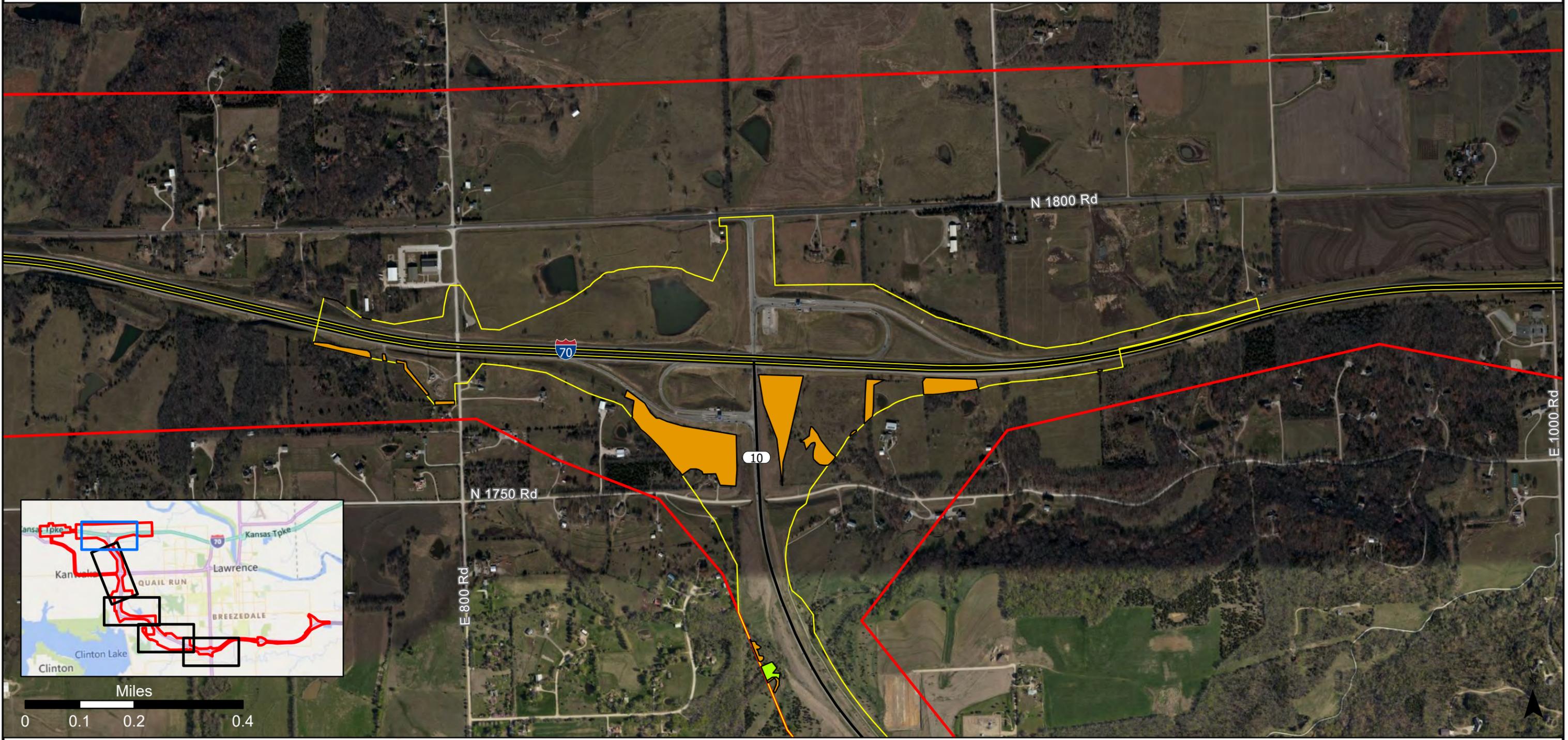




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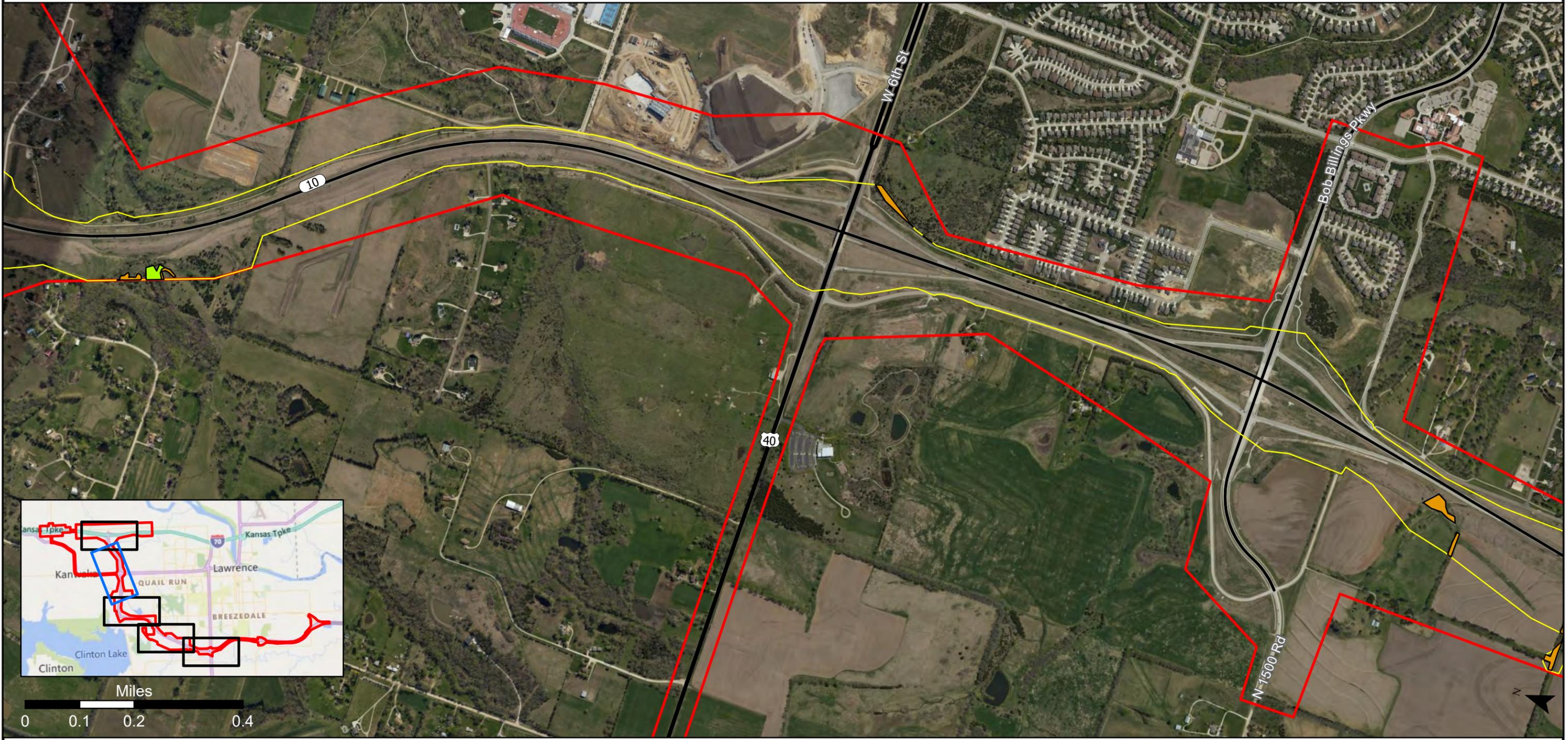




