WORK ORDER No. 1

7-106 K-7925-03
As-Needed Statewide Engineering Services

HNTB is under an As-Needed contract with KDOT to review developments along the K-7 corridor. This is in response to the first development. The Shoppes at Prairie Star Parkway is located adjacent to the K-7 corridor on the east side and just south of Prairie Star Parkway. The development is currently seeking approval of its development plans through the City of Lenexa.

The Prairie Star Parkway interchange is less than a mile from the large system to system interchange between K-10 and K-7. This means that the exit ramp that is adjacent to the development actually comes from a Collector/Distributor (CD) road that is developed south of K-10. This CD road also merges with traffic turning north onto K-7 from both directions of K-10. This CD road is planed to be a 3 lane section with the ramp leading up to Prairie Star Parkway being two lanes. All of this pushes the ramp closer to the development than the existing exit ramp. Because of this, HNTB was asked to look at this area with greater detail to look for conflicts and if any were found, to provided potential resolutions.

HNTB received an electronic copy of the latest development plan along with PDF files of the plan and profile for Monticello Terrace. The electronic file was lined up with our base files. The base files included mapping and contours used for the HNTB Prairie Star Parkway project, current pavement edge files from the K-7 and K-10 interchange (including the Prairie Star Parkway interchange), current InRoads horizontal and vertical alignments, and AIMS mapping and contours used to fill in pieces not included in the mapping.

Final Status
The purpose of this work order was to review a development plan proposed for the southeast corner of K-7 and Prairie Star Parkway. The development plan was withdrawn after the work order was completed. A development plan was put together in late 2006. See Work Order No. 6 for the revised plan.

K-7 On-Call Engineering Services
Work Order No. 2

LOCATION: 127th Street (Harold)/K-7 Interchange

The location of this work order task is the K-7 and 127h Street Interchange proposed within the K-7 Corridor Management Plan. The issue that arose is a proposed plat for new commercial development in the southeast quadrant, and a combined commercial and multi-unit residential development in the northeast quadrant of the existing signalized intersection. Both development plans are adjacent to the eastern boundary of existing K-7 highway right of way. Both proposed developments are in very close proximity to the future roundabout interchange shown on plate No. B-10 of the K-7 Corridor Management Study. The City of Olathe requested that KDOT refine and further develop the right of way limits thru the interchange with a more detailed layout of the roundabout, each diagonal ramp, and the connections to Ernie Miller Nature Center to the west and 127th Street to the east. Using more detailed information would then allow the City to recommend a plan to the developer that would work well today and also preserve right of way for future improvements to K-7 highway.

Some of the parameters for refined development of the ultimate interchange right of way "footprint" include several design assumptions of the future conditions. They include:

- 127th Street, the interchange ramp terminals, and the entrance to Ernie Miller Nature Center will all tie into a dual lane roundabout. The K-7 mainline freeway will overpass the roundabout. Retaining walls are likely in order to align the ramps with minimal parallel offset from the mainline lanes.
- To minimize impact to the park land to the west, the existing K-7 western right of way line is to be held, and all required right of way needed to construct the K-7 improvements would occur to the east. This assumption is used 2500-ft. to the north and south of 127th Street.
- Access to the park would be gained thru the west leg of the roundabout. Based on the current position of the entrance and interior park roads, considerable modification to the entrance would be required. A likely scenario for connection for the roundabout to the south pavilion and north parking lot are shown on the revised plate. All land disturbed from construction of a new connection would require mitigation. Retaining walls could be considered to minimize disturbance to the entrance to the park.
- To utilize a small individual tract of undevelopable land in the northeast quadrant of the existing intersection, the roundabout footprint was shifted from the position shown on plate B-10, north along K-7 approximately 150-ft.

The results of the more detailed interchange layout are shown on the revised plate B-10. On the revised plate, the proposed K-7 right of way limits have been refined to include the more detailed interchange footprint. Also, a future 120-ft. right of way for future expansion of 127th Street to a 4 lane arterial is shown. In preparing the roundabout and ramp layouts, truck turning movements and vertical alignment of the ramps were considered. HNTB coordinated with Johnson County Parks & Recreation on the proposed layout of the future interchange. The parks department stated that the entrance area contained rolling terrain and some specimen trees that they desire to be preserved if K-7 expansion were to occur.

Also, the parks department also emphasized that if, determined in preliminary design, right of way was needed, replacement land of equal value would be required.

In conclusion, the development plans under consideration should be compared to the right of way limits defined within this work order. In addition, any future entrances to these locations should be compared to the interchange layout. For conformity with the future roundabout, any entrances should be positioned to the east as much as possible to meet the City's minimum for right in/right out access point spacing from interchange ramp terminals. At the same time, consideration should also be given to the spacing from the commercial entrances to the intersection of 127th and Parker.

This summarizes the concerns, the tasks performed, and the conclusions determined by the City of Olathe, KDOT, and HNTB thru this work order process.

K-7 On-Call Engineering Services
Work Order No. 2

LOCATION: 175th Street/Future K-7 Interchange

The location of this work order task is the future K-7 and 175th Street Interchange proposed within the K-7 Corridor Management Plan. The issue that arose at this location is related to a proposed plat for new phases of residential development for the Nottington Creek Subdivision. The proposed development is located in the southwest corner of the intersection of 175th Street and Lone Elm Road. Based on the proximity of the proposed subdivision's access roads to the future interchange ramps and proposed local street network shown on the K-7 Corridor Management Study's original Plate No. B-6, the City of Olathe requested that KDOT review the plan for future roadway improvements and attempt to minimize impact to the development.

The tasks within this work order included reviewing the original interchange and relocated local street network. These elements were then refined using the lower acceptable range of the specific freeway, interchange, and arterial street design criteria to determine the "best case" scenario for minimizing impact to the proposed subdivision. Specifically, the elements of design that were studied included the spacing of the ramp terminals from the mainline, determination of sideroad over vs. sideroad under, the spacing from the ramp terminals to relocated Lone Elm Road, and the horizontal alignment geometrics of relocated Lone Elm Road approaching the intersection.

The tasks completed determined that if future K-7 were constructed as a mainline over 175th Street, the diamond interchange ramp terminals could be pulled in to create a "compressed" diamond. However the more conservative approach to right of way preservation, shown on the revised plate, is to use the wider right of way limits when comparing the original interchange and the compressed diamond interchange. Additionally, the original interchange layout is also shown on the revised plate.

On plate B-6 in the K-7 Corridor Management Study, the spacing between the western ramp terminals and relocated Lone Elm Road is 950-ft, compared to 750-ft. on the revised plate. The reduction is a result of modifications to the horizontal alignment of relocated Lone Elm Road, in order to minimize impacts to the proposed development. If the compressed diamond interchange option is constructed in the future, the 750-ft. spacing could be increased up to approximately 75-ft.

The conclusions of the work order were the following:

- to show the original interchange layout with more conservative right of way needs within the interchange area
- decrease the spacing between Lone Elm Road and the ramp terminals while holding the ramp terminals in the same location
- use the lower range of the City of Olathe's design criteria for a major arterial for relocated Lone Elm Road south of 175th Street

This summarizes the concerns, the tasks performed, and the conclusions determined by the City of Olathe, KDOT, and HNTB thru this work order process. The proposed Nottington Creek development, the refined future K-7 right of way, and the refined relocated Lone Elm Road alignment are shown on the revised plate.

K-7 On-Call Engineering Services
Work Order No. 2

<u>LOCATION:</u> Old US 56 Highway/Future K-7 (existing Lone Elm Road)

The location of this work order is the future K-7 and Old US 56 Highway Interchange proposed within the K-7 Corridor Management Plan. The specific issue that required additional detail and design analysis at this location is related to a proposed development at Mackenzie Park. The development is located in the southeast quadrant of the intersection of existing Lone Elm Road and Old US 56 Highway in Olathe.

The area of concern is shown on the K-7 Corridor Management Study's original Plate No. B-8. Based on the proximity of the western edge of the proposed development to the future K-7 expansion, the City of Olathe requested that KDOT review the development plans for Mackenzie Park and verify there were no conflicts with the recommended right of way corridor for future freeway and interchange improvements.

The tasks within this work order included obtaining the development maps for Mackenzie Park, incorporating that information onto the study plate exhibits, and lastly assessing the K-7 right of way needs versus the development plans within Mackenzie Park. Figure 1 shows the relationship between the proposed development and the recommended right of way for future K-7 expansion. From the analysis of the two, it does not appear that the development overlaps onto land needed for future freeway right of way. In July of 2006 KDOT, the City of Olathe, and HNTB met to discuss the results of the analysis. At that meeting the exhibits on the following pages were reviewed and verified the conclusions stated above. It was also noted by KDOT and concurred by the City of Olathe that the developer recognizes that the proposed access point from existing Lone Elm Road would be removed when future K-7 expansion improvements are made.

The conclusion of the work order for this location is that no conflict exists between the planned development, as provided to HNTB in June 2006, and future K-7 expansion right of way requirements. See Figure 1 and Revised Plate No. B-8 for details.

K-7 On-Call Engineering Services
Work Order No. 3

K-7 Corridor Public Meeting

The purpose of Work Order No. 3 was to perform public involvement assistance for a review committee meeting of the K-7 Corridor Study. The meeting was held in early 2006.

K-7 On-Call Engineering Services
Work Order No. 4

LOCATION: **Santa Fe (135th Street)/K-7 Interchange**

Background: KDOT contracted with HNTB to review the proposed development plans at the northwest quadrant of Santa Fe and K-7. When the development is constructed, the east entrance to the Wal-Mart Supercenter will have direct access to K-7 thru the existing traffic signal at Spruce Street. However, in the future when K-7 is expanded to a freeway the Spruce traffic signal and the development's direct access to K-7 will be removed. KDOT requested that HNTB prepare reasonable alternatives for access from the east entrance when K-7 is expanded to a freeway.

Alternative 1 (K-7 over both Santa Fe and Spruce with an urban diamond interchange at Santa Fe)
A southbound one-way frontage road would tie the east access point to the southbound off ramp. This access point would also connect thru to the east on Spruce Street with an underpass beneath K-7 intersecting with a northbound one-way frontage road on the east side of K-7.

- This alternative is essentially the plan shown on the original plates in the K-7 Corridor Study.
- The disadvantages to this option include a less than desirable vertical alignment of the northwest and the northeast ramps due to the grade separation at Spruce. Additionally, the vertical alignment issues create an inadequate weaving length between the tie in of the ramp and the one way frontage road to the future signals at the end of the ramp and Santa Fe.
- Based on these two disadvantages, KDOT did not prefer this alternative.
- It was noted that all alternatives must stay within the Right of Way line shown on the exhibits in the northwest quadrant.

Alternative 2 (The northeast and northwest ramps are shifted to north of Spruce. A multi-lane one-way frontage road system is then located between Santa Fe and Spruce with signalized intersections at each set of ramp terminals. An underpass connection from east Spruce Street into Wal-Mart is provided.)

- The steep vertical alignment and inadequate weaving distance issues in Alternative 1 are resolved. However, by shifting the ramps north of Spruce, an inadequate freeway weaving distance is created between the Spruce and the 127th Street interchange ramps to the north.
- Additionally, traffic capacity issues will arise at the ramp terminals at Spruce because most of the exiting and entering traffic's destination is Santa Fe. Traffic would be forced thru one additional signal on the ramp/frontage road system before getting to Santa Fe.
- Based on the conditions mentioned above, KDOT did not want to take this option any further for consideration.

Alternative 3 (The northeast and northwest ramp layouts are set like Alternative 1, however the Spruce Street underpass is eliminated.)
This condition would allow the K-7 mainline profile to be lowered, thus improving the vertical geometry between the ramp/one way frontage road. This would allow the connection of the ramp and the frontage road to occur sooner, thus increasing the weaving distance on the frontage road approaching Santa Fe. To help with traffic circulation and future access, the one-way frontage road system is extended north to

127th Street and a "Texas turnaround" added for southbound to northbound beneath the Santa Fe overpass.

- Connecting the one way frontage road system up to 127th could create potential impacts to the Ernie Miller Park on the west side of K-7. Retaining walls will probably be needed to keep the one-way frontage road grading limits within right of way. However, the lowering of K-7 at Spruce would reduce retaining walls in that vicinity.
- The group also discussed the feasibility of a single point urban interchange vs. the diamond interchange with two signals. Neither interchange option will affect the Wal-Mart access issue, so no further analysis of operational benefits of interchange types was requested.
- The Texas U-turn would provide greater efficiency at the ramp terminals.
- KDOT felt this option offered the best operational capacity for traffic. They would like the City of Olathe to comment on this alternative, since this alternative would eliminate a Spruce Street grade separation.

The result of the more detailed interchange layout is shown on the revised plate B-9. On the revised plate, the proposed K-7 right of way limits have been refined to include the revised interchange footprint. Also, the updates to the local road network, frontage roads, and ramps are shown based on the preferred alternative.

In conclusion, the preferred alternative removes the original plan for a grade separation at Spruce Street due to the reasons discussed under alternative 1. If the City determines at a later date that the grade separation (underpass) at Spruce was necessary, the entrance would not be able to tie-in to the off ramp. The underpass would only allow for access into the development from Spruce Street east of K-7. This summarizes the concerns, the tasks performed, and the conclusions determined by the City of Olathe, KDOT, and HNTB thru this work order process.

K-7 On-Call Engineering Services
Work Order No. 5

LOCATION: K-7 (From South of 75th Street to 43rd Street)

Background: KDOT contracted with HNTB to review proposed waterline expansion plans from Water One. Water One is preparing to build a new 60" water main in 2007 and securing the easements to allow for placing a second 60" line in the future. The design is being performed by Black and Veatch, and hard copy and electronic copy of the proposed waterline alignments were sent to HNTB. The proposed waterline runs parallel to the existing K-7 right of way, and is positioned either just inside or to the outside of existing right of way. However, new interchanges are proposed at 75th Street, 47th Street, and 43rd Street thru the waterline limits. The purpose of the work order was to better define the future right of way needs at these interchanges. This would then allow for any needed adjustments to the waterline alignment in order to avoid or minimize future conflicts with K-7 expansion or possible relocations.

The following is a brief summary of HNTB's findings during the work order. The summary and the action items were discussed at a review meeting in late December of 2006 and were documented and sent to KDOT and to Black and Veatch. The results of the review meeting were:

43rd Street Interchange

- Proposed cross sections of the future southeast interchange ramp show the waterline in over 20' of fill south of 43rd St. Shifting the waterline to the east will avoid this conflict. Water One agreed to relocate the waterline thru this area.
- Water One will shift the waterline to the east and adjust the profile of the waterline to avoid potential excavation conflicts for future roadway ditches.

47th Street Interchange

- The existing access road on the west of K-7 north of 47th street leaves little room to fit the proposed waterline west of K-7. The east side of K-7 could be a better location for the waterline in this area. Water One agreed to re-examine a previous location they had looked at that kept the waterline on the east side of K-7, approaching 47th Street from the north. A gas line on the east side was discussed as a potential relocation issue.
- The waterline will be lowered west of the southbound on-ramp near the gore to maintain the necessary cover.
- Water One will revise the waterline alignment to cross from the west side of K-7 to the east side just north of 47th Street and the future interchange. The waterline alignment will then stay on the east side of K-7 to the north across the railroad tracks on up to 43rd Street.

Johnson Drive Interchange

- Water One is coordinating with GBA, who is designing the proposed interchange plans. HNTB indicated that their current plan did not appear to pose any observed conflicts.

Shawnee Mission Parkway Interchange

- Water One is coordinating with Shawnee to avoid conflicts with the future city street east of K-7 and north of Shawnee Mission Parkway. This area was observed by the group and recognized to be a tight right-of-way area in which to place the proposed waterline.

75th Street Interchange

- The proposed waterline is located east of the retaining wall at the existing right of way, per a request by Willow Ridge Development.
- The future 75th street profile shows over 30' of fill above the proposed waterline on the east side of K-7. Additionally, KDOT mentioned that the waterline would need to be encased where it crosses under roadways within KDOT right of way. KDOT and Water One will explore moving the waterline to just outside the future 75th Street overpass bridge columns to avoid being underneath excessive fill. This would place the waterline inside the ramps on the east side.
- KDOT later determined that the 2- 60" mains could fit in a corridor from 100' to 120' right (east) of the K-7 centerline thru 75th Street. The encased pipes would be between the toe of the bridge embankment slope and the footing for the outside east pier. The future 75th Street bridge will most likely be a 3-span bridge with piers at the K-7 centerline and 90' left and right of centerline. The pipes would be located inside of existing K-7 right of way line, which is approximately 165' right of centerline. The pipes should be placed deep enough to allow for a future roadside ditch over the top of the water main(s).

The result of the more detailed interchange layouts are shown on the revised plates within the 2007 Corridor Study. On the revised plates, the proposed K-7 right of way limits have been refined as needed to include the updated interchange footprint. Also, the updates to the local road network, frontage roads, and ramps are shown. This summarizes the issues, the tasks performed, and the conclusions determined by the KDOT, Black and Veatch, and HNTB thru this work order process.

K-7 On-Call Engineering Services
Work Order No. 6

LOCATION: Prairie Star Parkway/K-7 Interchange

The location of this work order task is between 99th Street and Prairie Star Parkway within the K-7 Corridor Management Plan. The issue that arose at this location is related to the proposed site plan for a proposed development (The Fall's at Prairie Star Parkway). A review was performed by HNTB in March of 2006 of at this same location for The Shoppes at Prairie Star Parkway, a proposed development from the previous developer. The Fall's at Prairie Star Parkway is located in the southeast corner of the interchange of K-7 and Prairie Star Parkway. Based on the proximity of the proposed development to the future modified interchange at Prairie Star Parkway and the future overpass at 99th Street, the City of Lenexa requested that KDOT review the plan for future roadway improvements and attempt to minimize impact to the development.

