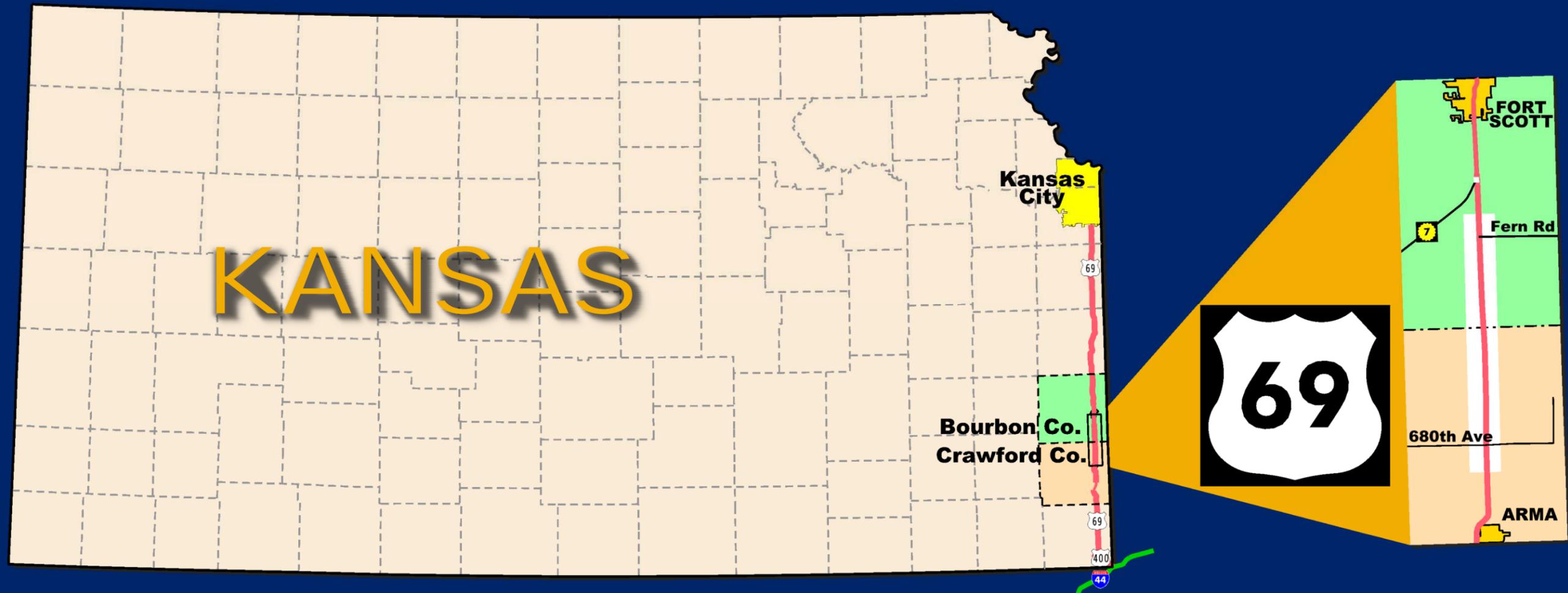


# US-69 CORRIDOR STUDY

Fort Scott to Arma

Projects 69-6 KA-1553-02 and 69-19 KA-1554-02



Prepared for



Report  
August 2011

Prepared by



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#### Disclaimer

The concepts illustrated in this report depict potential improvements for US-69 and the local street network from 680<sup>th</sup> Avenue to Grand Road. The exact location, design and right-of-way of these concepts cannot be determined from the exhibits shown here. Preliminary design will need to be performed to refine the improvements and right-of-way requirements. Changes in access are conceptual in nature and subject to case-by-case review. Access modification may occur with a change in use of the property (including redevelopment and development), when roadway improvements are constructed, and/or when a safety issue needs to be addressed.

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4. North of Deer Road to K-7

## Acknowledgements

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**Preface**

The US-69 Corridor Study was initiated prior to the selection of the T-WORKS expansion and modernization projects. Community input through a local consultation process to assist in determining projects for funding through the next ten-year comprehensive highway program was conducted before and after legislative authorization for T-WORKS. Consequently this study acknowledges the T-WORKS process as shown in the graphic to the right, but the stated purpose of this specific corridor study was to:

1. Develop probable costs and impacts for various facility types, and
2. Assess the probable level of environmental documentation to achieve those facility types.

The study included public involvement with an Advisory Committee, a public open-house meeting and sharing of information via KTOC (Kansas Transportation Online Community) and local media outlets. Consequently, this report's recommendation, while consistent in terms with the T-WORKS announcement, is made on a technical basis, with input from the public, and independent of budgetary influence and constraints.

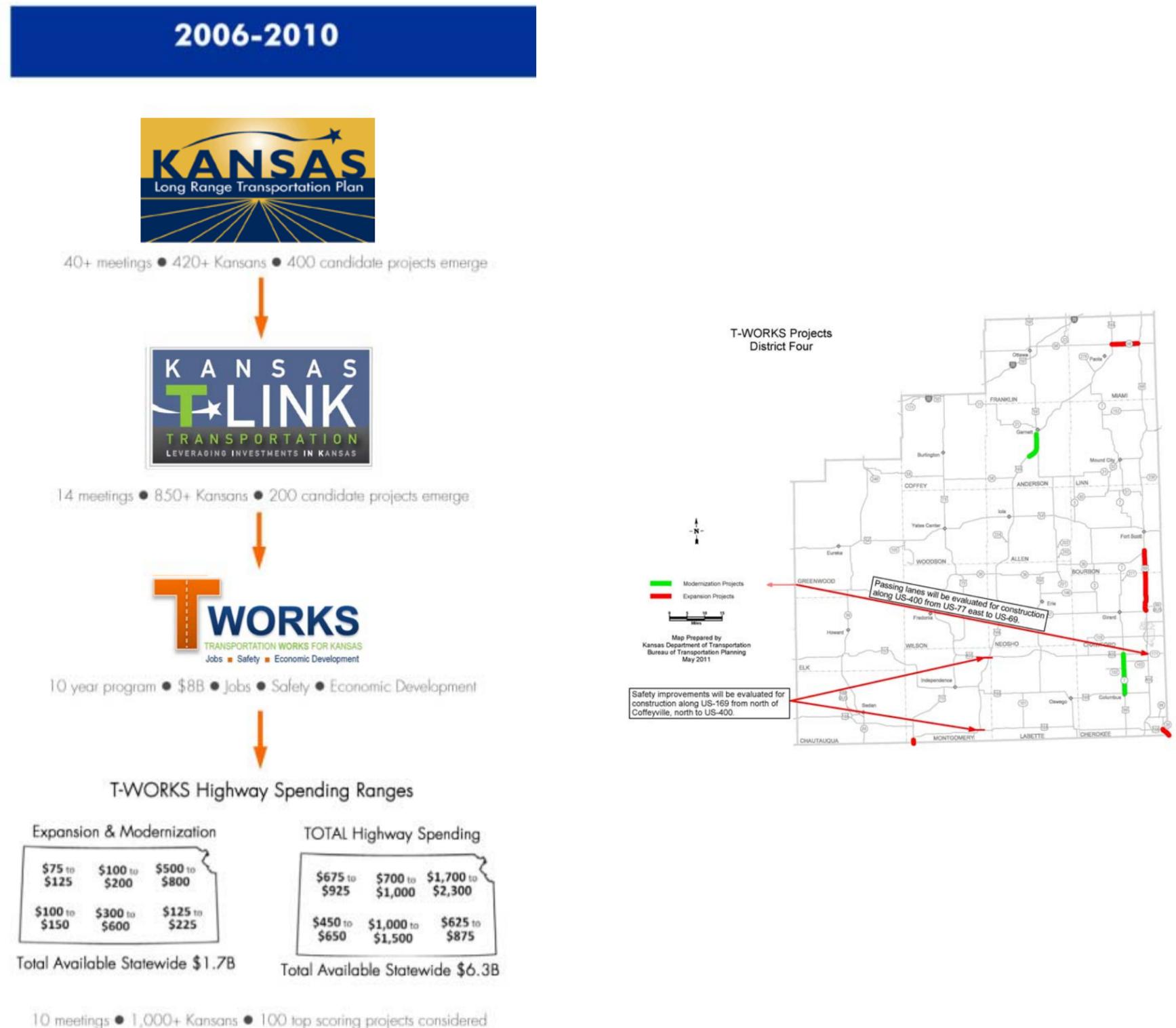
The following is a statewide overview of T-WORKS as provided on the <http://www.kdotapp.ksdot.org/TWorks/> website. While the June 1, 2011 announcement on this segment of US-69 focuses upon highway expansion and modernization, it's important to realize that the highway expansion and modernization projects represent just over 21 percent of the total program. Through the planning process, KDOT heard clearly that preserving our existing system is a priority for Kansans – and T-WORKS reflects that fact. Over half of the \$8B program is dedicated to preserving the roadways and bridges that we already have. In addition to highway investments, T-WORKS is about making sound investments in other modes of transportation. Three points worth remembering about T-WORKS are:

- T-WORKS is sized for our times.
- Practical improvements and designing to a budget will be used to stretch limited dollars.
- T-WORKS projects are widely supported by Kansans.

KDOT and Kansas communities have spent five years developing the T-WORKS program and have 10 years ahead to deliver it. A few updates worth noting include:

- Refined project costs – KDOT has started refining cost estimates from the 2016 planning construction cost estimates to actual programmed costs (i.e., what KDOT estimates it will cost to construct the project in the year in which it will likely be let for construction.)
- Preparing for the future.

KDOT understands that communities need more specific project schedules so they can plan the future. KDOT anticipates announcing project schedules (i.e., year the project will let to construction) in fall 2011. Looking forward, KDOT has made assumptions for the next 10 years. KDOT will monitor market and funding conditions closely including inflations rates, trends in construction prices, construction schedules, trends in material prices, and revenue sources.



**INTRODUCTION**

This section identifies the corridor limits of this particular segment of US-69 while acknowledging other recent studies along US-69 as well as the state and national continuity of US-69.

**This Segment**

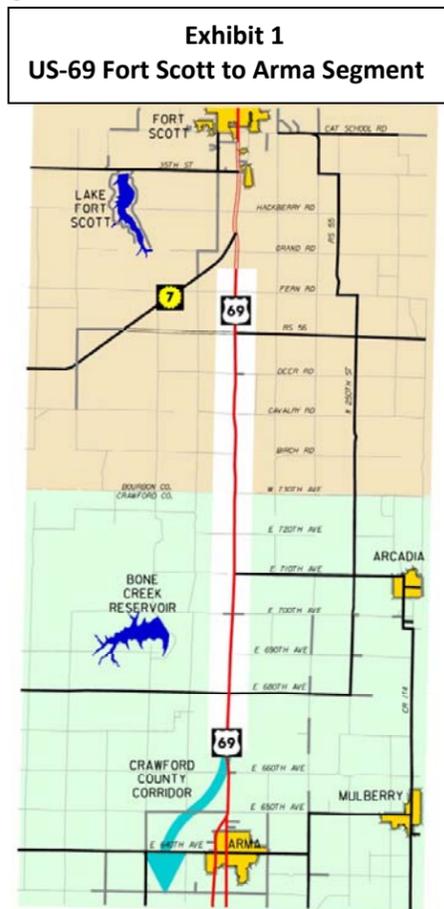
This segment of US-69 encompasses approximately 11 miles as shown in Exhibit 1 and is often referred to as the Fort Scott to Arma segment. The start of the corridor segment begins just south of the junction with 680<sup>th</sup> Avenue. This is approximately three miles north of Arma (and the junction of 650<sup>th</sup> Avenue) where right-of-way was purchased for a four-lane divided highway. The southern limits were determined in coordination with the on-going US-69 Environmental Assessment (EA) for the Pittsburg bypass now referred to as the Crawford County Corridor (CCC). That freeway corridor, as a bypass, is on new alignment and is being conceptually designed to tie into the existing highway alignment immediately south of the 680<sup>th</sup> Avenue junction.

The north limits of this segment are just south of the US-69 junction with K-7, specifically 1,000 feet south of the junction with Grand Road. This is the current transition (when travelling from south to north) from the existing two-lane highway to the four-lane urban expressway at the south end of Fort Scott. The four-lane junction with Grand Road is currently at-grade and would remain at-grade for all of the alternatives under investigation as part of this corridor study.

**US-69 in Context**

US-69 can be thought of in several contextual perspectives, ranging from the Southeast Kansas Region, to the state of Kansas and even to a national perspective.

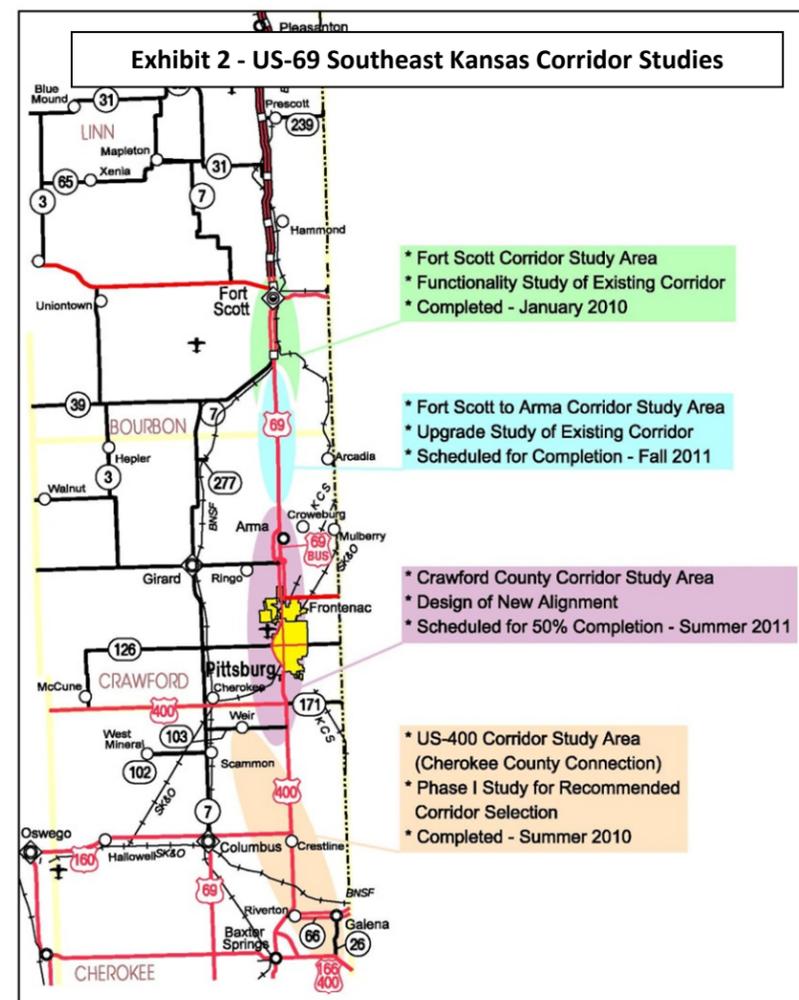
Southeast Kansas - For US-69, Southeast Kansas consists of five counties: Miami, Linn, Bourbon, Crawford and Cherokee. Recent construction activity on US-69 in Linn County brought a four-lane freeway south from Louisburg (junction of K-68) to the junction of US-54 on the north side of Fort Scott. Five miles south of Pittsburg US-69 achieves a dual designation with US-400, a continuous east-west corridor through Kansas from Missouri to Colorado. US-400 also intersects I-44 near the junction of three states; Kansas, Missouri and Oklahoma. Sixteen miles south of



Pittsburg, US-69 veers to the west (also designated US-160) towards Columbus before heading south into Oklahoma.

Recently, a series of studies have been conducted along US-69 that present a consistent vision for US-69 as a four-lane divided highway and ultimately as a freeway from I-44 to Kansas City. Those recent studies include and are shown in Exhibit 2:

- **Fort Scott**
  - This study, completed January 2010, explored the functionality of US-69 through Fort Scott. One of its recommendations was to develop a coordinated and progressive traffic signal system (KA-2279-01), which received funding through KDOT's Corridor Management Program and whose development is now underway. While this study explored portions of US-69 in Bourbon County south of K-7 and a four-lane divided highway, it acknowledged this current study to determine the appropriate facility type.



- **US-400 Corridor Study Area (Cherokee County Connection)**
  - The Phase I portion of this study was completed in June 2010. It recommended that a freeway on new alignment be developed though more detailed evaluation of potential corridors is necessary and will be accomplished through Phase II. The corridor limits for this study match with the corridor limits for the Crawford County Corridor. In fact, coordination between the two studies resulted in the recommendation for a corridor on new alignment at the Cherokee/Crawford County line.
- **Crawford County Corridor Study Area**
  - This study is in the process of preparing an Environmental Assessment scheduled for publication in the fall of 2011. As part of the environmental documentation process, KDOT is preparing plans to approximately 60% complete stage to determine the necessary property acquisition as well as better project cost estimates.

State of Kansas – The US-69 route enters Kansas from Picher, Oklahoma, but current efforts consider the US-69 corridor as a joint corridor with US-400 from its junction with I-44. Consequently, US-69 could eventually go from Missouri to Kansas and then back to Missouri via several dual designations. In the Kansas City region, US-69 joins I-35, then through the 18<sup>th</sup> Street Trafficway joins I-670 and eventually crosses the Missouri River via 7<sup>th</sup> Street Trafficway. More importantly, US-69 is seen as a high-speed mobility corridor parallel to US-71 in Missouri. Current daily traffic volumes along both US-69 and US-71 are shown in Exhibit 3 at points nearly equidistant and approximately 20 to 25 miles apart. Traffic volumes on US-71 are typically twice as high as US-69. Exhibit 4 illustrates the disconnect by facility type along both US-69 and US-71 to Interstate “standards” between Kansas City and I-44.