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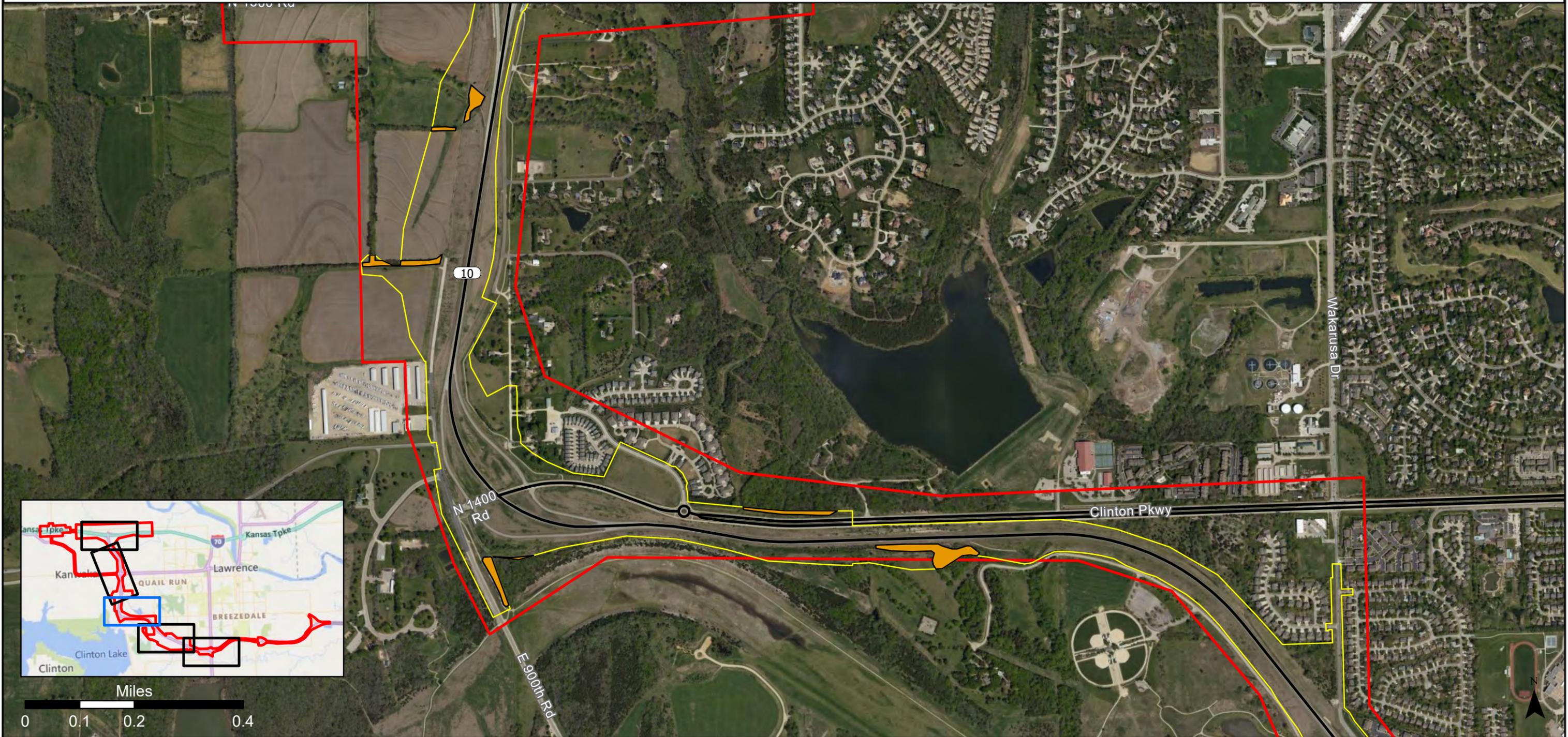




