Railroad Crossing Plan

Presented to:

Wichita Area Metropolitan Planning Organization

July 24, 2007

WAMPO

Wichita Area Metropolitan Planning Organization

RAILROAD CROSSING PLAN

We would like to take this opportunity to thank the following committee members, staff and representatives of the WAMPO region for their valuable input and resources. We appreciate their participation throughout the planning process.

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SECTION 1—INTRODUCTION

1.1 Overview

According to the Association of American Railroads, North American railroads operate over 173,000 miles of track and earn $42 billion in annual revenues.[1] Historically, cities emerged and flourished with the inception of the railroad industry in which goods could be shipped greater distances for less cost than by steamboat or conventional roadways. Railroads remain the backbone of Kansas as one of the principal rail centers in the Midwest; Kansas is served by 4,936 miles of railroad trackage, much of it operated by the BNSF Railway (BNSF) and by the Union Pacific Railroad (UPRR).[2] As a result of the increasing number of trains operating throughout Kansas, improving safety and reducing congestion at highway-railroad grade crossings are priorities for many communities. Nationwide, a collision occurs between a train and vehicle or a train and a pedestrian approximately every 2 hours.[3] Likewise, the number of vehicle miles traveled is increasing at a faster rate than train miles traveled. Therefore, it is important to manage crossing safety and delay at highway-railroad grade crossings.

The purpose of the Wichita Area Metropolitan Planning Organization Railroad Crossing Plan (WAMPO RRCP) is to identify and analyze safety and congestion issues at the WAMPO region's highway-railroad grade crossings. The RRCP will act as the primary tool to deal with crossing safety and delay in the planning area and provide a framework for project identification and future integration into WAMPO's planning processes.

1.2 Planning Process

The project planning process (see Exhibit 1) for the WAMPO RRCP began with understanding the goals and objectives as outlined in the WAMPO 2030 Long Range Transportation Plan. An inventory of existing conditions and baseline information was then taken for the planning area with the assistance of the Kansas Department of Transportation's (KDOT) Crossing Inventory database for the region. A Hazard Index rating was established for each crossing with reference to the crossing's existing warning device, daily train traffic, and average daily vehicular traffic.

EXHIBIT 1: PLANNING PROCESS

The next step in the planning process was to identify needs and deficiencies at grade crossings in the region. These included deteriorating crossing surfaces, emergency response access, delay at the crossing and the

safety of schoolchildren near the crossing, among others. Meetings with the WAMPO Advisory Committee and local representatives were held to discuss local concerns; a public information meeting was also held to discuss the RRCP with regional citizens. The study team then developed a project toolbox which would address both the overall needs of the region and methods to reduce the overall Hazard Index.

Finally, strategies for implementing the RRCP were developed. They include: integrate the RRCP into the planning process, encourage local application of the project toolbox, build partnerships, promote proactive integration, support efforts to educate and enforce and identify funding. These strategies will assist WAMPO and local governments in implementing the RRCP. Ultimately the RRCP will facilitate the integration of crossing improvements into WAMPO's Transportation Improvement Program (TIP) for project funding. Potential sources of funding for such improvements have been summarized in this report. The WAMPO RRCP will be a useful tool for the MPO to enable the prioritization and funding of improvements to railroad corridors or isolated crossings.

1.3 Goals and Objectives

The WAMPO 2030 Long Range Transportation Plan (LRTP) was adopted in August 2005 to lead the region toward a safe, efficient and secure transportation system. The LRTP process is guided by federal regulations that establish a cooperative, continuous, and comprehensive framework for making transportation investment decisions in metropolitan areas. The RRCP was initiated to help the MPO further define and measure specific goals in the LRTP. The RRCP was guided by Goal 6 of the LRTP (see Exhibit 2) and its subsequent objectives by analyzing the planning area's safety and congestion concerns at highway-railroad grade crossings and recommending further actions that can be taken by the WAMPO to mitigate such issues.

EXHIBIT 2: WAMPO 2030 LONG RANGE TRANSPORTATION PLAN

Goal 6. Rail Transportation and Freight Movement:
Promote the safe and efficient movement of goods on the region's rail and highway systems.

Objectives:

6.1 Encourage improvements to and the expansion of freight facilities and assets that the Wichita area remains a leader in the effective movement of goods.

6.2 Promote safety and decrease delay between transportation modes.

- **Continue to implement strategies and projects identified in the Wichita/Sedgwick County Railroad Alternatives Analysis.**
- **Prioritize at-grade highway-railroad crossings and develop a program to improve safety and the movement of goods and people at these locations.**
- **Promote grade separations at rail crossings and major corridors.**
- **Investigate advance technologies to increase the safety and efficiency of freight transportation services and facilities.**

6.3 Promote surface transportation linkages between the Wichita area and other large metropolitan areas.

SECTION 2—BACKGROUND

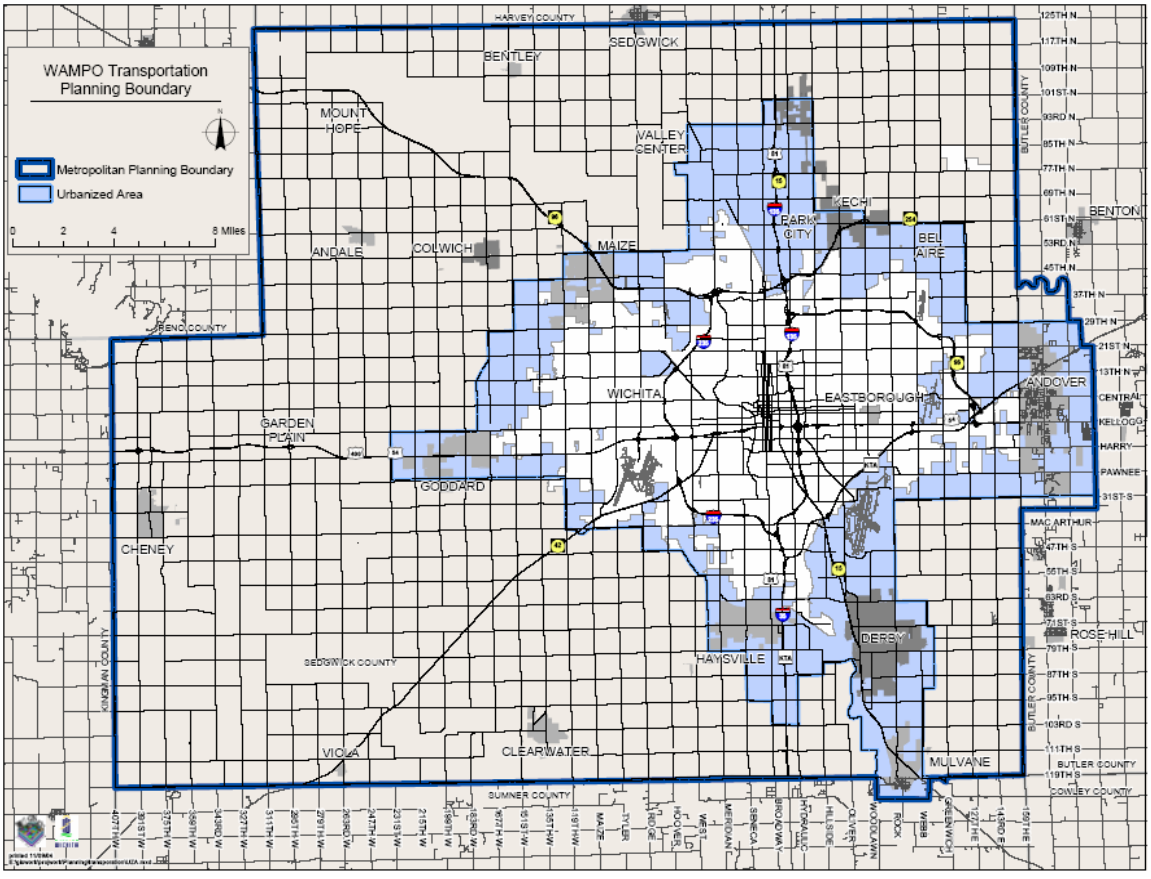
2.1 Wichita Area Metropolitan Planning Organization (WAMPO)

WAMPO was created in 2005 (formerly the Wichita-Sedgwick County Metropolitan Area Planning Commission) as the policy-making body for transportation planning in the Greater Wichita area. The National Association of Regional Councils describes an MPO as being an agency created by federal law to provide local input for urban transportation planning and allocating federal transportation funds to cities with populations greater than 50,000.[4] MPOs are also responsible for approving significant expenditures of federal dollars. Elected and appointed officials of WAMPO are involved in developing and maintaining the Long Range Transportation Plan, carrying out federally mandated activities and securing available state and federal transportation funds.

2.2 Regional Context

Centered around the railroad industry in the 1850's as a transportation center, Wichita became the largest city in Kansas and has the 2nd largest metropolitan area population (344,300). WAMPO serves a planning area of 1,036 square miles (see Exhibit 3) with a total population of 460,000.[5] The region has approximately 4,560 miles of roadway, 175 miles of Class I and shortline railroad trackage and 297 highway-railroad grade crossings. According to the WAMPO Travel Demand Model, the total number of Vehicle Miles Traveled (VMT) in the region in 2002 was 12,709,826.

EXHIBIT 3: WAMPO PLANNING AREA



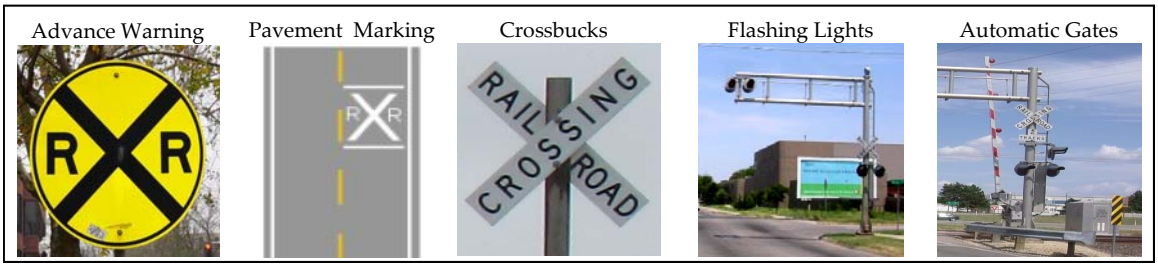
The WAMPO region is home to two Class I railroads, the BNSF and the UPRR; and one shortline railroad, the Kansas & Oklahoma Railroad (K&O) operated by WATCO Companies (see Exhibit 4, page 8). The BNSF operates over 100 trains per day through the WAMPO region; the UPRR operates 10 trains per day. The K&O operates 2 trains per week through Garden Plain and Cheney, and 1-2 trains per day through the Hutchinson and Conway Springs Subdivisions. The BNSF and the UPRR are part owners of the Wichita Terminal Association/ Wichita Union Terminal (WTA/WUT) in north Wichita and by agreement train movements are controlled by the BNSF through the Central Corridor. This joint agreement allows for coordinated railroad operations through Wichita's core.

2.3 Railroad Crossing Overview

Railroad crossings are classified as being either at-grade or grade separated. An at-grade crossing is one in which the roadway and railroad tracks are at the same elevation; a grade separated crossing is one in which the highway and railroad tracks are at different elevations, such as a bridge structure carrying the railroad over a highway or vice versa. Crossings can also be classified as either public or private. Public highway-railroad grade crossings are on streets and highways under the jurisdiction of and maintained by a public authority. Private highway-railroad grade crossings are located on a privately-owned road and are intended for use by the owner. These private roads are not intended for public use and are therefore not maintained by a public or state highway authority.

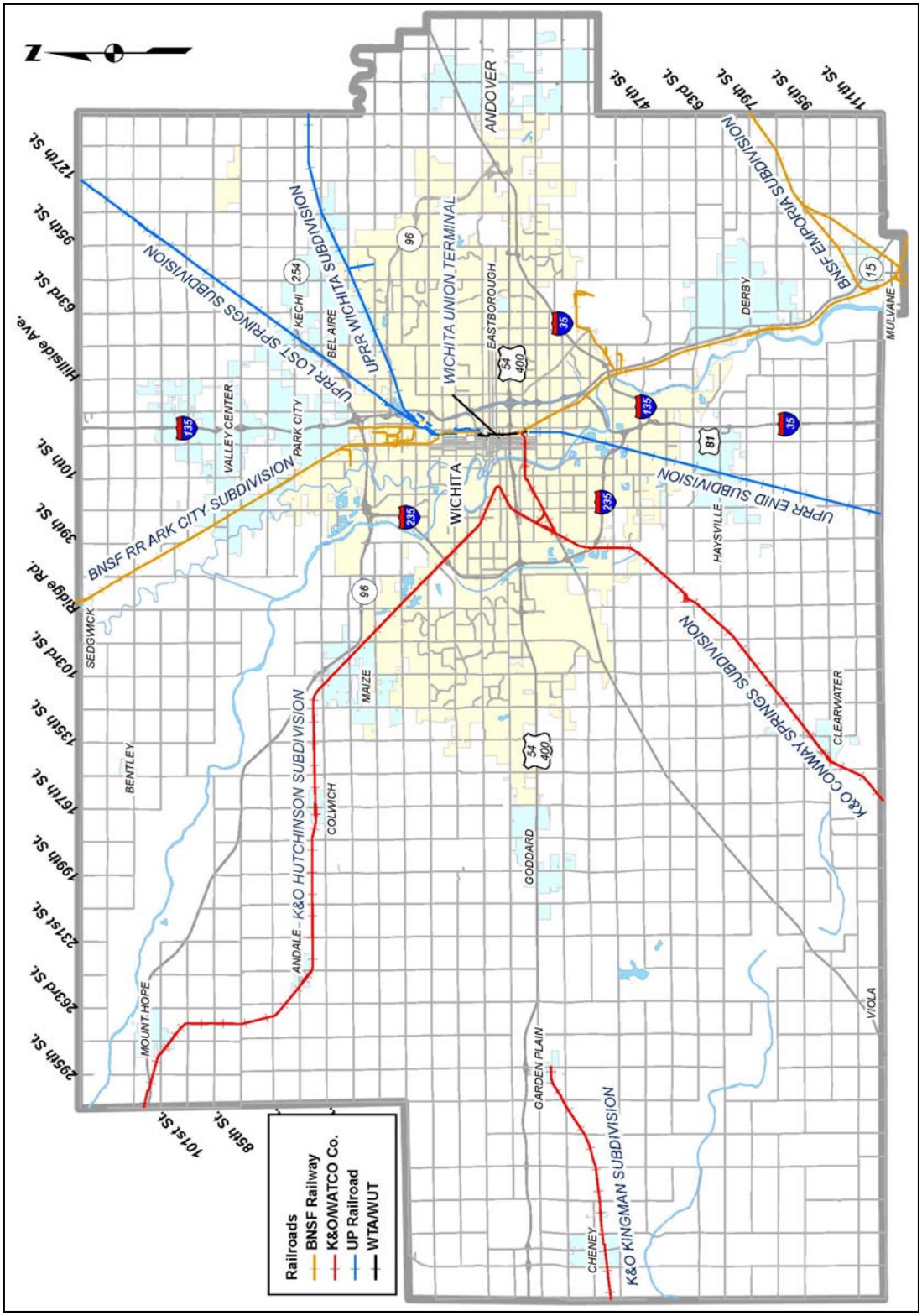
Safety measures at highway-railroad grade crossings can take many forms. Commonly displayed warning signs and devices include: advance warning signs, pavement markings, crossbuck signs, flashing lights and a combination of flashing lights and gates (see Exhibit 5). Advance warning signs, pavement markings and crossbuck signs are examples of passive warning devices. They are static traffic control devices alerting the presence of a railroad crossing. Flashing lights and gates are active or automatic warning devices, meaning they are activated by the presence of an oncoming train.