Nationally - A US designated route originally traversed across state lines serving interstate commerce. Often US routes were precursors to the Interstate System. In fact numerous interstate facilities carry dual designations with US numbered routes. US-69 is no exception and follows portions of I-35 and I-70 in parts of Kansas as well as in Missouri. A map, dating from the early-1960's, illustrates the route from Texas to Minnesota as shown in Exhibit 5.

**Exhibit 3 –Daily Traffic Volume Comparison (US-69 and US-71)**

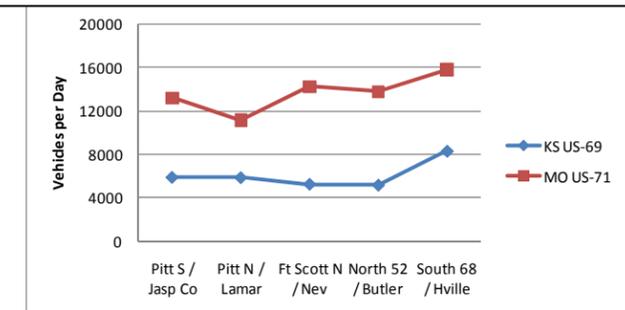




Exhibit 4 - US-69 in Kansas and US-71 in Missouri



Exhibit 5 – US-69 Texas to Minnesota

**Overview of Report Structure**

This report documents the process of a transportation planning effort through the four basic steps of:

1. Existing Conditions,
2. Projected Conditions,
3. Evaluation of Facility Types, and
4. Selection of a Preferred Facility Type.

The process follows the principles of an environmental document including but not limited to consideration of a no-build alternative, identification of environmental resources and recognizing the avoid, minimize, mitigate process of potential impacts. While this report is not an environmental document and has not been scoped by review agencies, it could be considered a precursor to an environmental document.

The conceptual design allows for suitable quantity estimates to support opinions of probable costs as well as the degree of impact as an assessment of potential impact (where applicable). This report focuses on technical elements within the corridor in an effort to provide sound information to decision makers and stakeholders in order to identify a financially feasible and community supported project. Consequently, cost estimates have been prepared independently of T-WORKS and therefore may differ from other published material.

*US-69 is a corridor of regional, statewide and national significance. Consequently the highway functions in many capacities. This segment, from Fort Scott to Arma, ties into other recent studies and on-going design projects. While this report acknowledges and incorporates those relationships, the transportation planning process documented here has been prepared in an independent manner with a matter-of-fact focus.*

**EXISTING CHARACTERISTICS**

This section on existing characteristics explores elements along the corridor itself from both a physical and traffic related perspective as well as the highway’s role in context to the regional and county transportation network.

**Physical**

The physical aspects of the highway focus upon the initial design of the alignment, condition of the existing highway and some of its specific features such as bridges, as well as the location of right-of-way. The surrounding environment is also explored to assist in determining what, if any, impacts could occur if improvement concepts require additional right-of-way.

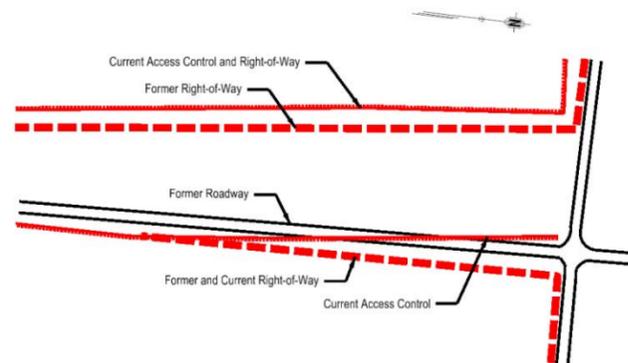
*As Designed Roadway*

The current US-69 highway is a two-lane undivided highway with one 12-foot wide travel lane and one 10-foot wide shoulder in each direction. This two-lane highway lies within the right-of-way for a potential four-lane divided expressway with a 60-foot wide depressed median. Along the corridor, the existing highway would essentially be converted to the southbound travel lanes. The new northbound lanes would be constructed with a 6-foot inside shoulder and a 10-foot outside shoulder. At this time it is not anticipated that the 10-foot wide (inside) existing shoulder would be reduced along the existing highway to six feet.



The east right-of-way line coincides with the former US-69 roadway’s right-of-way as shown in Exhibit 6. In certain cases sections the former US-69 serve as an access road and the right-of-way has been supplemented by an access control line.

**Exhibit 6 – Right-of-way Marker and As-built Plans**



An alignment shift occurs just north of the Crawford / Bourbon County line and utilizes a bridge over the West Fork of Dry Creek. Currently the bridge has two eight foot wide shoulders as seen in Exhibit 7. While slightly narrower than the existing 10-foot wide shoulders along the remainder of the highway, the total shoulder width is appropriate at 16 feet to accommodate a 6-foot wide inside shoulder and a 10-foot wide outside shoulder. Nonetheless, some improvement will be necessary to make the shift in the shoulder width.



**Exhibit 7 – Existing Bridge over North Fork Dry Wood Creek**

The planned four-lane divided highway (with a 60-foot median) included the future lanes with respect to grading limits in order to determine the necessary right-of-way for four-lanes. The right-of-way was acquired and fenced, although the grading for the future lanes was not accomplished as seen in Exhibit 8. In sections immediately south of this corridor study, the horizontal alignment appears to have been placed to avoid areas of rock outcropping.



**Exhibit 8 – Northbound Lanes of US-69**

The design criteria for the current highway’s horizontal and vertical alignment are listed at 70 mph. The design data was checked and confirmed with aerial survey to the existing alignment’s location and terrain. In late-June 2011, a legislative decision was made to increase the posted speed on US-69 from Kansas City to Fort Scott to 75 mph. If the decision is to have this section (Fort Scott to Arma) posted for 75 mph then further design review is needed.

*The Environment*

The environment can be thought of in three categories: natural, cultural and manmade resources. These resources are elements that help define the context of the environment and are identified here through literature research as part of the corridor study’s preliminary environmental review. This segment of US-69 was upgraded during the Comprehensive Highway Program (CHP) under K-4406-01 (Bourbon County) and under K-3276-01 (Crawford County). Later sections of this report will address if changes to the transportation system would likely have any effects upon these resources. The area within the existing right-of-way (even if it has not been graded) has previously received environmental clearance. Consequently, the discussion of the environment typically focuses upon areas outside the existing right-of-way. The location and determination of a specific resource cannot be exactly quantified until further investigation which is beyond the scope of this current study process. This preliminary review evaluates only known resources.

Natural

- Archeology- There is a high potential for encountering existing or other unidentified archeological sites along the corridor. Additional sites that have not been identified may be encountered anywhere outside of the existing right-of-way throughout the study area. An archeological survey should be conducted once the proposed alignment is defined.
- Area of 4(f) impacts (public parks, waterfowl and wildlife refuges) – NONE exist within the study area.
- Area of 6(f) impacts (outdoor recreation property that was acquired or developed with Land and Water Conservation Fund Act (LWCF) grant assistance) – Two skink mitigation sites are present and about the existing right-of-way
- Wetlands and Streams/Ponds- An area of wetland impacts will be based upon the location of mapped wetlands from the National Wetlands Inventory (NWI) Wetlands and Waters of the US map. These include riverine, unconsolidated bottom, aquatic bed, emergent, forested and scrub-shrub wetlands. NWI mapped wetlands may or may not qualify as Corps of Engineers (COE) jurisdictional wetlands when wetland determinations are performed. Fill placed in a COE jurisdictional wetlands or below the ordinary high water mark of COE jurisdictional streams and ponds requires Section 404 permits and mitigation. Many of these areas serve as a surrogate for designated critical habitat (DCH) for several threatened and endangered species, as underlined on the following page.
- Hazardous Waste sites – A search of the Kansas Department of Health & Environment (KDHE) data bases including the KDHE Identified Sites, KDHE Licensed Landfills, National Priorities, and CERLIS (EPA Superfund) did not identify any hazardous waste sites within the study limits.
- Wildlife - Area of woodlands/hardwoods serves as a surrogate for critical habitat, underlined on the following page, for several threatened and endangered species is listed as follows:

## US-69 Corridor Study – Fort Scott to Arma – Projects 69-6 KA-1553-02 and 69-19 KA-1554-02

<b>Federal</b>	Bourbon County	Threatened	Mead's Milkweed
	Crawford County	Endangered	Gray Bat
<b>State</b>	Bourbon County	Endangered	Mead's Milkweed
			American Burying Beetle
			Eskimo Curlew
			Gray Myotis
			Least Tern
	<u>DCH mature woodland</u>	Threatened	<u>Broadhead Skink</u>
			Common Map Turtle
			Eastern Newt
			Eastern Spotted Skunk
			Green Frog
DCH – not affected			Hornyhead Chub
<u>DCH ponds wetlands</u>			Piping Plover
			Redbelly Snake
<b>State</b>	Crawford County	Endangered	American Burying Beetle
			Eskimo Curlew
DCH – not affected			Gray Myotis
<u>DCH mature woodland</u>	Threatened		Least Tern
			<u>Broadhead Skink</u>
DCH – not affected			Common Map Turtle
DCH – damp woodlands			Eastern Newt
			Eastern Spotted Skunk
<u>DCH ponds wetlands</u>			Green Frog
			Piping Plover
			Redbelly Snake
			Snowy Plover
			<u>Spring Peeper</u>

The Kansas Biological Survey has indicated that surveys for Mead's Milkweed must be performed in May-June when the plants are visible. If a survey identifies Mead's Milkweed that would be impacted Section 7 consultation with United States Fish and Wildlife Services (USFWS) will be needed. Impacts to stream corridors in Crawford County where gray bats travel at night to feed on flying insects may need Section 7 consultation with USFWS.

### Cultural and Historical

There are no properties currently listed on the National Register of Historic Places (NRHP) within the study corridor. A list of known potentially eligible national register of historic places has been identified and includes:

- A structure (east) south of 690<sup>th</sup> Avenue,
- Fowler Cemetery and
- The former Dry Wood Town Hall shown in Exhibit 9.

**Exhibit 9 – Former Dry Wood Town Hall**



Additional Activity I investigations should be conducted once the study area is better defined to evaluate any potentially eligible properties that were not evaluated during the CHP projects.

### Manmade Resources

Manmade resources include but are not limited to residential or business relocation or displacement. The majority of building structures are generally set back a "reasonable" distance (on the order of 200 feet or more) from the highway and its current right-of-way. A few areas have structures in closer proximity (less than 200 feet) including the previously noted former Town Hall, as well as the former AT&T switching station located on the east side between Eagle and Fern Roads, and a few other structures.

### Traffic

Traffic related aspects of the corridor consider the current traffic volumes on the highway as well as their patterns and characteristics. This data combined with the dimensions of physical characteristics and types of operational control feeds directly into the assessment of the highway's capacity, both as a segment and through intersection operations. Traffic data also plays a critical role in the assessment of safety experience as the traffic volumes allow a calculation of an accident rate that can be compared to statewide averages.

A variety of acronyms is used and includes the following:

- ADT = Average Daily Traffic
- DHV = Design Hourly Volume
- vpd = vehicle per day
- LOS = Level of Service

### Volumes

Traffic volume data ranges from historic traffic patterns over many years, to monthly variations to daily and hourly traffic volumes. Another aspect of traffic data collection is vehicle classification and percentage of trucks on the highway. This data assists with the forecast of future traffic volumes as well as the assessment of existing operations.

### Historic Traffic Trends

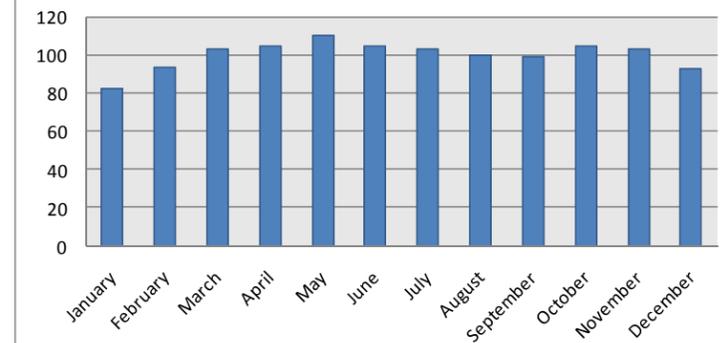
Statewide flow maps were reviewed in five-year increments to assemble historic traffic trends along the corridor. Since 1990 to 2010 traffic has increased from

4,000 to nearly 6,000 vpd. This 2,000 vpd increase in twenty years represents a 50 percent increase in 20-years or 2.05 percent per year compounded.

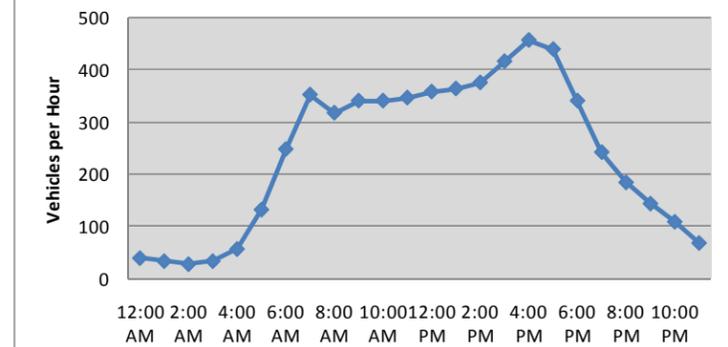
### Permanent Count Station

A permanent count station is located on US-69 two miles north of Fort Scott. That station shows similar traffic trends as previously noted. It also affords data on monthly variation as well as hourly variation, which are illustrated in Exhibits 10 and 11. While traffic volumes vary throughout the year, an Average Daily Traffic (ADT) volume makes adjustments to a consistent level of traffic. The PM peak hour effectively becomes the Design Hourly Volume (DHV).

**Exhibit 10 – Permanent Count Station Monthly Variation**



**Exhibit 11 – Permanent Count Station Hourly Variation**



### Existing Traffic Volumes

Traffic volumes were collected by KDOT's Bureau of Transportation Planning and developed into both ADT and DHV numbers. While some traffic variation occurs along the corridor, associated with turning movements to and from side streets, the corridor's daily volume is very consistent and is said to be at 6,000 vpd in 2010. It is also important to note the traffic volumes on the side streets. In all cases the side street volumes are low. In fact, many of the side streets have very low traffic volumes at or less than 100 vpd. It should be noted that throughout 18 hours a day US-69 has 100 vehicles or more per hour.

The highest side street traffic volume at 450 vpd occurs on 710<sup>th</sup> Avenue (RS 55) which serves the community of Arcadia. The next highest side street traffic volume is 250 vpd and occurs on 700<sup>th</sup> Avenue and may be directly attributed to the Waste Management facility several miles to the east along 700<sup>th</sup> Avenue. As daily traffic volumes, these numbers include vehicles in both directions. A peak hourly traffic volume for a roadway with 100 vpd could be five vehicles in each direction or one vehicle every 12 minutes. Side street traffic volumes are also used to identify if it may be appropriate to widen the median section. The volume threshold ranges between 800 and 1,000 vpd on the side street. None of the side streets are within (or near) that range of traffic volumes.

*Capacity*

A roadway's capacity can be measured in two basic manners: as a highway segment and at key intersections. Often rural highway capacity is dictated by the roadway segment as intersections generally have low side street traffic volumes. Nonetheless both are investigated here to provide a comprehensive assessment of operations.

Highway Segment - Methodology and Analysis

A two-lane highway segment's capacity is dictated by traffic volume as well as physical characteristics of roadway elements, including shoulder width and the percentage of "no passing" zones along the corridor. The traffic volumes used are the peak-hour volume in one direction. While an urban environment may have separate AM and PM peak periods often influenced by directional patterns with commuting trips, rural environments are defined by a Design Hourly Volume (DHV) with a directional distribution that is independent of a specific orientation. Another factor influencing traffic volumes is the percentage of trucks which is calculated at 12 percent. The physical aspects assigned to the highway have a wide shoulder, a posted speed of 65 mph, gentle terrain and a 25 percent no-passing area along the 11 miles.

Exhibit 12 – Level of Service (LOS) Definition	
A	Free flow
B	Stable flow
C	Restricted flow, yet stable
D	High-density flow
E	Unstable flow, at or near capacity
F	Forced flow

The capacity of the highway segment is calculated as a volume to capacity ratio based upon the density of traffic. The capacity is expressed as a Level of Service (LOS) ranging from free flow (LOS A) to forced flow (LOS F) as shown in Exhibit 12. Current traffic operations indicate a LOS C which represents stable flow and is considered acceptable. It is worth noting that other guidelines (1) suggest a LOS B as a goal for rural highways.

Key Intersections – Methodology and Analysis

An intersection's capacity is dictated by traffic volume as well as physical characteristics of roadway elements, including the number, width and configuration of travel lanes as well as type of intersection control (such as stop, yield or signal control). All intersections under evaluation along the corridor are under side street

stop control. Only the intersections with the three classified roadways were evaluated. Their side street traffic volumes range from 100 to 450 vpd. All side street approaches have one lane to accommodate left, through and right turning movements.

The capacity of an intersection is calculated as a volume to capacity ratio based upon the duration of stopped delay. The capacity is similarly expressed as a Level of Service (LOS) ranging from free flow (LOS A) to forced flow (LOS F). Current traffic operations indicate a LOS B which represents stable flow and is considered acceptable. Turning movements from the mainline highway operate at LOS A.

