



# US-77 CORRIDOR MANAGEMENT PLAN

K-360 to State Line Road

August 2007

PREPARED FOR:

**US-77 PARTNERSHIP:**

The City of Winfield

The City of Arkansas City

Cowley County

Kansas Department of Transportation



PREPARED BY

**HNTB**

IN ASSOCIATION WITH

Development Strategies, Inc.



# ACKNOWLEDGEMENTS

Preparation of this Plan required the input and efforts of many team members from the US-77 Partnership as well as community officials and the public. This report acknowledges and expresses our appreciation for everyone's efforts.

## US-77 TECHNICAL COMMITTEE

Warren Porter - City of Winfield  
Russ Tomevi - City of Winfield  
Dale Steward - Cowley County  
Leonard Richardson - Cowley County  
Zach Mohr - Arkansas City  
Wayne Short - Arkansas City  
Curtis Freeland - Arkansas City  
Doug Russell - Arkansas City  
Allen Grunder - KDOT

## KANSAS DEPARTMENT OF TRANSPORTATION

Allen Grunder  
Kristina Pyle  
Chris Herrick  
Bob Cook  
Martin Miller

## HNTB CORPORATION

Brian Comer  
Chris Rops  
Scott Heavin  
Betty Burry  
Kip Strauss  
Lindsey Bergman  
Darin Welch  
Sean Thompson

## DEVELOPMENT STRATEGIES

Robert Lewis  
Andy Pfister

# TABLE OF CONTENTS

<b>EXECUTIVE SUMMARY .....</b>	<b>i</b>	<b>ACCESS MANAGEMENT TOOLS .....</b>	<b>22</b>
INTRODUCTION .....	i	INTRODUCTION .....	22
KEY STUDY ISSUES .....	i	ACCESS MANAGEMENT TOOLS .....	22
STUDY OUTCOMES .....	i	FACILITY TYPE .....	22
STUDY CORRIDOR .....	i	LOCAL ACCESS GUIDELINES .....	23
PUBLIC PROCESS .....	i	CORRIDOR PRESERVATION TOOLS .....	23
KEY PLAN RECOMMENDATIONS .....	i	ACCESS MANAGEMENT TOOLKIT .....	24
<b>INTRODUCTION AND APPROACH .....</b>	<b>1</b>	<b>LAND USE PLAN .....</b>	<b>25</b>
PLAN PURPOSE .....	1	OVERVIEW .....	25
STUDY OBJECTIVES .....	1	JURISDICTION .....	25
STUDY CORRIDOR .....	1	PLAN USE .....	25
CHARRETTE PROCESS .....	1	LAND USE CATEGORIES .....	25
TECHNICAL ANALYSIS .....	2	ULTIMATE INFRASTRUCTURE SERVICE AREAS .....	28
ALTERNATIVE CONCEPTS AND TRADE-OFFS .....	2	<b>IMPLEMENTATION .....</b>	<b>30</b>
<b>TRAFFIC ANALYSIS .....</b>	<b>4</b>	US-77 OVERSIGHT COMMITTEE .....	30
INTRODUCTION .....	4	REGULATORY TOOLS .....	30
FACILITY TYPE (PHASE 1 MACRO-LEVEL CORRIDOR ANALYSIS) .....	4	FINANCING MECHANISMS .....	30
INTERSECTION IMPROVEMENTS (PHASE 2 MICRO-LEVEL ANALYSIS) .....	6	CORRIDOR PRESERVATION .....	31
INTERSECTION IMPROVEMENT RECOMMENDATIONS .....	13	COST ESTIMATES FOR PROPOSED IMPROVEMENTS .....	32
<b>TRANSPORTATION RECOMMENDATIONS .....</b>	<b>14</b>	<b>LIST OF EXHIBITS:</b>	
INTRODUCTION .....	14	LAND USE AND ULTIMATE TRANSPORTATION IMPROVEMENTS .....	ii
CORRIDOR PRESERVATION PLAN .....	14	EXHIBIT 1: STUDY CORRIDOR AND SEGMENT MAP .....	3
LOCAL STREET NETWORK IMPROVEMENTS .....	14	EXHIBIT 2: ACCIDENTS (2000-2005) .....	7
SEGMENT RECOMMENDATIONS .....	15	EXHIBIT 3: EXISTING TRAFFIC (2006) .....	8
Segment 1 Summary .....	15	EXHIBIT 4: EXPRESSWAY INTERIM AND ULTIMATE .....	9
Segment 2 Summary .....	16	EXHIBIT 5: FREEWAY INTERIM AND ULTIMATE .....	10
Segment 3 Summary .....	17	EXHIBIT 6: TRAVEL TIME RESULTS .....	11
Segment 4 Summary .....	18	EXHIBIT 7: LAND USE PLAN MAP .....	29
INTERIM PRIORITY PROJECTS .....	19	EXHIBIT 8: INDEX SHEET FOR APPENDIX A AND B .....	33
		<b>APPENDIX A: INTERIM PLATE MAPS (2017 +/-) .....</b>	<b>A1</b>
		<b>APPENDIX B: BUILD-OUT PLATE MAPS (2027 +/-) .....</b>	<b>B1</b>
		<b>APPENDIX C: MARKET ANALYSIS .....</b>	<b>C1</b>

# EXECUTIVE SUMMARY

## INTRODUCTION

The **US-77 Corridor Management Plan** (Plan) began in July of 2006 in response to a decision by the Kansas Department of Transportation (KDOT), the City of Winfield, the City of Arkansas City and Cowley County, Kansas that a comprehensive study of the corridor was needed. These entities comprise the US-77 Partnership formed to address future land use, utility service, traffic issues, safety concerns as well as balancing local access with regional mobility.

## KEY STUDY ISSUES

The key study issues raised during the public process are as follows:

- development pressures along US-77, especially south of Winfield and adjacent to Strother Field as well as the potential impacts of a new hospital at the 242nd Road intersection;
- safety concerns at a number of key intersections throughout the Study Corridor; and
- concerns about decreasing mobility, especially between the two communities.

## STUDY OUTCOMES

The **US-77 Corridor Management Plan**:

- identifies a future land use vision for the Study Corridor;
- balances the desire for mobility with accessibility needs;
- delineates future access points and improvements to the parallel road network;
- defines a planning-level footprint and preservation needs based upon the preferred facility type and associated improvements;
- identifies future improvements, priorities and phasing; and
- includes a Master Plan Agreement for Plan implementation.

## STUDY CORRIDOR

The Study Corridor limits are as follows:

- K-360 on the south side of Winfield to the north;
- Oklahoma state line (State Line Road) south of Arkansas City to the south; and
- properties within one-half mile on either side of the US-77 centerline and Strother Field.

## PUBLIC PROCESS

The Plan included an interactive charrette process involving the:

- US-77 Technical Team comprised of representatives from the Partnership;
- US-77 Advisory Group comprised of elected officials, major employers, property owners; and
- business owners, residents and interested citizens.

## KEY PLAN RECOMMENDATIONS

### Transportation

- Completion of an alignment study is recommended for a future West Winfield Bypass to connect US-77 to US-160 and US-77 north of Winfield.
- Development of a freeway facility with access at grade-separated interchanges between the future West Winfield Bypass and the north end of the Arkansas City Bypass.
- Due to the cost of the freeway, interim improvements are identified including traffic signals and roundabouts to address immediate traffic and safety needs.
- Ultimately, access will be controlled along the Study Corridor within the freeway segment and private access driveways will be relocated over time to improved or new collector and arterial roads. Existing driveways will be grandfathered. However, if the property owner subdivides or re-zones the property to a higher-intensity use, the owner will be required to relocate the driveway at their own expense. The Partnership will proactively look for opportunities to work with property owners to relocate existing driveways and improve access throughout the Study Corridor.
- Development of an expressway facility with controlled at-grade intersections between K-360 and the future West Winfield Bypass and the north-end of the Arkansas City Bypass to State Line Road.

### Land Use

- Utilizing the **US-77 Land Use Plan** to facilitate development within the Study Corridor by including recommended land uses, densities, locations and standards that are compatible with the Plan's transportation recommendations and long-term access strategy.
- Integration of the US-77 land use, transportation and access recommendations into City and County Comprehensive Plan guidelines as well as zoning and subdivision regulations.

### Utilities

- Coordination of utility improvements within the Study Corridor and delineation of potential future service areas.

### Implementation

- Formalization of the continued collaboration among the Study Partners and creation of a framework to guide Plan implementation efforts.
- Creation of a **US-77 Corridor Oversight Committee** (Committee) which will serve as an advisory body to review, evaluate, facilitate discussions and provide input on events and developments that may impact the Study Corridor. The Committee will be comprised of at least two representatives from the Partners and shall meet at least twice a year.



# INTRODUCTION AND APPROACH

## PLAN PURPOSE

The purpose of the **US-77 Corridor Management Plan** (Plan) is to outline a long-term comprehensive land use, transportation and access strategy for the US-77 Study Corridor (Corridor). The primary issues driving the need for the Plan include the following:

- development pressures along the Study Corridor including but not limited to:
  - south of Winfield: residential and potential commercial growth,
  - within and adjacent to Strother Field including the B and B Theater,
  - north of Arkansas City: future hospital at the intersection of 242nd Road;
- safety concerns at a number of key intersections; and
- concerns about decreasing mobility, especially between Winfield and Arkansas City.

## STUDY OBJECTIVES

To address these issues, representatives from the Kansas Department of Transportation (KDOT), the Cities of Winfield and Arkansas City and Cowley County formed a Partnership to manage access. The primary objectives of the Study were as follows:

- identify a future land use vision for the Study Corridor;
- determine what US-77's ultimate facility type will be (expressway and/or freeway);
- identify future access points as well as improvements to the parallel street network;
- define a planning-level right-of-way footprint and preservation needs based upon the facility type and associated improvements;
- determine acceptable phased implementation opportunities; and
- execute a Master Plan Agreement for Plan implementation.

## STUDY CORRIDOR

The Corridor (see Exhibit 1 on Page 3) limits are as follows:

- K-360 on the south side of Winfield to the north;
- Oklahoma state line (State Line Road) south of Arkansas City to the south; and
- includes properties within one-half mile on either side of the US-77 centerline and Strother Field.

## Segmental Approach

The Corridor is approximately 17.6 miles in length. Throughout the Corridor, the physical characteristics of the roadway, as well as surrounding land uses, change. US-77 varies from four-lane divided along much of the Corridor to two-lane with shoulders along portions of the Arkansas City Bypass. Posted speeds vary from 60 miles per hour along most of the Corridor to 35 miles per hour through Arkansas City south of the Bypass. Currently, most of the Corridor is rural, however, there are developed portions

including within and adjacent to Strother Field, and portions of Arkansas City along the Bypass. Based on this contrast of characteristics, the most efficient way to assess the Corridor and provide recommendations was to divide the US-77 into segments. These segments were delineated by an analysis of existing characteristics and by the future vision outlined by the Partnership and public at-large.

During the early stages of the study, the Partnership determined that the long-term or ultimate improvements for the Corridor should be an expressway or a freeway. Each of these options, or a combination of both, are vital to preservation of the integrity of the system and mobility through the Corridor. Depending on priorities for the segment, the Partners identified either a freeway or expressway option. However, within the City Limits of each community, access to the highway from side streets and occasional private drives ranked higher. Therefore, the traffic analysis and roadway improvement recommendations for the entire Corridor have been analyzed and created based on the following segments:

- Segment 1: K-360 south through Winfield to the potential West Winfield Bypass south of Country Club Road;
- Segment 2: Country Club Road south to the intersection of the US-77 Arkansas City Bypass and Summit Street;
- Segment 3: Intersection of US-77 Arkansas City Bypass the and Summit Street (north of Arkansas City) south to the Arkansas River; and
- Segment 4: Arkansas River south to the Kansas/Oklahoma state line.

## CHARRETTE PROCESS

Successful plans are achieved through fair and open public discussions. For this study, one of the most critical issues was achieving consensus within a compressed time frame. That meant accelerating the stakeholder's understanding of trade-offs that come with each possible solution, while meeting the unique challenges and constraints associated with the Corridor. It also meant effectively dealing with conflicting visions and values by ensuring candid and productive discussions. These challenges were addressed in a carefully planned and managed charrette process. Over a period of days, rather than weeks or months, the consultant team worked with the Partnership, stakeholders and the community at-large to understand their needs and values and to develop preliminary concepts and ideas for feedback. Those preliminary concepts, developed early in the process, were then refined and presented again to ensure that the Plan addressed key issues and met the community's needs.

## Technical Team

To start the process, the Partnership appointed a Technical Team with representatives from each jurisdiction. This committee provided guidance, input and direction to the Consultant Team throughout the process.

## Advisory Group

The Advisory Group included community leaders from a wide variety of interests representing

# INTRODUCTION AND APPROACH

all jurisdictions including elected officials, major employers, property owners, realtors and other stakeholders.

## Residents and Businesses

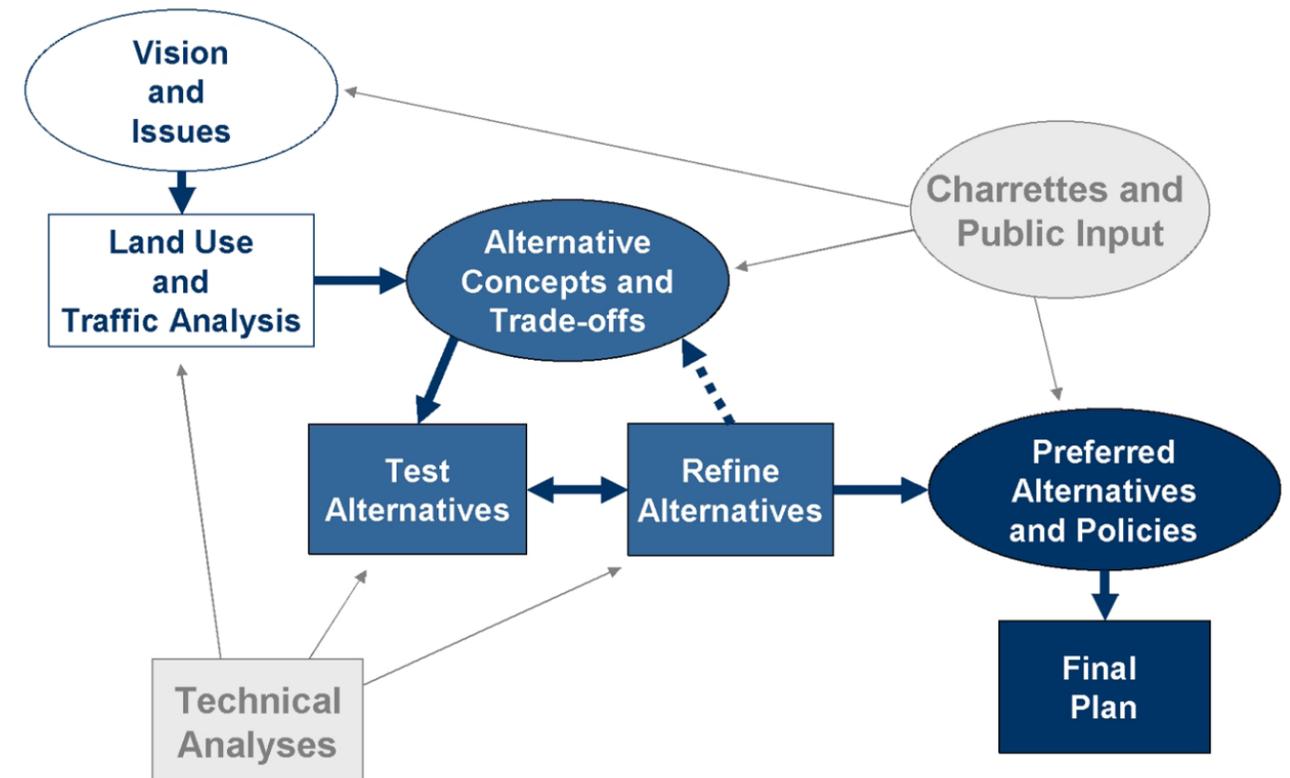
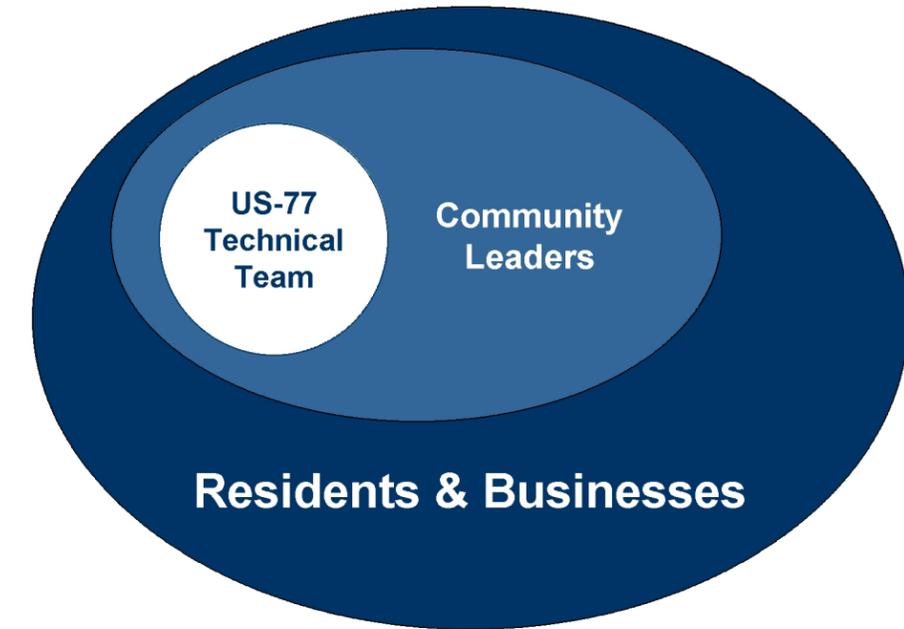
The Consultant Team and the Technical Team presented ideas and concepts for consideration by property owners, business owners, residents, and interested citizens. Each charrette concluded with a public open house, where the community at-large, as well as potentially affected property owners had a chance to discuss the project, and their concerns, with the project team. Based upon this input, the Plan concepts and alternatives were refined to reflect community input.

