APPENDIX 4

Kimball Avenue Traffic Impact Study (BG Consultants)

NORTH CAMPUS CORRIDOR
Kimball Avenue Expansion Project
2020 US DOT BUILD APPLICATION

City of Manhattan Kansas

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Traffic Study

for

Kimball Avenue Improvements

College Avenue to Meadowlark Road

Prepared for the City of Manhattan, KS

BG Project No. 13-1420M
January 9, 2018

BG CONSULTANTS
ENGINEERS · ARCHITECTS · SURVEYORS

Executive Summary

The City of Manhattan, Kansas engaged the services of BG Consultants, Inc. to perform Traffic Study for the Kimball Avenue Corridor to address the current and future transportation needs in a proactive manner. The purpose of this study is to explore the capacity benefits of transportation improvements to the Kimball Avenue corridor between College Avenue and Meadowlark Road. The study also estimates the volume of potential development opportunities that could be served by the corridor as a result of the improved transportation network. Finally, the study estimates the costs associated with the different construction alternatives.

The study analyzed the reconstruction of Kimball Avenue from its current four-lane, undivided cross section to a five-lane cross section including a center left-turn lane. The studied narrowed in on two alternatives for separating east/west traffic. One option considered a raised median and the other option considered a paved median. Ultimately, the alternative of incorporating a raised median into the improved cross section was recommended to control access, enhance pedestrian/bicycle safety, and provide opportunities for aesthetic enhancements. The raised median option with strategically located left-turn lanes will allow for more effective control of access along Kimball Avenue. This raised median alternative will provide a reduction in the number of conflict points and will assure better mobility along the Kimball Avenue corridor. The control of driveway access is significant for the ability to sustain adequate traffic operations for future conditions. A typical cross section of the recommended improvements with a raised median can be seen in Figure 5 of the study.

The study also recommends that the Kimball Avenue/College Avenue and Kimball Avenue/Denison Avenue intersections remain traffic signal controlled intersections with two thru lanes in both directions. The existing Kimball/College intersection has single left-turn lanes on all approaches and should be improved to have dual left-turn lanes on the Kimball Avenue approaches. The left-turn lanes on the College Avenue approaches should be lengthened to allow for sufficient vehicle storage. The existing Kimball/Denison intersection has single left-turn lanes on all approaches and should be improved to have dual left-turn lanes on all four approaches.

The infrastructure improvements along Kimball Avenue should also include improvements for pedestrians and bicyclists. The use of on-street bicycle lanes is one option for bicyclists but they tend to only be used by more experienced bicyclists if they are constructed on a high volume arterial such as Kimball Avenue. On-street bicycle lanes on Kimball Avenue could also have an adverse effect on the speed of traffic due to the increased width of pavement required. As a result, the recommended pedestrian and bicycle improvements along Kimball Avenue should be provided by off-street sidewalks and shared use paths.

Finally, the traffic study developed preliminary project cost estimates for all improvements to enable the City to better plan for and budget for implementation of the recommendations. The preliminary project cost to improve Kimball Avenue between College Avenue and Meadowlark Road

as described in this study (five lane cross section with raised median, intersection improvements, and pedestrian & bicycle improvements) is estimated to be $13.5 million. If the project improvements were to incorporate relocating existing overhead powerlines underground through the corridor, the project cost will increase to an estimated $15.8 million.

Introduction

The purpose of this study is to explore the capacity benefits of transportation improvements to the Kimball Avenue corridor between College Avenue and Meadowlark Road. The study also estimates the volume of potential development opportunities that could be served by the corridor as a result of the increased transportation capacity.

