

Chapter 7

TRAFFIC FORECASTING ANALYSIS

Local and regional trips are the two components of the traffic stream that contribute to future transportation needs along the US 69 corridor, each likely to grow at their own rate.

FUTURE REGIONAL GROWTH

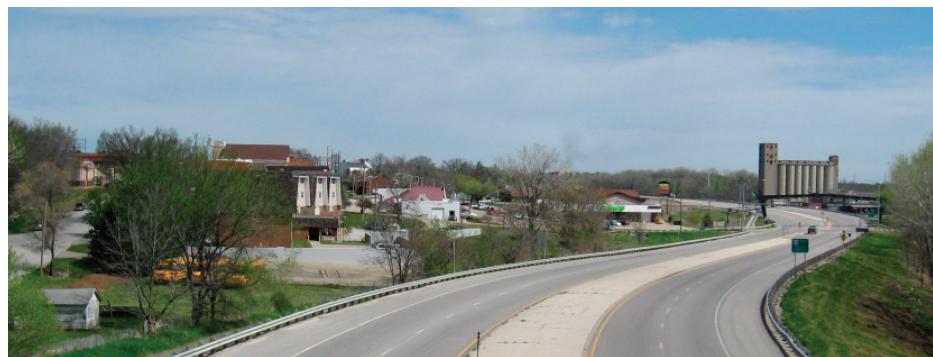
Local and regional trips are the two components of the traffic stream that contribute to future transportation needs along the US 69 corridor, each likely to grow at their own rate. Based on a review of KDOT historic daily traffic count data along US 69, regional traffic can be expected to grow about 0.9 percent annually in the study area. **Table 7.1** shows the annual growth rates along US 69 over the past eight years, from 2000 to 2008.

This time period provides enough historical perspective to understand past trends and provide a sound basis for future projections.

Two count locations were selected in each county to provide a good sampling of data along the US 69 corridor. As **Table 7.1** shows, the growth rate between passenger cars and trucks has differed over the past eight years. While overall traffic growth on US 69 the vicinity of Fort Scott in Bourbon County has been negligible, truck volumes have increased while car volumes have decreased. To account for these differences, this study uses two different growth rates to forecast future volumes.

The first growth rate applied to the total traffic volumes (including both cars and trucks) collected in early 2009 is 0.25 percent per year. This rate produces a conservative estimate of future traffic along US 69 through Fort Scott since it exceeds historic growth rates in Bourbon County. Any significant growth in car traffic on US 69 will probably be caused by new development discussed in Chapter Five.

The second scenario applies a 1.5 percent annual growth rate to heavy vehicle traffic only. As with car related traffic growth, some of this future growth is associated with new development in the Fort Scott area. Therefore, the 1.5 percent growth rate produces a conservative forecast for background traffic related to trucks.



The annual percentage growth rates were calculated with the following equation:

$$\text{PercentGrowth}(2000 - 2008) = \left(\frac{\text{Year}2008\text{ADT}}{\text{Year}2000\text{ADT}} \right)^{\left(\frac{1}{8}\right)} - 1$$

The compilation of these two growth rates in the traffic forecasting produces an annual growth rate slightly over 1 percent growth from 2009 to 2040, similar to the historic growth in the region on US 69 over the last eight years. **Table 7.2** shows a comparison of the existing daily traffic volumes on US 69 through Fort Scott to the projected 2040 traffic volumes that account for expected regional growth.

Figure A.6 in **Appendix A** exhibits the resulting traffic volumes for the 2040 No-Build Scenario, accounting for regional background growth.

NEW TRIP GENERATION

Proposed land use information for the 2040 analysis horizon was based upon the future land use plan presented in Chapter Five. The majority of the new/redeveloped land uses within Fort Scott will be located in the southern part of the city between Horton and Margrave Streets, from East National Avenue to Jayhawk Road. The land use information shown in **Table 7.3** was used to develop daily trip generation information for new/redeveloped areas within the study area.

The floor area totals shown for each land use were converted into daily trips, using typical planning assumptions for the number of trips typically generated per employee or per thousand square feet of development. These rates are shown in **Table A.1** in **Appendix A**.

Once the daily traffic was determined, the PM peak hour vehicle trip generation was calculated based on a comparison of daily and PM trip rate information provided in Trip Generation, 8th Edition, Institute of Transportation Engineers. **Table A.2** in **Appendix A** shows a summary of the information calculat-

ed from the trip generation manual that was used in this analysis.

FUTURE TOTAL TRAFFIC VOLUMES

Vehicle-Trip Distribution

Once the trips related to the new development expected within Fort Scott were calculated, a traffic model was developed with the use of the analysis program Traffix to distribute the new traffic to the roadway network. A set of distribution percentages for each type of land use (e.g., residential, retail, office etc.) to various parts of town and regionally on US 69 and US 54 were developed in order to distribute traffic throughout the forecasting model. **Table A.3** in **Appendix A** illustrates the various distribution percentages by land use type.

2040 Ultimate Traffic Volumes

The new trips from the expected future land uses in Fort Scott were added to the 2040 No-Build Traffic Volumes forecast shown in **Appendix A** on **Figure A.6** and the resultant 2040 Ultimate Traffic Volumes are shown on **Figure A.7**. As regional background growth and new development occurs over the next thirty years, total daily traffic volumes along US 69 through Fort Scott are expected to grow at a rate of approximately 1.3 to 2.0 percent per year. **Table 7.4** shows the growth expected on US 69 through Fort Scott with the addition of new traffic from the expected future land uses.

The resulting average daily traffic (ADT) volumes for the 2040 Ultimate Traffic Volume Scenario are shown on **Figure 7.1**. The PM peak traffic volumes shown on **Figure A.7** are the basis for the 2040 Ultimate operational analyses completed for this study.



Table 7.1 Historic Regional Growth on US 69

	Cars			Trucks			Total		
	Year 2000 Daily Traffic Volume	Year 2008 Daily Traffic Volume	Percent Growth (2000-2008)	Year 2000 Daily Traffic Volume	Year 2008 Daily Traffic Volume	Percent Growth (2000-2008)	Year 2000 Daily Traffic Volume	Year 2008 Daily Traffic Volume	Percent Growth (2000-2008)
Miami County	6,345	6,390	0.1%	1,315	1,440	1.1%	7,660	7,830	0.3%
	5,855	6,330	1.0%	1,200	1,290	0.9%	7,055	7,620	1.0%
Linn County	3,455	3,500	0.2%	1,095	1,210	1.3%	4,550	4,710	0.4%
	3,640	3,190	-1.6%	825	1,030	2.8%	4,465	4,220	-0.7%
Bourbon County	4,160	3,920	-0.7%	950	1,210	3.1%	5,110	5,130	0.0%
	7,750	7,590	-0.3%	1,100	1,300	2.1%	8,850	8,890	0.1%
Crawford County	3,715	4,600	2.7%	810	1,010	2.8%	4,525	5,610	2.7%
	3,895	4,830	2.7%	825	1,030	2.8%	4,720	5,860	2.7%
Cherokee County	4,660	4,720	0.2%	710	1,080	5.4%	5,370	5,800	1.0%
	3,735	4,325	1.9%	790	955	2.4%	4,525	5,280	1.9%
Regional Growth	47,210	49,395	0.6%	9,620	11,555	2.3%	56,830	60,950	0.9%

Source: Kansas Department of Transportation

Table 7.2 Comparison of Daily Traffic with Regional Growth (2040 No-Build)

Location on US 69	Existing	Year 2040	Annual Percent Growth
South of Jayhawk Rd.	7,100	9,700	1.01%
North of 23rd St.	18,200	24,900	1.02%
North of 12th St.	11,900	16,250	1.01%
North of Wall St.	9,000	12,300	1.01%
North of US 54	5,100	7,000	1.03%

Table 7.3 2040 Vehicle Trip Generation

Land Use Type	Size	Daily Trips	PM Peak Hour		
			Total	Inbound	Outbound
Commercial - Retail New	121,153 SF	5,210	453	222	231
Commercial - Light Industrial Removed	-96,475 SF	-579	-81	-10	-71
Commercial - Light Industrial New	121,817 SF	1,310	182	22	160
Commercial - General Industrial New	841,126 SF	1,682	234	28	206
Commercial - Office New	141,840 SF	1,063	143	24	119
Residential New	433 units	3,464	365	230	135
Total Trips Due to New Land Use		12,150	1,296	516	780

Table 7.4 Comparison of Daily Traffic with Regional Growth and New Land Uses (2040 Ultimate)

Location on US 69	Existing	Year 2040	Annual Percent Growth
South of Jayhawk Rd.	7,100	10,300	1.2%
North of 23rd St.	18,200	30,000	1.6%
North of 12th St.	11,900	22,500	2.1%
North of Wall St.	9,000	13,500	1.3%
North of US 54	5,100	7,600	1.3%

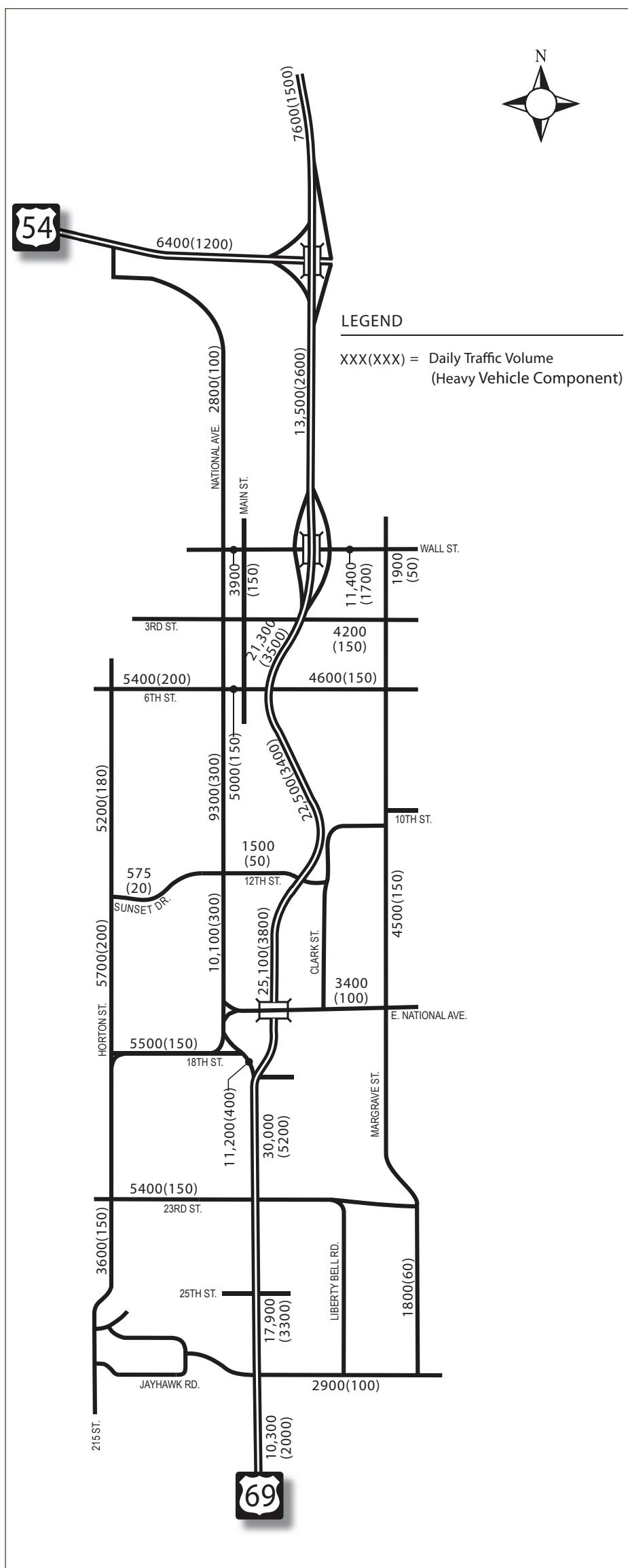
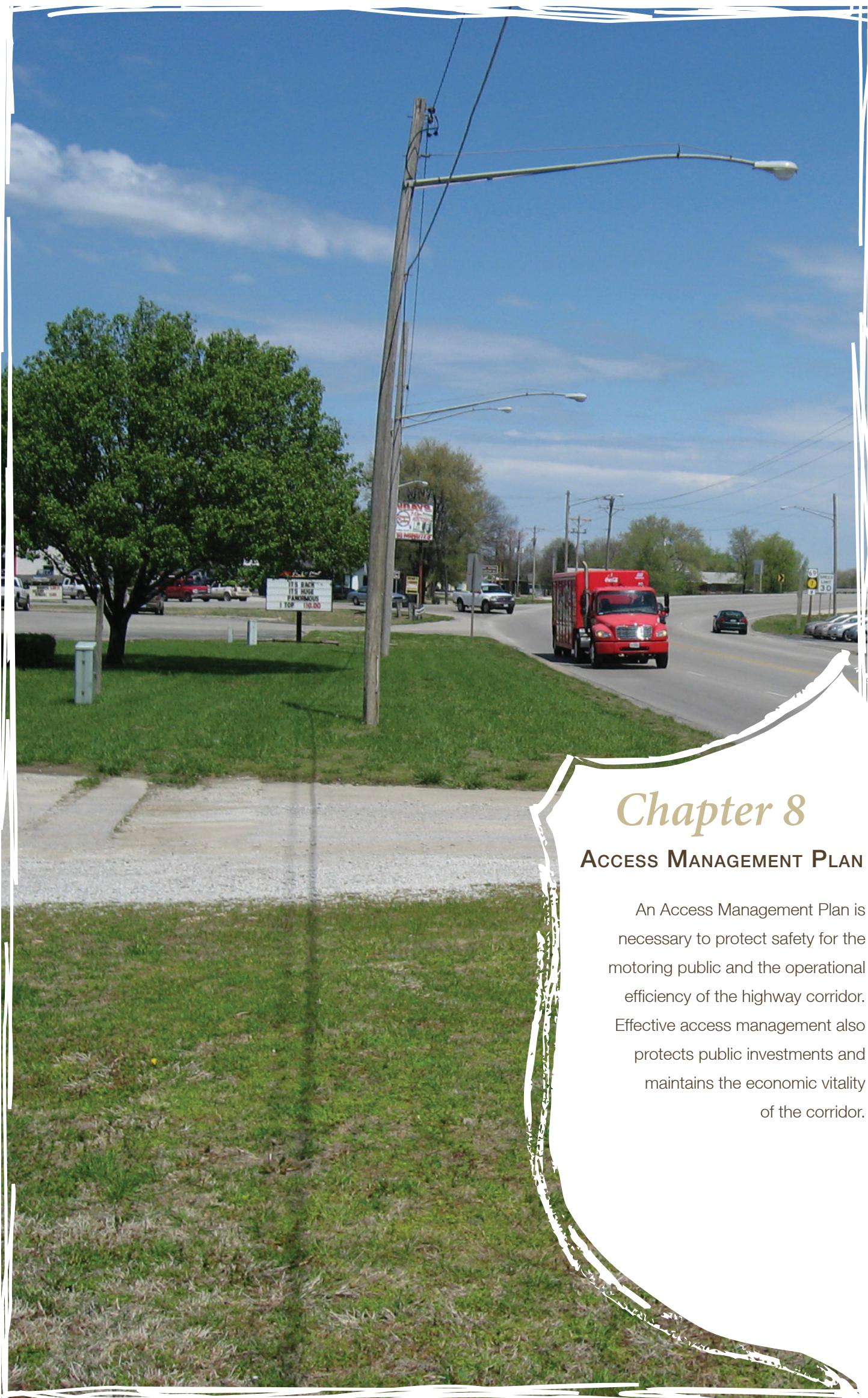


Figure 7.1 2040 Ultimate Daily Traffic Volumes



Chapter 8

ACCESS MANAGEMENT PLAN

An Access Management Plan is necessary to protect safety for the motoring public and the operational efficiency of the highway corridor. Effective access management also protects public investments and maintains the economic vitality of the corridor.

INTRODUCTION

An Access Management Plan is necessary to protect safety for the motoring public and the operational efficiency of the highway corridor. Effective access management also protects public investments and maintains the economic vitality of the corridor. In contrast, uncontrolled access generally impedes development and produces high costs when retrofits are needed.

Figure 8.1 illustrates the relationship between the amount of access provided and the facility type. Most of US 69 within the study area operates in the upper range of this graph, somewhere between Freeway and Major Arterial. North of the intersection with South National Avenue and south of the intersection with Jayhawk Road, access to the highway is limited to major cross streets and, for the most part, adequately spaced driveways. The US 69 segment between Jayhawk Road and South National Avenue operates more like a Major Arterial, with considerably more access provided to the adjacent businesses and properties.

It is widely accepted that good management of driveway access to major arterials improves safety, promotes more efficient road operation, and extends the capacity of roads. KDOT's

current Corridor Management Policy, updated in January 2003, provides local jurisdictions with criteria and procedures that both realize these benefits and maintains reasonable access to adjacent properties. This Access Management Plan applies these tools to US 69 in the Bourbon County study area.

Appropriate action on driveway access permits depends on the following criteria:

1. Providing reasonable access from the roadway to the property.
2. Maximizing the separation between the driveway approach and other driveway approaches and intersections.
3. Minimizing the number of conflict points between vehicles entering and exiting driveways and through traffic.
4. Minimizing conflicts between vehicles entering and exiting driveways and pedestrians using the public right-of-way.
5. Keeping the difference in speeds between the vehicles using driveways and through vehicles as low as practical.
6. Providing unobstructed visibility between vehicles entering or leaving the roadway at a driveway and other vehicles using the roadway.
7. Providing maximum safety and efficiency of turning vehicles using the driveway.
8. Minimizing the frequency of through vehicles forced to stop or substantially reduce speed because of vehicles entering or leaving the roadway approach.

This chapter summarizes access management principles, explains how these

principles achieve access management goals, and makes recommendations for access modifications, based on existing conditions on US 69.

PRINCIPLES OF ACCESS MANAGEMENT

City, county, and state governments can use their powers to protect public health, safety, and welfare to manage road access. Management programs can apply equally to all parts of the study area, or be established within specific areas using tools such as overlay districts. Access management ultimately involves the beneficial regulation of traffic flow, reducing conflicts between vehicles operating at different speeds or for different objectives.

According to the Transportation Research Board's **Access Management Manual**, access management programs limit and consolidate access along major roadways, while promoting a supporting street system and convenient local circulation systems to serve development. Effective management strategies provide adjacent owners with reasonable and often qualitatively improved access to their property from the area's street network. Access (connection with surrounding roadways) and routing (direction of flows between properties and surrounding roadways) are different components of system management and are controlled differently.

The following principles guide effective access management:

1. **Provide a Specialized Roadway System:** Different types of roadways serve different functions. It is important to design and manage roadways according to the primary functions that they are expected to serve.

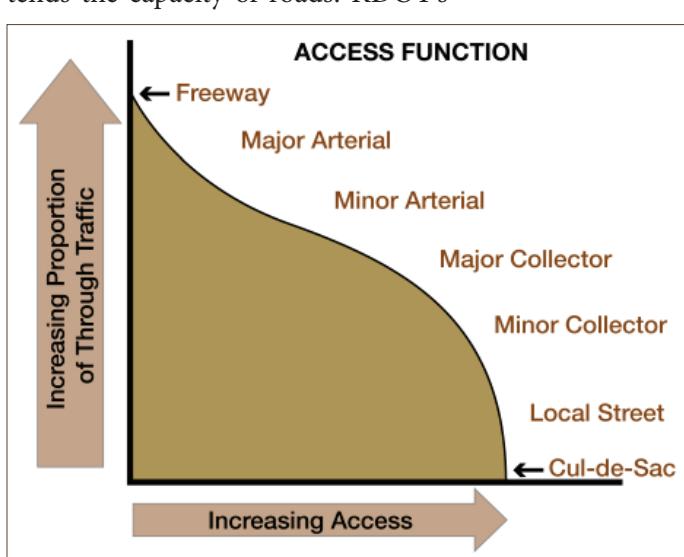


Figure 8.1 Access Functional Hierarchy



Access locations on northbound US 69.

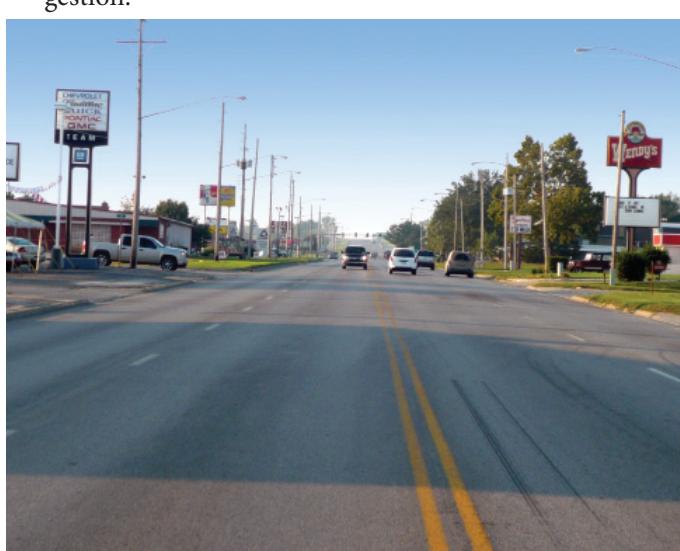
- 2. Limit Direct Access to Major Roadways:** Roadways that serve higher volumes of regional through traffic need more access control to preserve their traffic function. Frequent and direct property access is more compatible with the function of local and collector roadways.
- 3. Promote Intersection Hierarchy:** An efficient transportation network provides appropriate transitions from one classification of roadway to another. For example, freeways connect to arterials through an interchange that is designed for the transition. Extending this concept to other roadways results in a series of intersection types that range from the junction of two major arterial roadways, to a residential driveway connecting to a local street.
- 4. Locate Signals to Favor Through Movements:** Long, uniform spacing of intersections and signals on major roadways enhances the ability to coordinate signals and ensures continuous movement of traffic at the desired speed. Careless or unmanaged access connections or median openings that later become signalized often cause substantial increases in arterial travel times. In addition, poor signal placement can lead to delays that even computerized signal timing systems cannot correct.
- 5. Preserve the Functional Area of Intersections and Interchanges:** The “functional area” of an intersection or interchange is the area that is critical to its safe and efficient operation, where motorists are responding to the intersection or interchange, decelerating, and maneuvering into the appropriate lane to stop or complete a turn. Access connections too close to intersections or interchange ramps can cause serious traffic conflicts that result in crashes and congestion.
- 6. Limit the Number of Conflict Points:** Drivers make more mistakes and are more likely to have collisions when they are presented with complex driving situations created by numerous conflict points. Conversely, simplifying the driving task helps improve traffic operations and reduce collisions. A simplified driving environment is accomplished by limiting the number and type of conflicts between motor vehicles, vehicles and pedestrians, and motor vehicles and bicyclists.
- 7. Separate Conflict Areas:** Drivers need sufficient time to address one set of potential conflicts before facing another. The necessary spacing between conflict areas increases as travel speed increases, to provide drivers adequate perception and reaction time. Separating conflict areas helps to simplify the driving task and contributes to improved traffic operations and safety.
- 8. Remove Turning Vehicles from Through Traffic Lanes:** Turning lanes allow drivers to decelerate gradually out of the through lane and wait in a protected area for an opportunity to complete a turn. This reduces the severity and duration of conflict between turning vehicles and through traffic and improves the safety and efficiency of roadway intersections.
- 9. Use Non-traversable Medians to Manage Left-Turn Movements:** Medians channel turning movements on major roadways to controlled locations. Research shows that the majority of access-related crashes involve left turns. Therefore, non-traversable medians and other techniques that minimize left turns or reduce the driver workload can be especially effective in improving roadway safety.
- 10. Provide a Supporting Street and Circulation System:** Well-planned communities provide a supporting network of local and collector streets to accommodate development, as well as unified property access and circulation systems. Interconnected street and circulation systems support alternative modes of transportation and provide alternative routes for bicyclists, pedestrians, and drivers. Alternatively, commercial strip development with separate driveways for each business forces even short trips onto arterial roadways, thereby reducing safety and impeding mobility.