The tasks within this work order included review of the future interchange improvements at Prairie Star Parkway and K-7 and the future grade separation at 99th Street and K-7 for any conflicts with the proposed development plan. Analysis of the K-7 right of way shown on the development plans and review of the grading plan with respect to the future off-ramp grading from K-7 to Prairie Star Parkway was also provided. A review was also performed of the traffic study for The Fall's at Prairie Star Parkway. See the attached Technical Memorandum for the traffic study review.

The Prairie Star Parkway interchange is less than a mile from the large system to system interchange between K-10 and K-7. This means that the exit ramp that is adjacent to the development actually comes from a Collector/Distributor (CD) road that is developed south of K-10. This CD road also merges with traffic turning north onto K-7 from both directions of K-10. This CD road is planed to be a 3 lane section with the ramp leading up to Prairie Star Parkway being two lanes. All of this pushes the ramp closer to the development than the existing exit ramp. The grading of the development has taken this into account as indicated by no grading conflicts with the proposed future ramp.

A profile of 99th Street provided by Shafer Kline & Warren was reviewed with respect to the proposed CD road on the east side of the K-7 mainline. The profile of 99th Street was found to be only approximately 2 feet higher than the proposed elevation of the CD road at their intersection. Approximately 22 feet of clearance is recommended. The profile of 99th Street and the adjacent site plan need to be modified significantly to accommodate the future CD road.

The existing K-7 right of way adjacent to The Fall's at Prairie Star Parkway was analyzed to determine any discrepancies between the right of way shown on the K-7 Corridor Study and The Fall's at Prairie Star Parkway plan. It was determined there was a significant difference in the right of way shown for the two different plans. It should be noted that the source of the right of way for the K-10 Corridor Study was AIMS. Further right of way investigation should be performed to determine the accurate right of way limits.

The conclusions of the work order were the following:

- Modify the profile of 99th Street to accommodate the future CD road on the east side of K-7.
- Further investigate the existing K-7 right of way.

- Perform analysis to determine if the right-in access point on Prairie Star Parkway can be removed. If not, the access point should be relocated to the east to maximize the stopping sight distance and minimize the weave conditions. (See Technical Memorandum)
- Perform system analysis to help determine if the roundabout on Woodsonia Drive should be relocated further south to minimize vehicles from backing up into the roundabout from the signal at Prairie Star Parkway. (See Technical Memorandum)

This summarizes the issues, the tasks performed, and the conclusions determined by the City of Lenexa, KDOT, and HNTB thru this work order process. The proposed Fall's at Prairie Star Parkway development, the refined future K-7 right of way, and the updated Prairie Star Parkway interchange are shown on the revised plate.

TECHNICAL MEMORANDUM

To
Kansas Department of Transportation

From
Kip Strauss
HNTB Corporation

Cc
Scott Heavin, Phil Eilers
HNTB Corporation

Subject
The Falls at Prairie Star
Traffic Impact Study Review

Date
2/19/07

As part of the K-7 Corridor Management Study, KDOT has asked HNTB to review proposed developments in the K-7 study corridor. As a result, HNTB reviewed The Falls at Prairie Star, Traffic Impact Study, December 2006 and the associated Traffic Study Addendum, January 29, 2007.

The purpose of the review was to:

A. Review the study for potential conflicts to the future system improvements at K-7 and Prairie Start Parkway,
B. Review the need and the location for the right-in access east of K-7 on Prairie Start Parkway, and
C. Review the location of the proposed roundabout on Woodsonia Drive (old Monticello Terrace).

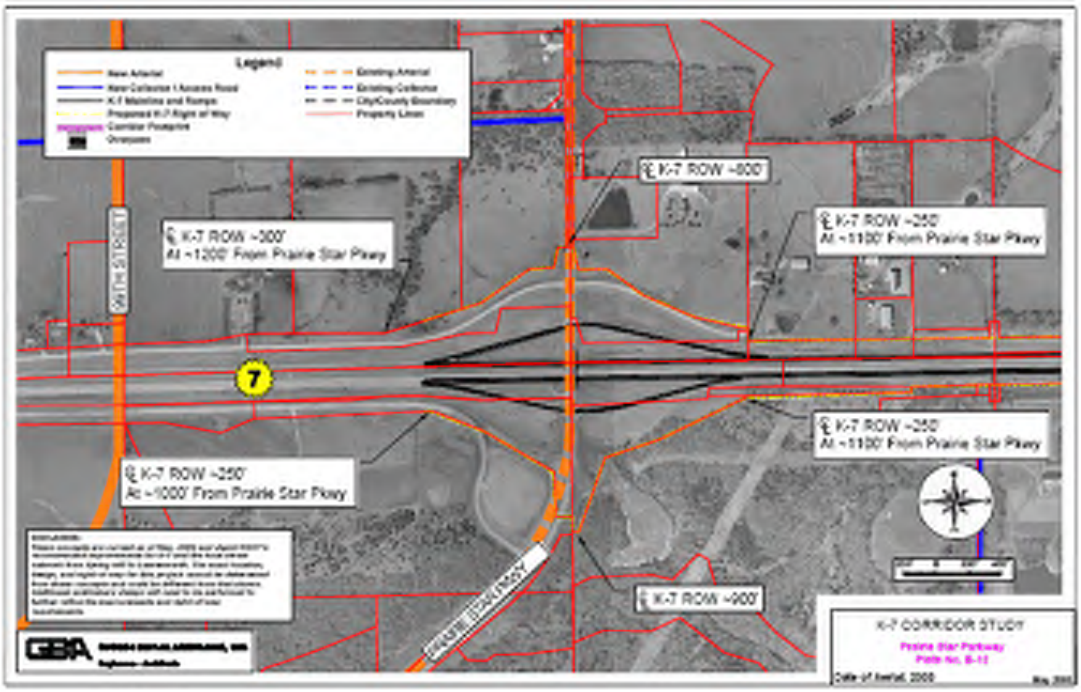
For each area evaluated, a review and conclusion is provided.

A. Future System Improvements at K-7 and Prairie Star Parkway

Review

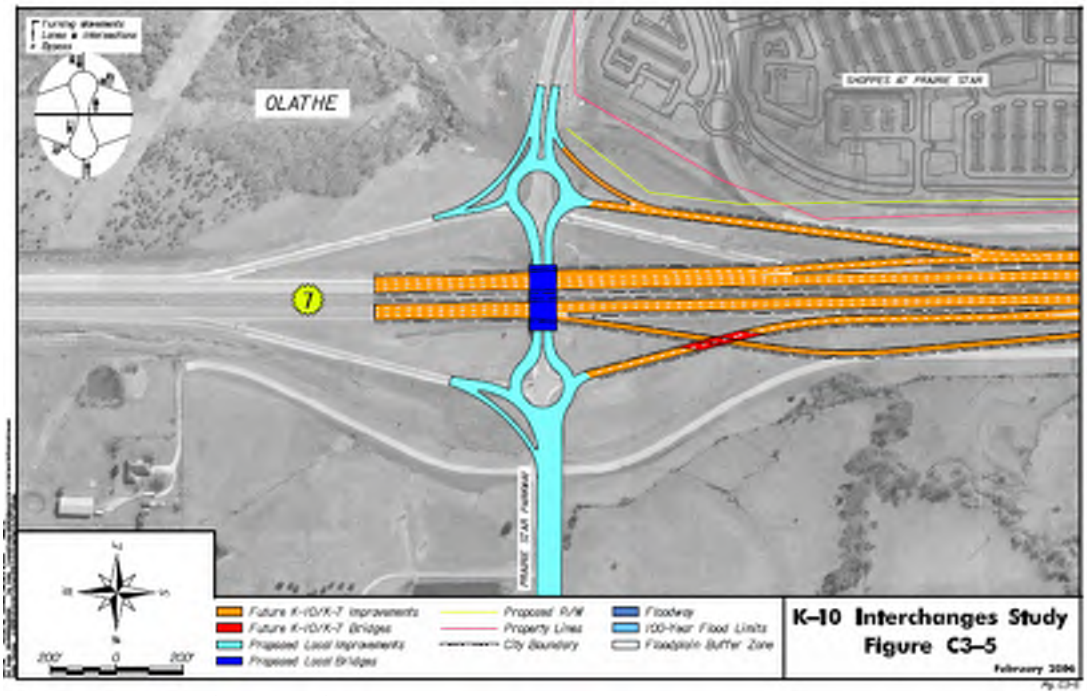
Transportation planning in the study area has consisted of Lenexa's arterial corridor planning for Prairie Star Parkway and KDOT's planning for K-7 highway. Recent planning for the K-7 and Prairie Star Parkway Interchange has consisted of the K-7 Corridor Management Plan (shown in Figure 1) and the K-10 Interchanges Study (Figure 2). Both projects were completed in 2006. The K-10 Interchanges study represents the most recent and more detailed traffic analysis at the interchange and along the Prairie Star Parkway corridor.

Figure 1
K-7 Corridor Management Plan (K-7 and Prairie Star Parkway)



Source: K-7 Corridor Management Plan, 2006

Figure 2
K-10 Interchanges Study (K-7 and Prairie Star Parkway)



Source: K-10 Interchanges Study, 2006

The K-10 Interchanges study developed a VISSIM operational traffic model which included the K-7 and Prairie Star Parkway Interchange. As shown in Figure 2, a 2-lane roundabout with a right turn bypass lane for the northbound ramp terminal was identified at this location. The Falls at Prairie Star Parkway traffic study identified signalized intersections at the interchange ramp terminals in the report and analyzed their impact in the report. A roundabout analysis was performed and included in the Appendix but was not identified in the report.

Conclusion

In conclusion, a write-up of the proposed Falls at Prairie Star development with the planned interchange roundabouts was not provided in the report. Traffic evaluation of vehicle operations and queues between the K-7 roundabout ramp terminal and Woodsonia Drive was not performed.

A system's analysis approach would provide a comprehensive understanding of cumulative impacts around the interchange and along Prairie Star Parkway to Woodsonia Drive. This type of analysis would also provide an arterial level of service on Prairie Star Parkway. This would provide a more comprehensive understanding of future K-7 and Prairie Star Parkway system improvements. This analysis could be provided with the current Synchro model developed for the project using SimTraffic simulation software.

B. Right-In Access off Prairie Star Parkway

Review

A right-in access is proposed off Prairie Star Parkway immediately east of the K-7 and Prairie Star Parkway Interchange. The right-in access point is expected to attract 208 PM peak hour vehicles into the project site in the 2030 design year. In comparison, 710 vehicles are forecasted at the eastbound right turn from Prairie Star Parkway to Woodsonia Drive.

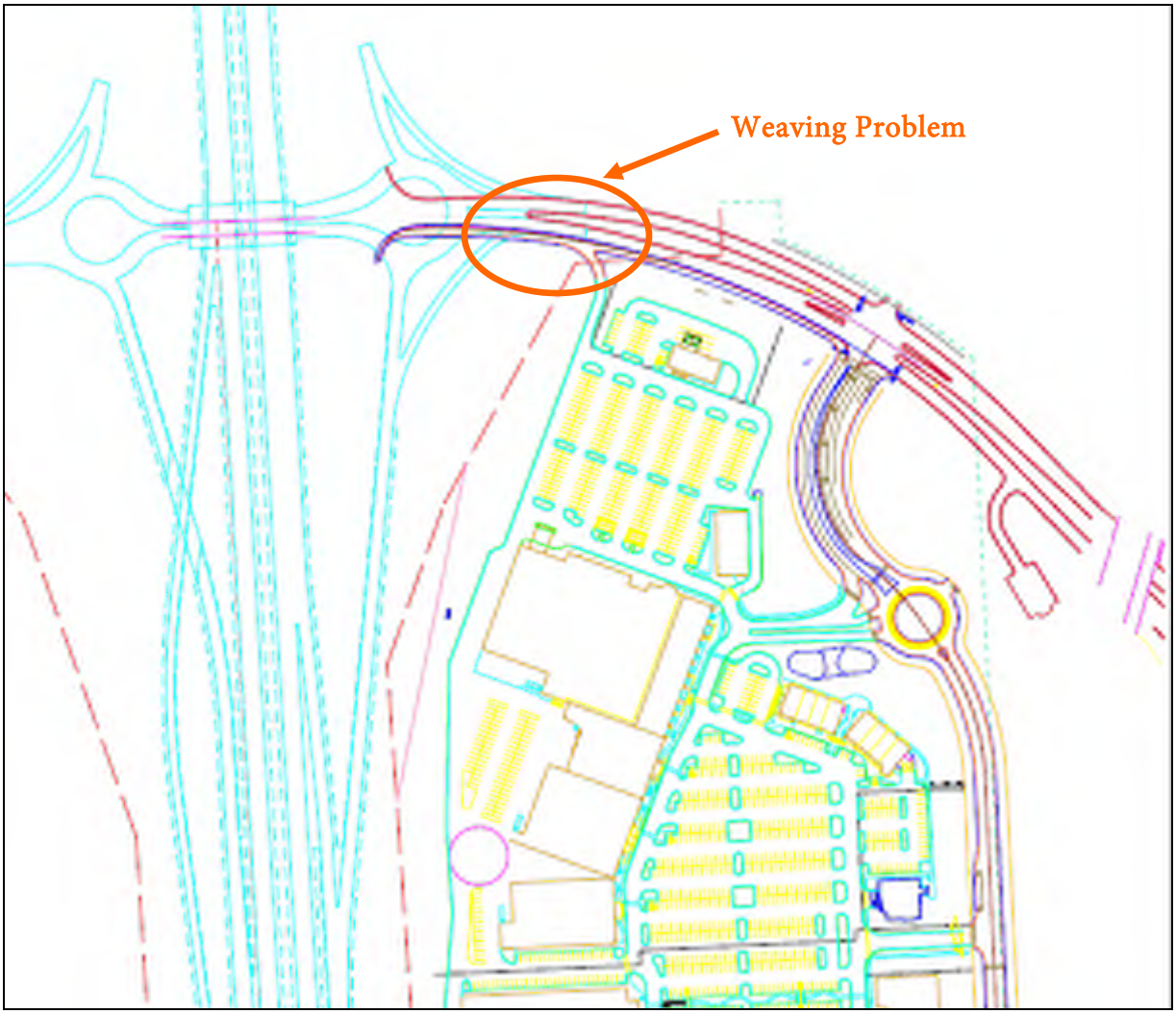
Figure 3 superimposes the K-10 Interchanges Study's K-7 and Prairie Star Parkway Interchange layout with the proposed right-in access identified in the traffic study. As shown, the right-in access point is in close proximity of the northbound right turn bypass lane. This right-turn bypass lane is expected to be a stop or yield controlled intersection. The right turn volume at this location was forecasted to be 580 in the 2030 PM peak hour.

The Falls at Prairie Star traffic study identifies an extended right turn auxiliary lane at Woodsonia Drive that extends beyond the right-in access to the northbound ramp terminal. A weaving of vehicles (shown in Table 1) and change in travel vehicle travel speeds would take place in a short distance between the northbound ramp terminal and the right-in access shown in Figure 3.

Table 1
Weaving Vehicles on Prairie Star Parkway
Between NB Ramp Terminal and Right-In Access

Weaving Area	To right-in access to site	To Woodsonia Drive
From eastbound through northbound ramp terminal roundabout	✓	✓
From northbound right turn bypass	✓	✓

Figure 3
K-10 Interchanges Study with Proposed Right-In Access



The estimated distance between the northbound ramp terminal and the right-in access point is less than 100 feet. AASHTO stopping sight distance design recommendations are 155 feet for 25 mph travel speed and 360 feet for 45 travel speed. Although Prairie Star Parkway is designed at 50 mph and will have a 45 mph posted speed, eastbound vehicles will likely be traveling closer to 25 mph exiting the northbound ramp terminal and northbound right turning vehicles will be starting from a stopped or yield condition from the right-turn bypass lane. The right-in access point would not provide adequate stopping sight distance in its current location.

Conclusion

In conclusion, the right-in access point provides direct access to the northernmost property identified at the site. In addition, the right-in access point provides an alternative relief point to a heavy eastbound right turn demand. The problem appears to be the location of the right-in access point in relation to the proposed northbound right-turn bypass lane. First, the right-in access point evaluation should analyze removing the access point and relocating the right turning motorists to Woodsonia Drive. If an acceptable level of service can not be achieved at this location, the right-in access should be relocated east to a distance that maximizes stopping sight distance and minimizes the weave conditions while balancing the back of queue from the eastbound approach to Woodsonia Drive.

C. Roundabout on Woodsonia Drive

Review

A single lane roundabout is proposed along the first full access driveway on Woodsonia Drive south of Prairie Star Parkway. The report states that the roundabout is located approximately 375 feet from the signalized intersection at Prairie Star Parkway and Woodsonia Drive. The Addendum relocates the roundabout approximately 100 feet south of its originally planned location and provides approximately 400 feet per lane for the dual northbound left turn lanes at Woodsonia Drive and Prairie Star Parkway. The report states that the 95th percentile storage is projected to be 481 feet for the northbound double left turn bays. As a result, vehicles are expected to back up into the roundabout during the weekday PM peak hour by 2030. Since the traffic study was performed using spot analysis of HCM at the signalized intersections using Synchro and SIDRA at the roundabout, system cumulative impacts of the queue back up are unrealized.