*Safety Experience*

Safety experience considers the most recent period of available accident data for five years. Consequently, a review of crashes that occurred between 2004 through 2008 was conducted. The review includes:

- **How many** accidents occurred,
- **When** the accidents occurred,
- **What type** of accident occurred,
- The **severity** of the accident, and
- **Where** the accidents occurred.

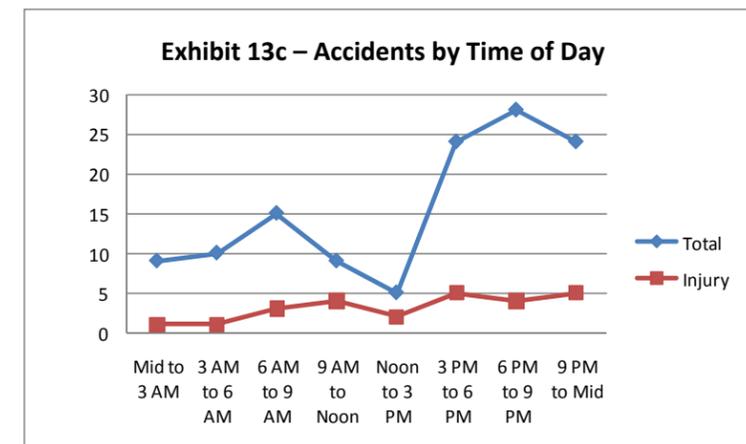
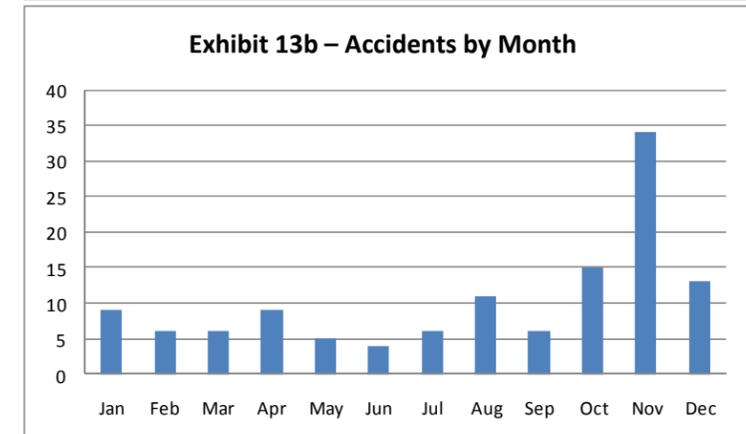
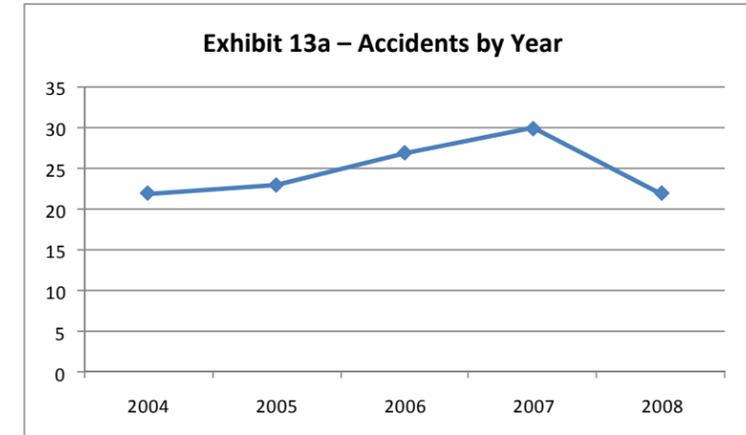
Finally, accident rates are developed and compared to statewide rates.

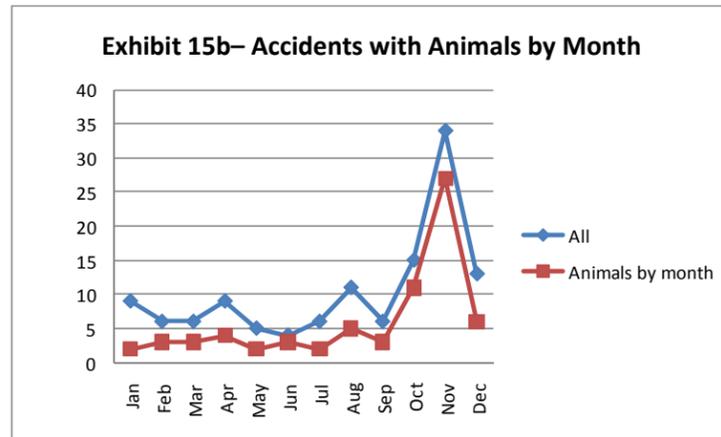
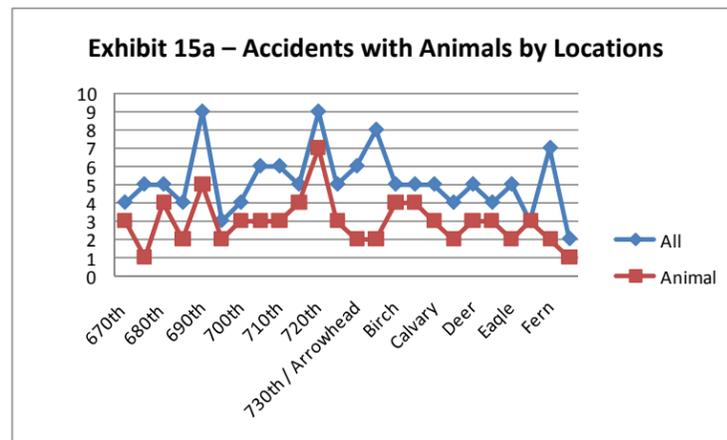
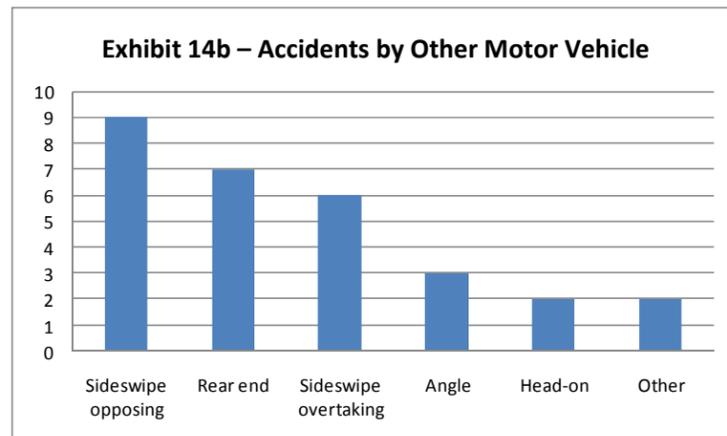
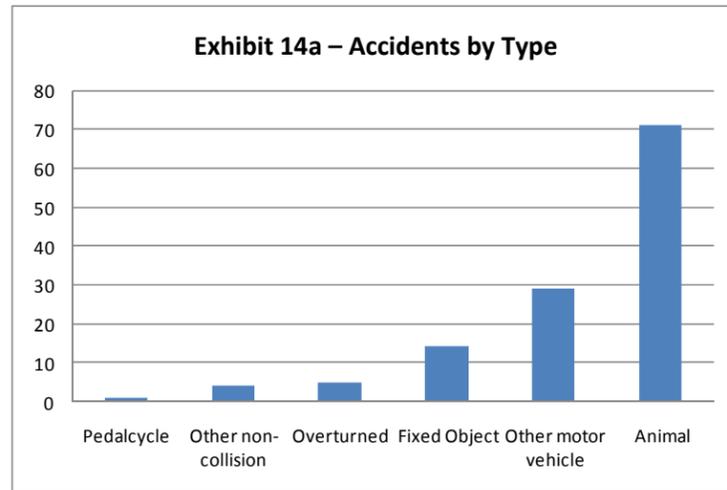
Throughout the five-year period a total of 125 accidents occurred. A year-by-year total is shown in Exhibit 13a and indicates that while the number of accidents rose between 2005 and 2007, the number of accidents in 2008 is equal to the number of accidents in 2004. When reviewing what month accidents occur, it is obvious that the month of November is significantly higher (generally three times higher) than any other month (see Exhibit 13b). And most of the accidents occur in the PM period from 3 PM to midnight (see Exhibit 13c).

The most prevalent type of accident involves collisions with animals, representing 56 percent of all accidents as shown in Exhibit 14a. The second most common accident type is with other vehicles and can be further subdivided into sideswipe opposing, rear end, and side swipe overtaking as shown in Exhibit 14b. One accident occurred with a bicycle and resulted in a fatality. A second fatality occurred with a single vehicle that lost control. The injury rate for all accidents is 19 percent, which is consistent with other rural highways.

The accidents are recorded by location and have been plotted in ½-mile increments as shown below. Only 8 percent (a very small amount) are associated with intersections or are intersection related. This is consistent with low side street traffic volumes.

What can attribute to the high number of accidents in the month of November? A review of the most prevalent type of accident (animal) on a monthly basis provides a direct correlation with animal accidents. This can also explain the higher number of accidents during the PM hours. And it can also be related to the location of "spikes" in the number of accidents, as shown in Exhibits 15a and 15b.



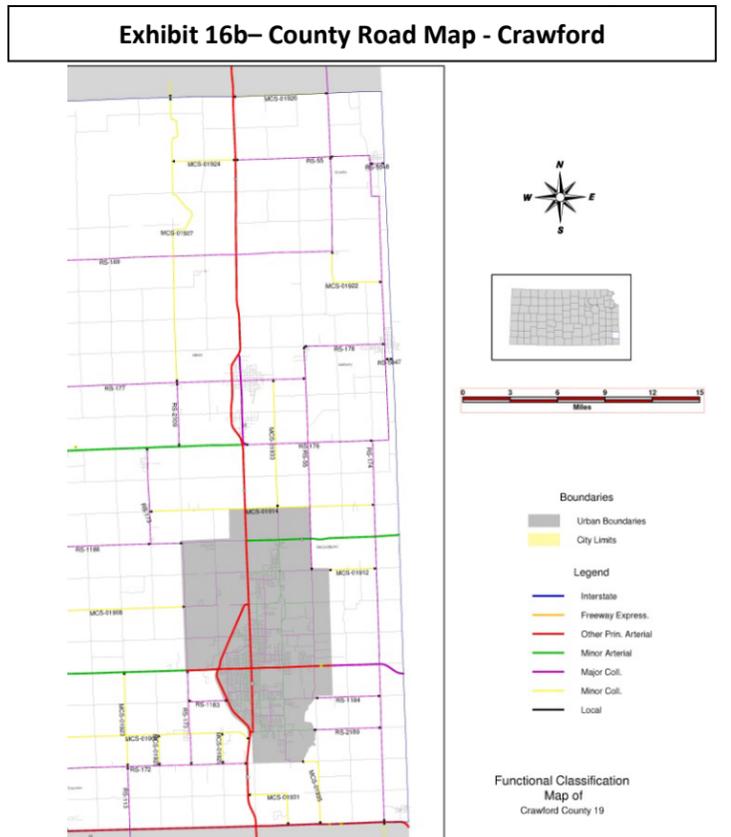
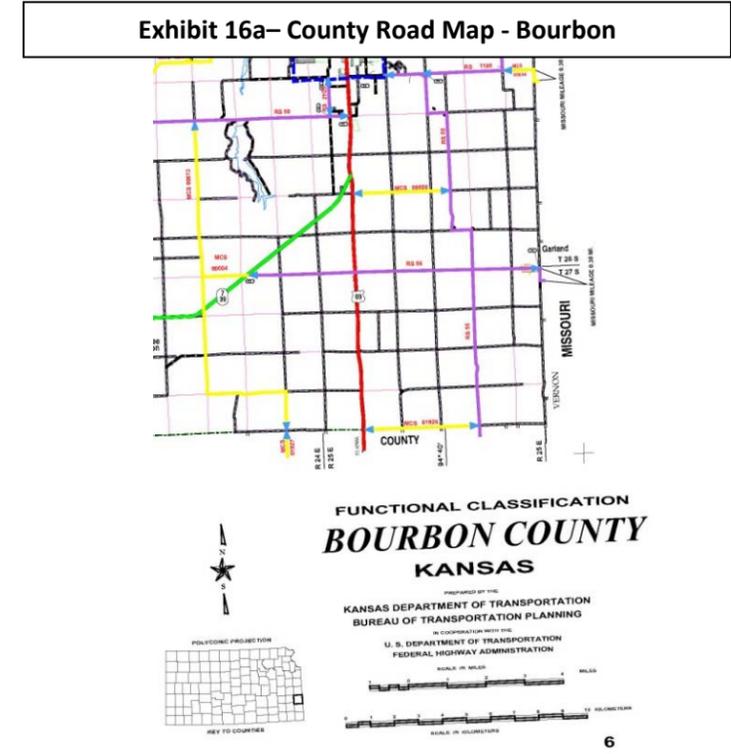


A comparison to statewide average accident rates was conducted. Statewide rates for total accidents are expressed in million vehicle miles travelled. This is calculated by multiplying the traffic volume by the length of the corridor times 365 days times five years. Statewide rates for fatal accidents are expressed in hundred million vehicle miles travelled. Rates are compared to similar facilities by number of lanes, undivided or divided, rural or urban and by the degree of access control - none, partial or full. The existing US-69 is a two-lane undivided rural partial access control facility. For this segment of US-69, the total rate is equivalent to the statewide average while its fatal rate is less than the statewide average.

### Regional and County Transportation Network

As previously noted, US-69 has a national and statewide transportation function. The highway also has a regional and local role as well with access to communities, businesses and private properties. Understanding the adjacent regional and county transportation network (as depicted by functional classification maps by county in Exhibits 16a and 16b) assists in developing appropriate access control measures to ensure regional mobility and community connectivity through the local transportation network.

As previously noted, three roadways are classified as rural secondary (RS) facilities; 680<sup>th</sup> Avenue (RS 169), 710<sup>th</sup> Avenue (RS 55), and Eagle Road (RS 56). Three other roadways are classified as minor collector secondary (MCS) and include 710<sup>th</sup> Avenue, west of US-69, (MC 01924), Arrowhead Road (MCS 01926) and Grand Road (MCS 00608). County maps also indicate paved and gravel roadways.



**Exhibit 17– County Roads with Signed Restrictions**



**Eagle Road**



**710<sup>th</sup> Avenue**



**680<sup>th</sup> Avenue**

Elements to consider with the county networks are physical constraints. Those constraints can range from a discontinuous roadway network, to restrictions on roadways (as shown in Exhibit 17) and bridges, such as weight and obstruction clearances, to terrain and topographic issues from low water crossings to steep grades. A brief discussion of these constraints follows.

*Discontinuous Roadway Network*

An initial review of the local roadway network considers first the presence of a roadway and then the condition of the roadway. As a north-south highway, parallel roadways were reviewed both west and east of US-69. From a county road designation perspective US-69 can also be referred to as 220<sup>th</sup> Road. To the west, the first continuous north-south roadway (from 680<sup>th</sup> Avenue in Crawford County to Grand Road in Bourbon County) is 210<sup>th</sup> Road. To the east, the first continuous north-south roadway is 250<sup>th</sup> Road or the former US-69 highway more than 70 years ago. 210<sup>th</sup> Road is a gravel road and is known to have standing water in certain locations. The material along 250<sup>th</sup> Road varies from gravel to paved material. It has a concrete arch bridge north of Deer Road.

In terms of east-west continuity, the local street network is interrupted by several physical features including Bone Creek Lake, Dry Creek and Walnut Creek. The majority of communities (Garland, Arcadia, Coalvale and Gross) are located on the east side of US-69 (along the former highway's route) while fewer communities (Englevale and Cato) are located on the west side of US-69. The RS routes are the principal roadways with east-west continuity. The RS 55 designation along 710<sup>th</sup> Avenue does not continue west of US-69, although this is classified as a

minor collector secondary roadway. However, 710<sup>th</sup> Avenue west of US-69 has a low water crossing and can often be closed because of high water, as shown in Exhibit 18.



**Exhibit 18– County Road with Warning Sign**

*Bridge Restrictions*

A review of "off-system" bridges identified numerous bridges and culverts along the adjacent and surrounding county road network at both the local and rural secondary classifications. Several of the structures have a low sufficiency index rating which include postings, such as weight restrictions. A structure built in 1965 along 210<sup>th</sup> Road (west of US-69) between 700<sup>th</sup> and 710<sup>th</sup> Avenues is posted at a 7 ton weight limit. Two structures along RS 169 that follows 680<sup>th</sup> Avenue and 250<sup>th</sup> Road (east of US-69) built in the 1920's also have low sufficiency indices. These existing limitations on the surrounding county network may influence access modifications under concepts considered in later sections of this report.

*Terrain and Topographic Issues*

Often issues of topography (including drainage features) can affect several aspects of the local road network. Even the discontinuous crossing of US-69 by Arrowhead Road and Birch Road is directly attributed to the presence and location of Dry Creek. Side street terrain adjacent to US-69 can be generally categorized by county. In Crawford County, the side street terrain is very rolling while in Bourbon County the side street terrain is relatively flat.

*The highway segment being evaluated was planned to be a four-lane divided expressway. The current highway was constructed in the mid-1990's and essentially built adjacent (on the west side) of the former two-lane highway. This construction included acquisition of sufficient right-of-way to construct the four-lane expressway with a 60 foot wide median. In terms of physical and operational conditions, US-69 is performing well. The environmental review identifies several elements that will require review if improvements occur outside the existing right-of-way. The surrounding local street network has several restrictions that may also influence the location and type of any access modifications.*

**PROJECTED CHARACTERISTICS**

This section on projected characteristics continues the exploration of specific elements along the corridor into the future. While it is acknowledged that time will cause physical deterioration to the highway, review of the condition of the pavement and its recent maintenance activities have determined that no major rehabilitation or reconstruction (for cost estimating purposes) is anticipated to the design year, 2040. Consequently, the most important element for the projected characteristics is forecasting future traffic volumes and determining the highway’s capacity.