## TECHNICAL ANALYSIS

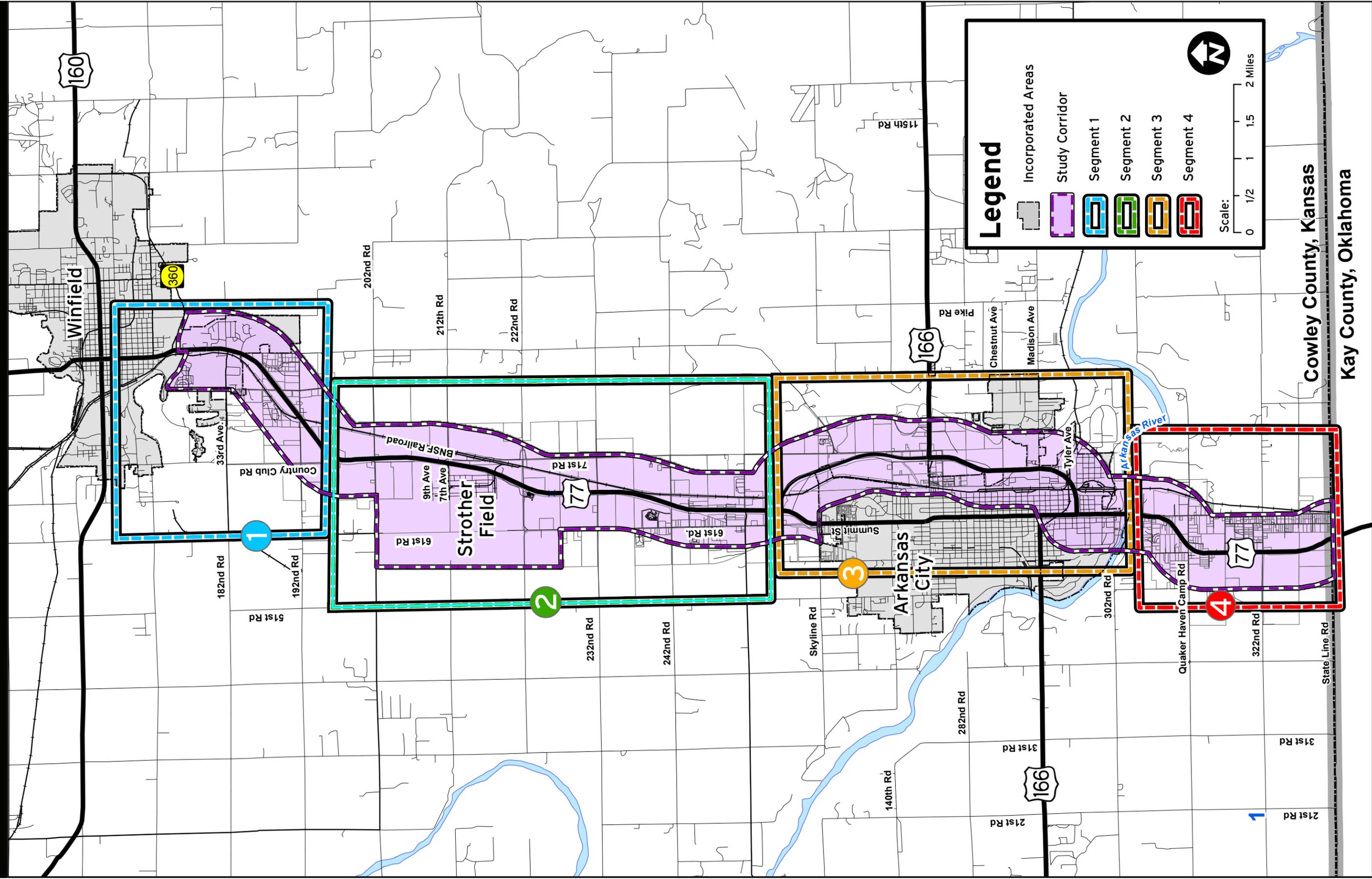
Based upon the issues raised by the Technical Team, community leaders and the general public, the Consultant Team conducted a technical analysis of the Corridor to address land use, utilities, traffic and preliminary engineering issues with respect to potential improvements. This information was then provided back to the groups to allow participants to make informed decisions about potential recommendations for the Corridor.

## ALTERNATIVE CONCEPTS AND TRADE-OFFS

Based upon input during the first charrette, and a preliminary market and traffic analysis of the Corridor, the Consultant Team provided the groups with puzzle pieces representing potential improvements along the Corridor and colored dots representing future land uses. These puzzle pieces included scaled interchange configurations, roundabouts, traffic lights and stop signs. Through this process, the work groups identified potential future land uses and associated improvements. The Consultant Team facilitated the process and provided guidance on the implications of potential future land use patterns and access strategy with travel time, safety, cost and other considerations based on the technical analysis. These considerations are outlined in the following chapters. Based upon this input and analysis, a preferred land use plan and associated transportation improvements and access strategy was identified. These recommendations were then incorporated into the final Plan.



**EXHIBIT 1: STUDY CORRIDOR AND SEGMENT MAP**



# TRAFFIC ANALYSIS

## INTRODUCTION

The Corridor street network and traffic analyses were performed for interim (2017+/-) and build out (2027+/-) years. The traffic analysis was separated into two phases consisting of a macro-level and a micro-level analysis. The Phase 1 macro-level analysis focused on identifying what type of facility US-77 should ultimately become: a freeway or an expressway. The Phase 2 micro-level analysis focused on developing Corridor intersection improvements that would operate at an acceptable level of service for the interim and build-out design years. The primary traffic tasks for each phase included:

### Facility Type (Phase 1 Macro-Level Corridor Analysis)

- Develop a planning level traffic forecasting tool to analyze facility type for the entire Corridor;
- forecast traffic volumes and turning movements for interim and build-out design years; and
- analyze potential facility types.

### Intersection Improvements (Phase 2 Micro-Level Intersection Analysis)

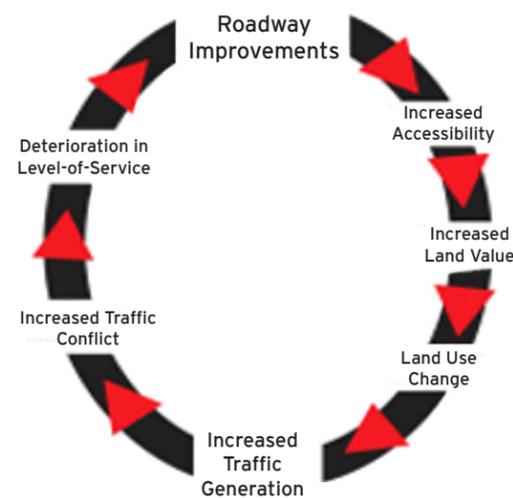
- Perform Highway Capacity Manual (HCM) methodology operational analysis of US-77 intersections; and
- provide recommended improvements for intersections on US-77 for both interim and build-out design years.

## FACILITY TYPE (PHASE 1 MACRO-LEVEL CORRIDOR ANALYSIS)

Increased development pressures along the Corridor brought Winfield, Arkansas City and Cowley County to the same planning table to discuss land use and transportation issues. As development along Corridor occurs, traffic increases. In addition to increases in traffic there are numerous driveways on US-77 causing accidents and lower operational efficiency.

If a transportation corridor becomes too congested with high traffic volumes, traffic operations can begin to experience congestion and adjacent land uses will ultimately suffer. Individuals make choices about where they live, work, shop, play and so do businesses in part based on the amount of travel time it takes them to access these destinations. Figure 1 shows the cycle of transportation and land use development. Based on these evolving issues, the communities, county and KDOT worked together to identify the future facility type for the Corridor. The facility alternatives were a freeway and expressway. See Table 1 on the following page.

Figure 1: Transportation Cycle



## Study Methodology

Phase 1 facility type analysis represented a macro-level planning understanding at the corridor level. The analysis focus was to assess the ability of US-77 to serve the transportation demand associated with the future land use when the facility was modeled as an expressway or freeway.

A pm peak hour travel demand model was developed using TransCAD to forecast traffic for four different scenarios:

1. interim (2017+/-) expressway;
2. build-out (2027+/-) expressway;
3. interim (2017+/-) freeway; and
4. build-out (2027+/-) freeway.

A roadway network and land use projections were developed within the Corridor. Land use projections were based on a market analysis (see Appendix C for a complete description of this analysis) and from the Technical Team, Advisory Group and public at-large during the charrette process.

The US-77 travel model was developed to forecast and analyze the Phase 1 facility type and the Phase 2 intersection improvements at a planning level. The model volumes produced were used in Synchro and SimTraffic to analyze travel time and intersection level of service amongst the alternatives.

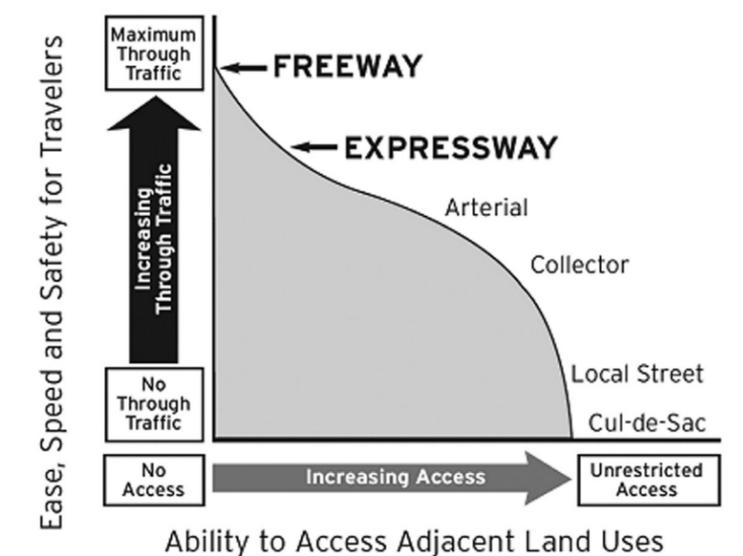
## Data Collection

Data collected in the Phase 1 analysis included a market analysis, land use plans, traffic counts, accident data and travel time data. Peak turning movement traffic counts at ten intersections and five mainline traffic counts were collected and used during model calibration and existing analysis. Trav-time data on the Corridor was also taken during the peak hours for model calibration.

## Mobility Versus Accessibility

As shown in Figure 2, there is a trade-off between mobility and accessibility (freeway verses expressway) when identifying the type of transportation improvement that best fits an area. Land uses, especially commercial, office and industrial uses need to be visible and accessible to and from the transportation network. Additionally, these uses also need to be convenient to areas where people live.

Figure 2: Freeway and Expressway: Mobility vs. Accessibility



# TRAFFIC ANALYSIS

## Freeway and Expressway Alternatives

Phase 1 analyzed facility type alternatives at a planning-level. Two facility types were developed for the Study consisting of a freeway and an expressway. Table 1 provides a description of each facility type. Each facility type provides a range of mobility and accessibility to motorists.

Table 1: Freeway and Expressway Facility Description

	Freeway	Expressway			
<b>Function Definition: How do we define road types?</b>	A multilane, divided highway with full control of access and uninterrupted flow of traffic. Access is provided with grade separated interchanges. <ul style="list-style-type: none"> <li>• Factors that affect traffic operations include interactions among vehicles and roadway geometrics.</li> <li>• 4-lane freeway is assumed with grade separated interchange spacing of approximately 1-2 miles.</li> </ul>	A multilane, divided expressway with partial control of access. Access is provided with interrupted flow at signalized intersections. <ul style="list-style-type: none"> <li>• Factors that affect traffic operations include spacing of intersections and signal timing.</li> <li>• 4-lane expressway with at grade, full access intersections approximately every 0.5-1 mile.</li> </ul>			
<b>Traffic Volume Served: How many vehicles can the road carry?</b>	Typical: 70,000 ADT (2100 vph pl) at LOS C	Typical: 55,000 ADT (1700 vph pl) at LOS C			
<b>Performance Measured: How do we tell how busy it is?</b>	<b>Density of vehicles</b> - Number of vehicles within a given space. <b>Average vehicle travel speed</b> - How fast a car can travel? <b>Travel time</b> - How long does it take to travel a given distance?	<b>Density of vehicles</b> - Number of vehicles within a given space. <b>Average vehicle travel speed</b> - How fast a car can travel? <b>Travel time</b> - How long does it take to travel a given distance?			
<b>Posted Travel Speed</b>	65 mph	55 mph			
<b>Kansas Statewide Accident Rates: 1999 through 2003</b>	<b>Total Accident Rate (phmvm)</b>	<b>Fatal Accident Rate (phmvm)</b>	<b>Total Accident Rate (phmvm)</b>	<b>Fatal Accident Rate (phmvm)</b>	
	Urban	1.256	0.591	2.575	1.521
	Rural	0.703	0.733	0.988	1.568

## Traffic Analysis

Phase 1 traffic analysis used the US-77 travel demand model to analyze traffic demand and travel characteristics. Results from this analysis were used to recommend a facility type for the Corridor.

## Existing Conditions

Currently, US-77 is a four-lane expressway that connects the towns of Winfield and Arkansas City within Cowley County, Kansas. Due to increased development pressures along the Corridor, there has been an increase in traffic volumes and accidents. Existing (2006) peak hour traffic volumes on US-77, as shown in Exhibit 3, range from 500 to 1,500 vehicles. Today, it takes approximately 18 minutes to travel the entire Study Corridor, as shown in Exhibit 6. Currently 90% of the traffic is traveling within Cowley County. However, there are outside factors impacting traffic, including nearby casinos in Oklahoma. It is also important to note that there is an at-grade rail crossing at Strother Field. This crossing is active and is used to transport materials from the main BNSF rail line east of US-77 to Strother Field west of US-77. Mobility is another important issue on US-77 as it serves regional, national and international travel. As shown on Figure 3, US-77 spans from Canada to Mexico.

Figure 3: US-77 National Context



## Interim Conditions

For the Interim forecast, two alternatives were tested: US-77 as an expressway and a freeway. The expressway alternative volumes, as shown in Exhibit 4, range from 630 to 1,980 vehicles during the PM peak. According to the analysis, in the expressway scenario, in ten years it will take approximately 23 minutes to travel the entire Corridor, as shown in Exhibit 6. The freeway alternative volumes, as shown in Exhibit 4, range from 830 to 2,040 vehicles during the PM peak. In the freeway scenario, in ten years, it will take approximately 21 minutes to travel the Corridor, as shown in Exhibit 6.

# TRAFFIC ANALYSIS

## Build-Out Conditions

For the build-out forecast, two alternatives were also tested: US-77 as an expressway and a freeway. The expressway alternative volumes, as shown in Exhibit 4, range from 910 to 2,390 vehicles during the PM peak. In the expressway scenario, in 20-years it will take approximately 25 minutes to travel the entire Corridor, as shown in Exhibit 6. The freeway alternative volumes, as shown in Exhibit 5, range from 1,000 to 2,460 vehicles during the PM peak. In the freeway scenario, in 20-years it will take approximately 22 minutes to travel the Corridor, as shown in Exhibit 6. Based on these forecasts, traffic volumes are expected to double by the build-out year.

It is important to note that the freeway alternatives include a West Winfield Bypass that connects US-77 to US-160 west of Winfield and US-77 north of Winfield. This West Bypass is needed to relieve congestion along the Study Corridor and provide a means for truck traffic to connect to US-160 and US-77 to north. Most traffic coming and going to Wichita would use this route. Traffic volumes just south of Winfield are lower for freeway alternatives, because of West Bypass. A Southwest Arkansas City Bypass is also recommended to connect US-77 to US-166 to the west.

## Safety Analysis

The purpose of the safety analysis in this study was to review and identify high accident locations. Five years of crash data was provided by KDOT from 2000 to 2005, and is shown in Exhibit 2. Traffic safety was discussed with the study team and public at the charrettes.

Based on the map and charrette comments here are some conclusions:

- Safety in and out of Strother Field is critical.
- Greens Farm Road carries significant traffic and serves as an alternative to US-77. Unfortunately, this road also has a significant number of accidents due to sight distance issues. In general, the county roads are not designed to handle high volumes of traffic.
- According to the data, a majority of the fatality accidents occurred along US-77 adjacent to Strother Field.
- There are safety concerns at the intersection of Kansas Avenue and the US-77 Arkansas City Bypass.
- The intersection of Madison Avenue and the US-77 Arkansas City bypass also has safety concerns.
- There are a significant number of accidents along US-77 near the Cherokee Strip Land Rush Museum.

## Facility Type Recommendations

Based on Phase 1 analysis results as well as input gathered during the public process, the following facility types are recommended:

- Segment 2: Freeway Facility
- Segments 1, 3 and 4: Expressway Facility
- Segment 1: the transition to an Expressway Facility is contingent upon the construction of a West Winfield Bypass.

## INTERSECTION IMPROVEMENTS (PHASE 2 MICRO-LEVEL ANALYSIS)

In Phase 2, the travel model was used at a greater level of detail that included intersection analysis. The Phase 2 analysis generated a micro-level understanding of US-77 and the intersection improvements for each intersection as opposed to the macro-level corridor analysis performed in Phase 1.

Based on the high number of existing accidents at some of the intersections and the need to facilitate mobility through the Study Corridor, consolidating access in the near future is critical. Consolidating access is critical in order to convert Segment 2 into a freeway and for a quality expressway within Segments 1, 3 and 4. Based on the findings in Phase 1, an intersection analysis was completed for two alternatives interim and build-out. The methodology and results for the intersection analysis are described in detail in the following sections.

## Study Methodology

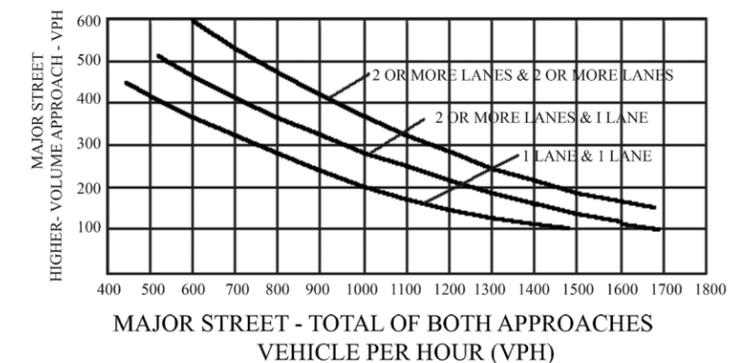
The Phase 2 traffic analysis tested intersection level of service results for US-77. This intersection traffic analysis utilized traditional Highway Capacity Manual, 2000 methods. Table 2 shows the level of service thresholds based on intersection delay for signalized and unsignalized/roundabout intersections. Design level of service C was used as the acceptable level for both the interim and build-out alternatives. The Manual on Uniform Traffic Control Devices (MUTCD) was used to identify where traffic signals would be needed. Figure 4 shows the graph used to identify where signals are warranted.