The report identifies a possible mitigation of this problem to be a triple northbound left turn from Woodsonia Drive to Prairie Star Parkway. This does not appear to be feasible since Prairie Star Parkway is a 4-lane roadway with two westbound lanes west of the Woodsonia Drive intersection.

Conclusion

In conclusion, the proximity of the roundabout creates an undesirable condition as the report states that northbound left turning vehicles onto Prairie Star Parkway are expected to back-up into the roundabout. This will create an unsafe and over-saturated condition of gridlock as motorist will be “stuck” in the roundabout.

In addition, a system analysis would provide a comprehensive understanding of cumulative impacts along Woodsonia Drive, since oversaturated conditions and queue problems are anticipated in this section of the study network. This could be important to better understand the relationship between the signalized intersection at Woodsonia Drive and Prairie Star Parkway and the roundabout on Woodsonia Drive. One alternative solution would be to relocate the roundabout further to the south beyond the 95th percentile queue.

K-7 On-Call Engineering Services
Work Order No. 7

K-7 & Johnson Drive Interchange Public Meeting

The purpose of Work Order No. 7 was to perform public involvement assistance for a public meeting on the K-7 & Johnson Drive Interchange Improvements. The meeting was held in early 2007.

K-7 On-Call Engineering Services
Work Order No. 8

LOCATION: 191st Street/K-7 Interchange

Background: KDOT contracted with HNTB under the rapid response engineering services agreement to evaluate three proposed development plans at 191st Street and Highway 169 along the K-7 Corridor in Spring Hill. Each location required a more detailed evaluation of the right of way requirements to preserve future right of way as shown in the K-7 Corridor Management Plan. KDOT requested that HNTB perform a geometric layout and determine conceptual grading limits for the 191st Street interchange, and then refine or confirm the right of way limits shown in the study.

The following interchange alternatives were reviewed:

1. Standard Diamond – The alternative assumes a 191st Street overpass of K-7 with the ramps spaced 370 feet from the centerline of K-7. A future profile of 191st Street was created showing fill depths of nearly 30 feet in some locations.

- This alternative is essentially the same concept shown on the plates of the 2006 K-7 Corridor Management Plan.
- A disadvantage of this option includes the need for right of way in addition to what was shown in the K-7 Corridor Management Plan, based on the ramp grading limits determined thru this work order.
- The grading limits of all three options shown overlap into the proposed development areas. In order to construct any of the interchange options, preservation of right of way is required from the currently proposed commercial development in the southeast quadrant (Crossings of Spring Hill), the currently proposed commercial portion of the development in the northwest quadrant (Dayton Creek), and the existing platted development in the northeast quadrant (Country Meadows Industrial Park).
- Another disadvantage is that Webster Drive (the reverse frontage road to the east) will only be spaced approximately 600 feet from the east ramp terminal. The desired spacing recommended in the Corridor Management Plan is 1000 feet.
- The reverse frontage road on the west side of K-7 will still be spaced a distance of 1100 feet from the west ramp terminal.
- All three options will require the access from Madison Street (the existing street approximately 500 feet east of the centerline of K-7) onto 191st Street to be removed. Madison Street will need to terminate as a cul-de-sac north of 191st Street.
- It was also noted that with a freeway concept for future K-7, direct access onto K-7 should be removed to the church south of 191st Street. Access will be provided to the property from the reverse frontage road on the west side of K-7.

2. Modified Diamond (191st Street Over)- The alternative assumes a 191st Street overpass of K-7 with the ramps spaced 200 feet from the centerline of K-7. The same vertical alignment was used for 191st Street as in the Standard Diamond Option.

- An advantage to this alternative is the reduction of required right of way compared to the Standard Diamond Option.

- This option also provides more distance between the east ramp terminal and Webster Drive (approximately 800 feet).
- A disadvantage pointed out by KDOT was the future maintenance costs required for the retaining walls that are needed between the ramps and K-7.
- KDOT and Spring Hill would like HNTB to provide a rough cost difference between the Standard Diamond Option and the Modified Diamond Option. KDOT and Spring Hill agree the more conservative standard diamond option would be preferred. This would preserve a more conservative "footprint" for future right of way.

3. Modified Diamond (191st Street Under)- This alternative assumes a 191st Street underpass of K-7 with the ramps spaced 200 feet from the centerline of K-7.

- A profile of this option shows that 191st Street matches the existing terrain better than the options of 191st Street over K-7.
- This option would require a smaller right of way "footprint" than the other two alternatives.
- This option does require the reconstruction of approximately 3000 feet of K-7 in order to build the highway overpass of 191st Street. Due the cost of reconstruction of K-7, the group agreed this is not a viable option.

Miscellaneous Items:

- It was noted by HNTB that it appeared the Dayton Creek plat did not show 300 feet of right of way along K-7. KDOT provided HNTB with old US 169 plans to determine existing right of way limits in the project area. HNTB reviewed the existing right of way from the old US 169 plans and determined it does vary along the west line north of 191st Street as shown in the Dayton Creek Plat. Approximately 1300 north of 191st Street, the right of way line is shown 125 feet from centerline instead of 150 feet.

The result of the more detailed interchange layout is shown on the revised plate B-4. On the revised plate, the proposed K-7 right of way limits have been refined to include the revised interchange footprint. Also, updates to the local road network, frontage roads, and ramps are shown based on the preferred alternative.

In conclusion, KDOT and Spring Hill agree the more conservative standard diamond option would be preferred to preserve a larger "footprint" for future right of way. This summarizes the concerns, the tasks performed, and the conclusions determined by the City of Spring Hill, KDOT, and HNTB thru this work order process.

K-7 On-Call Engineering Services
Work Order No. 9

LOCATION: 75th Street/Future K-7 Interchange

The location of this work order is the future K-7 and 75th Street Interchange proposed within the K-7 Corridor Management Plan. The City of Shawnee requested HNTB to prepare a conceptual construction cost estimate for a future interchange at this location. The City requested that one alternative should include the cost estimate for a single point urban interchange. KDOT requested that a cost estimate for an urban diamond interchange also be prepared. The two options could then be compared and contrasted for consideration of which one would be most appropriate to submit for funding.

The following is a summary of each of the cost estimates. Each cost estimate included auxiliary lanes on K-7 between the existing interchanges to the north and south of 75th Street. Each cost estimate also took into consideration the required 75th Street improvements and the results of work order 5 (Water One waterline expansion) in order to avoid future possible future relocations.

Interchange option 1 – Single point urban interchange

Assumptions

- 75th Street future roadway section will be 4-lane arterial
- 75th Street will be over K-7 Highway
- An auxiliary lane is assumed on K-7 (north and southbound) between Shawnee Mission Parkway and the proposed interchange, and between 83rd Street and the proposed interchange
- Consistent with the function of a SPUI interchange, the left turning movements from 75th Street at the SPUI were assumed to be dual left turns
- The overall bridge width is 8-lanes plus a 4-ft median and pedestrian walkways on both sides of the bridge
- The bridge was estimated as a 3 span prestressed concrete beam bridge with span lengths of 90'-90'-60' to accommodate a future 20' waterline corridor east of K-7.
- Both of the nearest sidestreets (Hedge Lane to the west and Monticello Terrace to the east) should be estimated as full access intersections. As a result, single left turn lanes should be provided on 75th and the street width will be 5 lanes thru each intersection.
- Interchange ramps will also have dual left turning lanes
- The cost estimate contains a 20% contingency and is inflated from 2007 dollars to 2012 dollars at a rate of 21.2%.
- The traffic control cost estimate assumes that 75th Street would be closed during construction
- Interchange lighting and 75th Street lighting has been assumed

Interchange option 2 – Diamond interchange with "compressed" ramps, or, modified diamond

Assumptions

- 75th Street future roadway section will be 4-lane arterial
- 75th Street will be over K-7 Highway

- An auxiliary lane is assumed on K-7 (north and southbound) between Shawnee Mission Parkway to the proposed interchange, and between 83rd Street and the proposed interchange
- Ramp terminals will have traffic signals. The signals at the ramp terminals are spaced 400-ft. apart. Dual left turn lanes have been estimated for each direction on 75th Street
- The overall bridge width is 8-lanes plus a 4-ft median and pedestrian walkways on both sides of the bridge
- The bridge was estimated as a 4 span prestressed concrete beam bridge with span lengths of 60'-90'-90'-60' to accommodate a future 20' waterline corridor east of K-7.
- Both of the nearest sidestreets (Hedge Lane to the west and Monticello Terrace to the east) should be estimated as full access intersections. As a result, single left turn lanes should be provided on 75th and the street width will be 5 lanes thru each intersection.
- The cost estimate contains a 20% contingency and is inflated from 2007 dollars to 2012 dollars at a rate of 21.2%.
- The traffic control cost estimate assumes that 75th Street would be closed during construction
- Interchange lighting and 75th Street lighting has been assumed

The cost estimate for each interchange type is provided. Plate B-14 has been updated to include the diamond interchange alternative. This summarizes the tasks performed, and the results of the work prepared for the City of Shawnee and KDOT thru this work order process.

HNTB

75th & K-7 Highway
& 75th Street Arterial Improvements

Single Point Urban Interchange

ENGINEERS OPINION OF PROBABLE PROJECT COSTS

February 16, 2007

75th Street (four-lane thoroughfare with dual left turn lanes through interchange)	
Grading and Drainage	$3,716,036
Surfacing	$1,134,330
Lighting and Traffic Signals	$800,000
Traffic Control	$113,000
Pavement Marking	$23,000
Signing	$68,000
Temporary Erosion Control	$75,000
Seeding and Landscaping	$11,000
75th Street Subtotal	$5,940,366
Contingency (20%)	$1,188,073
75th Street Construction Total (2007 Dollars)	$7,128,440
75th Street Construction Total (F.Y. 2012 Dollars @ 21.2% Inflation)	**$8,639,669**

K-7 Highway Improvements (ramps; auxiliary lanes - NB and SB btw. interchanges)	
Grading and Drainage	$7,485,044
Surfacing	$4,727,342
Retaining Walls	$1,320,000
Bridge	$5,400,000
Fencing	$125,000
Lighting	$80,000
Traffic Control	$800,000
Pavement Marking	$95,000
Signing	$375,000
Temporary Erosion Control	$100,000
Seeding and Landscaping	$47,000
K-7 Subtotal	$20,554,386
Contingency (20%)	$4,110,877
K-7 Construction Total (2007 Dollars)	$24,665,263
K-7 Construction Total (F.Y. 2012 Dollars @ 21.2% Inflation)	**$29,894,299**

Construction Total (2012 Dollars)	**$38,534,000**
ROW ******	$4,000,000
Utilities ******	$1,900,000
Design Engineering (9.5% to 10%) ******	$3,853,000
Construction Engineering (7.5% to 8%)	$3,083,000
Project Total	**$51,370,000**

****** Project Costs that are non-participating

The costs above represent an estimate of probable construction cost prepared in good faith and with reasonable care. HNTB has no control over the costs of construction labor, materials, equipment or competitive bidding or negotiating methods and does not make any commitment or assume any duty to assure that bids or negotiated prices will not vary from the estimate.

HNTB

75th & K-7 Highway
& 75th Street Arterial Improvements

Modified Diamond Interchange

ENGINEERS OPINION OF PROBABLE PROJECT COSTS

February 16, 2007

75th Street (four-lane thoroughfare with dual left turn lanes through interchange)	
Grading and Drainage	$2,756,000
Surfacing	$825,100
Retaining Walls	$0
Lighting and Traffic Signals	$800,000
Traffic Control	$82,500
Pavement Marking	$17,000
Signing	$68,000
Temporary Erosion Control	$65,000
Seeding and Landscaping	$8,000
75th Street Subtotal	$4,621,600
Contingency (20%)	$924,320
75th Street Construction Total (2007 Dollars)	$5,545,920
75th Street Construction Total (F.Y. 2012 Dollars @ 21.2% Inflation)	**$6,722,000**

K-7 Highway Improvements (ramps; auxiliary lanes - NB and SB btw. interchanges)	
Grading and Drainage	$5,477,700
Surfacing	$3,673,000
Retaining Walls	$990,000
Bridge	$4,080,000
Fencing	$121,000
Lighting and Traffic Signals	$80,000
Traffic Control	$367,300
Pavement Marking	$73,000
Signing	$375,000
Temporary Erosion Control	$100,000
Seeding and Landscaping	$37,000
K-7 Subtotal	$15,374,000
Contingency (20%)	$3,074,800
K-7 Construction Total (2007 Dollars)	$18,448,800
K-7 Construction Total (F.Y. 2012 Dollars @ 21.2% Inflation)	**$22,360,000**

Construction Total (2012 Dollars)	**$29,082,000**
ROW ******	$4,000,000
Utilities ******	$1,500,000
Design Engineering (9.5% to 10%) ******	$2,908,000
Construction Engineering (7.5% to 8%)	$2,327,000
Project Total (2012 Dollars)	**$39,817,000**

****** Project Costs that are non-participating

The costs above represent an estimate of probable construction cost prepared in good faith and with reasonable care. HNTB has no control over the costs of construction labor, materials, equipment or competitive bidding or negotiating methods and does not make any commitment or assume any duty to assure that bids or negotiated prices will not vary from the estimate.

K-7 On-Call Engineering Services
Work Order No. 10

<u>LOCATION:</u> 127th Street (Harold)/K-7 Intersection (Future Interchange)

The location of this work order task is the K-7 and 127h Street intersection in Olathe, proposed as a future interchange in the K-7 Corridor Management Plan. The issue of concern is a proposed development plan for a combined commercial and multi-unit residential development in the northeast corner of the intersection. The development plan is adjacent to the eastern boundary of the existing K-7 highway right-of-way. The proposed development is in close proximity to the future roundabout interchange shown on plate No. B-10 of the K-7 Corridor Management Plan(see exhibit). KDOT requested under the rapid response engineering contract for K-7, that HNTB review the development plan for consistency with the future K-7 corridor improvements. The goal of this review is to allow the developer to move ahead with plans while also preserving right of way for future improvements to K-7 highway.

The parameters reviewed include:

- Future right-of-way requirements for 127th Street and the NE K-7 ramp terminal, compared to the limits of the development plan parking lots, roadways, sidewalks and trails, etc.
- Future grading limits on 127th Street & the northeast K-7 interchange ramp in comparison with the proposed grading of the development plan.
- Intersection spacing of proposed Aurora Street with respect to the ramp terminals to the west and with existing Parker Street to the east.

The preliminary analysis and recommendations are:

- The horizontal placement of Aurora Street (street within development) encroaches into the recommended future K-7 right-of-way from future ramp (northeast) stations 685+00 to 689+00. Although Aurora Street is shown in plan view within the future K-7 right-of-way, the grading limits between the future ramp and Aurora Street are close but do not overlap.

  Based on this comparison, the recommendation is to shift Aurora Street and the sidewalk 12-ft. to the northeast moving the development improvements off of future K-7 right-of-way. The segment that should be shifted is the tangent piece that runs parallel to K-7 right-of-way.

- The bike trail along K-7 encroaches into the recommended future K-7 right-of-way from the proposed ramp (northeast) station 690+00 to 701+00. This poses a problem with K-7 grading between the northeast ramp stations 693+00 to 694+00, not allowing a typical ditch to be developed between the ramp shoulder and the trail within the development. Grading would be acceptable on future K-7 right-of-way along the bike trail in all areas, as long as the elevation of the bike trail does not increase over the proposed grade submitted for review, with the exception of the stretch within future ramp (northeast) stations 693+00 to 694+00.

  The recommendation is to shift the proposed trail 8-ft. to the northeast and away from the future right-of-way. The trail needs to be shifted the entire stretch that parallels the right-of-way. The

trail grading should be tied into existing ground outside of the future right-of-way in order to allow for enough space for a ditch to handle drainage of the future northeast ramp.

- The intersection spacing for Aurora Street with respect to future K-7 / 127th St Interchange and to Parker Street appears to be insufficient, assuming a full access intersection. Per the K-7 Corridor Management Plan, 1000 feet is the desired spacing between ramp terminals and the next full access intersection. Therefore, a discussion should be made regarding the access from the developments north and south of 127th Street in the full build out.

  The recommendation is to add a stipulation to both developments (north and south of 127th Street) that if operational concerns or problems are encountered as a result of the close spacing of the three intersections, the development access could be reconfigured to right in/right out. To aid in access and traffic circulation, the intersection of Parker and 127th could be reconfigured to a roundabout with a median extended from Parker to K-7. Currently, there is approximately 900 feet between the location of the future ramp terminals and Parker Street.

K-7 On-Call Engineering Services
Work Order No. 11

The purpose of Work Order No. 11 was to provide the K-7 Corridor Committee members with GIS information on the K-7 Corridor including the proposed right-of-way limits. C-plates were created for each overpass along the K-7 Corridor. An official roll plot map of the K-7 Corridor was created that included call-offs that dimension the right of way break points in the vicinity of each interchange or overpass of K-7 and a sideroad.

K-7 On-Call Engineering Services
Work Order No. 12

LOCATION: K-7/75th Street Interchange

Background: KDOT contracted with HNTB under the rapid response engineering services agreement to evaluate the K-7/75th Street interchange. This evaluation consisted of two parts. Part 1 evaluated alternatives to minimize the right of way impacts to the Newcomer's Cemetery property in the southwest quadrant of the K-7/75th Street interchange. KDOT proposed evaluating 6 interchange alternatives to determine which alternative would have the least impact and provide reasonable interchange access for the future K-7 freeway condition.