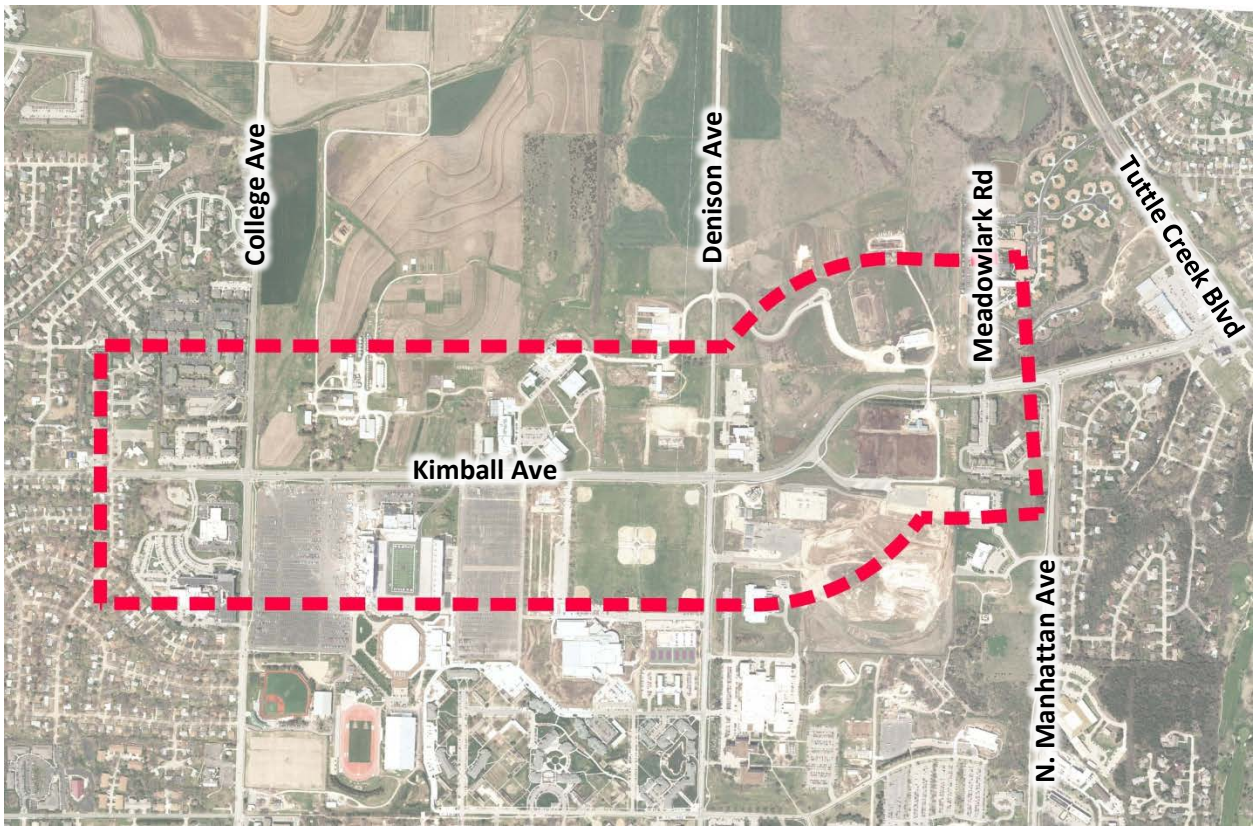

FIGURE 1: Location Map

Existing Conditions

Kimball Avenue is a 40 mph, 4-lane arterial street carrying approximately 20,000 vehicles per day (vpd) in the northern part of Manhattan, Kansas. The corridor also serves as the main route to access a variety of Kansas State University (KSU) facilities such as agriculture research sites and athletic facilities, including the Bill Snyder Family Stadium. The National Bio & Agro-defense Facility (NBAF) will also be served by this arterial street.

The existing roadway is approximately 48 feet wide, including the curb and gutter. The two eastbound and two westbound lanes vary slightly in width through the corridor, but are each about 10.5 feet wide. A shared use path parallels the south side of Kimball Avenue. The path is 8 feet wide between College and Denison, and 10 feet wide east of Denison. There are short sections of sidewalk on the north side of the street, but lack continuity to sufficiently serve pedestrians.

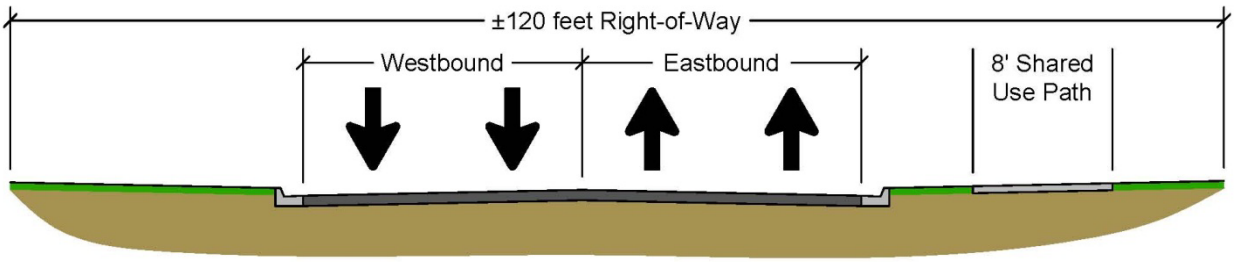

FIGURE 2: Existing Typical Section of Kimball Ave

City of Manhattan Staff collected daily traffic volume data and peak-hour turning movement data for the intersections of Kimball/College and Kimball/Denison. For the purposes of this study, the data is assumed to be representative of the existing traffic demand placed on the corridor. As will be discussed later in this report, these two intersections are the critical transportation infrastructure components controlling the capacity to serve the traffic needs of this area.

The intersections of Kimball/College and Kimball/Denison are both controlled by traffic signals. The ability of an intersection to meet traffic demand is typically described as level of service (LOS). The intersection is assigned a letter grade A through F based on the average delay experienced by motorists. LOS A indicates excellent traffic operations with minimal delay. LOS F indicates demand exceeds capacity and excessive traffic queues could be anticipated. LOS C or better is desired for most facilities with LOS D being generally accepted as the lower end of acceptable for signalized arterial streets.

Intersection capacity utilization (ICU) is the ratio of traffic demand to the available capacity of the intersection. ICU is often times used to describe the efficiency of an intersection and to estimate how much capacity may be available for additional traffic demands. It is desirable for the ICU to be at or below 85 percent for an intersection to operate sufficiently and to sustain manageable traffic queues.

The existing traffic data was analyzed to establish the corridor's baseline traffic operating conditions. Existing traffic currently utilizes between 55 and 75 percent of the existing roadway capacity during the peak hours of a typical weekday. The resulting level of service provided by both

the Kimball/College and Kimball/Denison intersections is LOS C during the AM and PM peak hours. Figure 3 summarizes the existing peak hour traffic demands, the level-of-service (LOS) provided by these intersections and the intersection capacity utilization.