Access Management Strategies

While short-term reductions in access points along US 69 may be difficult, an Access Management Plan is important to guide actions on future access requests, and direct the consolidation of access points with roadway improvements or when opportunities emerge.

KDOT, as the agency responsible for managing access to US 69, may initiate driveway approach modifications if:

1. Continued use of the driveway approach imposes an unreasonable burden on the free flow of and movement of traffic.
2. The roadway is being reconstructed, repaved, relocated, or redesigned.
3. The driveway approach is defective in construction, in a deteriorated condition, or deviates from permit terms.
4. The property served by the driveway is developed, redeveloped, or changes in land use.



Multiple access locations along southern commercial corridor in Fort Scott.



Driveways have been consolidated along some stretches of US 69 to provide adequate spacing.

This Access Management Plan recommends the following actions at appropriate places within the US 69 Corridor to ensure safer, smoother traffic movement along this important highway.

Closing Access Points

Improving the urban section of US 69 to meet access control standards is a gradual process. KDOT, Fort Scott and Bourbon County should seek and take advantage of opportunities to eliminate access at locations other than those proposed in this Management Plan.

Establishing Shared Access Points

The plan strongly encourages joint access to the highway and local street network by adjacent property owners. When the city and county review development applications, they should consider, as a condition of approval, a grant of a recorded easement by the applicant to adjoining property owners or other appropriate conditions that meet access management goals. In addition, consolidating two adjacent property access points into one shared point produces a more efficient highway system and often can increase the parking supply and efficiency of internal circulation. Incentives should be offered to encourage voluntary access consolidations.

Approval Processes And Conditions

KDOT has the authority to permit access to a state highway or city connecting link, consistent with its Corridor Management Policy. The Department approves and controls access requests by issuing a Highway Permit, which is a legal document that establishes conditions of access granted to the landowner. All points of access to the state highway system are governed by a Highway Permit, including installation, relocation, improvement, removal, or replacement

of access connections, local streets, and intersections. Conditions of the permit include the location of the point of access, construction-related issues, permitted uses at the access point and other conditions and limitations. A request for a Highway Permit is made with the appropriate KDOT Area Office.

Fort Scott and Bourbon County approve access to local roadways. The city and county should enforce the Access Management Plan to control local road access using zoning and subdivision regulations. These provisions may be established through a corridor overlay district, establishing special conditions for development in the area. On city connecting links, a Highway Permit must be obtained for work in the right-of-way. Executed copies of the permit, approved by KDOT and the city or county will be provided to the property owner.

Coordinating Access Management

Because of the importance of access management on US 69 and the governmental relationships and responsibilities discussed earlier, Fort Scott and Bourbon County must consult with KDOT on development applications that propose access points on the mainline highway and on portions of the local street network that are included in the US 69 Corridor Management Plan.

The US 69 Corridor Management Plan recommends existing access points on the highway that should be closed or consolidated over time, as appropriate circumstances present themselves, to achieve these access management objectives. The city and county should cooperate with KDOT to identify existing access points that can be eliminated or consolidated. Early coordination with KDOT at the site plan and preliminary plat stages is especially important.

EXISTING ACCESS CONDITIONS

Previous chapters have discussed the different contexts of US 69 and the study area. As an element of the National Highway System, US 69 is classified as a Class "B" Route classification, protected by allowing direct access only when alternative access is unfeasible. The three contexts described previously – the urban, mixed use, and rural transition segments – are used to define access management zones, each with individual characteristics and management challenges. Descriptions of access management objectives for each zone are summarized below. Chapters Four and Five describe these segments in greater detail.

Urban Corridor: US 54 To South National Avenue

This segment is a four-lane divided roadway with no direct driveway access along the entire 2.5 mile length. The access characteristics along this fully controlled segment are described in Chapter Four.

Mixed Use Corridor: National Avenue To Jayhawk Road

The northern portion of this segment, from South National Avenue to 23rd Street, is a four-lane undivided cross section with multiple driveways and cross street intersections. This largely commercial segment lacks a left-turn lane or pedestrian and bicycle access. South of 23rd Street, the section transitions to a five-lane section, and access points generally meet KDOT access spacing criteria.



Access consolidation is also necessary on segments of South National Avenue, near the intersection with US 69.



Driveway access to adjacent properties is not provided along the urban corridor in Fort Scott.

Rural Corridor: Jayhawk Road To Bourbon/Crawford County Line

Between Jayhawk Road and the interchange the K-7 interchange, US 69 is a four-lane divided section with access at approximately $\frac{1}{4}$ mile spacing. This section was constructed to expressway standards, providing at-grade intersections and driveways. South of K-7, US 69 is a two-lane rural section through agricultural land, with access points at $\frac{1}{2}$ mile intervals and county roads.

Access Spacing

Table 8.1 enumerates access points located within each segment by direction. Any driveway or cross street located on the right side of the roadway in the direction of travel is considered an access point. The mixed use (or South Main) corridor segment has a large number of access points compared to the other context segments. Calculating the average number of accesses per mile provides a basis for uniform comparison of segments with each other and with national standards. For example, the Mixed Use Corridor, with a length of 0.97 miles, has 21 access point/mile northbound and 24 access points/mile southbound.

Table 8.1 also summarizes the existing and desirable access spacing within each segment. The only recommended changes in access location and spacing are within the Mixed Use Corridor, where the recommended spacing between access points is at least 300 feet. These recommended changes are discussed in more detail in the following section.

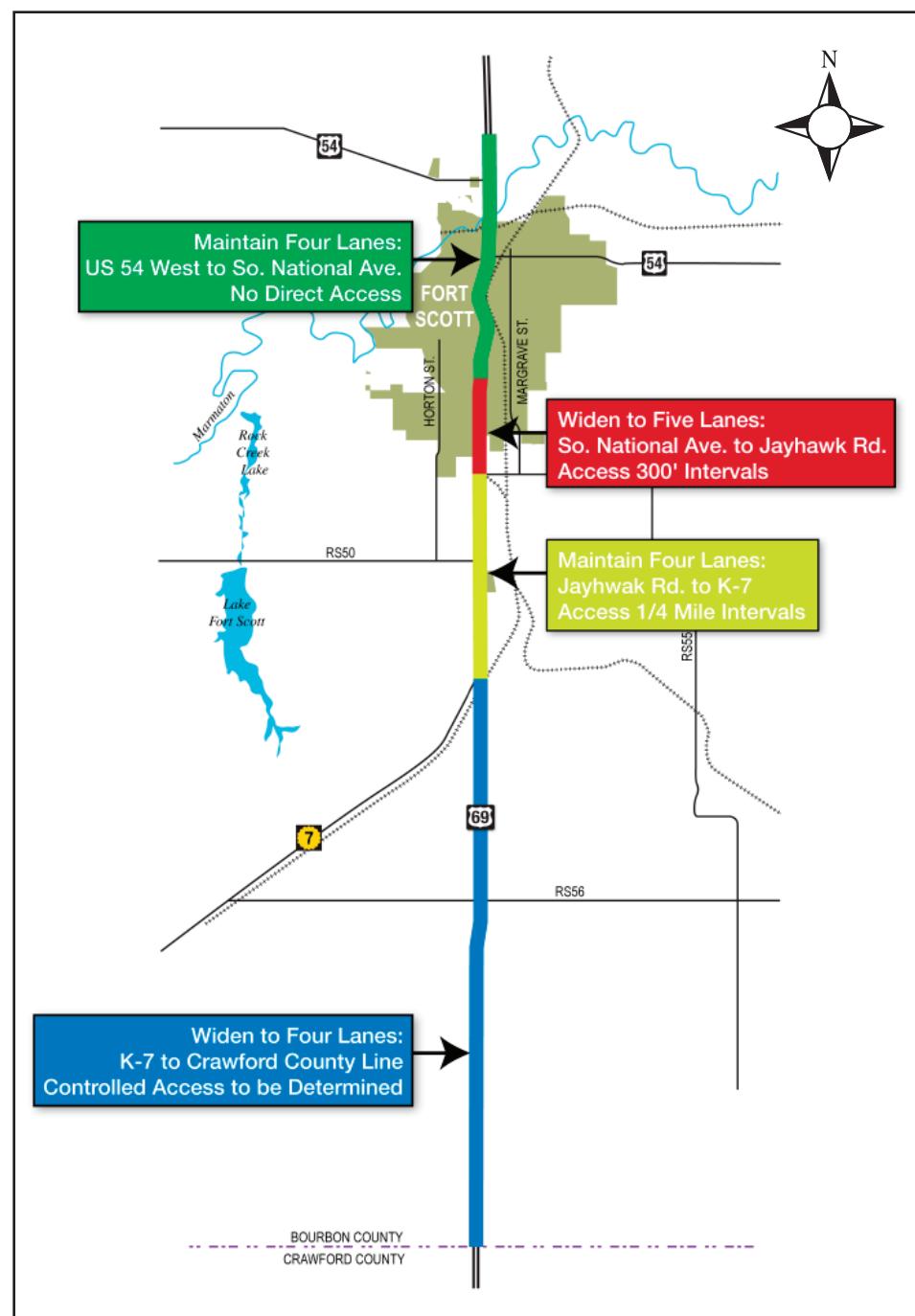


Figure 8.2 Corridor Access Spacing Recommendations (4 Segments) by FHU

Table 8.1 Existing Access Spacing Conditions

	Urban Corridor ¹	Mixed Use Corridor ²	Northern Rural Corridor ³	Southern Rural Corridor ⁴
Northbound Access Points	7	21	6	13
Northbound Access Points/Mile	2.4	21.0	2.4	2.0
Southbound Access Points	7	24	9	10
Southbound Access Points/Mile	2.4	24.0	3.6	1.5
Existing Access Spacing	660 – 3300 Feet	70 - 300 Feet	1/4 Mile	1/2 Mile
Desirable Access Spacing	660 – 3300 Feet	Not less than 300 Feet	To Be Determined ⁵	To Be Determined ⁶

¹Urban Corridor: US 54 to So. National Ave.

²Mixed Use Corridor: So. National Ave. to Jayhawk Road

³Northern Rural Corridor: Jayhawk Road to K-7

⁴Southern Rural Corridor: K-7 to Bourbon/Crawford County Line

⁵The existing interchanges and signalized intersections must remain in their present location

⁶KDOT is currently studying this section of US 69 to determine facility type.

Table 8.2 Summary of Access Management Strategies along US 69

Tool	Description	Recommended Locations (Graphic)	Jurisdiction
Close Mainline Median Breaks	Eliminate existing median breaks to prohibit left turns to/from mainline and abutting properties. (Consult with District Engineer)	300' north and south of 23 rd Street Between realigned 18 th Street and 19 th Street	KDOT
Consolidate Private Driveways	Eliminate redundant driveway connections to mainline into single driveway connection, either within an individual tract or at property line of contiguous tracts.	Multiple locations between 19 th and 23 rd Streets	KDOT FORT SCOTT
Eliminate Private Driveways/ Provide Side-Road Access	Where property owner has frontage on both mainline and side-road, eliminate mainline driveway and restrict access to side-road.	All locations fronting the highway within the South National Business District	KDOT FORT SCOTT
Eliminate Public Road Connections to Mainline, 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.	Not recommended	KDOT FORT SCOTT
Eliminate Private Driveways, Re-Connect to Frontage Road	Where private driveways connect directly to mainline, eliminate private driveways and re-connect to newly installed frontage or reverse road.	Between 20 th and 23 rd Street	KDOT FORT SCOTT
Intersection Consolidation	Consolidate redundant, at-grade local road intersections into single intersection by establishing local road network to facilitate connection to single remaining at-grade intersection.	Not recommended	KDOT FORT SCOTT
Interchanges at Major Roads	Replace major road at-grade intersections with grade-separated interchanges	Not recommended	KDOT
Advance ROW Acquisition	Identify and prioritize critical parcels most vulnerable to development or other market forces.	Realigned 18 th Street US 69 from South National Ave. to 23 rd Street Multiple locations on recommended Local Street Network	KDOT FORT SCOTT
Intersection Upgrades	Monitor traffic volumes and accident rates to determine when intersection improvements are needed.	SB Wall Street On-ramp 3 rd Street 6 th Street 12 th Street 18 th Street 23 rd Street	KDOT FORT SCOTT

US 69 ACCESS MANAGEMENT RECOMMENDATIONS

Access management along the corridor is often combined with traffic operational improvements and controls. This section identifies problems found along the corridor that can be addressed by improved access management to improve safety and smooth traffic flow. **Table 8.2** provides a summary of access management tools applicable to projects within the corridor.

US 54 To South National Avenue

The primary focus of this segment, with its already managed access, is to reduce the differential in speeds and improve traffic circulation. Turbulence in the traffic flow is caused by some drivers driving excessively fast and failing to anticipate signalized intersections along this segment of highway. Intelligent Transportation Systems (ITS) that improve advance warning of the traffic signals and interconnected communication between each signal should be employed to maintain good signal progression and improve driver awareness and expectations. These improvements will reduce the need for through trucks to stop and slowly accelerate in traffic.

South National Avenue To Jayhawk Road

Access management policy along this segment should minimize the construction of new driveways, and consolidate and eliminate existing driveways, applying KDOT guidelines. **Figure 8.3** illustrates a concept based on access management and enhanced development of vacant or underused properties in this area. The highway here would also be widened from north of 23rd Street to the

planned 18th Street intersection, providing a center left turn lane similar to US 69 from 23rd Street to Jayhawk Road.

A raised median with a separate left turn lane could be used in place of the center turn lane to provide better access management. Right turn lanes should also be added at the signalized intersections and other major movements to maintain the platoon of through vehicles within this section US 69. The southern section of this area, from 23rd Street to Jayhawk Road displays effective access management techniques that should be used as other sections of US 69 are redeveloped.

Jayhawk Road To Crawford County Line

Access management policy here should control the number and location of access points when development occurs south of Jayhawk Road, consistent with the land use principles established in Chapter Five. The current spacing of access points and median breaks at approximately $\frac{1}{4}$ mile and $\frac{1}{2}$ mile points north and south of K-7 respectively should be maintained. Right turn lanes should also be added at those locations where major movements are anticipated, to minimize interference with through vehicles. KDOT is currently studying this rural section of US 69 to determine if an expressway or freeway section should be constructed.

TRAVEL SPEED AND ACCESS DENSITY

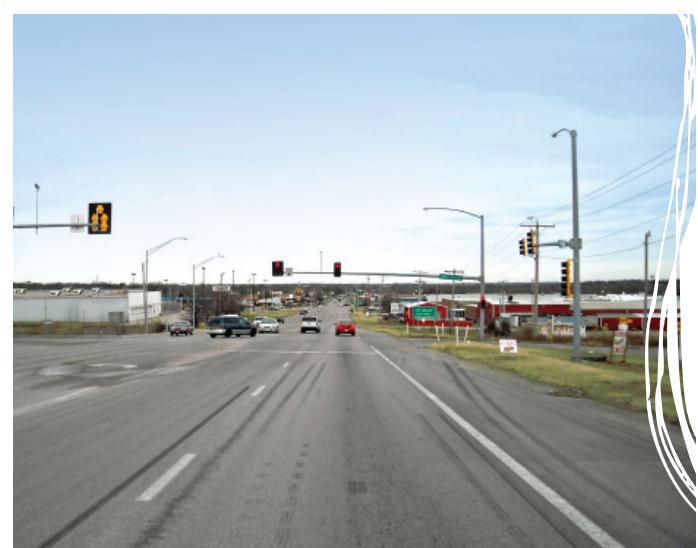
The **Highway Capacity Manual** (HCM) indicates that the free-flow speed on an undivided multi-lane highway is about 1.6 mph less than a divided highway (similar to the proposed 5-lane section between 23rd Street and 18th Street/

South National Avenue). The HCM also indicates that for every 10 access points per mile, the free flow speed on the highway will decrease by 2.5 mph.

The 0.42 mile segment of US 69 between 23rd Street and 18th Street/South National Avenue currently has ten access points for northbound traffic, and 16 access points for southbound traffic. This equates to 24 access points/mile northbound, corresponding to a decrease of 6.0 mph, and 38 access points/mile southbound, or a decrease of 9.5 mph.

The proposed Access Management Plan for this segment of US 69, as shown in **Figure 8.3**, recommends elimination and consolidation of driveways, resulting in seven northbound and nine southbound access points in this segment. This corresponds to 17 access points/mile northbound (a decrease of 4.3 mph), and 21 access points/mile southbound (a decrease of 5.3 mph). The widening of US 69 to provide a five-lane section in this area will result in additional travel time improvements. With the reduced number of access points and widening to a five-lane section, average travel speeds would be increased by 3.3 mph in the northbound direction and 5.8 mph in the southbound direction.

The effect of access spacing and land configuration on the segment from 23rd Street to 18th Street/South National Avenue is summarized in **Table 8.3**. This improvement in travel speeds and operations will tend to make regional travelers more tolerant of the local character of US 69 through this segment of the highway, which generates substantial sales revenues and economic activity for the city and county.



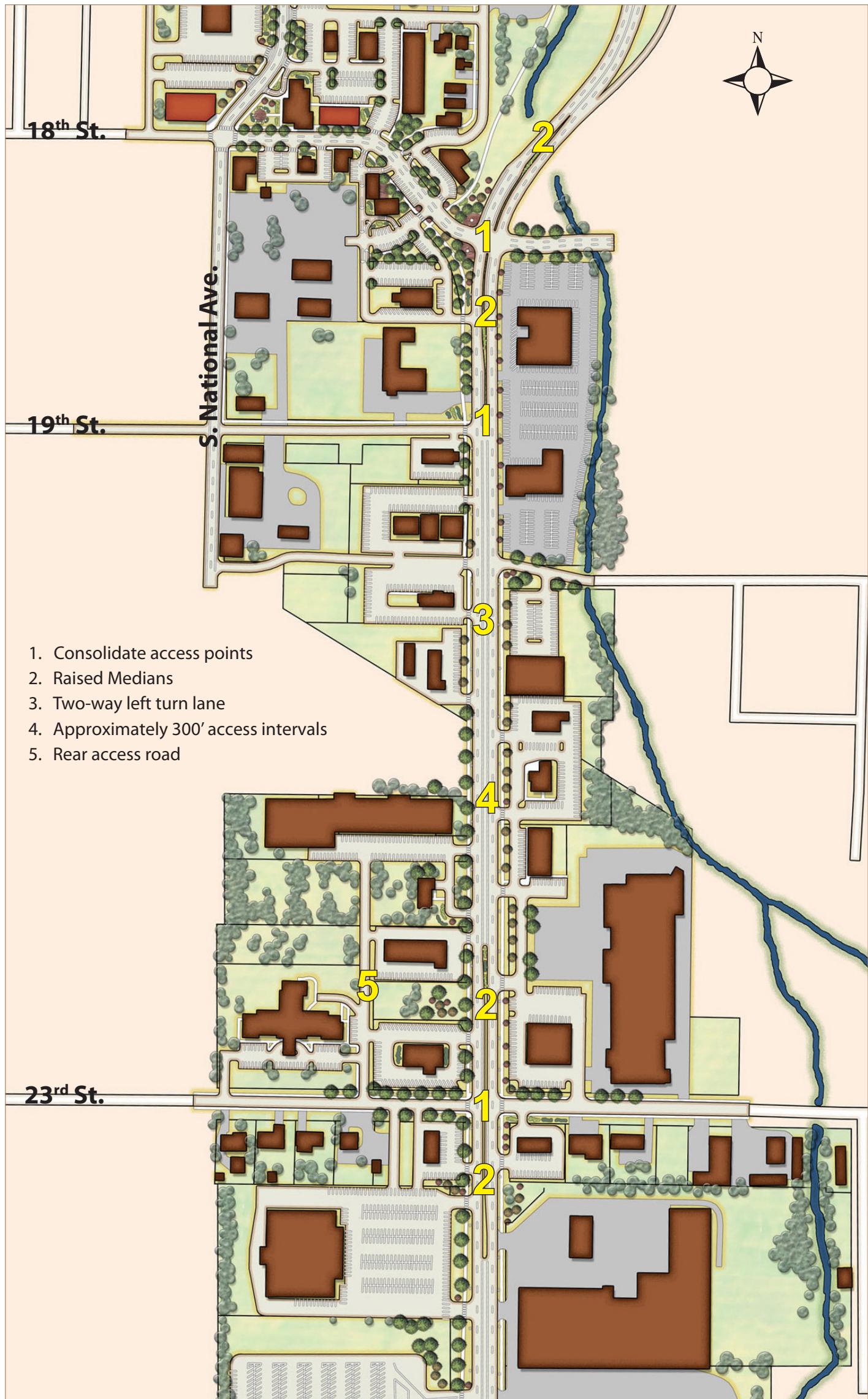


Figure 8.3 Commercial Corridor Access Modifications

Table 8.3 Speed Effect of Access Spacing – 23rd St to 18th St /South National Ave

Year	2009 Existing		2040 Background		2040 Total	
Direction	Northbound	Southbound	Northbound	Southbound	Northbound	Southbound
Cross Section	4-lane	4-lane	4-lane	4-lane	5-lane	5-lane
Speed Decrease (mph)	1.6	1.6	1.6	1.6	0.0	0.0
Access points / mile	24	38	24	38	17	21
Speed Decrease (mph)	6.0	9.5	6.0	9.5	4.3	5.3
Total Speed Decrease (mph)	7.6	11.1	7.6	11.1	4.3	5.3
Free Flow Speed (mph)*	22.4	18.9	22.4	18.9	25.7	24.7

* Free Flow Speed based upon 30 mph baseline speed

ENHANCEMENTS TO LOCAL STREET NETWORK

The local street network proposed in this Corridor Management Plan is also critical to providing safe and efficient traffic flow along US 69 through Fort Scott. The land use and development concepts presented in Chapter 5 and 6 require an integrated street network that both provides functional highway access and establishes complementary routes for local traffic. These new and extended local streets strengthen north-south mobility by all modes and reduce

the use of the main line by local traffic bound for major retailing, the hospital, the community college, and industrial employment centers.