A previous task order evaluated the proposed K-7/75th Street standard diamond interchange recommended in the K-7 Corridor Study. The revised recommendation calls for a tight urban diamond interchange at this location (for more detailed discussion of this prior recommendation, see the Task Order # Work Order Summary). Under the revised recommendation Hedge Lane Terrace is relocated approximately 750' west of the centerline of the existing K-7 centerline and significantly impacts a portion of the undeveloped Newcomer's Cemetery tract. Addressing the impacts created by Hedge Lane Terrace and each of the 6 interchange alternatives is the focus of Part 1.

Following the completion of Part 1, the scope of the task order was expanded to evaluate the traffic impacts to the proposed interchange alternative due to the proximity of the Silverheel intersection to the East. Part 2, performed a traffic study of the preferred interchange alternative and 3 alternatives for the Silverheel/K-7 intersection to determine which intersection/interchange combination provided an acceptable Level of Service (LOS) in the future condition..

PART 1:

The following 6 alternatives proposed by KDOT were reviewed and the following observations were made:

1. Hedge Lane Terrace braided with west ramps and passes under 75th Street – This alternative required additional bridges for the interchange ramps so Hedge Lane Terrace could pass under them. Due to the vertical clearance required to pass Hedge Lane Terrace underneath the on-ramp, the on-ramp needed to be longer causing Hedge Lane Terrace to impact the parking lot of a business south of the cemetery property. While this alternative did not impact Newcomer's property, it did impact the property on the north side of 75th Street by splitting it in half. The Pros and Cons for this alternative are:

Pros

- *Reduces required right of way on cemetery property*
- *Stays off stream*

Cons

- *High cost with the 2 additional ramp bridges*
- *Splits property on the SE side of intersection*
- *Use of retaining walls or special grading may be required in order to save business at start of SW ramp*

2. Hedge Lane Terrace runs along west side of ramps and passes under 75th Street- This alternative is less costly than Alternative 1 since you do not need bridges for the ramps. However, there would need to be a bridge/box to allow Hedge Lane Terrace to pass under 75th Street on the west side of the ramps. This would require 75th Street to remain elevated longer and tie into the existing street further west. It was pointed out that 75th Street heads uphill to the west so at least you wouldn't be chasing grade when tying back into the existing roadway. This alternative does not impact the business and had minimal impact on Newcomer's property. It does split the property to the north in two pieces and impacts the stream. The Pros and Cons for this alternative are:

Pros

- *Lower cost than Alternative 1*
- *Reduces required right of way on cemetery property*
- *Does not affect business at start of SW ramp*

Cons

- *Higher cost with the additional box/bridge at 75th St*
- *Splits property on the SE side of intersection*
- *Impacts stream*

3. Close Hedge Lane Terrace- This alternative requires very little expense and no additional right of way. Access to Hedge Lane Terrace from 75th Street can be removed without land locking any properties. However, travelers wishing to visit the businesses along Hedge Lane Terrace would now have to access them from 83rd Street only causing additional travel time. Also, the only other through connection between 83rd Street and 75th Street in the vicinity would be a residential road which is undesirable for heavy traffic. The Pros and Cons for this alternative are:

Pros

- *Very little expense*
- *No additional right of way is needed*
- *Can be done without land locking any properties*

Cons

- *Remove direct access and through access*
- *Moves through access to K-7 onto residential street*

4. Hedge Lane Terrace runs along west side of ramps and along south side of 75th Street – This alternative has a tremendous impact on the Newcomer's property which is trying to be avoided in the first place. In order to minimize impacts to the property undesirable horizontal curves must be used. The speed would have to be reduced to 15 mph. The Pros and Cons for this alternative are:

Pros

- *Lower cost*

Cons

- *Large amount of additional right of way is needed*
- *Still splits cemetery property on the SW side of intersection*
- *Impacts stream*
- *Requires undesirable horizontal curves*

5. Roundabout at Hedge Lane Terrace, ramps, and 75th Street- This alternative allows all access points to tie in closely to one another and maintain traffic flow. It minimizes impacts to

Newcomer's property as well as the property north of 75th Street. The 75th Street tie in to the west would be longer due to the need to keep the grades flat through the roundabout. This alternative also has a large impact to the stream and would require a long box culvert underneath the roundabout. It was pointed out however, that the existing length of concrete channel upstream from 75th Street could be used as a mitigation area. The Pros and Cons for this alternative are:

Pros

- *Min. impact to properties on North and South sides of 75th St*
- *No need for retaining wall between Hedge Lane Terrace and the SW ramp*

Cons

- *Would extend 75th St tie in to the East and West. This could possibly impact the cemetery*
- *Possibly a large impact to stream causing additional cost with rerouting stream or constructing box under roundabout*

6a. Split Diamond with One-way traffic on the frontage roads- This alternative creates one-way frontage roads between the 75th Street and 83rd Street interchanges. Slip ramps could be added to enable access on/off K-7 at each interchange. The frontage road on the west side of K-7 would be the existing Hedge Lane Terrace. This would provide access to the businesses off of Hedge Lane Terrace. On the east side of K-7, Silverheel Drive/Monticello Terrace would serve as the frontage road. A portion of this frontage road has been constructed north of 83rd Street and the remainder would still need to be constructed as the area develops. The Pros and Cons for this alternative are:

Pros

- *Minimal impact to cemetery property by combining Hedge Lane Terrace and K-7 ramp*
- *Allows for slip ramps to improve access to K-7*
- *Stays off stream*

Cons

- *Forces Hedge Lane Terrace traffic into one direction. Causes extra drive time for traffic to get to 75th St*
- *Additional right of way for Hedge Lane Terrace needed to allow for a slip ramp and acceleration lane on southbound K-7 at 75th St*

6b. Split Diamond with two-way traffic on the frontage roads- This alternative creates two-way frontage roads between the 75th Street and 83rd Street interchanges. This alternative provides the same benefits as Alternative 6a, with the addition of two-way traffic on the frontage roads. However, if the frontage road is designed for two-way traffic, slip ramps for K-7 would not be allowed. Traffic would have to access the frontage road through the ramp terminal intersections at 75th Street and 83rd Street. In addition, access to K-7 would be split between the two interchanges.

Pros

- *Min. additional right of way needed due to small footprint*
- *Allows easy access between 75th St and 83rd St*
- *Stays off stream*

Cons

- *Slip ramps would not be allowed, therefore decreasing accessibility to K-7*

- *Causes safety issue at 75th St and Frontage roads and 83rd St and Frontage. This is due to the fact that a two way road is intersecting the side road at the same location as a one way road (K-7 ramps)*

Part 1 Summary:

The conceptual layouts of the six alternatives were reviewed with KDOT and the City of Shawnee. During the meeting KDOT also suggested several other alternatives for the K-7/75th Street intersection. They were:

- **Close the intersection and construct 75th Street as an overpass of K-7:** The City of Shawnee strongly opposed this option, indicating that they feared both the 83rd Street and the Shawnee Mission Parkway interchanges would become overloaded, significantly impacting their LOS. The City feels that the future 75th Street/K-7 interchange is their second highest priority along the K-7 corridor behind the K-7/Johnson Drive interchange. This alternative was not pursued further.

- **Relocate Hedge Lane Terrace west of the Newcomer Cemetery property:** Several potential alignments were discussed during the meeting using the existing aerial photography as a base map. Ultimately, no clear route could be defined that did not either potentially impact a business on the west side of K-7 or that did not result in routing Hedge Lane Terrace through a residential area. This alternative was not pursued further.

- **Purchase the required right of way for the tight urban diamond and frontage road relocations.:** A "windshield appraisal" was conducted by the KDOT Bureau of Right of Way. The sales ranged in Highest and Best Use from residential to commercial/light industrial. The Table below contains a brief outline of the sales and their location:

Location	Sale Price	Sale Date	Total Acreage	Total Sqft	Price / Sqft	Use
Northwest corner 55th Street/K-7 Highway (Tract 17)	$850,000	10/2001	15.11	658,192	$1.29	Planned Residential abutting commercial. Currently listed for sale and appraised at $2.00 per square foot for K-7925-02.
7702 Meadow View Drive	$542,453	01/2006	5.9	257,004	$2.11	West side of 7 HWY. Lt. Indust. (South side of subject.)
71st and Woodland Drive	$152,500	02/2007	7.77	338,461	$0.45	East of 7 HWY. Surrounded by SFR subdivisions.
47th Street/Woodland Drive	$108,000	01/2007	4.77	207,781	$0.52	East of 7 HWY. Surrounded by SFR

Based on this information, the Bureau of Right of Way believes the land could bring in the range of $1.30 to $1.75 per square foot. **These numbers were not an appraisal and were used for estimating only.** Based on these numbers, it would place the approximate value for the vacant cemetery tract from $990,000 to $1,330,00. The city of Shawnee determined that at this time they did not have the ability to purchase the area in question. This alternative was not pursued further.

Ultimately, it was decided that the design of Alternatives 5 and 6 should be evaluated further and a preferred alternative selected from these two options. Grading limits and right of way impacts were developed for each of these two alternatives in order to determine the preferred alternative.

Part 1 Conclusions:

Overall Alternative 5 (the split diamond alternative) had the greatest potential to minimize impact to Newcomer's property, the streamway west of K-7, and minimizes the amount of right of way needed at the interchanges. However, in discussions with KDOT and the City, this alternative was ruled out because it violated driver expectation and did not provide adequate access to the existing businesses west of K-7 between 75th Street and 83rd Street. There also was concern that the interchange configuration would result in potential safety issues along the frontage roads. Therefore, Alternative 5 was selected of the preferred alternative.

During the evaluation of the preferred alternatives, it was recognized that the existing location of the Silverheel intersection with 75th Street was approximately 300 feet from the eastern ramp terminal of the proposed interchange. Due to the potential for this intersection to significantly impair the LOS of the overall interchange, the scope of the task order was expanded to evaluate the traffic impacts to the proposed interchange due to the proximity of the Silverheel intersection. This evaluation is discussed in Part 2.

PART 2:

The purpose of this study is to determine the safest and most efficient traffic operation of a planned K-7 and 75th Street Interchange with roundabout ramp terminals and provide guidance as to how to accommodate access at Silverheel. At the proposed K-7/75th Street interchange location, the frontage roads of Silverheel (east frontage road) and Hedge Lane Terrace (west frontage road) are located in close proximity to K-7. The distance between a roundabout NB ramp terminal and Silverheel is approximately 300 feet. KDOT's access management guidelines indicate that the functional area around an interchange should be kept free and clear of driveway and other public streets. This ensures that the investment in the interchange is maintained with safe and efficient operations. Access management guidelines suggest that the first full access break be located 1,320 feet (1/4 mile) from the interchange ramp terminal and that a right-in, right-out access could be located within half that distance or 660 feet from the ramp terminal. Discussions with the City of Shawnee have indicated that the City prefers to maintain full access to Silverheel to accommodate existing and future development.

In order to determine the viability of maintaining full access in the future at Silverheel instead of right-in, right-out or the preferred option of moving the intersection further east, the task order was developed to study 3 options:

- **Option 1 -** Roundabouts at the K-7 ramp terminals and a signalized intersection at Silverheel.

- **Option 2 –** Roundabouts at the K-7 ramp terminals and a roundabout intersection at Silverheel.

- **Option 3 –** Roundabouts at the K-7 ramp terminals and Silverheel connected into the east ramp terminal.

For a detailed evaluation of the traffic study, please see the attached

Part 2 Summary:

The K-7 Corridor study documented Shawnee's desire for access to K-7 via a grade-separated interchange at 75th Street. The close proximity of the west and east frontage roads as well as existing physical land use constraints of a cemetery on the west side and residential homes on the east side creates a challenging transportation system.

Based on the data developed in this study, the following study conclusions are made related to the three alternatives studied:

- **K-7 Southbound Ramp Terminal:** The proposed 2-plus lane roundabout incorporating Hedge Lane Terrace (south) into the ramp terminals will operate at an acceptable level for 2030 traffic. However, this intersection is shown to fail at full build out.

- **K-7 Northbound Ramp Terminal:** The proposed 2-plus lane roundabout will operate at an acceptable level with either a traffic signal or a roundabout at Silverheel Street with the forecasted 2030 traffic volumes. However, this intersection is shown to fail at full build out.

- **Silverheel Street:** This intersection will operate at acceptable level with both a traffic signal and a roundabout with the forecasted 2030 traffic volumes. However, should a full access intersection ultimately be developed at this location, a roundabout will provide more reserve capacity than a signalized intersection. The estimated back of queue between K-7 northbound ramp and Silverheel Street is shorter with a roundabout at Silverheel Street than a signalized intersection at this location. Therefore, a roundabout would be preferred over a traffic signal through 2030. It should be noted, however, that this intersection also fails at full build out in each scenario.

Part 2 Conclusion:

The three options evaluated in this study failed during the full build traffic condition. This is primarily due to the close proximity of Silverheel to the proposed ramp terminal interchanges. As stated before, KDOT establishes access management guidelines in order to protect the investment of a new interchange as well as maximize the safety and efficiency of the transportation system. (A tight diamond at this location was estimated at $40 -$50 million dollars in 2008 construction

dollars). Access management guidelines recommend that the first full access break be located 1,320 feet (1/4 mile) from the interchange ramp terminal and that a right-in, right-out access could be located within half that distance or 660 feet from the ramp terminal.

Task Order 12 Overall Recommendation:

Due to the physical land use constraints and the close proximity of the proposed intersections, a comprehensive interchange study should be performed to identify the best overall interchange type, the K-7 mainline improvement needs with adjacent interchanges at 83rd Street and 67th Street, and the surrounding street network connections to meet 2030 and full build conditions. The scope of KDOT's K-7 On-Call services agreement does not provide for this level of study. In addition to traffic and geometrics, a comprehensive interchange study would consider specific concerns such as necessary signing plans, arterial weaving and other design decisions in detail. Until a comprehensive study can be undertaken, the tight urban diamond improvements previously recommended should continue to be used for planning purposes. The tight urban diamond and the proposed locations for the adjacent frontage roads will provide a conservative right of way footprint for corridor preservation until a more detailed study can be performed.

K-7 On-Call Engineering Services
Work Order No. 13

LOCATION: Kansas Avenue/K-7 Intersection (Future Interchange)

The location of this work order task is the Kansas Avenue/K-7 intersection in Bonner Springs, proposed as a future interchange in the K-7 Corridor Management Plan. The issue of concern is a proposed development plan for a commercial development in the northeast corner of the intersection. The development plan is adjacent to the eastern boundary of the existing K-7 highway right-of-way. The proposed development is in close proximity to the future single point diamond interchange shown on plate No. B-21 of the K-7 Corridor Management Plan(see exhibit). KDOT requested under the rapid response engineering contract for K-7, that HNTB review the development plan for consistency with the future K-7 corridor improvements. The goal of this review is to allow the developer to move ahead with plans while also preserving right of way for future improvements to K-7 highway. At the same time, HNTB was asked to review the remaining 3 quadrants (northwest, southwest, and southeast) and determine potential right of way impacts to the existing developments.

The parameters reviewed include:

- Review of the future profile of Kansas Avenue under K-7.
- Review of the updated lane configurations proposed by George Butler and Associates for the K-7/Kansas Avenue Interchange for their impact on right of way.
- Access management of the existing driveway entrances east and west of the interchange along Kansas Avenue between Commercial Drive and Tulip Drive.
- Intersection spacing of proposed Tulip Drive realignment with respect to the ramp terminals to the west.
- Intersection spacing of Commercial Drive with respect to the ramp terminals to the east.
- Future grading limits on Kansas & the northeast K-7 interchange ramp in comparison with the proposed grading of the development plan.
- Future right-of-way requirements for Kansas Avenue and the NE K-7 ramp terminal, compared to the limits of the development plan parking lots, roadways, sidewalks, etc.

The preliminary analysis and recommendations are:

- K-7 is proposed to be elevated over Kansas Avenue. In order to maintain proper clearance under K-7 with the proposed improvements, Kansas Avenue will need to be lowered approximately 4-5 feet. The profile will match back into existing by Commercial Drive to the west and Tulip Drive to the east.

  Because of the change in grade, the recommendation is that the first existing entrance west of K-7 on the north side be closed.

- The proposed lane configurations along Kansas Avenue include two through lanes in each direction, double left turn lanes at the interchange, and single right turns. The requested turn bay storage was achieved in both the east and westerly directions, however, the west bound Kansas Avenue left turn lane storage is barely achieved in order to maintain two way access into the westerly Wal-mart parking lot driveway.

  With the additional lanes proposed along Kansas Avenue, the recommendation is that retaining walls will be required both north and south of Kansas Avenue to minimize impacts to the existing commercial parking lots. Due to the proposed grading for the interchange and the change in elevation of Kansas Avenue, the entrance into the gas station at the northwest corner of K-7 and Kansas Avenue will need to be removed. With the widening of K-7 Highway and the addition of the single point diamond ramps, there could be up to 30 feet of encroachment along the east edge of this property.

- West of K-7 on Kansas Avenue there are a number of drive entrances to the north and south. On the north side between Commercial Drive and K-7 there are 2 drive entrances into the commercial strip center. When the future improvements are made to the interchange eastbound double left turn lanes will be required.

  It is recommended that when the turn lanes are introduced a median be constructed to control access and protect the turn bays. When the median is constructed, the easterly drive entrance will need to be closed and the westerly entrance will become right in/right out. Two way access to these businesses will need to come from Commercial Drive through the existing strip center development. The McDonalds entrance on the south side will also be right in/right out.

- East of K-7, existing Tulip Drive intersects with Kansas Avenue approximately 350 feet from the K-7/Kansas Avenue intersection. When the protected double left turns are added to westbound Kansas Avenue, Tulip Drive will become right in/right out south of Kansas Avenue.