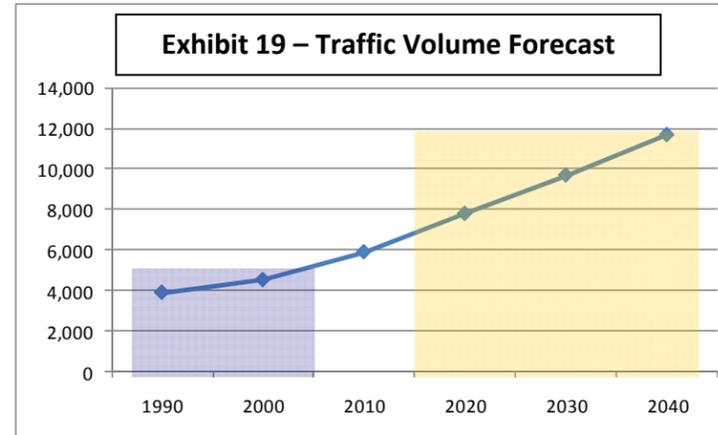
**Future Traffic Volumes (Design Year)**

Design year traffic is typically forecast to 20 years and may include the estimated time of construction. At the start of the corridor study, neither a funding commitment for construction nor a schedule for implementation was known. And since obtaining funding, permitting, design and construction can often take many years, traffic was forecast to the year 2040 - 30 years from start of the study in 2010.

*Methodology*

The forecast was conducted by KDOT’s Bureau of Transportation Planning. The bureau utilizes a statewide travel demand forecasting model based upon the typical four-step forecasting process of trip generation, trip distribution, mode choice and trip assignment. The model portrays the transportation network as a series of links and nodes reflecting attributes of length, speed and capacity as well as being calibrated to existing traffic volumes. The model’s area also includes an “external” area outside the state of Kansas that may affect traffic volumes within the state of Kansas. Of particular interest for this US-69 corridor is the parallel north-south highway of US-71 in Missouri some 20 miles to the east of US-69. US-71 is currently a continuous four-lane divided highway from Kansas City to I-44. And while it currently changes between a freeway and an expressway throughout its length, the model links’ segment capacity does not change. US-71 is in the process of being converted to a freeway (meaning access only via interchanges). Consequently only access points could be expected to change, yet these correspond to the nodes or junctions with the major street network, typically corresponding to state highway or classified roadways, and few modifications were necessary. Similarly the future network along US-69 required few modifications beyond increasing link capacity to an assumed four-lane divided facility from I-44 to Fort Scott.

The ADT volume forecast to 2040 is estimated at 11,600 vpd. This is a difference of 5,900 vpd over the current traffic volume of 5,700 vpd and represents a 100 percent increase in 30 years or 2.40% percent per year compounded. This rate of increase is greater than the historic increase in the previous 20 years and in part is a reflection of the change in available capacity as well as regional growth. Exhibit 19 illustrates both historic growth trends as well as forecasted traffic volumes along this segment of US-69.



Traffic volumes on side streets were also forecast and are projected to experience minimal growth. 710<sup>th</sup> Avenue is projected to increase from 450 vpd to 525 vpd. This is a difference of 75 vpd and represents an 18% increase in 30 years or less than 1 percent per year compounded.

**Capacity Analysis (Design Year)**

As previously discussed, roadway capacity can be measured in two basic manners: as a highway segment and at key intersections. Both types are investigated here to provide a comprehensive assessment of operations.

*Highway Segment*

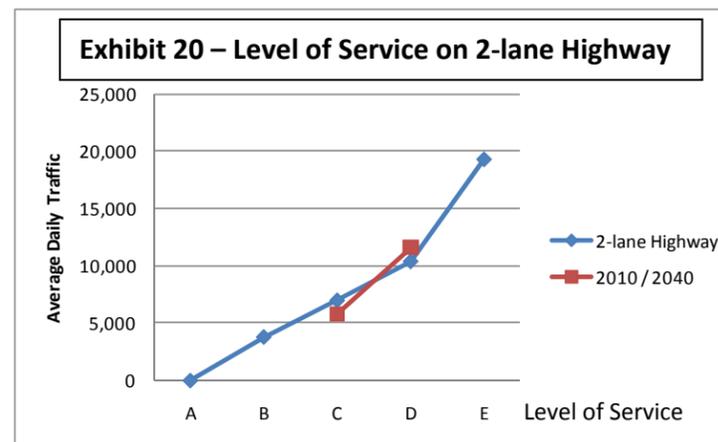
The projected characteristics first assume a no-build condition. This means that the two-lane undivided highway segment’s capacity is controlled by the same physical characteristics of roadway elements, including shoulder width and the percentage of “no passing” zones along the corridor as are existing conditions. Only the traffic volumes change. The capacity of the highway segment is calculated as a volume-to-capacity ratio based upon the density of traffic. The capacity is expressed as a Level of Service (LOS) ranging from free flow (LOS A) to forced flow (LOS F). Projected traffic operations indicate a LOS D which represents high-density flow as shown in Exhibit 20.

This represents a degrading of the level of service over existing conditions and indicates the need to plan for capacity improvements. Traffic volumes would need to increase significantly before approaching unstable flow or LOS E. The next chapter on Alternatives discusses the capacity under a four-lane divided facility.

*Key Intersections*

Similarly, the projected characteristics for intersections first assume a no-build condition. This means that the intersection’s capacity is controlled by the same physical characteristics of roadway elements, including the number, width and configuration of travel lanes, as well as type of intersection control (stop control). Again, only the intersections with the three classified roadways were evaluated. The capacity of an intersection is calculated as a volume to capacity ratio based upon the duration of stopped delay. And in much the same manner as the highway segment, projected traffic operations for the intersections indicate a LOS C which represents restricted but stable flow and is considered acceptable. Nonetheless, this represents a degrading of the level of service over existing conditions. Turning movements from the mainline highway continue to operate at LOS A.

*Before the design year 2040, traffic volumes will warrant capacity improvements to the two-lane highway that would be sufficiently addressed by a four-lane highway.*



**ALTERNATIVES**

This section provides an overview of the basic alternatives as well as a more detailed description and depiction of the alternatives through a series of aerial based maps. A comparison of the alternatives is provided based upon probable operations, costs and environmental documentation.

**Overview**

In the most general sense, two alternatives are being evaluated: a no-build alternative and a build alternative. While the build alternative can be correctly categorized as a four-lane divided highway, its role and function is made more complex by the degrees of access control, both in terms of type and location. Nonetheless, a common element for all of the build alternatives is the use of the existing alignment corridor and use of the existing two lanes. Under certain concepts, additional right-of-way may be required, however it would be immediately adjacent to the existing highway. Unlike a bypass on new location such as the Crawford or Cherokee County Corridors, this 12-mile segment proposes to utilize the existing alignment.

A series of a four-lane divided highway types were considered and include:

- Expressway (with 1/2-mile and 1-mile median opening spacing)
- Freeway
- Upgradeable Expressway (extent of construction is dependent upon funding)

An “expressway” is defined as:

- A multi-lane highway with a median
- Cross roads meet the highway at the same level (at-grade) as the highway (as shown in Exhibit 21)
- Access is more controlled (fewer access points) than on two-lane highways

**Exhibit 21 – Example of an At-grade Junction on an “Expressway”**



A “freeway” is defined as:

- A multi-lane highway with a median
- Access allowed only at interchanges
- Motorists enter and exit the highway using on- and off-ramps (as shown in Exhibit 22)



An “upgradeable expressway” is defined as an expressway where sufficient right-of-way has been purchased to build a freeway in the future. The primary difference between an expressway and a freeway is access control, or how vehicles enter and exit the highway. There are many possible stages of upgradeable expressway, depending on when access roads, bridges and future interchanges are constructed. An expressway is not considered upgraded to a freeway until the ONLY access points permitted are at interchanges. There are no at-grade road intersections on a freeway.

The upgradeable expressway could include all access roads, and all grade separations (bridges), while allowing at-grade intersections at future locations for interchanges. This level of design is close to a freeway and is reflected in the costs being nearly 70 percent of the freeway costs. Under this scenario, three future interchanges are conceptually planned for 680<sup>th</sup> Avenue (RS 169), 710<sup>th</sup> Avenue (RS 55/MCS 01924), and Eagle Road (RS 56). Other levels of upgradeable expressway (dependent upon funding) may only build some of the access roads and overpasses/underpasses.

**Description of Alternatives**

The following sections provide a basic description of the alternative being considered along with a discussion of key elements that are unique to the alternative, such as access control measures at public road junctions. Each alternative begins and ends at the same point along the corridor and follows certain assumptions, although those assumptions are subject to change during a design phase. At the south end of the corridor, the project begins approximately 0.75 miles

south of 680<sup>th</sup> Avenue. This is where the two-lane highway remains and the transition to the four-lane highway begins. It is acknowledged that the Crawford County Corridor goes on new alignment immediately south of 680<sup>th</sup> Avenue. At the north end of the corridor, the project will tie in with the four-lane highway approximately 0.20 miles south of Grand Road. The existing junction of US-69 with Grand Road would remain at-grade. While several phasing sequences are possible regarding which project might get constructed first, which in turn could affect project limits and assignment of probable costs, this study assumes that the 680<sup>th</sup> Avenue intersection is included within these project limits. Again, these assumptions are subject to change during the design phase.

*Expressway*

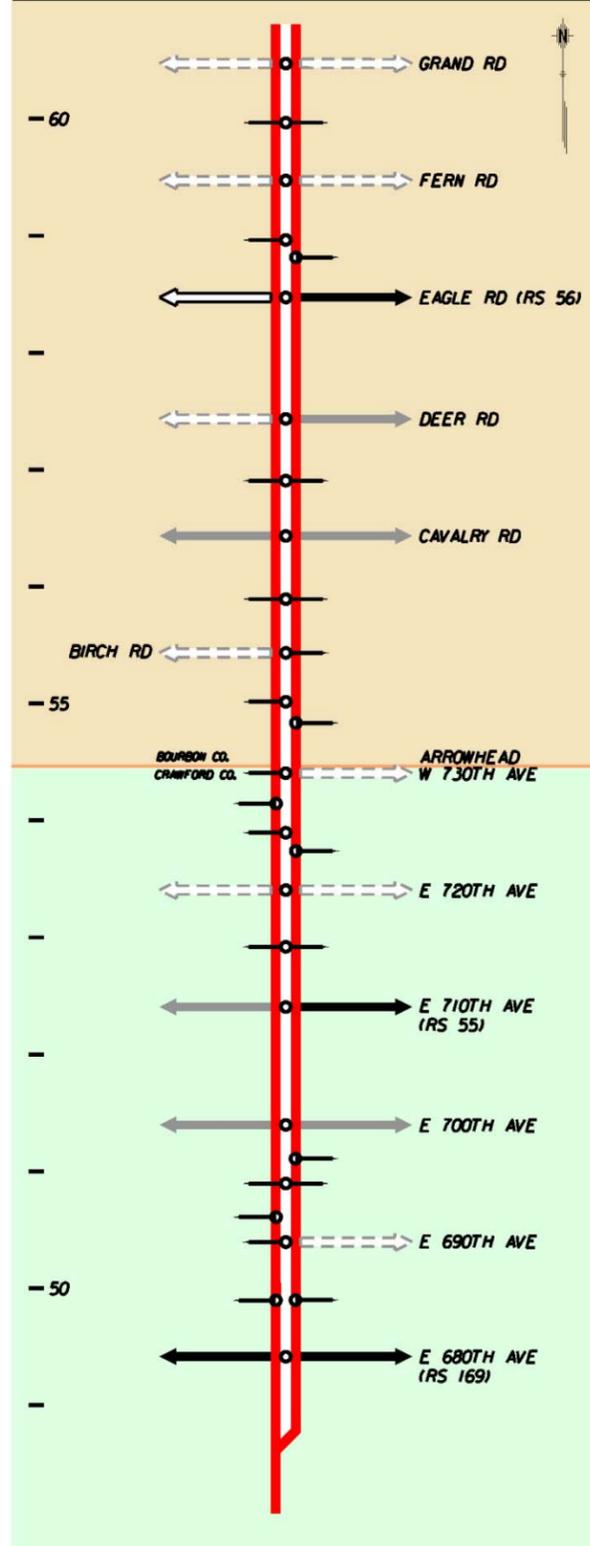
The expressway alternative allows for at-grade access. The access points are generally at the junction with public roads and are accommodated by a median opening, typically with 1-mile spacing. An access point can also include a private driveway typically not located at a uniform spacing. The initial four-lane highway design allows for access to private property and often located such access points at a consistent spacing of one-half mile. Consequently an initial form of expressway retains access to private property and often provides a median opening at the 1/2-mile spacing. Access points not at the 1/2-mile may remain with “right in, right out” turning movements.

Construction activities include the grading for and construction of the roadway (two 12-foot travel lanes), along with a 6-foot inside shoulder and a 10-foot outside shoulder. Two bridges would be constructed including the crossing of the West Fork of Dry Creek and Walnut Creek, both immediately north of the Crawford-Bourbon County line. The median opening designs are proposed to follow the design guidelines for projected turning movements at median openings. If left turning movements into a side street meet or exceed 150 vpd, then an exclusive turn bay is provided. Similar traffic volume warrants are accordingly used to design for other turning movements such as right turns entering a side street, and right turns exiting a side street. The only intersection whose turning movements are projected to require a left turn pocket for the basic median opening design occur at the junction of 710<sup>th</sup> Avenue which provides access to the town of Arcadia, four miles east of US-69.

For consistency purposes in making comparisons to other alternatives, Exhibit 23 provides summary data including the length of elements that may not yet directly apply to this concept such as the length of access roads, bridges or interchanges, as well as the area of probable right-of-way.

Element	Unit	Value
Length of mainline roadway	miles	11.6
Length of access roads	miles	0.0
Number of grade separations	each	0
Number of interchanges	each	0
Area of right-of-way (estimated)	acres	0 to 10

**Exhibit 23 – Summary Map – Expressway  
(1/2 mile median opening spacing)**



**LEGEND**

- Access Point/Median Opening
- Right in Right Out
- Direction Access To Property
- Existing 2-Lane Roadway
- Expressway
- Freeway
- Classified Paved Roadway
- Classified Gravel Roadway
- UnClassified Paved Roadway
- UnClassified Gravel Roadway
- Proposed Access Roads
- Access Road (CCC)
- Proposed Interchange
- Proposed Bridge

The preferred design of an expressway is to have access points spaced at a minimum 1-mile interval and only serving public roadways. With the existing public roadway network at 1-mile spacing, it is feasible to achieve this desired median opening spacing, although private access points may either need to be relocated to the side street or an access road is needed in order to provide access. The determination of where access roads are located follows several basic principles including:

- Property characteristics that determine the need for an access road.
  - Having frontage to only US-69, or
  - Having frontage to a side street.
- Access road direction based upon.
  - The location of the property, as well as
  - The terrain and probable impacts of an access road
- Access roads require public right-of-way and will be under the respective County's maintenance. Access roads may serve one or more properties.
- The relocation of an access point to a side road via only a driveway does not require right-of-way.

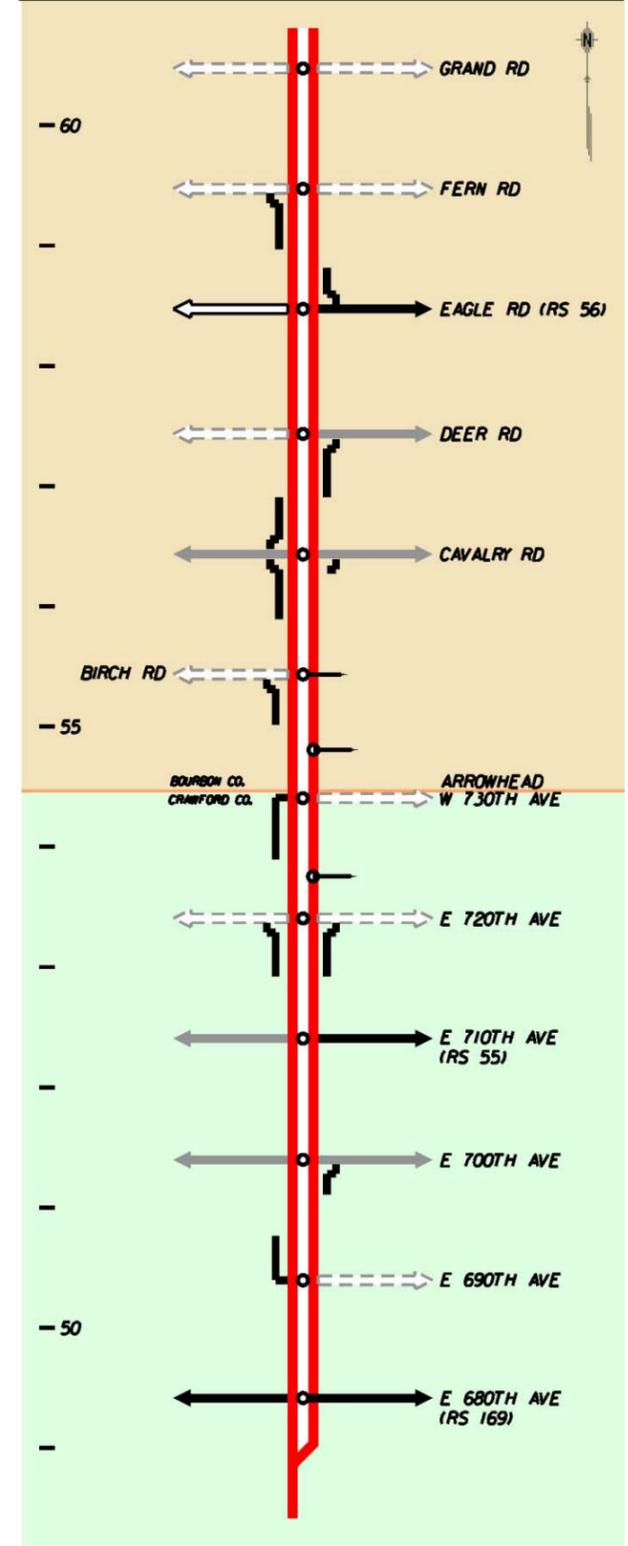
The key point here is that properties that only have frontage to US-69 require an access road or consideration of total property acquisition. The location of a relocated driveway and the compensation for such relocation are addressed during acquisition negotiations with the property owner. Consequently the costs for driveway relocation are included as part of the right-of-way estimate while costs for access road construction are provided in two line items - a cost for right-of-way acquisition and a cost for access road construction. The access management strategy of a 1-mile median opening spacing results in the need for over five miles of access roads along the corridor. Summary data for the expressway with 1-mile median opening spacing is shown in Exhibit 24.