Figure 8.4 illustrates a potential local street network for the study area between East National Avenue and Jayhawk Road. Key components are:

- Extension of South National Avenue to 23rd Street.
- Extension of 20th Street to Horton Street.
- Redesign of the street system in the south national business district

and extension of 18th Street east of US 69 as a “rearage” facility serving existing and new development between the highway and the BNSF.

- A 23rd Street overpass over the railroad.
- Improved bicycle and pedestrian access south of 12th Street.

This concept will inevitably be modified to support actual developments as they emerge. However, it demonstrates a general program for local access and should remain a top priority for transportation system improvements.

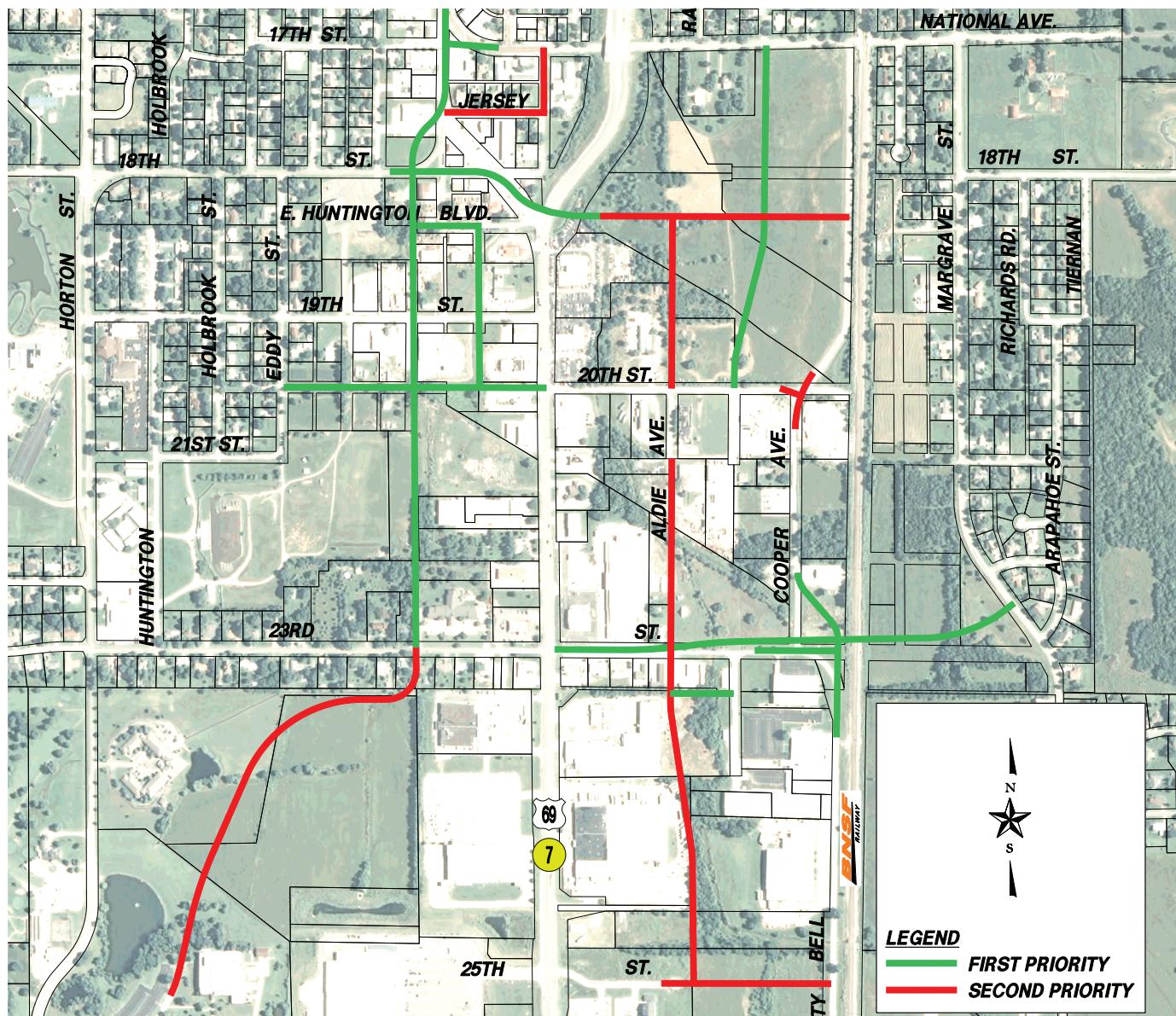
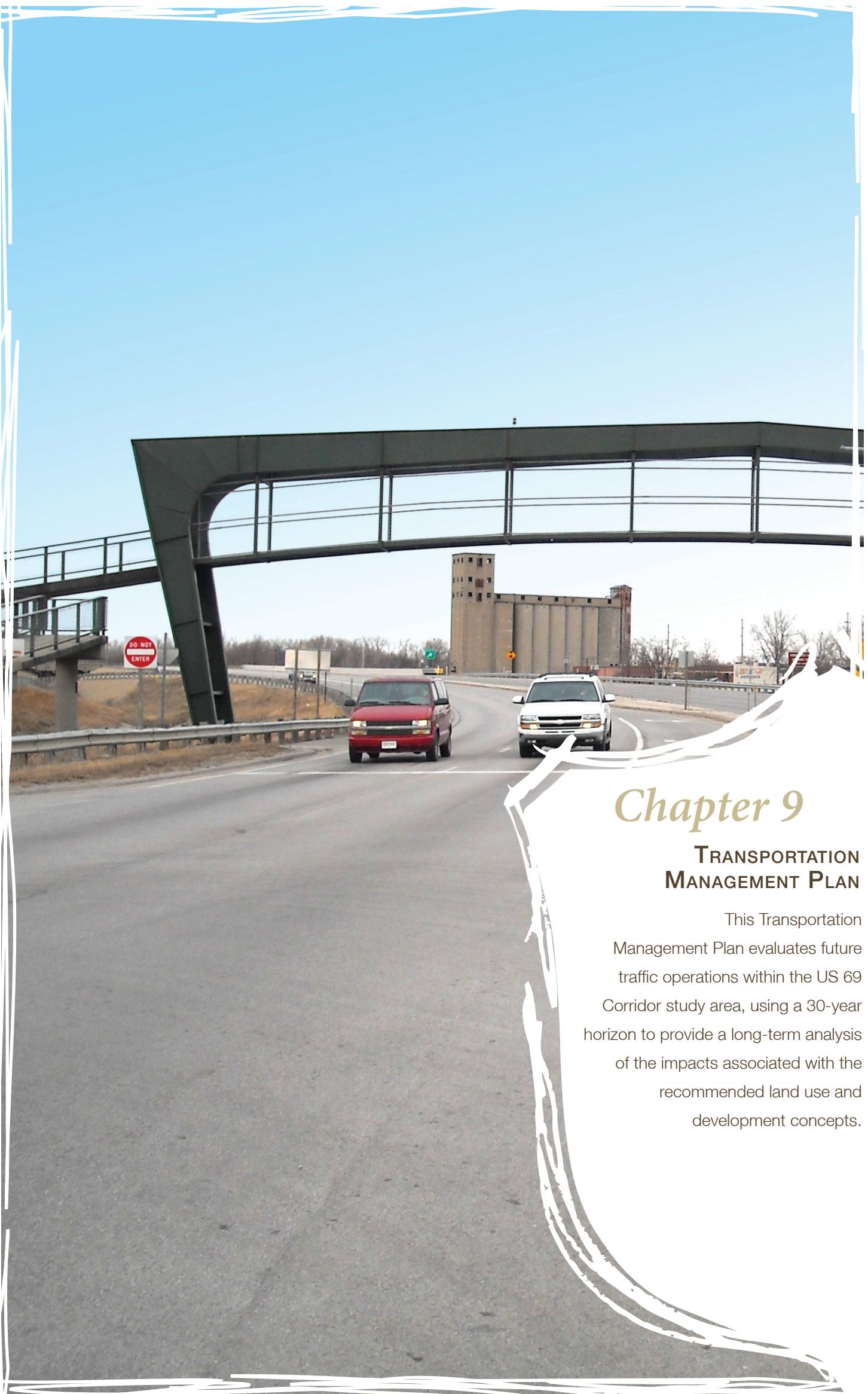


Figure 8.4 Local Street Network Improvements (off-system)



Chapter 9

TRANSPORTATION MANAGEMENT PLAN

This Transportation Management Plan evaluates future traffic operations within the US 69 Corridor study area, using a 30-year horizon to provide a long-term analysis of the impacts associated with the recommended land use and development concepts.

INTRODUCTION

This Transportation Management Plan evaluates future traffic operations within the US 69 Corridor study area, using a 30-year horizon to provide a long-term analysis of the impacts associated with the recommended land use and development concepts presented in Chapters Five and Six. This chapter describes traffic operations for two transportation development scenarios within the US 69 study area: the 2040 No-Build and the 2040 Ultimate scenarios.

The 2040 No-Build scenario presents the projected 2040 traffic volumes based

on expected regional and local growth and development patterns. It depicts anticipated traffic operations if growth occurs in the US 69 corridor study area following historic rates, and Fort Scott continues to develop with the existing transportation system (including a two-lane US 69 from K-7 to the Crawford County Line) in place without change. The 2040 No-Build scenario traffic operations analysis together with Chapter Four's safety analysis were used to identify a number of transportation system improvements both along US 69 and off-system. The 2040 Ultimate scenario evaluates future traffic operations assuming implementation of these transportation system improvements and the access management plan described in Chapter 8. The 2040 Ultimate scenario assumes development projected by the future land use plan presented in Chapter 5 and continued regional growth at historic rates along US 69.

For comparison purposes, the 2009 Existing scenario summarizes information previously covered in Chapter 4. Its inclusion in this section helps compare current system operations to these two future scenarios.

TRANSPORTATION SYSTEM IMPROVEMENTS

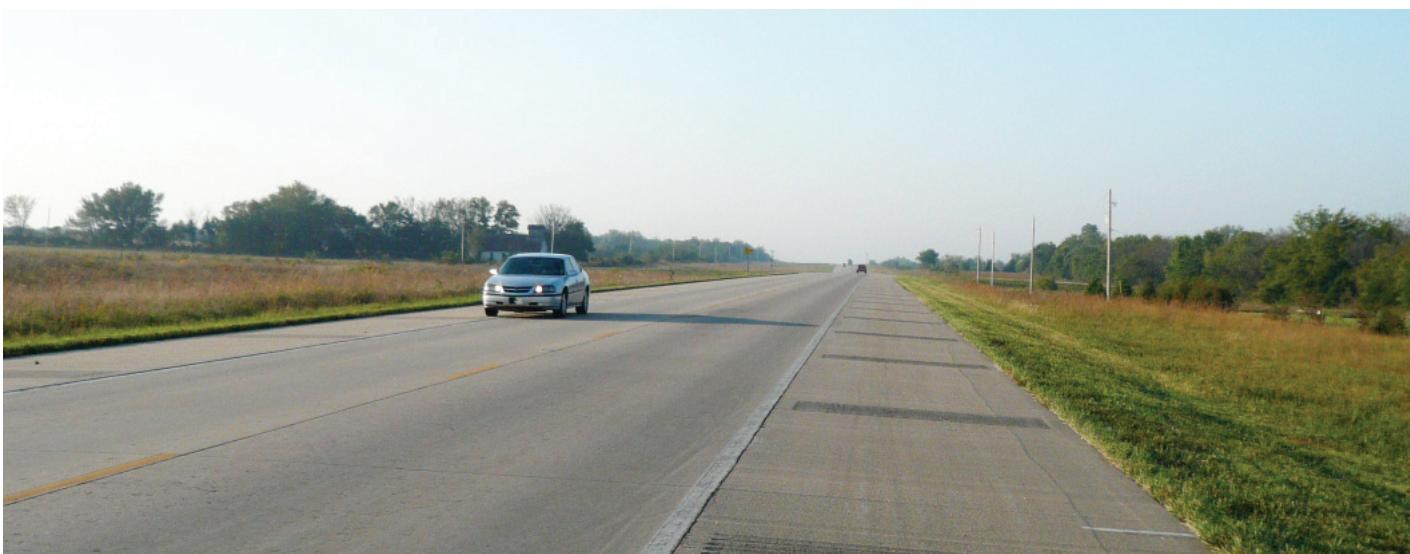
The analysis of traffic operations and crash history along the US 69 corridor and the performance of the 2040 No-Build scenario generated an array of recommended transportation system improvements. These improvements, described in this section, have been incorporated into the 2040 Ultimate scenario and group into the following categories:

- US Highway 69 Widening
- Traffic Signal Communication
- Dilemma Zone Improvements
- Advanced Warning Signs and Beacons
- Intersection Improvements
- Off System Improvements
- Pedestrian and Bicycle Improvements

It should be noted that all of the recommended improvements discussed in this chapter will incorporate best management practices for storm water management and address floodplain impacts as necessary, particularly on the north end of the corridor.



US 69, looking north toward 6th Street Intersection.



US 69 - Two Lane Section south of Fort Scott between K-7 and Arma, Kansas

US Highway 69 Widening

Two roadway widening projects have been identified along US Highway 69 within the study area to improve traffic operations: the rural section of US 69 from Arma to K-7, and the urban section of US 69 from 23rd Street to 18th Street/South National Avenue.

Arma to K-7 Interchange

US 69, between the I-44 interchange in Oklahoma to the north side of Arma (along with the proposed Pittsburg Bypass), will ultimately be a four-lane freeway, providing a high speed, limited access facility that improves regional freight movements and vehicular traffic operations along the corridor. The US 69 section from Arma to K-7 was originally planned as an expressway, allowing at-grade intersections and a limited number of driveways with direct access to the highway. KDOT is currently studying this section to determine whether the most appropriate design solution is the current expressway concept, an expressway upgradable to freeway standards, or a freeway with limited access.

23rd Street to 18th Street / South National Avenue

Within the urban area of Fort Scott, US 69 narrows to a four-lane undivided section from north of 23rd Street through the intersection with 18th Street/South National Avenue. This portion of the highway should be reconstructed to a 5-lane section with a center two-way left-turn lane. In addition to the widening, this project should consolidate access points, to provide greatest feasible consistency with a 300-foot access spacing standard.

Traffic Signal Communication/Coordination

Currently, the five traffic signals along US 69 through the Fort Scott area lack a communication and coordination system. As a result, each signal operates independently, producing inefficient stop and go operations for through traffic. This is a particularly important issue because of the growing amount of heavy truck traffic on the highway. Better signal timing coordination will reduce the negative impact of trucks stopping at several intersections through the city.

A hard-wired communication system should be installed to allow for future signal coordination and timing plans to improve traffic progression. The installation process must be coordinated with KDOT traffic engineering and Intelligent Transportation System (ITS) divisions. An adaptive traffic signal control system, in conjunction with the signal communication system, presents another option for improved operations along US 69.

Dilemma Zone Improvements

The “dilemma zone” factor is another major contributor to crashes at some of Fort Scott’s signalized intersections. Dilemma zones (**illustrated in Figure 9.1**) are the areas on approach to intersections through which a vehicle can neither proceed before the traffic signal turns red nor stop safely. Dilemma zones occur when intersection approach speeds exceed 45 mph and when the signal is isolated or unexpected. Intersections with these conditions often have a crash history of frequent rear-end, signal violation, or right-angle crashes.



US 69 - 23rd Street to 18th Street / South National Avenue

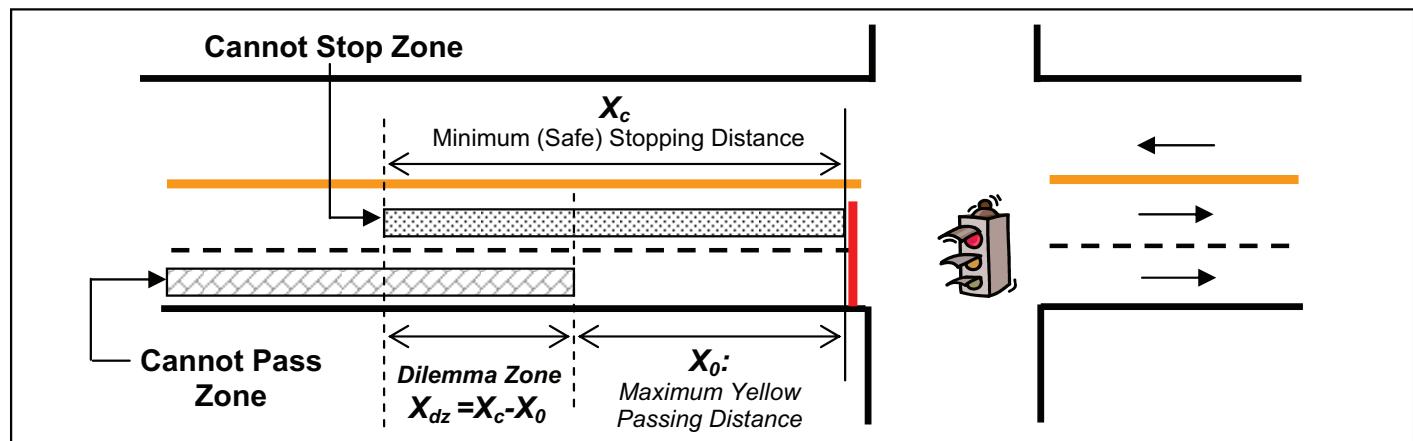


Figure 9.1 Formation of Dilemma Zone

Signal violations at dilemma zones can be corrected with advance warning signs with the message “Prepare to Stop” (W3-3 and/or W3-7) combined with flashing beacons that are interconnected with the traffic signal. In Fort Scott, a dilemma zone protection system is currently installed on US 69 at the northbound approach to the intersection with 25th Street. A similar system should be installed on US 69 at the southbound approach to 3rd Street.

Advance Warning Signs and Beacons

Typically, KDOT installs an advance warning system at locations where there may be limited sight distance. In Fort Scott, some form of advance warning now exists in at least one direction of travel on US 69 at 3rd Street, 6th Street, and 12th Street. At these intersections the location of signs on each approach was checked to determine if adequate warning is provided for the posted speed. The advance warning sign and beacon systems should be upgraded at the signalized intersections on US 69 in Fort Scott per the AASHTO Roadway Design Manual (Green Book). This is discussed in more detail in the following sections for each intersections.

US 69 Intersection Improvements

3rd Street Intersection

The first traffic signal that southbound travelers on US 69 encounter south of I-435 in Overland Park is 3rd Street in Fort Scott, 78 miles away. Not surprisingly, crash record narratives indicate that many drivers did not expect to encounter this signal. The posted speed limit on US 69 is 50 mph at 3rd Street, and typical traffic speeds approaching this intersection exceed 45 mph. Third Street has the highest crash rate of any intersection along US 69 in the study area, and a majority of collisions involve southbound vehicles in either rear-end crashes or signal violations. Several improvements can improve safety here:

- For southbound traffic, the dilemma zone protection system described previously should be installed to replace the existing advance warning signs.
- Advance warning signs (w3-3) and beacons should be installed per AASHTO guidelines on the northbound approach to 3rd Street. The existing sign and beacon are too close to the intersection to reduce roadway speed.

- The southbound US 69 entrance ramp from Wall Street should be extended through the 3rd Street as an auxiliary lane to provide additional length for merging. The merge length for the US 69 entrance ramp is substandard for the posted speed of 50 mph. Per the AASHTO **Roadway Design Manual** (Green Book), the recommended taper rate for the ramp to merge into through traffic lanes is 600 feet. The existing taper length is only 180 feet, and the distance to the 3rd Street stop bar is just 300 feet from the ramp’s merge with US 69. As a result, there is inadequate room for southbound vehicles to merge onto US 69 before encountering the signalized intersection at 3rd Street. A detailed engineering study should be conducted to fully evaluate the potential impacts of extending the on-ramp lane through the intersection.

- Construction of an exclusive northbound right-turn lane should be considered to separate slow moving local traffic from the through traffic mix. Current traffic volumes (94 vph in the PM peak hour) are not high enough to warrant an exclusive right-turn lane based solely on volumes. However, traffic volumes



Dilemma Zone Protection System near 25th Street looking north on US 69.



Existing Warning Sign and Beacon at 3rd Street.

and operations at the intersection should be monitored to determine if they eventually warrant an exclusive right-turn lane.

6th Street Intersection

A number of the crashes at this intersection also involved southbound vehicles. Due to the curvature of the roadway on the approaches to the intersection, advance warning signs and beacons should be installed per AASHTO guidelines for both the northbound and southbound approaches to this location. Although “signal ahead” signs and flashing beacons are already provided, they may be too close to the intersection to be effective, given the speed and roadway alignment.

Northbound and southbound right turn lanes should also be considered at 6th Street to remove slow moving local traffic from the through traffic mix. Current traffic volumes (31 and 47 vph in the PM peak hour northbound and southbound, respectively) are not high enough to warrant exclusive right-turn lanes based solely on traffic movements. However, traffic volumes and operations at the intersection should be monitored to determine if they eventually warrant exclusive right-turn lanes.

12th Street Intersection

Due to the limited sight distance and curvature of the highway on both approaches to the intersection of US 69 with 12th Street, “signal ahead” signs followed by “Be Prepared to Stop” signs are currently provided. To improve advanced warning, a study should be conducted to determine if signs and beacons similar to those recommended at 6th should be installed on both approaches to replace the existing signs.

Northbound and southbound right turn lanes should also be considered at 12th Street to remove slow moving local traffic from the through traffic mix. Current traffic volumes (85 and 30 vph in the PM peak hour northbound and southbound, respectively) do not warrant exclusive right-turn lane based solely on volumes. However, traffic volumes and operations at the intersection should be monitored to determine if they eventually warrant exclusive right-turn lanes.

18th Street / South National Avenue Intersection

Most of the collisions at US 69/South National Avenue intersection involved vehicles traveling southeast on South

National Avenue or northbound on US 69, in turning maneuvers, rear end, or right angle crash types. A review of MUTCD traffic signal warrants determined that existing traffic volumes warranted signalization. The recommended improvement program for this intersection includes:

- Reconstructing the intersection to provide an exclusive northbound left-turn lane on US 69, an exclusive right-turn lane for southeast bound South National Avenue, and a traffic signal. A raised median on the highway approaches to the intersection would also limit full movement access to driveways adjacent to the intersection (Figure 9.2). The traffic signal should provide a separate left turn (green arrow) phase for northbound traffic with an overlapping right turn arrow for southeast bound vehicles on South National Avenue.
- Designing the new 18th Street alignment shown in the proposed

South National District Plan as a 3-lane section on the west leg of the intersection. Eighteenth Street should eventually be extended east of the highway to provide access to undeveloped properties between US 69 and the BNSF tracks and connect with the future street network previously described.

- Consider installing advanced warning signs and beacons for southbound traffic because of limited sight distance and highway curvature between 12th and 18th Streets. Traffic conditions after signalization should be monitored to determine the need for dilemma zone protection.

19th Street / 20th Street Intersection

Most collisions in the vicinity of 19th Street and 20th Street involved turning maneuvers or side swipes, probably caused by close spacing of driveways and streets and the lack of a center turn lane.