EXHIBIT 5: TYPES OF WARNING DEVICES



Advance warning signs are yellow and round, usually bearing the lettering "RxR". It is most often the first warning seen when nearing a railroad crossing. Pavement markings include the large "RxR" painted on the pavement and a stop line painted closer to the tracks. Crossbucks, acting as a yield sign, have the words "Railroad" and "Crossing" in black and white assembled in a large "X" configuration. If there is more than one set of tracks, the number of tracks will be indicated below the crossbuck.

EXHIBIT 4: REGIONAL RAILROADS



A flashing light signal is used along with the crossbuck signs at many railroad crossings. If there is more than one track, all tracks must be clear before lights cease flashing. Automatic gates provide a barrier arm which lowers across the lanes of the roadway in advance of an oncoming train. Flashing light signals are always used with gates. The standard gate system is a two-quadrant system that includes a gate which spans the approach lanes on each side of the crossing; four-quadrant gate systems use gates that span the entry and exit lanes of traffic on both sides of the track.

2.4 Railroad Crossing Inventory and KDOT Database

According to KDOT's 1995 Long Range Transportation Plan (KLRTP), the state of Kansas has 6,376 public highway-railroad grade crossings, of which 1,684 have flashing light systems and 1,126 have automatic gates.[6] The remaining 4,692 crossings have passive signage which may include crossbucks, advance warning signs, and pavement markings. There are also several crossings that are signed with stop signs. KDOT is currently in the process of updating their KLRTP to reflect current crossing status.

Successful programs to address safety at highway-railroad grade crossings are measured by a reduced number of collisions and fatalities (see Exhibit 6). According to the Federal Railroad Administration (FRA), 57 collisions resulting in 15 fatalities occurred at grade crossings in the state of Kansas during 2006; a total of 21 fatalities occurred in 2006 as a result of trespassing on railroad property. The number of fatalities in 2006 increased from 2005, when there were 63 collisions resulting in seven fatalities; nine additional fatalities were a result of trespassing on railroad property.[7] In Sedgwick County, there were eight collisions resulting in one fatality in 2006; there were ten collisions resulting in one fatality in 2005.[8]

EXHIBIT 6: NUMBER OF COLLISIONS AND FATALITIES IN 2005 AND 2006

	Sedgwick County		State of Kansas	
	2005	**2006**	**2005**	**2006**
# of Collisions	10	8	63	57
# of Collision Fatalities	1	1	7	15
# of Trespassing Fatalities	2	1	9	21

The FRA compiles and maintains the U.S. Department of Transportation's (DOT) Highway-Rail Crossing Inventory to assist states in assessing grade crossing safety. Inaccurate information in the Crossing Inventory can lead to invalid hazard and accident-prediction assessments. Therefore, the National Transportation Safety Board made recommendations to the Federal Highway Administration (FHWA) in 1999 asking the FHWA to "require states to update the Highway-Rail Crossing Inventory to accurately reflect current railroad operations."[9]

Compliant with Federal Section 130, KDOT established a state Crossing Inventory database and Hazard Index to prioritize all at-grade public crossings in the state of Kansas for safety improvements. The Hazard Index objectively ranks the crossings based on the amount of average daily traffic, the number of trains per day, and the present type of warning system.

Other components of the KDOT Crossing Inventory database include crossing surface type, functional roadway classification and train speed, among many other attributes. This has enhanced statewide crossing safety programs by providing detailed subset data as well as photos of each grade crossing. The updated KDOT Crossing Inventory database for at-grade public crossings in the WAMPO region was received by TranSystems in December 2006. A maintenance plan and user manual has been written to assist WAMPO in updating the Crossing Inventory database in the future.

2.5 WAMPO Database Deliverable

The Crossing Inventory database for the WAMPO planning area as supplied by KDOT has been converted for use by WAMPO staff. As part of this conversion, all information from the KDOT database has been stored electronically for each crossing, including the DOT #, crossing surface type, ADT, number of trains per day, train speed, the existing warning device and the crossing's corresponding Hazard Index. Additionally, photo hyperlinks for each crossing are available to view. These photos contain the crossing's DOT #, approach, approach looking right, crossing surface, departure and departure looking right. An instruction manual has been created for WAMPO staff to describe the processes that should be taken to update the Crossing Inventory database. WAMPO staff can provide information to the general public regarding specific crossings or locations within the database.

SECTION 3—IDENTIFY NEEDS AND DEFICIENCIES

3.1 Community Input

Input was gathered from WAMPO Advisory Committee members throughout the planning process to understand the needs and deficiencies of highway-railroad grade crossings in the region. The Advisory Committee was comprised of representatives from major railroads, cities and counties in the planning area, FRA, FHWA, KDOT, WAMPO and the Metropolitan Area Planning Department (MAPD). Committee members were asked to think of groups or focus areas that are impacted by grade crossings. After the focus areas were identified, specific issues were listed to understand what was to be considered when formulating ideas to address grade crossings.

EXHIBIT 7: LOCAL REPRESENTATIVES MEETINGS

Meeting Locations
Garden Plain Senior Center
Colwich City Hall
Valley Center City Hall
Haysville Community Building
Wichita City Hall (City of Wichita)
Wichita City Hall (open to all)

Six local representative meetings were also held throughout the WAMPO region to understand regional needs and deficiencies from the perspective of those who contend with grade crossings on a daily basis. Representatives came from neighboring cities, Sedgwick County, police and fire departments, school districts, City Councils, and WAMPO. The meetings were held in various locations to focus on corridor solutions and encourage attendance (see Exhibit 7).

Throughout the meetings, the underlying theme drawn from local representatives was to reduce obstacles that impede traffic and pedestrian flow. The study team encouraged representatives to list ways to mitigate those obstacles and identify locations that they believed should be addressed. Three areas of focus emerged during the meetings: quality of life, overall safety and congestion, and emergency response.

A public informational meeting was then held to discuss the inventory of highway-railroad grade crossings in the region, answer questions and gather feedback from regional citizens. Their comments are compiled in Appendix A.

3.2 Warning Devices

In the WAMPO region, almost 40% of existing crossings are considered passive, marked only by crossbucks (see Exhibit 8). The remaining 60% are active crossings; 18% are marked with flashing lights and 42% are equipped with flashing lights and gates.

EXHIBIT 8: REGIONAL WARNING DEVICES

Warning Device	# of Crossings
Crossbucks	117
Flashing Lights	55
Flashing Lights/Gates	125
Total	**297**

3.3 Crossing Surfaces

Approximately 40% of crossing surfaces in the WAMPO region are comprised of concrete or rubber (see Exhibit 9, page 12); 60% of crossings surfaces are either unconsolidated materials, asphalt, a combination of asphalt and flange, or timber. An unconsolidated crossing is one composed of a dirt or gravel surface.

EXHIBIT 9: CROSSING SURFACE TYPES BASED ON ANNUAL DAILY TRAFFIC (ADT)						
ADT Range	**Unconsoli-dated**	**Asphalt**	**Asphalt & Flange**	**Timber**	**Concrete, Concrete & Rubber**	**Rubber**
0-500	19	15	8	64	9	1
500-1,000	2	10	2	19	11	0
1,000-5,000	0	12	2	19	35	3
>5,000	0	5	0	3	40	18
Total	**21**	**42**	**12**	**105**	**95**	**22**

Deteriorating crossing surfaces was mentioned at local representatives meetings as both a safety and quality of life issue. Safety concerns arise when a crossing surface does not meet minimum surface quality standards with regard to the volumes of vehicular and train traffic present, as well as the speeds at which those vehicles and trains travel over the crossing. Substandard crossing surfaces can cause motor vehicle damage, harm to the existing track and can create a hazardous setting for bicyclists and pedestrians. Quality of life issues occur when a motorist is required to reduce speed in order to traverse the crossing or when a bicyclist or pedestrian is unable to cross due to poor surface condition.

Crossing surfaces can be classified as being either monolithic or sectional. Monolithic surfaces are those formed at the crossing and must be destroyed to be removed. The most common monolithic surface is asphalt. Sectional surfaces, on the other hand, are manufactured in pieces and can be removed and/or reinstalled without being destroyed. Typical sectional surfaces include timber, rubber and insulated concrete panels.

3.4 Hazard Index

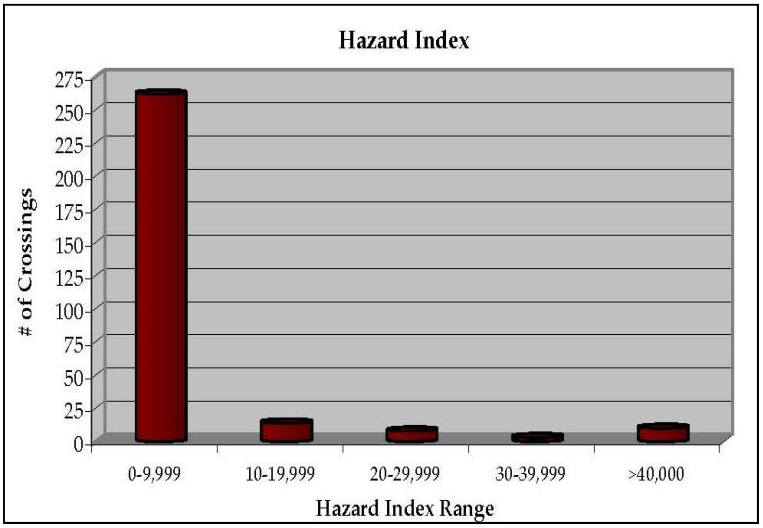
Safety and congestion can be measured effectively with the Hazard Index. According to KDOT, the Hazard Index is used to objectively rate the relative hazard *potential* for all crossings and is based on highway traffic volumes, train traffic, and the existing warning device. Each year a number of the highest ranked crossings that have not been addressed in prior programs are selected for project review. A preliminary review of those crossings is then conducted to verify crossing inventory information. The formula located to the right is used to determine a crossing's Hazard Index.

Hazard Index = ADT x T x W

ADT = Average Daily Traffic
T = Average Number of Trains Per Day
W = Warning Device Factor

- W = 0.1 for Flashing Lights and Gates
- W = 0.6 for Flashing Lights
- W = 1.0 for Crossbucks

EXHIBIT 10: REGIONAL HAZARD INDEX



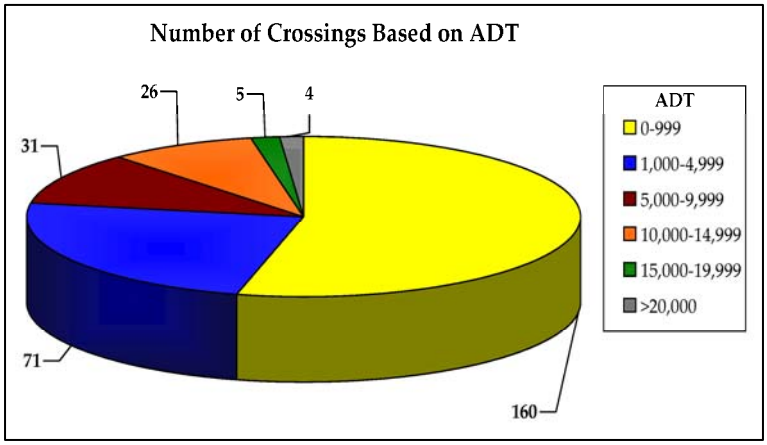
In the WAMPO region, 88% of crossings have a Hazard Index of less than 10,000 (see Exhibit 10); the Hazard Index for the entire region is 1,491,822. Following the completion of Wichita's Central Corridor project, the regional Hazard Index will be decreased by 12.5%. As a strategy aimed at making the region safer, Advisory Committee members recommended reducing the planning area's overall Hazard Index.

3.5 Average Daily Traffic

Average Daily Traffic (ADT) is a measure used to determine how many vehicles travel on a given road in one day and is one of three criteria used to calculate a crossing's Hazard Index. Over one-half (54%) of the highway-railroad grade crossings in the WAMPO region have an ADT of less than 1,000 vehicles (see Exhibit 11). However, there are numerous crossings in which daily traffic volumes of more than 10,000 vehicles are recorded. Crossings experiencing the most vehicles per day include:

- K-15 Highway in Wichita, on the BNSF
- Pawnee Avenue in Wichita, on the BNSF and UPRR
- 47th Street in Wichita, on the BNSF and UPRR
- Meridian Ave. in Wichita, on the BNSF and K&O
- West Street in Wichita, on the K&O
- Seneca Street in Wichita, on the K&O
- 13th Street in Wichita, on the Central Corridor

EXHIBIT 11: ADT AT CROSSINGS



According to the WAMPO Travel Demand Model, total Vehicle Miles Traveled (VMT) in 2002 was 12,709,826; VMT is projected to increase to 18,404,132 in 2030. Additionally, the average vehicular travel time in 2002 was calculated at 16.89 minutes; this is projected to increase to approximately 19.67 minutes by 2030. Travel time on routes which intersect grade crossings is expected to be higher as train lengths and train traffic increase over the same time period.

3.6 Train Traffic

Exhibit 12 illustrates the number of crossings which fall into each category of daily train traffic. It is clear that the majority of crossings (77%) experience 0-10 trains per day. These crossings are located on the UPRR and K&O. 4% of all crossings in the WAMPO region experience the highest volumes of daily train traffic (41-52 trains per day). These crossings are located on the BNSF Emporia Subdivision.