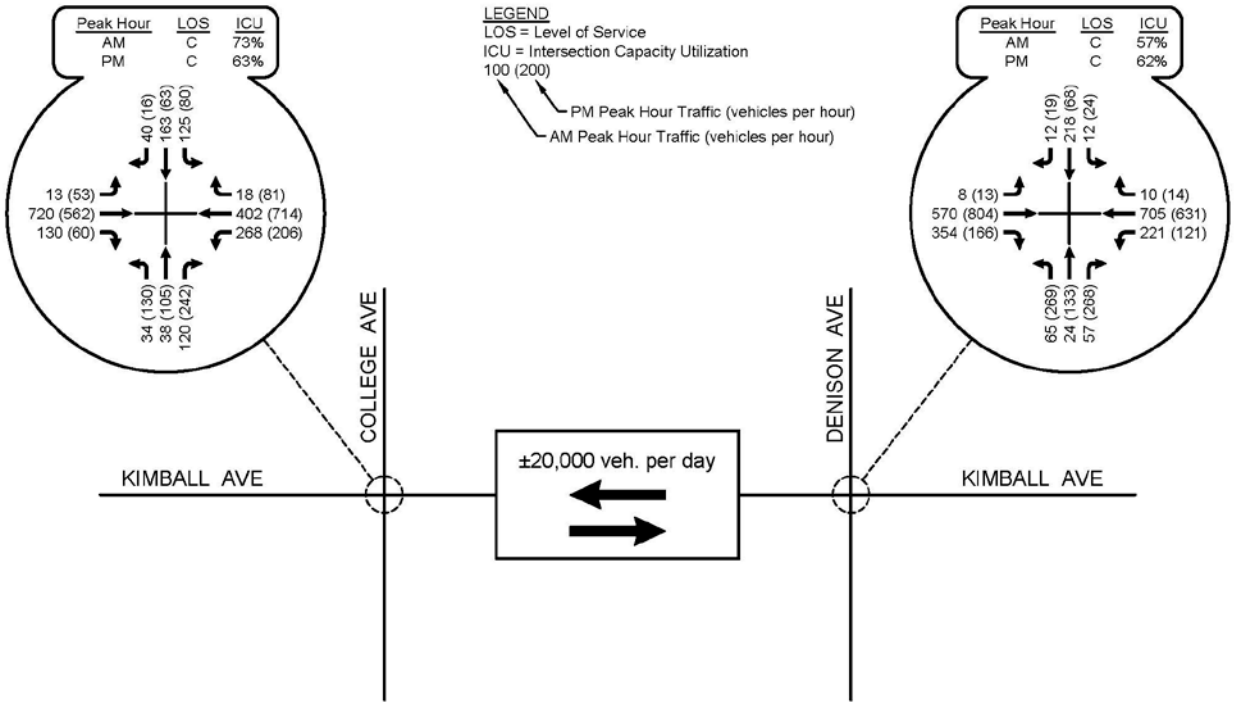

FIGURE 3: Existing Traffic Conditions

Existing Land Use Conditions and Future Opportunities

The Kimball Avenue corridor is in a near fully developed condition within approximately one-half mile to the south, west and east. Several pockets of undeveloped property exist near the NBAF site and most of the property to the north of Kimball Avenue remains undeveloped. Key land uses impacting the corridor include the Mercy Regional Health Center and Manhattan Surgical Hospital on the southwest corner of the Kimball/College intersection, the KSU athletic facilities on the south side of Kimball Avenue between College Avenue and Denison Avenue, and the NBAF site on the southeast corner of the Kimball/Denison intersection. These key land uses affect the corridor in a variety of ways by demanding a range of access and mobility needs on a daily basis and during major events such as KSU football games.

Opportunities for increased development density exist mostly along the north side of Kimball Avenue. However, there are several opportunities for increased development density on the south side of Kimball Avenue primarily located near the NBAF site. The intensity of potential development near the NBAF site will depend on the availability of transportation access to either Kimball Avenue and/or North Manhattan Avenue.

Most of the properties offering development opportunities adjacent to the corridor consist of rural type land uses for agriculture research. These sites generate a relatively small demand on the adjacent transportation system. As these areas increase in development intensity, the traffic demand will also increase along Kimball Avenue, College Avenue, and Denison Avenue. Infrastructure improvements will be necessary to maintain adequate transportation for this area of Manhattan.

Street Infrastructure Improvement Options and Development Potential

The need to preserve arterial street mobility is crucial to sustain adequate traffic operations for current and future traffic demands. Two focus areas have been identified to describe potential transportation facility improvements. The first focus area is highlighted in green on Figure 4 and includes the segment of Kimball Avenue between College Avenue and Denison Avenue. The Kimball/College and Kimball/Denison intersections are included in the recommendations for Focus Area #1. The second focus area is the segment of Kimball Avenue east of Denison Avenue highlighted in yellow.

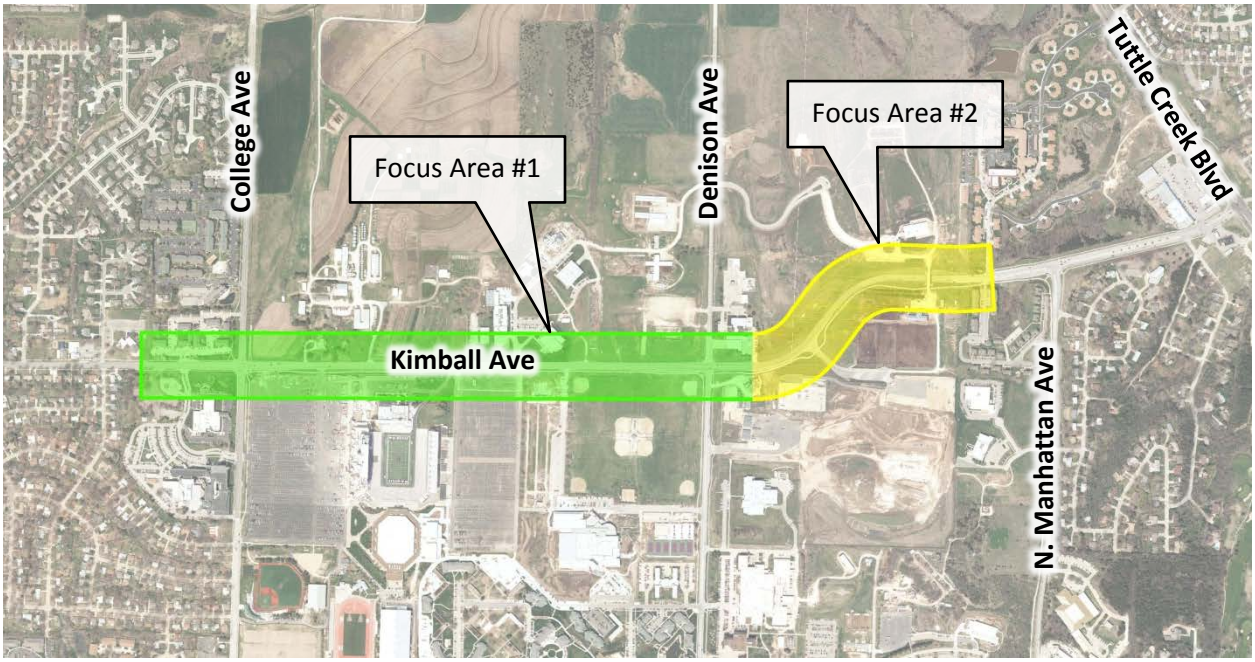

FIGURE 4: Kimball Avenue – Focus Areas of Improvements

Focus Area #1:

Focus Area #1 is the Kimball Avenue corridor between College Avenue and Denison Avenue. The capacity of the Kimball/College and Kimball/Denison intersections on either end are the critical components of the transportation system controlling the level of service provided by the Kimball Avenue corridor. This is assuming property access to Kimball Avenue between the two intersections is limited to no access or low volume weekday access only.