Table 2: Level of Service Thresholds

LOS	Signalized Intersections Avg. Delay (sec/veh)	Unsignalized / Roundabout Intersections Avg. Delay (sec/veh)
A	≤ 10	≤ 10
B	> 10 - 20	> 10 - 15
C	> 20 - 35	> 15 - 25
D	> 35 - 55	> 25 - 35
E	> 55 - 80	> 35 - 50
F	> 80	> 50

*Highway Capacity Manual 2000*

Figure 4: MUTCD Signal Warrant, Peak Hour

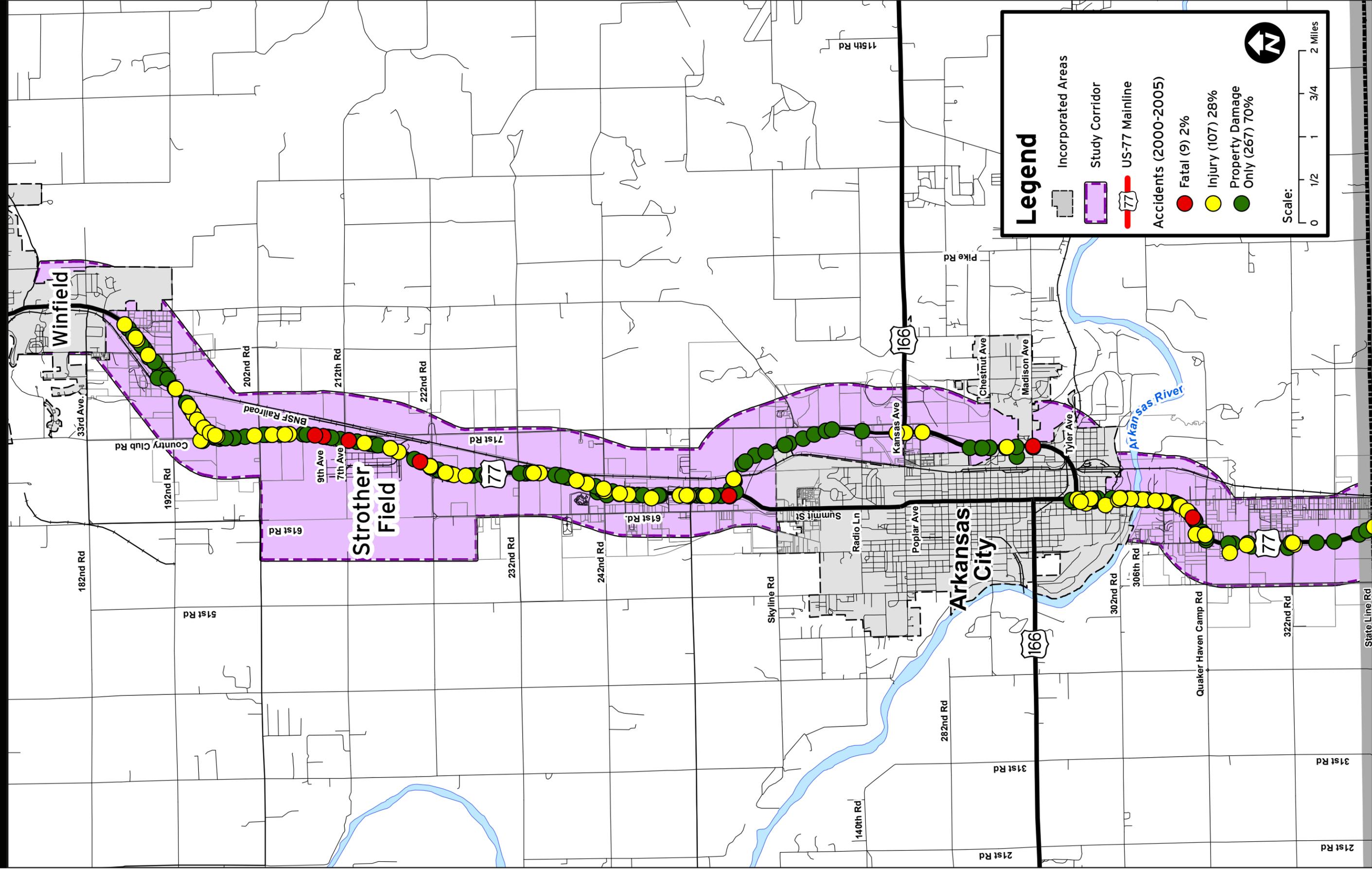


Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100vph applies as the lower threshold volume for a minor street approach with one lane

## Traffic Analysis

Phase 2 traffic analysis used a more detailed US-77 traffic model to analyze traffic operations for the US-77 Corridor and supporting street network. Results from this analysis were used to identify the necessary interim and full build out intersection improvements.

**EXHIBIT 2: ACCIDENTS (2000-2005)**



**Legend**

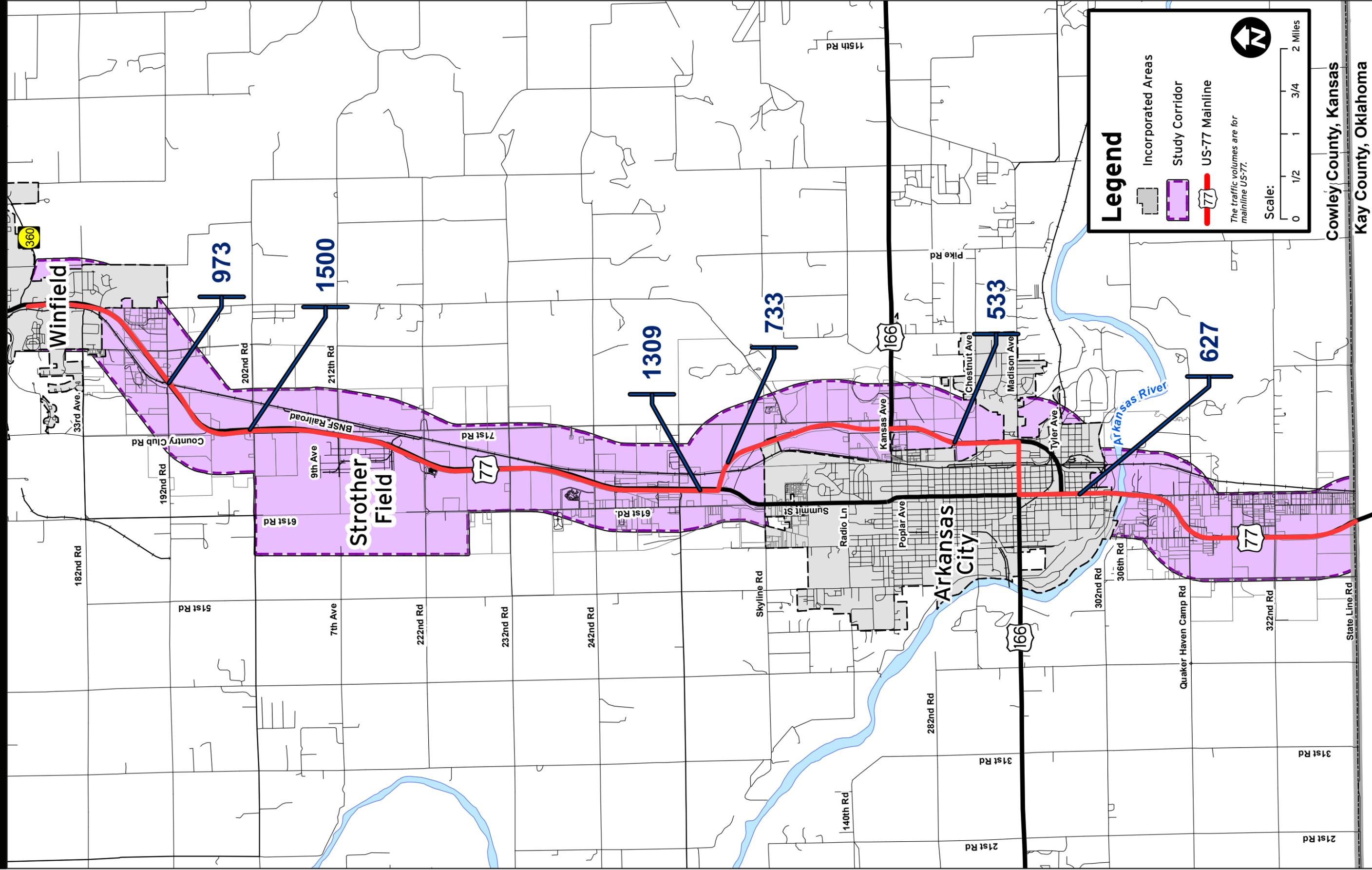
- Incorporated Areas
- Study Corridor
- US-77 Mainline

**Accidents (2000-2005)**

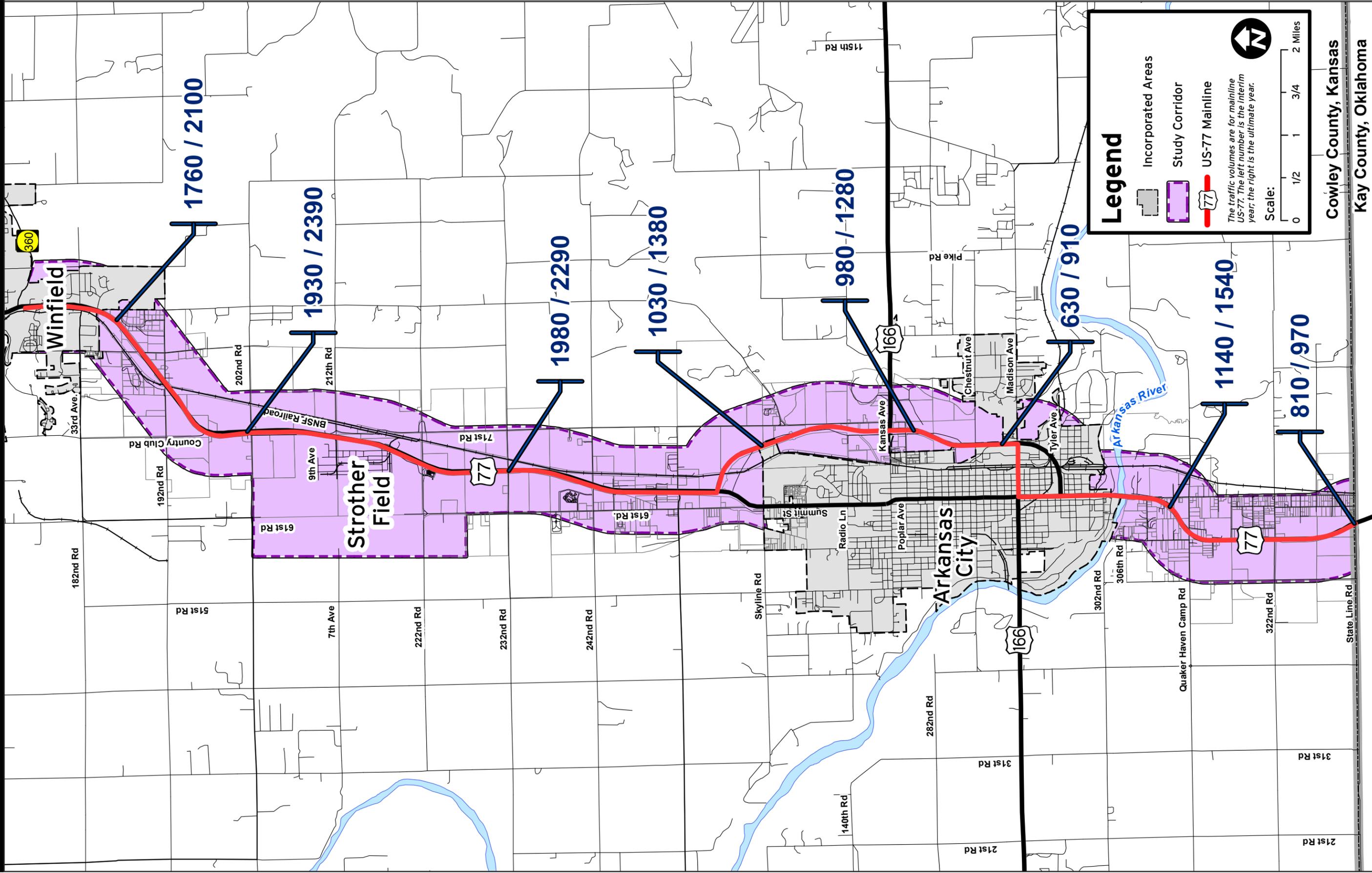
- Fatal (9) 2%
- Injury (107) 28%
- Property Damage Only (267) 70%

Scale: 0 1/2 1 3/4 2 Miles

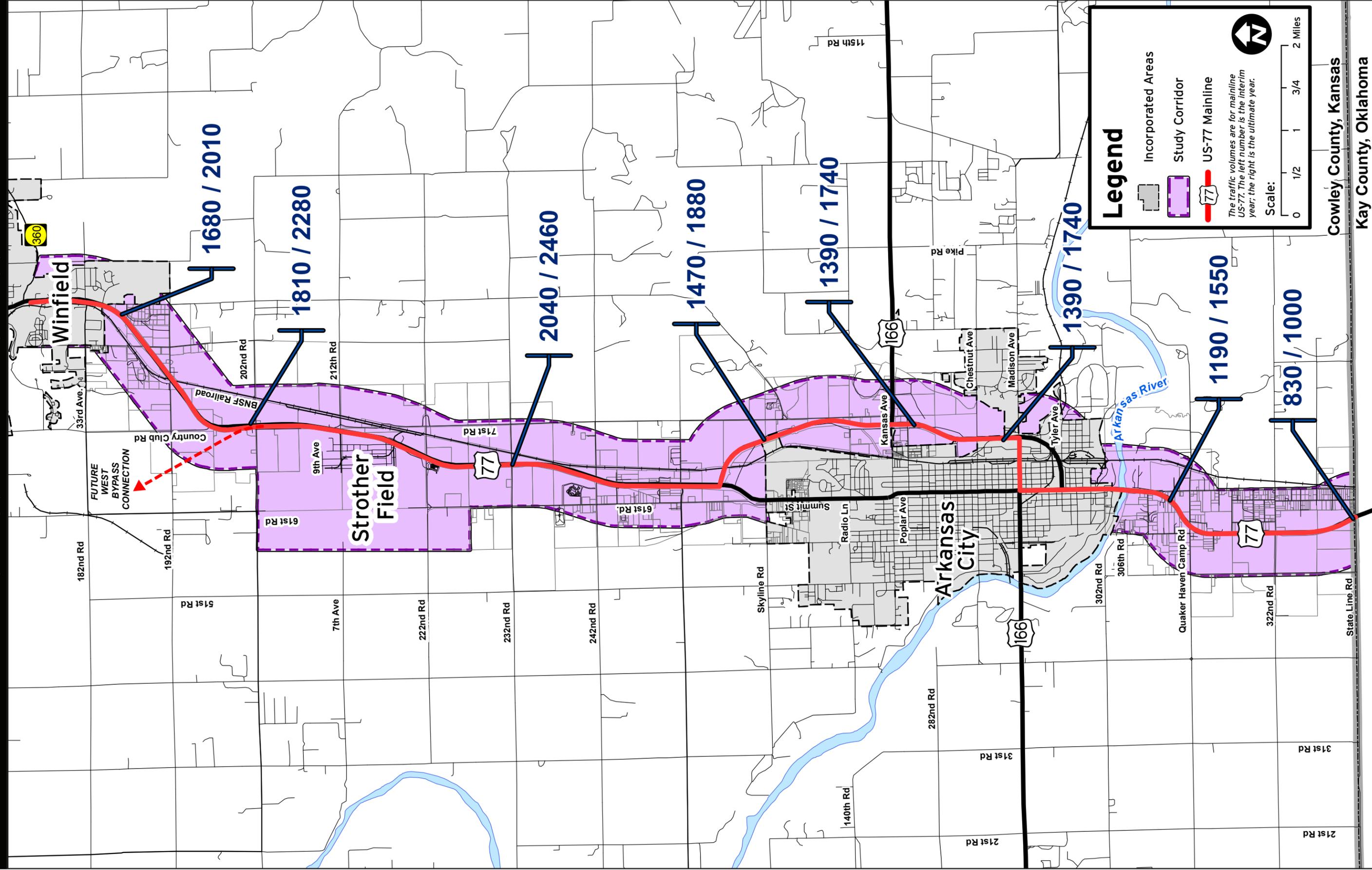
EXHIBIT 3: EXISTING TRAFFIC (2006)