EXHIBIT 12: CHART OF REGIONAL TRAIN TRAFFIC

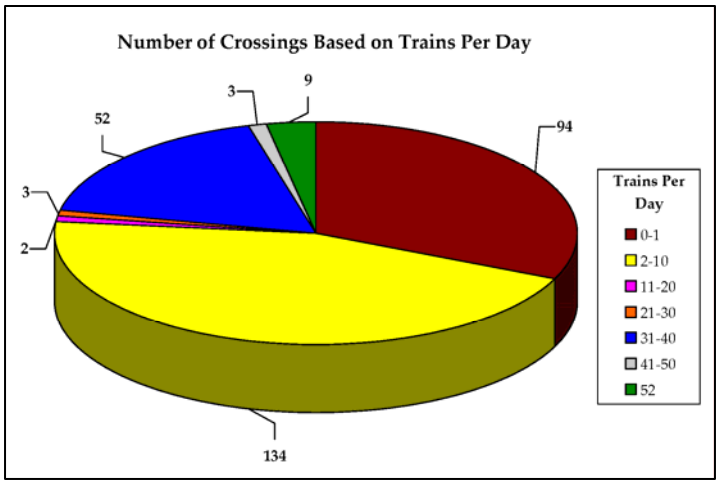


Exhibit 13 (see page 15) depicts daily train traffic traveling throughout the WAMPO region. The BNSF operates the highest number of trains per day; the BNSF Emporia subdivision operates up to 52 trains each day. The K&O operates less than one to two trains per day through the region, while the UPRR operates up to ten trains per day.

3.7 Emergency Response

Emergency response is an equally important concern but one that is difficult to measure due to the unpredictability of emergency occurrences and the irregularity of train traffic. Exhibit 14 (see page 16) illustrates the WAMPO region's Emergency Medical Services (EMS) response areas and fire stations in relation to the location of grade crossings. Land use and facility planning can be an effective way to influence future development and shape the region's growth. Consideration of impacts on emergency response time at grade crossings can help local governments outline where future development should occur or determine response area boundaries.

EXHIBIT 13: REGIONAL TRAIN TRAFFIC

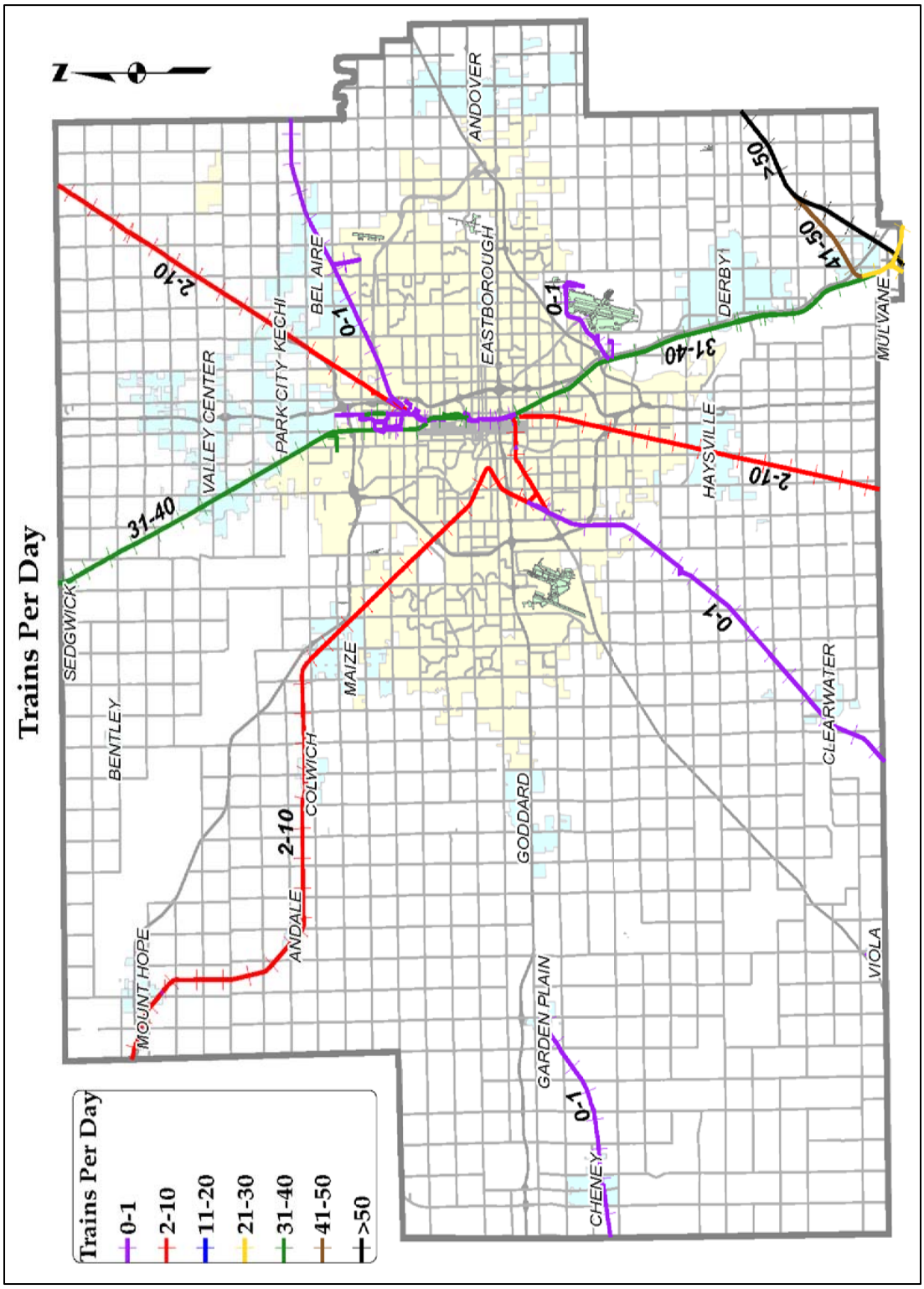
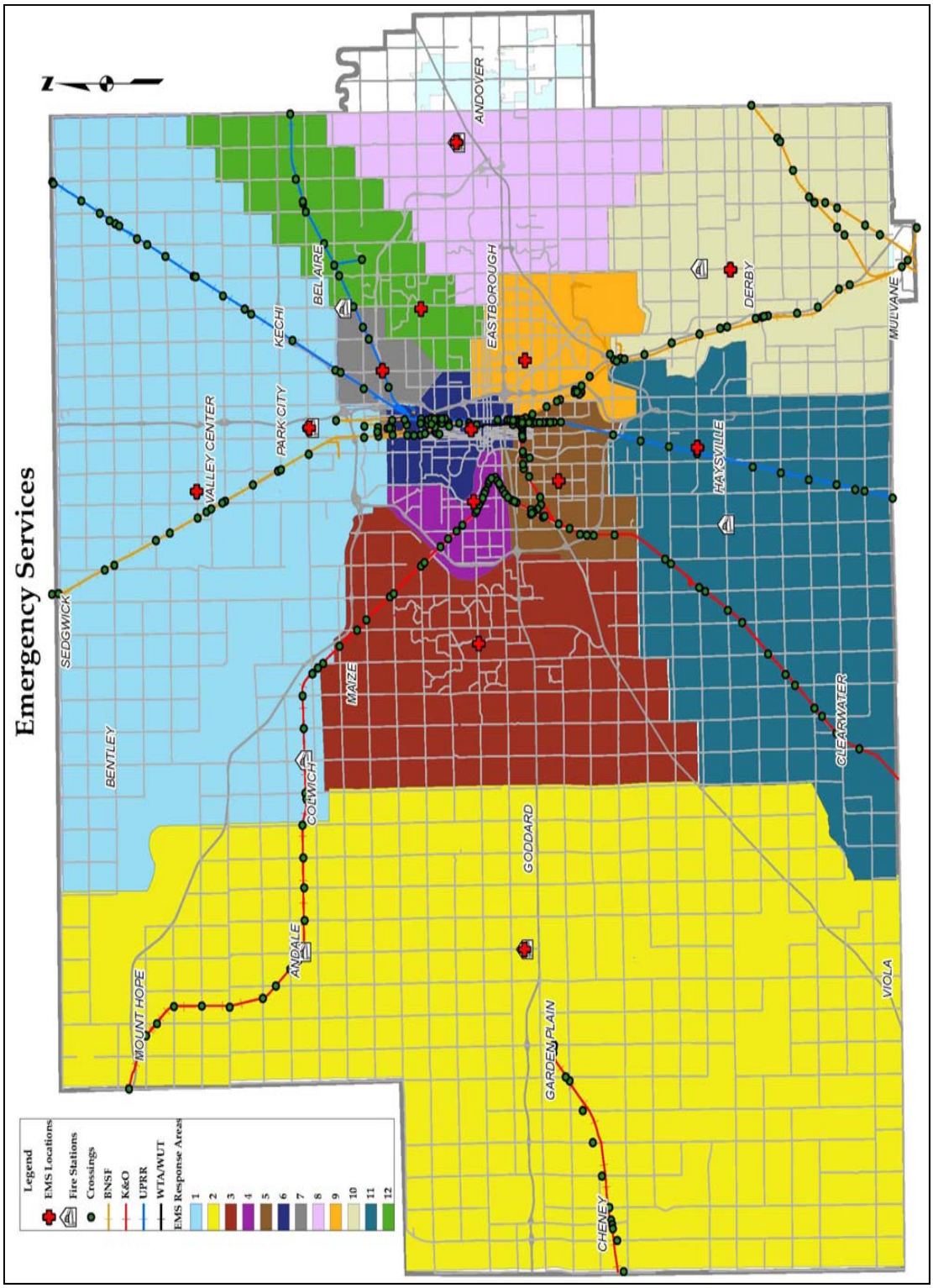


EXHIBIT 14: EMERGENCY RESPONSE MAP



SECTION 4—PROJECT TOOLBOX

In an effort to address safety and congestion issues at the region's highway-railroad grade crossings, a project toolbox was developed. This toolbox gives WAMPO and member communities opportunities and solutions to apply at crossings throughout the region. The following nine tools provide the framework for the WAMPO RRCP project toolbox:

- Crossing Condition
- Quiet Zones
- Land Use Planning
- Crossing Consolidation
- Grade Separation
- Turn Lane Extension
- Install Active Warning Devices
- Crossing Geometry
- Approach Improvements

Although the inventory of project tools is comprehensive, other tools may be added to the toolbox as developed. As part of the RRCP, project examples were identified at locations that appeared on the Top 50 Hazard Index list, at locations where projects have been planned, or at locations in which projects are possible. Project examples shown in the toolbox were chosen with regard to operational and feasibility considerations; these project examples can be used in conjunction with a detailed diagnostic study to evaluate their merits during field reviews for an accurate assessment of the region's grade crossings. Each tool is flexible enough to be applied at many locations throughout the region, not just at the location listed for the corresponding project example.

The majority of project examples presented here are located at highway-railroad grade crossings that have a Hazard Index on the Top 50 list and have great potential to lessen the regional Hazard Index if implemented. Each of the Top 50 Hazard Index crossings were analyzed for potential project examples to decrease the regional Hazard Index. They were evaluated for all alternatives listed in the project toolbox. At several crossings it was not possible to identify a project example due to site-specific circumstances or impacts on adjacent residential and/or commercial properties. Crossings on the Top 50 Hazard Index list that were not suitable for major crossing improvements include: 1st Street (DOT #009231N), 29th Street (DOT #009259E), 53rd Street (DOT #009252G) and 95th Street (DOT #009636R). Although not all identified project examples are expected to be implemented, it is important to recognize that many of these project examples may be used as a tool to apply at several locations as focus shifts to other crossings in the future.

Exhibit 15 (see page 18) displays the list of Top 50 Hazard Index crossing locations. It lists each crossing's unique identification number (DOT #), street name, railroad, crossing surface type, ADT, number of trains per day, current warning device, hazard weight and its corresponding Hazard Index. Crossing surfaces in the Top 50 list are comprised of timber, asphalt, concrete, rubber or a combination of concrete and rubber (C&R). The ADT and the number of trains per day are listed for each crossing. The current warning device at each crossing is listed as crossbucks (Xbucks), flashing lights (FL) or a combination of flashing lights and gates (FL/G); each warning device is given a weighting factor used in the equation for determining the crossing's Hazard Index. The weighting factor for crossbucks is 1.0, the factor for flashing lights is 0.6 and the weighting factor for a combination of flashing lights and gates is 0.1.

EXHIBIT 15: TOP 50 HAZARD INDEX CROSSINGS LIST

DOT #	Street	Railroad	Surface	ADT	Trains/Day	Warning Device	Hazard Weight	Hazard Index
009286B	Pawnee Avenue	BNSF	C&R	20,536	38	FL/G	0.1	78037
009295A	47th Street	BNSF	C&R	18,090	38	FL/G	0.1	68742
009268D	13th Street	BNSF	C&R	14,898	38	FL/G	0.1	56612
009272T	Murdock Street	BNSF	C&R	13,440	38	FL/G	0.1	51072
009273A	Central Street	WTA/WUT	Concrete	13,371	38	FL/G	0.1	50810
009293L	Macarthur Road	BNSF	Rubber	13,143	38	FL/G	0.1	49943
009263U	21st Street	BNSF	C&R	12,912	38	FL/G	0.1	49066
009290R	31st Street	BNSF	C&R	1,287	38	Xbucks	1.0	48906
009283F	Harry Street	BNSF	C&R	11,931	38	FL/G	0.1	45338
009388U	63rd Street	BNSF	C&R	10,905	38	FL/G	0.1	41439
009377G	K-15 Highway	BNSF	Rubber	31,407	2	FL	0.6	37688
009382D	K-15 Highway	BNSF	Rubber	29,319	2	FL	0.6	35183
009280K	Lincoln Avenue	BNSF	C&R	8,372	38	FL/G	0.1	31814
009259E	29th Street	BNSF	C&R	7,744	38	FL/G	0.1	29427
009252G	53rd Street	BNSF	C&R	7,583	38	FL/G	0.1	28815
009284M	Mt. Vernon Street	BNSF	C&R	7,108	38	FL/G	0.1	27010
009285U	Hydraulic Avenue	BNSF	C&R	7,065	38	FL/G	0.1	26847
445091N	21st Street	UPRR	C&R	13,393	20	FL/G	0.1	26786
009248S	77th Street	BNSF	C&R	6,762	38	FL/G	0.1	25696
009257R	37th Street	BNSF	Rubber	6,424	38	FL/G	0.1	24411
009282Y	Washington Street	BNSF	C&R	5,782	38	FL/G	0.1	21972
009393R	Market Street	BNSF	C&R	5,219	38	FL/G	0.1	19832
009287H	Wassall Road	BNSF	C&R	4,933	38	FL/G	0.1	18745
009368H	Seneca Street	K&O	Rubber	15,383	2	FL	0.6	18460
009266P	17th Street	BNSF	C&R	4,639	38	FL/G	0.1	17628
595029R	21st Street	UPRR	Concrete	12,983	13	FL/G	0.1	16878
595060C	Pawnee Avenue	UPRR	C&R	22,964	7	FL/G	0.1	16075
595034M	13th Street North	UPRR	Concrete	15,343	10	FL/G	0.1	15343
009406P	K-53 Highway	BNSF	C&R	5,126	29	FL/G	0.1	14865
009315J	17th Street	WTA/WUT	Asphalt	4,515	3	Xbucks	1.0	13545
445161B	Douglas Street	K&O	C&R	10,714	2	FL	0.6	12857
595038P	Murdock Street	UPRR	Concrete	12,577	10	FL/G	0.1	12577
009636R	95th Street East	BNSF	C&R	2,215	52	FL/G	0.1	11518
009246D	Main Street	BNSF	C&R	3,000	38	FL/G	0.1	11400
445179I	29th Street	K&O	Concrete	10,851	1	Xbucks	1.0	10851
595063X	Macarthur Road	UPRR	C&R	14,259	7	FL/G	0.1	9981
595065L	47th Street	UPRR	C&R	13,824	7	FL/G	0.1	9677
009231N	1st Street	BNSF	Concrete	2,520	38	FL/G	0.1	9576
445187D	Meridian Avenue	K&O	C&R	7,487	2	FL	0.6	8984
445167S	Maple Street	K&O	Rubber	7,446	2	FL	0.6	8935
009251A	61st Street	BNSF	C&R	2,187	38	FL/G	0.1	8311
009390V	71st Street	BNSF	Timber	2,135	38	FL/G	0.1	8113
009628Y	190th Street	BNSF	C&R	1,540	52	FL/G	0.1	8008
009385Y	55th Street	BNSF	Timber	348	38	FL	0.6	7934
595053S	Harry Street	UPRR	Concrete	10,435	7	FL/G	0.1	7305
009294T	Clifton Avenue	BNSF	C&R	1,871	38	FL/G	0.1	7110
445210V	Maize Road	K&O	Asphalt	5,335	2	FL	0.6	6402
009247K	Meridian Avenue	BNSF	C&R	1,680	38	FL/G	0.1	6384
009243H	5th Street	BNSF	C&R	1,648	38	FL/G	0.1	6262
439344F	Woodlawn Blvd	UPRR	C&R	10,299	1	FL	0.6	6179