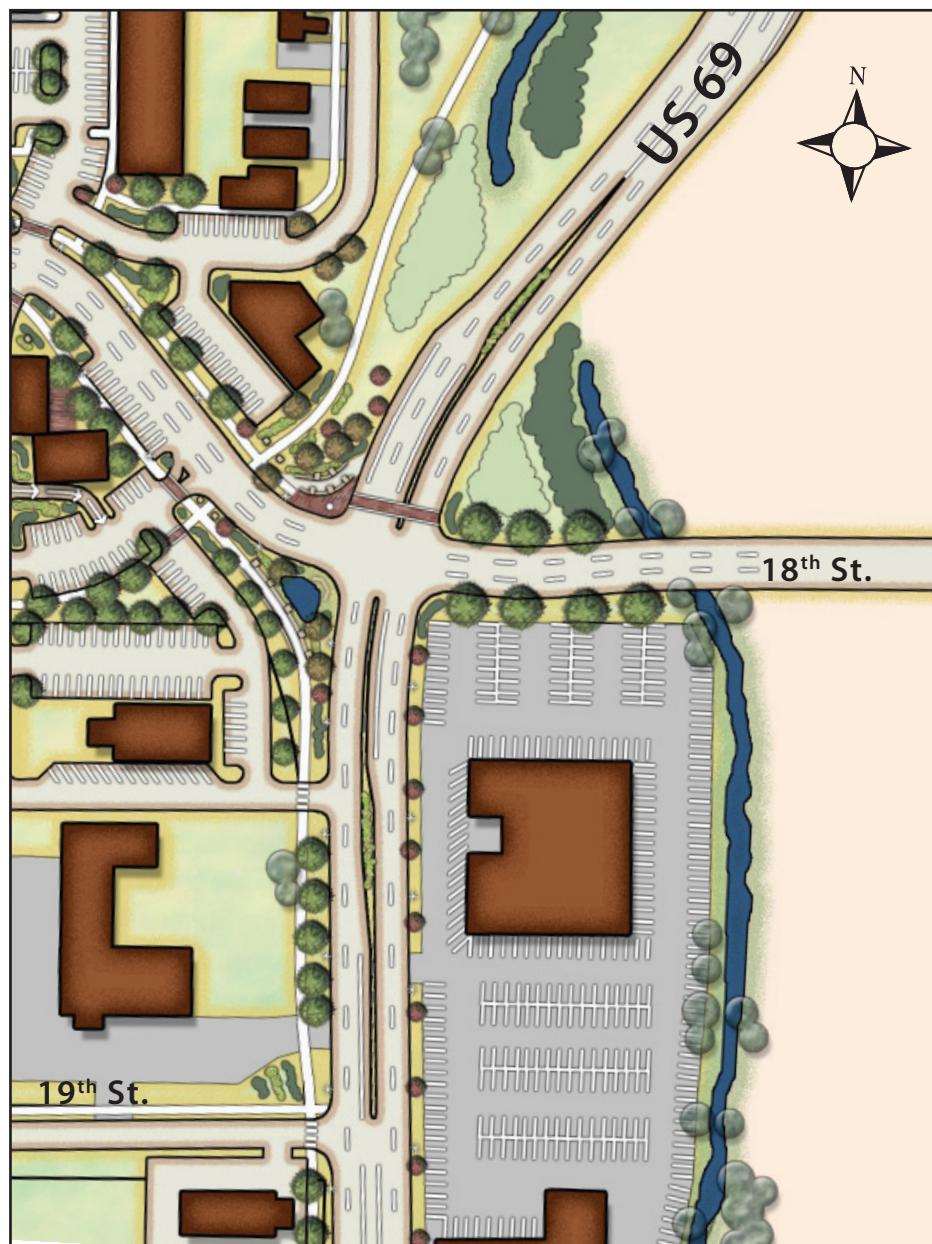
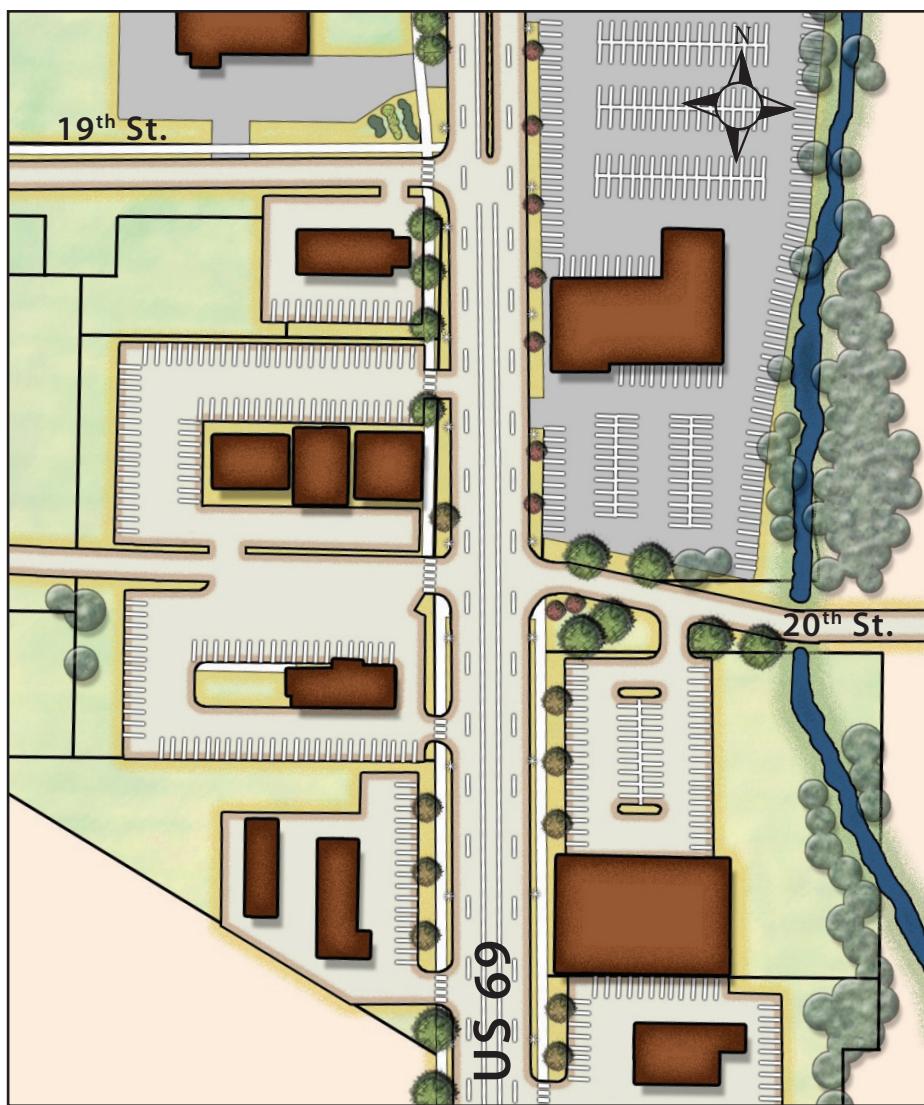


Figure 9.2 Recommended Configuration at Intersection of 18th Street/National Avenue and US 69

Figure 9.3 Recommended Configuration at 19th and 20th Streets.

The access management plan proposes consolidating driveways and establishing 20th Street as an area collector (**Figure 9.3**.) The 20th Street intersection should be rebuilt slightly north of the current alignment to provide common access to the commercial properties on the west side of US 69. Widening the highway to a five-lane section provides protected left turn movements. Traffic operations should be monitored to determine future signal warrants at the new 20th Street intersection.

23rd Street Intersection

Based on crash experience, an access control program around the 23rd Street intersection (**Figure 9.4**) should consolidate driveways and emphasize 23rd Street as the primary connection to US 69 from adjacent properties. A 300-foot raised median on US 69 north and south of 23rd Street should be built to convert existing private driveways to right-in/right-out operation.

Exclusive left-turn lanes should also be provided on 23rd Street. The Fort Scott Highway/Railroad Crossing Safety Study identified 23rd Street as the most feasible grade separation over the BNSF, and this important project will inevitably increase traffic on 23rd Street, including turning movements. Left-turn lanes can reduce green time needed for 23rd Street, providing additional capacity for US 69 through traffic.

25th Street Intersection

This intersection was recently reconstructed with the Walmart development on the west side of US 69. A new traffic signal was installed, along with dilemma zone protection for the northbound approach to the intersection. No additional improvements are required at this location.

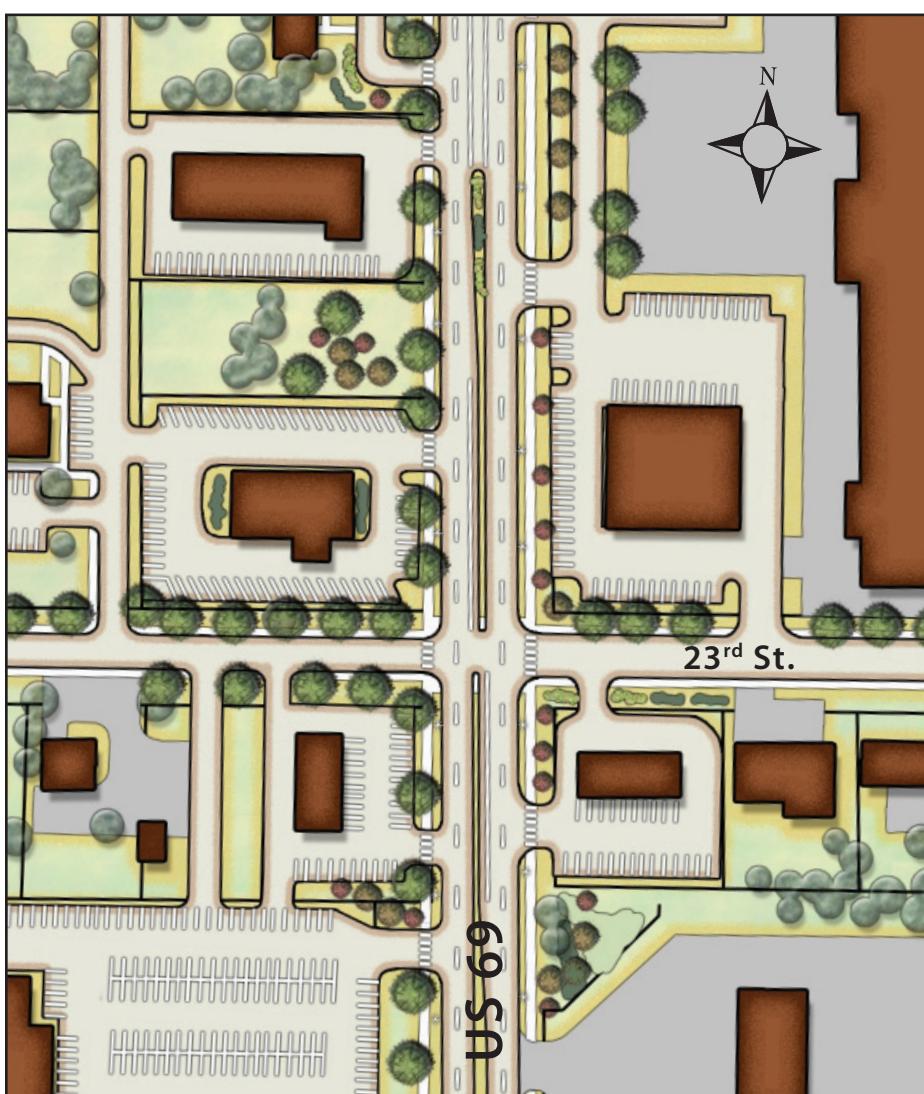
Jayhawk Road Intersection

Forecasts for 2040 do not warrant traffic signalization at this intersection. However, the city and KDOT should monitor traffic operations and crash records to determine if MUTCD traffic signal warrants are satisfied in the future.

Off-System Improvements

Railroad Grade Separation

The 2007 Fort Scott Highway / Railroad Crossing Safety Study evaluated several locations for a new railroad grade separation over the BNSF mainline in Fort Scott (**Figure 9.5**), and recommended

Figure 9.4 Recommended Configuration at 23rd Street

locating an overpass at 23rd Street. The railroad grade separation project also improves the adjoining roadway network to provide system connectivity. Building a new railroad grade separation gives Fort Scott a new, southern route over the BNSF mainline. This is especially important for emergency vehicles and other vehicles too high to clear the existing 3rd Street underpass. A grade separation also relieves local traffic congestion at the existing 3rd Street underpass when train movements block surface crossings.

Railroad Quiet Zone

The 2007 Fort Scott Highway/Railroad Crossing Safety Study recommended creating a railroad quiet zone on the BNSF mainline in Fort Scott. A quiet zone requires improving several highway-rail grade crossings, including Wall Street, 6th Street, 10th Street, East National Avenue and Jayhawk Road (Figure 9.5). Quiet zones should be implemented in two phases. Phase one includes crossings at Wall Street, 6th Street, 10th Street, and East National Avenue, while phase two includes construction of the 23rd Street viaduct and crossing safety improvements at Jayhawk Road.

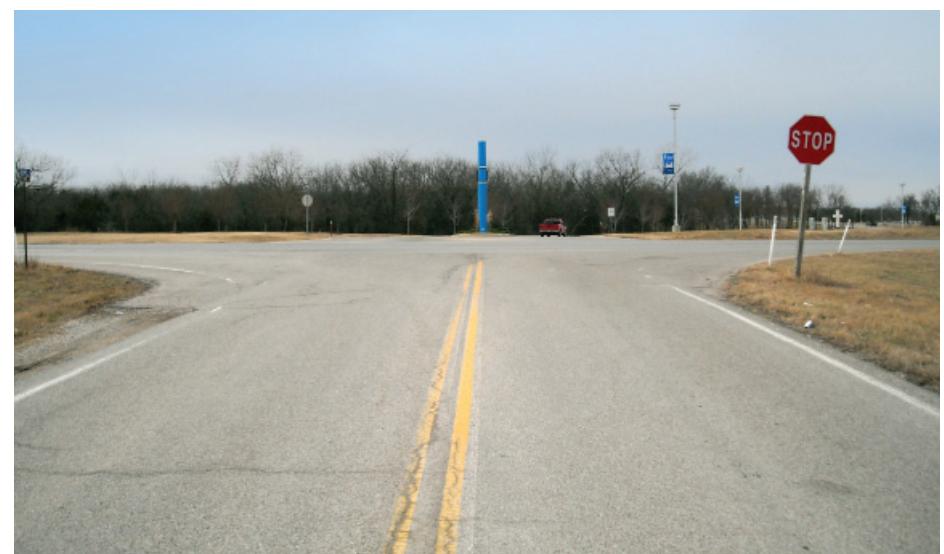
Implementing a quiet zone would silence train horns in Fort Scott and would produce major community benefits, including improving property values for homes near the railroad, making strategic development sites near downtown more marketable for hotels and other commercial uses, and improving development prospects west of Margrave. The construction of raised medians on the approaches to each crossing also improves safety by preventing motorists from driving around the gate arms when trains are approaching.

Local Street Network

East Circulation Roads. Chapters 5 and 8 proposed a local street network parallel to and east of US 69, with connections to the existing road system. Connections to and extensions of existing roadways would eventually include East National Avenue, 18th Street, Aldie Avenue, and 20th Street (shown in Figure 8.4). This eastside street network opens land for development between US 69 and the BNSF. In addition, the north/south circulators relieve US 69 by providing alternative routes to commercial destinations in south Fort Scott. Some of the roadway links will be built as land develops in this area.



US 69 south of 25th Street



Jayhawk Road south of US 69

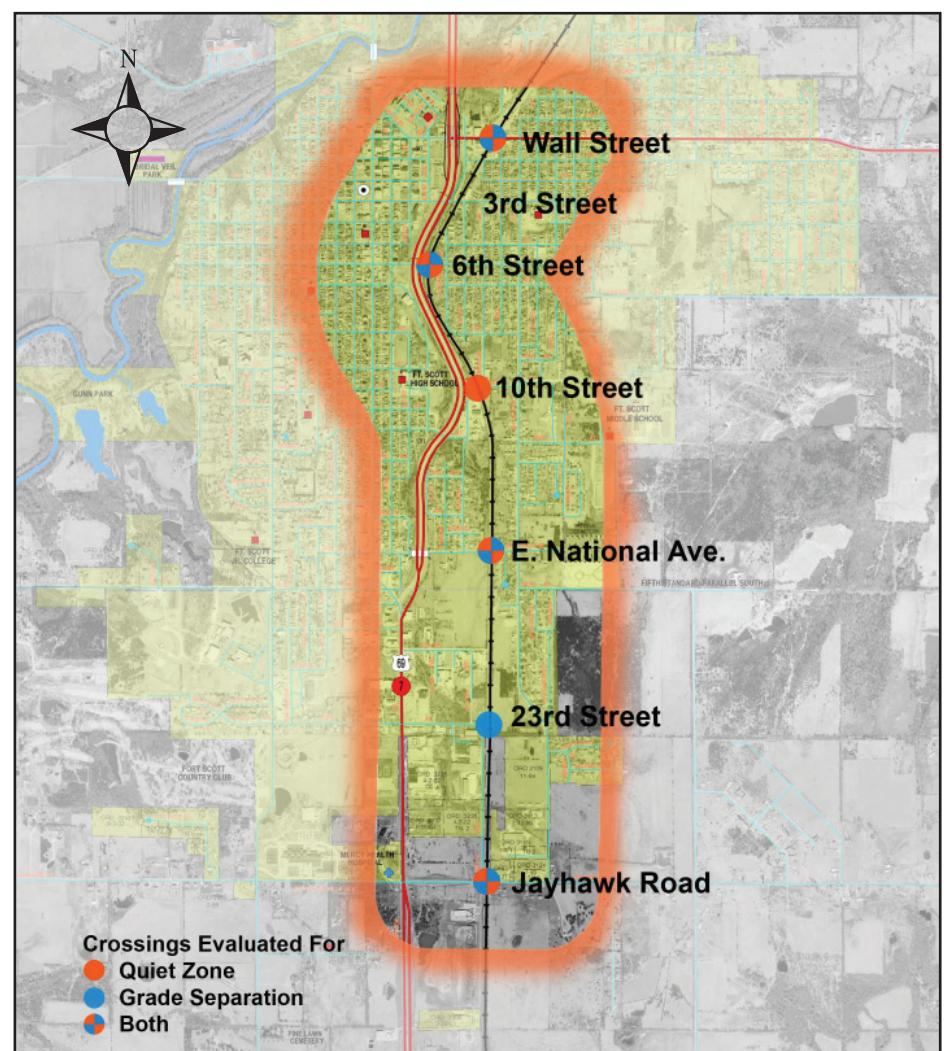


Figure 9.5 2007 Railroad Study Location Map



Northbound Main Street

Table 9.1 Treatments for Streets

Roadway Width or Character	Examples	No Parking	One-Sided Parking	Two-Sided Parking
30 feet	3 rd Street, 12 th Street	5-foot bike lanes, or sharrows 4 feet from pavement edge	Sharrows 11 feet from curb with parking, 4 feet from curb without parking	Sharrows 11 feet from curb.
35-36 feet	East National, Horton north of 18 th Street	5- foot bike lanes both sides	Five foot bike lane on side without parking. Solid white line 7 feet from curb to define parking area Sharrows 11 feet from curb on side with parking.	Solid white lines 7 feet from curb to define parking. Sharrows 11 feet from curb.
38-40 feet	National Avenue, 6th Street	5-foot bike lanes both sides	Five foot bike lane on both sides, with minimum 7.5-foot distance from curb on side with parking. If clearance is impossible, sharrow 11 feet from curb on side with parking	Solid white lines 7 feet from curb to define parking. Sharrows 11 feet from curb.
48-50 feet	Margrave, 6 th to 18 th , Wall	6-foot bike lanes; possible restriping as 3-lane section	6-foot bike lanes with minimum 7.5-foot distance from curb on side with parking.	5-foot bike lanes with minimum 7.5-foot distance from curb
Horton Street Boulevard Section	Horton, 18th to Meadow Lane	6-foot bike lanes	NA	NA

West Circulation Roads. This plan proposes a similar system of roadway extensions and new connections west of US 69 (Also shown in **Figure 8.4**). The highest priority project would extend South National Avenue, with local connections to 18th, 19th, 20th, and 23rd Streets. The westside circulation network provides local routes to commercial and community destinations

in this area, diverting additional traffic from US 69.

Main Street One-Way Conversion. Main Street's current northbound one-way operation limits downtown business exposure, prevents visitors to the historic fort property from easily driving downtown, and generally confuses people who are unfamiliar with Fort

Scott. Main Street should return to two-way operation between 3rd Street to Wall Street. With two-way circulation, diagonal parking on one side of the street would convert to parallel parking. Off-street parking improvements and efficiencies, proposed in Chapter Six, more than compensate for reduced on-street parking. Changes to traffic flow would also modify existing signs and striping.

Bicycle And Pedestrian Improvements

Developing the US 69 study area as a complete transportation corridor can help traffic operations in the entire Fort Scott system by diverting unnecessary automobile trips to alternative modes. The city's size and layout is ideal for bicycling or walking for short commutes to work, occasional shopping trips, and travel for education, recreation, and personal health and enjoyment. Measures of success for an alternative transportation network include:

- **Directness.** The system should get people to desired destinations without excessive detours or diversions.
- **Integrity.** The system's components should connect to each other and avoid dead-ends or segments that leave users in disorienting or uncomfortable settings.
- **Safety.** The system should be fundamentally safe and avoid exposing users to hazards.
- **Comfort.** The system should recognize different levels of user ability, and provide routes that are within these capacities.
- **Experience.** The system should offer users attractive and engaging routes showcasing the community.

This section presents recommendations for a bicycle and pedestrian transportation that satisfies these criteria and becomes an integrated part of the city's transportation system.

Bicycle Network

The proposed bicycle network (**Figure 9.6**) for the planning area proposes five levels of facilities:



Bicycle lanes with Sharrow

Multi-use pathways, typically 10-foot paved trails on right-of-ways separated from roadways. Multi-use pathways define the "Great Circle" concept presented in Chapter Six, and are intended for pedestrians, bicyclists, and in-line skaters. The proposed pathway corridors include:

- *The US 69/Buck Run Greenway*, along the creek and parks and green space paralleling US 69 between the Marmaton River and the redesigned 18th Street/US 69 intersection
- *The Marmaton River Trail*, connecting with the Buck Run Greenway east of US 69, using an abandoned railroad alignment under the highway, and continuing along the river to Gunn Park.
- *A southeast trail*, following drainage patterns between the 18th Street/US 69 intersection and the approach to the proposed 23rd Street overpass.
- *The "Gordon Parks Trail,"* continuing the Great Circle system from 18th Street and Gunn Park Road, through the Fort Scott Community College campus and county fairgrounds to the west side of US 69.