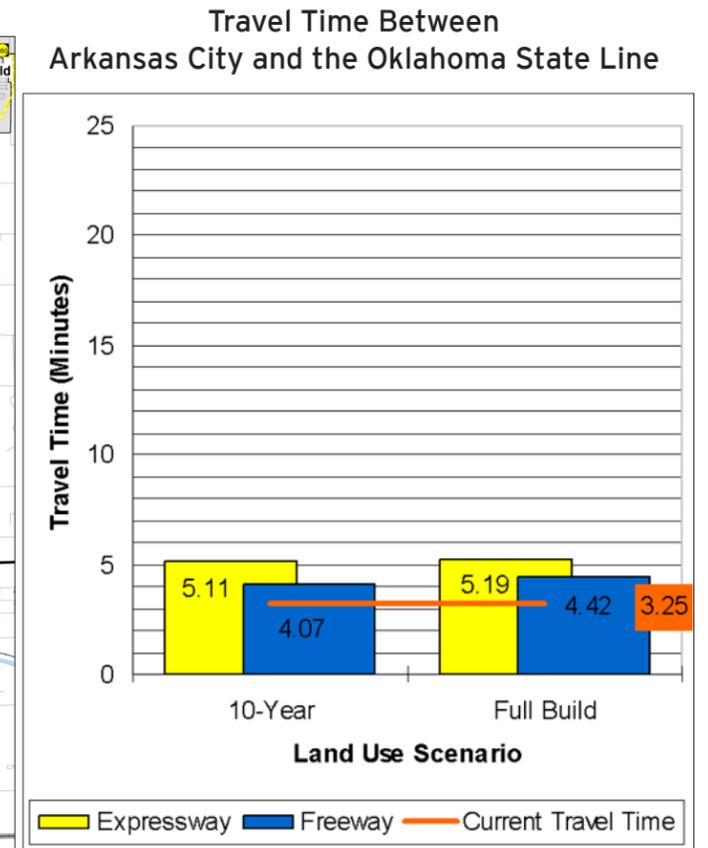
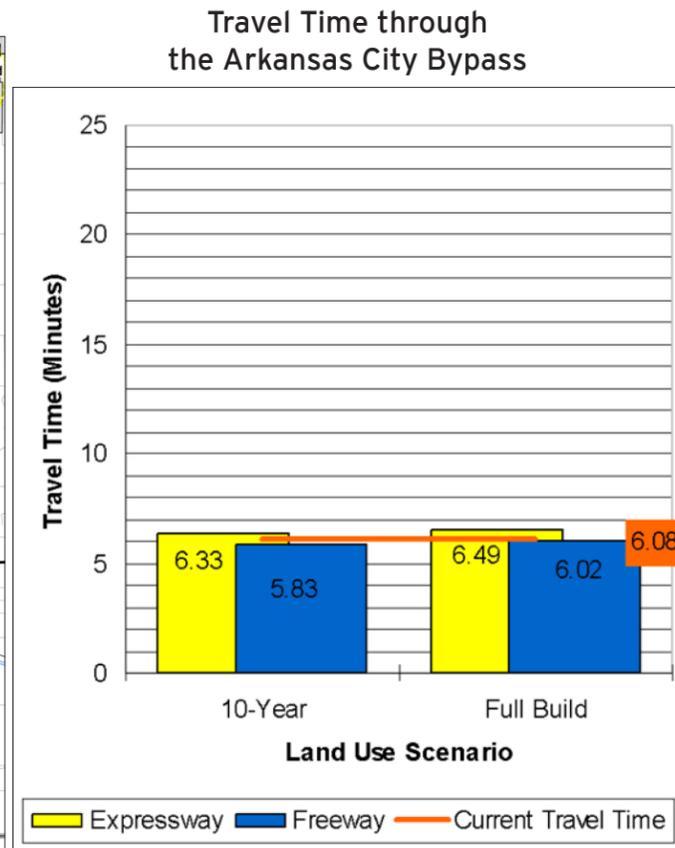
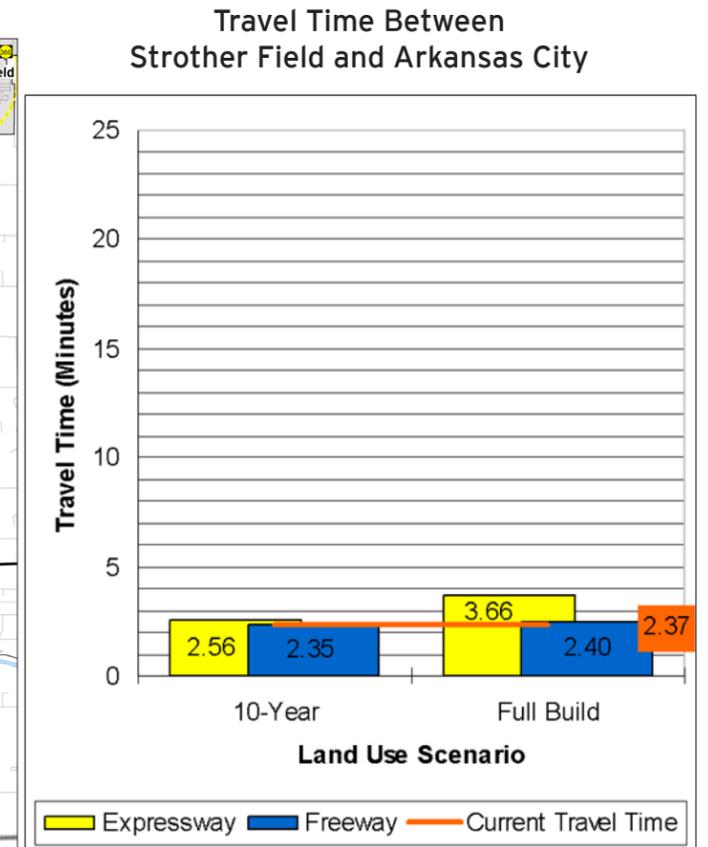
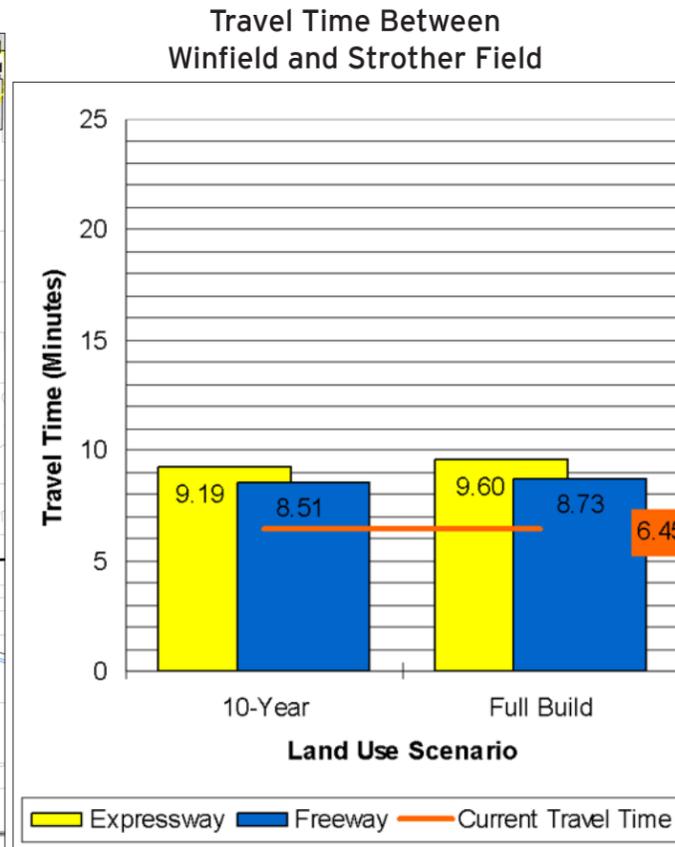
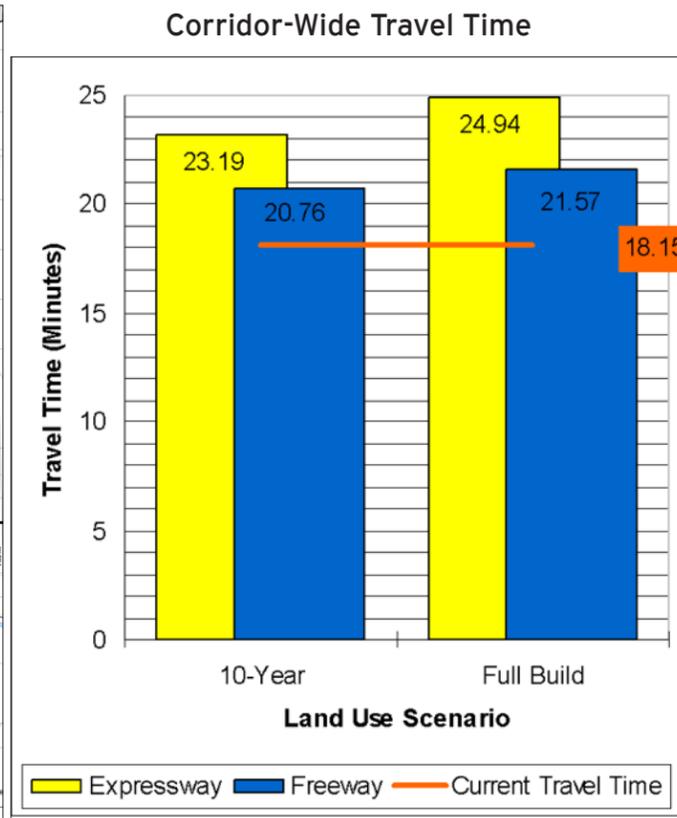


**EXHIBIT 4: EXPRESSWAY - INTERIM (2017 +/-) AND ULTIMATE (2027 +/-)**



**EXHIBIT 5: FREEWAY - INTERIM (2017 +/-) AND BUILD-OUT (2027 +/-)**





# TRAFFIC ANALYSIS

## Interim Intersection Analysis

Through the study process, several intersections were identified where signals would likely be needed. These intersections include K-360, US-77 North Bypass and Kansas Avenue. The rest of the intersections were tested as stop controlled using the HCM 2000 methodology and the MUTCD as shown in Table 2 and Figure 4. As shown in Table 3 below, many of the stop controlled intersections fail in the intersection analysis, while some warrant signals. The intersection improvements identified within the interim are intended to address potential safety and operational concerns. However, some improvements, such as traffic signals, may negatively impact mobility within the short-term. Therefore, any intersection improvements should be carefully considered. If development occurs within the interim, a traffic study should be completed to determine the need for improvements to US-77 as well as the parallel road network caused by the development.

Table 3: Interim (ten-year) Intersection Analysis Results

Intersection	Interim Control	Intersection Analysis*	MUTCD Signal Warrant
K-360	Signal (Existing)	Works	Warranted
33rd Avenue	Stop	Stop control fails	Warranted
Quail Ridge Drive	Stop	N/A	N/A
81st Road	Stop	Stop control fails	Warranted
71st/Country Club Road	Stop	Stop control fails	Warranted
202nd Road	Stop	Stop control fails	Warranted
7th Avenue	Stop	Stop control fails	Warranted
1st Avenue	No Access	N/A	N/A
222nd Road	Stop	Stop control fails	Warranted
232nd Road	Stop	Stop control fails	Warranted
242nd Road	Stop	Stop control fails	Warranted
244th Road	Stop	N/A	N/A
248th Road	Stop	N/A	N/A
252nd Road	Stop	N/A	N/A
US-77 North Bypass	Signal	Works	Warranted
Quarry/Concrete Plant	Stop	N/A	N/A
Kansas Avenue	Roundabout	Works	Warranted
Chestnut Avenue	Stop	Stop control fails	Warranted
Madison Avenue	Stop	Works	-
Mill Road	Stop	Works	-
Southwest Bypass	Signal	Works	Warranted
306th Road	Stop	N/A	N/A
312th Road	Stop	Works	-
314th Road	Stop	N/A	N/A
322nd Road	Stop	Works	-
332nd Road	Stop	Works	-

\* Acceptable LOS is level C or better

## Build-Out Intersection Analysis

For build-out, US-77 would be a freeway facility within Segment 2. The designation of a freeway facility means access to US-77 will occur at grade-separated interchanges. With an approximate two-mile spacing between the identified interchanges, merging and diverging should not be an issue. In order to facilitate quality mobility through the designated expressway portions of the Study Corridor, access should be consolidated where feasible and uncontrolled intersections should be upgraded to incorporate signals, roundabouts and in some cases be closed. Table 4 shows the intersection controls analyzed for build-out. Based on the analysis, the identified intersection controls operate at an acceptable level of service.

Table 4: Build-Out Intersection Analysis Results

Intersection	Full Build Control	Intersection Analysis*	MUTCD Signal Warrant
K-360	Signal (Existing)	Works	Warranted
33rd Avenue	Stop	Stop control fails	Warranted
Quail Ridge Drive	-	N/A	N/A
81st Road	Stop	Stop control fails	Warranted
71st/Country Club Road	Stop	Stop control fails	Warranted
Future West Bypass	202nd Road No Access	N/A	N/A
7th Avenue	No Access	N/A	N/A
1st Avenue	No Access	N/A	N/A
222nd Road	Interchange	Works	-
232nd Road	No Access	N/A	N/A
242nd Road	Interchange	Works	-
244th Road	No Access	N/A	N/A
248th Road	No Access	N/A	N/A
252nd Road	No Access	N/A	N/A
US-77 North Bypass	Interchange/Roundabout	Works	-
Quarry/Concrete Plant	Stop	N/A	N/A
Kansas Avenue	Roundabout	Works	-
Chestnut Avenue	Stop	N/A	-
Madison Avenue	Roundabout	Works	-
Mill Road	Stop	Works	-
Southwest Bypass	Signal	Works	Warranted
306th Road	Stop	N/A	N/A
312th Road	Stop	Works	-
314th Road	No Access	N/A	N/A
322nd Road	Stop	Works	-
332nd Road	Stop	Works	-

\* Acceptable LOS is level C or better

# TRAFFIC ANALYSIS

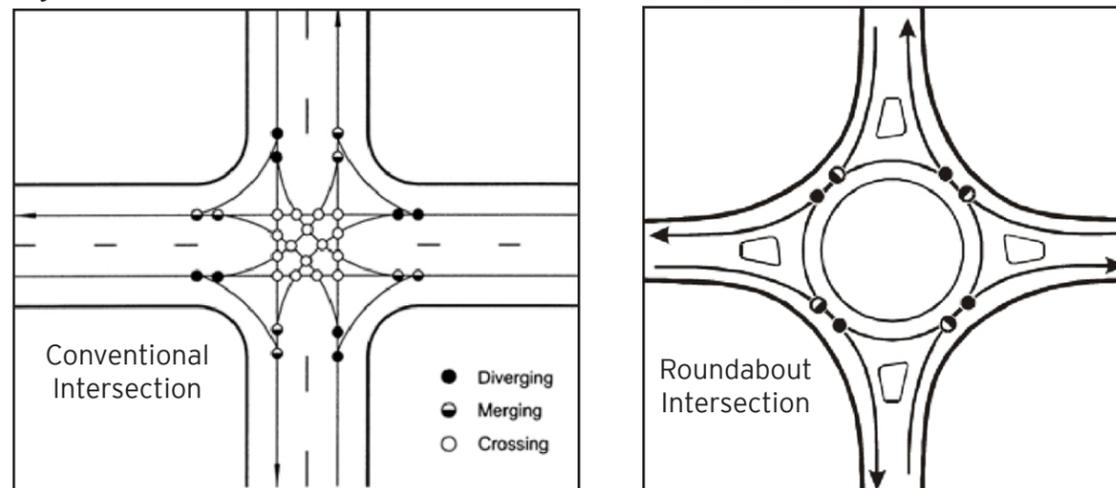
## INTERSECTION IMPROVEMENT RECOMMENDATIONS

Based on the Phase 2 analysis, and public comments during the charrette process, intersection improvements were identified for both the interim and build-out design years. Table 5 shows the recommended intersection improvements.

Four of the intersections on the US-77 Arkansas City Bypass have special circumstances:

- US-77 Arkansas City Bypass and Kansas Avenue: There are concerns with safety and stopping mainline traffic, so to address these joint concerns, the team recommends a roundabout. In general, public reaction to the roundabouts were mixed. There is concern from the technical committee and the public about vehicles running a stop light or stop sign. As illustrated in Figure 5, the number of conflict points are much lower for a roundabout than a typical signalized or stop controlled intersection. An additional advantage of roundabouts is that traffic is slowed down but does not stop, allowing continuous through movements.
- US-77 Arkansas City Bypass and Chestnut Avenue: The County Bridge to the east is deteriorating and will need to be replaced within the next ten to 15 years. Cowley County has indicated that they may consider repairing or replacing the bridge in the future. A majority of the public believed strongly that the intersection should remain open in the future. Chestnut is an important east-west connection from the neighborhoods east of the Bypass to Downtown Arkansas City west of the Bypass.
- US-77 Arkansas City bypass and Madison Avenue: There are also concerns with safety and stopping mainline traffic, so a roundabout is also recommended for this intersection.
- Summit Street and US-77 Arkansas City South Bypass: Has businesses located adjacent to the intersection, making major improvements difficult without acquiring additional right-of-way.

Figure 5: Conventional and Roundabout Intersection Conflict Points



A conventional intersection has 32 conflict points.

A roundabout intersection has 8 conflict points.

Source: FHWA

Table 5: Intersection Improvement Recommendations

Intersection	Interim (10-year)	Full Build Out
K-360	Signal (Existing)	*Signal (Existing)
33rd Avenue	Stop control	*Signal
Quail Ridge Drive	Stop control	*Stop Control
81st Road	Stop control	*Signal
71st/Country Club Road	Signal	Signal
Future West Bypass	Close access (202nd Road)	Interchange
7th Avenue	Close access	No Access
1st Avenue	Close access	No Access
222nd Road	Signal	Interchange
232nd Road	Close access	No Access
242nd Road	Signal	Interchange
244th Road	Close access	No Access
248th Road	Close access	No Access
252nd Road	Close access	No Access
US-77 North Bypass	Signal	Half Diamond Interchange/Signal
Quarry/Concrete Plant	Stop	Stop
Kansas Avenue	Roundabout	Roundabout
Chestnut Avenue	Right turn only	Right turn only
Madison Avenue	Roundabout by 2017	Roundabout
Mill Road	Stop	Stop
Southwest Bypass	Signal	Signal
306th Road	Stop	Stop
312th Road	Stop	Stop
314th Road	Close access	No Access
322nd Road	Stop	Stop
332nd Road	Stop	Stop

\*This section will be converted into a local Expressway if a West Bypass is constructed.

When consolidating access is proposed, improving the local street network and providing driveway access will be necessary. The proposed improvements and relocating driveway access are shown in the Plan Plates within Appendix A and B. Consolidating access will re-route additional traffic onto the access points with US-77, and the recommended intersection improvements will handle the additional capacity. By consolidating access the US-77 Corridor will see additional improvements, such as a reduction in conflict points and accidents, and it will provide better traffic flow on the US-77 Corridor and local street network.

# TRANSPORTATION RECOMMENDATIONS

## INTRODUCTION

The purpose of the transportation recommendations is to focus on US-77, the major intersecting highways and streets, and the adjacent local street system. US-77 and the local street network are an integrated system and it would not be prudent to focus on the mainline at the expense of the local street network, or conversely, to have a focus on the local street network at the expense of the mainline. It is equally important to identify the long-term improvements and to also consider the appropriate interim improvements as well.

Before any consideration for interim or build-out improvements to the Corridor, the Consultant Team reviewed the capacity, type, function, and parameters of US-77 from the state line north to K-360. Within the Corridor limits there is a significant contrast in roadway characteristics. Some of the varying roadway characteristics include:

- number of lanes;
- type of access control;
- median divided lanes or undivided;
- traffic control at intersections;
- posted speed limit and roadway design speed;
- curb and gutter or shoulder; and
- frequent private driveways or limited private access.

### Parallel and Intersecting Local Street Network

US-77 and the local street network function as an integrated system that serves different destination and travel purposes. The differing destinations are evident in the aerial photography shown in Appendix A and B respectively. With the freeway facility-type determination made for the segment between Winfield and Arkansas City, US-77's travel purpose will be to serve the higher traffic demand volumes and the priority given for mobility between the two communities. The local county road network will provide access to final destinations and the ability to provide a standard or reverse frontage road system to distribute traffic and facilitate development opportunities.

Designing an effective street network for the interim and build-out conditions will enhance the capacity of US-77 and make appropriate use of the surrounding land, both developed and undeveloped. To provide an effective layout of the street network around US-77, the Consultant Team gathered input from previous plans and studies as well as input from the work groups and public through the charrette process.

## CORRIDOR PRESERVATION PLAN

The creation of this Plan is a significant milestone in the preservation of the integrity of US-77 through south-central Kansas. Through the course of this study, it has been decided that the long term goal for US-77 is a combination of an expressway and a freeway facility. The freeway portion of the Study Corridor will extend between Winfield and Arkansas City. The freeway section would preserve the short travel time and high mobility between the two communities. The results of this study and the plates

provided will be a tool for KDOT, Arkansas City, Winfield, and Cowley County to plan and preserve the needed right-of-way for the combination expressway and freeway. This Plan will be used by the Partners to prevent future access problems and provide solutions to existing access problems. The goal of the transportation improvements shown are to improve safety and operation of the primary roadway.