Roadway Section

The median width for the expressway concept is 60 feet. The 60-foot measurement is from the inside edge of travel way to inside edge of travel way. This width is the same for either expressway option. A wider median, dictated by side street traffic volumes in excess of 1,800 vpd, is not needed. The highest projected traffic volume for a side street in the design year (2040) is only 750 vpd.

Item	Unit	Value
Length of mainline roadway	miles	11.6
Length of access roads	miles	5.3
Number of grade separations	each	0
Number of interchanges	each	0
Area of right-of-way (estimated)	acres	50

**Exhibit 24 – Summary Map – Expressway  
(1 mile median opening spacing)**



## US-69 Corridor Study – Fort Scott to Arma – Projects 69-6 KA-1553-02 and 69-19 KA-1554-02

### Freeway

The freeway alternative allows for access only at interchanges. Interchanges are typically provided at only public streets that have been classified, such as a rural secondary classification. Interchange spacing in a rural environment generally ranges between 4 to 7 miles apart. Interchange spacing in an urban environment can range between 1 to 2 miles apart. Within the corridor, only three RS classified public roadways intersect with US-69 including:

1. 680<sup>th</sup> Avenue (RS 169) east and west of US-69
2. 710<sup>th</sup> Avenue (RS 55) east of US-69, and
3. Eagle Road (RS 56) east and west of US-69.

Other interchange warrants include (from AASHTO's A Policy on Geometric Design of Highways and Streets):

- Design designation
- Reduction of congestion
- Improvement of safety
- Site topography
- Traffic volume
- Road-user benefits

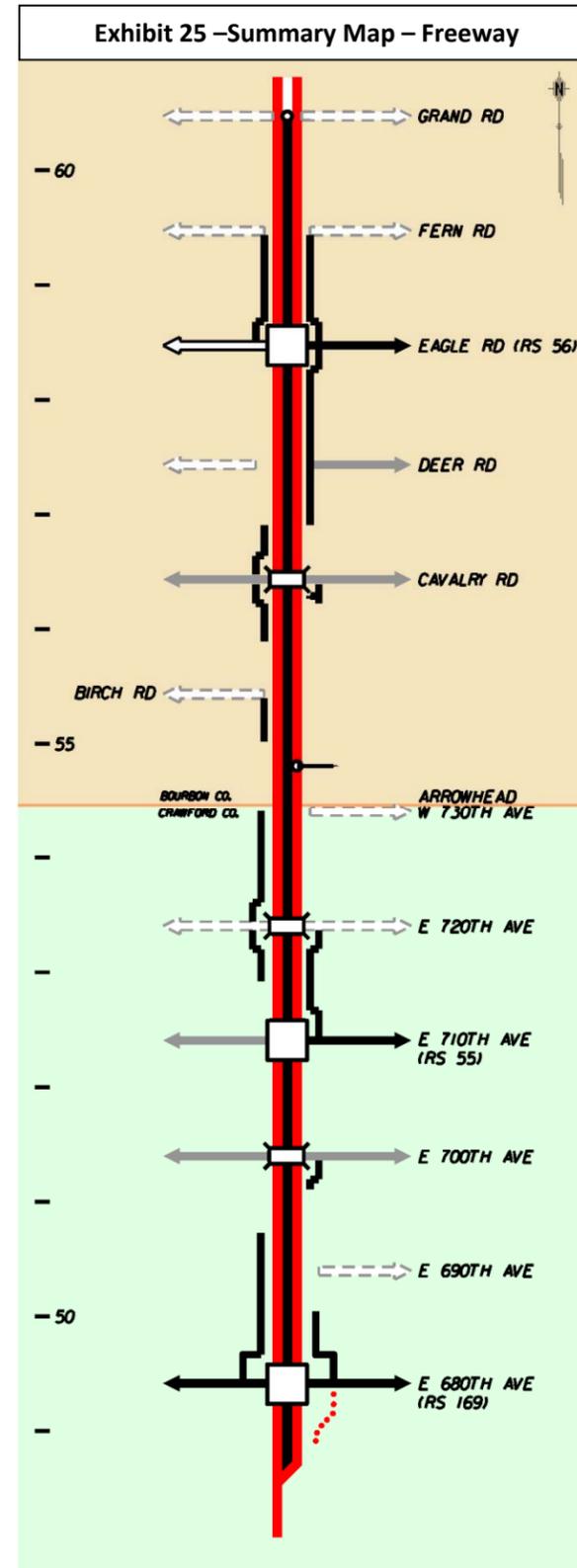
Under design designation, the rule of thumb is that if a traffic signal is warranted with a side road then a grade separation or interchange is indicated. For a traffic signal to be warranted, a minimum of 100 approaching vehicles per hour on the side street is needed. In the design year, many of the side streets in the corridor barely exceed 100 vehicles in both directions throughout the entire day. Consequently, interchanges are proposed at:

- 680<sup>th</sup> Avenue
  - Spacing of three miles between
- 710<sup>th</sup> Avenue
  - Spacing of six miles between
- Eagle Road.

The next design aspect of access control to be determined is locating bridges (overpasses or underpasses) to cross US-69. The purpose of bridges is to provide local road access across US-69. Three-legged junctions with US-69 cannot provide continuity. The following side roads will not connect to US-69 and will terminate with a cul-de-sac:

1. 690<sup>th</sup> Avenue to the east
2. 730<sup>th</sup> Avenue (Arrowhead) to the east, and
3. Birch Road to the west.

Overpasses or underpasses should be appropriately spaced to afford reasonable mobility taking into account the location of interchanges as well as junctions that are closed along the highway and the condition and availability of the local transportation network, including proposed access roads. The location of overpasses and underpasses must also be balanced with an overall project cost as well as the potential for probable impacts. Taking these factors into account suggests the following locations for an overpass or underpass: 700<sup>th</sup> Avenue, 720<sup>th</sup> Avenue, and Calvary Road.



The longest distance between a side road with a crossing of US-69 would be three miles (between 720<sup>th</sup> Avenue and Calvary Road). This distance is in part dictated by the diagonal traversing of the highway by Dry Creek. This natural drainage feature also results in 730<sup>th</sup> Ave. / Arrowhead and Birch Roads being three-legged junctions.

### Interchange descriptions

Diamond interchanges are proposed based upon traffic volumes and site conditions.

680<sup>th</sup> Avenue – In the future when the CCC's new alignment ties in, the existing US-69 south of 680<sup>th</sup> Avenue is shown relocated to the east of the interchange.

710<sup>th</sup> Avenue - This location is complicated by the presence of rock and steep topography of the side road. The resulting concept envisions shifting 710<sup>th</sup> Street approximately 300 feet to the north to cross over US-69, minimizing earthwork and rock excavation, thereby minimizing costs.

Eagle Road - This location has a double-cell 12-foot by 18-foot culvert under US-69 and Eagle Road on the east side of US-69. An interchange will require the extension on this culvert across several of the interchange's ramps.

### Roadway Section

With a freeway or upgradeable expressway significant amounts of right-of-way will be required to construct interchanges and access roads. The 84-foot median width also provides for an improved median design to enhance safety and allow for future highway expansion without further affecting adjacent landowners. This roadway section will also match the freeway design on the CCC. Additionally future highway expansion would have less impact upon motorists during construction.

Summary data for the freeway concept is shown in Exhibit 25.

<i>Exhibit 25 - Summary Data - Freeway</i>		
<i>Length of mainline roadway</i>	<i>miles</i>	11.6
<i>Length of access roads</i>	<i>miles</i>	10.1
<i>Number of grade separations</i>	<i>each</i>	3
<i>Number of interchanges</i>	<i>each</i>	3
<i>Area of right-of-way (estimated)</i>	<i>acres</i>	100

### Upgradeable Expressway

The term upgradeable expressway as defined earlier requires at a minimum the purchase of right-of-way to accommodate (in the future) a freeway design. The phasing and implementation of the access control to achieve a freeway may be dependent upon funding levels. The access management elements for an upgradeable expressway include:

- Constructing all access roads,
- Constructing all overpasses/underpasses,
- While having at-grade junctions at future interchange locations.

And this is what is shown in the exhibits, but other forms of an upgradeable expressway are presented in the section on probable costs. To allow the greatest flexibility with constructability, it is desired to have all grade separations, or bridges, with the side road over, however an exception could be made at 700<sup>th</sup> Avenue in an effort to minimize potential impacts. Advantages of the side road over are lower traffic volumes on the side road, having one bridge versus two bridges, ease of constructability and cost effectiveness. Summary data for the upgradeable expressway concept is shown in Exhibit 26

<b>Exhibit 26 - Summary Data - Upgradeable Expressway (all access control modifications except interchanges)</b>		
Length of mainline roadway	miles	11.6
Length of access roads	miles	10.1
Number of grade separations	each	3
Number of interchanges	each	0
Area of right-of-way (estimated)	acres	100

Exhibit 27 shows the expressway, upgradeable expressway and freeway concepts at a 600 scale aerial based map.

**Comparisons**

The alternatives are essentially compared based upon the following three elements:

1. Probable Operations
2. Probable Costs, and
3. Probable Environmental Documentation.

Each of these elements is described in more detail below. The two-lane undivided highway (or no-build option) is discussed for future use as part of any necessary environmental documentation. It provides the justification (laying the groundwork for a "purpose and need" section) by identifying operational constraints if in fact no changes were to be made to the facility. And while the expressway options are essentially distinct from each other (at least in terms of probable costs and impacts), the freeway and upgradeable expressway are the same in terms of probable environmental impacts since the upgradeable expressway requires the right-of-way footprint of a freeway.

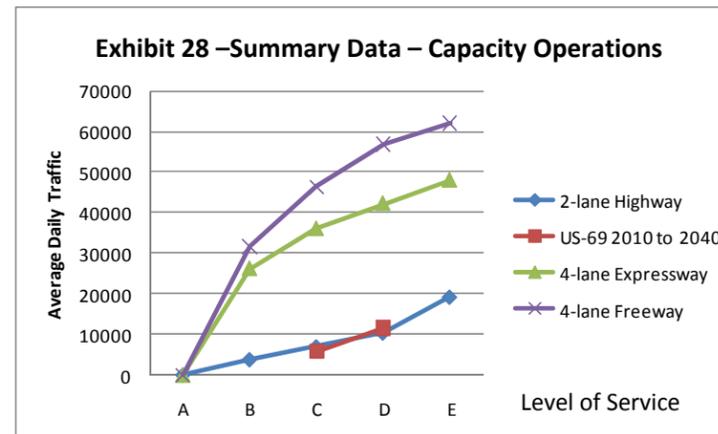
*Probable Operations – Capacity and Safety*

The two-lane highway in the design year is projected to operate at LOS D (unstable) for its basic highway segment. This level of congestion is considered unacceptable for rural conditions in Kansas. And while recent safety history shows that the highway is operating at or below statewide average rates for similar two-lane highways under partial access control, experience also recognizes that as traffic volumes increase, accident rates also have a tendency to increase. Consequently it

could be anticipated that accident rates could reach or exceed statewide averages by the future design year.

The capacity of the expressway segment is projected to operate at LOS A (free flowing) in the design year. The additional travel lane in each direction significantly improves capacity by removing the impediment to pass slower moving vehicles. While only minor differences in capacity can be due to a change in the spacing of median openings from ½-mile to 1-mile, fewer access points should result in less conflict and therefore increased capacity. Safety rates for a divided expressway are significantly improved over an undivided facility, both in terms of total accident rates and fatal accident rates. However, the statewide average rates do not reflect such variations and are simply defined as "partial" access control.

The capacity of the freeway segment is projected to operate at LOS A (free flowing) in the design year. Again, the additional travel lane in each direction significantly improves the capacity by removing the impediment to pass slower moving vehicles. Little difference in segment capacity is expected due to a change between a freeway and an upgradeable expressway, differing from an interchange with a freeway to at-grade junctions only at future interchange locations. However, engineering judgment would indicate that with fewer access points to US-69, traffic volumes at those access points would likely increase because of the consolidation of traffic and the controlling element of capacity could shift from segment analysis to intersection analysis.



	2040	2-lane highway	Expressway	Freeway
Segment		D	A	A
Intersections		C	B	A

When comparing an expressway to a freeway, the segment capacity is essentially the same until traffic volumes reach in excess of 40,000 vpd. The design year forecast is 11,600 vpd. Even if the forecast is off by a factor of three, segment capacity would not be significantly affected as illustrated in Exhibit 28.

The intersection analysis under the expressway condition is LOS B in the design year. That could drop to LOS C – still an acceptable condition - with a consolidation and redistribution of traffic volumes to three junctions.

In a similar manner safety rates for a divided freeway are significantly improved over an undivided facility, both in terms of total accident rates and fatal accident rates. The accident rates for an expressway are defined as "partial" access control while the accident rates for a freeway are defined as "full" access control. The total accident rates for a freeway are very similar to an expressway. However, the fatal accident rate for a freeway is better when compared to an expressway as illustrated in Exhibit 29.

**Exhibit 29 – Summary Data – Safety Operations**

Statewide	2-lane highway partial	Expressway partial	Freeway full
Total (MVM)	1.143	0.955	0.668
Actual	1.04	NA	NA
Fatal (HMVM)	2.305	1.599	0.557
Actual	1.76	NA	NA

*Probable Costs*

Total project costs include right-of-way acquisition costs, utility relocation as well as design and construction engineering costs. These costs were developed using planning level information and are shown in Exhibit 30. All estimates are preliminary and are subject to change as more information becomes available during the design stage. Costs are presented in future year (2016) dollars. Construction costs for all three concepts include grading, drainage and pavement for the two new lanes. The upgradeable expressway costs also include access roads and bridges at side roads. Freeway costs also include access roads, interchanges and bridges at side roads.

The intent of the maps depicting the concepts is to define the elements of the proposed project and allow for sufficient quantity estimating that in turn results in a reasonable opinion of probable costs and associated impacts. The physical and financial elements shown include:

Mainline highway construction with grading limits and extensions of drainage pipes.

Cost estimating includes grading by volume (including estimated rock excavation based upon prior geologic information), length of mainline highway and length of pipe extensions by size. It is assumed that the existing highway pavement is in sufficient condition (based upon the recent rehabilitation project) that no improvement costs are necessary with the existing highway.

**US-69 Corridor Study – Fort Scott to Arma – Projects 69-6 KA-1553-02 and 69-19 KA-1554-02**

Exhibit 30 –Summary Data – Probable Costs	EXPRESSWAY		FREEWAY	UPGRADEABLE EXPRESSWAY <small>All Upgradeable Expressway scenarios include the purchase of right-of-way in order to upgrade to a freeway in the future.</small>		
	Minimum 1/2 mile median opening spacing COST (Million \$)	Minimum 1-mile median opening spacing COST (Million \$)	COST (Million \$)	Make access control modifications later COST (Million \$)	Make all access control modifications except interchanges and overpasses / underpasses COST (Million \$)	Make all access control modifications except interchanges COST (Million \$)
T-WORKS Southeast Region Expansion and Modernization Projects Proposed construction dollars total \$190 million in 2016 dollars						
Mainline roadway and structures	\$ 40.0	\$ 40.0	\$ 42.5	\$ 42.5	\$ 42.5	\$ 42.5
Access roads (See Note 1)	\$ -	\$ 8.0	\$ 17.5	\$ -	\$ 17.5	\$ 17.5
Overpasses/Underpasses	\$ -	\$ -	\$ 10.0	\$ -	\$ -	\$ 10.0
Interchanges	\$ -	\$ -	\$ 30.0	\$ -	\$ -	\$ -
<b>Construction Costs (2016)</b>	<b>\$ 40.0</b>	<b>\$ 48.0</b>	<b>\$ 100.0</b>	<b>\$ 42.5</b>	<b>\$ 60.0</b>	<b>\$ 70.0</b>
Right-of-way, utility relocation and design/inspection costs	\$ 10.0	\$ 13.0	\$ 30.0	\$ 14.0	\$ 21.0	\$ 23.0
<b>TOTAL PROJECT COSTS (2016)</b>	<b>\$ 50.0</b>	<b>\$ 61.0</b>	<b>\$ 130.0</b>	<b>\$ 56.5</b>	<b>\$ 81.0</b>	<b>\$ 93.0</b>

**NOTES:**

1 - The need for, and construction of, access roads will be determined during the design stage.