  It is recommended that the proposed development in the northeast corner of the intersection construct the Tulip Drive/Kansas Avenue intersection approximately 600 feet east of the K-7/Kansas Avenue intersection, lining it up with the westerly Wal-mart entrance. The new intersection will be full access. If possible, Tulip drive to the south should be relocated to line up with Tulip Drive to the north.

- West of K-7, Commercial Drive is approximately 600 feet from the K-7/Kansas Avenue intersection. Moving Commercial Drive further west would be preferred, however, the existing development will not allow for this.

  It is recommended that Commercial Drive be the first full access intersection on Kansas Avenue west of K-7.

- The existing terrain in the northeast corner requires significant grading for the future interchange.

  The recommendation is for the developer's site to be regraded as part of the development plan to work with the proposed ramp profile. In discussions with the developer's engineers preliminary ramp profiles and cross sections were provided.

- The proposed right of way in the northeast corner of the interchange will need to accommodate the proposed ramp and toe of slope ditch. These limits were provided to the developer's engineer.

  The right of way recommendation for the plat would be to offset the preliminary grading limits 10 to 15 feet to set the right of way line. It is also recommended that a 10 foot utility easement be shown behind the right of way. The preliminary plat for the development shows the future right of way line almost on top of the preliminary grading limits. This may require future retaining walls and retaining wall easements to minimize future impacts to the development. Right of way in the updated plate reflects the proposed right of way location and the utility easement.

K-7 On-Call Engineering Services
Work Order No. 14

Olathe K-7 Corridor Public Meeting

The purpose of Work Order No. 14 was to perform public involvement assistance for a public meeting of the K-7 Corridor Study through Olathe. The meeting was held in early 2008.

7-106 K-7925-03
K-7 On Call Engineering Services
Work Order No. 15 – Review of Retaining Walls
July 14, 2008

Project Background

In November 2007, HNTB was hired by the city of Olathe and KDOT to perform preliminary geometric design, identify bridge pier locations and develop a preliminary signing plan layout on the re-alignment of K-7 along Lone Elm Road from 183rd Street to Old U.S. 56 Hwy. The "Preliminary K-7 Freeway Design Study" reviewed interchanges at 183rd St., 175th St., 167th St., I-35, 151st St., and Old U.S. 56 Hwy and included an overpass at 159th Street. (See Exhibits.) Grading limits, based on the study geometrics, were used to determine preliminary right-of-way limits.

Prior to the completion of the "Preliminary K-7 Freeway Design Study", Olathe asked for a preliminary right-of-way offset in the southwest quadrant of 151st Street & Lone Elm. HNTB suggested a 260' offset from the K-7 centerline (section line) based on preliminary grading information at that time. In April 2008, a property owner submitted to Olathe a proposed development site plan located in this southwest quadrant. The proposed site plan used the 260' offset. Olathe requested that HNTB review potential conflicts between the proposed site plan and the future 151st Street Interchange. (See Exhibit.) The City rejected the site plan in April 2008 based on other concerns.

In June 2008, HNTB completed the "Preliminary K-7 Freeway Design Study".

Project Description

The city of Olathe and KDOT expect commercial interests in the area to grow because of the new I-35 & Lone Elm Interchange which is less than one mile south of the 151st Street intersection. The work order requested a feasibility study of retaining walls along 151st Street and K-7 ramps in the full build-out configuration of the K-7 freeway system. (See Exhibits.)

Option #1 – Use Retaining Walls

Because a 260' offset was used in the site plan, an effort was made to use the offset in the location and design of the retaining walls. The retaining walls were located at 15' offset from the 260' right-of-way line. This 15' provided room for a maintenance area and a possible interception ditch for the retaining walls. The retaining wall height through this area averaged 20' and ran nearly the length of the property. The use of a Mechanically Stabilized Earth (MSE) wall was recommended because of the lower cost per square foot. (See Exhibit.) MSE wall consideration is appropriate based on preliminary information. Geotechnical study and wall design are necessary for final design and costs.

Option #2 – Review Grading Limits

In the final draft of the "Preliminary K-7 Freeway Design Study" the right-of –way limits in the southwest quadrant were identified at a 350' offset from K-7 centerline (section line) and were based on preliminary grading limits. Olathe alternative considerations for

the grading limits in the effort to reduce right-of-way limits. An optional ramp movement was eliminated and HNTB was able to reduce the right-of-way by 25'. No revision was made to the typical section. (See Exhibit.)

Cost Estimates

Cost estimates developed based on 2008 dollars. The cost of right-of-way was assumed at $3.50 per sq. ft. and is based on agricultural land use. The costs are differential costs between right-of-way acquisition and retaining wall cost and does not include utility easement corridors or roadway and ramp construction.

Attachments

Typical Sections
Plan Exhibits
Cost Estimate – Retaining Walls and Right-of-Way

7-106 K-7925-03
K-7 On Call Engineering Services
Work Order No. 16 – K-7 Corridor GIS Deliverable Determination
February 22, 2010

Project Background & Description

In January 2010, HNTB was hired by KDOT to update the GIS deliverable for the K-7 Corridor. The goals of the task order are as follows:

1. HNTB will meet with KDOT, then meet with a Johnson County and a Wyandotte County City to receive input on a standard GIS deliverable for the K-7 Corridor Report. HNTB will prepare a technical memorandum outlining the deliverable for KDOT's review.
2. HNTB will prepare GIS deliverable for the corridor incorporating any of the final adjustments to the right of way and the preliminary interchange layouts for the first 15 task orders. HNTB will deliver updated shape files similar to the original corridor study deliverable only modifying the shape file to remove the duplicate lines in the original base information and incorporating the previous task order changes.
3. HNTB will prepare a 400 scale color exhibits for the entire K-7 corridor.

Meetings

HNTB met with KDOT on November 12, 2009. The purpose of the meeting was to determine if KDOT GIS staff utilized the K-7 corridor GIS information and if they had any additional information they wanted to include with the new deliverable. KDOT's GIS representative did not utilize the information and did not have any special requests for this update. KDOT only posts the information on their website for the member communities to download.

HNTB met with the city of Shawnee, KS on January 12, 2010. A KDOT representative was also in attendance. The city uses the GIS information for planning, development, and construction purposes. The city requested the following updates to the GIS information.

- Separate levels/attributes for
  - K-7 mainline and ramps
  - Proposed right of way
  - Local streets
  - City / County limits
- Identify street type and number of lanes

These requests were discussed and HNTB indicated that they would evaluate the feasibility of including these features under this task order. It was likely that not all the features requested could be accommodated at this time.

The K-7 Corridor Committee met on January 19, 2010 at the Bonner Springs library. HNTB gave an update of task order #16, describing Shawnee's input. HNTB offered to

meet with the Unified Government to get additional input, but the Unified Government declined. The other member cities seemed pleased with Shawnee's input and no additional meetings suggestions were made.

Conclusions

Based on the feedback received, HNTB will make the following adjustments to the GIS Deliverable & Exhibit:

- Update shape files, removing any duplicate lines
- Update GIS information for revised right of way & interchange layout based on the previous task orders.
- Provide separate levels/attributes for
    - K-7 mainline and ramps
    - Proposed right of way
    - Local streets
    - City / County limits
- Provide 400 scale color exhibits for KDOT's use in future meetings with MARC.

The GIS deliverable will contain the following layers. A description of each layer is provided:

- K7 improvements – improvements to K7 mainline including interchanges and overpasses
- K7 row – proposed K7 right-of-way
- K7 local – the surrounding local street network
- K7 footprint – boundary of the K7 impact area
- K7 corridor boundary – shape used for the K7 exhibits

7-106 K-7925-03
K-7 On Call Engineering Services
Work Order No. 17 – Develop an Updated K-7 Corridor Management Study Report

Project Background & Description

In June 2010, HNTB was hired by KDOT to update the K-7 Corridor Management Study Report. The goals of the task order were as follows:

1. HNTB will take the revised plates from the first 16 task orders, insert them into the 2006 study, and determine how to incorporate them into 2006 study. It will be important to consider how the plates generated from the 2008 Preliminary Engineering Study and the new "C" plates showing the overpass locations will be inserted in order to maintain the continuity of the plate number in the revised report.
2. HNTB will assemble the work order summaries that were created with the first 16 task orders and insert them as a new appendix to the report.
3. HNTB will include all any original plates that were revised as part of the task order process in a new appendix. Original plates will be clearly marked as revised and reference which task order revised the plate. One conference call will be held with KDOT to review the proposed revised sheet and appendices layout.
4. HNTB will contact the K-7 Corridor Committee team members and ask for updates on the local roadway network and any revisions to the attribute data in the GIS Deliverable for the corridor. Comments will be incorporated into the GIS data for the study. These revisions do not include new GIS attributes for the deliverable, only revisions to the attributes established in Task Order 016. It is anticipated that only 4 meetings will be held with key member communities to review the most changes suggested and 1 meeting will be held with KDOT to review the incorporated changes.
5. HNTB will hold one kick-off conference call with KDOT to begin the update and one meeting to review the revised document.
6. HNTB will meet with GBA in July to received changes to the K-7/I-70 interchange layout and the final layout for the Johnson Drive interchange and the surrounding local roadway network. These changes will be incorporated into the report plates for inclusion in this study update. It is anticipated that a meeting will be held with GBA to receive the information and a second meeting to review the incorporated changes.
7. Once all revisions are made and appendices are created, HNTB will print 20 revised study reports and 20 CDs of the revised GIS data and distribute them to KDOT and the member communities. Reports will be bound in a 3-ring 11"x17" view binder.

In 2012, the City of Olathe terminated its K-7 Corridor Management Plan Memorandum of Understanding with KDOT. Therefore, in November 2012, HNTB was provided a supplemental agreement by KDOT to revise all "A" and "B" plates in Olathe reflecting that areas from 175th Street to 167th Street and Old Highway 56 to 127th Street are still under further review. HNTB will also revise the "A" and "B" plates from 167th Street to Old Highway 56 to reflect a K-7 arterial that was developed during the Environmental Assessment for the City of Olathe.

Final Deliverable

Based on meetings and feedback from KDOT, HNTB provided CDs and 3-ring 11”X17” view binders that included the following:

- Original report text from the K-7 Corridor Management Plan
- All current “A” and “B” plates that include revised plates from previous task orders and plate incorporating overpass locations
- Work order summaries from all task orders
- Bike/Pedestrian Analysis Technical Memorandum
- K-7 North interim Strategies Plan
- K-7/223rd Street Area Transportation Plan
- Original “A” and “B” plates from 2006

7-106 K-7925-03
K-7 On Call Engineering Services
Work Order No. 18 – Review Proposed WaterOne waterline location and incorporate College & K-10 Interchanges into K-7 Corridor Management Study Report

Project Background & Description

In November 2010, HNTB was hired by KDOT to Review Proposed WaterOne waterline location and incorporate College & K-10 Interchanges into K-7 Corridor Management Study Report. Water One is proposing to install a 48" water main in the southeast quadrant of the K-10/K-7. The line is proposed to be located in a new easement along the outside of the proposed right of way as shown in the "K-10 Interchanges Study" and the "K-7 Corridor Management Study." The water line is also proposed to cross under K-7 just south of the existing K-7/K-10 ramps. Water One is also proposing to locate a Water Tower east of the Aldi facility in Alternative Site 5a (see attached exhibit). Water One is currently in negotiations for acquisition of the water line easement and tower location. The goals of the task order were as follows:

1. Review the Proposed Right of Way as shown on the attached exhibit for compliance with the "K-10 Interchanges Study" and the "K-7 Corridor Management Study." If differences are found, coordinate with Water One on the correct location of the proposed right of way. Proposed right of way will be referenced as a distance from the existing right of way as shown in AIMS mapping.
2. Review the crossing location for the 48" waterline crossing of K-7 versus the proposed profiles of K-7 and the future ramps.
3. Review the Alternative Site 5a location for the future water tower versus the proposed future profile of K-10 and the ramps north of the future tower site. Review will be based on the "K-10 Interchanges Study" and the "K-7 Corridor Management Study" assuming that the K-10/Lone Elm Road interchange is matching the proposed plans.

In March 2013, HNTB was provided a supplemental agreement by KDOT to also investigate the K-7 proposed right of way needs on the west side of K-7 between College Boulevard and K-10. WaterOne is proposing a 48" water main along K-7on the west side adjacent to a proposed development in the northwest quadrant of the College Boulevard/K-7 interchange. The line is proposed to be located in a new easement along the outside of the proposed right of way as shown in the "K-10 Interchanges Study" and the "K-7 Corridor Management Study."

7-106 K-7925-03
K-7 On Call Engineering Services
Work Order No. 19 – Provide GIS Assistance to KU Class Performing K-7 Multimodal Study

Project Background & Description

In January 2011, HNTB was hired by KDOT to provide GIS assistance to a KU class performing a K-7 Multimodal study. The goal of the task order was to provide the current GIS deliverable to the KU class on CD ROM and provide GIS assistance to the students performing the study.

7-106 K-7925-03
K-7 On Call Engineering Services
Work Order No. 20 – Bike/Pedestrian Analyses for the K-7 Corridor

Project Background & Description

In March 2012, HNTB was hired by KDOT to provide a bike/pedestrian analyses for the K-7 Corridor. In 2010 & 2011, the University Of Kansas Department Of Urban Planning's Transportation Planning Implementation class conducted a study of alternative modes of transportation. The study included the best practices and possible next steps for promoting alternative modes of transportation throughout the K-7 corridor. This work order expands on that study by providing a map of existing facilities, identifying gaps along the corridor, recommending connections, meeting with local government, and developing a report of the findings. The goals of the task order were broken up into the following 3 phases:

Phase 1 – GIS Mapping

- Attend a meeting with MARC to discuss and obtain updated electronic GIS information of existing and proposed bike/pedestrian facilities that they collected from the communities and merged into one database. It is assumed that accuracy of the existing and proposed facilities will be verified by the individual local communities.
- Develop map with GIS line work along the K-7 Corridor that shows existing and proposed bike/pedestrian facilities. This will be accomplished by stripping down the information from MARC to include only a corridor one mile on each side along K-7, including the Mill Creek trail system. Incorporate shapefiles of existing sidewalk from communities that have that information. The GIS deliverable will be provided to KDOT on CD ROM.
- Identify gaps in the bicycle and pedestrian system and potential connections for those gaps. Included are concepts for crossing the Kansas River and for crossing the three major system-to-system interchanges on K-7 at I-35, K-10 and I-70.

Phase 2 – Local Government Stakeholders

- HNTB will prepare for and facilitate a meeting coordinated by KDOT with local government staff that is directly responsible for multimodal operations, policies, and plans. The meeting will be to discuss the map created in Phase 1 and document suggestions for modifications to the identified gaps and concepts for crossing the Kansas River and system-to-system interchanges.
- Revise the map, identified gaps, and major crossing concepts developed in Phase 1 based on suggestions from the meeting with government stakeholders.
- Provide a summary of the findings in Phase 1 and 2 including meeting documentation, revised map, identified gaps, and major crossing concepts. Cost estimates for the major crossings or filling the gaps is not included in this scope of services.

Phase 3 – Report Development

- Provide general analysis of existing bike/pedestrian facilities. Discussion shall include the user type, facilities in state or local ROW, current relationship with transit, and other current issues in addition to gaps. In addition, HNTB will provide policies or examples concerning whether facilities are in state or local ROW along similar types of corridors within Kansas or other states.
- Provide input on the constraints and/or opportunities on how the existing K-7 corridor management plan and the local road network impacts the future development of bike/pedestrian facilities.
- Provide a summary of recommended next steps including who is responsible for those next steps.

See Appendix D for the Bike/Pedestrian Analysis Technical Memorandum.

7-106 K-7925-03
K-7 On Call Engineering Services
Work Order No. 21 – Kansas River Bike/Pedestrian Crossing Feasibility Study

This task order was cancelled before it was executed.

7-106 K-7925-03
K-7 On Call Engineering Services
Work Order No. 22 – Spring Hill Interchange/Overpass Evaluation

Project Background & Description

In January 2014, HNTB was hired by KDOT to evaluate the modification of the original K-7 Corridor Study by changing 215th Street from an overpass to an interchange and 207th Street from an interchange to an overpass. More specifically, KDOT asked HNTB to provide the following tasks:

- Develop a conceptual horizontal and vertical layout of a standard diamond interchange at K-7 and 215th Street and prepare conceptual right of way impacts based on conceptual horizontal and vertical layout of the interchange.
- Develop a conceptual horizontal and vertical layout of an overpass at K-7 and 207th Street and prepare conceptual right of way impacts based on conceptual horizontal and vertical layout of the interchange.
- Conduct a 1-hour work session with Spring Hill staff and City Council and KDOT staff to discuss the City Council's position and views on the interchange/overpass alternatives.
- Evaluate the switch of the interchange/overpass location by using a list of pros/cons for each alternative. Specific consideration will be given to the evaluation of the impacts of an interchange at 215th Street on the collector street to the east. Evaluation factors could include right of way impacts, major utility impacts, relative construction costs, potential impacts to local street network, and potential impacts to property access.
- Meet with KDOT and Spring Hill staff to review the results of the conceptual evaluation and to prepare to have a public meeting.
- Prepare and hold one public meeting to present interchange alternatives.
- Meet with KDOT and Spring Hill staff to review the final evaluation
- Present to City Council final results and recommendations to be incorporated into the K-7 Corridor Study.