Appendix A and B presents plate drawings at a scale allowing the proposed local street network system to be shown and defines the right-of-way preservation needs for US-77 and associated intersection improvements including future footprints for roundabouts and interchanges. The Appendix A Plates illustrate interim (ten-year) improvements and Appendix B Plates illustrate build-out (20+year) improvements. The Appendix B Plates should be used to preserve future right-of-way needs. The plate drawings are developed with the following basic criteria:

US-77 interim and build-out improvements are identified and evaluated on a segmental basis. Segment 2 will ultimately be a freeway; Segments 1, 3 and 4 will be an expressway.

- Long term goals are to eliminate identified existing access points along US-77 and provide access at grade separated interchanges within the freeway segment. For the expressway segments, the long-term goal is to plan for intersection improvements at priority locations. These locations will provide the desired spacing between traffic signals, roundabouts and stop-sign controlled intersections, thus creating a highly mobile and functioning expressway. Several access points that do not create the situation stated above will be recommended for removal in the long-term.
- US-77 will require approximately 300-feet of right-of-way for the mainline through Segment 2. With exception to the future interchange locations, the existing right-of-way satisfies this requirement.
- KDOT will continue to have primary responsibility for US-77.
- Interchanges are typically laid out as standard KDOT diamond interchanges with standard right-of-way needs preserved where feasible.
- Within freeway segments, desirable interchange spacing is every two miles to allow for safe weaving associated with ingress and egress to the freeway.
- The desired spacing for side road access on the four-lane divided expressway segments is one-mile, and the minimum spacing is one-half mile.

Typical sections for both the freeway and expressway segments of the US-77 mainline characteristics are provided in Figures 6, 7 and 8. Individual intersection or interchange observations are summarized with the Segment Summaries on the following pages and unique traffic challenges discussed within the Traffic Analysis Section of the report.

## LOCAL STREET NETWORK IMPROVEMENTS

The proposed local street network improvements were established through a combination of input from the Technical Committee members, future city and county plans, and individual meetings with stakeholders to assess how their local street network was affected by the US-77 recommendations. Through local input and use of general traffic planning principles, the following guidelines were established. See guidelines on the next page.

# TRANSPORTATION RECOMMENDATIONS

## Arterials:

1. The primary function is to distribute traffic away from the interchanges and intersections, serve as medium to longer range travel on the local street network, and distribute traffic to the collector road system.
2. The County Arterials should be planned as two-lane facilities with additional intersection turn lanes as dictated by turning movement volumes.
3. Arterials should be planned to provide control of access as much as possible, particularly near the intersections with US-77. For the arterials in urban areas, the desired intersection spacing is one-half mile with right-in/right-outs allowed at one-quarter mile spacing.
4. For the side street Arterials within Segment 2, access control is especially critical at interchange locations. Access control is needed to more safely and effectively distribute the traffic desiring to enter and exit the US-77 freeway and avoid adverse operations. The desired guidelines include having intersections a minimum of 1000 feet from the ramp intersections.
5. Urban Arterial streets are recommended to have a minimum proposed right-of-way of 120 feet. County Arterial roadways should have 80-120 feet.

## Collectors:

1. The primary function is to distribute traffic away from the arterials, provide short range trips to final destinations, and provide access into developments and residential areas.
2. Collectors should be planned as two-lane facilities with an extra left turning lane provided if warranted.
3. For Segment 2, collectors immediately adjacent to US-77 will act as reverse frontage roads to distribute traffic and provide access to properties for economic development.
4. Rural and urban collector streets are recommended to have a minimum proposed right-of-way of 60-80 feet, respectively.
5. Generally cities and counties have ordinances that require dedication of right-of-way for roadway purposes as development occurs. These general guidelines along with the Phase 2 Segment level traffic analysis, provided the principles used to establish the proposed right-of-way recommendations for the arterial and collector street as shown in the Appendix A and B plate drawings. Typical sections of the arterial and collector roadway characteristics are provided in Figures 9, 10, 11 and 12.

## SEGMENT RECOMMENDATIONS

This report only shows approximate locations of the recommended future local street network. The intent is to show the approximate locations of these streets and not their final location. It is understood that as the corridor develops, things will change. There will be developments that occur that may necessitate changes in the local street network shown. As these developments occur however, Arkansas City, Winfield, and Cowley County should seek to preserve the right-of-way for both US-77 and the local street network.

It is also recommended that the local street network be incorporated into Arkansas City, Winfield, and Cowley County's long range plans. These long range plans should contain more detail about the exact location of the street network. The intent of this report is to show the right-of-way preservation needs that should be secured as development occurs.

## Segment 1 Summary

The first segment of the US-77 corridor begins at the K-360 intersection, and extends south beyond the Winfield city limits to the proposed future interchange with the West Winfield Bypass. Although the existing US-77 roadway has partial access control, there is a moderate level of residential and business development on the intersecting side streets. With the exception of the K-360 intersection which is signalized, the remainder of the intersections are stop controlled on the local road. The existing roadway is four-lane undivided within the city limits, and transitions to a grassed median divided expressway south of Winfield. Likewise, the posted speed transitions from 35 mph to 70 mph respectively.

The future interim and long term corridor management plan has been prepared to consider the possibility of a western US-77 bypass of the City of Winfield. If a bypass were in place, existing US-77 from K-360 to County Club Road would no longer be US-77. Based on input from the technical committee which included representatives from KDOT and the City of Winfield, the bypass concept should be implemented into the long term plans for the US-77 corridor. As a result, the long term, or build-out corridor management plans have been prepared to consider the bypass. Appendix A and B provide plate drawings showing the integrated US-77 expressway and local street system. The following is a summary of issues and recommendations within this segment:

- The US-77 and K-360 intersection configuration should remain the same as the existing condition, as a signalized intersection.
- The 33rd Avenue intersection configuration for future improvements is shown as a two-way stop controlled intersection. Existing constraints such as the side road geometry and the proximity of the BNSF railway to the intersection make this an undesirable location for future improvements. Should a signalized intersection in this segment be warranted in the



K-360 Intersection



Country Club Road Intersection

# TRANSPORTATION RECOMMENDATIONS

future, H.H. Constant Road would be a better location for intersection improvements.

- The Quail Ridge Road intersection configuration should remain the same for both the interim and build-out time-frames. Traffic signals could be added in the future if warranted.
- The H.H. Constant Road (81st Road) intersection configuration as a two-way stop controlled intersection will likely require future improvements. The recommendation is to place a higher priority on this intersection as opposed to 33rd Avenue, due to the existing constraints mentioned above. Consideration should be given to improving the horizontal geometry of the side road for better intersecting angle with US-77.
- The Country Club Road intersection should undergo interim improvements that also correspond with the build-out improvements for a West Winfield Bypass. The one-way stop controlled intersection will need to be signalized in the future. If traffic signals are installed for the interim condition, the configuration of the intersection should also be improved to correspond to the future western bypass and interchange as well.
- The construction of the West Winfield Bypass is a linchpin of the freeway section. If the West Winfield Bypass concept is not carried forward and/or significant development occurs south of Winfield, this segment would continue to operate as an expressway (as in the Interim) with signalized intersections spaced at one-mile. This would limit the freeway section to 222nd Road at Strother Field to the north-end of the Arkansas City Bypass which may be impractical from a cost-benefit standpoint. The intent of the West Winfield Bypass is to extend the freeway section to US-160 west of Winfield and ultimately to US-77 north of Winfield which is ultimately planned as a four lane facility. At a minimum, Country Club Road should be realigned as shown in the Interim Plan Plates and improved to an urban arterial.



33rd Avenue Intersection

## Segment 2 Summary

Over the next several years, this segment could experience the most rapid development. In fact, major development plans over the past few years in this segment brought recognition to the need for a US-77 corridor management plan. US-77 is essentially a four-lane median divided expressway with decent access control between Arkansas City and Winfield. Generally, the local intersecting county road network is spaced at one mile intervals. However, there are some dead end roads accessing rural subdivisions and residential areas. Strother Field Airfield and Industrial Park are also located within this segment. Currently, Strother Field has direct access to US-77 from 222nd Road, 1st Street, and 7th Street. The

long-term plan for this segment is to transform US-77 from an expressway to a freeway. This long term strategy will help to avoid degradation of KDOT's investment in the state highway system between Winfield and Arkansas City.

During the development of the Plan, the Technical Committee, Advisory Group and the public at-large listed mobility between the communities as a top priority. The build-out improvements shown in the Plan Plates (Appendix B) represent a plan that will accomplish this goal. In order to maintain mobility, modifications to the existing access will be required. Interchanges will be constructed to replace existing at-grade intersections with county roads. Additionally, frontage roads and major local road improvements will be necessary to support the recommended interchanges. Similar to the improvements shown in Segment 1, this segment will also take into account a future western bypass of Winfield as a long range plan. Appendix A and B provide plate drawings showing the integrated US-77 and local street system. The following is a brief summary of issues primarily focused on the interchanges and the area surrounding:

- The Interchange configuration near the intersection of 202nd Road has taken into account the possibility of a future West Winfield Bypass. The footprint of the future interchange is developed with the assumption as a side road overpass of US-77. The concept for a western bypass was considered by the City during preparations for applications to be submitted for KDOT's system enhancement program. At that time, the City of Winfield developed several bypass concepts, and ultimately submitted the application for the West Bypass. The application was not selected; however the City still would like to move forward with the bypass concept into the long-term plans for improvements to US-77. Because this is a long range improvement with no funding for construction or with an alignment identified, it is shown on the long term plan. The next step for the City of Winfield would be to conduct an alignment study for the western bypass. However, if the concept of a western bypass was not carried forward, right-of-way would not need to be preserved for the interchange and the right-of-way and transportation improvements shown in the interim situation would control.
- The 202nd Road intersection and direct access to US-77 would be removed in the long term plan. Traffic from west 202nd Street would gain access to US-77 by the relocated 202nd Road and the future interchange with the bypass. Traffic from east 202nd would be routed to the relocated roadway by a frontage road.
- The 212th Road (7th Street) intersection, or north Strother Field entrance, direct access to US-77 will be removed in the long term plan. Traffic would gain access to US-77 by the proposed interchanges.



212th Road Intersection

# TRANSPORTATION RECOMMENDATIONS

- The 1st Street intersection, or south Strother Field entrance, direct access to US-77 will be removed in the long term plan. Traffic would gain access to US-77 by the proposed interchanges.
- Consideration should be made for the existing spur track off of the BNSF Railway. Should the spur track remain in place during the implementation of the long term improvements to the corridor, a grade separation will be required between the spur track and the mainline lanes of US-77. The long term improvements shown on the plate's show that US-77 over the spur track would also allow an access road to the land east of US-77 to be built beneath the freeway.
- The 222nd Road Interchange configuration is assumed as a mainline over 222nd Road. This assumption has been made based on an attempt to minimize impacts to existing constraints, and based on the proximity of the spur track grade separation.
- The 232nd Road intersection and direct access to US-77 would be removed in the long term plan. Traffic from this side road would use 61st Road and 71st Road for connection to interchange side roads.
- The 242nd Road Interchange is the lowest priority location within Segment 2. The future interchange layout is assumed as side road over. If construction of the medical center moves forward, the entrance from 242nd Street should be located far enough to the west to allow adequate spacing between the west ramp terminals and the entrance. Likewise, on the east side of the interchange, adequate spacing should be provided between the local access road from the south and the eastern ramps. If existing topography does not permit adequate spacing on the east side, a roundabout connecting the ramp terminals and the access road could be considered.
- The Summit Street/US-77 Bypass intersection represents the southern endpoint of the freeway section between Arkansas City and Winfield. South of this point the corridor transitions to an expressway section. During the development of the corridor management plan, several scenarios for an intersection or an interchange were discussed. Ulti-



At-grade railroad crossing at Strother Field



222nd Road Intersection



US-77 and Arkansas City Bypass Intersection

mately, the most realistic and feasible option with a priority on safety and mobility was identified and is shown in the build-out plan. This option is a half diamond interchange, with priority given to the highest traffic movements. At-grade intersection options, such as a roundabout or traffic signals, were also considered at this location. Should the half interchange become less attractive an option due to site conditions or economic constraints, the at-grade type intersection should be reconsidered. As shown in the Plate Maps, the grade separated interchange represents the most conservative footprint for right-of-way preservation.

## Segment 3 Summary

Segment 3 of US-77 begins at on the north side of Arkansas City and extends along the eastern US-77 Bypass, turning south at Summit Street and through the southern part of the City, and ending at the Arkansas River Bridge. This segment is mainly access controlled along the bypass, but has no access control between the bypass and the river. The segment varies in posted speed ranging from 35 to 65 mph, and the number of lanes varies from four-lanes to two-lanes. US-77 along the bypass has the feel of a rural expressway, while the section south of the bypass feels more like an arterial street. No development is anticipated on the bypass. However, redevelopment may be anticipated along south Summit Street due to the completion of the levee system and recent modifications to floodplain maps. Appendix A and B provide plate drawings that illustrate the integrated US-77 and local street system, as well as providing limits for the access management strategies that should be implemented in correlation with redevelopment. The following is a brief summary of issues primarily focused on the intersections within Segment 3:

- The private entrance to the existing concrete plant will remain as a one-way stop controlled intersection in the interim and build-out plan.
- The Kansas Avenue/US-166 Intersection will most likely need intersection improvements in the interim condition. This is based on the traffic anticipated on Kansas Avenue once the BNSF overpass is completed, and the growing safety concerns for the site today. The existing two-way stop controlled intersection is not anticipated to be able to handle anticipated traffic projections. Two options for improvement include a traffic signal and turning lane additions, or a two-lane roundabout. The Technical Committee recommended showing the roundabout option in the Plan, as well as the likely right-of-way requirements for the future. The plan to show the roundabout option was made based on similar KDOT rural highway intersections where roundabouts have been a positive solution.
- The Chestnut Avenue Intersection currently op-



Kansas Avenue/US-166 Intersection

# TRANSPORTATION RECOMMENDATIONS

erates as a two-way stop controlled intersection. The intersection is approximately one-half mile north of Madison Avenue. The County Bridge to the east is deteriorating and will need to be replaced within the next ten to 15 years. Cowley County has indicated that they intend to repair or replace the bridge in the future and a majority of the public believed strongly that the intersection should remain open in the future. Therefore, it is recommended that this intersection continue to be stop controlled.

- The Madison Avenue intersection also currently operates as a two-way stop controlled intersection. Future traffic also indicates that this intersection could require improvements in increase safety. Similar to Kansas Avenue, the technical committee identified two likely options for this location. Those options would include a traffic signal and turning lane additions, or a two-lane roundabout. Each roadway improvement option for this location should be studied in more detail for an appropriate determination to be made.
- The Mill Road Intersection configuration will remain in both the interim and the build-out as a one-way stop controlled intersection.
- The Summit Street intersection has been shown on the interim and the build-out plans to continue as a signalized intersection. A potential west leg of this intersection would be the US-166 Southwest Bypass, and is shown in the Plan Plates.
- The section of the corridor between the intersection of the Bypass and Summit Street functions as an urban arterial street. Some of the existing characteristics of this area include multiple commercial entrances, sidewalks and high pedestrian movements, multiple collector road intersections, and low posted speed limit. The corridor management plan recommends that current access management techniques should be implemented during redevelopment opportunities. This would include the area through the intersections of Polk, Taylor, Filmore, Pierce, Buchanan, and Lincoln Avenues. See page 22 for the access management tools and techniques.

## Segment 4 Summary

The southern segment of the US-77 Corridor is from the Arkansas River south to the Kansas/Oklahoma state line. This segment consists of a mixture of existing residential and light commercial development south of the river. Currently, this segment is not experiencing any significant development, and the City of Arkansas City does not have immediate plans to extend city water or sewer south of the river. US-77 is essentially a four-lane divided expressway currently from just south of the state line to just south of the Arkansas City river bridge. There are eight local street intersections with US-77, and each are stop controlled on the side road with continuous traffic on US-77. The several of the local street intersections



Chestnut Avenue Intersection

are spaced at a one-mile interval, with a few exceptions at half mile or less spacing. This segment also has some existing commercial entrances with direct access to US-77, located through the four-lane undivided transition south of the river. Also, there are six (6) private property residential and field entrances directly off of the expressway. Appendix A and B provide plate drawings showing the integrated US-77 and local street system recommendations for build-out. The following is a brief summary of issues primarily focused on the intersections and private property entrances, as well as the interim and build-out improvement recommendations:

- The 306th Road interim and build-out intersection recommendation will remain the same as the existing condition of a one-way stop. In order to preserve the ability to turn northbound from 306th Road, the cross over should remain open.
- The commercial drives north and south of 306th Road on the west side of US-77 cannot be easily replaced with new drives from 306th Road. Even though the entrances should remain, there are specific long term corridor improvements that can be made to increase safety. Such improvements include consolidation of access points for adjacent businesses, removing the median crossover to allow right in/right out movements only.
- The 61st Road intersection and connection to US-77 is currently set up as a 'T' intersection with a right turning roadway acceleration lane for the northbound side road traffic. The existing configuration does not allow for the side road to southbound US-77 movement. In the future, an increase in side road traffic or overall safety concerns could necessitate roadway geometric improvements. The recommendation is to realign the side road leg to intersect with US-77 at a right angle. A traffic signal may also be needed at this location should traffic warrant such measures.



US-77 North of the Arkansas River.



US-77 South of the Arkansas River.



61st Road Intersection

# TRANSPORTATION RECOMMENDATIONS

- The 312th Road (Quaker Haven Camp Road) intersection currently operates as a two-way stop controlled intersection. The interim configuration is recommended to remain as a two-way stop controlled intersection. Although no development plans within this area exist, closure of 314th Drive and Wright Avenue could result in additional traffic at this intersection. If this occurs, an evaluation should be made to determine if turning lane additions are needed. Also, as a long term improvement, realignment of the side road should be considered. Realigning the side road to intersect with US-77 closer to a right angle would improve driver visibility at the intersection.
- The 314th Drive/Private Entrance is approximately one-quarter of a mile south of the 312th Road intersection. For long-term corridor improvement, the intersection is shown as a closure. Closing these access points would assist in preserving the suburban and rural expressway concept goal to provide major side road intersections at one-mile spacing. However, if the area south of Arkansas City does not develop at a rapid pace, this closure would be a low priority improvement based on the cost of the required local road improvements.
- The Wright Avenue/Private Entrance intersection is shown as a closure on the build-out improvements plan. Closing these access points would assist in creating an expressway and provide intersections at one-mile spacing. However, if the area south of Arkansas City does not develop at a rapid pace, this closure would be a lower priority improvement based on the cost of the required local improvements.
- The 322nd Road intersection interim and build-out configuration is recommended to remain as a two-way stop controlled intersection. The existing roadway is an unpaved county collector road, with a medium level of residential development that utilizes this intersection. Based on this scenario with no future traffic concerns, no intersection improvements are anticipated.