4.1 Crossing Condition

Crossing surface types are classified as being unconsolidated, asphalt, a combination of asphalt and flange, timber, concrete, a combination of concrete and rubber or entirely rubber. According to the railroad industry, most crossing surface upgrades take the form of precast concrete panels. This surface treatment is advantageous at crossings with moderate to high levels of vehicular and train traffic due to its durability, smoothness and long-term value. Surface upgrades are typically done in conjunction with regularly-scheduled railroad maintenance projects or with crossing signal upgrades completed by KDOT.

KDOT conducts a statewide annual review for highway-railroad grade crossing surfaces as part of the Rural State Highway Crossing Surface Projects program. This program analyzes and funds public crossing surface upgrades in cities with populations of less than 2,500. Projects are selected from applications submitted by the railroad and local districts, and are evaluated on the overall ride quality of the surface at the posted speed limit. As of 2006, there is approximately $500,000 to be distributed annually through this program.

For cities with populations greater than 2,500, an agreement must be made between the city and the respective railroad to share costs of upgrading crossing surfaces otherwise not replaced in conjunction with a crossing signal project or in association with other capital improvement programs. Cities will work with their railroad public projects representative on crossing surface upgrades.

The overall cost (including labor) for replacing a crossing surface with concrete is approximately $1,500 per linear foot. On a four-lane road with a perpendicular crossing and a single track, one could estimate the total length to be 52 feet including shoulders. Therefore, surface upgrades are estimated to cost approximately $78,000 per crossing. Although improving the condition of a crossing does not directly impact the Hazard Index, it can increase crossing safety for motorists, pedestrians and railroad operations. For instance, damaged crossing surfaces can interfere with active warning devices by falsely activating the devices and increasing the potential of drivers circumventing gate arms at these locations.

The following locations could be possible projects for improving crossing condition:

- 17th Street (DOT #009315J) in Wichita, on the WTA/WUT
- 55th Street (DOT #009385Y) in Wichita, on the BNSF
- 71st Street (DOT #009390V) in Derby, on the BNSF

Each of the crossing locations below are listed on the Top 50 Hazard Index. Numerous improvements were reviewed for each location but it was concluded that none of these locations would be suitable for grade separation or major crossing improvement due to adjacent property impacts or other constraints. All crossing surfaces could be upgraded to insulated concrete.

17th Street (DOT #009315J)

The 17th Street crossing is located in Wichita on the WTA/ WUT; this track has less than three trains per day. However, the crossing is listed on the Top 50 Hazard Index and it may be beneficial to upgrade the crossing surface from asphalt to insulated concrete. The warning device at this location could also be upgraded from crossbucks to a combination of flashing lights and gates.

55th Street (DOT #009385Y)

The 55th Street crossing is located in Wichita on the BNSF. It is on KDOT's 2006 Section 130 list to upgrade the current warning device from flashing lights to a combination of flashing lights and gates. Installation will most likely be complete in spring 2007. The timber crossing surface was evaluated by KDOT and determined to be in good condition, however it may be beneficial to upgrade the crossing surface from timber to insulated concrete in the future.

71st Street (DOT #009390V)

The 71st Street crossing is located in Derby on the BNSF. The ADT at this crossing is 2,135 and it may be beneficial to upgrade the crossing surface from timber to insulated concrete.

4.2 Quiet Zones

Quiet Zones are a tool that can be used to silence train horns while keeping motorists safe at highway-railroad grade crossings. Quiet Zones positively impact the quality of life near residential populations, sensitive commercial developments and customer-driven uses while providing Supplemental Safety Measures (SSMs) in place of sounding the train horn. The initial requirements for a Quiet Zone focus on the corridor length and the warning devices installed at each crossing. A Quiet Zone must be at least one-half mile in length and each highway-rail grade crossing must be equipped with active warning devices comprising of flashing lights and gates operated with constant warning time and power-out indicators. In addition, SSMs should be installed at each public crossing in the Quiet Zone (see Exhibit 16) to adequately address risk calculations defined by the FRA.

EXHIBIT 16: SUPPLEMENTAL SAFETY MEASURES (SSMS)

Temporary Closure Temporary closure of a public highway-rail grade crossing will close the crossing to highway traffic during a designated quiet period, for instance provide locked gates from 9:00 p.m. to 6:00 a.m.	**Four-Quadrant Gate System** A Four-Quadrant Gate System will install gates at a crossing sufficient to fully block highway traffic from entering the crossing when the gates are lowered, including at least one gate for each direction of traffic on each approach.
Permanent Closure This measure would permanently close the crossing to highway traffic.	**One-Way Streets with Gates** For this option, gates must be installed such that all approaching highway lanes to the public highway-rail grade crossing are completely blocked.
Gates with Medians or Channelization This measure would install medians or channelization devices on both highway approaches to a public highway-rail grade crossing denying to the highway user the option of circumventing the approach lane gates by switching to the opposing (oncoming) traffic lane and driving around the lowered gates to cross the tracks.	**Wayside Horns** A wayside horn is a stationary horn located at the highway-rail grade crossing designed to provide, upon the approach of a locomotive or train, audible warning to oncoming motorists of the approach of a train. This measure is not a true SSM but is looked at as a substitute for the locomotive horn and the crossing will not be included in risk calculations.

Steps to Acquire a Quiet Zone

The Use of Locomotive Horns at Highway-Rail Grade Crossings Final Rule (Final Rule) was written by the FRA and took effect on June 24, 2005. The Final Rule has established a formal process for application for a Quiet Zone. The community initiating the effort will need to obtain cooperation from all jurisdictions affected including KDOT, the railroads and FRA. This can be initiated by scheduling a diagnostic review of the crossings and reviewing the community's intent with the parties involved. Once cooperation has been obtained, the process to create a New Quiet Zone can be initiated. The following steps should be pursued:

1. Update the National Crossing Inventory with KDOT and FRA assistance.
2. Submit a Notice of Intent to the FRA to create a New Quiet Zone. There is a 60-day comment period associated with this filing.
3. Calculate appropriate risk values.

4. Determine appropriate SSMs to install at each crossing.
5. File a Public Authority Application to the FRA. The recommended SSMs should be reviewed by the FRA and the railroads to determine if they will meet Quiet Zone requirements before installation. There is a 60-day comment period associated with this filing.
6. Install SSMs and update the National Inventory with new crossing information.
7. Provide Notice of Quiet Zone Establishment and implement the Quiet Zone. This is the final step that will silence the train horns and install signage at crossings notifying drivers that the train horn will not sound.
8. Annual risk calculations will require the community to periodically review the Quiet Zone status with the FRA.

Additional Considerations

Private crossings are treated differently from public crossings in a Quiet Zone corridor and may not be included in a Quiet Zone without upgrades or conversion to a public crossing. It is also important to note that the installation of a Quiet Zone is a process that could take one to two years considering application filing and comment periods as well as design, material acquisition and construction. Railroads work with public agencies to implement safety improvement projects; there is no cost for preliminary meetings and project scope development. If a project moves forward, it is likely that funds from the community will be used to cover the costs.

Although not all crossings in the WAMPO region may qualify for or satisfy the requirements for a Quiet Zone designation, a Quiet Zone is a useful tool which can be operational on a larger scale by taking the necessary steps now for future application. This could include the installation of medians in conjunction with roadway widening or the permanent closure of a crossing in the corridor. Installation of such improvements is less challenging when done in conjunction with a capacity improvement or other major construction project rather than attempting to retrofit improvements down the road.

The following locations could be possible projects for a potential Quiet Zone designation:

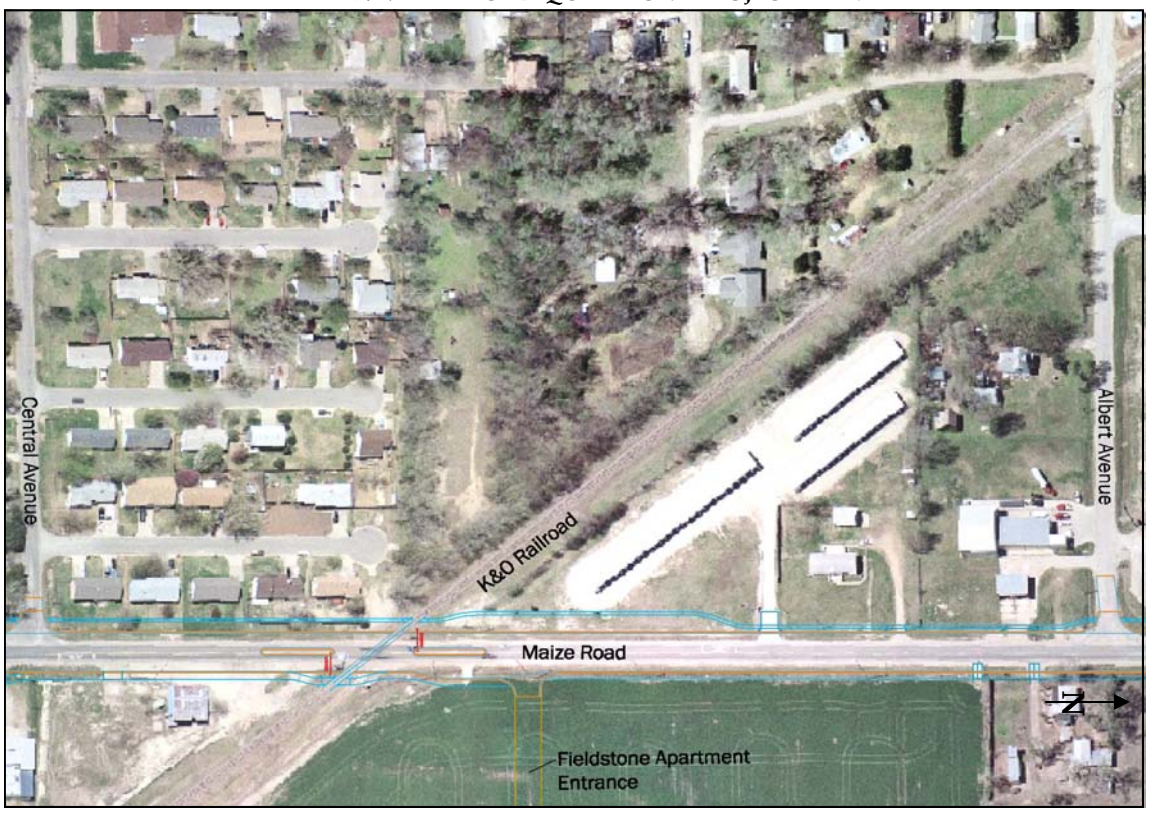
- Maize Road (DOT #445210V) in Maize, on the K&O
- Woodlawn Boulevard (DOT #439344F) in Bel Aire, on the UPRR
- Valley Center Corridor in Valley Center, on the BNSF

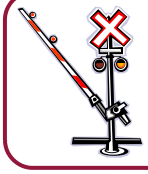
Maize Road and Woodlawn Boulevard should be considered a proactive step toward the implementation of a Quiet Zone throughout the corridor rather than an isolated location for a Quiet Zone designation. Quiet Zones are most effective when designated in conjunction with adjacent crossings; it is beneficial to plan ahead for such designation by taking a corridor approach. The Valley Center Corridor project example may be applied at any corridor in the region. Numerous improvements were reviewed for each location but it was concluded that Maize Road and Woodlawn Boulevard are not suitable for grade separation or major crossing improvements due to adjacent residential and commercial property impacts. Several crossings in the Valley Center corridor were suitable for grade separations and/or other crossing improvements and are discussed in other sections of the toolbox.

Maize Road (DOT #445210V)

The Maize Road crossing is located in Maize on the K&O, west of K-96 Highway. The Maize Road corridor from 45th Street to 53rd Street is currently under design to widen the existing two-lane road to four lanes with a center turning lane (see Exhibit 17). Warning device upgrades to flashing lights and gates are also planned at the time Maize Road is widened. A Quiet Zone designation may be possible at this crossing by constructing 100-foot medians on both roadway approaches; there will be no driveways or intersections within this 100 foot distance. Additionally, the distance from the center of Maize Road crossing to the center of Albert Street crossing is 1,322 feet; the distance from the center of Maize Road crossing to the center of 45th Street crossing is 4,135 feet. These distances satisfy the one-half mile minimum length requirement of a Quiet Zone designation. Although these improvements do not necessarily guarantee a Quiet Zone, it is valuable to plan ahead for such designation. Adjacent crossings may be evaluated to determine whether a Quiet Zone designation is viable along the corridor. At the time of construction, it is proposed the crossing surface be updated to concrete. Maize Road is also listed as a non-programmed warning device upgrade project example (see Exhibit 39).