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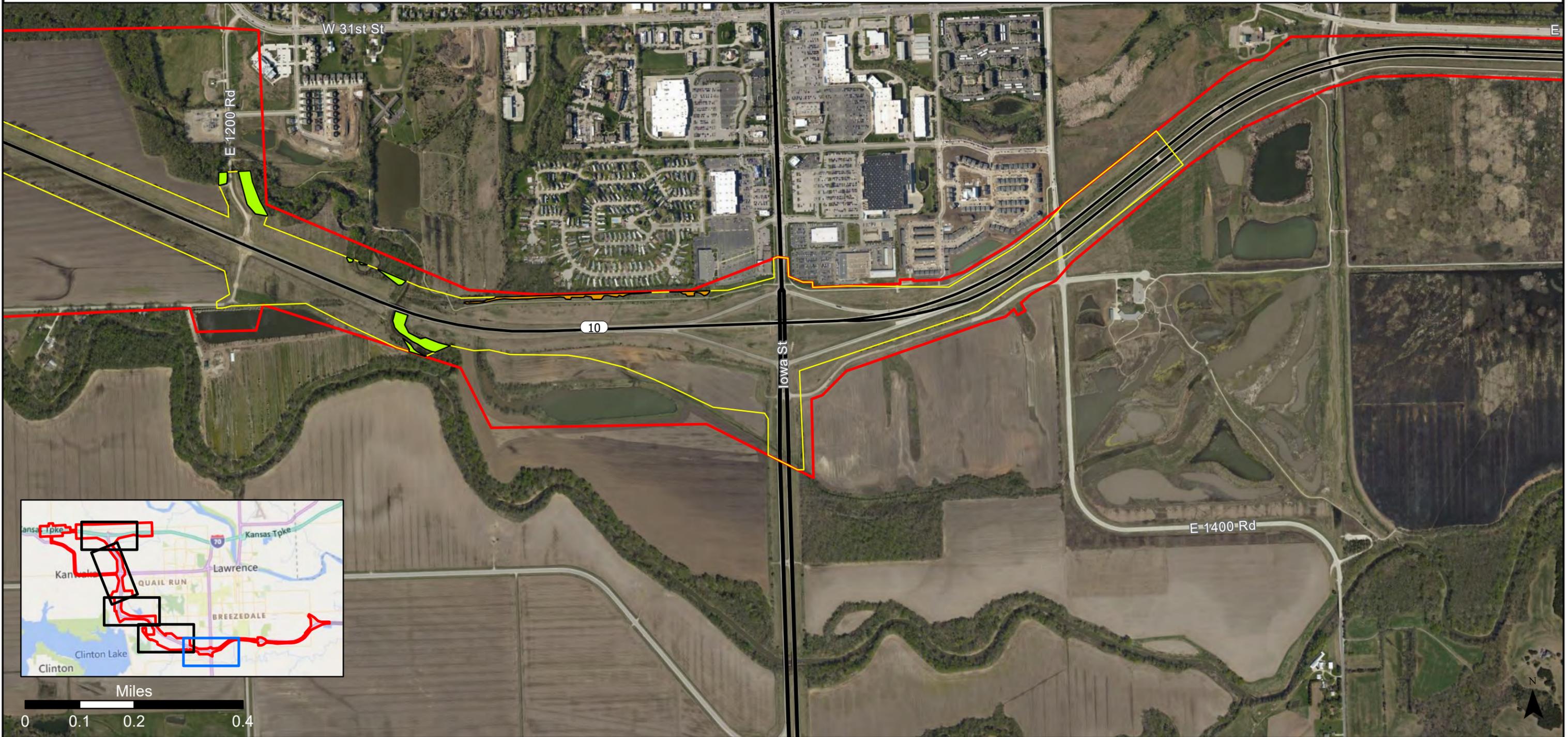




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