Enhanced sidepaths, typically ten-foot paved pathways adjacent to and usually a part of road right-of-ways. Sidepaths must be carefully designed at intersections of driveways and intersecting streets to prevent crashes between pathway users and turning traffic. Techniques include proper location of crossing points, clear visibility and marking of conflict zones, cautionary signage, and access management. Sidepaths become safer when the number of intersecting streets and drives are reduced. Proposed sidepath corridors include:



Possible bicycle lanes along South National Avenue.

- South US 69 (South Main) between the proposed 18th Street intersection and Jayhawk Road. Ultimately, this sidepath could continue south and west to provide a bicycle route to Lake Fort Scott.
- The proposed 23rd Street overpass, between its west approach and Margrave Street.
- 18th Street from Gunn Park Road to the west boundary of the FSCC campus.

Complete Streets, higher order streets with moderate traffic (such as collectors or minor arterials) that provide continuity through the city and access to important destinations. For bicycle transportation, complete streets provide pavement markings and MUTCD "share-the-road" caution signs that define routes and advise motorists of the probable presence of bicyclists. Complete streets should also include fully accessible sidewalks in good repair. Typical pavement markings include bicycle lanes, defined by solid white lines enclosing a bicycle symbol and directional arrow, or sharrows, a new symbol connoting shared use lanes marked by a bicycle symbol and a directional chevron. Sharrows are used when a street section is too narrow to accommodate bicycle lanes.

Complete streets in the proposed Fort Scott system include:

- National Avenue from the Marmaton River Trail to 23rd Street (with proposed extension).
- Horton Street from 6th Street to the Mercy Hospital west entrance.
- Margrave Street from 3rd Street to 23rd Street.
- Wall Street from National Avenue to Margrave Street.

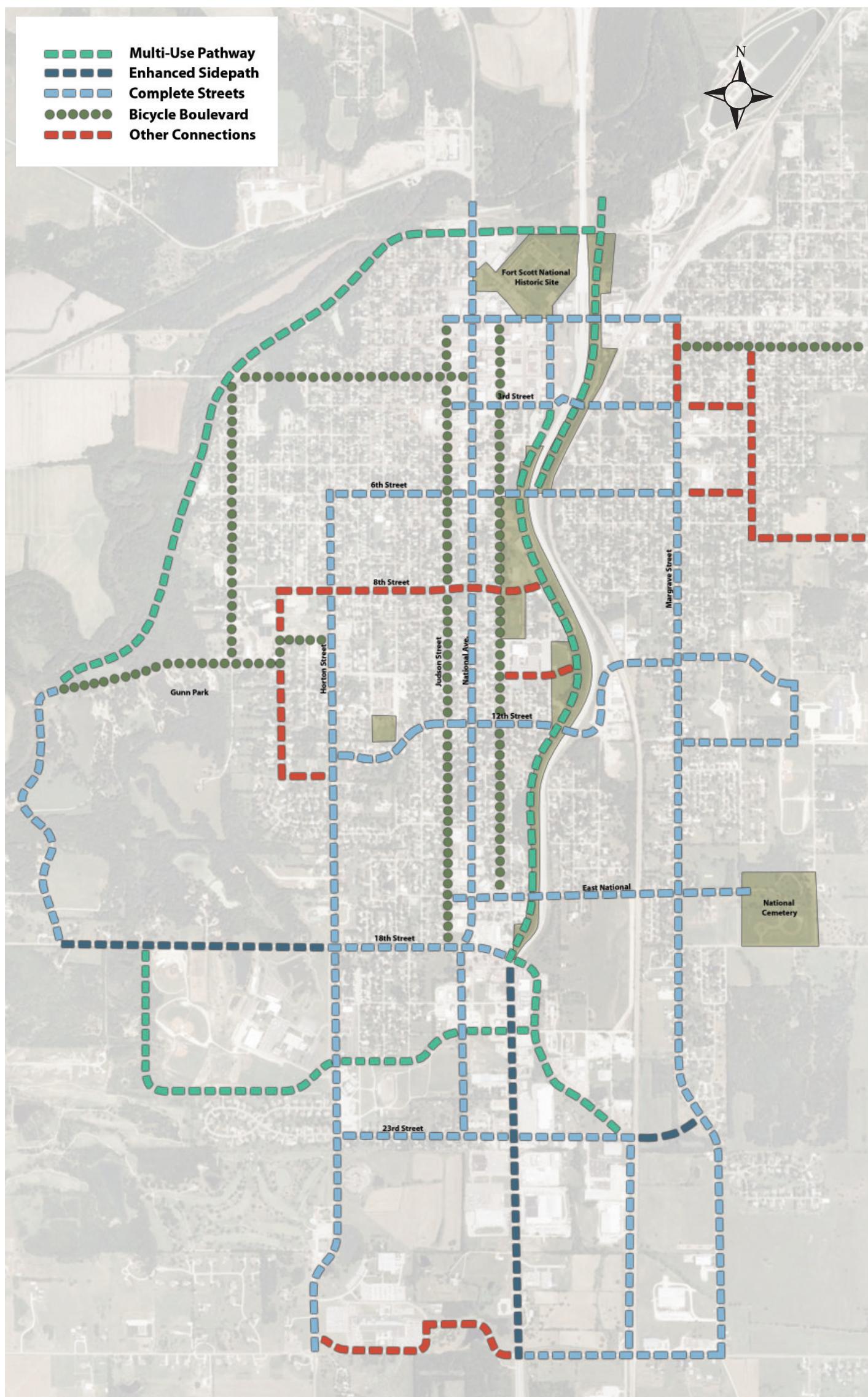


Figure 9.6 Proposed Trails network

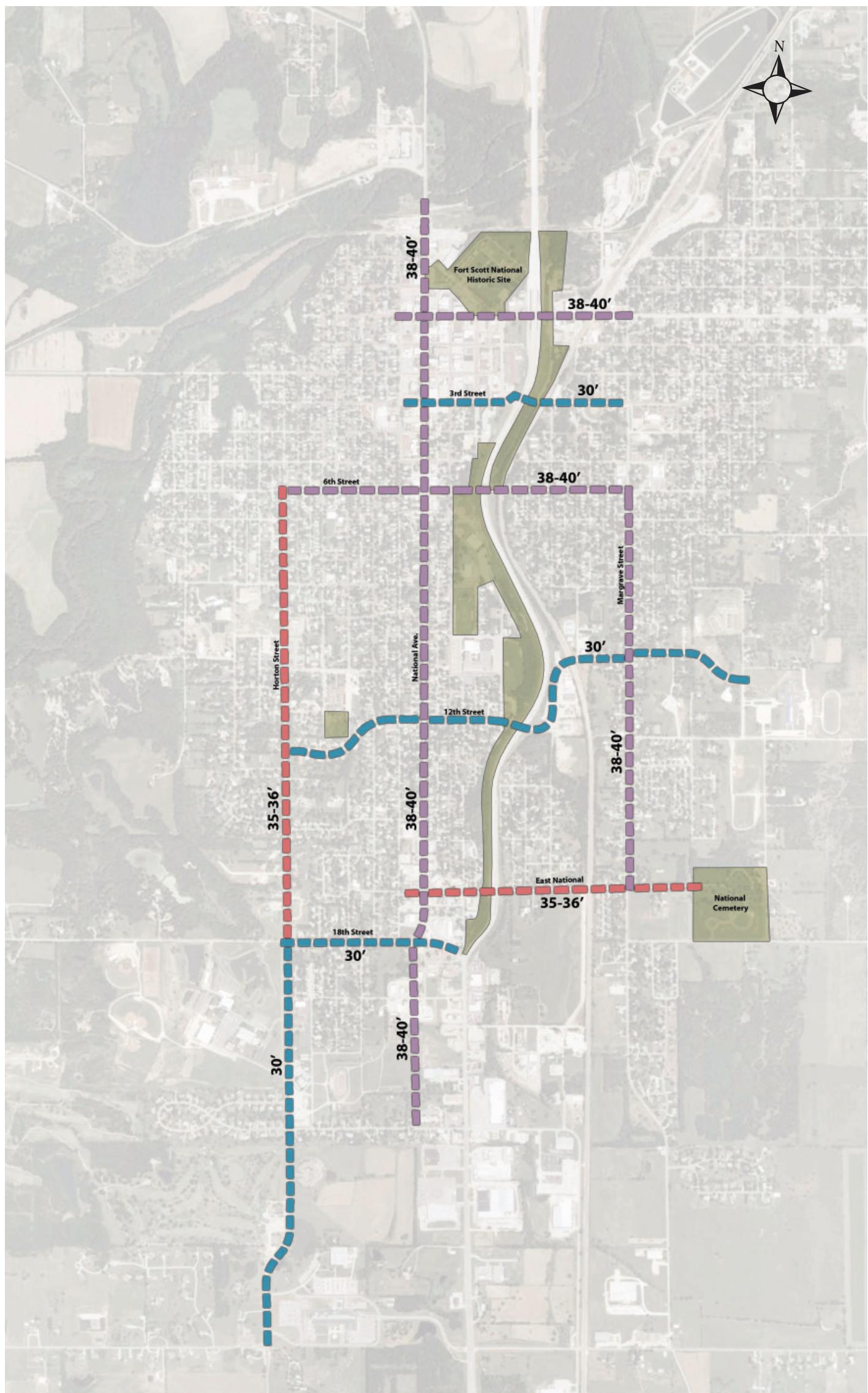


Figure 9.7 Complete Streets Treatments (see also Table 9.1)

- 3rd Street from Judson Street to Margrave Street.
- 6th Street from Horton Street to Margrave Street.
- Sunset and 12th Streets from Horton Street to Fort Scott Middle School.
- East National Avenue from South National Avenue to the National Cemetery.
- 18th Street from the FSCC campus west boundary to the US 69 sidewalk and proposed Southeast Trail.
- 23rd Street from Horton Street to the proposed overpass.
- Gunn Park Road from Gunn Park to 18th Street.

Pavement marking concepts depend on the width and on-street parking conditions of specific street segments. **Table 9.1** presents alternatives for different contexts, which are illustrated in **Figure 9.7**.

Bicycle Boulevards, local streets that parallel higher order streets with good system continuity. Because bicycle boulevards carry fewer motor vehicles, they are comfortable for a wider range of users than complete streets. Like complete streets, bicycle boulevards should also include fully accessible sidewalks in good repair. Typical policies for developing bicycle boulevards include special sign designations, removal of hazards such as sewer grates with longitudinal openings, and traffic control preferences or four-way stops at crossings with otherwise higher-order streets. Bicycle boulevards in the proposed system include:

- Judson Street from Wall Street to 18th Street.
- Main Street from Wall Street to East National Avenue.
- East 1st Street from Margrave Street to Brown Street.
- 2nd Street from Main Street to Heyman Street.

- Heyman Street from 2nd Street to Park Avenue.
- Park Avenue to Gunn Park.

Local streets, low volume streets providing access largely to residential areas, make up the balance of the system. No special modifications are needed to adapt them to bicycle traffic.

Pedestrian Facilities

Pedestrian transportation needs are largely met by elements of the bicycle network. For example, multi-use trails and sidepaths provide both pedestrian and bicycle access. Complete streets and bicycle boulevards must also provide continuous, barrier-free pathways (usually by sidewalks) on at least one side of the street. These pathways together provide the city's basic transportation network, and new segments, repairs, and improvements should be publicly financed rather than specially assessed.

However, other actions and policies are specific to pedestrians and are needed to provide basic access throughout the city. These include:

- Redesigning the South National business district, as discussed in Chapter Six. By managing driveways, establishing curb lines, and re-aligning streets, this important service area can become a friendly and pleasant place for pedestrians. Each new street or alignment should include sidewalks, separated from the back of curb by a tree lawn.
- Incorporating sidewalks or another parallel pathway into all major street projects, including the 23rd Street overpass.
- Establishing design guidelines that require safe and comfortable pedestrian routes from public sidewalks and pathways to the entrances of major commercial or civic projects, and initiating an incentive program to encourage retrofits of existing projects. Pedestrian access does not stop at street right-

of-way lines, and people on foot should not battle with cars to reach the front door of major retailers or other destinations. Pedestrian access improvements may be incorporated into access management projects that consolidate driveway approaches.

- Actively participating in Safe Routes to Schools programs and encouraging initiatives, such as "walking school buses" that encourage children to walk to school.
- Instituting local area access and pedestrian audits to find and repair obstacles to secure pedestrian transportation.
- Providing standards at crosswalks that promote visibility and motorists' recognition of pedestrians.

FUTURE TRAFFIC OPERATIONS

An analysis of traffic operations for the 2040 No-Build and the 2040 Ultimate scenarios determines whether the transportation system operates at acceptable levels of service for either condition. A comparison of the anticipated traffic operations for each scenario follows, evaluating highway mainline segments, interchanges and signalized intersections.

US 69 Mainline Analyses

The mainline analysis uses the Highway Capacity Software (HCS), based on traffic forecasts developed in Chapter 7. This analysis was limited to the rural sections of US 69, between the US 54 interchange and Wall Street on the north, and between the Bourbon/Crawford County line and Jayhawk Road on the south.

Using existing geometrics, all of the US 69 mainline segments in the study area should meet the operational goal of LOS C or better in 2040, as shown in **Table 9.2**. The segment between the

Table 9.2 US 69 Mainline Operations Analysis - PM Peak Hours LOS

Segment of US 69	2009 Existing	2040 No-Build	2040 Ultimate
County Line to K-7	C*	C*	A
K-7 to Jayhawk Rd.	A	A	A
Wall St. to US 54	A	A	A

* Assumes existing 2-lane highway

Bourbon/Crawford County Line and K-7 is expected to operate at LOS C in 2040 if it remains a two-lane highway. With improvement a four-lane divided cross section, traffic operations should attain LOS A.

On the existing four-lane divided segment between K-7 and Jayhawk Road, the highway is expected to operate at LOS A for all traffic scenarios. The four-lane divided mainline segment between Wall Street and US 54 is also expected to operate at LOS A for all traffic scenarios.

Interchange Analyses

Wall Street (US 54 Interchange)

At the Wall Street interchange, US 69 is expected to remain a four-lane cross-section through 2040. The existing geometrics are also maintained at the interchange, with single-lane ramps in all four quadrants. As shown in **Table 9.3** the southbound merge and diverge movements are both expected to operate at LOS A in 2040 for the PM peak hour. The northbound merge and diverge movements are also both expected to operate at LOS A in the PM peak hour.

US 54 Interchange

At the northern US 54 interchange, US 69 has recently been improved to a four-lane cross-section. All merge and diverge movements are expected to operate at LOS A in the PM peak hour for the Year 2040.

Signalized Intersection Analyses

Figure A.8 in Appendix A shows the lane geometry, traffic control, and levels of service for 2040 No-Build traffic conditions. The lane configurations at all study intersections are based on existing geometrics. All study intersections

are expected to operate at acceptable levels of service in the PM peak hour. All signalized intersections should operate at LOS B or better, and the critical movements at the unsignalized intersections should operate at LOS C or better. **Appendix C** presents capacity analysis worksheets for the 2040 No-Build traffic conditions scenario.

lementation plan to guide decision-makers and elected officials through the process of building a better US 69 corridor. This plan proposes guidelines for setting priorities, and phasing and funding the elements of this multi-faceted Corridor Management Plan.

Figure A.9 in Appendix A shows the lane geometry, traffic control, and levels of service for 2040 Ultimate traffic conditions. The lane configurations at all study intersections are based on improvements proposed in the overall plan. All study intersections are expected to operate at acceptable levels of service in the PM peak hour. All of the signalized intersections operate at LOS B or better, and the critical movements at the unsignalized intersections all operate at LOS C or better. Capacity analysis worksheets for 2040 ultimate traffic conditions scenario are included in the **Technical Appendix**.

SUMMARY

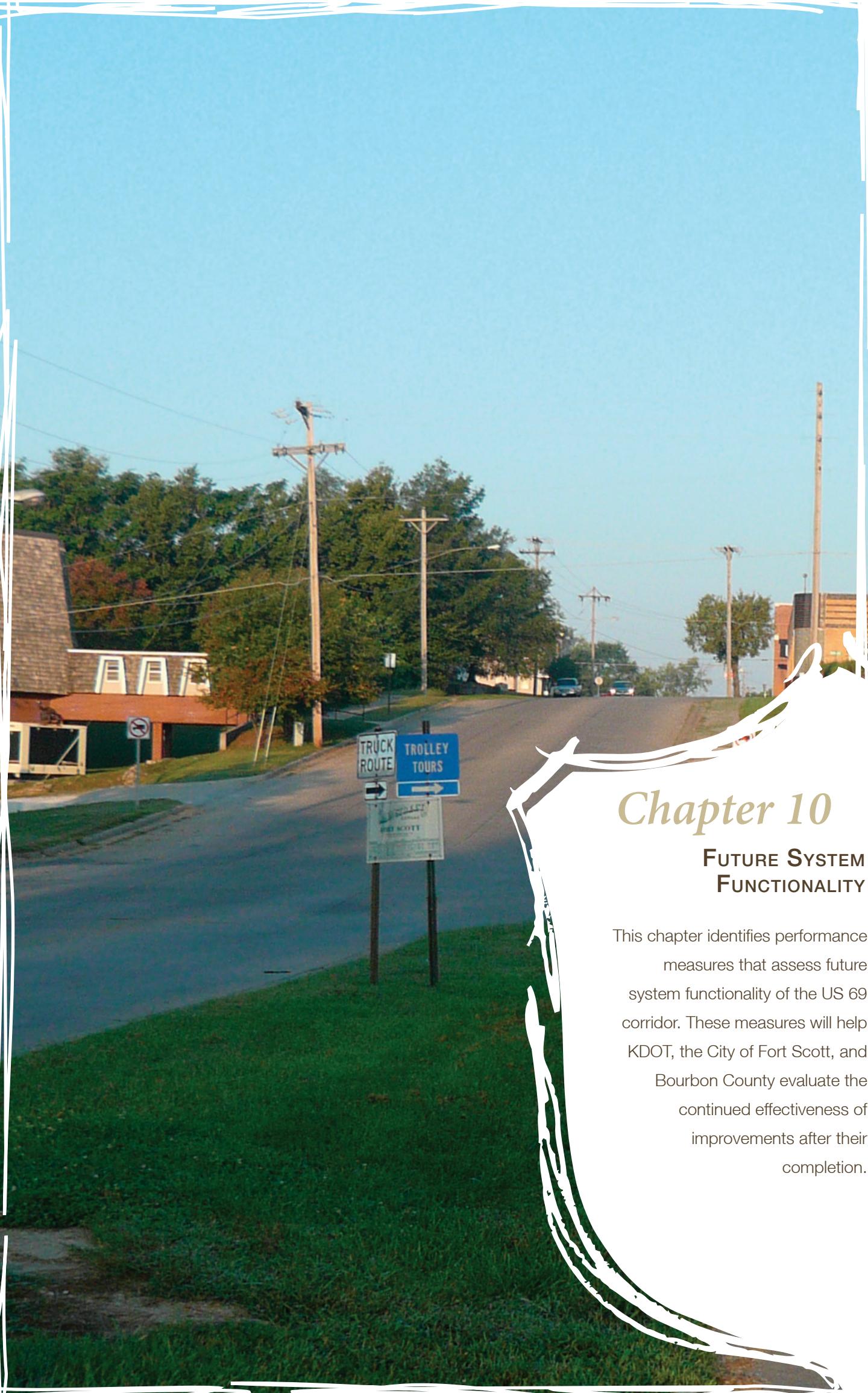
A number of transportation system improvements along US 69, as well as off-system improvements, have been identified as part of this Transportation Management Plan. These transportation system improvements should work in conjunction with and often are integrated into the land use plan described in Chapter 5 and the access management plan recommendations described in Chapter 8.

Chapter 10 identifies a number of performance measures to evaluate the future system functionality of the US 69 corridor. These measures will provide a framework for KDOT, the City of Fort Scott, and Bourbon County to determine the effectiveness of this corridor improvement program once it is in place. Chapter 11 presents an im-

Table 9.3 US 69 Interchange Operations Analysis - PM Peak Hours LOS

Interchange	Movement	2009 Existing	2040 No-Build	2040 Ultimate
Wall Street	NB diverge	A	A	A
	NB merge	A	A	A
	SB diverge	A	A	A
	SB merge	A	A	A
US 54	NB diverge	A	A	A
	NB merge	A	A	A
	SB diverge	A	A	A
	SB merge	A	A	A





Chapter 10

FUTURE SYSTEM FUNCTIONALITY

This chapter identifies performance measures that assess future system functionality of the US 69 corridor. These measures will help KDOT, the City of Fort Scott, and Bourbon County evaluate the continued effectiveness of improvements after their completion.

INTRODUCTION

This chapter identifies performance measures that assess future system functionality of the US 69 corridor. These measures will help KDOT, the City of Fort Scott, and Bourbon County evaluate the continued effectiveness of improvements after their completion and monitor whether the enhanced system on its existing alignment continues to provide an acceptable level of service through the 30-year study horizon.

This chapter includes reserve capacity sensitivity analyses to compare the future system functionality for the three development scenarios (2009 Existing, 2040 No-Build, and 2040 Ultimate) to a theoretical scenario called 2040 Threshold. The 2040 Threshold scenario represents expected traffic operations with the corridor maintaining its regional performance target threshold of level of service (LOS) C/D. This chapter also describes a number of external and regional influences that could cause the US 69 corridor to experience traffic growth above forecast levels.

PERFORMANCE MEASURES

A number of performance factors apply to the function, service, safety, and performance of the US 69 corridor. Evaluating operations against these factors helps engineers, planners and policy makers understand the changing dynamics of the system, and how to preserve, recover, and enhance its functionality. These performance measures also compare US 69 operations to statewide rates for similar facilities, and track performance trends over time. Ultimately, they help decision-makers decide whether the current corridor provides the functionality and safety expected by its users and stakeholders.

KDOT Priority Formula

KDOT uses its planning database to measure the relative need for major modifications to all roadways on the state highway system. A “Priority Formula” reflects current technology, policy directions, and available data and uses current survey information to update priority ratings. The sidebar lists the factors included in the KDOT Priority Formula.

This US 69 Corridor Management Plan considers several of these criteria (shown in bold) as valid performance measures for the future highway. The 2008 KDOT Long Range Transportation Plan has also stressed the need to consider economic criteria for setting priorities for highway improvement projects.

National Corridor Performance Measures

The 2004 National Transportation Operations Coalition (NTOC) **Performance Measurement Initiative Final Report** is one of the primary national resources for transportation-based performance measures. This report provides a wide range of performance measures to consider for any corridor planning initiative. The recommended measures were field-tested in various locations throughout the country and the results were published in a 2008 NCHRP report titled **Guide to Benchmarking Operations Performance Measures**. Although some of the performance measures listed in the adjacent text box do not apply to this study, they are included here for future reference and use by US Highway 69 stakeholders. Neither the 2004 NTOC report nor

KDOT Priority Formula Criteria

- Crash rate
- Shoulder type
- Lane width
- **Current traffic volume**
- **Projected traffic volume**
- **Traffic volume/capacity**
- Bridge deck condition
- Bridge structure condition
- Pavement surface condition
- Pavement structure condition
- Narrow structures
- **Route classification**
- Shoulder width
- Sight distance
- **Truck traffic**
- Bridge width

the 2008 NCHRP report present quantitative performance criteria or benchmark values as baseline measurements. However, this study combines qualitative and quantitative performance measurements and thresholds to evaluate roadway function.