EXHIBIT 17: MAIZE ROAD QUIET ZONE PROJECT EXAMPLE





The Maize Road corridor is currently seeking financial assistance through WAMPO's TIP. If approved, corridor improvements may begin as early as 2012. Construction costs were approximated for 2010, in which the Maize Road corridor is estimated to cost $6,200,000.

Woodlawn Boulevard (DOT #439344F)

The Woodlawn Boulevard crossing is located in Bel Aire on the UPRR. The Woodlawn Boulevard corridor from 37th Street to 45th Street is on the out years of the WAMPO's TIP to widen and reconstruct the roadway from two lanes to four lanes. A Quiet Zone designation may be possible at this location by upgrading the crossing's warning device to a combination of flashing lights and gates in addition to the construction of 60-foot medians on both approaches (see Exhibit 18). With the construction of 60-foot medians, however, the driveway north of the tracks would need to be realigned. Additionally, the entrance to the adjacent business directly south of the tracks must be closed to allow 60-foot medians. The distance from the center of Woodlawn Boulevard crossing to the center of 79th Street crossing is 5,778 feet; distance from the Woodlawn Boulevard crossing to 37th Street crossing is 3,655 feet. These distances satisfy the one-half mile minimum length requirement of a Quiet Zone designation. Although these improvements do not necessarily guarantee a Quiet Zone, it is valuable to plan ahead for such designation. Adjacent crossings may be evaluated to determine whether a Quiet Zone designation is viable along the corridor. Woodlawn Boulevard is also listed as a non-programmed warning device upgrade project example (see Exhibit 39).

EXHIBIT 18: WOODLAWN BOULEVARD QUIET ZONE PROJECT EXAMPLE

The preliminary estimated construction cost for the Woodlawn Boulevard corridor project as of 2005 is $4,375,000.

Valley Center Corridor

The Valley Center Corridor consists of nine public crossings on the BNSF: 61st Street (DOT #009251A), Seneca Street (DOT #009250T), 69th Street (DOT #009249Y), 77th Street (DOT #009248S), Meridian Avenue (DOT #009247K), Main Street (DOT #009246D), 2nd Street (DOT #009244P), 5th Street (DOT #009243H) and 93rd Street (DOT #009242B). The table below evaluated Supplemental Safety Measures (SSMs) at each Valley Center crossing for Quiet Zone designation (see Exhibit 19); it has been updated to reflect the official diagnostic evaluation of the Corridor's crossings with KDOT, FRA and BNSF. The diagnostic review was done on March 22, 2007.

EXHIBIT 19: EVALUATION OF SSMS AT POTENTIAL QUIET ZONE CROSSINGS

Highway-Rail Grade Crossing	DOT #	Constant Warning Installed?	Flashing Lights/Gates Installed?	Temporary Closure	4-Quad Gate System	Permanent Closure	Medians with Gates	One-Way Street with Gates	Wayside Horns
61st Street	009251A	No	Yes	○	◒	○	●	○	◒
Seneca Street	009250T	No	Yes	○	◒	○	●	○	◒
69th Street	009249Y	No	Yes	○	◒	○	●	○	◒
77th Street	009248S	No	Yes	○	◒	◒	●	○	◒
Meridian Ave.	009247K	Yes	Yes	○	◒	○	●	○	◒
Main Street	009246D	Yes	Yes	○	●	○	○	○	◒
2nd Street	009244P	Yes	Yes	○	◒	○	●	○	◒
5th Street	009243H	Yes	Yes	○	◒	○	●	○	◒
93rd Street	009242B	No	No	○	◒	◒	○	○	◒

○ = Not a Viable Option ◒ = Possible Option ● = Most Probable Option

As Exhibit 19 shows, the most probable option for all crossings except Main and 93rd Streets is a median with gates. A median at Main Street would block driveway access on three quadrants of the intersection. A median at 93rd Street is not possible with the existing roadway width; the road would need to be widened and paved. In the event that median installation is not accepted as the appropriate safety measure, four-quadrant gates or wayside horns are possible options for all crossings. Wayside horns do not create a completely quiet corridor; however, the noise impact is directed only at oncoming travel lanes. One-way streets were determined a nonviable option for all crossings because they only work well on parallel streets that do not require drivers to travel more than one or two blocks out of their original path. Similarly, temporary or permanent closure of crossings are not viable options other than at 77th and 93rd Streets, due to the long distance required for detoured traffic and daily traffic volumes on these roads.

It would likely be the sole responsibility of the City of Valley Center to pay for costs associated with this Quiet Zone project example; however, the railroad and state may choose to participate if crossings are closed along the corridor. With the four-quadrant gate system, the railroad may require an annual payment from the City for routine maintenance of the third and fourth gates.

61st and Seneca Streets are listed as a crossing consolidation project example (see Exhibit 21) and grade separation project example (see Exhibit 27). 77th Street and Meridian Avenue are also listed as a crossing consolidation project example (see Exhibit 22) and grade separation project example (see Exhibit 28).

4.3 Land Use Planning

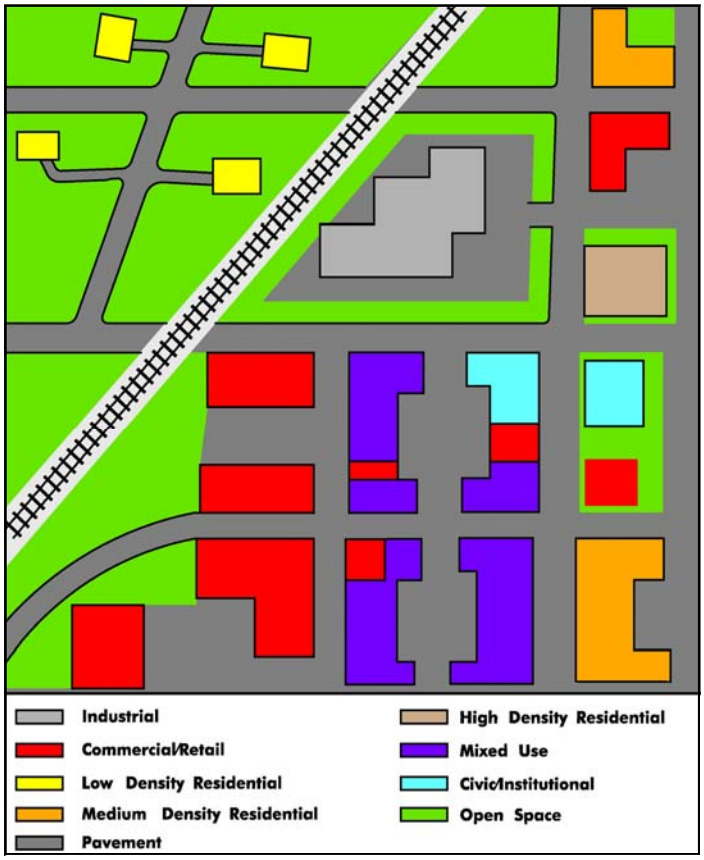
Land use planning involves the regulation of land and resources so as to efficiently manage its functionality and protect the surrounding environment. The compatibility of adjacent land uses is extremely important for the safety and general welfare of the public in addition to the economic development of the region. Local jurisdictions can include land use planning guidelines in their Comprehensive Plan as a strategy to direct future growth. For example, the 1999 Update to the 1993 Wichita/Sedgwick County Comprehensive Plan states that "Fire and EMS stations should be located in accordance with response time standards established in adopted facility plans".[10]

Effective land use planning is extremely important in all communities, especially those that are historic transportation centers. During the railroad boom in the 1850's, many towns and cities grew around the physical railroad tracks. However, many of these cities did not plan ahead for land use compatibility or placement of emergency response facilities in regards to high-density uses such as industry, schools, multifamily residential or civic uses. Patterns of development that generate significant traffic across highway-railroad grade crossings should be avoided whenever possible.

For instance, the Comprehensive Plan can include guidelines such as: "If necessary, encourage only low-density development when Emergency Response facilities are opposite the tracks" (see Exhibit 20) or "Use railroad tracks and major arterials to define boundaries of service areas for schools, parks, neighborhood shopping facilities, etc".

Such guidelines encourage appropriate development and create an awareness toward compatible land uses. This is not to say that adjacent land uses must be identical but that they promote key elements of urban design and form. Additionally, by encouraging low density uses opposite the railroad tracks from Emergency Response facilities, the likelihood of an emergency and therefore the likelihood of emergency vehicles responding at that location is decreased.

EXHIBIT 20: LAND USE DEMONSTRATION PROJECT



4.4 Crossing Consolidations

The consolidation or closure of redundant grade crossings is a safe and reasonably cost-effective alternative to decrease the regional Hazard Index by eliminating the grade crossing altogether. Consolidating grade crossings alleviates the possibility of a collision where the crossing once was located and redirects traffic to a nearby route. To be successful, crossing consolidation requires the cooperation of local and state governments, and the operating railroad. The state and railroad will work with the community when crossings are consolidated.

The existing crossing surface, pavement markings, warning devices and any other traffic control devices at or near the crossing should be removed upon the closure of a crossing. Oftentimes the railroad is responsible for the removal of the actual crossing surface and warning devices located at the crossing while the local highway authority is responsible for the removal of any traffic control devices or advance warning approaching the crossing. Barricades and other regulatory signage should be installed to alert motorists that the crossing is now closed; signage may include information regarding alternate routes.

The following locations could be possible projects for crossing consolidation:

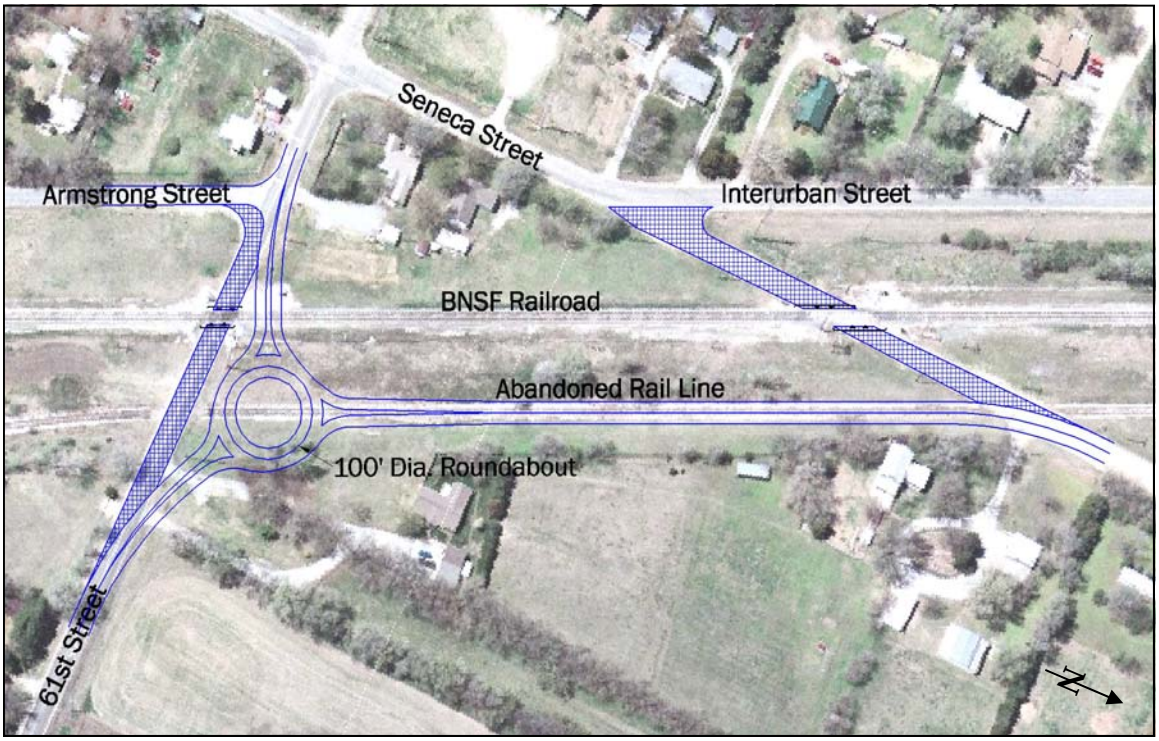
- 61st Street (DOT #009251A) and Seneca Street (DOT #009250T) in Valley Center, on the BNSF
- 77th Street (DOT #009248S) and Meridian Avenue (DOT #009247K) in Valley Center, on the BNSF
- Clifton Avenue (DOT #009294T) in Sedgwick County, on the BNSF
- 53rd Street (DOT #445213R) and Park Street (DOT #445212J) in Maize, on the K&O
- Washington Avenue (DOT #009394X) and Kay Street (DOT #009395E) in Derby, on the BNSF
- Wichita Corridor in Wichita, on the K&O

53rd Street, Park Street, Seneca Street, Washington Avenue, Kay Street and those crossings included in the Wichita Corridor are not listed in the Top 50 Hazard Index, however crossing consolidations may be possible at each location. Numerous improvements were reviewed at each crossing but it was concluded that Clifton Avenue, 53rd Street, Park Street, Washington Avenue, Kay Street and the Wichita Corridor are not suitable for grade separation or major crossing improvement due to adjacent residential and commercial property impacts as well as right-of-way acquisition. The remaining crossings were considered suitable examples for grade separations and/or other improvements and are discussed in other sections of the toolbox.

61st Street (DOT #009251A) and Seneca Street (DOT #009250T)

The 61st Street and Seneca Street crossings are located in Valley Center on the BNSF. The Seneca Street crossing could be closed at this location and 61st Street crossing realigned to create a perpendicular crossing (see Exhibit 21). When a railroad diagonally crosses two intersecting section line roads, it is possible that an alternative like this could be applied at such locations. A compact roundabout and roadway connecting 61st Street to Seneca Street could be constructed along the abandoned rail line. Approval would need to be granted to construct the roadway along the abandoned rail line. Additionally, building a roundabout may have an impact on the single-family home located adjacent to the proposed roundabout. Currently there is storage for approximately two vehicles on the south approach of the railroad crossing; it may be difficult to construct more vehicular storage at this location. A standard intersection with stop signs is also acceptable in place of a compact roundabout. 61st and Seneca Streets are listed as a Quiet Zone project example in the Valley Center Corridor (see Exhibit 19) and a grade separation project example (see Exhibit 27).

EXHIBIT 21: 61ST STREET AND SENECA STREET CROSSING CONSOLIDATION PROJECT EXAMPLE



The preliminary construction cost estimate for the 61st Street and Seneca Street consolidation project as of 2007 totals approximately $1,500,000.