The costs of bridges are also included for the crossing of the West Fork of Dry Wood Creek and Walnut Creek. For the freeway concept quantities and costs were developed for interchanges and grade separations.

Access roads are shown as 28-foot wide asphalt with grading and drainage costs included in the unit costs for the length of roadway.

Driveways are shown as 24-foot wide gravel for cost estimating purposes only. The probable costs are not shown in the construction cost line item but in the right-of-way compensation line item because this element is assumed to be in the form of compensation to the property owner. Because of negotiations and potential changes a higher contingency is allowed (50 percent).

A right-of-way area is estimated based upon a 50-foot offset from the centerline of the access road. The actual right-of-way will be determined during the design phase, yet this estimate of right-of-way area is reasonable for this planning-level concept (and for assessing the degree of impacts as noted below). In certain cases the access control line will need to be re-described that would result in the filing of new titles for affected properties. A programming cost line item is included to account for design services, including survey and geotechnical components, utility relocation as well as construction inspection services.

*Probable Environmental Documentation*

While the determination of the level of environmental documentation requires coordination with review agencies, only two alternatives need be considered since the upgradeable expressway requires the footprint of a freeway. Quantifying probable impacts are viewed in the same manner as the categories of resources: natural, cultural and manmade. The estimate of probable impact is based upon the extent of effect (often an area) of new right-of-way required upon a known or potential resource. In many circumstances determining the location of a resource such as Mead's Milkweed, which is only visible at certain times of the year (May and June), as well as the extent of probable impact cannot be exactly quantified until further investigation and or development of design plans. The purpose of these estimates, summarized in Exhibit 31, is to allow a determination of the probable type of environmental document needed to obtain clearance based upon the facility type and associated impacts, if any. Applicable permits will be sought through the appropriate coordinating agencies.

The following general statements can be made regarding all the facility types.

- The expressway with 1/2-mile median opening spacing should not specifically require additional right-of-way. However the location and proximity of certain access roads to the mainline highway suggest the need for some improved access management and thereby may need some additional right-of-way.

- The freeway and the upgradeable expressway are viewed as having the same degree of impact based upon the area of right-of-way to be acquired.
- Some critical environmental features, including 4(f) land impacts and hazardous waste sites, are not known to be located within the corridor study area and therefore are not impacted.
- Some critical environmental features are located immediately adjacent to the existing highway right-of-way and therefore may be impacted for those concepts requiring additional right-of-way. The environmental features include potential 6(f) land impacts for the two skink mitigation sites as well as an area of woodlands/hardwoods. There are also wetlands defined by the National Wetlands Inventory (NWI) maps which serve as a surrogate for critical habitat for several threatened and endangered species including the threatened broadhead skink and spring peeper in both Bourbon and Crawford County as well as the redbelly snake in Crawford County.
- With regards to the three known potentially eligible national register of historic places, none of the concepts appear to have any direct impact (to the structure) or indirect impact (to the property). Additional Activity I investigations should be conducted to evaluate any potentially eligible properties outside the right-of-way that were not evaluated during the Comprehensive Highway Program projects.

**Exhibit 31 –Summary Data – Probable Impacts**

Area (acres)	Expressway		Freeway
	1/2 mile	1-mile	
Right-of-way	0 to 10	50	115
Hardwoods	0	10	40
Archeological	0.0	2.5	2.6
Stream/wetland	0.0	0.9	1.9
Skink mitigation	0.0	0.4	0.5

A four-lane highway will provide sufficient capacity to the design year 2040. However several types of four-lane highways are possible ranging from expressway to freeway and including an upgradeable expressway (essentially a phased freeway). Construction costs for these facility types can range from \$40 million for an expressway to \$100 million for a freeway (in 2016 dollars). The initial phase of an upgradeable expressway will be determined during the design stage.

A Categorical Exclusion (CE) is the appropriate level of documentation for the expressway or freeway concept. From an environmental review perspective, the upgradeable expressway is the same as a freeway.

**PUBLIC INVOLVEMENT**

A comprehensive public involvement plan was developed to meet the needs of the US-69 Corridor Study. The plan outlined specific activities, yet was flexible and able to adapt as the study progressed. Key Public involvement activities included the formation of an Advisory Committee and a Public Open House.

**Advisory Committee**

An Advisory Committee was formed at the beginning of the process, which included representation from more than 16 organizations. Key stakeholder groups represented included:

- business interests,
- property owners,
- city government,
- county government,
- emergency service providers,
- school districts, as well as,
- historic preservation and
- environmental interests.

Members were selected by KDOT with input from the represented organizations. The Advisory Committee met four times during the course of the study and acted as a sounding board for proposed design concepts.

While the Committee members had varying opinions about whether this section of US-69 should be designed as an expressway, an upgradeable expressway or a freeway, there was consensus on the need to design and build a four-lane facility. The following key concerns were raised, regardless of facility type:

- Moving traffic as safely and efficiently as possible
- Supporting potential future economic development



- Maintaining sufficient access for property owners and emergency service providers
- Using available money efficiently

Four meetings were held throughout the course of the study covering the following topics:

1. Study Introduction and Existing Conditions (October 21, 2010)
2. Summary of Concepts (February 28, 2011)
3. Discussion of Upgradeable Expressway (April 18, 2011)
4. Summary and Next Steps (June 23, 2011)

Additional material, including Advisory Committee meeting summaries, copies of handouts, presentations and sign-in sheets, are provided in the Appendix.



**Public Officials Briefing and Open House**

A Public Officials Briefing was held on Tuesday, April 26 from 4:00 – 5:00 PM at the Fort Scott Community College in Fort Scott, Kansas. KDOT staff presented an overview of the study process and the material to be displayed during the public open-house that followed from 5:00 – 7:00 PM. The public open house was promoted through electronic message boards, media outreach, word of mouth, KDOT's K-TOC online portal, Twitter, post cards to nearly 1,000 property owners along the corridor, and paid advertisements in the *Fort Scott Tribune* and the *Pittsburg Morning Sun*. More than 125 people attended. Fifty-three written comments were submitted that night and in the weeks that followed.

There was general consensus that a four-lane facility is needed for this section of US-69 and everyone was anxious to find out when a decision would be made. Attendees preferring an expressway or an upgradeable expressway often felt that the freeway option was too much money and unnecessary at this time. Maintaining property access was also frequently cited as a priority by landowners along the corridor. Individuals favoring a freeway expressed concern over planning for the future needs of the corridor and the ability to maintain and attract economic development to Southeast Kansas. Several property owners adjacent to the

highway as well as regional businesses, such as Waste Management, expressed their need for additional access roads in order to improve access constrained by the county road network. Some selected written comments include:

Expressway

- *Freeway is great ONLY for people passing through.*
- *Closure of county roads may make the highway safer however, it will raise the traffic and accident rates on county roads.*
- *Denying access will do agriculture in our community a serious death.*
- *Direct access to Cherry Grove Church which serves as a community storm shelter and emergency center is important.*

Freeway

- *Would make this stretch of US-69 the same as the area north of Fort Scott.*
- *Let's finish what we started!*
- *It's been an on-going project for many decades.*

Upgradeable Expressway

- *This would allow for expansion as additional money becomes available.*
- *This is a good idea to start with and will leave options open for the future.*
- *With proper communication with stakeholders, this compromise option holds the most long-term promise.*

**Media Coverage**

Local media outlets were invited to all Advisory Committee meetings and the Public Open House. Media outreach resulted in more than 10 newspaper articles covering the US-69 Study throughout the course of the project. These articles can be found in the Appendix.

*While many adjacent property owners were concerned about impacts to their property and access and supported the expressway concept, others saw this segment of US-69 in context of the statewide corridor from I-44 in Missouri to Kansas City and strongly supported a freeway. After explanation, the concept of an upgradeable expressway was understood, and is now enhanced by the definition provided by the T-WORKS announcement (June 1, 2011) that put a budget to the project, and in turn, will determine the extent of access control associated with a phased freeway. Public input from adjacent property owners and regional business regarding the location of access roads may result in additional access roads along the corridor than that shown in the concepts. The location of access roads will be determined through the design process.*

## RECOMMENDATIONS

This section discusses this corridor study's recommendation for this specific segment of the US-69 corridor (from Fort Scott to Arma) as well as summarizing the recent T-WORKS announcement regarding US-69 and discusses the facility type selected, its associated construction budget, and probable schedule for implementation.

### This Corridor Study's Recommendation

The recommendation from this study is made independently from the T-WORKS announcement made on June 1, 2011. The recommendation is based upon the technical assessment of traffic operations to the design year on this 12-mile long segment and supplemented by the continuity aspects of the route's transportation system, as well as the public input received. Consequently, the recommendation is made in two parts:

- A recommendation to the design year (2040), and
- A recommendation beyond the design year.

While the overall recommendation is consistent with the T-WORKS announcement, the probable costs associated with this recommendation are made irrespective of an available budget for implementation.

#### To the Design Year (2040)

As a 12-mile long segment with a projected ADT to 2040 of 11,600 vpd and with very low traffic volumes on the side streets, a four-lane expressway would provide sufficient capacity (at LOS A) to serve the projected traffic volumes. The current degree of access control (partial) provides access essentially to public roads at 1-mile spacing and additional access to private properties typically at ½-mile spacing. The private property access is mainly agricultural and residential. While some immediately adjacent properties are commercial or institutional (a small engine repair shop, a mining operation, and several churches), many have access to the side road and these developments are not anticipated to become significant traffic generators.

#### Beyond the Design Year

US-69 is a transportation corridor of significance in Kansas connecting the economic engines of southeast Kansas (Pittsburg) with the northeast area of Kansas (Kansas City metropolitan region) including Johnson County. There has been a long-standing vision to connect these regions along US-69 as a four-lane highway. Recent construction (over the last decade) has seen a steady progression of four-lane construction on US-69 south from K-68, as a freeway, to the north side of Fort Scott to the junction of US-54. US-69 through Fort Scott is four lanes with several major intersections controlled by traffic signals. A signal progression project has recently begun to coordinate the signal system to enhance mobility and efficiency. Other on-going study/planning efforts by KDOT have concluded a US-69/400 corridor on new alignment as a freeway. Consequently it can be concluded that eventually the US-69/400 corridor will become a freeway from I-44 to Kansas City. In fact a T-WORKS project on US-400 will construct a 3-mile segment north from I-44 as a freeway. Therefore it makes logical sense to plan for a continuous freeway along US-69.

One means to accomplish a freeway is through the "upgradeable expressway" concept (or phased freeway). This approach acquires the right-of-way now while ultimately constructing the freeway when needed or when funding is available. The configuration of the highway includes the acquisition of sufficient right-of-way for access roads, overpasses/underpasses as well as future interchange locations. Consequently, this study's recommendation (independent of funding) supports an upgradeable expressway. Certainly by the time the Crawford County Corridor is fully implemented as a freeway, this segment should also have access control at the freeway level.

### T-WORKS Announcement

On June 1, 2011 in Fort Scott, Governor Sam Brownback along with Secretary Deb Miller of the Kansas Department of Transportation announced continued expansion of US-69 and safety improvements to enhance other southeast Kansas roads as shown in Exhibit 33. Speaking at the Kansas Department of Transportation Fort Scott Subarea Office, the Governor said a four-lane upgradeable expressway will be built from Arma to Fort Scott at an estimated cost of \$47 million. "These projects are the result of a wise, well-thought-out, innovative process to maximize our limited dollars. Taken together, they balance the need to continue building on earlier investments on US-69, improve other important corridors in the region – and create immediate construction jobs as well as infrastructure for long-term economic growth," he said. "We have designed to a budget rather than the full-blown scopes of past projects, recognizing that some improvement is better than no improvement at all," said Secretary Miller. "We selected lower-cost options, such as expressways instead of freeways."

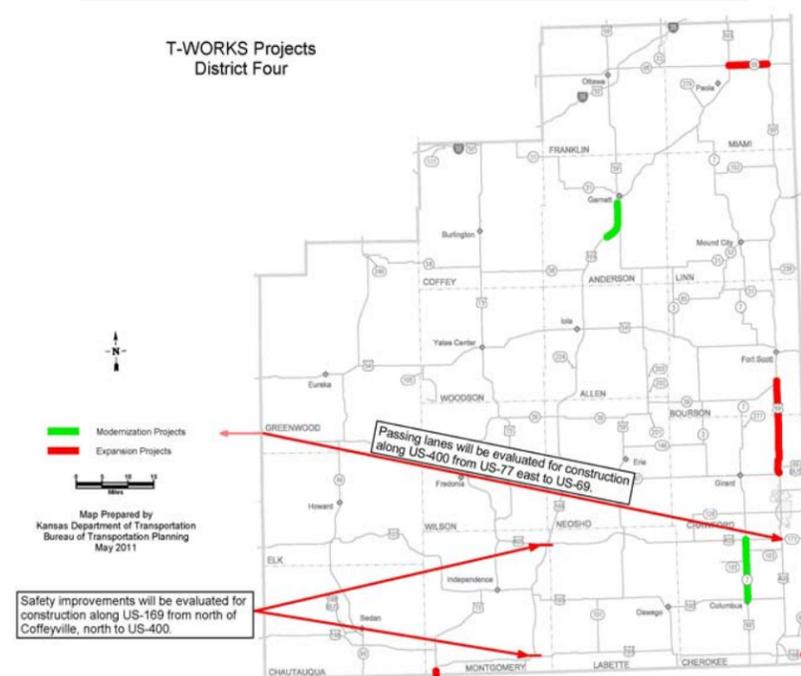
This project continues the improvement work on the US-69 corridor and is the next logical segment. Although some US-69 advocates would prefer a four-lane freeway (at \$85 M), the upgradeable expressway fits the traffic needs of today while preserving the future freeway option by purchasing the right-of-way necessary for interchanges now. This is the right-sized project for today. Following the completion of this project, there will still be six miles remaining of the two-lane highway, in the vicinity of Arma on the Pittsburg to KC corridor. KDOT has recently begun a study to determine alternatives and costs to complete the remaining miles of the corridor, which may allow for more work to be done in the future.

### Implementation Schedule

The T-WORKS website, launched June 8, 2011, enables Kansans to see how much money has been invested in their county, when projects are scheduled to be completed, maps of the projects and the latest news in Kansas transportation. "This site allows Kansans to see if a project is on-schedule, holding us accountable for delivering projects on time," KDOT Secretary Deb Miller said. Since T-WORKS is a 10 year-year program and not all projects have been selected, the site will be updated continuously with any new projects. It will also provide timely updates on existing projects as they develop. Secretary Miller said "Our goal with this site is to keep them (Kansans) informed of our progress and provide them an opportunity to give us input on how the program is being delivered. Together, we can make sure they are getting the most out of their investments."

The design and construction of a highway is an activity that takes many years and includes major milestones such as field survey, design, environmental clearance, right-of-way acquisition, and bid letting as well as potential construction start dates and completion. Field surveys are expected to begin in 2012 with a construction letting in 2017. The right-of-way acquisition process could take 1 to 2 years. This schedule is subject to revision throughout the course of implementation.