312th Road Intersection



314th Road Intersection

- The 332nd Road (State Line) intersection interim and build-out configuration is recommended to remain as a two-way stop controlled intersection. The existing roadway is an unpaved county collector road, and no development plans within this area exist. Based on this scenario with no future traffic concerns, no intersection improvements are anticipated.

## INTERIM PRIORITY PROJECTS

Based upon input throughout the Plan process, as well as analysis of existing conditions, the following projects have been identified as catalyst projects to help implement the Plan vision. These projects are listed in order of priority and should be implemented 3 to 5 years. These priorities may be modified by the Partnership based upon the changing needs of the Corridor. Priorities for the build-out year improvements will be established by a Partnership Advisory Group.

1. Design and construct a roundabout at the intersection of Kansas Avenue and the Arkansas City Bypass.
2. Commission an alignment study for the West Winfield Bypass to determine a centerline and probable future right-of-way.
3. Realign and improve County Club Road to an arterial. This should be completed in conjunction with the alignment study for the West Winfield Bypass.
4. Consolidate access points by closing (7th and 1st Streets) at Strother Field. This will require improvement of internal roads within Strother Field and intersection improvements at 222nd Road.
5. Upgrade 61st Road between the Future Hospital Site and Arkansas City to an urban arterial.

# TRANSPORTATION RECOMMENDATIONS

Figure 6: Typical Section, Freeway/Expressway Open Median

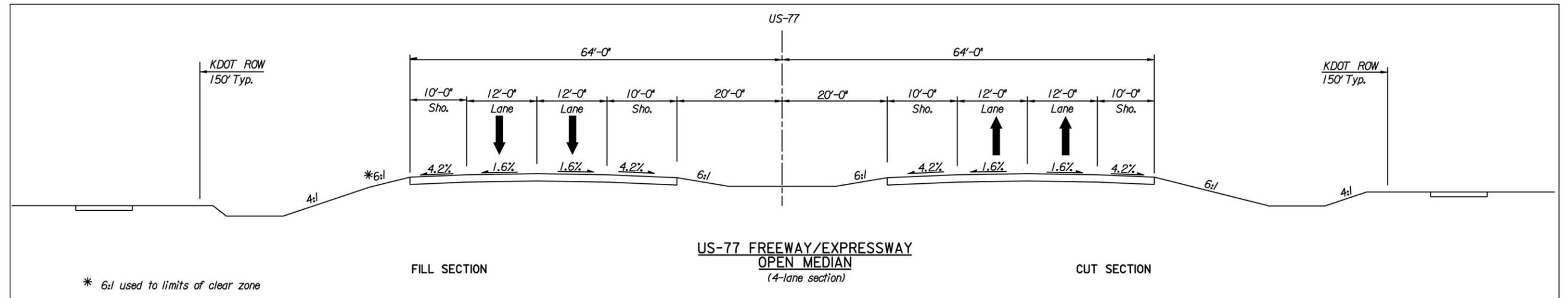


Figure 7: Typical Section, Four-Lane Expressway Undivided

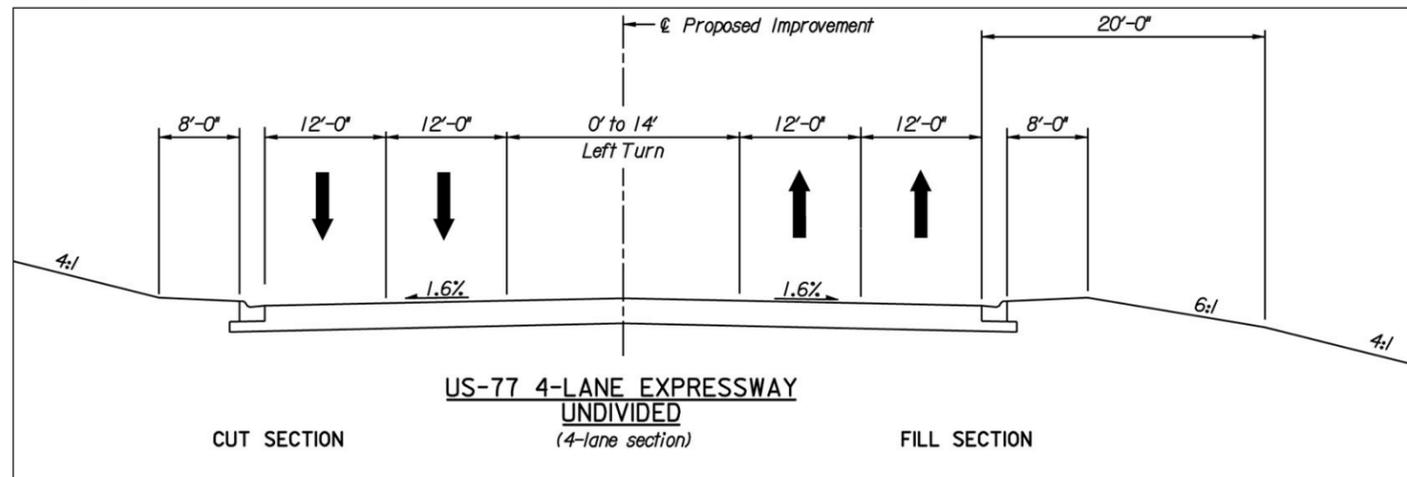
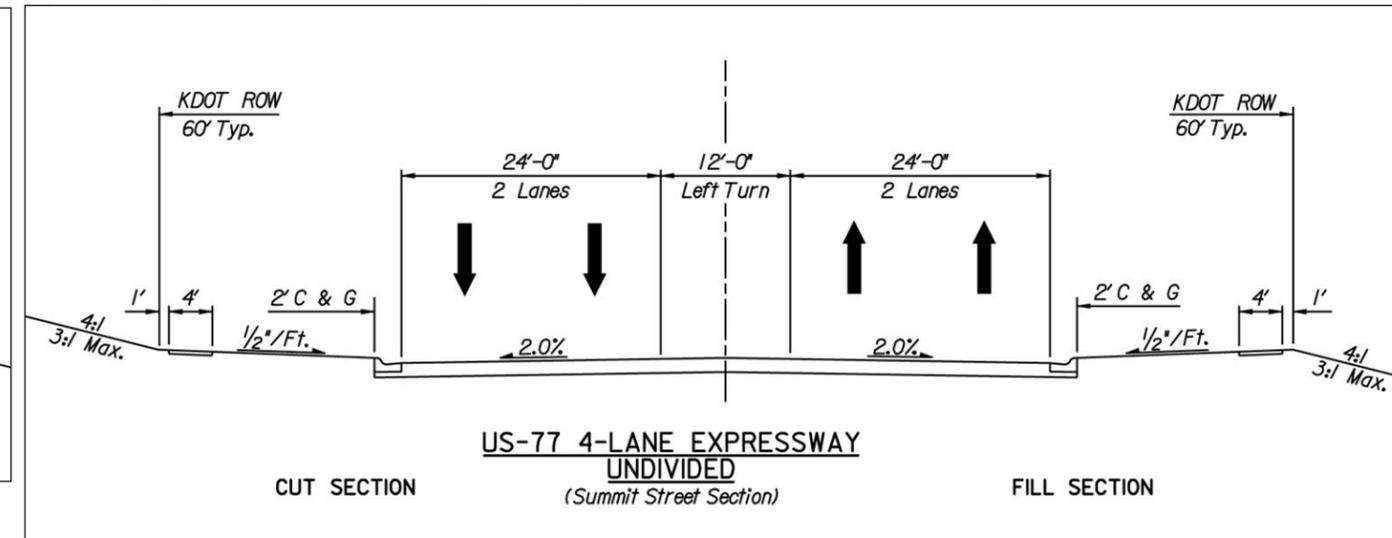


Figure 8: Typical Section, Four-Lane Expressway Undivided (Summit Street Section)



# TRANSPORTATION RECOMMENDATIONS

Figure 9: Typical Section, Four-Lane Urban Arterial

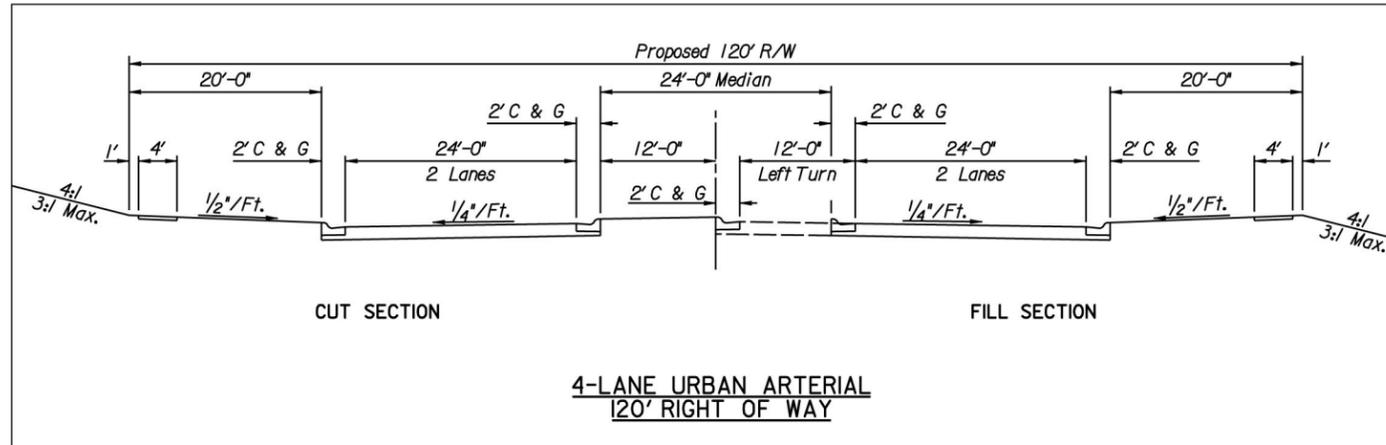


Figure 10: Typical Section, Four-Lane Rural Arterial

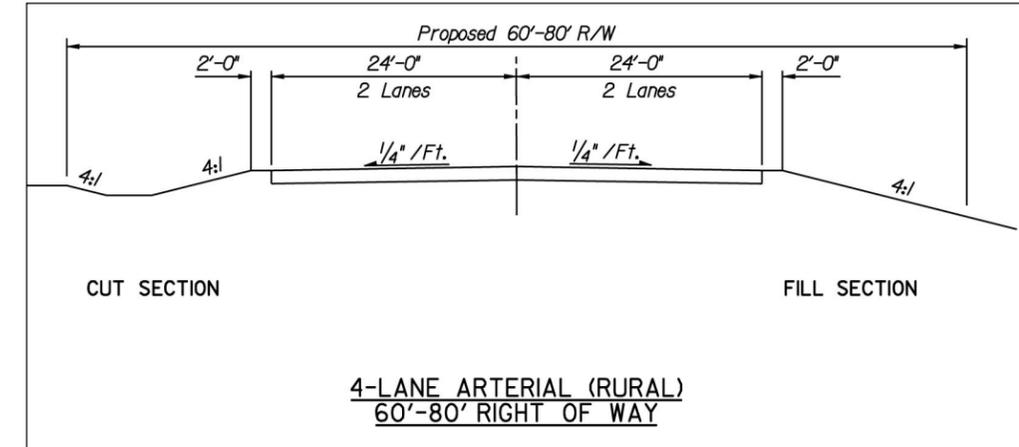


Figure 11: Typical Section, Two-Lane Urban Collector

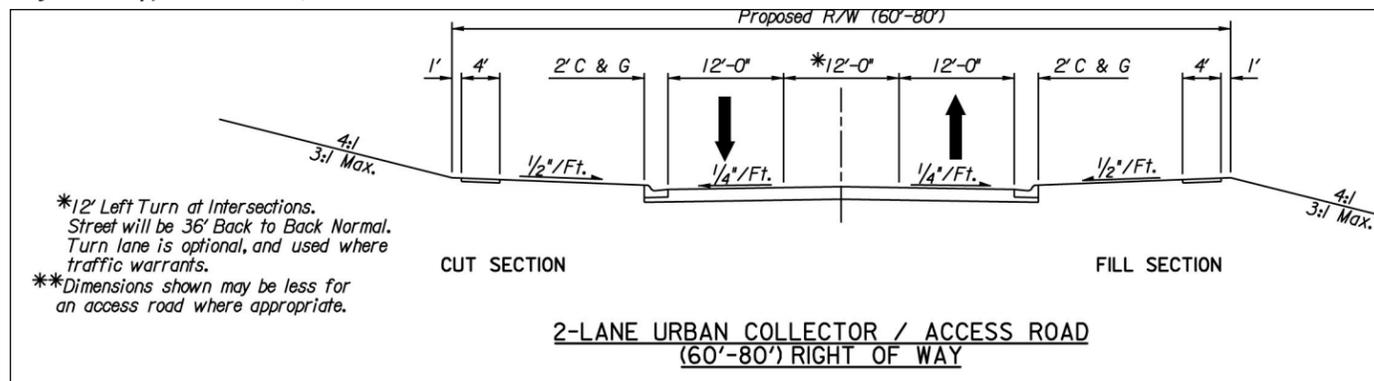
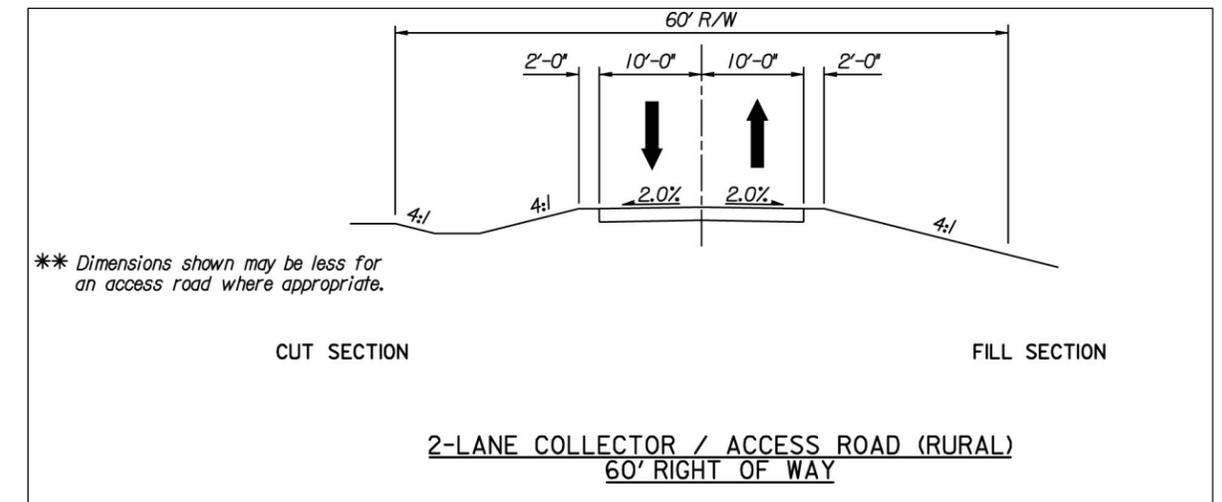


Figure 12: Typical Section, Two-Lane Rural Collector



# ACCESS MANAGEMENT TOOLS

## INTRODUCTION

Access management tools are important instruments for the Partners as they implement the Plan. While the ultimate objective of an access controlled facility cannot be realized immediately, the Partners should look for opportunities to consolidate access at approved interchange locations and at-grade controlled intersections.

## ACCESS MANAGEMENT TOOLS

Access management is necessary to protect the safety of the public and the operational efficiency of the Study Corridor. Effective access management also protects public investment and the continued economic vitality of the Study Corridor. Uncontrolled access on the other hand, can impede development and produce high costs in the future as retrofits are needed.

The Partners can undertake access management activities as part of what are known as “police powers” which is the authority to take action to protect citizens’ safety, health and welfare. A component of access management is regulation of traffic flow which is a police power. Regulation of traffic flow could include several actions outlined in the access management tools within this section. Managing access is complicated and requires careful consideration, but, done properly, protects the driving public as well as providing adjacent property owners with reasonable access to their property and the parallel road network.

## FACILITY TYPE

Two facility types are recommended for the Study Corridor: freeway and expressway. These determinations were based upon an analysis of existing and future traffic impacts, physical/environmental constraints, potential impacts and extensive public input gathered during the charrette process. See descriptions below and Figures 13 and 14.

A **freeway facility** is recommended for Segment 2. Freeway facility guidelines are as follows:

- access to this portion of US-77 will be at grade-separated interchanges;
- interchange spacing is 2 miles or more;
- all other existing at-grade access including road connections will eventually be closed; and
- local access will be through the parallel road network or frontage roads to connect to the nearest interchange location.

An **expressway facility** is recommended for Segments 1, 3 and 4. Expressway facility guidelines are as follows:

- primary access to US-77 will be at controlled intersections spaced at approximately one-mile;
- driveway spacing will be at least one-half mile and should be right-in/right-out; all other existing access should be closed or consolidated; and
- all other local access to US-77 will be through the parallel road network or frontage roads to connect to the nearest identified intersection location.

Figure 13: Typical Freeway Segment

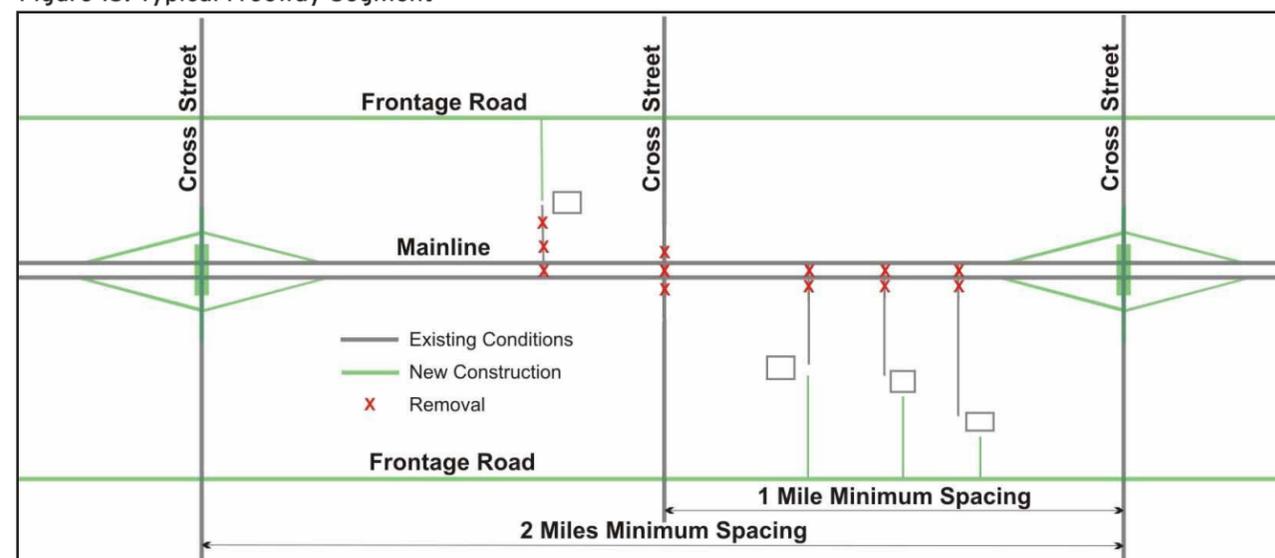


Figure 14: Typical Expressway Segment



# ACCESS MANAGEMENT TOOLS

## LOCAL ACCESS GUIDELINES

Today, portions of existing US-77 function as a city-type arterial roadway with numerous intersections and individual driveways. This condition exists south of the Arkansas City Bypass to the Arkansas River. Because of the number of existing driveways and access points, Arkansas City should work with individual property owners to achieve the best possible access solution based upon existing constraints.