Roadway Geometry Recommendations: The recommended transportation improvements include reconstruction of Kimball Avenue to a width sufficient for a 4-lane cross section with a raised median and strategically located left-turn lanes to control access. The use of a raised median will allow for more effective control of access between College Avenue and Denison Avenue, thereby reducing the number of conflict points and assuring better mobility along the arterial corridor. An alternative to the raised median is to install a paved median. The paved median does not provide the access control benefits of a raised median, but it will provide additional paved area for event day traffic and will also serve typical weekday traffic better than the existing roadway geometry.

The raised or paved median separating the eastbound and westbound traffic should be at least 20 feet wide. This width will enable sufficient tapers and transitions to be designed between the key intersections and access points. The recommended median width will also give the Police Department greater flexibility to channelize multiple lanes of traffic in various directions during major events at Bill Snyder Family Stadium. The proposed width would require widening the pavement approximately 6 feet to the south and approximately 14 feet to the north. The existing right-of-way will be sufficient through most of the corridor to accommodate the proposed widening. A typical cross section of each option is shown below.

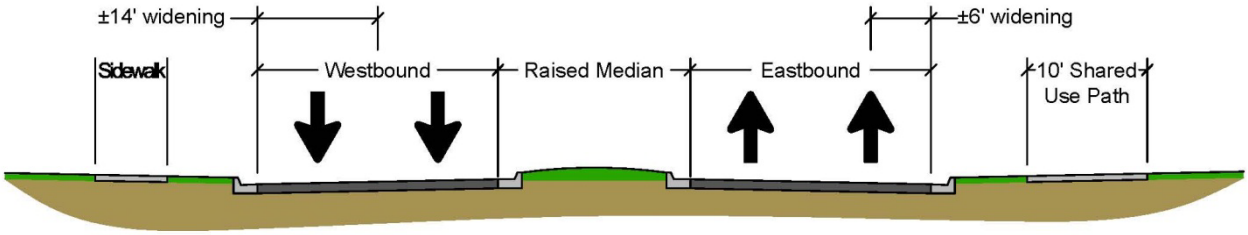

FIGURE 5: Option #1 – Proposed Kimball Avenue Typical Cross Section (Raised Median)

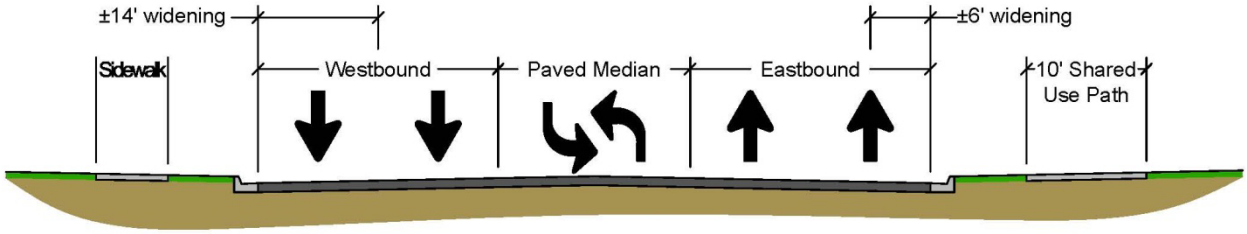

FIGURE 6: Option #2 – Proposed Kimball Avenue Typical Cross Section (Paved Median)

Both the Kimball/College and Kimball/Denison intersections should remain traffic signal controlled intersections and should be reconstructed with 2-thru lanes in both directions. Dual left-turn lanes should be provided for the Kimball Avenue approaches at the Kimball/College intersection and dual left-turn lanes should be provided on all approaches at the Kimball/Denison intersection. The eastbound Kimball Avenue left-turn to northbound Denison Avenue may need to be blocked out with pavement markings if the second receiving lane on Denison Avenue is not built during the initial phase of construction. The second receiving lane should eventually be constructed to the north where it could either extend to Marlatt Avenue or terminate in a dedicated right-turn lane for the KSU Equine Education Center.

Access Control Recommendations: The decision to construct a paved median or a raised median on Kimball Avenue will depend on the desire to control access and the desire to aesthetically improve the corridor. The control of driveway access is important to sustain adequate traffic

operations well into the future. Additional driveway access to Kimball Avenue between College Avenue and Denison Avenue should not be allowed and the City should explore access management opportunities during the design of Kimball Avenue improvements to close, combine, relocate or restrict existing driveway access.

Left-turn movements at driveways tend to be the traffic pattern which places the highest degree of congestion on transportation systems. The most feasible way to restrict left-turns at lower volume driveways is with a raised median. Some existing driveways, such as the KSU Grain Science Entrance, will have higher traffic demands may justify a break in the raised median with a dedicated left-turn lane to maintain full access. It should also be noted that the raised median will allow for landscaping and street trees to aesthetically improve the corridor.

Exhibit #1a and #1b depicts the concept of the recommended improvements and the control of access to Kimball Avenue through the use of a raised median. Several driveways are shown with dedicated left-turns based on the magnitude of land use the driveway serves. Additional analysis and property owner coordination will be necessary during the design process to determine the best locations for median breaks and the length needed for left-turn lanes.