77th Street (DOT #009248S) and Meridian Avenue (DOT #009247K)

The 77th Street and Meridian Avenue crossings are located in Valley Center on the BNSF. The 77th Street crossing could be closed and traffic diverted onto Ramsey Drive (see Exhibit 22). When a railroad diagonally crosses two intersecting section line roads, it is possible that an alternative like this could be applied to those locations. Ramsey Drive would most likely be realigned and improved to handle the increase in vehicular traffic. The diagram shows a curved alignment for Ramsey Drive designed at 20 mph to minimize adjacent property impacts. The intersection of Ramsey Drive and Meridian Avenue may meet traffic signal warrants and should be studied for signalization. 77th Street and Meridian Avenue are listed as a Quiet Zone project example in the Valley Center Corridor (see Exhibit 19) and as a grade separation project example (see Exhibit 28).

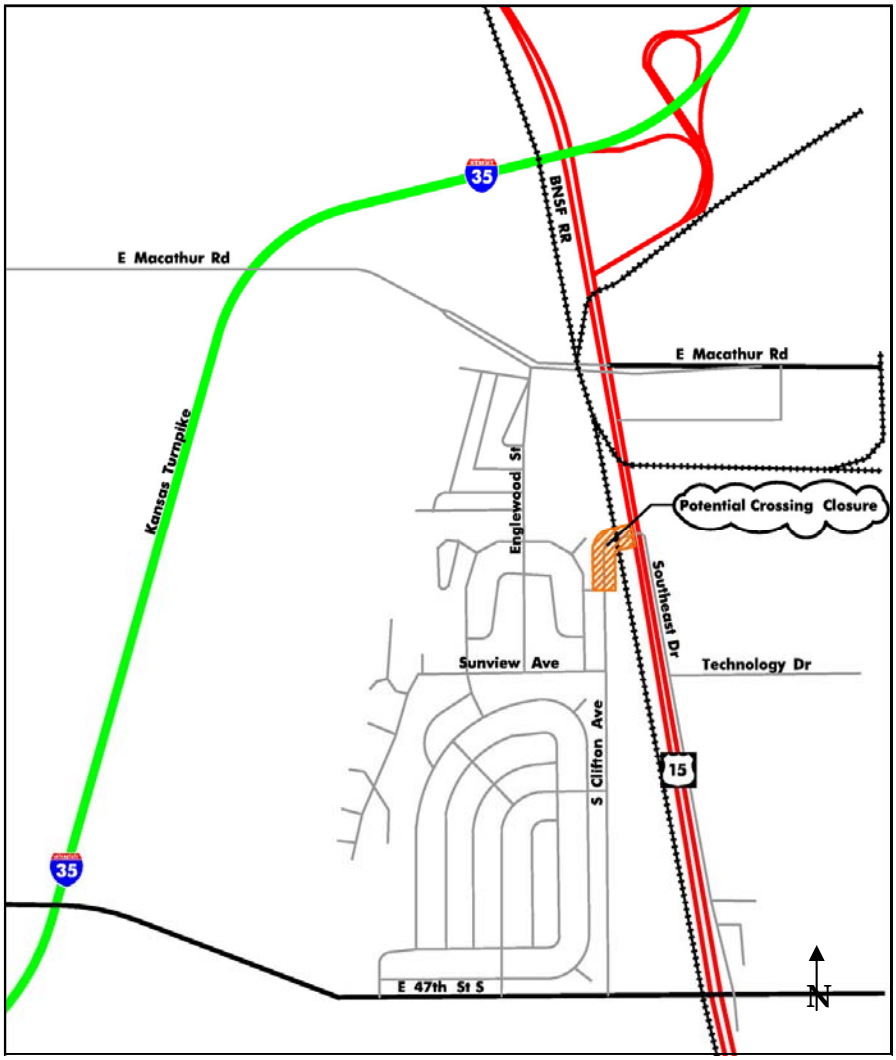
EXHIBIT 22: 77TH STREET AND MERIDIAN AVE. CROSSING CONSOLIDATION PROJECT EXAMPLE

The preliminary construction cost estimate for the 77th Street and Meridian Avenue consolidation project as of 2007 totals approximately $450,000.

Clifton Avenue (DOT #009294T)

The Clifton Avenue crossing is located in Sedgwick County on the BNSF and intersects K-15 Highway. The Clifton Avenue crossing could be closed (see Exhibit 23). The adjacent neighborhood to the west is accessible from the north off of Macarthur Road and from the south off of 47th Street. Closing the crossing at Clifton Avenue may increase traffic on Macarthur Road, therefore intersection improvements (including signalization) at Englewood Street may also be considered.

EXHIBIT 23: CLIFTON AVENUE CROSSING CONSOLIDATION PROJECT EXAMPLE



The preliminary construction cost estimate for the Clifton Avenue consolidation project as of 2007 totals approximately $60,000. This would not include signalization at the intersection of MacArthur Road and Englewood Street or any intersection improvements at Englewood Street.

53rd Street (DOT #445213R) and Park Street (DOT #445212J)

The 53rd Street and Park Street crossings are located in Maize on the K&O. The Park Street crossing could be closed (see Exhibit 24) and Depot Street could then be realigned to create a perpendicular intersection at 53rd Street. The diagram shows a curved alignment for Depot Street designed at 25 mph to minimize adjacent property impacts. Sedgwick Street would remain to provide additional access to the adjacent mobile home community. In conjunction with this crossing consolidation, the warning device at 53rd Street crossing could be upgraded from flashing lights to a combination of flashing lights and gates.

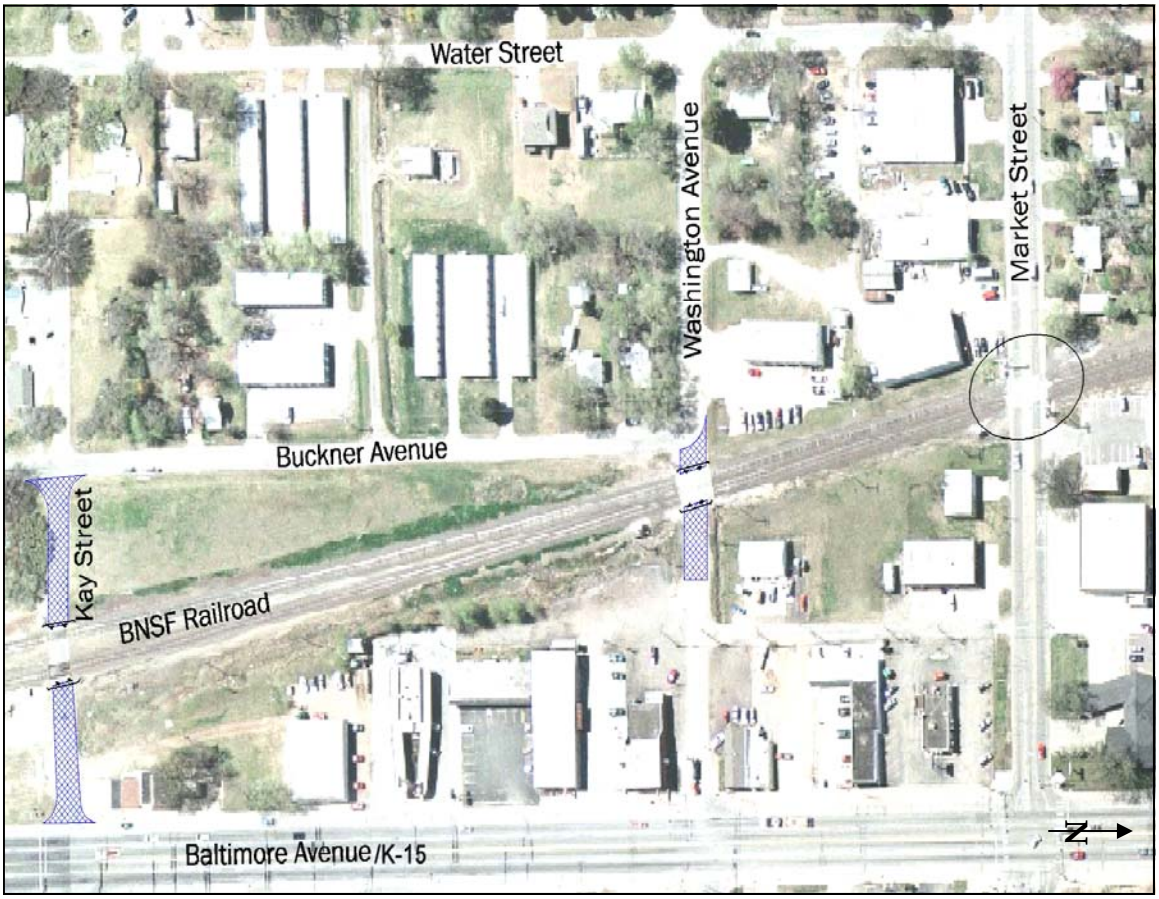
EXHIBIT 24: 53RD STREET AND PARK STREET CROSSING CONSOLIDATION PROJECT EXAMPLE

The preliminary construction cost estimate for the 53rd Street and Park Street consolidation project as of 2007 totals approximately $125,000.

Washington Avenue (DOT #009394X) and Kay Street (DOT #009395E)

The Washington Avenue and Kay Street crossings are located in Derby on the BNSF. Both crossings could be closed with traffic redirected to Water Street or Buckner Avenue to then use the crossing at Market Street (see Exhibit 25). The traffic volumes on Washington Street and Kay Street are 1,278 and 656, respectively so it is likely that Buckner Avenue, Water Street and Market Street would be able to handle this increase in traffic without intersection improvements. By consolidating these crossings, it may allow the City of Derby to make improvements at Market Street for a possible Quiet Zone designation in the future.

EXHIBIT 25: WASHINGTON AVE. AND KAY STREET CROSSING CONSOLIDATION PROJECT EXAMPLE

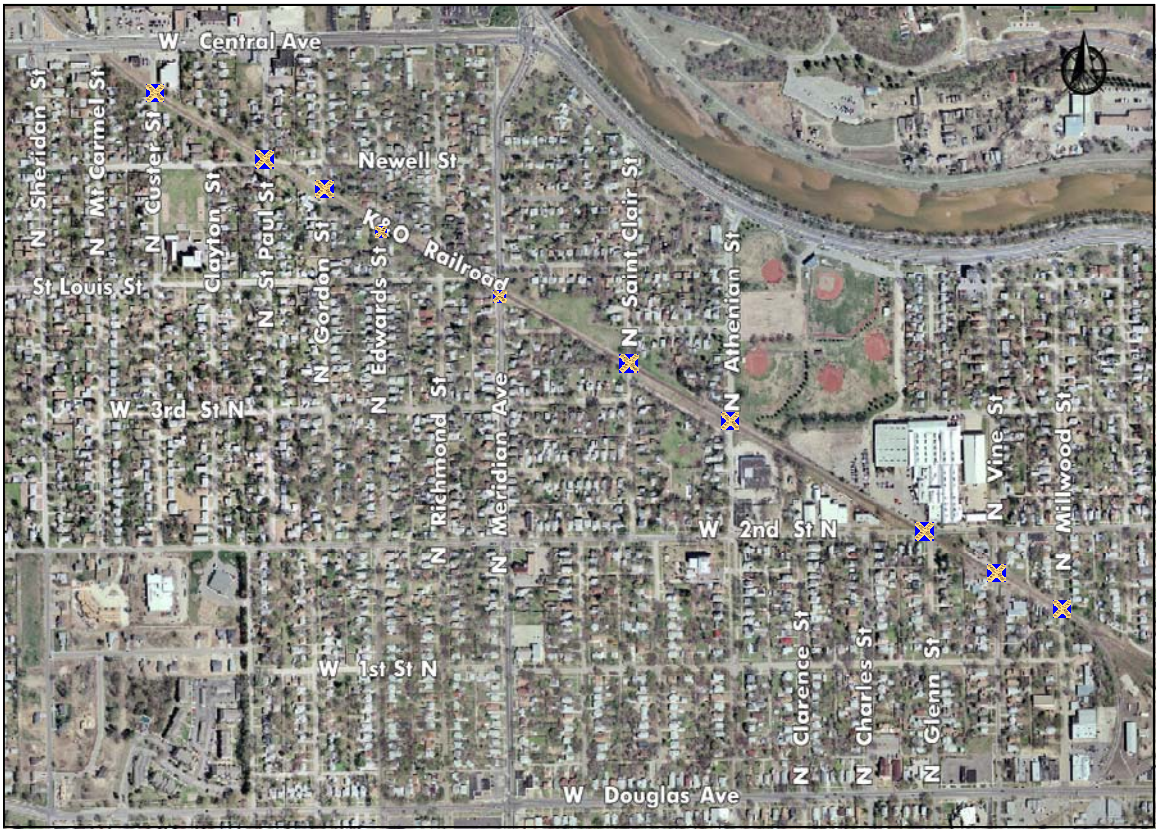


The preliminary construction cost estimate for the Washington Avenue and Kay Street consolidation project as of 2007 totals approximately $65,000.

Wichita Corridor

The Wichita Corridor is slightly more than one mile in length, and consists of ten public crossings on the K&O between Central Avenue and 1st Street: Custer Street (DOT #445191T), St. Paul Street (DOT #445190L), Gordon Street (DOT #445189S), Edwards Street (DOT #445188K), Meridian Avenue (DOT #445187D), St. Clair Street (DOT #445186W), Athenian Street (DOT #445185P), 2nd Street (DOT #445183B), Vine Street (DOT #445182U) and Millwood Street (DOT #445181M). The majority of these crossings are located within residential neighborhoods; one or more redundant crossings along this Corridor could be consolidated (see crossing locations in Exhibit 26). Crossing consolidation is effective in locations where motorists do not have to detour more than a few blocks out of their way, as is the case in this corridor which has closely spaced blocks. One or more crossings with traffic counts of less than 300 vehicles per day (ie: Gordon, Custer or St. Clair Streets) may be consolidated with traffic rerouted to one of the nearby collectors or local roads. Meridian Avenue is programmed for KDOT Section 130 funding in Fiscal Year 2008 to upgrade the existing warning device from lights to a combination of flashing lights and gates.

EXHIBIT 26: WICHITA CORRIDOR CROSSING CONSOLIDATION PROJECT EXAMPLE



A preliminary construction cost estimate for the Wichita Corridor consolidation project is dependent upon which crossing(s) would be consolidated, and is therefore unavailable at this time. The City of Wichita may perform traffic studies at each location to identify the most feasible crossing(s) for consolidation.

4.5 Grade Separations

Grade separations eliminate an existing highway-railroad grade crossing by elevating either the highway or the railroad tracks, thus allowing traffic to move unimpeded at crossings. The elimination of a grade crossing by grade separation removes the possibility of a collision at the crossing and therefore greatly increases vehicular safety at the location. Also, it lessens motorist delay by eliminating the need to stop when a train occupies the crossing. Grade separations are extremely costly projects which may require the financial support of federal, state and/or local agencies as well as the cooperation of the railroad.