US 69 Corridor Performance Measures

Discussions with the project Steering Committee and reviews of KDOT, NCHRP and FHWA publications helped select the performance measure benchmarks described in this section.

Customer Satisfaction

Periodic surveys can measure the public's satisfaction with roadway condition, management and traffic operations on a given segment of highway. The survey instrument includes a baseline set of questions customized to local conditions and concerns, and may be administered once or repetitively to gauge changes in perception. The survey may evaluate local community concerns such as acceptable levels of truck traffic through the city, or regional issues such as the efficacy of freight traffic movements along US 69.

Incident Duration

Incidents along the highway cause congestion and delays. In urbanized areas, even minor incidents can intensify existing congestion by slowing traffic flow or blocking the use of lanes. Incident duration measures the smaller of elapsed time from notification of an incident until removal of all evidence, or until all response vehicles have left the incident scene. Although this study used crash data, it did not evaluate in-

NTOC Performance Measures

- Customer Satisfaction
- Incident Duration
- Crash Rates
- Total Freight Movement
- Travel Time – Facility
(aka Travel Time Index)
- Throughput – Vehicle
(aka Volume to Capacity (V/C) Ratio)
- Heavy Truck Traffic
- Travel Time Reliability
(aka Buffer Time Index)
- Level of Service - LOS
- Bridge width



cient duration because crashes are not a significant cause of congestion in Fort Scott. This performance measure is more relevant to densely populated areas with congested freeways or other high capacity roadways.

Crash Rates

Traveler safety is always a top priority along a highway corridor, and to this end, KDOT and local law enforcement officials compile crash records by location and track a number of statistical categories annually. KDOT defines statewide crash rates on specific highway segments in crashes per million vehicle miles traveled (MVMT), and at intersections in crashes per ten million entering vehicles (TMEV). Calculating these rates annually helps KDOT identify high risk segments and intersections on the state highway system.

This plan has established US 69 baseline crash rates for the corridor, providing a background for regular evaluation of annual crash rates to identify upward trends. KDOT and local officials should also examine the outcomes of implementing this plan's recommendations, paying special attention to truck-related crash rates because of anticipated growth in freight traffic.

Total Freight Movement

US 69 is a critical rural link between the State's agriculture and manufacturing industries and statewide, regional, and national markets. Statewide growth in freight movements, projected at about 1.5% annually for the next 20 years, may challenge future system capacity. Faster than anticipated growth rates along US 69, considered both alone and in comparison with other corridors, could reduce corridor performance. Customer satisfaction surveys can identify any operational effects of these increases from both local and regional perspectives.

The 2009 Kansas Statewide Freight Study indicates that KDOT data collection efforts do not focus on forecasting regional freight system demand, and are generally limited to truck traffic volumes and transportation system condition and performance. More specific information is available from other sources and should be utilized to measure the effect of increasing freight traffic on road performance.

Traffic Flow

Most measurements of traffic flow along corridors or highway segments apply to congested urban areas and freeways. However, the measures presented here are appropriate to US 69 in the study area. People perceive congestion differently – a good traffic day in the Kansas City metropolitan area may be considered unacceptably congested in Fort Scott. Therefore, thresholds for some measures are adjusted accordingly.

1. Facility Travel Time

(Travel Time Index)

The Travel Time Index looks at the average time required to traverse a section of roadway in a single direction. The index also can compare travel conditions in the peak period and free-flow conditions to define extra time spent during a trip. The 2004 NTOC report established a 30% increment in travel time as a threshold for considering a facility "congested." This performance measure is most meaningful within the Fort Scott urban corridor, because the traffic operations analysis shows that the rural section of US 69, widened to four lanes, will operate at LOS A.

2. Average Speed

This factor evaluates the average speed of vehicles measured in a single lane for a single direction of flow at a specific location. Ideally, vehicles will travel through the corridor at or near the posted speed limit and significantly

lower speeds indicate a disruption in traffic flow. The travel time performance method can be employed by comparing average speed during peak and off-peak periods. A 50% reduction of the average free flow speed during the peak periods indicates significant congestion and difficulty in traffic movement through the area. Again, this measure is most relevant to the Fort Scott urban area.

3. Vehicle Throughput

(Volume to Capacity (V/C) Ratio)

Throughput performance measures the number of vehicles traversing a roadway section in one direction per unit time or the number of vehicles traversing a screen line in one direction per unit time. The number of vehicles counted is then compared to the design capacity of the roadway. One of the most venerable engineering methods for gauging congestion is the volume-to-capacity (V/C) ratio. KDOT has selected a V/C ratio of 0.7 as a threshold of moderate congestion or worse.

For travelers, the word "congestion" conjures up such strong images as "delay," "air pollution," and "traffic jam." In practice, however, travelers and engineers, local and regional users, and residents and businesses, can have vastly different ideas of what constitutes a congested roadway. Ultimately, KDOT must evaluate congestion against the relative needs of all similar facilities in the state.

4. Heavy Truck Traffic

The volume of heavy truck traffic on US 69 is a highly relevant measure for two reasons. First, most of this traffic stream is driving through, not to, Fort Scott and Bourbon County, and want to get to their destinations as quickly as possible. Increasing heavy truck volumes may contribute to unacceptable delays for these users and undesirable economic impacts to Fort Scott area businesses.

Table 10.1 Level of Service (LOS) Criteria

Level of Service	Average Control Delay per Vehicle (sec/veh)		Density (pc/mi/ln)
	Signalized Intersections	Stop Sign Controlled Intersections	
A	≤ 10	≤ 11	≤ 11
B	> 10 to 20	> 10 to 15	> 11 to 18
C	> 20 to 35	> 15 to 25	> 18 to 26
D	> 35 to 55	> 25 to 35	> 26 to 35
E	> 55 to 80	> 35 to 50	> 35 to 40
F	> 80	> 50	> 40

Source: Highway Capacity Manual

Second, local traffic as well as heavy trucks use US 69 through Fort Scott, apparent because 2009 ADT volumes are substantially greater in Fort Scott than north or south of the city (**Figure 4.2**). The interaction of local and through traffic contributes to the concerns about congestion, delay and safety. There are no specific threshold values to quantify “unacceptable” mixtures of traffic streams. However, indicators that suggest unacceptable traffic friction include volume of heavy trucks, level of service changes, facility travel time, customer satisfaction survey results, and crash statistics involving heavy trucks and automobiles. A suggested threshold may be an average of 2,000 daily through truck movements on US 69 in the study area.

5. Travel Time Reliability

(Buffer Time Index)

Repetitive vehicle delays for the current time-of-day, day-of-week, and day type are considered “recurring delays”. Travelers who frequently use congested roadways expect recurring delays at specific points and plan accordingly. Similarly, freight travel times may be adjusted to compensate for delays on a congested highway. The impact of recurring delay is demonstrated by the Travel Time Reliability and Level of Service performance measures.

The Travel Time Reliability performance measure describes the incremental time that must be planned over expected travel time (as defined by Facility Travel Time) to ensure travelers a 95% on-time arrival rate at their destinations. This increment should not exceed 30% of the average trip duration. This measurement can be calculated for long, regional trips, or for specific corridor segments, provided the segment is long enough to provide a valid result. Travel Time Reliability is most relevant in highly urbanized areas, where high

way segments carry a high percentage of local trips.

6. Level of Service - LOS

The transportation level of service (LOS) system is a simple performance measure that assigns a rating by the letters A through F. LOS A represents essentially uninterrupted flow, and LOS F represents a breakdown of traffic flow with noticeable congestion and delay. LOS is a qualitative assessment of traffic operational conditions within a traffic stream and can describe traffic operations for controlled intersections, freeways and divided highways. **Table 10.1** summarizes LOS criteria for both signalized and unsignalized (stop sign controlled) intersections, as well as multilane highways. For highway segments, level of service is defined by the number of vehicles per lane mile per lane.

A regional performance target on the border between LOS C and LOS D was identified for signalized intersections, mainline highway segments, and interchange ramps.

Performance Measure Application

Table 10.2 summarizes the performance measures most relevant for this corridor. Taken together, they can indicate how well the US 69 corridor is operating in Bourbon County, and are most effectively used by tracking changes over time. Trends should be monitored regularly to assess the ongoing health of the corridor’s function, rather than waiting until specific thresholds are reached.

As a part of the intergovernmental agreement discussed in Chapter 11, KDOT, the City of Fort Scott and Bourbon County will form a Corridor Advisory Committee, with representatives of each jurisdiction. This committee

will be an advisory body that regularly reviews and evaluates events and developments affecting the US 69 corridor and the Corridor Management Plan. The Committee will also evaluate the ongoing performance of the corridor, using these measures as analysis tools.

RESERVE CAPACITY SENSITIVITY ANALYSES

This study included sensitivity analyses, comparing the future system functionality for the three development scenarios (2009 Existing, 2040 No-Build, and 2040 Ultimate) to a theoretical scenario called 2040 Threshold. The 2040 Threshold scenario represents expected transportation operations with the US 69 corridor operating at a regional performance target threshold on the border between LOS C and LOS D, identified through discussions with the project Steering Committee.

The sensitivity analyses were performed at the signalized intersections and mainline segments along the US 69 Corridor in Fort Scott. The sensitivity analyses determines the “reserve capacity” available between the 2040 Ultimate forecasted traffic volumes and the volumes that produce the LOS C/D threshold.

Intersection Operations

The 2040 Ultimate entering PM peak hour traffic volumes at each intersection (shown in **Appendix A** on **Figure A.7**) were multiplied by growth factors to determine the “LOS C/D Threshold Traffic Volumes”. The factors in **Table 10.3** show the future growth (or reserve capacity available) that US 69 through Fort Scott could accommodate before overall intersection operations (with recommended improvements) reach the LOS C/D threshold. A factor of 1.00

Table 10.2 Summary of Performance Measures

Performance Measure	Measurement	Application to the US 69 Corridor Management Plan	Benchmark Value
Customer Satisfaction	"Very Satisfied" Through "Very Dissatisfied" or "Don't Know/N/A"	Survey the following stakeholders regarding US 69 operations: 1. Local businesses to determine if congestion is affecting their services. 2. Local residents to determine if congestion is affecting their quality of life. 3. Public services to determine if congestion is inhibiting service. 4. Freight carriers to determine if congestion is affecting their route selection or operations.	Dependant upon the survey type and question makeup. ¹
Incident Duration	Median minutes per incident	Not considered in this study.	N/A
Crash Rate	Crashes per million vehicle miles traveled	Evaluate the safety of segments of the corridor relative to similar state highways.	State-wide average for similar facilities. ²
	Crashes per ten million entering vehicles	Evaluate the safety of intersections relative to others in Kansas.	State-wide average for similar facilities. ²
Traffic Flow			
1. Facility Travel Time (Travel Time Index)	Minutes per trip	Evaluate driver expectations for through traffic time of travel along the corridor within Fort Scott. Serves as the basis for delay and reliability measures.	Travel times greater than 30% of baseline during peak periods. ¹
2. Speed	Miles per hour	Evaluate if vehicles are flowing through specific corridor locations within a reasonable range of the posted speed.	Not more than 50% mph below the posted speed limit during peak periods.
3. Vehicle Throughput (Volume to Capacity (V/C) Ratio)	Vehicles per hour	Evaluate the number of vehicles expected to move through the corridor as designed in comparison to actual operations. This measure has a long history of use originating from planning applications.	V/C ratio = 0.7 ⁴
4. Heavy Truck Traffic	Heavy Trucks per Day	Monitor the volume of heavy truck traffic per day through the study area.	2,000 heavy trucks per day.
5. Travel Time Reliability (aka Buffer Time Index)	Minutes. May also be expressed as a % of total trip time or as an index.	Evaluate if travelers within and through the corridor need to allow for an unacceptable amount of time in addition to the average trip duration. Reliability measures are expected to grow in use and importance in determining funding and policy.	No more than 30% of the average trip duration for local and through traffic. ¹
6. Level of Service	Seconds of delay correlated to a grade of A-F	Summarize the relative vehicle control delay at signalized and unsignalized intersections, as well as on segments of highway.	Signalized Intersections = 35 seconds/vehicle. Unsignalized intersections = 25 seconds/vehicle. Highway Segments = 26 pc/mile/lane.

(1) 2004 NTOC Report

(2) KDOT Annual Traffic Accident Fact Book

(3) 2009 KDOT Statewide Freight Study

(4) KDOT 2008 LRTP

(5) 2009 Corridor Advisory Committee

(6) FHWA

Table 10.3 Comparison of Total Entering PM Peak Hour Traffic Volumes to LOS C/D Threshold

Intersection on US 69	2009 Existing	2040 Ultimate	2040 Threshold	Reserve Capacity Factor
Jayhawk Rd.*	900	1,260	1,385	1.10*
25th St.	1,150	1,760	3,430	1.95
23rd St.	1,440	2,190	3,615	1.65
18th St.	1,455	2,495	3,870	1.55
12th St.	1,310	2,200	3,850	1.75
6th St.	1,125	2,120	3,810	1.80
3rd St.	1,220	1,915	3,065	1.20
NB Wall St. Ramps*	653	920	1,105	1.20*
SB Wall St. Ramps*	548	775	775	1.00*

* unsignalized intersection; factor reflects minor movement LOS

Table 10.4 Comparison of Mainline PM Peak Hour Traffic Volumes to LOS C/D Threshold

Location on US 69	2009 Existing	2040 Ultimate	2040 Threshold	Reserve Capacity Factor
County Line to K-7 (2-lane)	625*	910*	955*	1.05*
County Line to K-7 (4-lane)	N/A	910	4,780	5.25
K-7 to Jayhawk Rd	625	910	4,780	5.25
Wall St. to US 54	655	865	4,585	5.30
NB Wall St. Ramps Diverge	575	710	4,225	5.95
NB Wall St. Ramps Merge	365	500	2,975	5.95
SB Wall St. Ramps Merge	330	485	2,695	5.55

* Assumes 2-lane cross section

Table 10.5 US 69 Intersection PM Peak V/C Ratios

Location	2009 Existing	2040 No-Build	2040 Ultimate	2040 Threshold
Jayhawk Rd.*	0.32*	0.41*	0.50*	0.61*
25th St.	0.37	0.38	0.47	0.92
23rd St.	0.46	0.50	0.76	1.27
18th St. / National Ave	0.38*	0.48	0.62	0.86
12th St.	0.54	0.58	0.66	1.07
6th St.	0.38	0.42	0.55	0.97
3rd St.	0.53	0.65	0.84	1.24
NB Wall St. Ramps*	0.16*	0.20*	0.28*	0.41*
SB Wall St. Ramps*	0.20*	0.35*	0.36*	0.36*

* unsignalized intersection

Table 10.6 US 69 Mainline PM Peak V/C Ratios

Location	2009 Existing	2040 No-Build	2040 Ultimate	2040 Threshold
County Line to K-7	0.23	0.31*	0.33*	0.35*
K-7 to Jayhawk Rd	0.08	0.11	0.12	0.64
Wall St. to US 54	0.09	0.12	0.12	0.62

* assumes 2 lane cross section



indicates that the intersection is at capacity in 2040; a factor of 1.10 indicates that the forecasted 2040 Ultimate entering traffic would need to grow by 10% before capacity is reached.

Mainline and Interchange Operations

The 2040 Ultimate PM peak hour traffic volumes on each roadway segment were multiplied by growth factors to determine the LOS C/D Threshold traffic volumes. The factors in **Table 10.4** show the future growth (or reserve capacity available) that US 69 through Fort Scott could accommodate before mainline and interchange operations (with recommended improvements) reach the LOS C/D threshold. As before, a factor of 1.00 indicates that the segment is at capacity in 2040; a factor of 1.10 indicates that the forecasted 2040 total traffic would need to grow by 10% before capacity is reached.

The sensitivity analysis indicates that all of the signalized intersection and mainline segments along the US 69 corridor would have substantial reserve capacity beyond the 2040 Ultimate traffic volume forecasts. These analyses assume that all system improvements previously identified in this plan are in place. Additional changes to signal phasing and timing could expand capacity beyond these levels.

Volume to Capacity Ratio Comparison

As mentioned earlier, the volume-to-capacity (V/C) ratio is a standard method for measuring congestion. In its 2008 Long Range Transportation Plan, KDOT's standard indicator for moder-

ate or worse congestion is a V/C ratio of 0.7 or higher.

In **Table 10.5**, traffic volume scenarios are divided by the calculated roadway capacity for each intersection to generate V/C ratios. The Synchro traffic analysis program was used to determine intersection values, and are the maximum V/C ratio experienced for any individual turning movement. This process indicates that the only intersections with individual turning movements likely to experience moderate congestion for 2040 Ultimate conditions are 3rd Street and 23rd Street.

In **Table 10.6**, traffic volume scenarios are divided by the calculated roadway capacity for each segment to generate V/C ratios. Roadway segment V/C ratios were determined using Highway Capacity Manual (HCM) equations and HCS software. As shown, none of the US 69 mainline segments are expected to experience even moderate congestion for the 2040 No-Build or 2040 Ultimate traffic levels.

EXTERNAL AND REGIONAL INFLUENCES

A number of external and regional influences may cause the US 69 corridor to experience growth above the expected volumes described in Chapter 7. These influences, and their probable effects, are discussed below.

US Highway 69 Association

The US 69 Association has a stated goal to complete US 69 as a multilane facility from I-435 in Overland Park to I-44

in Oklahoma. The Association includes officials and business leaders along the US 69 corridor, with participants from Johnson, Miami, Linn, Bourbon, Crawford and Cherokee counties. This group has successfully secured funding for building US 69 to freeway standards from Overland Park to Fort Scott. The Association and other regional interests want to accelerate economic development along the corridor, and will be vitally involved in discussions over the design of US 69 south of Fort Scott.

Completion of US 69 to a Four-lane High Speed Facility

As previously noted, KDOT has recently completed freeway construction of US 69 from Overland Park to Fort Scott, and is developing plans for a similar freeway between I-44 in Oklahoma to just north of Arma, including a bypass of Pittsburg. As discussed earlier, KDOT is beginning to study options for the remaining segment between Arma and Fort Scott. If the Arma to Fort Scott segment were developed as a freeway, pressure would increase to identify alternatives to the existing alignment through the city. Should a future decision move in this direction, an alignment should be defined as soon as possible to reduce uncertainties about the future use of property along the corridor.

Changes to Regional Freight Routes

Completion of US 69 as a multi-lane facility from Overland Park to I-44 should increase use of the route by through traffic. This study projects that total regional traffic through Fort Scott will grow at an annual rate of 0.25%,



and that regional heavy vehicle traffic through Fort Scott will increase at 1.5% annually. Some traffic now using the multi-lane US 71 in Missouri is likely to shift to a US 69 corridor developed to comparable standards.

This increase in traffic expected by this study could be considerably greater if major industrial and/or commercial generators such as Walmart, Tyson, BNSF, and freight trucking carriers change shipping routes and/or increase the volume of freight shipped along the US 69 corridor. On the other hand, future improvements to US 71, including designation of the route as I-49 in Arkansas and Missouri, would have an opposite effect on regional freight shipping routes, potentially decreasing truck traffic on US 69.

Economic Development

Major new developments along US 69, such as construction of a major business park or regional inter-modal distribution center similar to the BNSF Intermodal Facility and the New Century Air Center in Johnson County, would greatly affect this study's traffic forecast assumptions. If major entities decided to construct a similar facility along either the US 69 corridor in Kansas or the US 71 corridor in Missouri, traffic forecasts and travel patterns would change substantially.

SUMMARY

External and regional influences may cause the US 69 corridor to experience traffic volume levels different from those foreseen by this study. The sensitivity analyses presented in this chapter measure the capacity of an improved US 69 to accommodate the possibility

of higher traffic volumes. These analyses indicated that all of the signalized intersections and mainline segments along the US 69 corridor have reserve capacity beyond the 2040 Ultimate traffic volume forecasts. The projected 2040 Ultimate traffic volumes could be increased by at least 50% before traffic operations would exceed the regional target threshold of LOS C/D, with the following exceptions in Fort Scott:

- The unsignalized ramp terminal intersections of US 69 with Wall Street would operate at or near capacity with 2040 Ultimate traffic volumes. These intersections would need signalization to increase reserve capacity.
- 2040 Ultimate traffic volumes at the intersection of US 69 with 3rd Street could be increased by only 20% with recommended improvements. Additional capacity improvements would be needed here if traffic volume grows beyond this level.
- At the unsignalized intersection of US 69 with Jayhawk Road, the cross street movement 2040 Ultimate traffic volumes could be increased by only 10% with the recommended improvements. Traffic signalization at this location would increase the capacity of this intersection.

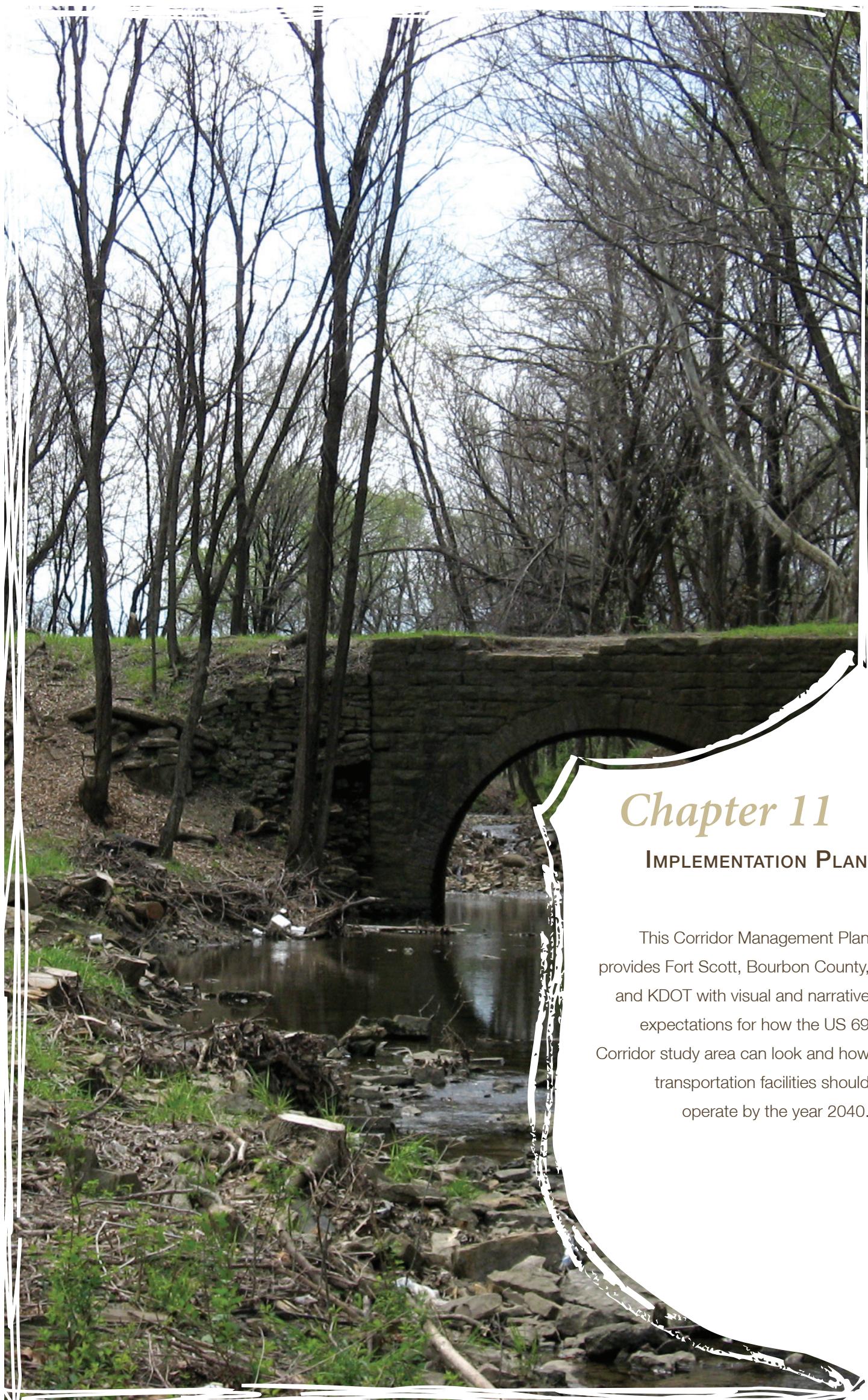
The only US 69 intersections in Fort Scott where individual turning movements would experience moderate congestion levels ($V/C > 0.7$) for 2040 Ultimate conditions are 23rd Street and 3rd Street. No US 69 mainline segment is expected to experience even moderate congestion ($V/C > 0.7$) for either the 2040 Ultimate conditions or 2040 Threshold traffic levels.