Local Street/Collector Street Recommendations: A local street parallel to and north of Kimball Avenue should also be planned and built as additional development takes place on KSU property. This future local street is necessary to provide adequate site access and to convey the traffic from the adjacent sites to the collector streets, College Avenue and Denison Avenue. The future local street has been shown conceptually on Exhibits #1a and #1b.

Collector street improvements will be also necessary. Roadway improvements to College Avenue should extend north and south of Kimball Avenue a sufficient distance for storage of traffic queues approaching the intersection, to allow for widened departing lanes to receive the dual left-turns from Kimball Avenue, and to taper the roadway back to the existing 4-lane cross section. The recent storm sewer construction project on the east side of College Avenue will help facilitate the recommended improvements.

Current improvement plans for the Kimball/Denison intersection include widening Denison Avenue to the south to accommodate a signalized entrance for the NBAF site. Improvements continue south transitioning to the existing 3-lane cross section. No significant modifications to these plans will be necessary to facilitate the corridor recommendations.

North of Kimball Avenue, the previously planned improvements to Denison Avenue should be modified to accommodate the latest development potential on the adjacent KSU properties. A 4-lane section should be planned for approximately one-quarter mile. The 4-lane section will provide one southbound thru lane, two northbound thru lanes, and a two-way left-turn lane separating thru traffic. The east-most northbound lane is necessary to provide lane balance for the dual left-turn lanes on Kimball Avenue. This lane can terminate in a right-turn only movement at the entrance to the KSU Equine Education Center. Depending on the timing of developments on KSU property and funds available during initial construction, the east-most northbound lane on Denison Avenue could be phased for construction at a later date when development warrants the improvement.

Focus Area #2:

Focus Area #2 is Kimball Avenue between Denison Avenue and Meadowlark Road. This segment is currently a 4-lane undivided roadway with two access points. The existing horizontal alignment consists of reverse curves each having a radius of 550 feet and 5 percent pavement superelevation. A new roadway designed in accordance with current design criteria with these geometric characteristics would result in a design speed of approximately 40 mph. The relatively narrow driving lanes of approximately 10 feet per lane reduce the comfort level of a driver operating a vehicle through the curves.

Roadway Geometry Recommendations: The recommended transportation improvements for Focus Area #2 include reconstruction of the roadway to a width sufficient for a 5-lane cross section. Five 12 foot lanes with curb and gutter will be sufficient through this area for a total pavement cross section width of 64 feet. The 5-lane cross section will enable the design and construction of a raised median with a dedicated left-turn lane for the existing NBAF driveway east of Denison Avenue.

The existing reverse curvature of Kimball Avenue will need to be maintained, but the horizontal geometry and roadway cross slope should be modified to improve driver comfort. The concept improvements shown on Exhibit #1b includes reverse curves with a radius of 750 feet and superelevation of 3 percent, sufficient for a current day design speed of 45 mph. A short tangent section is shown between the two curves to facilitate transition of the superelevation. Additional right-of-way may be required on the north side of Kimball Avenue on the inside of the west curve and the south side of Kimball Avenue on the inside of the east curve. The cattle overpass located just west of Meadowlark Road will also need to be removed to facilitate the improvements.

Fire Department Access Recommendation: The existing fire department access to Kimball Avenue just east of Denison Avenue should be closed to facilitate adequate channelization and storage of traffic approaching the Kimball/Denison intersection. The driveway currently allows vehicles to enter the east side of the fire station's garage and park the vehicles facing west for a quick exit during emergency responses. To mitigate the impacts of this driveway closure, the parking lots could be connected around the northeast corner of the fire station. The new traffic signal system at the Kimball/Denison intersection should also include the proper emergency vehicle preemption controls for the fire department to control the traffic signal when crews exit the fire station onto Denison Avenue during emergency response.

NBAF Driveway Recommendation: Options to modify the existing NBAF driveway 800 feet east of Denison Avenue were explored to facilitate improved corridor access for adjacent development opportunities. Due to the existing horizontal geometry and lack of a left-turn lane on Kimball Avenue, the existing driveway is currently restricted to a right-in/right-out form of access through the use of pavement markings. The recommended roadway improvements will address the geometric concerns and allow for a full access driveway, but the high volume of future traffic on Kimball Avenue will cause left-turn movements out of the NBAF driveway to operate at LOS F.

Options were considered to mitigate or minimize excess delay experienced by left-turning movements exiting the NBAF driveway. The options ranged from restricting the left-turn movement to restricting the intensity of site development such that the volume of potential left-turns won't exceed the available capacity. The following list summarizes the options for modifying the existing NBAF driveway and improving access to the undeveloped site directly north of the NBAF site.

- Option #1: Maintain the NBAF driveway in the existing right-in/right-out configuration. Traffic operations will be sufficient in this option due to the minimal conflict and delay resulting from right-turn movements. However, this option provides minimal access benefit to the adjacent site. If this option is implemented, alternative means of egress to North Manhattan Avenue should be constructed for the future research land use site. The site could potentially support up to 50,000 sq. ft. of office space.

- Option #2: Convert the NBAF driveway to a full access driveway allowing right-turns and left-turns in all directions. The recommended corridor improvements will provide a left-turn lane on Kimball Avenue for deceleration and storage of turning vehicles. However, drivers exiting the site and attempting to turn left onto Kimball Avenue will experience excessive delay. If this option is pursued, the site development should be restricted in size to limit the amount of trips generated by the site to approximately 30 total trips or less during the PM peak hour. Using the ITE *Trip Generation Manual* code 710, this equates to about 20,000 square feet of general office space. The actual size of the development will depend on the specific user of the site.

- Option #3: Convert the NBAF driveway to a three-quarter access driveway allowing turning movements in all directions except for the left-turn egress movement onto Kimball Avenue. This option would allow a slightly higher intensity of research/office development, but would require drivers wishing to turn left onto Kimball Avenue to find an alternate route. Converting the Kimball/N Manhattan intersection to accommodate an eastbound U-turn movement could mitigate this concern. If alternate means of egress are implemented, this site could potentially support up to 50,000 sq. ft. of future research land use.