HNTB completed work on the first two tasks that included developing a conceptual horizontal and vertical layout of a standard diamond interchange at K-7 and 215th Street and an overpass at K-7 and 207th Street. Following a review meeting with KDOT and Spring Hill to review the layouts of the revised interchanges/overpasses, a meeting with the Spring Hill City Council occurred on May 29th, 2014. The purpose of the meeting was to discuss the preliminary results of the interchange/overpass switch along with the pros/cons of the switch. The City Council decided to not pursue any further the switch of the overpass and interchange due to negative impacts on existing development. The task order was suspended following the City Council meeting.

7-106 K-7925-03
K-7 On Call Engineering Services
Work Order No. 23 – Proposed ROW Acquisition Costs (K-10 to the Kansas River)

Project Background & Description
In January 2014, HNTB was hired by KDOT develop ROW acquisition costs along K-7, between College Boulevard and the Kansas River, based on the proposed right of way previously developed for the K-7 Corridor Study.

- Evaluation of Right of Way Needs
    - Obtain updated AIMS existing ROW line work and incorporate into base files from K-10 to the Kansas River.
    - Determine tracts along K-7, between K-10 and the Kansas River, that will require right of way acquisition based on the updated existing right of way and proposed right of way previously developed for the K-7 Corridor Study. Determine proposed right of way acquisition areas for each of these tracts and note tracts where it would be logical to assume acquisition of the entire tract would be needed.
    - Develop an excel spreadsheet documenting the tract owner, proposed right of way acquisition area, estimated cost per square foot to acquire right of way, and total right of way acquisition cost per tract.
    - Prepare exhibits noting the properties with land acquisition corresponding to the table created in the previous task.
    - Attached is a table summarizing the ROW needs and exhibits showing the required hatched future ROW needs.

- Evaluation of K-7 Direct Access
    - Evaluate the removal of the private accesses on both sides of K-7 approximately 1/2 mile north of Prairie Star Parkway. Includes the development of preferred conceptual alternate access to each of the properties. Evaluation will also include meeting with the City of Lenexa to review any prior development plans or alternate access discussions that the City may have had in the past.
    - Evaluate the removal of the private field entrance on the east side of K-7 north of 47th St. and the Greenview Ridge Subdivision. Includes the development of preferred conceptual alternate access to the property.
    - We met with KDOT, Lenexa, and Shawnee to review the results of the alternate access evaluation north of Prairie Star Parkway and results of the alternate access evaluation north of 47th St. and the Greenview Ridge Subdivision.
    - It was determined that there were alternatives for relocating the access on the west side of K-7. The Exhibit 1 shows a potential relocated access from 91st Terrace to serve the property. The exact location would be coordinated with the property owner in the future or as redevelopment may occur.
    - It was also determined that there was not a realistic solution to provide alternate access to the homes on the east side of K-7 at this time. This would

only be possible if development would occur east of these properties resulting in a street network that could access the properties. It was also noted that the volumes using this direct access are very minimal and do not pose a major safety concern today.

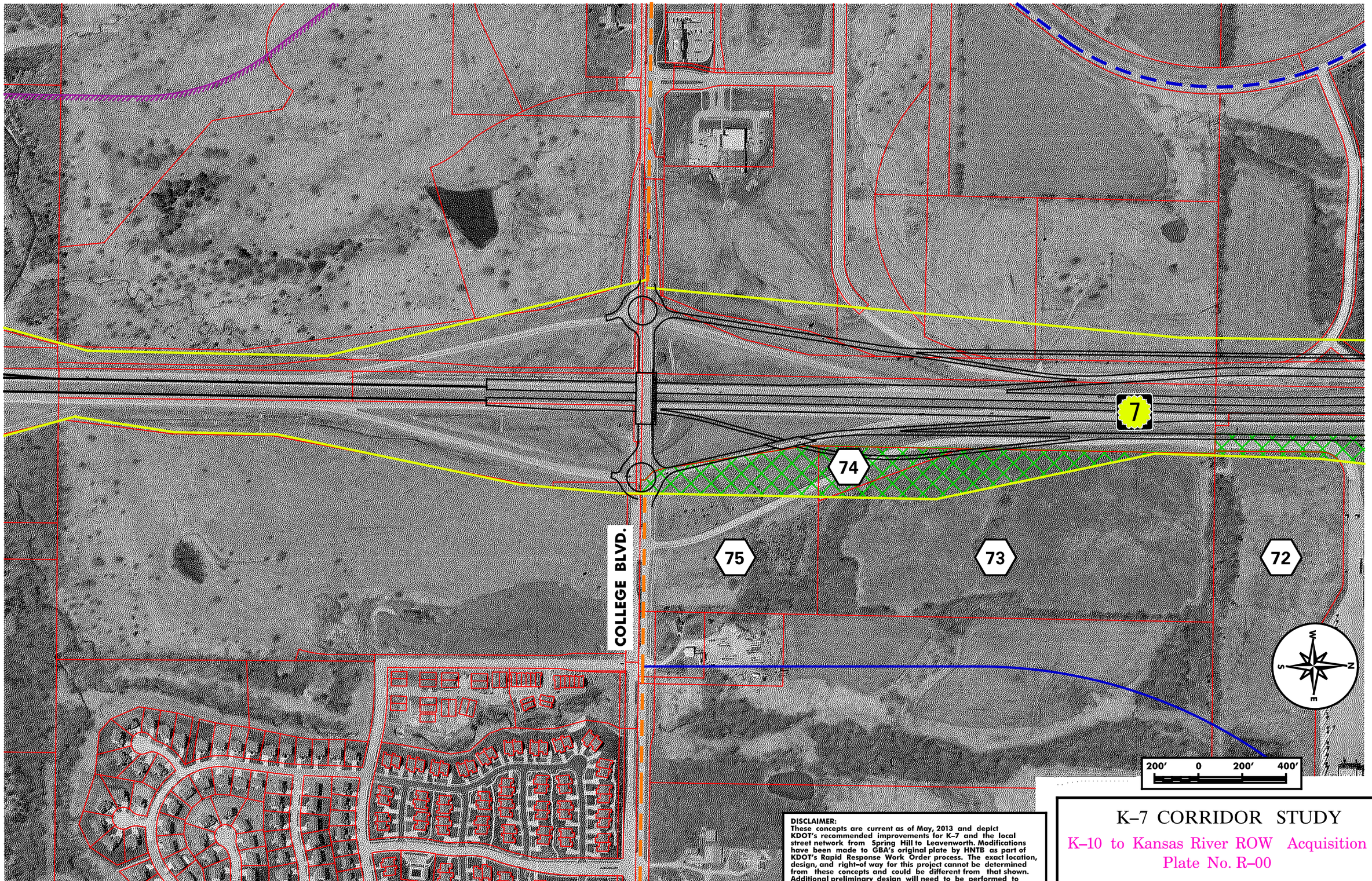
- Exhibit 2 shows the current direct access north of 47th St. It was also determined that this location did not have realistic options at this time due to the railroad track and steep grades north of the property as well as being restricted by the existing Greenview Ridge Subdivision to the south. This access will also remain in the near term but will be discussed as any development may occur.

Exhibit 1 - Alternate Access Evaluation North of Prairie Star Parkway

Exhibit 2 - Alternate Access Evaluation North of Prairie Star Parkway

K-7 Corridor Study - Task Order #23
Proposed ROW Acquisition Costs (K-10 to the Kansas River)

Tract	Property Owner	ROW Acquisition Area (Acres)	Acquisition Cost Range ($2/sf - $4/sf)		Class	Property Type	Comments
1	K10-C, L.L.C.	8.1353	$708,747	$1,417,495	A	Farming / ranch land (no improvements)	
2	K10-C, L.L.C.	2.8413	$247,534	$495,068	A	Farming / ranch land (no improvements)	
3	Boehm, Michael A.	2.3961	$208,748	$417,496	F	Farming / ranch land (no improvements)	
8	Penny's Concrete, Inc.	0.2663	$23,200	$46,400	C	Gypsum / plaster / concrete products mfg	
11	D.W. Newcomer's Sons, Inc.	3.7244	$324,470	$648,939	V	Vacant Lot	
13	D.W. Newcomer's Sons, Inc.	0.3913	$34,090	$68,180	C	Commerical: Commercial or Industrial property	
14	A & A Rentals, LLC	6.2702	$546,260	$1,092,520	F	Farming / ranch operation (with improvements)	
15	Town & Country Villas	0.3298	$28,732	$57,464	V	Residential common area and support facilities	Listed as V on AIMS but lot contains residences
17	Town & Country Villas	1.2653	$110,233	$220,466	V	Residential common area and support facilities	Listed as V on AIMS but lot contains residences, would be less due to residences and constricting taking to land only
18	Town & Country Villas	0.1031	$8,982	$17,964	R	Residential common area and support facilities	
19	Vanlerberg, Mary E. Trustee	2.7324	$238,047	$476,093	F	Farming / ranch operation (with improvements)	includes building, assumes
20	Shawnee Golf & Country Club		$0	$0	C	Country club golf course	probably not needed
21	Shawnee Golf & Country Club		$0	$0	A	Farming / ranch land (no improvements)	Assumed ROW since AIMS shows K7 privately owned, probably not needed
25	Garrett, Edward H. Trustee ETAL	1.5627	$136,142	$272,285	A	Farming / ranch land (no improvements)	
26	Smith, Judith G.	0.0187	$1,629	$3,258	R	Residential: All dwellings, apartments, and mobile homes	
27	Smith, Judith G.	0.0457	$3,981	$7,963	R	Residential: All dwellings, apartments, and mobile homes	
28	Reynolds, Raymond E. & Reynolds, Joyce L.	0.0246	$2,143	$4,286	R	Residential: All dwellings, apartments, and mobile homes	
29	Smith, Judith G.	0.3279	$28,567	$57,133	R	Residential: All dwellings, apartments, and mobile homes	
30	Wong, Ching Yu	0.3199	$27,870	$55,739	R	Residential: All dwellings, apartments, and mobile homes	inlcudes house, estimated at $130K
31	Smith, Christopher G. & Smith, Ashlee B.	0.4573	$39,840	$79,680	R	Residential: All dwellings, apartments, and mobile homes	
32	McGee, Scott & McGee, Megan	0.2332	$20,316	$40,633	R	Residential: All dwellings, apartments, and mobile homes	
33	McEndree, Mervin L. Trust	0.2904	$25,300	$50,599	C	Mobile home / manufactured housing dealership	could be avoided
34	McEndree, Mervin L. Trust	0.0308	$2,683	$5,367	A	Farming / ranch land (no improvements)	could be avoided
35	NEW TKG-KC LLC	2.9134	$253,815	$507,631	C	Mini-storage warehouse / self-storage	could be total take
36	NEW TKG-KC LLC	0.4432	$38,612	$77,223	C	Mini-storage warehouse / self-storage	could be total take
37	Martin, Keith U. Trustee & Martin, Keith U. Rev Trust	1.0686	$93,096	$186,193	A	Farming / ranch land (no improvements)	
38	Vans Holding Company	1.806	$157,339	$314,677	A	Farming / ranch land (with Ag improvements)	
39	Smith, Robert E.	1.1081	$96,538	$193,075	A	Agricultural/ Agricultural Rural	
40	Vans Holding Company	0.2726	$23,749	$47,498	A	Farming / ranch land (no improvements)	AIMS indicates private property but some of it is most likely KDOT ROW
41	Coleman Farm Properties, G.P.	2.0915			A	Farming / ranch land (no improvements)	AIMS indicates private property but is most likely KDOT ROW
42	B & D Business Holdings LLC	1.3532	$117,891	$235,782	C	Commerical: Commercial or Industrial property	AIMS indicates private property but some of it is most likely KDOT ROW
43	B & D Business Holdings LLC	0.4489	$39,108	$78,216	R	Residential: All dwellings, apartments, and mobile homes	
44	Country Landscapes Real Estate Partnership	0.3893	$33,916	$67,832	V	Vacant Lot	
44b	Country Landscapes Real Estate Partnership	0.2446	$21,310	$42,619	V	Vacant Lot	Assumes Total Take
45	Timbercreek Development Co., Inc.	0.0481	$4,190	$8,381	A	Farming / ranch land (no improvements)	
46	Greenview Ridge Homes Association, Inc.	0.16	$13,939	$27,878	V	Vacant Lot	
47	Greenview Ridge Homes Association, Inc.	0.0497	$4,330	$8,660	R	Residential: All dwellings, apartments, and mobile homes	
48	MacInnis, Dean & Weir, Jenny Rebecca	0.0298	$2,596	$5,192	R	Residential: All dwellings, apartments, and mobile homes	
49	Baghal, M. Aziz	0.0335	$2,919	$5,837	R	Residential: All dwellings, apartments, and mobile homes	
50	Greenview Ridge Homes Association, Inc.	0.0339	$2,953	$5,907	R	Residential: All dwellings, apartments, and mobile homes	
51	Timbercreek Development Co., Inc.	0.7968	$69,417	$138,834	V	Vacant Lot	
52b	Sisters of Charity of Leavenworth Health System, Inc.	0.1781			A	Farming / ranch land (no improvements)	AIMS indicates private property but is most likely KDOT ROW
53	Sisters of Charity of Leavenworth Health System, Inc.	4.2984			V	Vacant Lot	AIMS indicates private property but is most likely KDOT ROW
54	Sisters of Charity of Leavenworth Health System, Inc.	0.0954			V	Vacant Lot	AIMS indicates private property but is most likely KDOT ROW
55	71st & K-7, LLC.	1.2504	$108,935	$217,870	V	Vacant Lot	AIMS indicates private property but some of it is most likely KDOT ROW
56	Willow Ridge Development, L.L.C.	6.37	$554,954	$1,109,909	A	Farming / ranch land (no improvements)	AIMS indicates private property but some of it is most likely KDOT ROW
57	Willow Ridge Development, L.L.C.	0.6301	$54,894	$109,789	V	Vacant Lot	
58	Go West, Inc.	2.3094	$201,195	$402,390	A	Farming / ranch land (no improvements)	
59	Water District #1 of Johnson County	0.6241	$54,372	$108,743	E	Exempt	
60	Water District #1 of Johnson County	0.0327	$2,849	$5,698	E	Exempt	
60b	Go West, Inc.	1.5303			A	Farming / ranch land (no improvements)	should be existing ROW
60c	Stueck Shawnee Properties, LLC	2.9298			V	Vacant Lot (prive street/road)	AIMS indicates private property but is most likely KDOT ROW
67	Prairie Star Land Assoc. LLC	0.6118	$53,300	$106,600	A	Farming / ranch operation (no improvements)	
68	Prairie Star Land Assoc. LLC	1.8739	$163,254	$326,508	A	Farming / ranch operation (no improvements)	
69	Smileys, LLC	4.3598	$379,826	$759,652	A	Farming / ranch operation (no improvements)	
70	Smileys, LLC	14.0359	$1,222,808	$2,445,615	C	Smiley's Golf Complex and Executive Golf Course	
71	Aldi Inc.	9.5993	$836,291	$1,672,582	C	Cold Storage Warehouse	
72	Aldi Inc.	0.2292	$19,968	$39,936	A	Farming / ranch land (no improvements)	
73	FSDA, LLC	3.4163	$297,628	$595,256	V	Residential highest and best use	
74	FSDA, LLC						AIMS indicates private property but is most likely KDOT ROW
75	Cedar View Land Co.						AIMS indicates private property but is most likely KDOT ROW
		Total	$7,693,506	$15,387,012			



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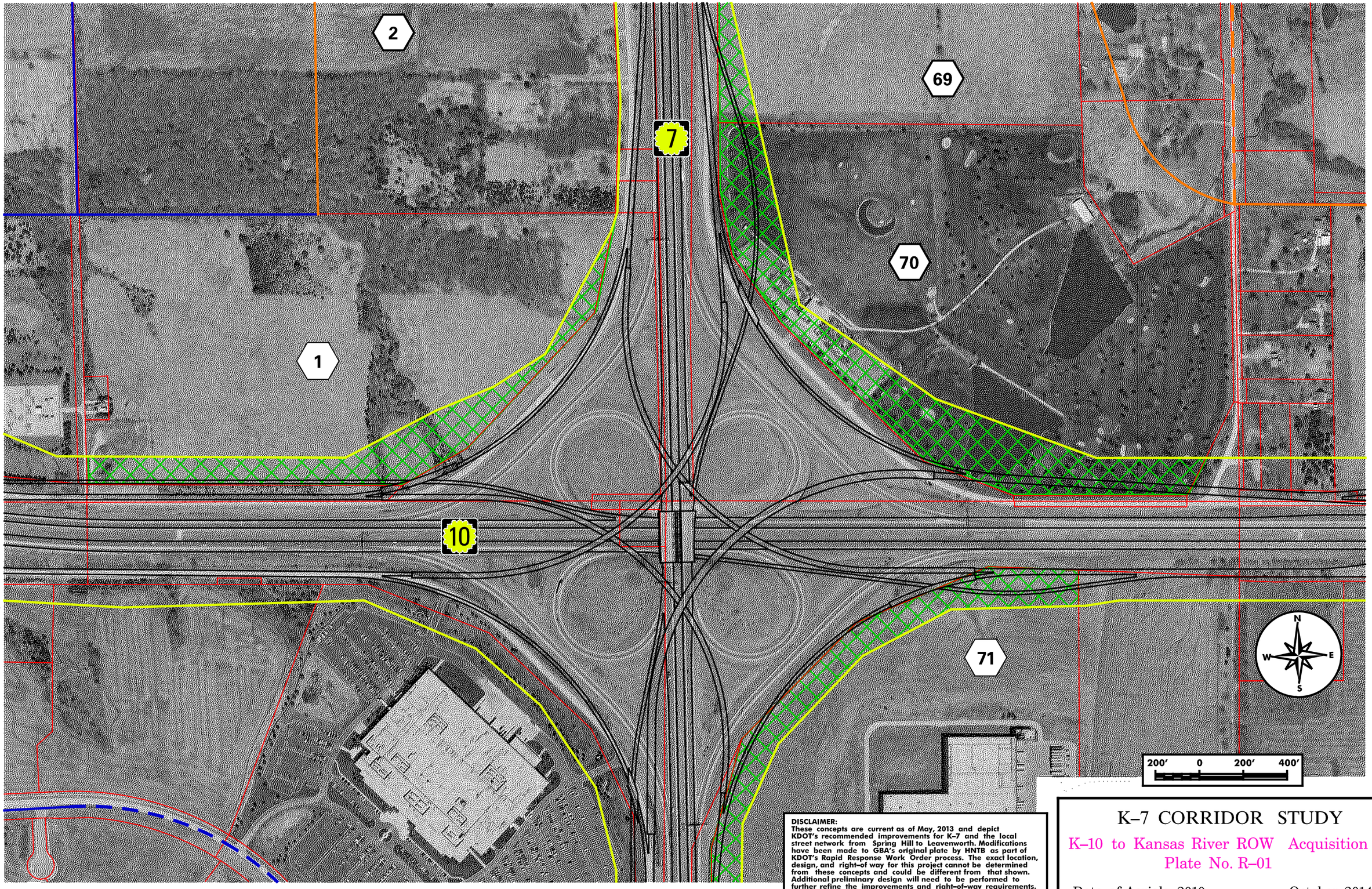
K–7 CORRIDOR STUDY