The following locations could be possible projects for grade separation:

- 61st Street (DOT #009251A) and Seneca Street (DOT #009250T) in Valley Center, on the BNSF
- 77th Street (DOT #009248S) and Meridian Avenue (DOT #009247K) in Valley Center, on the BNSF
- 79th Street/190th Street (DOT #009628Y) on County Line Road, on the BNSF
- K-53 Highway (DOT #009406P) in Mulvane, on the BNSF

The Wichita/Sedgwick County Railroad Alternative Analysis (1997) and Supplement (1998) were completed following a merger of the UPRR with the Southern Pacific Railroad, resulting in an increase in train traffic throughout the region. The Analysis outlined projects to mitigate the increase of such traffic as well as to address safety and congestion concerns. The Central Corridor project is a product of this Analysis and will ultimately elevate the WUT/WTA corridor through the center of Wichita. It grade separates three new crossings and corrects vertical clearance at two others. The RRCP cross-referenced the existing Alternative Analysis to identify other potential grade separation projects in the region. Although several locations were identified in the Alternative Analysis and were also listed with a Top 50 Hazard Index, this section focuses on four projects with high Hazard Indices:

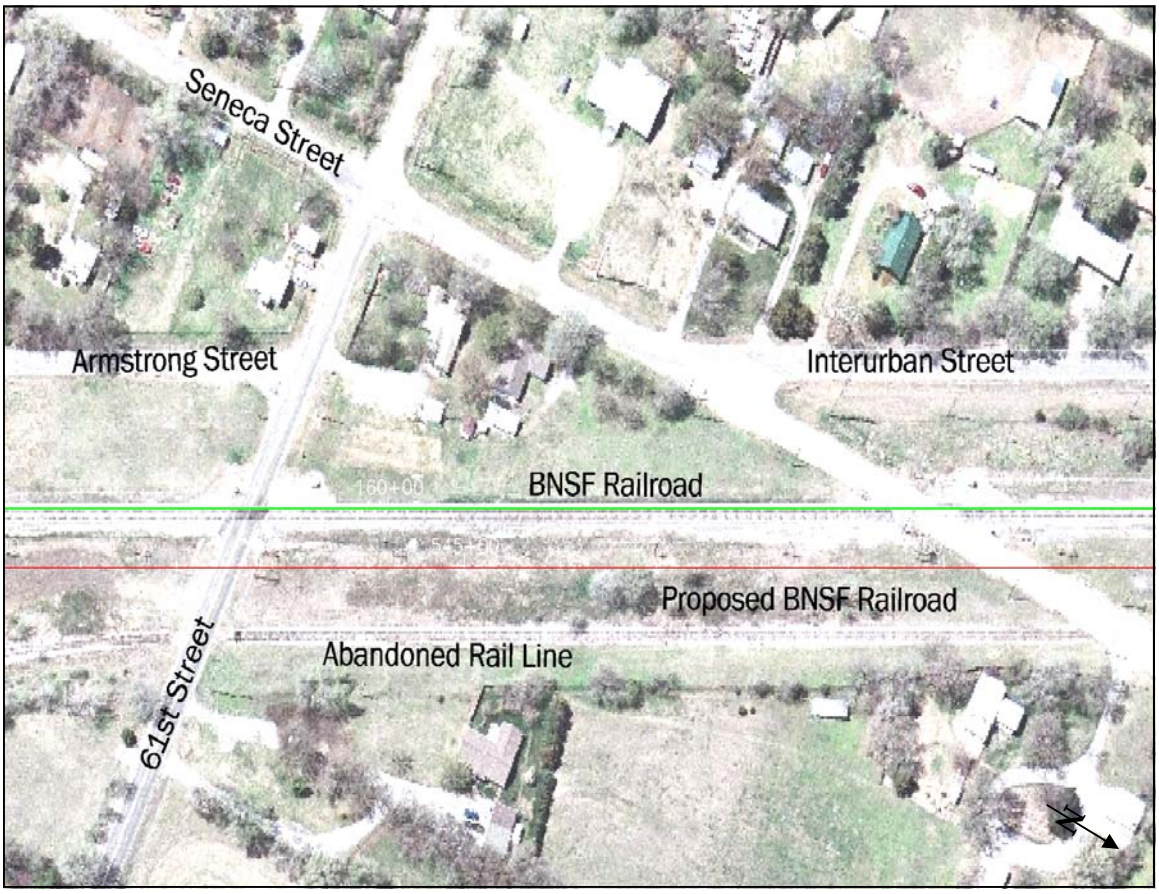
- Pawnee Avenue (DOT #009286B) and Hydraulic Avenue (DOT #009285U) Underpass in Wichita, on the BNSF
- Lincoln Avenue (DOT #009280K) to Wassall Road (DOT #009287H) Underpass in Wichita, on the BNSF
- Pawnee Avenue Underpass (DOT #595060C) in Wichita, on the UPRR
- 21st Street (DOT #595029R and #445091N) Underpass in Wichita, on the UPRR

All proposed grade separation projects shown in both the Wichita/Sedgwick County Alternative Analysis and Top 50 Hazard Index list is available in Exhibit 35 (see page 43). Although the proposed expanded project of elevating the BNSF tracks from Lincoln Avenue to Wassall Road is not specifically outlined in the Analysis, it has great potential to lessen the regional Hazard Index and is included here as a project example.

61st Street (DOT #009251A) and Seneca Street (DOT #009250T)

The 61st Street and Seneca Street crossings are located in Valley Center, on the BNSF. At these crossing locations, the BNSF railroad tracks could be shifted 50 feet east of the existing tracks and elevated, carrying the tracks over 61st Street and Seneca Street crossings (see Exhibit 27). 61st Street and Seneca Street are also listed as a Quiet Zone project example in the Valley Center Corridor (see Exhibit 19) and as a crossing consolidation project example (see Exhibit 21).

EXHIBIT 27: 61ST STREET AND SENECA STREET GRADE SEPARATION PROJECT EXAMPLE

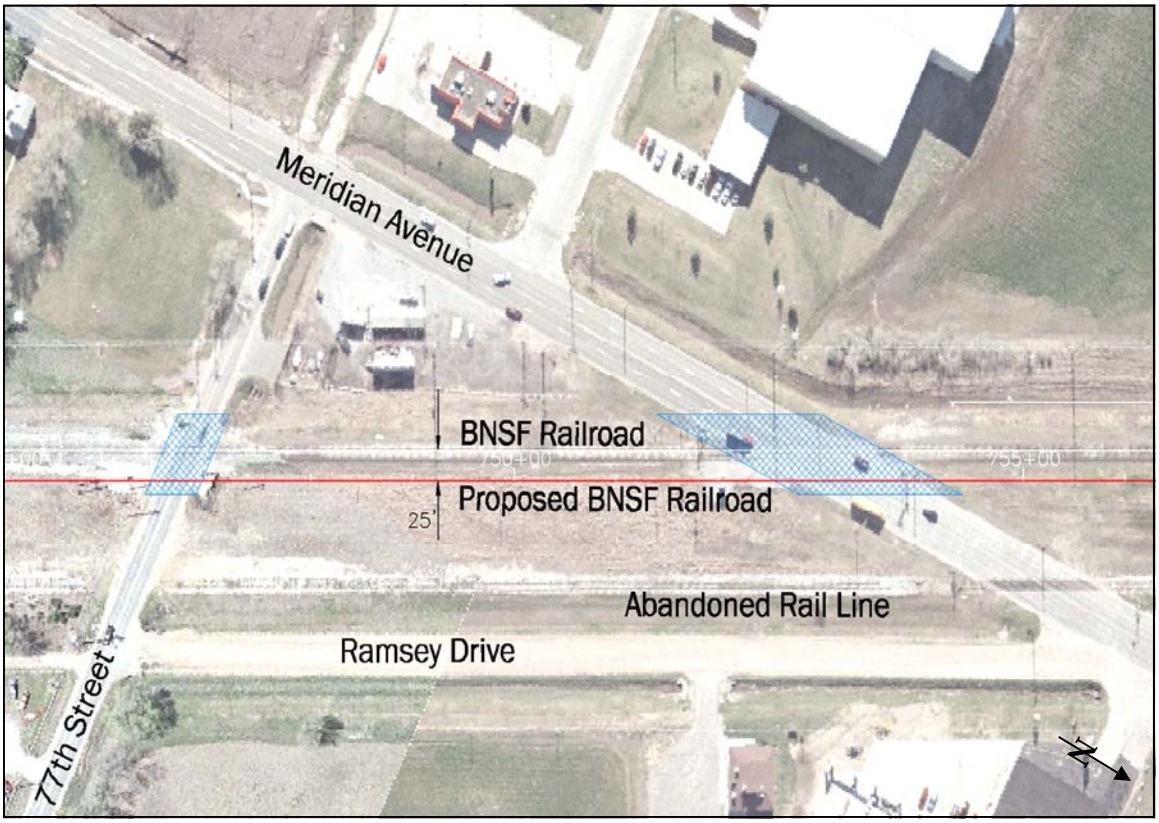


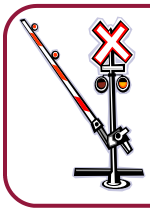
The preliminary construction cost estimate for the 61st Street and Seneca Street grade separation project as of 2007 totals approximately $14,500,000.

77th Street (DOT #009248S) and Meridian Avenue (DOT #009247K)

The 77th Street and Meridian Avenue crossings are located in Valley Center on the BNSF. At these crossing locations the BNSF railroad tracks could be shifted 25 feet east of the existing tracks and elevated, carrying the tracks over the 77th Street and Meridian Avenue crossings (see Exhibit 28). The 77th Street and Meridian Avenue crossings are also listed as a Quiet Zone project example in the Valley Center Corridor (see Exhibit 19) and as a crossing consolidation project example (see Exhibit 22).

EXHIBIT 28: 77TH STREET AND MERIDIAN AVENUE GRADE SEPARATION PROJECT EXAMPLE



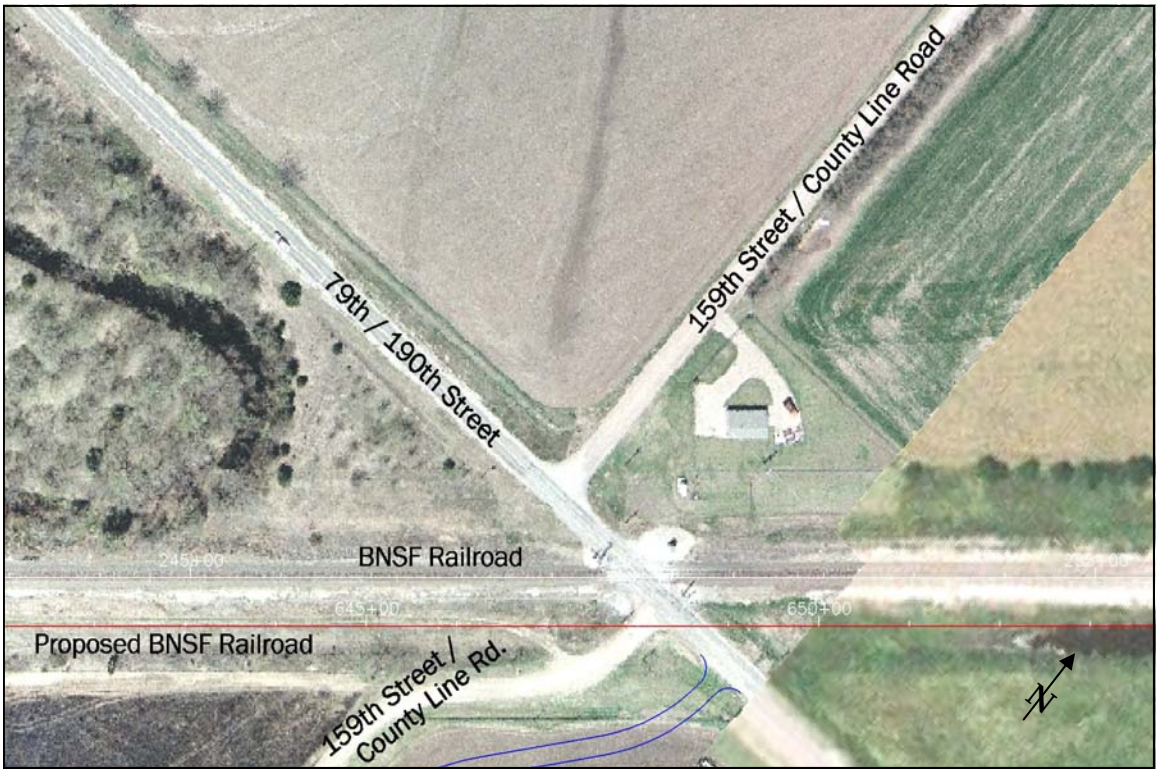


The preliminary construction cost estimate for the 77th Street and Meridian Avenue grade separation project as of 2007 totals approximately $19,500,000. The cost estimate provided assumes earth embankment on the majority of the corridor rather than being built completely with retaining walls, which are more expensive. However, retaining walls would be needed near the grain elevator.

79th/190th Street (DOT #009628Y)

The 79th/190th Street crossing is located on the border of Sedgwick and Butler Counties, on the BNSF. The BNSF railroad tracks could be shifted 50 feet east of the existing tracks and elevated at this location, carrying the tracks over 79th/190th Street (see Exhibit 29) and realigning County Line Road. There are three drainage structures located within the limits of the grade separation. These would most likely need to be extended to provide adequate flow. There is also a turnout located north of the crossing that would need to be replaced. The railroad will most likely require the structure be built to accommodate a future second main line as well as an access road. A second main line has been constructed south of Mulvane to increase railroad capacity. It is important to note that 79th/190th Street is located on the boundary of the WAMPO planning area and would therefore require a bi-county program for implementation. 79th/190th Street is also listed as a crossing geometry project example (see Exhibit 40).