With development of the system improvements recommended by this plan,

the US 69 corridor through Fort Scott and Bourbon County will function at or above the regional performance target threshold of LOS C/D through 2040. However, satisfaction of local and regional customers, along with external political and business interests, may determine that the existing alignment through Fort Scott does not meet their functional objectives.

Were a new US 69 alignment to be constructed in or around the study area, the existing US 69 corridor through Fort Scott would become a business route for local traffic or through traffic seeking services. Under this scenario, system upgrades, including traffic and safety improvements and access management implementation, are still necessary to provide a safe and efficient transportation system in the interim. As important, implementing this program converts the existing corridor into a major community asset on many levels, adding opportunities for new development, and making the great and historic community of Fort Scott an even better place for living, working, shopping, and enjoying. Finally, a great street is a delight for residents and visitors alike, and is demonstrably effective at attracting travelers off the freeway to enjoy this city and its unique features.

The US 69 Corridor Management Plan presents an ambitious but realistic program for this important corridor. Chapter 11's implementation plan presents a roadmap to guide elected officials and other decision-makers through the process of setting priorities and phases, and securing the funding that will realize the transportation and community development promise of this important project.



Chapter 11

IMPLEMENTATION PLAN

This Corridor Management Plan provides Fort Scott, Bourbon County, and KDOT with visual and narrative expectations for how the US 69 Corridor study area can look and how transportation facilities should operate by the year 2040.

INTRODUCTION

This Corridor Management Plan provides Fort Scott, Bourbon County, and KDOT with a vision of US 69 and its surrounding area, describing how the corridor can function as a transportation facility, look as an urban environment, and perform as an economic asset by the year 2040.

The project implementation plan sets priorities for improvement projects, provides cost estimates, identifies the stakeholder(s) responsible for administering funding and construction, and introduces a framework for corridor oversight and preservation.

This chapter summarizes methods of achieving that vision, including

- Statements of Probable Cost and Priority Criteria
- Financing Strategies
- Corridor Coordination and Oversight
- Corridor Preservation Strategies

STATEMENTS OF PROBABLE COST AND PRIORITY CRITERIA

Statements of probable cost are included for each improvement project recommended in this study. These very preliminary statements are intended only as an approximate guide for decisions on project implementation. More detailed estimates of cost will be prepared during the detailed design process for individual projects.

Project Priorities

Recommended projects fall into two categories: transportation system enhancements and community enhancements. Project priorities for each category depend on different evaluative criteria. For transportation system en-

hancements, these criteria include:

- Ability to improve corridor safety.
- Impact of 2040 system performance.
- Reserve capacity sensitivity analyses.
- External and regional influences.
- Effectiveness at improving local mobility and provide alternative access.

Evaluative criteria for community enhancements include:

- Positive impact or support for the local business environment.
- Ability to generate desirable private investment.
- Improvement of the city's marketing image.
- Accommodation of pedestrian and bicycle transportation.
- Impact on Fort Scott's physical and design environment.
- Cost effectiveness related to community benefits.
- Ability to support other ongoing community initiatives.
- Relative ease of implementation and control of property.

Based on these general criteria, improvement projects are categorized as short-term, medium-term, or long-term priorities. Short-term priority improvements should be implemented within 1-5 years; medium-term within 5-10 years; and low priority improvements within 10-20 years. Projects categorized as "ongoing" will be completed over a number of years in gradual phases.

Stakeholder Responsibility

The following tables define stakeholder responsibility as local (including the City of Fort Scott and Bourbon County), state (primarily the Kansas Department of Transportation), or private, including business leaders, land owners, and developers. Although the stakeholder responsibilities are noted, this plan does not commit these agencies and jurisdictions to fund the recommended improvements.

Transportation System Enhancements

Table 11.1 summarizes recommended transportation system enhancements.

Projects may involve multiple phases, and probable costs presented below represent all phases of each project. The probable cost of the entire proposed transportation system enhancement program is about \$35.6 million. About 65% of these costs are related to three projects: widening of the two-lane rural section of US 69 from K-7 to the county line, a 23rd Street overpass over the BNSF, and full development of an east side circulator road system between US 69 and the railroad. Much of the circulator system will develop over time, consistent with development demands. **Tables A.4 through A.12 in Appendix A** present detailed statements of probable cost for transportation enhancements.

Community Enhancements

Tables 11.2-11.6 present statements of probable cost for the community enhancement program presented in Chapter 6. Each table addresses projects for a specific location, including Downtown Fort Scott, the South National District, the South Main Corridor, the Rural Transition zone, and the US 69/Buck Run greenway corridor. Projects may involve multiple phases, and probable costs presented below represent all phases of each project. **Tables A.13 and A.26 in Appendix A** present more detailed probable cost statements for community enhancement initiatives.

Downtown Fort Scott

The recommended Downtown Fort Scott enhancement program, presented in **Table 11.2**, totals \$6.8 million in public improvements and \$6.7 million in estimated private projects or building improvements. Short-term priority projects include the Wall Street Boulevard and Carscape Plaza. The former performs the important task of linking downtown directly and attractively to the US 69 corridor, while the latter resolves the use of an important downtown site and provides features that support existing downtown businesses.

Table 11.1 Transportation System Enhancement Projects

	Responsible Stakeholder	Probable Cost
Short-term Priority		
23rd St Intersection Improvements	Fort Scott/KDOT	\$260,000
US 69 Widening National Ave to 23rd St	Fort Scott/KDOT	\$3,335,000
18th St / National Ave Intersection Reconstruction	Fort Scott/KDOT	\$2,243,000
3rd St SB Right Turn Lane Extension	Fort Scott/KDOT	\$310,000
US 69 Signal Coordination and Communication	Fort Scott/KDOT	\$146,000
US 69 Signal Ahead Signs/Beacons	Fort Scott/KDOT	\$68,000
US 69 Dilemma Zone Protection	Fort Scott/KDOT	\$43,000
Off System - Railroad Quiet Zone	Fort Scott	\$353,000 ¹
Off System - Main St. One-Way Conversion	Fort Scott	\$32,000
		\$6,790,000
Medium-term Priority		
US 69 Widening K-7 to County Line	KDOT	\$10,200,000
19th/20th St Intersection Improvements	Fort Scott/KDOT	\$1,081,000
US 69 Streetscape - Wall St to 18th St	Fort Scott/KDOT	\$2,670,000
Off System - 23rd St Viaduct & Adjacent Street Improvements	Fort Scott	\$5,210,000 ¹
Off System - S. National Ave Extension	Fort Scott	\$1,842,000
Off System - West Circulation Roads	Fort Scott	\$1,666,000
Off System - East Circulation Roads, Phase One	Fort Scott/ Private	\$850,000
		\$23,746,000
Low Priority		
Off System - South National Ave Extension	Fort Scott	\$1,464,000
Off System - West Circulation Roads, Phase Two	Fort Scott/ Private	\$999,000
Off System - East Circulation Roads, Phase Two	Fort Scott/ Private	\$2,774,000
Jayhawk Rd Signalization	Fort Scott/KDOT	\$100,000
Wall St Ramp Terminal Signalization	Fort Scott/KDOT	\$100,000
Bicycle Network & Sidewalk Improvements	Fort Scott	Varies
		\$5,437,000
GRAND TOTAL		\$35,586,000

¹ 2007 Railroad Study costs have been increased by 7% annually for 2 years

Table 11.2 Community Enhancement Projects-Downtown Development District

	Responsible Stakeholder	Probable Cost
Short-term Priority		
Wall Street Boulevard Streetscape	Fort Scott	\$380,000
Old Fort Boulevard Area	Fort Scott	\$2,772,000
Multi-Use Carscape Plaza (Farmers Market)	Fort Scott	\$713,000
		\$3,865,000
Medium-term Priority		
Wall St Interchange Public Art Project	Fort Scott	\$1,669,000
Urban Townhouse / Multi-Family Housing	Private	\$1,300,000
		\$2,969,000
Ongoing		
Wall St / State St Redevelopment Site	Fort Scott	\$870,000
Wall and State Hotel Redevelopment	Private	\$3,114,000
National Avenue Residential Development	Private	\$900,000
Downtown Building Rehabilitation	Private	\$900,000
Upper Level Residential Reuse (20 units)	Private	\$1,800,000
		\$7,584,000



Table 11.3 Community Enhancement Projects-South National District

	Stakeholder	Cost Estimate
Short-term Priority		
Community Improvement District	Fort Scott	NA
Street and Streetscape Improvements	Fort Scott, CID	\$2,800,000
		\$2,800,000
Medium-term Priority		
South National Commercial Center	Fort Scott/Private	\$1,842,000
NW 18th & National Commercial Development	Private	\$1,558,000
East National / National Intersection Improvements	Fort Scott	\$500,000
		\$3,900,000
Ongoing		
Private Building Upgrades	Private	\$1,000,000
		\$1,000,000

Table 11.4 Community Enhancement Projects-South Main Corridor

	Stakeholder	Cost Estimate
Short-term Priority		
Community Improvement District	Fort Scott	NA
Phase One Streetscape, 18th to 23rd Streets	Fort Scott	\$240,000
18th Street Intersection Gateway	Fort Scott, CID	\$320,000
		\$560,000
Medium Priority		
Phase Two Streetscape, 23rd to Jayhawk	Fort Scott	\$317,000
Great Circle Connection	Fort Scott	\$150,000
Improved utilization of existing commercial sites	Fort Scott/Private	\$1,500,000
		\$1,967,000
Long-term Priority		
New Development Sites	Private	\$4,000,000
		\$4,000,000
Ongoing		
Access Management and Parking Lot Design	Fort Scott/KDOT/ Private	\$1,000,000
		\$1,000,000

Table 11.5 Community Enhancement Projects-Rural Transition

	Stakeholder	Cost Estimate
Short-term Priority		
Community Improvement District	Bourbon County	NA
Overlay District and Interlocal Land Use Agreement	Fort Scott/ Bourbon County	NA
Medium-term Priority		
Design Features – Monument Markers	Fort Scott/ Bourbon County	\$200,000
Ongoing		
Land Use Management – Industrial Standards	Bourbon County	NA
Land Use Management – Industrial / Commercial Development	Bourbon County	NA
Land Use Management – Agricultural	Bourbon County	NA
Stormwater Management	Bourbon County/KDOT	NA

Table 11.6 Community Enhancement Projects-US 69/Buck Run Greenway

	Stakeholder	Cost Estimate
Short-term Priority		
Trail and Bridges, Wall to 12th Street	Fort Scott	\$507,000
Cultural Amenities, Wall to 12th Street	Fort Scott	\$455,000
Environmental Enhancements, Wall to 12th Street	KDOT, Fort Scott	\$593,000
		\$1,555,000
Medium-term Priority		
Trail, 12th Street to 18th Street	Fort Scott	\$539,000
Cultural Amenities, 12th to 18th Street	Fort Scott	\$438,000
Environmental Enhancements, 12th to 18th Street	Fort Scott	\$323,000
		\$1,300,000
Long-term Priority		
Trail, Wall Street to Marmaton River	Fort Scott	\$125,000
3rd Street Underpass Pedestrian Improvement	Fort Scott/Private	\$200,000
3rd Street Overpass Reconstruction	Fort Scott/KDOT	\$1,500,000
6th Street Overpass Reconstruction	Fort Scott/KDOT	\$1,500,000
		\$3,325,000

South National District

The recommended South National District improvement program, presented in **Table 11.3**, totals \$4.2 million in public improvements and \$3.5 million in corresponding private development. A Community Improvement District should be established at the beginning of the development process. Major capital improvements begin with modification of the district's street system, coordinated with the redesign of the 18th and US 69 intersection.

South Main Corridor

The recommended South Main program, presented in **Table 11.4**, totals

\$1.4 million in public improvements and \$6.2 million in corresponding private development and improvements. A Community Improvement District should be established at the beginning of the development process. Initial capital development along the corridor should include sidepath construction, funded as an element of the US 69 improvement between 18th and 23rd Streets.

Rural Transition

Recommended improvements for the Rural Transition area south of Jayhawk Road total \$200,000 in public gateway improvements. Short-term priorities for this corridor are access control and land use policies. While these are not capital improvements, they are important to

maintaining control over development in this part of the study area.

US 69/Buck Run Greenway Corridor

Recommended improvements for the greenway between the river and 18th Street total \$6.2 million in public projects. This project will be accomplished in phases, with trail development, creek reconstruction and enhancements, landscaping and greenway development, pedestrian bridge improvements and other elements continuing incrementally.

THE FUTURE OF THE CORRIDOR

Each project described in this chapter helps achieve the important and necessary goals for the US 69 Corridor and brings added value to the city and county. The following section describes how the corridor might operate as projects are completed according to the implementation schedule.

The Corridor after Five Years

After five years, residents of Fort Scott and travelers along US 69 will see dramatic improvements along the highway and in the surrounding area. Most apparent will be the widening of US 69 from 18th to 23rd Streets, providing a much needed left-turn lane along this commercial segment. The angled divergence at South National will be replaced by a signalized, standard intersection, leading motorists west along a realigned 18th Street. An attractive gateway will identify a revitalizing South National business district, further enhanced by new sidewalks, landscaping, and more convenient parking. A wide sidepath along the west side of the widened US 69 will provide safe access to pedestrians and bicyclists traveling to corridor businesses.

US 69 travelers will also notice important, although more subtle, improvements along other parts of the corridor in Fort Scott. Improved signage and beacons will provide motorists with better advance warning as they approach at-grade intersections at 3rd, 6th, and 12th Streets. This part of the corridor will also look better, as the first stage of landscape enhancements create a beautiful green corridor through the center of the city. But US 69 will be a pleasant experience for people on foot and on two wheels as well. The Buck Run Greenway Trail will be complete between Wall and 12th Street, linking downtown with the city park and high school. The creek channel itself will be greatly improved, providing an attractive environmental feature and improving stormwater management. One of the most important and appreciated changes will be something that people will neither see nor hear – the presence of train horns – with the implementation of quiet zone improvements from Wall Street to East National Avenue.

Downtown Fort Scott, one of the region's most important and distinctive assets, will also experience major positive changes. A landscaped boulevard,

honoring people who have served our country in the military from the time when Fort Scott was active and before, will lead visitors to national historic sites and to downtown. Once there, an improved traffic pattern and green space system will enhance their experience in town and a two-way Main Street will provide them with an easy way to patronize district stores and restaurants.

The “Carscape Plaza” at Wall and Main will be a center of activity, hosting events such as the weekly Farmers’ Market and special events, and providing convenient parking when not otherwise used. Public investment projects like the Wall Street boulevard will make downtown development especially attractive, and may include construction of a new hotel at the Wall Street interchange.

The Corridor after Ten Years

The second phase of corridor development will build from the major changes of the first five years. During this period, the two-lane rural section south of the city to the county line will be upgraded to a four-lane divided facility. Train horns and traffic delays will be a thing of the past with the completion of a 23rd Street grade-separated crossing of the BNSF main line. Local residents will have new routes to destinations in the south part of the city when South National Avenue is extended to 23rd Street. The US 69 sidepath will also be extended to Jayhawk Road, providing pedestrians and cyclists with new access to Walmart, the hospital, and other destinations. With improved local and regional access, available sites east and west of the highway will begin to develop, and will be served by a planned local street network.

Along the in-city segment of US 69, the second phase of corridor enhancements, including the Buck Run Greenway Trail, arts and cultural features, and creek enhancements, will be completed to 18th Street. A unique public art installation, possibly celebrating the heritage of Fort Scott as a continuing leader in the evolution of photography and as the hometown of Gordon Parks, will punctuate this distinctive, green corridor. A reconstructed 6th Street pedestrian overpass will provide both a functional and visual feature to the central part of US 69 through Fort Scott.

The South National district, buttressed by a convenient street pattern, landscaped sidewalks, and streetscape en-

hancements will continue to improve, as new sites created by the revised street pattern begin to develop. A resurgent downtown will also begin to attract new residential development, as sites with deteriorated buildings along National Avenue near the river develop with new urban townhomes.

The Corridor in Later Years

Continued development along US 69 will include completion of industrial areas and parks on the east side of the highway, extending as far south as the K-7 interchange. Work on the local street system will continue, providing area businesses with good circulation throughout the area. Major economic development will continue to take hold in the downtown, South National, and South Main districts, a consequence of the emergence of US 69 as a safe and attractive transportation facility and a vital community asset. Finally, the “Great Circle” concept will be fully realized, with connection of the Buck Run Greenway Trail to the riverfront, development of the Riverfront Trail to Gunn Park, and development of the final arc of the circle through the community college and fairgrounds.

FINANCING STRATEGIES

Both traditional and innovative financing sources and partnerships will be required to complete the US 69 Corridor improvement program. This section discusses financing currently available options for corridor management projects. While new, private development can offset some costs of corridor modifications and off-system improvements, KDOT and local jurisdictions hold primary responsibility for funding and executing the plan. At a minimum, new private developments should be required to:

- Dedicate necessary right-of-way for US 69 improvements and the local street network;
- Build improvements required to accommodate the traffic impact of developments (i.e., turn lanes, local streets, reverse frontage (backage) roads, etc.); and



- Post a bond for future improvements (traffic signals, turn lanes, etc.)

Traditional Financing

Traditional financing mechanisms include federal and state transportation programs, real and personal property taxation, sales taxation, economic development tax exemptions, special assessments, and use of the Main Trafficway Act. Techniques presented below focus on local funding mechanisms.

Improvement Districts (City, County)

Within Improvement Districts, cities and counties can build public improvements, financed by general obligation bonds retired by special assessments on benefited properties. This technique is often used to finance construction of new sidewalks in existing developments. Properly used, it ensures that existing property owners do not pay for improvements that do not benefit them. State statutes establish a specific process for establishing a district and assessing properties within that district.

Main Trafficway (City)

Fort Scott should approve an ordinance that designates US 69 as a Main Trafficway, a facility that moves traffic between areas of concentrated activity within and outside the city. This designation authorizes the city to improve or reconstruct such a trafficway, and to purchase or condemn land necessary for improvements. The city can pay for improvements and acquisition from the general improvement fund, internal improvement fund, other available funds, or by issuing general obligation bonds. Voter approval of bond issues for Main Trafficways is not required. This method is often combined with the improvement district statute to finance street improvements.

Traditional Municipal Bonds (City, County, KDOT)

Fort Scott and Bourbon County may issue long-term debt to finance projects, to be retired by a variety of traditional and alternative revenue sources. Among other advantages, bonding provides front-end financing that allows governments to complete projects in response to critical priorities or favorable financial markets. Types of municipal bonds include:

- General obligation bonds, payable from a general tax levy on all taxable property within the city.
- Revenue bonds, repaid from a pledge of the revenue from a specified income-generating facility or source.
- Special assessment bonds, repaid, in whole or in part, by special assessments on properties benefited by improvements within an assessment district. These bonds are general obligations of the issuer that backs debt retirement by its full faith and credit.
- Special obligation bonds used to finance redevelopment projects. These bonds are payable from incremental property tax increases resulting from the redevelopment in an established redevelopment district, pledges of a portion of the revenues received by the issuer from transient guest, sales and use taxes collected from taxpayers doing business in a redevelopment district, franchise fees, private, state or federal assistance, or any combination of these sources.

Alternative Financing

A variety of non-traditional mechanisms can be used to finance recommended improvements and provide incentives for desirable development.

Impact Fees (City, County)

Impact fees are one-time regulatory fees assessed against projects to cover the costs for necessary capital facilities, based on the demand generated by the new development; payment of these fees is a condition for project approval. An impact fee system requires adoption of a fee calculation methodology for the fee, and a system of credits, exemptions and appeals. Typically, a project pays a transportation impact fee based on the amount of additional traffic generated (often measured by the PM peak). Impact fees must meet the test of a “critical nexus” – that is, projects funded by fee proceeds must directly address impacts created by payers of that fee. Impact fees are most frequently used in high growth areas, and Fort Scott should pursue other financing strategies before considering this method.

Excise Tax (City, County)

Excise taxes are levied on certain activities or the exercise of a privilege, such as business done, income received, or privilege enjoyed. Excise taxes have been used to fund transportation network improvements that are required to support development, and may be structured as a tax on the platting of lots. The tax rate may be based on such factors as proposed building or land areas or vehicles added to the traffic system. Excise taxes are not required to meet the constitutional benefit or critical nexus tests of regulatory fees such as impact fees. A development excise tax is only available to local governments with a development excise tax in place before July 1, 2006; communities with such a tax must receive voter approval to increase the rate.

Transportation Development District (City, County)

A Transportation Development District can help build, maintain, and finance a broad array of transportation projects,

including streets, roads, highway access roads, interchanges, bridges, and mass transit facilities. A transportation development district may levy a sales tax of up to 1%, in addition to any special assessments within the district. Its formation requires a petition signed by owners of all of the land area within the proposed district. The governing body must hold a duly noticed public hearing before adopting the resolution or ordinance creating the district and approving the method of financing projects within the district. A TDD could help fund maintenance of roadscape improvements such as the Wall Street boulevard and landscaped medians, and street trees and other landscaping.