- Option #4: Reconstruct the existing cattle overpass so egress traffic destined for westbound Kimball Avenue could cross over the corridor and then access Kimball Avenue with a right-turn movement. This option essentially would create a grade separated access point for the property and would require significantly more funds to construct the improvements.

<u>Future Access Recommendation:</u> Due to the anticipated future traffic volume, terrain of adjacent properties and the horizontal alignment of Kimball Avenue, no additional access to Kimball Avenue should be allowed between Denison Avenue and North Manhattan Avenue.

Pedestrian and Bicycle Accommodations

Infrastructure improvements for pedestrians and bicyclists should be included with other transportation system improvements. These accommodations are typically provided in the form of off-street facilities such as sidewalks and shared use paths. The use of on-street bicycle lanes is another option to address the needs of bicyclists. However, on-street bicycle lanes placed on high volume arterial streets such as Kimball Avenue tend to be used only by more experienced bicyclists and could have an adverse effect on the speed of traffic due to the increased width of pavement.

Exhibits #1a and #1b include proposed pedestrian and bicycle infrastructure which should be constructed concurrent with other transportation improvements in the corridor. The existing path on the south side of Kimball Avenue has a width less than recommended for shared use paths and will likely be impacted in isolated areas by the roadway and storm sewer improvements. The shared use path should be reconstructed between College Avenue and Denison Avenue to the recommended width of 10 feet. Shared use path reconstruction should continue east of Denison Avenue until it matches the recently constructed 10 foot wide shared use path crossing the NBAF driveway.

A sidewalk of at least 5 feet in width should be constructed along the north side of Kimball Avenue. This sidewalk will provide east/west connectivity to existing sidewalks and also provide pedestrians a path to access signalized intersections for crossing Kimball Avenue. The installation of a pedestrian hybrid beacon should also be considered midway between the Kimball/College and Kimball/Denison intersections to connect sites on the north side of Kimball Avenue with the shared use path and sites to the south of Kimball Avenue.

Transportation Capacity and Potential Development

The transportation recommendations described above will significantly improve transportation capacity. As a general rule of thumb, a 4-lane signalized arterial corridor similar to Kimball Avenue could serve 25,000 to 35,000 vpd depending on the amount of driveway access to the arterial and the volume of traffic on the side streets intersecting the arterial.

The corridor was analyzed through an iterative process to estimate the approximate amount of additional development which could be reasonably served by the transportation improvements. The increase in traffic demand is expected to be partly generated by a modest growth of existing traffic patterns as well as new traffic introduced into the corridor as a result of urban growth on currently undeveloped/underutilized properties. Existing traffic patterns were inflated by 25% to estimate future increases in demand due to influences outside of the study area. The remainder of the future increased traffic demands is anticipated from the areas highlighted on Figure 7 below.

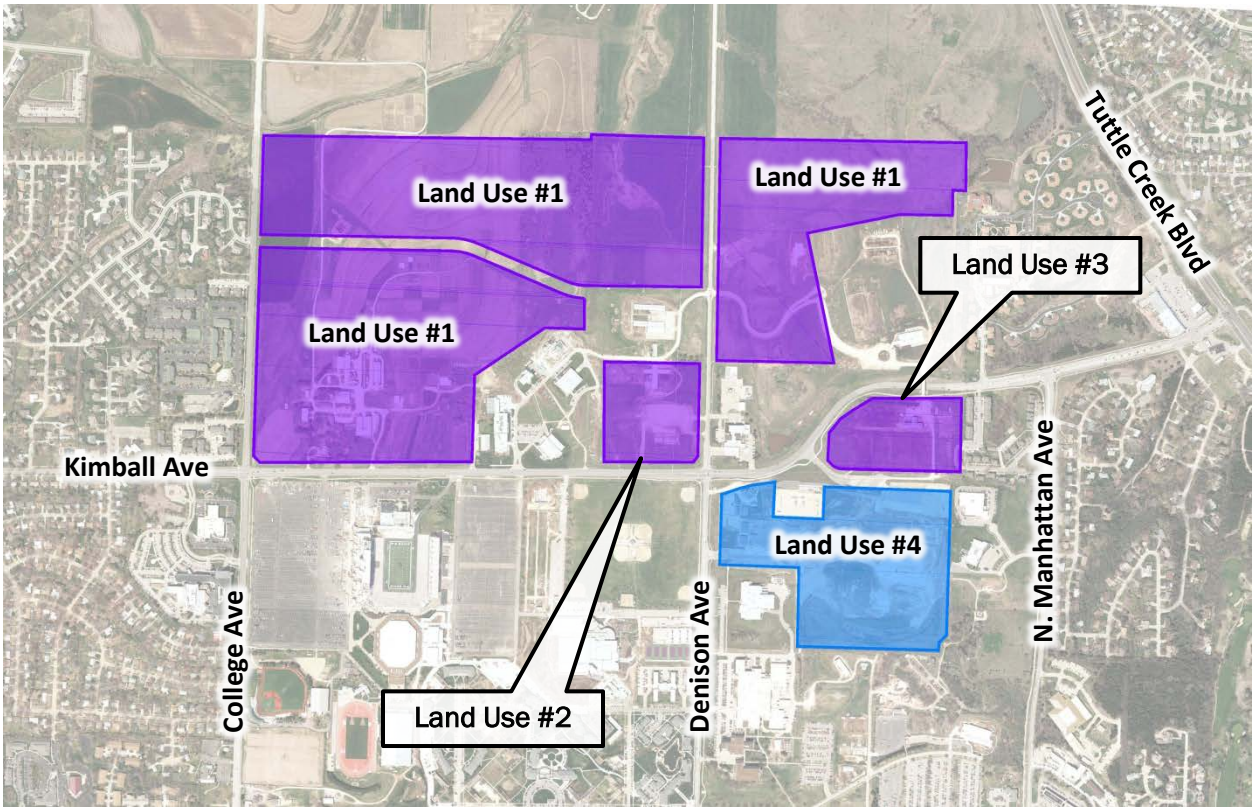

FIGURE 7: Future Land Use Opportunities

The following table summarizes the future potential sites for development and the estimated scope of development which could be served by the improved Kimball Avenue corridor.