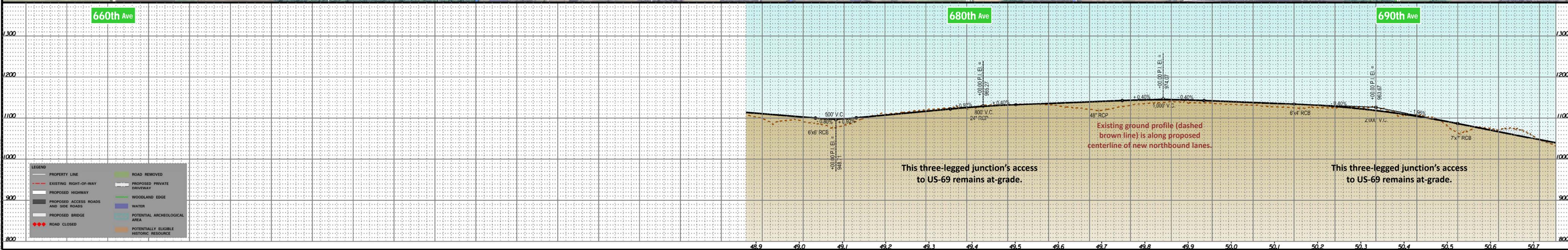
Exhibit 33 – June 1, 2011 T-WORKS Announcement



*This study's recommendation is presented in two parts, a recommendation to the design year (2040) and to a time beyond 2040. This approach fits in well with the funded project for an "upgradeable expressway". With budgetary constraints for transportation projects throughout the state of Kansas, the form of the upgradeable expressway will be designed to meet the budget while at a minimum acquiring the necessary right-of-way for implementing freeway access control at a later date when funding allows.*



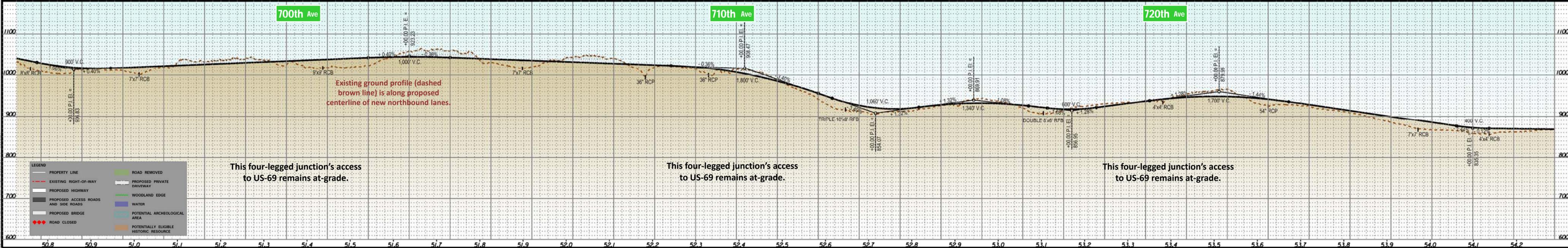
**Disclaimer:**  
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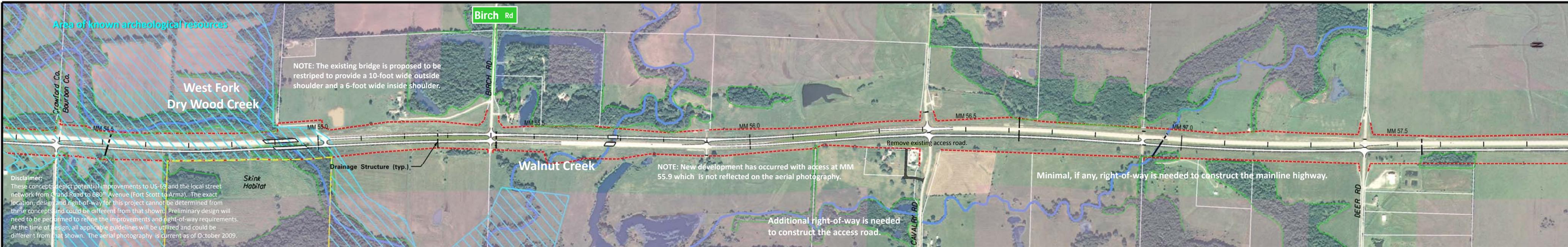
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—	PROPERTY LINE
- - -	EXISTING RIGHT-OF-WAY
—	PROPOSED HIGHWAY
—	PROPOSED ACCESS ROADS AND SIDE ROADS
—	PROPOSED BRIDGE
◆◆◆	ROAD CLOSED
—	ROAD REMOVED
—	PROPOSED PRIVATE DRIVEWAY
—	WOODLAND EDGE
—	WATER
—	POTENTIAL ARCHEOLOGICAL AREA
—	POTENTIALLY ELIGIBLE HISTORIC RESOURCE



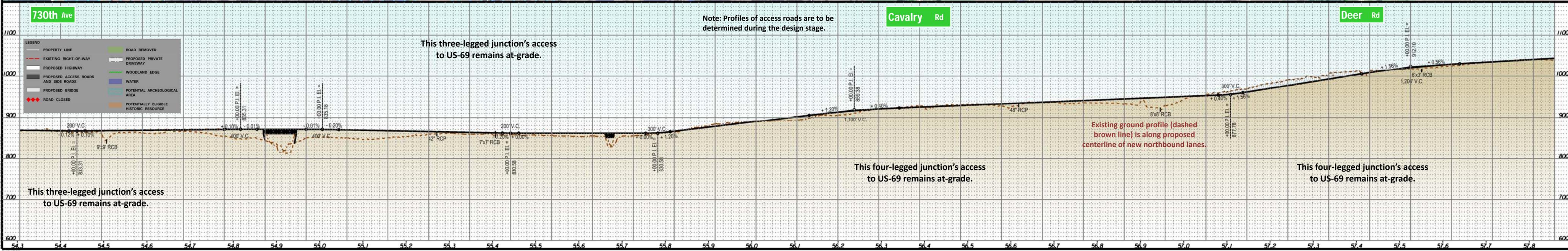
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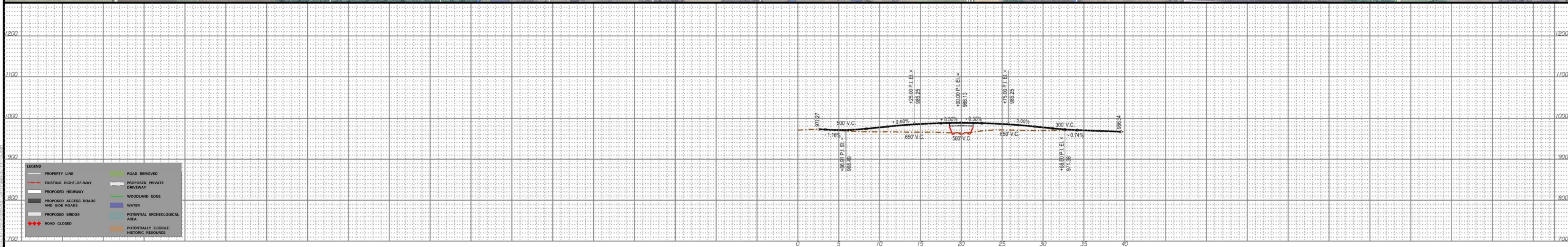
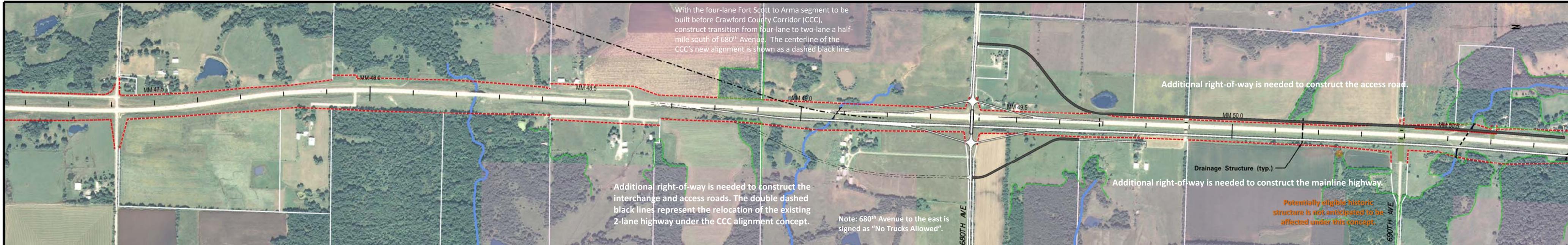


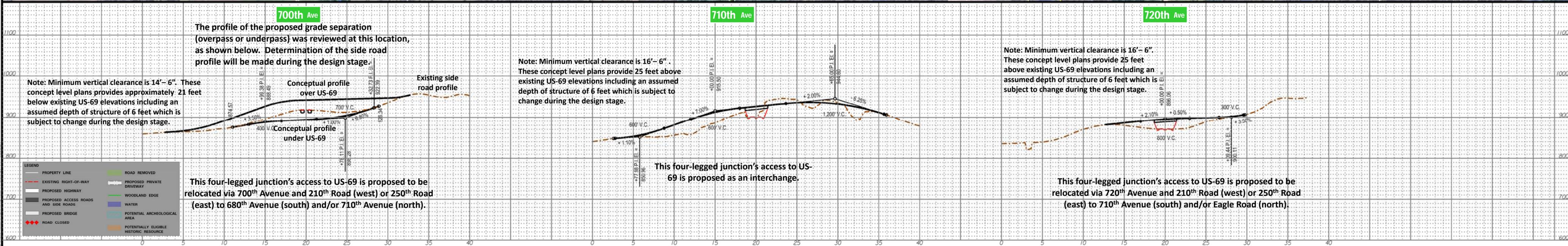
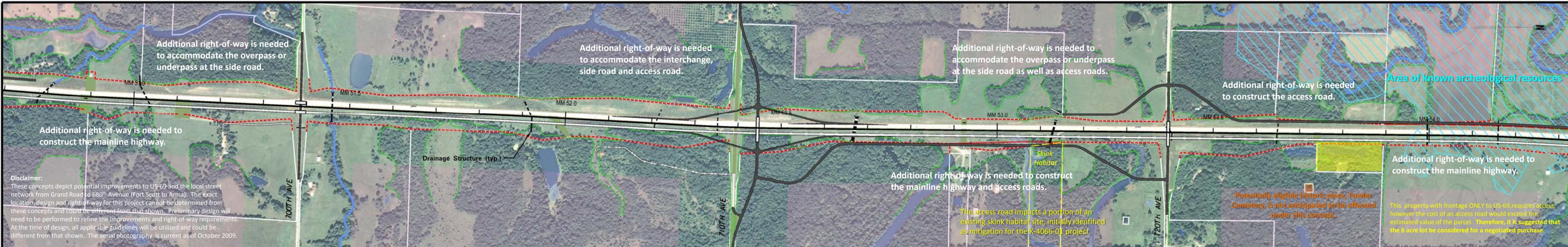
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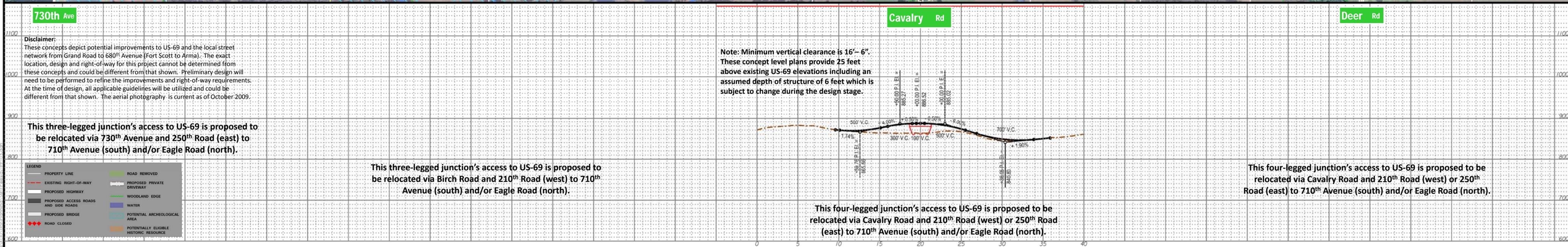
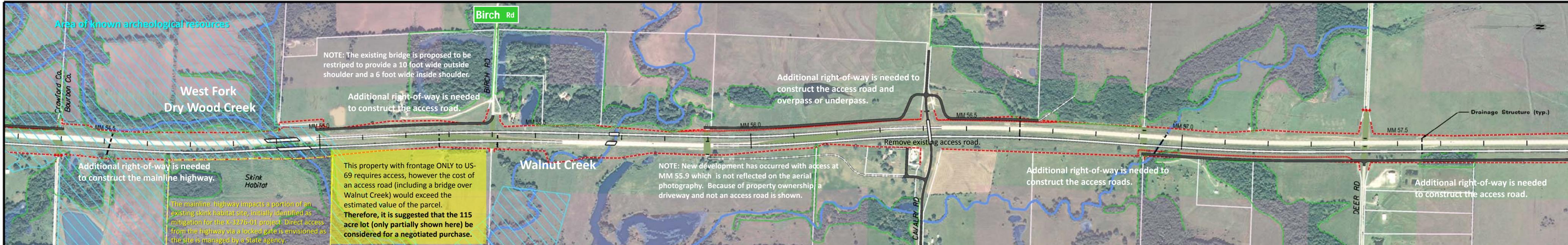


LEGEND	
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**730th Ave**

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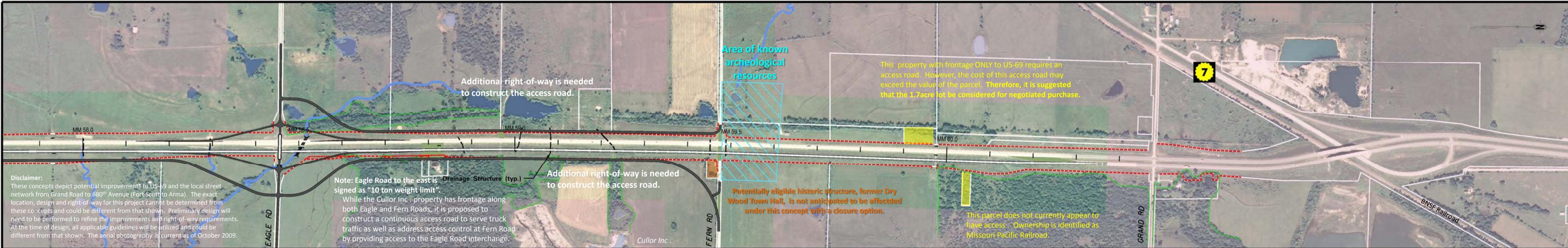
**This three-legged junction's access to US-69 is proposed to be relocated via 730th Avenue and 250th Road (east) to 710th Avenue (south) and/or Eagle Road (north).**

LEGEND	
	PROPERTY LINE
	EXISTING RIGHT-OF-WAY
	PROPOSED HIGHWAY
	PROPOSED ACCESS ROADS AND SIDE ROADS
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**This three-legged junction's access to US-69 is proposed to be relocated via Birch Road and 210th Road (west) to 710th Avenue (south) and/or Eagle Road (north).**

**This four-legged junction's access to US-69 is proposed to be relocated via Cavalry Road and 210th Road (west) or 250th Road (east) to 710th Avenue (south) and/or Eagle Road (north).**

**This four-legged junction's access to US-69 is proposed to be relocated via Cavalry Road and 210th Road (west) or 250th Road (east) to 710th Avenue (south) and/or Eagle Road (north).**



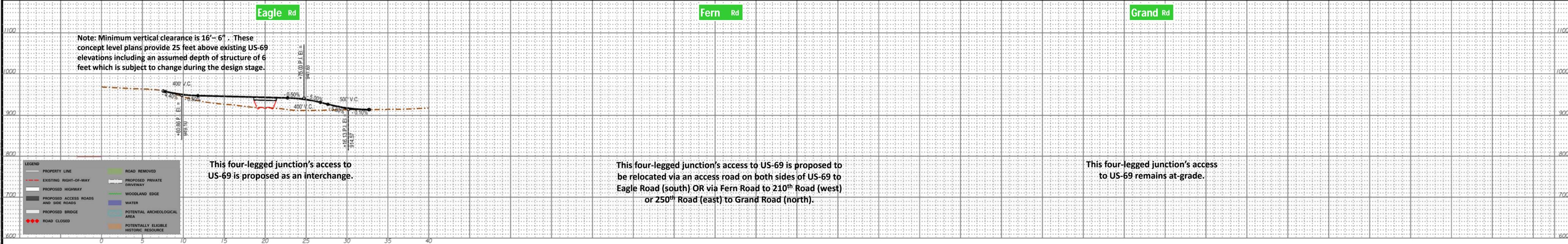
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**Note:** Eagle Road to the east is signed as "10 ton weight limit". While the Cullor Inc. property has frontage along both Eagle and Fern Roads, it is proposed to construct a continuous access road to serve truck traffic as well as address access control at Fern Road by providing access to the Eagle Road interchange.

Potentially eligible historic structure, former Dry Wood Town Hall, is not anticipated to be affected under this concept with a closure option.

This parcel does not currently appear to have access. Ownership is identified as Missouri Pacific Railroad.

This property with frontage ONLY to US-69 requires an access road. However, the cost of this access road may exceed the value of the parcel. Therefore, it is suggested that the 1.7-acre lot be considered for negotiated purchase.



**Note:** Minimum vertical clearance is 16'-6". These concept level plans provide 25 feet above existing US-69 elevations including an assumed depth of structure of 6 feet which is subject to change during the design stage.

This four-legged junction's access to US-69 is proposed as an interchange.

This four-legged junction's access to US-69 is proposed to be relocated via an access road on both sides of US-69 to Eagle Road (south) OR via Fern Road to 210th Road (west) or 250th Road (east) to Grand Road (north).

This four-legged junction's access to US-69 remains at-grade.

LEGEND	
	PROPERTY LINE
	EXISTING RIGHT-OF-WAY
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## Public Involvement

Key public involvement activities included the formation of an Advisory Committee and a Public Open House. The Advisory Committee was appointed by KDOT and met four times throughout the course of the study to provide input and act as a sounding board for concepts.



The Public Open House, held in Fort Scott, provided the public an opportunity to preview the three highway types under consideration, ask questions and provide comments. Public feedback indicated general support for building a four-lane highway; opinions varied over which type would best meet the corridor's needs. Individuals preferring an expressway or an upgradable expressway, often felt that the freeway option was too much money and unnecessary at this time. Maintaining property access was also frequently cited as a priority by landowners along the corridor. Individuals favoring a freeway expressed concern over planning for the future needs of the corridor and the ability to maintain and attract economic development to Southeast Kansas.

## Recommendation

This study's recommendation is presented in two parts - a recommendation to the design year (2040) and to a time beyond 2040. This approach fits in well with the T-WORKS funded project for an "upgradeable expressway". As a 12-mile long segment with a projected Average Daily Traffic (ADT) of 11,600 vehicles per day (vpd) in the year 2040 and with very low traffic volumes on the side streets, a four-lane highway would provide sufficient capacity (at LOS A) to serve the projected traffic volumes.

US-69 is a transportation corridor of significance in Kansas connecting the economic engines of southeast Kansas (Pittsburg) with the northeast area of Kansas (Kansas City metropolitan region) including Johnson County. There has been a long-standing vision to connect these regions and with other planning efforts along the remainder of the corridor, it can be concluded that the US-69/400 corridor will eventually become a freeway from Interstate 44 to Kansas City. The Advisory Committee stated its preference for a freeway concept. One way to accomplish this ultimate vision is through the "upgradeable expressway" concept (or phased freeway).

The upgradeable expressway allows for the construction of a four-lane facility meeting today's needs while setting the framework to upgrade to a freeway when traffic volumes warrant and when funding is available.