The district may also issue bonds backed by the revenues received from properties in the district from the imposed sales tax or special assessment. This technique can also be used to help finance key portions of the adjacent local street network. Statutes provide flexibility in defining district boundaries, with the agreement of all included property owners. This tool should be considered for funding, particularly when a property owner or owners want to develop land at an access point with a sales tax generator.

Transportation Utility Fee (City, County)

A Transportation Utility Fee (TUF) is collected from residences and businesses within a city's or county's corporate limits tied to the use and consumption of the transportation system. TUFs may not require voter approval and revenues may be used for maintenance and operations costs, as well as facilities construction. Utility fees are collected from all development, both existing and new with connection to the existing system. Charges are based on usage estimates of trips by land use and project budgets. This technique has significant potential as a funding strategy, but requires careful coordination with legal counsel to ensure a defensible structure. Fort Scott should consider other financing strategies discussed here before considering a TUF.

Tax Increment Financing (City, County)

Tax Increment Financing (TIF) uses added, or "incremental," taxes created by a project to finance public infrastructure related to that project. Eligible incremental taxes include all of part of increases in property tax, guest taxes, added local sales taxes from business ac-

tivity within the district, and increased franchise fees. TIF funding can provide funds either as collected (pay-as-you-go) or through special obligation tax increment bonds repaid over twenty years. TIF can be used only in locally designated redevelopment districts that fall into at least one of the following categories :

- Blighted
- Blighted and in a 100-year flood-plain
- Intermodal transportation area
- Major commercial entertainment and tourism area
- Conservation (becoming blighted)
- Major tourism area
- Historic theater
- Enterprise zone
- Environmentally contaminated area

Consideration of TIF should include a specific analysis of potentially eligible sites and economic costs and benefits. This tool can provide extremely useful incentives for private developments and investments that may result from implementing the corridor management plan.

Sales Tax and Revenue Bond Districts (City, County)

Under this mechanism, the city can issue special obligation bonds in specific districts (called STAR bond project districts) to finance individual projects in the district (STAR bond projects). These bonds are retired by allocating the city and county sales and use taxes and incremental state sales taxes collected in the city portion of the district. STAR bonds can be used in combination with property tax related TIF proceeds and local sales, use and franchise fees to repay special obligation bonds.

Community Improvement Districts (City, County)

Community Improvement Districts (CID) may be established to finance a variety of the improvements and services proposed by this plan. Special obligation and full faith and credit bonds may be issued to finance projects, subject to a defined process for filing and voting against the district. In addition to improvements, bond proceeds may be used for preliminary reports, plans and specifications; publication and ordinance or resolution preparation costs; necessary fees of consultants; bond issuance and interest costs; and city/county administrative costs not to exceed 5% of

total project cost. The development of the South National Business District is an appropriate use of the CID tool.

General Contracting Authority (City, County, KDOT)

The state constitutional home rule amendment and Chapter 19 of the Kansas Statutes give local governments all powers of local legislation and administration that they deem appropriate, with minor exceptions. Chapter 19 sets forth these grants of power, which include the power to regulate through exercise of the police power; the power to zone, tax, charge fees, and impose special assessments; and the ability to purchase, hold, sell and convey land, including exercise of the power of eminent domain.

The home rule provisions give local governments the ability to enter into contracts that enable them to perform the functions of government for the benefit of citizens. Additional state statutes provide specific statutory delegation of power to cities, counties and the KDOT Secretary. Like all payments by public entities, payments or incentives that meet contractual obligations must be used for a public purpose.

When a city provides public incentives to a developer, a contract is employed to establish the duties and obligations of each party. The community will require specific benefits in return for the grant of development incentives. In individual project negotiations with individual developers and landowners, the city and county should emphasize private actions that help implement this plan, without abrogating governmental responsibility to protect public health, safety and general welfare.

CORRIDOR COORDINATION AND OVERSIGHT

Successfully implementing the US 69 Corridor Management Plan will require a close, long-term working partnership between the three governments – the State of Kansas through KDOT, Bourbon County, and the City of Fort Scott. The following recommendations, which involve very little cost, will establish the framework for intergovernmental cooperation and ongoing implementation. These management items are very high priorities that should be put in place as soon as practical.



Interlocal Agreement

The framework for collaborative plan implementation begins with development and approval of an interlocal agreement between Fort Scott and Bourbon County, with potential participation by the Kansas DOT. This agreement should address such issues as corridor management responsibilities, land use regulation, project financing, and sequencing. Elements of the agreement may include:

- Defining the purpose of the corridor plan and the roles and responsibilities of each partner.
- Establishing a Corridor Advisory Committee to review the progress of plan implementation and to evaluate any necessary changes to the study's recommendations over time.
- Agreement to establish a corridor development district that regulates land use and access in the corridor consistent with the US 69 Plan according to common standards.
- Agreement to review and comment by each jurisdiction of all rezoning or development applications or text amendments that affect land use regulation.
- Creation of a joint city/county planning commission and/or joint board of zoning appeals with jurisdiction over the study area corridor.
- Use of City of Fort Scott City staff to administer land use regulations and to process development applications and permits on behalf of the County.
- Conceptual agreements on the use of financing techniques (such as improvement or tax allocation districts) that affect the parties to the agreement.

As a legal and public document, the agreement must be approved by the Attorney General and filed with the county

register of deeds and the Office of Secretary of State. Completing, approving, and filing the intergovernmental agreement will be the first implementation step in the US 69 improvement process. Corridor land use regulations may be adopted as part of the approval of the agreement.

Corridor Advisory Committee

A standing Corridor Advisory Committee should be a key provision of the Interlocal Agreement. The committee must include city, county, and state government representatives, and community interests, businesses, and other corridor stakeholders. The Committee should meet at least quarterly to guide and coordinate implementation efforts.

Public Education and Outreach

The Corridor Advisory Committee should develop and implement a strategy to build public awareness about the potentials and policies of the US 69 Corridor Management Plan, and to provide updated information on the overall program's progress. This strategy should include education of public officials, special districts, landowners, developers, real estate agents, and local development consultants. It may include ongoing updates through a website, social media, and other communication tools.

Capital Programming and Funding

Each year, the Corridor Advisory Committee, in cooperation with the city and county, should develop a capital improvement program for anticipated projects and improvements along US 69. This disciplined process will help ensure steady progress toward implementing the plan's recommendations, and will help state and local governments provide adequate resources over a longer term. The capital program should also identify specific funding mechanisms for individual projects.

Corridor Preservation Strategies

Corridor preservation strategies control or protect areas necessary for improving both the mainline highway and the supporting street network. These strategies will help:

- Prevent development incompatible with the corridor vision.
- Minimize adverse environmental, social, and economic impacts.
- Reduce future displacements of developed property.
- Establish the location of streets, roads, and pathways that support new development opportunities.
- Provide a basis for public and private decision making.
- Reduce future project costs.

This section describes the tools that the city, county, and state can use as partners to maintain the integrity of the corridor and use adjacent properties to their maximum potential for economic growth and community enhancement.

Planning Tools

Comprehensive Planning (City And County)

The City of Fort Scott should adopt the US 69 Corridor Management Plan as a part of the City's comprehensive plan. Adoption as a comprehensive plan element provides a credible framework for public and private land use and investment decisions within the city and its planning jurisdiction. This action requires a public hearing by, and a recommendation from, the Fort Scott Planning Commission, with final action by the Fort Scott City Commission. After adoption, Fort Scott should review other parts of its comprehensive plan, completed in 2007, to eliminate any inconsistencies.

Bourbon County does not have a comprehensive plan, but should officially adopt the Corridor Management Plan following one of two processes:

- Adoption by motion or resolution of the Board of County Commissioners (BOCC), or
- Creation of a county planning commission, followed by a public hearing and action by that planning commission to recommend the Plan for adoption by the BOCC, followed by BOCC action by resolution to adopt the Plan.

The second procedure is preferred because it provides a stronger basis for county policy and decision-making. Bourbon County should put the plan into operation by approving Inter-local Agreement and corridor-specific land use controls.

Official Maps (City)

Fort Scott should adopt an official map that shows the specific location and width of proposed streets, public facilities, public areas, and drainage rights-of-way. The Official Map is used to for use when considering the consistency of development applications with the US 69 Corridor Management Plan.

Utility Planning (City, County, KDOT)

The three jurisdictions should coordinate any relevant utility master plans with the Corridor Management Plan to ensure consistency. Decisions about new utility location and related easements should be weighed against their implications for implementing the US 69 Corridor Management Plan. Each jurisdiction should also establish a regular point of contact with each utility provider, ensuring coordination in ongoing planning, capital development, land acquisition, and placement decisions.

Public Improvement Reviews (City, County)

All construction plans that affect public improvements, public facilities or public utilities should be submitted to the City of Fort Scott and/or Bourbon County in a timely manner for review of conformance with the adopted comprehensive plans.

Regulatory Tools

Development Moratorium (City, County)

A development moratorium temporarily halts the processing of development applications for specific types of projects until a guiding governmental activity, such as plan adoptions or ordinance revision, is completed. This action is most appropriate if the city and county are experiencing short-term development pressures that compromise plan implementation. A moratorium on corridor development provides time for the city and county to put appropriate guidelines or other controls in place, and should have a specific expiration date. This tool may be appropriately used while special corridor land use and access regulations and standards are being developed for the US 69 corridor.

Zoning

Public agencies use zoning ordinances to implement comprehensive plans by managing land use. In the US 69 corridor, zoning revisions maybe needed to:

- Establish land uses set forth by the US 69 Corridor Management Plan.
- Create special guidance for access and development design consistent with the recommendations of this plan.
- Provide incentives for private investment in the study area that advances the transportation, land use, and urban design directions of this document.
- Extends land use control into areas currently without zoning, where unmanaged development could affect the transportation performance, appearance, or long-term development potential of the corridor.

In 2007, Fort Scott adopted zoning regulations that classify land into distinct areas and districts of land use. These regulations apply to property within the City and land outside the City within a designated "Growth Area". This Growth Area extends south along US 69 approximately one mile south of the municipal limits. Because Bourbon County lacks zoning regulations, the City of Fort Scott can extend zoning control out to three miles beyond its city limits. The City must provide written notice of its intent to adopt zoning outside its limits to the Bourbon County Board of County Commissioners. By statute Bourbon

County can also extend zoning to all or any portion of its unincorporated area.

Process

Zoning should be adopted for the entire distance of the corridor using the following process:

- Fort Scott amends its current regulations to establish a US 69 overlay district, and applies the district within the corridor both inside the City and any portion of the corridor within three miles of the City's limits.
- Bourbon County establishes base districts along the balance of the corridor, using the nearest applicable zoning designator in the Fort Scott ordinance. In most cases, this base will be an agricultural district. The county also adopts a US 69 overlay district consistent with that developed by Fort Scott, and applies the new zoning to the corridor within its jurisdiction.
- All zoning actions, including establishment of new districts, must provide notice to property owners and to the public, and include a public hearing followed by Planning Commission and City Commission action, consistent with Kansas statutes and the City administrative procedures.
- The City and the County execute an interlocal agreement with provisions that coordinate the administration and application of zoning along the corridor, as discussed earlier.

To establish limited area zoning outside of the Fort Scott Growth Area, the Bourbon County Board of County Commissioners must create a planning commission that studies and holds a public hearing on proposed regulations. The process may work most expeditiously if the county and city work together to draft a consistent corridor overlay district with modifications appropriate for the county, form a joint planning commission to manage the overlay, and use existing city staff for administration and enforcement.

Base and Overlay Districts. Traditional zoning ordinances such as Fort Scott's include both base and overlay districts. Base districts identify permitted uses and development regulations for sites within the district, but generally do not reflect individual situations or contexts. Overlay districts modify or supplement base district regulations to respond to special conditions and requirements of



specific areas or types of projects. Fort Scott administers zoning and subdivision regulations within its jurisdiction, but it lacks some of the tools needed to implement the land use concepts of this plan. Bourbon County, without existing zoning, now exercises little land use control.

Bourbon County should apply base districts from Fort Scott's zoning ordinance to land along the US 69 corridor district in its jurisdiction. Most corridor land in the county jurisdiction will be placed in an agricultural district. Both city and county will then apply a consistent overlay district along the entire corridor, used in combination with the base districts.

The special overlay district regulations may address issues such as:

- Access control
- Signage
- Relationship of buildings to the highway
- Special setback requirements to preserve right-of-ways
- Building scale, form, and materials
- Visibility of loading docks and service areas
- Parking lot design and circulation.
- Site landscaping
- Pedestrian and bicycle access
- Impermeable surface limitations and storm drainage
- Procedures for special site plan or development review

Within the overlay district, standards may vary to reflect different contexts. The context analysis presented in Chapter Five included a discussion of the individual character of different parts of the study area. The overlay regulations and guidelines should reflect these dif-

ferences. For example, regulations appropriate in the pedestrian environment of Downtown or South National do not apply to the high-speed US 69 environment between Jayhawk and K-7.

Zoning Review and Approval. Once base and overlay districts are in place, the Fort Scott or joint city/county planning commission will review development and rezoning applications. This review should specifically consistency with the US 69 Corridor Management Plan, as adopted as a comprehensive plan element. If the reviewing staff determines that a project may have an adverse effect on the corridor, KDOT should receive a copy of the application, along with the staff report, for review and comment.

Planned Districts and Site Plan Review. Planned districts or common plans of development in Fort Scott and Bourbon County require submittal of information such as contemplated uses, proposed site terrain, location and type of infrastructure being proposed, building arrangement, architectural design and other features of development to the planning commission and governing body. The regulations may require this additional level of application detail for some or all project types developed within the US 69 overlay district.

In planned districts, the applicant submits two separate plans at different points in the approval process. The plan contains an increasing level of detail commensurate with the stage at which the property is in the development process. Initially, the applicant submits a preliminary development plan with an application for rezoning, but preliminary plan approval is a prerequisite for rezoning. The applicant then submits a final development plan for approval following completion of design drawings. This final plan must be approved before a building permit may be issued.

Site plan review process is an alternative to the planned development approval process. The applicant submits a specific site plan, which is then reviewed and acted upon, based on conformance with the design and performance guidelines of the overlay district and other zoning criteria.

In either a planned development or site plan review procedure, KDOT should review and comment on applications that staff determines may have an adverse effect on the corridor's transportation operation. This distribution should occur no later than notice of public hearing for the action. If the action does not require a hearing, KDOT should have enough time before action on the application to allow meaningful input.

Subdivision Regulations (City, County)

Subdivision regulations control the division land by requiring developments comply with set design standards and local procedures. They specify the improvements and construction standards required of developers. Subdivision regulations address such issues as efficient and orderly location of streets; reduction of vehicular congestion; reservation or dedication of land for open spaces; off-site and on-site public improvements; recreational facilities; flood protection; building lines; compatibility of design; storm water runoff; and other appropriate services, facilities and improvements.

In Bourbon County outside of Fort Scott's jurisdiction, subdivision regulations may be an alternative to zoning, although they are far less effective at guiding development patterns. Each plat would be submitted to the Board of County Commissioners, which determines if the plat conforms to the subdivision regulations. The Board notifies the owners of a finding of conformance and endorses its finding on the plat.



Dedications of land for public purposes must be accepted by the governing body before they take effect.

Building Permits (City, County)

Building permits are issued for the use or construction of any structure on a platted lot in areas governed by subdivision regulations. To receive a permit, buildings must conform to zoning requirements, providing an effective review and enforcement mechanism. If the city implements an impact fee program in the future, fees may be collected at the time of building permit application.

Transfer Of Development Rights (TDR) And Density Transfers (City, County)

Fort Scott and Bourbon County may establish a system of density incentives and transfers to promote effective use of property. Through TDR's, an owner may transfer all or part of the permitted density on one parcel to another parcel or to another portion of that same parcel, allowing a higher density on the site receiving the transfer than allowable by normal zoning. The transfer or removal of the right to develop or build is expressed by a density measure such as units per acre or floor area ratio (the gross area of a building divided by the area of a site). The TDR concept can encourage preservation of special site features or environmental resources on otherwise developable land.

Density Incentives (City, County)

This technique provides incentives for desirable, high-density development at specific sites, such as parcels near interchanges or at other points of maximum access. Commonly used incentives include streamlined development approvals, site design flexibility, density bonuses over normal zoning requirements, or targeted use of TIF or other financing incentives.

Cluster Development (City, County)

Cluster developments are a form of TDR, concentrating development at higher densities on a part of a site in exchange for maintaining open space or conservation uses on other parts of a parcel. Typically, the remaining land is used for recreation, common open space, or preservation of historically or environmentally sensitive areas. Cluster design is most often used for residential projects, and may apply to parts of the US 69 corridor.

Setback Ordinances (City, County)

It is essential that private developments do not encroach on right-of-way that will eventually be needed for highway and interchange improvements. One very effective way to preserve right-of-way and reduce future acquisition costs is adopting building and setback lines as part of a US 69 overlay district. Establishing these required setbacks will benefit from consultation with the Secretary of Transportation and KDOT staff, the Bourbon County engineer, and the Fort Scott Planning Commission. The setback ordinance should include an official map showing with survey accuracy the location and width of existing or proposed major streets or highways and any setback or building line. A building or setback line cannot be enforced until a certified copy of the map and any adopting ordinance or resolution is filed with the register of deeds of each county. This tool within the corridor is particularly important for the Bourbon County segment south of K-7.

Setback restrictions may be used in combination with other development tools, such as TDR's. For example, using this technique, an owner may be able to transfer development otherwise permitted in an exceptional setback area to other parts of the site, or even to a different location.

4(f) Uses (City, County, KDOT)

Federal statute places significant restrictions on the authority of the United States Secretary of Transportation to approve a transportation program requiring use of "4(f) properties" such as publicly-owned land, a public park, recreation area or wildlife refuges or land of a historic site. Because state transportation programs or projects often involve federal funds, the Secretary's approval is commonly required. Accordingly, it is important that these uses not be located within the Corridor unless another viable option is unavailable. Thus, Fort Scott and Bourbon County must avoid locating or approving development applications seeking to establish 4(f) properties in the areas shown on the Plan footprint map as right-of-way for the mainline or of any portion of the local street network.

Variances (City, County)

Fort Scott and Bourbon County can grant variances from zoning regulations when normal requirements create a hardship because of special conditions, and a variance is not contrary to the public interest. The grant of a variance from district restrictions, such as parking and impervious surface requirements, may help an important development proposal proceed with minor modifications that meet corridor setback requirements. At the same time, the grant of some variances could negatively affect some plan recommendations. For example, a setback or site plan variance request could cause a traffic queue that could obstruct traffic movement on the highway.

In considering variances, the board of zoning appeals should consult the US 69 Corridor Management Plan, to determine whether the request complies with it as a comprehensive plan element. KDOT should also have the opportunity to review and comment on any request that staff believes may affect

plan implementation or the operation of the US 69 corridor.

Administrative Tools

Accessibility Of The Comprehensive Plan (City, County)

The comprehensive plan, including this corridor management plan, should be posted on the Fort Scott and Bourbon County websites and filed at other appropriate locations to inform all interested parties of recommendations for the US 69 study area.

Notice Of Applicability Of Plan (City, County)

To ensure transparency for all stakeholders, all plats approved by Fort Scott and Bourbon County should contain a statement, similar to the following, placed in the dedication section of each approved plat.

"The property shown on and described in this plat is and shall hereinafter perpetually be subject to that certain US 69 Corridor Management Plan, adopted by the Kansas Department of Transportation on _____, the City of _____, Kansas on _____, _____ and _____ County, Kansas on _____, _____, recorded in the Register of Deeds for _____ County, Kansas, in Book _____, at Page _____."

Development applications should highlight the existence of special planning areas in the city or county, including the areas covered by the US 69 Corridor Management Plan. This could be handled informally by asking applicants of the property location or by inserting a line on all applications with a space to identify parcels covered by special plan areas. Entities or persons interested in developing at locations within the corridor may also become informed of the existence of the Plan as a result of the required filing of the Interlocal Cooperation Agreement in the Bourbon County register of deeds office.

Notice Of Opportunity To Provide Input (City, County, KDOT)

All parties with an interest in potential development along the corridor should have the opportunity to provide input development actions and proposals. Thus, Fort Scott and Bourbon County should provide KDOT with appropri-

ate notice of any development application (including rezoning and associated preliminary development plan applications, special or conditional use applications, site plan applications and preliminary plat applications and hearings on an amendment to that community's comprehensive plan), that could have adverse effects on the corridor and its operations. In addition, KDOT should receive advance copies of all such proposed plan amendments or development applications and any related staff reports.

Notice Of Land Marketed For Sale (City, County, KDOT)

It is imperative that right-of-way necessary for the mainline highway improvements be acquired as soon as possible, making the ability to act quickly when opportunities arise extremely important. If KDOT is aware that strategic properties are available for purchase, it will be able to coordinate acquisition with Fort Scott and Bourbon County. Therefore, the city and county should develop methods of continuously monitoring land purchase opportunities in the corridor, and providing rapid information to KDOT.

Economic Incentive Policy (City, County)

Economic incentives can increase or extend resources available to pay for acquisition of land needed for transportation facilities, capital construction, and voluntary land dedications. Economic incentive options other than regulatory tools are described in the Financing Strategies section.

Acquisition Tools

Land Acquisition (City, County, KDOT)

Public sector entities can acquire land for public improvements, including state highways and local roads and streets by gift, purchase, or condemnation. All corridor partners must work closely and continuously to identify acquisition opportunities. Partners must also be committed to cooperating in the identifying traditional and innovative strategies for funding and acquisition.

Access Acquisition (City, County, KDOT)

Existing access points that are not consistent with the Access Management Plan (Chapter 8) can often be eliminat-

ed though the exercise of police power. Adjacent landowners must be left with "reasonable" access after the inconsistent access point is removed. A private property owner does not have a legal right to direct access to the highway or to a particular local street. Acquisition of access rights can be applied to:

- Limit access to designated locations or side streets;
- Control access and sight distance at intersections or interchanges;
- Introduce long term or permanent access control; and/or
- Control traffic and turning movements at locations where high numbers of conflicting movements occur.

In many cases, removing extraneous access points can benefit property owners and businesses by making sites more efficient, add parking, improve circulation, and remove safety hazards. The city and KDOT should consider providing site planning assistance to owners when accesses are closed through this process.

Land Dedication And In-Lieu Fees (City, County)

A critical goal of this plan is right-of-way preservation – the governmental partners must do everything possible to preserve and acquire land necessary to enhance the highway mainline and the adjacent local street network. Economic opportunity and excellent transportation performance are linked: a project that may produce small, short-term benefits to a single owner may well obstruct long-term transportation improvements that produce far greater benefits to both that owner and the entire community. New development within the corridor generates new traffic, and almost always adds to the need for facility improvements.

As a condition of development approval, Fort Scott and Bourbon County should require that new developments dedicate the right-of-way needed for network improvements, at least in proportion to the facility improvement needs that it generates. A carefully calculated system of fees in lieu of dedication also can be effective in providing resources necessary for the timely purchase of rights-of-way. Both the City and County should adopt a right-of-way dedication and/or in-lieu fee program to minimize acquisition outlays and accelerate implementation of this plan.