### Local Access Tools

- Ideally, primary access to this portion of US-77 will be at controlled intersections spaced a half-mile.
- driveway spacing should be at least 1/4 mile and should be right-in/right-out;
- driveways should be located away from intersections; and
- all other existing access should be consolidated through the following measures:
  - shared parking;
  - cross access;
  - joint access; and
  - access easements.

**Shared Parking:** Shared parking between adjacent properties shall be encouraged to the greatest extent possible. The City should consider reducing parking requirements if adjacent property owners agree to share parking. The number of parking spaces shall be dependent upon the types of uses and size of development.

**Cross Access:** Property owners are encouraged to provide cross access and/or shared parking areas between adjacent developments. This should ensure a safe and efficient flow of traffic throughout the study area and allow local traffic to access adjacent developments without having to enter onto US-77. Whenever possible, adjacent property owners shall be required to enter into cross access agreements and/or provide cross access easements between properties.

**Joint Access:** Joint access is a single point of access to one or more properties. Joint access may provide one or more points of entry and access between adjacent developments. At a minimum, property owners should be required to provide joint access between all adjacent developments. This should provide vehicles the opportunity to access adjacent developments without having to enter onto US-77.

**Access Easements:** Access roads, cross access easements and/or joint use driveways shall be incorporated in the site review process. Property owners shall dedicate an easement allowing for cross access to and from other properties served by joint use driveways. Upon approval by the City, the easement shall be dedicated on a plat of the property or by separate legal instrument. The plat or separate instrument shall then be recorded. Whenever possible, rear access roads and cross access points should be utilized.

## CORRIDOR PRESERVATION TOOLS

Corridor preservation is the application of planning efforts to identify needed right-of-way and control or protect it for a future transportation facility. Frequently, the application of corridor preservation also accomplishes access management goals by providing connectivity to alternate transportation facilities for existing access points that are desired to be removed. The following tools can be used to preserve right-of-way and accomplish the Plan's access goals:

**Right-of-Way Preservation:** The Partnership should use the Plan Plates to preserve future right-of-way for proposed transportation improvements. This includes integrating the Plan's Land Use Plan and Plate Maps into the site review process through local zoning and subdivision regulations. As stated in the Land Use Plan section of this report, existing driveways should be considered a non-conforming use. This means, if the property owner decides to subdivide or change use of the property, the property owner should implement the Plan's access recommendations as shown in the Plan Plates at the owner's expense. In cases where the property does not change use, the Partnership should work with individual property owners to meet the Plan's access goals. In these cases, the Partners should consider one of the strategies below:

**Advanced Land Acquisition:** Public sector entities have the authority to acquire land for public improvements including state highways and local roads and streets by gift, purchase, or condemnation. Sufficient land may be acquired to accommodate immediate construction needs, as well as for future needs. In appropriate circumstances, public sector entities can acquire interests in land for public improvements in advance of the date of the start of construction.

**Land Swaps:** Land swaps can be used by local governments to relocate properties within the Study Corridor to accomplish the Plan's access goals. For example, some parcels with shallow lot depths or that are constrained from alternative access because of existing environmental or physical conditions may need to be relocated to areas better suited to provide safe access onto US-77 or the parallel road network. Once relocated, these shallow lots could be converted to open space.

**Eminent Domain:** Eminent domain or condemnation is a tool used by local governments to acquire land for redevelopment or for the greater good of the community. The condemning authority is obligated to provide the property owner compensation based upon "fair market value" of the property. Typically, this tool is used as a last resort. Recently, the use of this power has been debated in the State legislature to restrict the use of this tool.

## Access Management Toolkit

Tool	Description	Jurisdiction	Implementation and Compensation Requirements
Close mainline median breaks within the freeway segment	Eliminate existing median breaks to prohibit left turns to/from abutting properties.	KDOT	Administrative action under police power to regulate traffic flow. No private property right exists in traffic flow (turning movements) and therefore no compensation is due for abutting property owners.
Consolidate private driveways within freeway and expressway segments	Eliminate redundant driveway connections to US-77, either within an individual tract or at property line of contiguous tracts.	KDOT, Winfield, Arkansas City, Cowley County	If "reasonable" access to the property remains, driveway consolidation can be accomplished by KDOT and the local Partners under police power without payment of compensation to affected property owners. Typically, existing access control breaks allowing private driveways to mainline are acquired through traditional negotiation or condemnation. If the abutting property owner submits a re-zoning or development proposal to the local government, driveway locations are subject to regulation under zoning authority without payment of compensation as condition of zoning or development plan approval.
Eliminate and/or relocate private driveways/side road access within the freeway segment.	Where property owner has frontage on both mainline and side-road, eliminate mainline driveway and restrict access to side road.	KDOT, Winfield, Arkansas City, Cowley County	If "reasonable" access to the property remains, driveway elimination/relocation can be accomplished by KDOT and the local Partners under police power without payment of compensation to affected property owners. As is the case with consolidation, existing access breaks allowing private driveways to mainline are acquired through traditional negotiation or condemnation. If the abutting property owner submits a re-zoning or development proposal to the local government, driveway locations are subject to regulation under zoning authority without payment of compensation as condition of zoning or development plan approval.
Eliminate public road connections to mainline within the freeway segment, re-connect to frontage road	Where local roads connect to mainline at locations other than mile roads, eliminate connection between mainline and local cross-road, re-connecting cross road to newly installed frontage or reverse frontage road.	KDOT, Winfield, Arkansas City, Cowley County	KDOT may regulate location where public roads connect to mainline under general statutory authority to establish and maintain state system and its police power. No public "property right" in location where local roads connect to mainline. Therefore, local governments cannot enjoin closure of mainline connections nor can abutting property owners seek compensation for resulting re-routing along local roads to mainline. More typically, KDOT and local governments will jointly undertake coordinated road improvement projects pursuant to their respective general statutory powers to establish and maintain public roadways. Such a project would include replacing side-road intersections with overpasses or underpasses at mainline. If abutting property owner submits a re-zoning or development proposal to local government, intersection location is subject to regulation under zoning authority without payment of compensation as condition of zoning or development plan approval.
Eliminate private driveways, within the freeway and expressway segment re-connect to parallel roads	Where private driveways connect directly to mainline, eliminate private driveways and re-connect to new or improved collector or arterial roads.	KDOT, Winfield, Arkansas City, Cowley County	Acquire existing access control breaks through negotiation or condemnation, stipulating property remaining will be connected to a newly installed frontage or reverse frontage road. If abutting property owner submits a re-zoning or development proposal to local government, driveway locations are subject to regulation under zoning authority without payment of compensation as condition of zoning or development plan approval.
Eliminate at-grade local road intersections within the freeway segment	Where local roads connect to mainline at at-grade intersections, install overpass or underpass to eliminate at-grade intersections.	KDOT, Winfield, Arkansas City, Cowley County	KDOT may regulate location where public roads connect to mainline under general statutory authority to establish and maintain state system and its police power. No public "property right" in location where local roads connect to mainline. Therefore, local governments cannot enjoin closure of mainline connections nor can abutting property owners seek compensation for resulting re-routing along local roads to mainline. More typically, KDOT and local governments will jointly undertake coordinated road improvement projects pursuant to their respective general statutory powers to establish and maintain public roadways. Such a project would include replacing side-road intersections with overpasses or underpasses at mainline. If abutting property owner submits a re-zoning or development proposal to local government, intersection location is subject to regulation under zoning authority without payment of compensation as condition of zoning or development plan approval.
Coordinate utility improvements	The Partnership jurisdictions will coordinate future utility improvements and extensions within the Study Corridor.	Winfield, Arkansas City, Cowley County	
Intersection consolidation	Consolidate redundant, at-grade local road intersections into a single-intersection by establishing a parallel local road network to facilitate safe and efficient connections to the identified at-grade intersections within the expressway segments.	KDOT, Winfield, Arkansas City, Cowley County	KDOT may regulate location where public roads connect to mainline under general statutory authority to establish and maintain state system and its police power. No public "property right" in location where local roads connect to mainline. Therefore, local governments cannot enjoin closure of mainline connections nor can abutting property owners seek compensation for resulting re-routing along local roads to mainline. More typically, KDOT and local governments will jointly undertake coordinated road improvement projects pursuant to their respective general statutory powers to establish and maintain public roadways. Such a project would include consolidating redundant, at-grade local road intersections with local road network to facilitate connection to single remaining at-grade intersection. If abutting property owner submits a re-zoning or development proposal to local government, intersection location is subject to regulation under zoning authority without payment of compensation as condition of zoning or development plan approval.
Interchanges at mile roads	Replace at-grade intersections within the freeway segment with grade-separated interchanges.	KDOT	KDOT may install interchanges under general statutory authority to establish and maintain state system. Acquire necessary right of way through traditional negotiation and condemnation processes.
Advance right-of-way acquisition	Identify and prioritize critical parcels most vulnerable to development or other market forces.	KDOT, Winfield, Arkansas City, Cowley County	After identifying and prioritizing critical parcels most vulnerable to development or other market forces which would make acquisition at time of future project physically impossible or unnecessarily expensive, KDOT or local government may acquire necessary right of way as funding is available through traditional negotiation and condemnation processes.
Interim intersection upgrades	Identify one-mile at-grade intersections where traffic volumes or accident rates require interim improvement until interchange is constructed.	KDOT, Winfield, Arkansas City, Cowley County	KDOT may authorize interim intersection improvements including traffic signals, turn-lanes and acceleration/deceleration lanes under general statutory authority to establish and maintain state system.
Dedication of right-of-way for mainline and local roads in proportion to traffic demands created by development.	The conveyance by an owner or developer of private land for public use and the acceptance of that land for that use by the public sector entity having jurisdiction over the public function for which it will be used. It is common practice for public sector entities to condition approval of a development application, such as site plan, rezoning, special use permit or plat application on the requirement that the applicant dedicate an interest in land, which is needed for the improvements necessary to support the development, to the approving entity. The US Constitution requires that such a permit condition involving a required dedication serve the same legitimate public purpose as a refusal to issue the permit. There must be an essential nexus between the specified state interest and the dedication requirements. The Supreme Court has stated that permit conditions involving a requirement for the conveyance of an interest in land will be strictly scrutinized.	KDOT	

# LAND USE PLAN

## OVERVIEW

Throughout the plan process, community leaders, business owners, property owners and interested residents recognized the importance of the US-77 Corridor as a potential economic engine for Winfield, Arkansas City and Cowley County. Future development along the US-77 Corridor has the potential to provide amenities, services and jobs as well as a solid tax base for the communities. Participants also recognized the need for a safe and functional US-77 Corridor that meets the mobility needs of through traffic. The US-77 Corridor Land Use Plan (Land Use Plan) provides a balance between the desire to develop portions of the Corridor and local access with the need to preserve safe, efficient and timely through movements between the two communities and regionally.

## JURISDICTION

As agreed upon by the Partnership, the Land Use Plan limits will include properties within one-half mile of the US-77 centerline. The Cities of Winfield and Arkansas City have jurisdiction within their city limits and may make recommendations within three-miles of their city limits. It is not the intention of this Plan to institute county-wide zoning. Rather, the **Land Use Plan** seeks to facilitate development along the Corridor by balancing access, safety and mobility.

## PLAN USE

The Land Use Plan is intended to be used as a guide by the Winfield and Arkansas City Planning and City Commissions as well as the Cowley County Planning Commission and Board of County Commissioners in considering future development proposals within the Corridor. The policies within this chapter work together with the US-77 Land Use Plan Map (see Exhibit 7) to provide a guide for future development within the Corridor by use, size, density and location. When considering development proposals within the Corridor, City and County staff and officials will consider the following factors:

- existing access to US-77;
- recommended Interim Access and Improvements;
- recommended Build-Out Access and Improvements;
- identified land use designation on the Land Use Plan Map (Exhibit 7);
- the type, size and density of surrounding existing development; and
- the adequacy of infrastructure to support the proposed development; especially improved roads, water and wastewater provisions.

## Landscape and Setbacks

Proposed developments should address any compatibility issues with surrounding developments. Ideally, land uses should transition in intensity and density. However, when dissimilar uses occur next to one another, transitions should be used including setbacks and screening including landscape treatments, berms and fences or structures.

## Access Guidelines

The public input process identified the need to improve mobility, safety and travel time along the Study Corridor. However, the Partners also recognize the need to identify a strategy to allow the Study Corridor to develop in a managed way and to implement the transportation recommendations and access strategy outlined within this Plan. Therefore, a reasonable and flexible process should be identified that protects existing uses while ensuring that future uses meet the identified standards. Identified driveways within the Plan Plates will be considered a non-conforming use. Existing driveways will be “grandfathered” allowing for the implementation of Plan policies and standards over time. The Partners will work proactively with individual property owners to seek opportunities to close identified driveways and relocate access to the nearest improved collector or arterial road. However, under the following conditions, the property owner must relocate existing driveways at their own expense in conformance with the Plan under the following conditions:

### Access Drives must be Closed and Relocated in Conformance with the Plan if and when:

- the property is subdivided; and/or
- the property owner requests a zoning change to a higher intensity use; or
- enlargements or improvements of existing use(s) increase the gross square footage by 25 percent or more (excluding agricultural uses and rural residences).

## LAND USE CATEGORIES

**Floodplain:** These areas are within the 100-year floodplain. Land use policies within the areas are geared toward mitigating potential flood hazards. All encroachments, including fill, new construction, substantial improvements and other developments will be prohibited unless certified plans are provided by a registered engineer or architect demonstrating the encroachments will not result in any increase in flood levels during occurrence of a one hundred year flood discharge.

### Allowed Uses:

- Agriculture and ranches;
- golf course, parks, recreation and open space;
- residential side yards and common grounds; and
- limited rural residential development with structures elevated at least one-foot above base flood elevation.

### Required Infrastructure:

- On-site septic systems for rural residences (subject to inspection);
- wells or municipal water for rural residences; and
- access to county collector for rural residences and agricultural uses.

# LAND USE PLAN

**Rural Residential:** These areas represent the last expansion and growth areas for the Cities. It is unlikely that these areas will be served by municipal sewer or improved roads within the next 15 years. Some of these areas, due to flooding and other physical constraints may remain rural indefinitely.

**Allowed Uses:**

- Agriculture;
- ranches; and
- single-family detached residential development on lots with a minimum of one dwelling unit per 20-acres.

*A one-time lot split will be allowed provided the principle tract remains 20-acres or greater and the newly created lot is no smaller than three-acres.*



**Required Infrastructure:**

- On-site septic systems allowed (subject to inspection);
- wells or municipal water;
- gravel or chip and seal local road; and
- access to county collector or arterial.

*If a lot split is requested, the property owner will be asked to remove the existing driveway to US-77 and provide new access to an improved or new collector or arterial road.*

**Low-Density Residential:** These areas are intended primarily for single-family detached residences with densities ranging from two to six dwelling units per acre.

**Allowed Uses:**

- Single-family detached residences.

**Required Infrastructure:**

- Central sewer required;
- municipal water required;
- if a lot split or subdivision is requested, the property owner will be asked to remove the existing driveway to US-77 and provide new access to an improved or new collector or arterial; and
- paved internal roads are required with curbs, gutters and sidewalks.



*New developments will require a traffic study to determine the need for improvements to the parallel collector or arterial road network as well as US-77 system improvements such as turn lanes, lighting, signals, roundabouts, etc. caused by the development.*

**Multi-Family Residential:** These areas are intended to provide a wide-range of housing choices including attached and detached residences with a densities ranging from 4 to 16 dwelling units per acre.

**Allowed Uses:**

- Townhomes;
- duplexes;
- triplexes;
- fourplexes;
- apartments;
- elderly housing; and
- mobile home parks.



**Landscape Treatments (If adjacent to a lesser or more intensive use):**

- Ten-foot setback with a landscape buffer consisting of a combination of groundcover, shrubs and trees.
- Landscape treatments will also be provided along the property frontage to screen buildings and parking areas from US-77.

**Required Infrastructure:**

- Central sewer required;
- municipal water required;
- access to an improved or new arterial or collector road;
- paved internal roads are required with curbs, gutters and sidewalks; and
- existing access to US-77 will be modified according to the Build-Out Plan Plates.

*New developments will require a traffic study to determine the need for improvements to the parallel collector or arterial road network as well as US-77 system improvements such as turn lanes, lighting, traffic signals, roundabouts, etc. caused by the development.*

**Commercial/Office:** Allows a wide-range of commercial and office development.

**Allowed Uses:**

- Anchor-retail (ranging in size between 50,000 to 125,000 square-feet) including big-box retail centers;
- commercial-retail (ranging in size between 5,000 to 50,000 square-feet) including sit-down restaurants, convenience stores, drug stores, banks, etc;
- professional office and services;
- hotels and motels; and



# LAND USE PLAN

## **(Commercial/Office): Landscape Treatments** (If adjacent to a lesser or more intensive use)

- A minimum 25-foot setback with a landscape buffer consisting of a combination of a berm, groundcover, shrubs and trees.
- Landscape treatments will also be provided along the property frontage to screen buildings and parking areas from US-77 and adjacent arterial roads.

### **Required Infrastructure:**

- Central sewer required;
- municipal water required;
- access to an improved or new arterial road with dedicated turn lane(s);
- paved internal roads are required with curbs, gutters, sidewalks and street lights; and
- existing access to US-77 will be modified according to the Build-Out Plan Plates.

*New developments will require a traffic study to determine the need for improvements to the parallel Arterial road network as well as US-77 system improvements such as turn lanes, lighting, signals, roundabouts, interchanges, etc. caused by the development.*

**Medical/Office:** Allows medical-related uses including hospitals, medical offices, supporting commercial-retail and services.

### **Allowed Uses:**

- Hospital;
- commercial-retail (less than 50,000 square feet);
- professional office; and
- service uses.