Location	Site Size	Future Use	Size	Remarks
Land Use #1	190 acres	Research/Office	1,000,000 s.f.	Floor Area Ratio = ±0.12
Land Use #2	14 acres	Office	250,000 s.f.	Three 5-story buildings
Land Use #3	12 acres	Research/Office	20,000 to 50,000 s.f.	Size Depends on Access
Land Use #4	45 acres	NBAF	300 employees	

The following items were considered in the planning level traffic analysis.

LIST OF TRAFFIC ANALYSIS AND LAND USE CRITERIA AND ASSUMPTIONS

- Existing traffic demand patterns will increase by 25%.
- The maximum intersection capacity utilization goal is 85%.
- The level-of-service provided by the two key intersections will be LOS D or better.
- Traffic signals will operate during AM and PM peak hours on a cycle of 120 seconds.
- New trips generated by sites within one-half north of Kimball Avenue will use the Kimball Avenue corridor.
- Land use code 710 from ITE's *Trip Generation Manual* used for site generated traffic of future Research/Office type land uses.
- Traffic generated by NBAF based on September 2010 *Update to NBAF Traffic Impact Study*.
- Intersection design will provide sufficient storage length and turn-lane entry tapers to avoid 95th percentile queue spillback into thru lanes.

The recommended improvements and the planning level land use assumptions described above will result in estimated traffic demands during the AM and PM peak hours as shown in Figure 8. The Kimball/College and Kimball/Denison intersections improved as previously recommended are estimated to operate between 70 and 85 percent of capacity during peak hours of a typical weekday. At the Kimball/College intersection, the level of service provided is estimated to be LOS D during both peak hours. At the Kimball/Denison intersection, the level of service provided is estimated to be LOS D during the AM peak hour and LOS C during the PM Peak Hour.

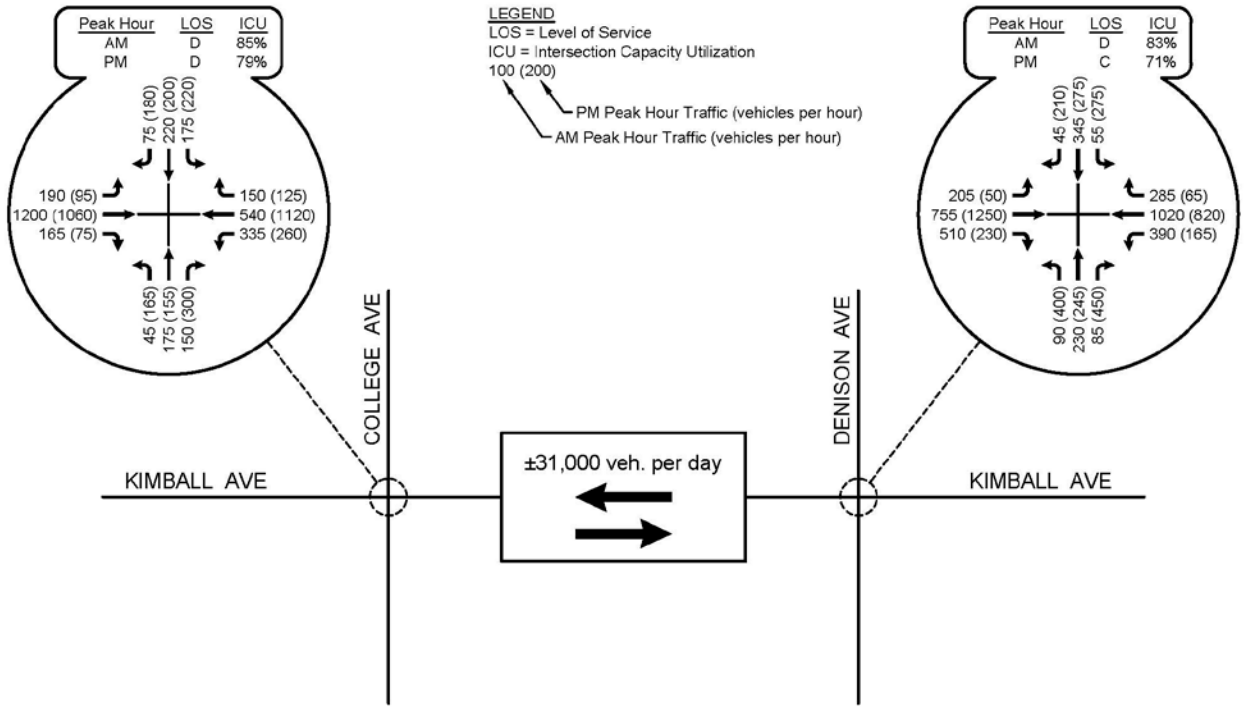

FIGURE 8: Proposed Traffic

Opinion of Probable Project Costs

Significant financial investment will be necessary to achieve the recommended improvements. Opinion of probable construction costs for the various improvement recommendations are summarized below and are provided to assist City Staff with developing budgets and possible phasing of the recommendations. Additional costs for design, construction administration, relocating existing overhead powerlines underground, and other incidental project costs will need to be included during budget preparation.

- Focus Area #1: Kimball Avenue Option #1 (Raised Median) Improvements.
  - **Construction = $10.5 million.**
  - Kimball/College Intersection Improvements (±31% of project budget)
  - Kimball/Denison Intersection Improvements (±45% of project budget)
  - Kimball Ave Improvements between College and Denison (±24% of project budget).
    - 4-lane divided arterial with Raised Median.
    - Pedestrian and bicycle improvements.
    - Incidental storm drainage improvements.

- Focus Area #1: Kimball Avenue Option #2 (Paved Median) Improvements.
  - **Construction = $11 million.**
  - Same as Focus Area #1, Option #1 except Paved Median from College to Denison.