K–10 to Kansas River ROW Acquisition
Plate No. R–00

Date of Aerials: 2010

October 2014



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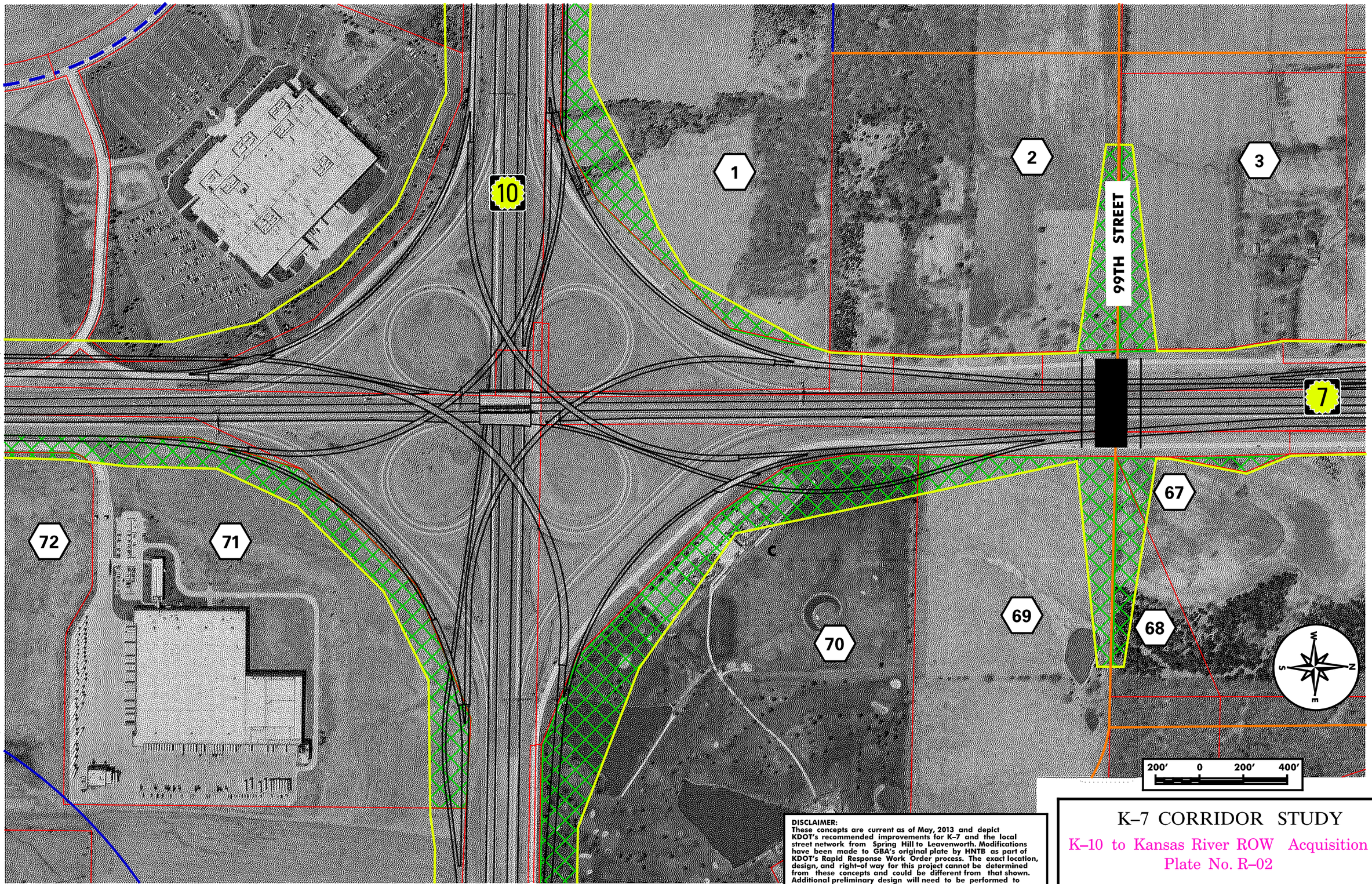
K–7 CORRIDOR STUDY

K–10 to Kansas River ROW Acquisition
Plate No. R–01

Date of Aerials: 2010

October 2014



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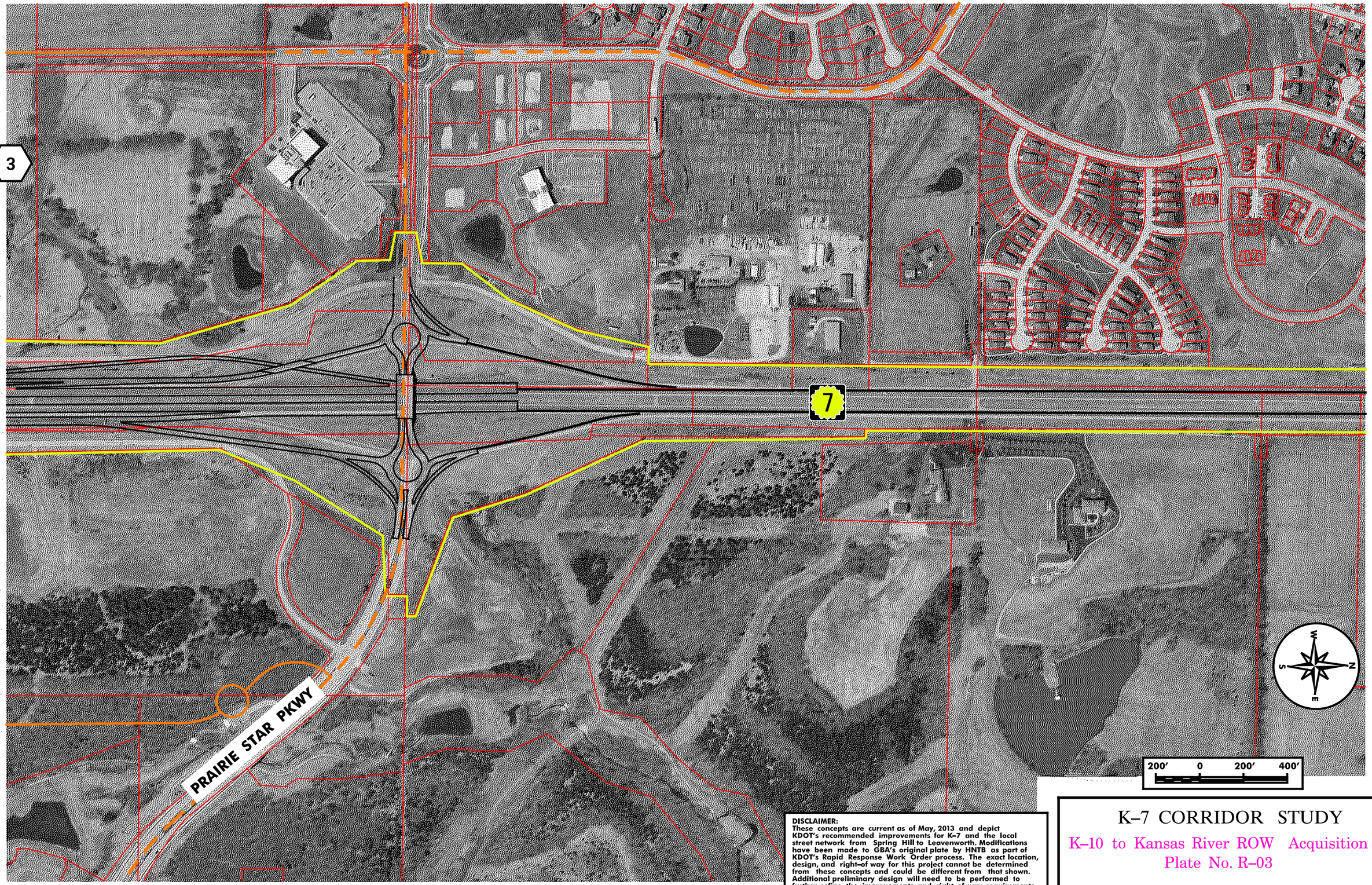
K–7 CORRIDOR STUDY

K–10 to Kansas River ROW Acquisition
Plate No. R–02

Date of Aerials: 2010

October 2014



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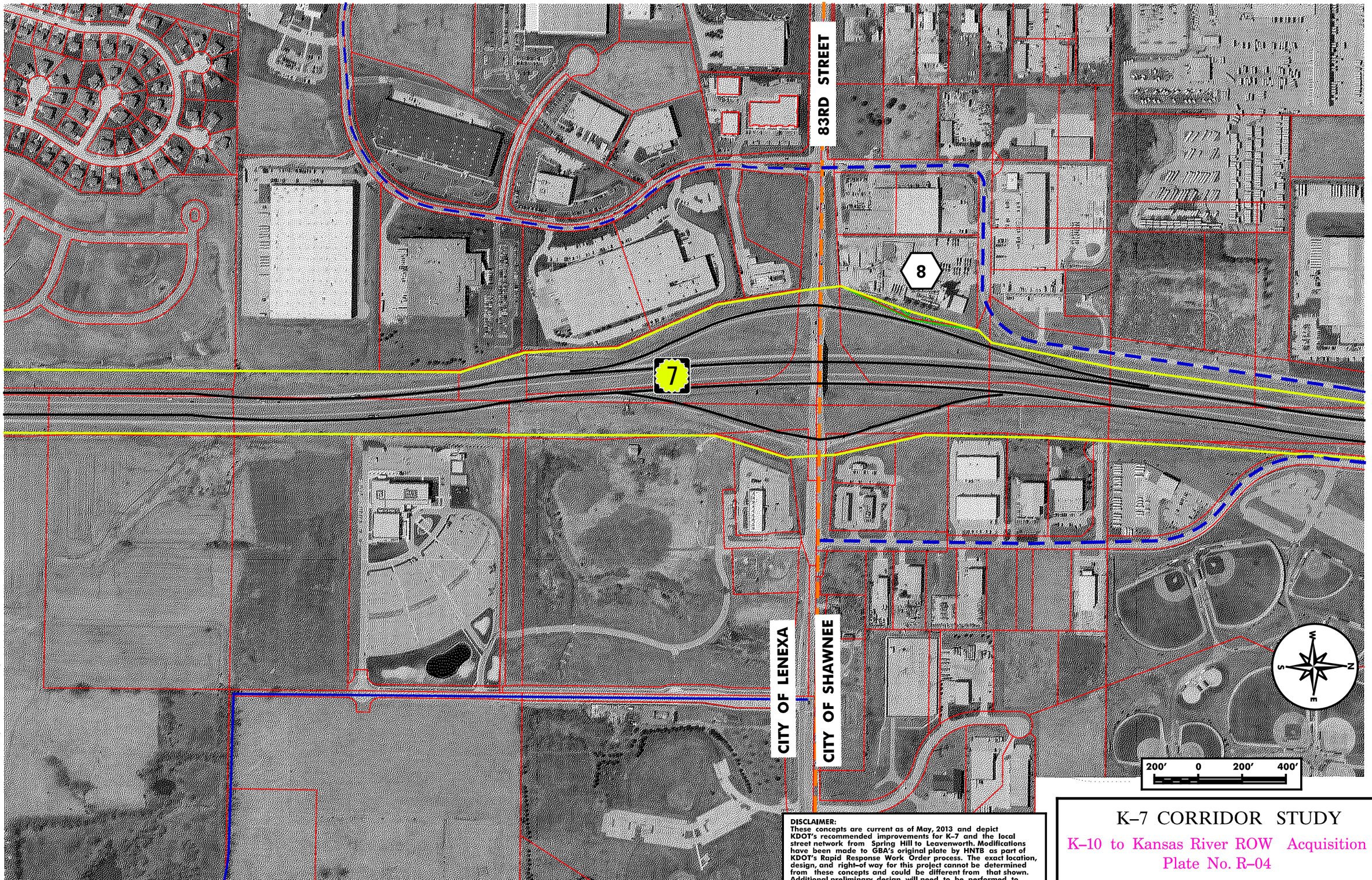
K–7 CORRIDOR STUDY

K–10 to Kansas River ROW Acquisition
Plate No. R–03

Date of Aerials: 2010

October 2014



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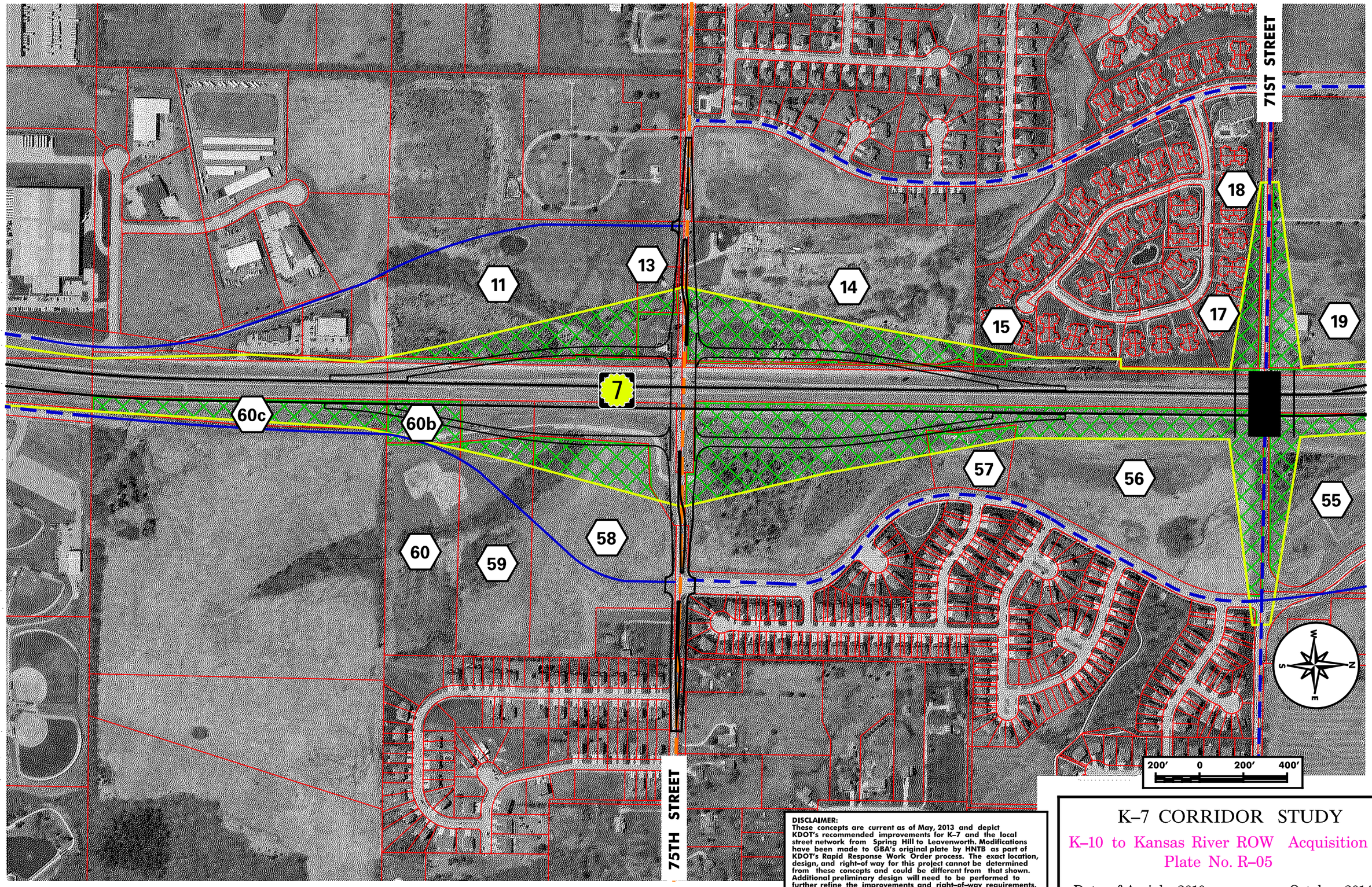
K–7 CORRIDOR STUDY