## T-WORKS Announcement

On June 1, 2011 in Fort Scott, Governor Sam Brownback along with Secretary Deb Miller of the Kansas Department of Transportation announced continued expansion of US-69 and safety improvements to enhance other southeast Kansas roads. Speaking at the Kansas Department of Transportation Subarea Office, the Governor said a four-lane upgradeable expressway will be built from Arma to Fort Scott at an estimated cost of \$47 million. "These projects are the result of a wise, well-thought-out, innovative process to maximize our limited dollars. Taken together, they balance the need to continue building on earlier investments on US-69, improve other important corridors in the region – and create immediate construction jobs as well as infrastructure for long-term economic growth," he said.



"We have designed to a budget rather than the full-blown scopes of past projects, recognizing that some improvement is better than no improvement at all," said Secretary Miller. "We selected lower-cost options, such as expressways instead of freeways."

*Stay current with the schedule for these projects*

*69-6 KA-1553-02 and 69-19 KA-1554-02*

*In Bourbon and Crawford Counties*

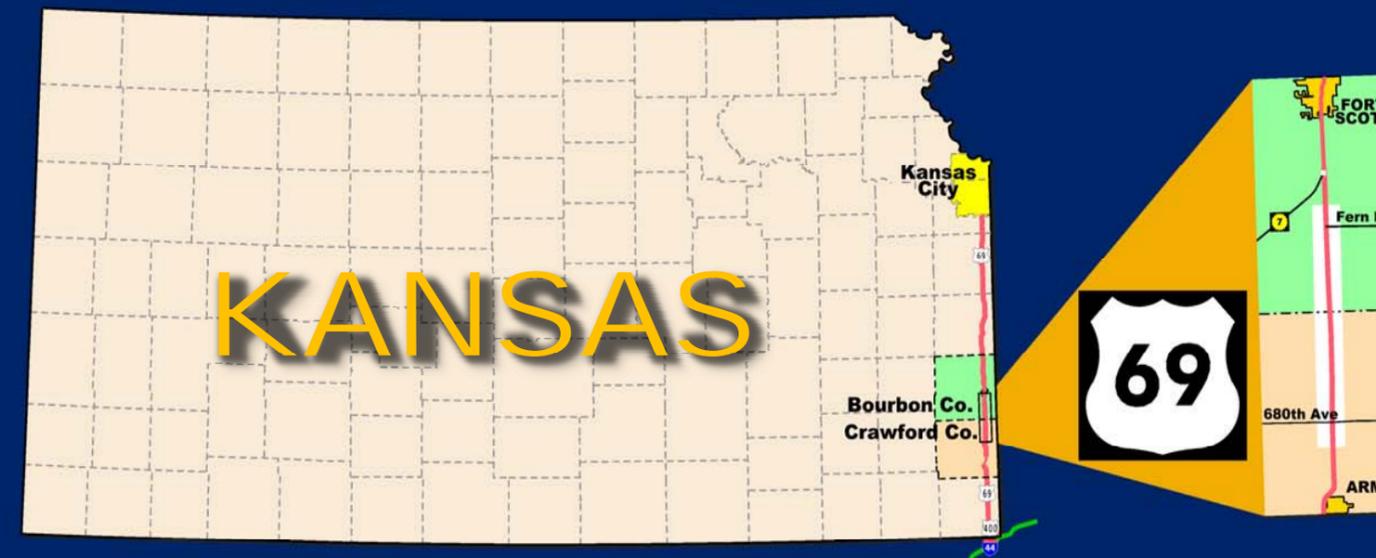
*by visiting the website:*

<http://kdotapp.ksdot.org/TWorks>

# US-69 CORRIDOR STUDY

## Fort Scott to Arma

Projects 69-6 KA-1553-02 and 69-19 KA-1554-02



Prepared for



## Summary

August 2011

Prepared by



## Introduction

The US-69 Corridor Study was initiated prior to the selection of the T-WORKS expansion and modernization projects. T-WORKS' objective was to obtain community input through a local consultation process and thereby assist in determining projects for funding through the next ten-year comprehensive highway program. Consequently this study acknowledges the T-WORKS process, but the stated purpose of this specific corridor study was to:

- Develop probable costs and impacts for various facility types, and

- Assess the probable level of environmental documentation necessary to achieve those facility types.

The study included public involvement with an Advisory Committee, an open-house meeting and sharing of information via KTOC (Kansas Transportation Online Community) and local media outlets. This report's recommendation, while consistent with the T-WORKS announcement, is made on a technical basis, with input from the public, and is independent of budgetary constraints.



## UPGRADEABLE EXPRESSWAY in CRAWFORD COUNTY

### Process

This report documents the process of a transportation planning effort through the four basic steps of:

1. Existing Conditions
2. Projected Conditions,
3. Evaluation of Facility Types, and
4. Selection of a Preferred Facility Type.

The process follows the principles of an environmental document including but not limited to consideration of a no-build alternative, identification of environmental resources and recognizing the process to avoid, minimize, and mitigate potential impacts. The conceptual design allows for suitable quantity estimates to support opinions of probable costs as well as an assessment of potential impact, where applicable. This report focuses upon technical elements within the corridor in an effort to provide sound information to decision makers and stakeholders in order to identify a

financially feasible and community supported project. Consequently, cost estimates have been prepared independently of T-WORKS and therefore may differ from previous published material.

### Today (2010) to Design Year (2040)

The highway segment being evaluated was planned to be a four-lane divided highway. The current highway was constructed in the mid-1990's and essentially built adjacent (on the west side) of the former two-lane highway. This construction included acquisition of sufficient right-of-way to construct four lanes.

Current traffic operations indicate stable flow. However, before the design year 2040, traffic volumes will warrant improvements to the two-lane highway that would be sufficiently addressed by a four-lane highway.

### Facility Types Considered

A four-lane highway will provide sufficient capacity to and beyond the design year 2040. Several types of four-lane highways are possible ranging from:

An **“expressway”** – defined as:  
 A multi-lane highway with a median  
 Cross roads meet the highway at the same level (at-grade) as the highway  
 Access is more controlled than on two-lane highways

A **“freeway”** – defined as:  
 A multi-lane highway with a median  
 Access allowed only at interchanges  
 Motorists enter and exit the highway using on- and off-ramps

An **“upgradeable expressway”** is defined as an expressway where sufficient right-of-way has been purchased to build a freeway in the future. There are many possible stages of upgradeable expressway, depending on when access roads, bridges and future interchanges are constructed.

### Probable Costs

Construction costs for these facility types can range from \$40 million for an expressway to \$100 million for a freeway (in 2016 dollars). The upgradeable expressway is defined by the degree of access control and for practical purposes will be defined by the allocated budget.

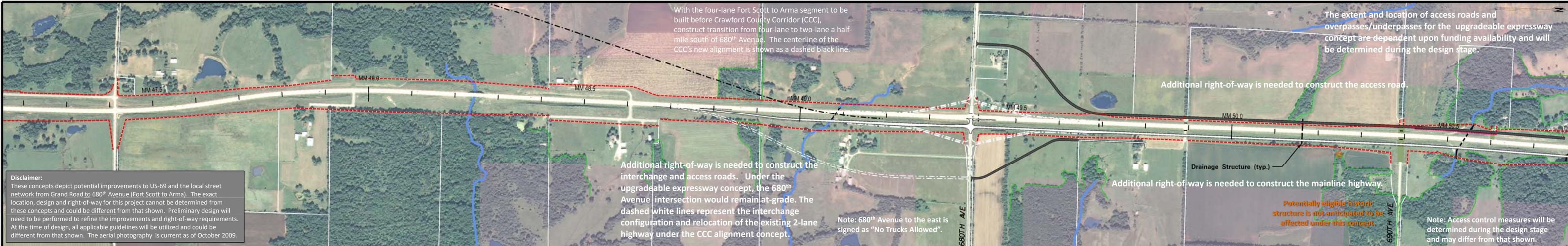
### Probable Impacts

The expressway concept with 1/2 mile access spacing does not require an environmental document, except for construction permitting. Additional right-of-way though requires a review process. Additional right-of-way is necessary for both the freeway and upgradeable expressway concepts. The environmental classification has been reviewed through the study process and it has been determined that the appropriate level of classification is a Categorical Exclusion (CE).

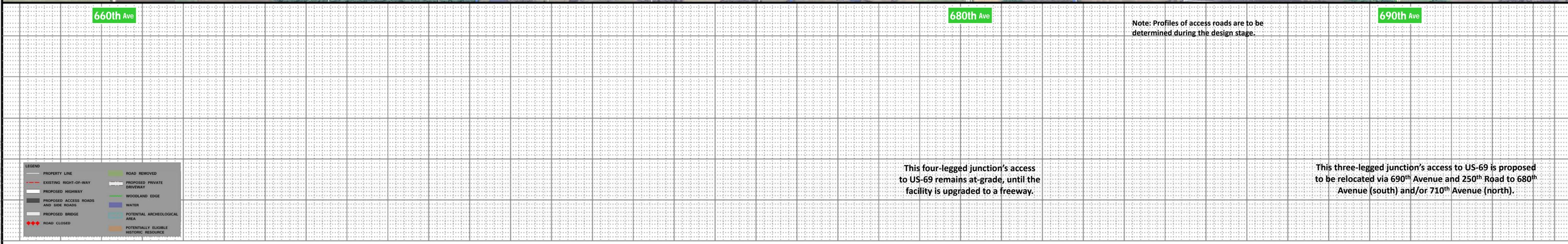
**Disclaimer:**  
 These concepts depict potential improvements to US-69 and the local street network from Grand Road to 680th Avenue (Fort Scott to Arma). The exact location, design and right-of-way for this project cannot be determined from these concepts and could be different from that shown. Preliminary design will need to be performed to refine the improvements and right-of-way requirements. At the time of design, all applicable guidelines will be utilized and could be different from that shown. The aerial photography is current as of October 2009.

## UPGRADEABLE EXPRESSWAY in BOURBON COUNTY





**Disclaimer:**  
 These concepts depict potential improvements to US-69 and the local street network from Grand Road to 680<sup>th</sup> Avenue (Fort Scott to Arma). The exact location, design and right-of-way for this project cannot be determined from these concepts and could be different from that shown. Preliminary design will need to be performed to refine the improvements and right-of-way requirements. At the time of design, all applicable guidelines will be utilized and could be different from that shown. The aerial photography is current as of October 2009.

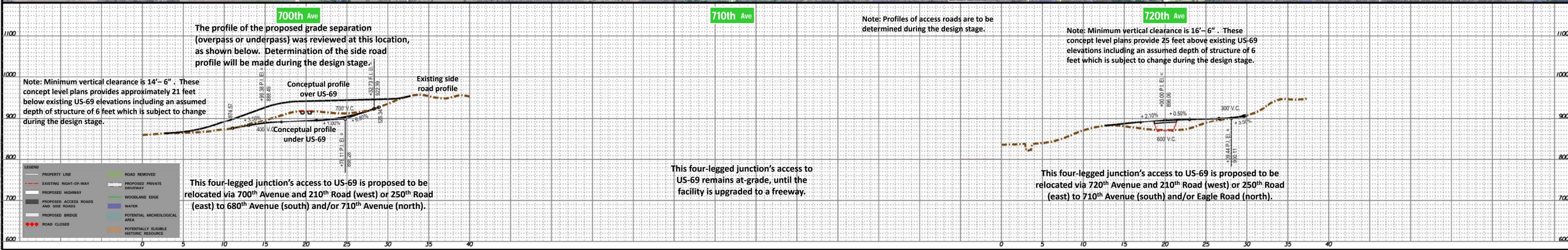


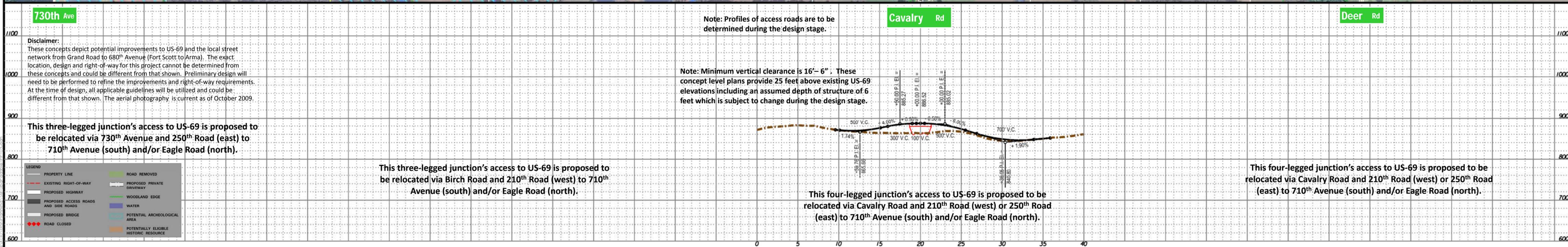
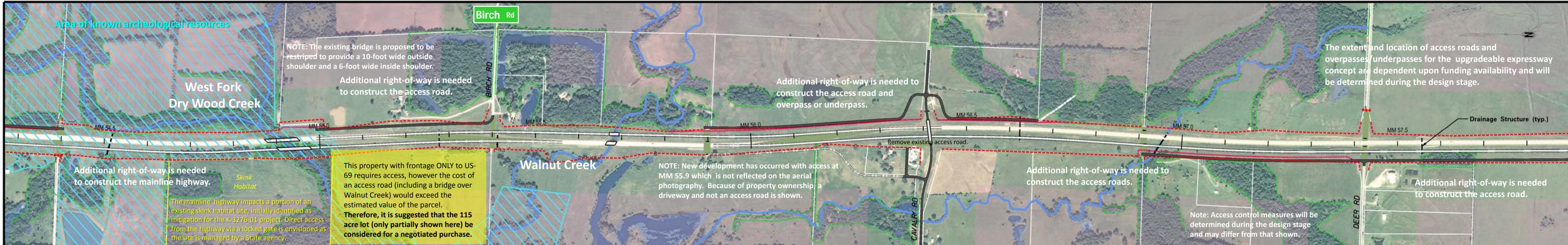
LEGEND	
	PROPERTY LINE
	EXISTING RIGHT-OF-WAY
	PROPOSED HIGHWAY
	PROPOSED ACCESS ROADS AND SIDE ROADS
	PROPOSED BRIDGE
	ROAD CLOSED
	ROAD REMOVED
	PROPOSED PRIVATE DRIVEWAY
	WOODLAND EDGE
	WATER
	POTENTIAL ARCHEOLOGICAL AREA
	POTENTIALLY ELIGIBLE HISTORIC RESOURCE

This four-legged junction's access to US-69 remains at-grade, until the facility is upgraded to a freeway.

This three-legged junction's access to US-69 is proposed to be relocated via 690<sup>th</sup> Avenue and 250<sup>th</sup> Road to 680<sup>th</sup> Avenue (south) and/or 710<sup>th</sup> Avenue (north).

9/8/2011





Additional right-of-way is needed to accommodate the interchange and access roads. Under the upgradeable expressway concept, this intersection would remain at-grade.

Note: Access control measures will be determined during the design stage and may differ from that shown.

Area of known archeological resources

This property with frontage ONLY to US-69 requires an access road. However, the cost of this access road may exceed the value of the parcel. Therefore, it is suggested that the 1.7-acre lot be considered for negotiated purchase.

The extent and location of access roads and overpasses/underpasses for the upgradeable expressway concept are dependent upon funding availability and will be determined during the design stage.

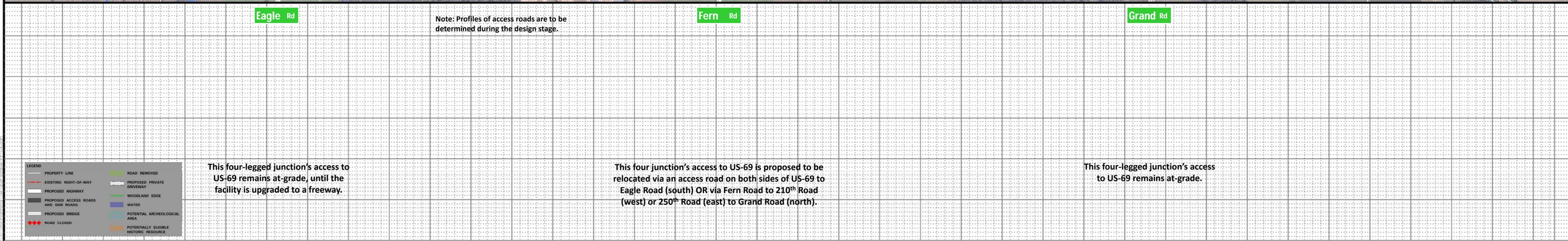
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Note: Eagle Road to the east is signed as "10 ton weight limit". While the Cullor Inc. property has frontage along both Eagle and Fern Roads, it is proposed to construct a continuous access road to serve truck traffic as well as address access control at Fern Road by providing access to the Eagle Road interchange.

Additional right-of-way is needed to construct the access road.

Potentially eligible historic structure, former Dry Wood Town Hall, is not anticipated to be affected under this concept with a closure option.

This parcel does not currently appear to have access. Ownership is identified as Missouri Pacific Railroad.



Eagle Rd

Note: Profiles of access roads are to be determined during the design stage.

Fern Rd

Grand Rd

This four-legged junction's access to US-69 remains at-grade, until the facility is upgraded to a freeway.

This four junction's access to US-69 is proposed to be relocated via an access road on both sides of US-69 to Eagle Road (south) OR via Fern Road to 210th Road (west) or 250th Road (east) to Grand Road (north).

This four-legged junction's access to US-69 remains at-grade.

LEGEND	
	PROPERTY LINE
	EXISTING RIGHT-OF-WAY
	PROPOSED HIGHWAY
	PROPOSED ACCESS ROADS AND SIDE ROADS
	PROPOSED BRIDGE
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