- Focus Area #2: Kimball Avenue Geometric Improvements.
  - **Construction = $3 million.**
  - Kimball Avenue geometric improvements to reverse curves east of Denison Ave.
  - Removal of cattle overpass.
  - Access modifications to NBAF driveway to Kimball.
  - Sidewalk on north side of Kimball Avenue.

- Future Local Street Improvements parallel and north of Kimball Ave.
  - **Construction = $1.65 million.**

- Denison Avenue Improvements north of Kimball Avenue.
  - **Construction = $850,000.**
  - ±1000 feet of 4-lane collector street improvements north of Fire Department.
  - Pedestrian and bicycle improvements.

Future Local Street

FUTURE OFFICE / RESEARCH LAND USE

MATCH LINE

Denison Ave

Future Local Street

College Ave

FUTURE OFFICE / RESEARCH LAND USE

KSU - SHEEP MEAT GOAT FACILITY

Reconstruct North leg for dual receiving lanes. Lengthen left-turn lane.

Consider Pedestrian Hybrid Beacon

KSU Grain Science Entrance

FUTURE OFFICE LAND USE

Kimball Ave

Widen south leg to the west for dual receiving lanes. Lengthen left-turn lane. Mill and overlay existing mainline

BILL SNYDER FAMILY STADIUM

Explore access removal and/or parking lot modifications to combine with access on west side of building.

MATCH LINE

BG Consultants, Inc.
Engineering Architecture Surveying

EXHIBIT #1a - Kimball Avenue Improvements
(Option #1 with Raised Median Shown)
Manhattan, Kansas

Project No.
13-1420M

Date
April 21, 2014

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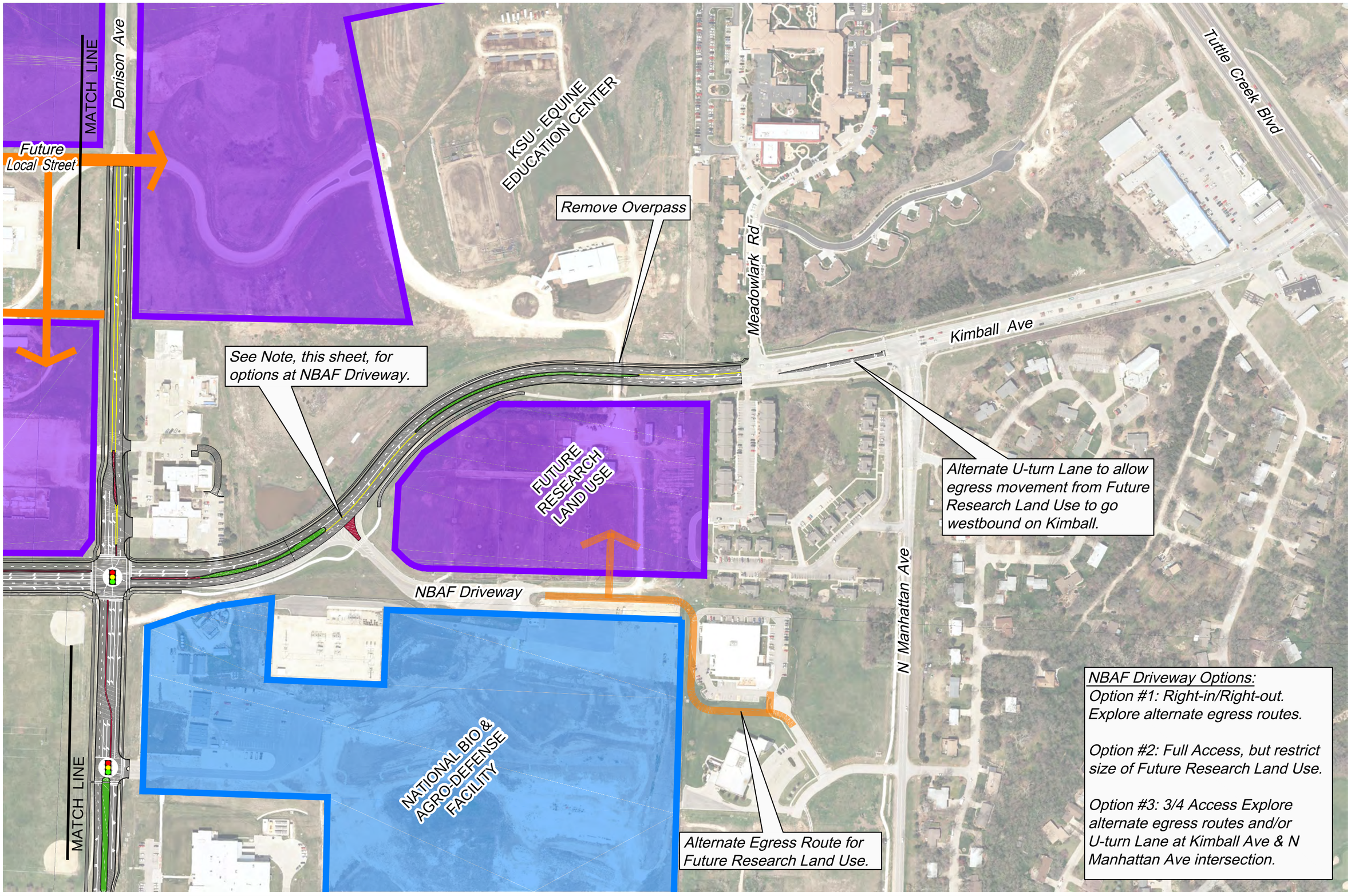
NOT TO SCALE



BG Consultants, Inc.
Engineering ▪ Architecture ▪ Surveying

EXHIBIT #1b - Kimball Avenue Improvements
(Option #1 with Raised Median Shown)
Manhattan, Kansas

Project No.
13-1420M

Date
April 21, 2014

N

NOT TO SCALE