K–10 to Kansas River ROW Acquisition
Plate No. R–04

Date of Aerials: 2010

October 2014



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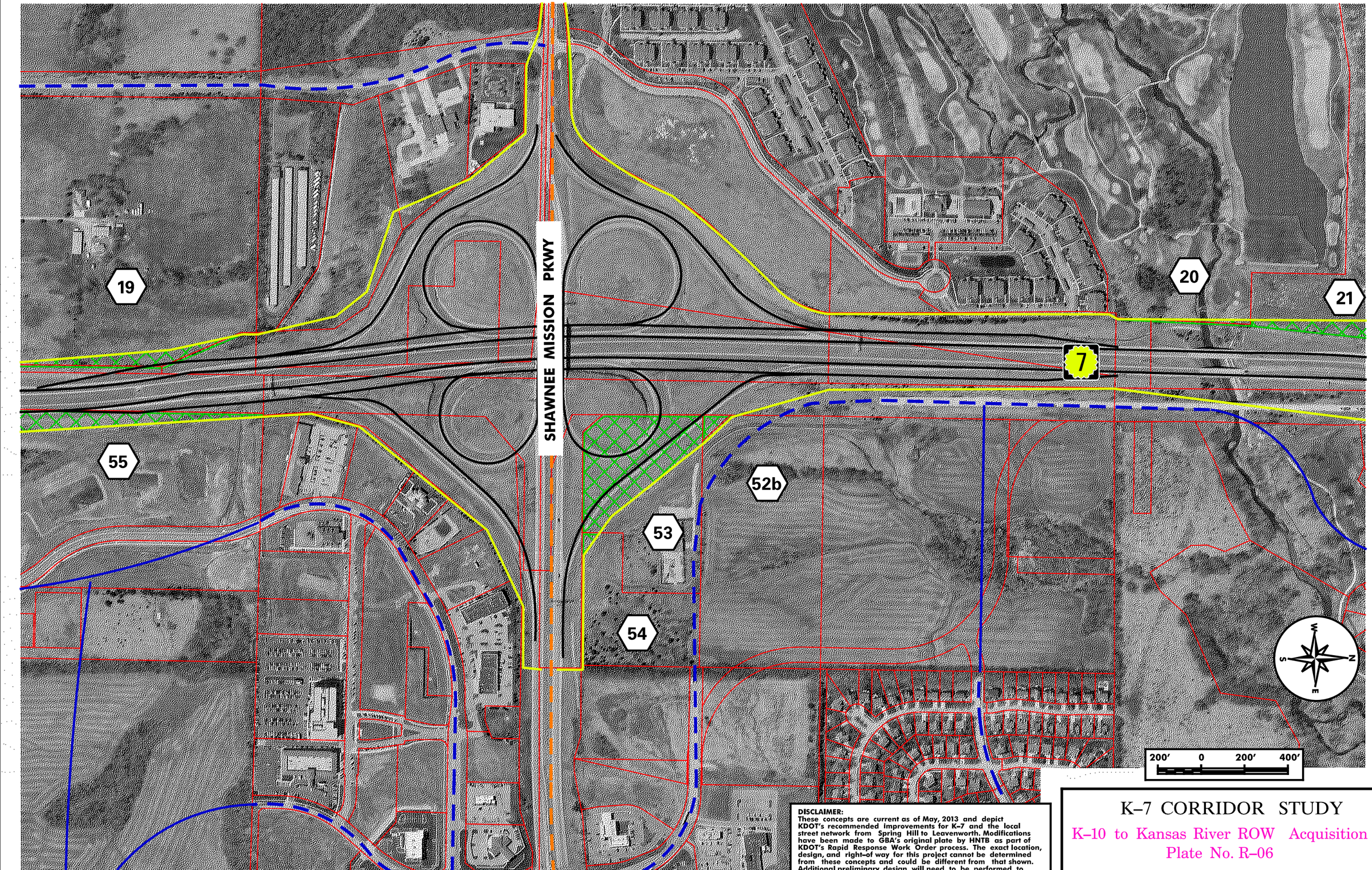
K–7 CORRIDOR STUDY

K–10 to Kansas River ROW Acquisition
Plate No. R–05

Date of Aerials: 2010

October 2014



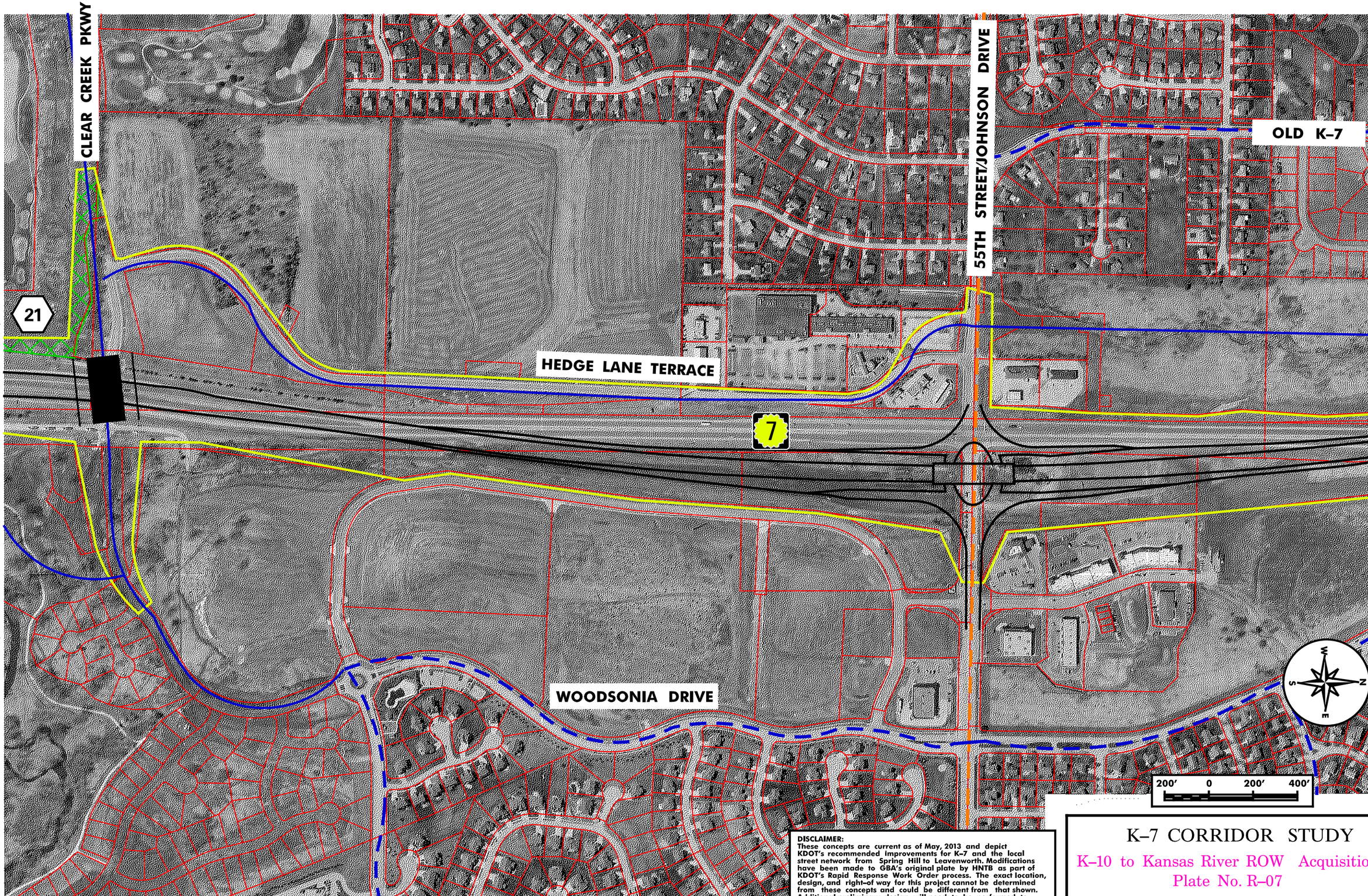
K–7 CORRIDOR STUDY

K–10 to Kansas River ROW Acquisition

Plate No. R–06

Date of Aerials: 2010

October 2014



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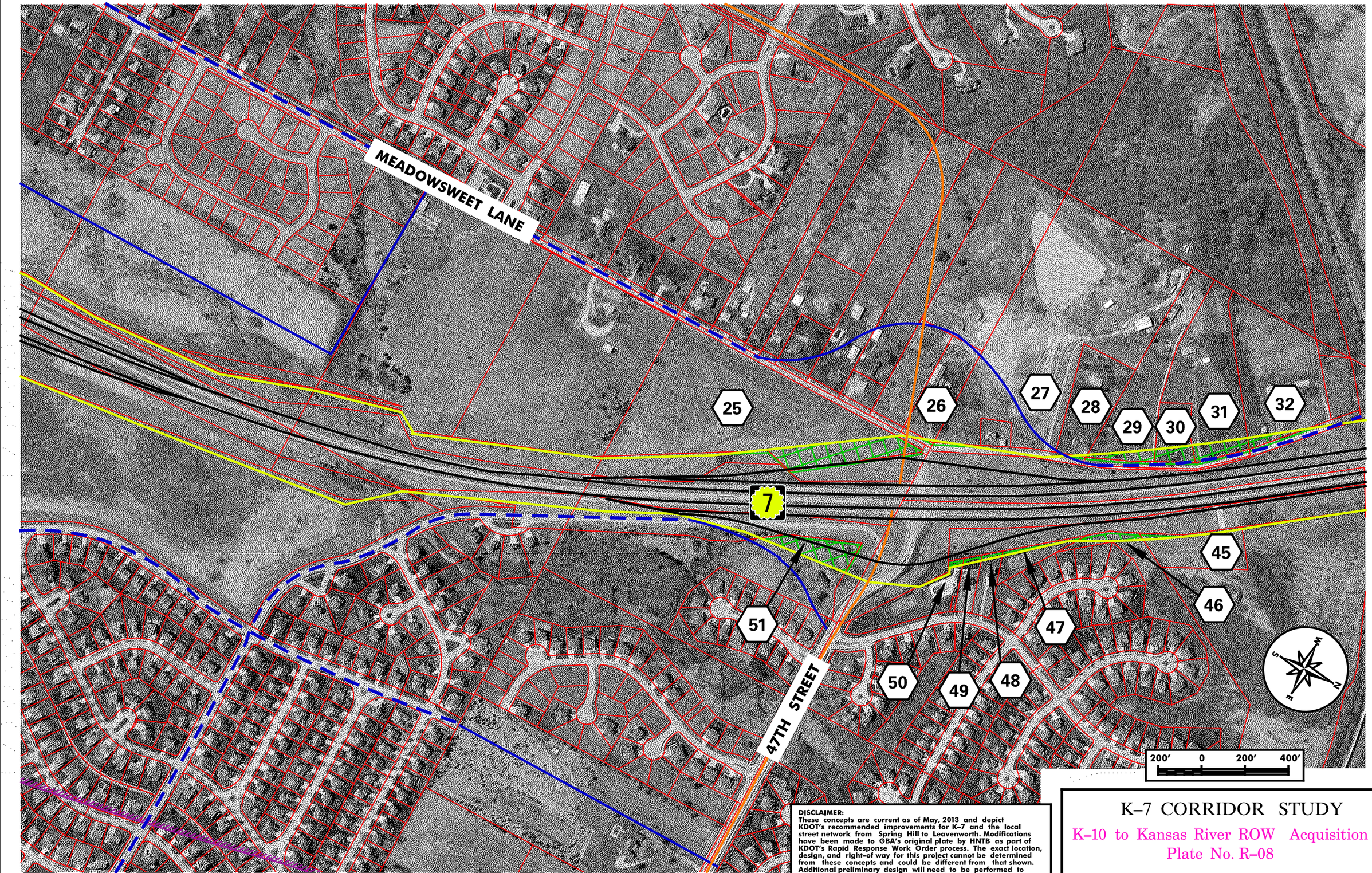
K–7 CORRIDOR STUDY

K–10 to Kansas River ROW Acquisition
Plate No. R–07

Date of Aerials: 2010

October 2014



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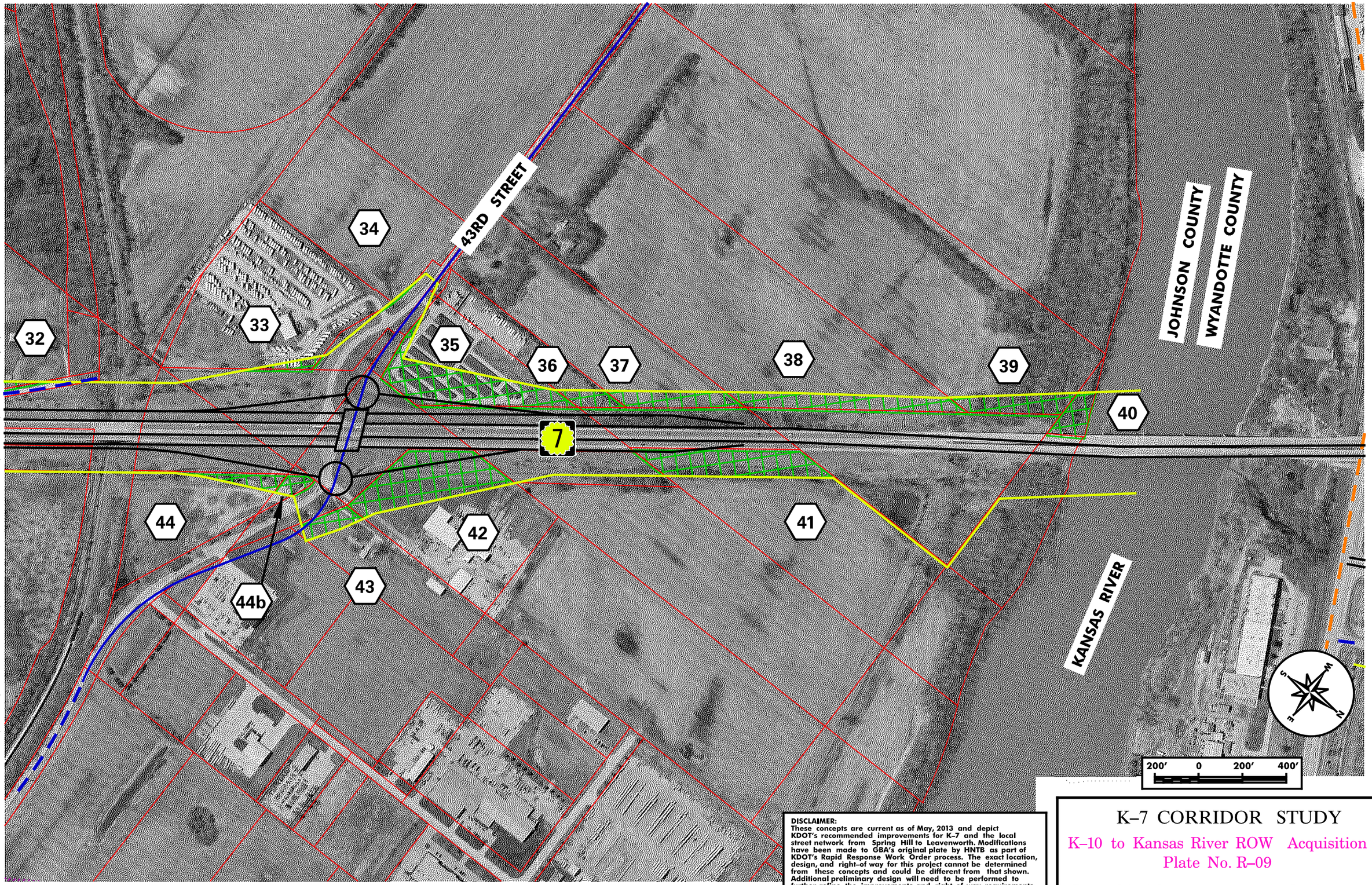
K–7 CORRIDOR STUDY

K–10 to Kansas River ROW Acquisition
Plate No. R–08

Date of Aerials: 2010

October 2014



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K–7 CORRIDOR STUDY

K–10 to Kansas River ROW Acquisition
Plate No. R–09

Date of Aerials: 2010 October 2014

7-106 K-7925-03
K-7 On Call Engineering Services
Work Order No. 24 – K-7/223rd Street Area Transportation

Project Background & Description

In August 2014, HNTB was hired by KDOT to evaluate 223rd Street from Columbia Road to Victory Road due to increased development in the corridor. Specifically, recommendations were given for the 223rd St. /Webster St./Harrison St. intersection and 223rd St./Victory Road intersection with respect to increased traffic from the currently planned multi-family residential Blackhawk Development and anticipated commercial growth along 223rd St. Additional intersections along the corridor that were evaluated west of K-7 were the 223rd St./Old KC Road intersection as well as the 223rd St./Columbia Road intersection. More specifically, KDOT asked HNTB to provide the following:

- Perform a review of previous studies in the corridor and provide a summary:
- Develop corridor improvement/access management alternatives and provide 100 scale exhibits of the alternatives from Columbia Road to Victory Road.
- Qualitatively evaluate the alternatives by using a list of pros/cons for each alternative. Evaluation factors could include traffic operations, safety, costs, potential impacts to local street network, and potential impacts to property access. Identify the preferred alternative.
- Meet with KDOT, Spring Hill, and Miami County staff to review the alternative evaluation along with the preferred alternative.
- Develop 2040 AM and PM peak hour traffic volumes by growing the 2030 volumes from the 2007 Wilson Study.
- Perform 2040 AM and PM peak hour Synchro analysis of the preferred alternative to prove traffic operational acceptance.
- Present to City Council final study results and recommendation

See Appendix F for the report for this task order.