**Landscape Treatments** (If adjacent to a lesser or more intensive use):

- A minimum 25-foot setback with a landscape buffer consisting of a combination of a berm, groundcover, shrubs and trees.
- Landscape treatments will also be provided along the property frontage to screen buildings and parking areas from US-77 and adjacent arterial roads.

### **Required Infrastructure:**

- Central sewer required;
- municipal water required;
- access to an improved or new arterial road with dedicated turn lane(s); and
- paved internal roads are required with curbs, gutters, sidewalks and street lights.

*New developments will require a traffic study to determine the need for improvements to the parallel Arterial road network as well as US-77 system improvements such as turn lanes, lighting, signals, roundabouts, interchanges, etc. caused by the development.*

**Industrial:** These areas are intended to provide a stable employment base through a wide-range of industries and businesses supported by available infrastructure and proximity to highway, rail and air transportation.

### **Allowed Uses:**

- Manufacturing and processing;
- warehouse and distribution; and
- industrial-related retail and office.

**Landscape Treatments** (If adjacent to a lesser-intensive use):

- A minimum 50-foot setback with a landscape buffer consisting of a combination of a berm, fence or structure, groundcover, shrubs and trees.
- Landscape treatments will also be provided along the property frontage to screen buildings and parking areas from US-77 and adjacent arterial roads.

### **Required Infrastructure:**

- Central sewer required;
- municipal water required;
- access to an improved or new arterial road with dedicated turn lane(s); and
- paved internal roads are required with curbs and gutters.

*New developments will require a traffic study to determine the need for improvements to the parallel arterial road network as well as US-77 system improvements such as turn lanes, lighting, signals, roundabouts, interchanges, etc. caused by the development.*

**Potential Multi-Modal Facility:** During the charrette process, it was noted that the property east of US-77, west of the BNSF rail line, north of 202nd Road and south of 192nd Road would be ideal for a future inter-modal facility due to access from the rail line and excellent proximity to the future West Winfield Bypass.

**Public:** These areas include public buildings, schools, and civic organizations. When these uses are sold, the City and County Commissions should carefully consider alternative uses for new development.

### **Allowed Uses:**

- Public buildings and property;
- cemeteries; and
- utilities.

### **Required Infrastructure:**

- Public buildings and active uses will require access to an improved or new collector or arterial.



# LAND USE PLAN

**Park/Open Space:** Public or private land reserved for parks and/or open space intended to accommodate active and passive parks, trails, recreation uses, environmentally sensitive areas, or any other lands reserved for permanent open space purposes.

**Allowed Uses:**

- Active and passive parks;
- open space; and
- trails.

**Required Infrastructure:**

- Active park uses and trail heads will require access to an improved or new collector or arterial.

**Airport Approach Zone:** The underlying land uses identified within this Plan are appropriate within this zone, however, the heights of structures should be limited according to the guidelines outlined within the *Strother Field Airport Master Plan*. The approach zone delineates a vertical surface that should be free of objects which could endanger the safe flight of aircraft. The actual recommended maximum heights of structures vary within this zone and decrease the closer the use is to the runway.

**Allowed Uses:**

- Buildings/structures limited to no more than two-stories or 30-feet;
- landscape buffer zones, open space; and
- surface parking lots.

**Required Infrastructure:**

- Access to an improved or new collector or arterial road for parking or property access.



## ULTIMATE INFRASTRUCTURE SERVICE AREAS

Uses requiring central sewer and city water should contact the appropriate jurisdiction to inquire about potential future service or extension of existing service. The purpose of delineating these areas is to coordinate ultimate future infrastructure improvements among the Partnership and to provide guidance to existing and future property about which jurisdiction to contact about existing and future water and wastewater service. Timing and availability of actual service is not determined.

**City of Winfield**

- Central Sewer: North of 222nd Road
- City Water: North of 202nd Road

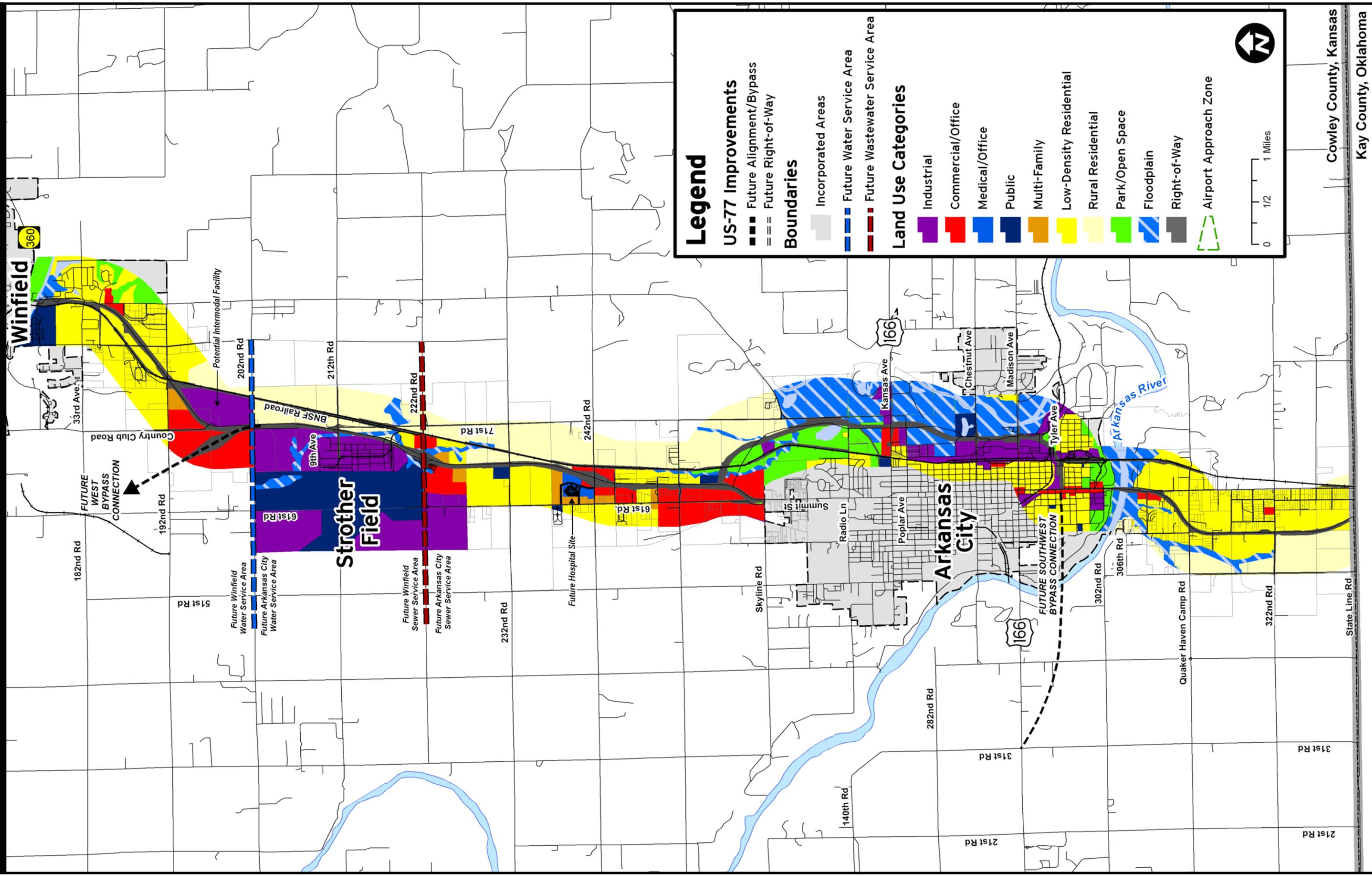
**Arkansas City:**

- Central Sewer: South of 222nd Road
- City Water: South of 202nd Road

**Strother Field:**

- Long-term (20+ years) central sewer and water service should be consolidated and provided through the City of Winfield or Arkansas City.

**Exhibit 7: US-77 Land Use Plan Map**



# IMPLEMENTATION

## US-77 OVERSIGHT COMMITTEE

The purpose of the Oversight Committee is to serve as an advisory body to regularly review, evaluate, facilitate discussions and provide input on events and developments that may have an impact on the Study Corridor and to assist in the development of the Plan implementation strategy. The Committee shall not have any authority regarding powers vested in cities and counties pursuant to state law. The Committee shall be composed of at least two representatives from Winfield, Arkansas City, Cowley County and KDOT. The city and county representatives shall be appointed by the chief elected official of that particular city or county for a term to be determined by that official. A KDOT representative will serve as one Co-Chair of the Committee and the members of the Committee each year shall elect one other member to serve as the other Co-Chair. The Committee shall meet whenever the Co-Chairs jointly determine that a meeting is appropriate, but shall, at a minimum, meet at least twice a year.

## REGULATORY TOOLS

Access management tools and regulations can and should be integrated within city and county zoning and subdivision regulations and can be administered through use of an overlay district to include the Study Corridor limits. It is not the intention of this Plan to institute county-wide zoning. Rather, the intention is to facilitate development within the Study Corridor in a consistent manner with the Plan's long-term transportation goals. The benefits of regulatory tools include:

- preventing incompatible development;
- mitigating environmental, health and safety impacts;
- ensuring provision of adequate infrastructure and public facilities;
- delineating appropriate facility-types allowing communities to make future plans with orderly development; and
- reduction in project costs, especially future right-of-way acquisition costs.

Close coordination between the Partnership is essential since authority for some preservation tools are vested in the state and others are vested in the local governments.

### Development Moratorium

The adoption by a public sector entity of a temporary halt on the processing of applications for all or a specified type of development until a governmental activity is completed such as the adoption of a plan or the passage of a revised ordinance on a specified subject. The Supreme Court recently held that a reasonable moratorium fulfills a legitimate public purpose and is not per se a taking.

### Subdivision Regulations

The control of the division of a tract of land according to design standards and procedures adopted by local ordinance. These regulations usually specify what improvements the subdivider will be required to provide and the standard to which the improvements will need to be constructed. A plat is a map prepared by a registered civil engineer or licensed land surveyor showing the boundaries and locations of individual properties and streets of a proposed subdivision. The plat generally also shows land to be

dedicated to a public sector entity for streets and easements for public utilities. Winfield and Arkansas City have subdivision regulations within their three-miles of their municipal boundaries.

### Zoning

A process utilizing the police power of local governments classifying land into areas and districts, such areas and districts being generally referred to as "zones" and imposing, in each area and district, regulations concerning building and structure designs, building and structure placement, and uses to which land, buildings, and structures within these districts may be put, including setbacks and height restrictions, lot coverage restrictions, impervious cover restrictions and typically allowing for certain uses only by special or conditional use permit. Winfield and Arkansas City have the authority to zone within their three-miles of its municipal boundary.

### Overlay Districts

A zoning district that can be either initially mapped or narratively described to be mapped at some later point in time. An overlay district superimposes certain additional requirements that modify or supplement the regulations of the underlying general zoning district or districts, in recognition that distinguishing circumstances exist within the area that must be regulated in a manner different from the regulations of the underlying district. In the instance of conflicting requirements, the stricter of the requirements apply.

### Setback Ordinances

Regulations establishing the requirement that a building or structure be set back a certain distance from a road, street highway or lot line, generally at street-grade level, although it can be at a prescribed height. *K.S.A. § 12-765* is an example of legislation that authorizes the adoption of setback regulations from major streets or highways by cities or counties. This statute specifically authorizes the incorporation by reference of an official map and a prohibition on the locations of any new buildings or structures within the established building setback lines.

### Official Map

A legally adopted map that conclusively shows the location and width of proposed roads or streets, public facilities and public areas and drainage rights-of-way.

## FINANCING MECHANISMS

KDOT currently has little funding to implement the Plan recommendations. There is currently a Corridor Management Fund which could be utilized for US-77 to preserve strategic parcels of right-of-way and for improvements to the parallel road network. KDOT also has Economic Development funds for qualifying projects to construct minor interim improvements. Beyond these, potential for significant funding will have to wait until another highway bill is passed. Federal dollars are also available for several of the needed interim improvements. Projects would need to qualify for the various federal funding sources' KDOT would look for ways to co-sponsor identified Plan improvements.

# IMPLEMENTATION

As private development occurs along US-77, developers could be required to dedicate reasonable amounts of right-of-way for US-77 and the parallel road network. In addition, they could be required to construct improvements needed as a result of their developments (i.e. new or improved arterial and collector roads, turn lanes, lighting, etc.).

Funding will also need to come from the communities themselves. Given the tight Capital Improvement Program (CIP) budgets with many other needs, the communities have expressed an interest in identifying new funding sources which could be used to help finance the Plan. After evaluating a number of options, several funding options show some potential and are outlined on the following pages.

## **Excise Tax**

**Description:** Method of raising revenue by levying a tax on a certain activity, income received, or privilege enjoyed.

**Premise:** Some activities (such as platting) create extra impacts (e.g., necessitating new or widened roads) and those activities should pay accordingly.

**Geographic Application:** City-wide.

**Who Pays:** Developer at platting (home buyer at purchase).

**Use of Funds:** Anything in budget if money is placed in general fund, but good faith and/or adopting ordinance may require use for purpose adopted, e.g., transportation improvements.

**Keeping of Funds:** Permitted in general fund, but may be held in special account

**Challenges:** Only works where developers are platting.

**Used in Kansas:** Yes, widely used

## **Transportation Development District (TDD)**

**Description:** Form of special assessment district focused on transportation needs. The TDD has authority to raise funds either through special assessment or sales tax in district.

**Premise:** District should pay for improvements for which it creates the demand. This can be done through assessing property and/or imposing sales tax.

**Geographic Application:** District identified at project creation.

**Who Pays:** Property owners or users.

**Use of Funds:** Extensive list provided in statute.

**Keeping of Funds:** Special account.

**Challenge:** Requires approval of all property owners within the district.

**Used in Kansas:** Yes, authorized by *K.S.A. 12-17,141 et seq.*

## **Impact Fees**

**Description:** One time payments assessed against new development to cover the costs for necessary capital improvements proportionate to the demand generated by the new development.

**Premise:** Existing development has already paid for its infrastructure; new development should pay for its own infrastructure.

**Geographic Application:** Typically community-wide but has been limited to specific corridors in Kansas.

**Who Pays:** Depends upon when fee is collected, which ranges from platting to certificate of occupancy.

**Use of Funds:** New capital facilities and services required by development: roads, sewer, stormwater.

**Keeping of Fees:** Special account.

**Challenge:** Amount of fee collected depends on rate of development and the law.

**Used in Kansas:** Yes, but through home rule, no specific authority.

## **Special Assessment (Benefit) Districts**

**Description:** Also known as benefit districts, this funding mechanism allows property owners to share the cost of infrastructure improvements.

**Premise:** The cost of a facility such as a road improvement is allocated fully or partially against benefited property.

**Geographic Application:** Area defined by the impact of the proposed improvement.

**Who Pays:** Property owners within the defined benefit district.

**Use of Funds:** New capital facilities and services within the defined district including roads, sewer, stormwater, etc.

**Keeping of Fees:** Special account.

**Challenge:** Property owners must vote to create the district and assess themselves. This type of funding mechanism usually works when it is instigated by the developer or a greenfield site where infrastructure improvements would not normally occur.

**Used in Kansas:** Yes.

## **CORRIDOR PRESERVATION**

With the general right-of-way needs identified in the Plan, coupled with the parcel maps, needed tracts of land will be identified for right-of-way preservation. Planning tools highlighted in previous sections of this report should be utilized, including overlay districts to assist in the preservation of needed land. As development occurs through the platting process, communities will need to collaborate with KDOT and each other regarding the need for dedication and/or purchase of the required parcels of land, the construction of portions of the street network (i.e. turn lanes, reverse frontage roads, etc.), and in the

# IMPLEMENTATION

modifications to local access to US-77. A number of the access management tools identified in previous sections of this report should be used to eventually achieve the access parameters established for the corridor.

## Permanent Improvements

### Mainline US-77

At some point in the future, preliminary design will be needed for the proposed US-77 improvements to further define in more detail the required right-of-way footprint for the Study Corridor. The Plate Maps within this Plan identify a conceptual right-of-way footprint based on standard interchange and roundabout templates and conservative assumptions on customized interchange configurations. No vertical information has been analyzed nor any detailed horizontal alignments performed. More detailed traffic analysis along with preliminary horizontal and vertical geometrics, cross sections, drainage, and environmental work will need to be performed to determine grading limits and more accurate right-of-way requirements. Furthermore, the West Winfield Bypass will need an alignment study to delineate a centerline to determine future right-of-way needs. Finally, as traffic warrants and as funding becomes available, final design will need to be performed on those sections of US-77 which move forward to construction.

### Local Street Network

As development occurs and as traffic demand increases, each community will need to make to design and construct new or improve existing parallel Arterial and Collector roads in compliance with the Plan. This can be completed through normal CIP improvements or can be accomplished through private development participation.

## Interim Improvements

Given the current lack of funding to build the identified ultimate improvements, interim improvements will be needed to accommodate the growing traffic demands and to address safety issues. Examples of interim improvements include adding traffic signals and/or roundabouts, turn lanes and lighting at intersections which will eventually become interchanges.

**These improvements could be funded from one or several of the following sources:**

1. projects which qualify for federal funding;
2. projects which qualify for special KDOT funding (i.e. geometric improvements);
3. projects which are included on a communities CIP; and
4. projects funded by developers as a result of development impacts.

## COST ESTIMATES FOR PROPOSED IMPROVEMENTS

(Projected costs based on 2007 year construction values)

The costs shown do not take into account specific site constraints or complications for any one individual location or piece of the corridor study. The intention of the information shown is to be used in the planning of each individual improvement location or segment. The intent for the section is to provide a guide for macro level project budgeting and planning. The figures shown do not include preliminary and construction engineering, right-of-way, and utility relocations.

Estimated costs for conceptual transportation improvements shown in the Plan:

- Improve an existing stop-controlled intersection to signalized intersection: \$500,000
- Improve an existing at-grade intersection to a grade separated interchange with access to US-77: \$13,000,000.
- Improve existing at-grade intersection to a grade separated intersection (no access to US-77): \$7,000,000.
- Improve existing at-grade intersection to a roundabout: \$500,000 (one-lane roundabout): \$800,000 (two-lane roundabout).
- Improve existing two-lane county road to rural arterial standards: \$200 per foot (two-lane, shoulders, with left turn lanes).
- Improve existing two-lane county road to urban arterial standards: \$550 per foot (four-lane, curb and gutter, and storm sewer).
- Construct new urban arterial roadway: \$650 per foot (four-lane, curb & gutter, and storm sewer)
- Construct new rural collector roadway or access road: \$75 per foot (two-lane).

EXHIBIT 8: INDEX SHEET FOR APPENDIX A AND B