EXHIBIT 29: 79TH/190TH STREET GRADE SEPARATION PROJECT EXAMPLE

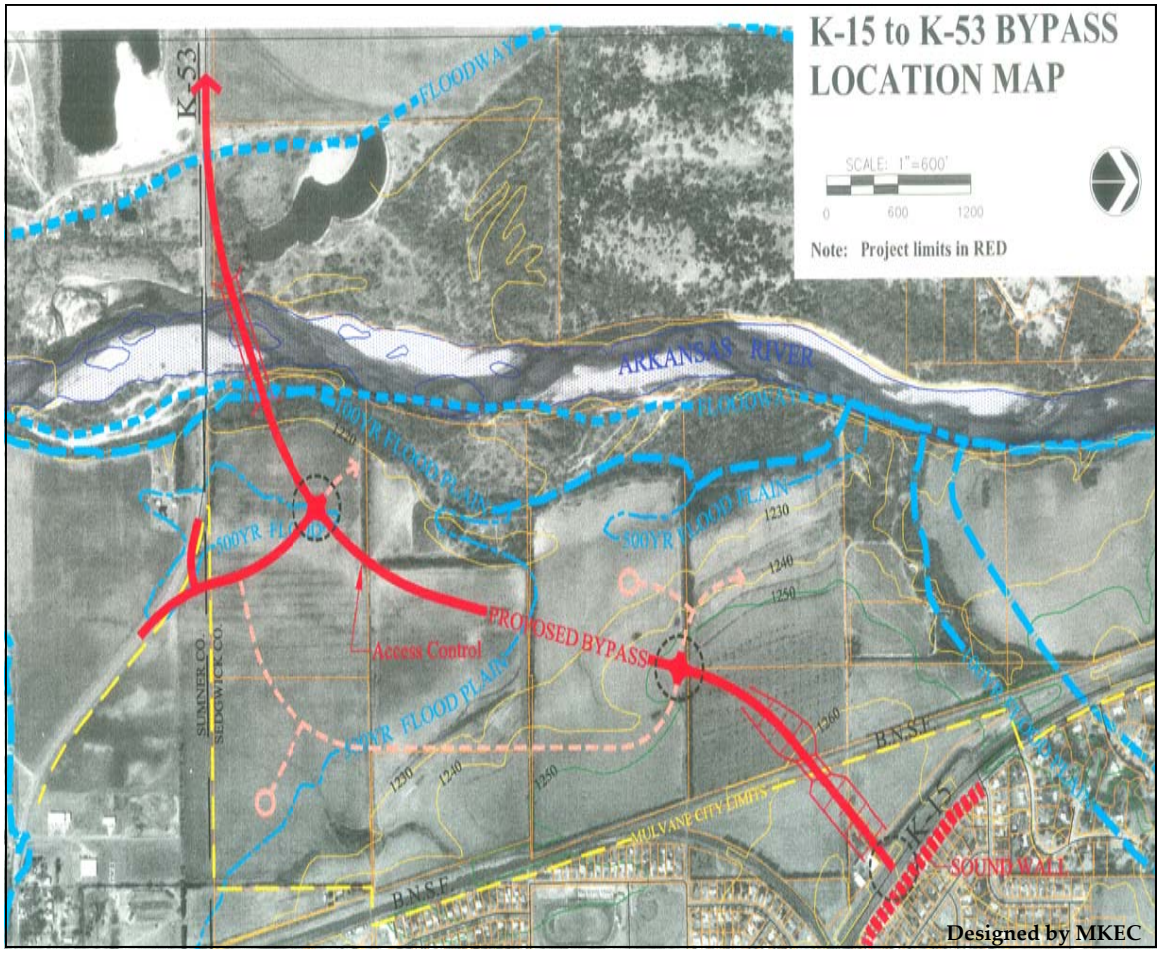


The preliminary construction cost estimate for the 79th/190th Street grade separation project as of 2007 totals approximately $12,750,000.

K-53 Highway (DOT #009406P)

The K-53 Highway crossing is located in Mulvane, on the BNSF. In the 1990's the City of Mulvane applied for funds to construct a bypass from K-53 Highway near the Arkansas River to K-15 Highway; this project would include a grade separation over the existing BNSF tracks near the proposed K-15 Highway intersection. Mid-Kansas Engineering Consultants created a preliminary project design (see Exhibit 30) in 1999.

EXHIBIT 30: K-53 HIGHWAY GRADE SEPARATION PROJECT EXAMPLE



A preliminary construction cost estimate for the K-53 Highway grade separation project is currently unavailable.

Pawnee Avenue (DOT #009286B) and Hydraulic Avenue (DOT #009285U)

According to the Wichita/Sedgwick County Alternative Analysis, the BNSF railroad tracks could be elevated at the Hydraulic Avenue and Pawnee Avenue crossings as part of the Pawnee Avenue BNSF underpass project (see Exhibit 31). To provide a minimum amount of relocation on the BNSF, the existing grade on Pawnee and Hydraulic would be lowered approximately five feet. The lowering of these streets would then require reconstruction of a portion of Southeast Boulevard and Pawnee Avenue to the east. It was assumed that storm water pump stations would be required at each location. By lowering the grades of these streets by five feet, the length of track to be raised is reduced to 6,500 feet and improves the approaches to the intersections with Mt. Vernon Street and Wassall Road.[11]

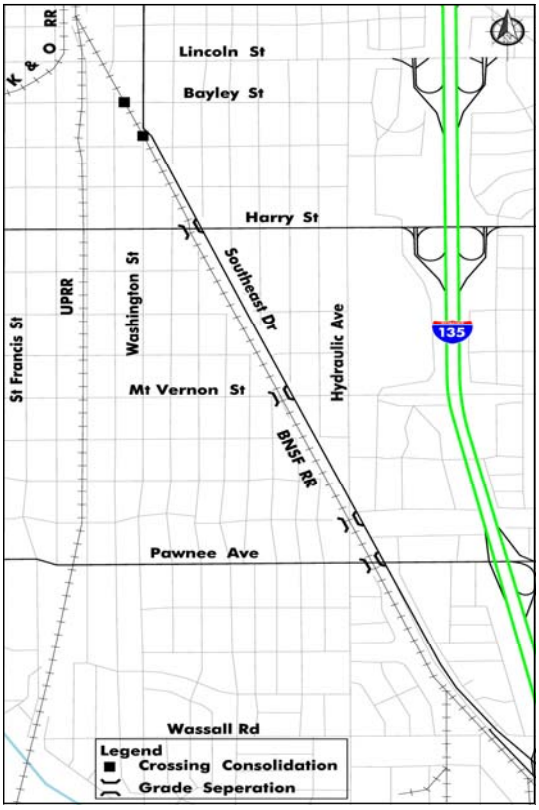
EXHIBIT 31: PAWNEE AVE. AND HYDRAULIC AVE. GRADE SEPARATION PROJECT EXAMPLE

The preliminary construction cost estimate for the Pawnee Avenue and Hydraulic Avenue - BNSF underpass project as of 2007 totals approximately $18,500,000.

Lincoln Avenue (DOT #009280K) to Wassall Road (DOT #009287H)

Lincoln Avenue (DOT #009280K), Bayley Street (DOT #009281S), Washington Street (DOT #009282Y), Harry Street (DOT #009283F), Mt. Vernon Street (DOT #009284M), Hydraulic Avenue (DOT #009285U), Pawnee Avenue (DOT #009286B) and Wassall Road (DOT #009287H) crossings are located in Wichita, on the BNSF. This project example would expand the project limits of the previous Pawnee Avenue and Hydraulic Avenue BNSF underpass project (see Exhibit 31) by not only elevating the BNSF tracks over Pawnee Avenue and Hydraulic Avenue, but also elevating the tracks over Mt. Vernon Street (DOT #009284M) and Harry Street (DOT #009283F) crossings (see Exhibit 32). Additionally, grade crossings at Washington Street (DOT #009282Y) and Bayley Street (DOT #009281S) could be closed to bring the elevated tracks to existing grade south of Bayley Street. There would be no road work required at Lincoln Street crossing; the existing crossing at Wassall Road would be raised approximately eight inches to match the proposed track elevation. Retaining walls are proposed on the east side of the elevated tracks and an earth embankment is proposed on the west side of the tracks.

EXHIBIT 32: LINCOLN AVENUE TO WASSALL ROAD GRADE SEPARATION PROJECT EXAMPLE

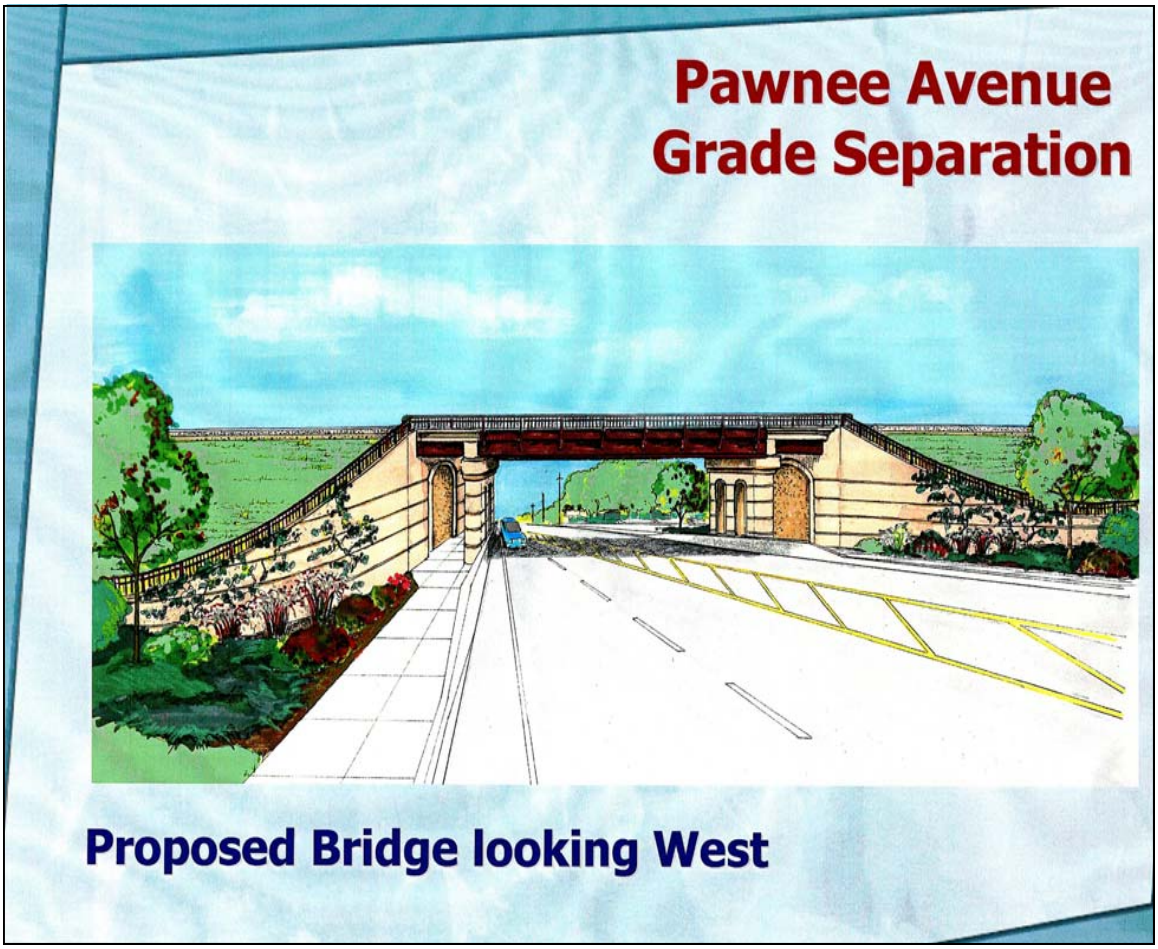


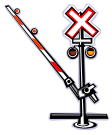
30% concept plans were originally completed from Mt. Vernon Street to Wassall Road and included underpasses at Pawnee Avenue and Hydraulic Avenue as well as road work at Mt. Vernon and Wassall. The preliminary construction cost estimate for the Lincoln Avenue to Wassall Road BNSF underpass project example as of 2007 totals approximately $45,000,000-$65,000,000. This estimate includes the original concept plans and expands the project limits north to Lincoln Street. Probable construction costs would be dependent on several key design criteria not yet negotiated between the City of Wichita and the BNSF.

Pawnee Avenue (DOT #595060C)

According to the Wichita/Sedgwick County Alternative Analysis, the UPRR railroad tracks could be elevated at the Pawnee Avenue crossing as part of the Pawnee Avenue UPRR underpass project (see Exhibit 33). To provide a minimum amount of relocation on the UPRR, the existing grade on Pawnee Avenue could be lowered. A storm water pump station may also be needed at this location. A Shoo-fly detour for trains may be required during construction.

EXHIBIT 33: PAWNEE AVENUE GRADE SEPARATION PROJECT EXAMPLE





The preliminary construction cost estimate for the Pawnee Avenue - UPRR underpass project as of 2007 totals approximately $17,250,000.

21st Street (DOT #445091N)

The 21st Street crossing is located in Wichita, on the UPRR. Existing concepts are being reviewed at this location, including the option presented below (see Exhibit 34). Original concepts were developed in the Wichita/Sedgwick County Alternative Analysis. Preliminary design elevates 21st Street over two UPRR tracks. This concept would redirect east and west bound traffic north of 21st Street over the existing tracks. Additionally, this would leave 21st Street open during construction for local access. Two industrial entrances on 21st Street would be realigned to enhance accessibility. Designs were current as of May 2006.

EXHIBIT 34: 21ST STREET GRADE SEPARATION PROJECT EXAMPLE

The preliminary construction cost estimate for the 21st Street grade separation project as of 2007 totals approximately $26,000,000.

Wichita/Sedgwick County Alternative Analysis Grade Separation Projects

The table below (see Exhibit 35) shows all grade separation projects which were recorded in both the Wichita/Sedgwick County Alternative Analysis and also fall on the Top 50 Hazard Index list. Concept plans for grade separation projects can be found in the Alternative Analysis and Supplement. Grade separation projects labeled as "Status Currently Pending" are those in which further design or construction has been completed since the 1997 study. Cost estimates are shown below with rounded original figures from 1997 as well as adjusted figures for 2007. The multiplier used is based on KDOT's rate of inflation at 41.20%. Estimates include all construction costs, 15% contingency, right-of-way cost, utilities, and preliminary and construction engineering.

EXHIBIT 35: WICHITA/SEDGWICK COUNTY ALTERNATIVE ANALYSIS GRADE SEPARATIONS

Street Name	Hazard Index	Overpass or Underpass?	Operating Railroad	1997 Total Cost Estimate	2007 Total Cost Estimate
STATUS CURRENTLY PENDING					
Pawnee Avenue	78,037	Underpass	BNSF	$10,250,000	$18,500,000*
Hydraulic Ave.	26,847				
13th Street	56,612	Central Corridor	WUT	$46,000,000	$99,000,000*
Murdock Street	51,072				
Central Street	50,810				
21st Street	49,066	Overpass	UPRR	$24,000,000	$26,000,000*
Pawnee Avenue	16,075	Underpass	UPRR	$6,000,000	$17,250,000**
			Subtotal	$86,250,000	$160,750,000
STATUS NOT CURRENTLY PENDING/UNKNOWN					
47th Street	68,742	Underpass	BNSF	$7,000,000	$9,750,000
Harry Street	45,338	Underpass	BNSF	$7,500,000	$10,500,000
Harry Street	45,338	Overpass	BNSF/UPRR	$19,000,000	$26,750,000
63rd Street	41,439	Underpass	BNSF	$7,250,000	$10,250,000
63rd Street	41,439	Overpass	BNSF	$8,250,000	$11,750,000
47th Street	9,677	Overpass	UPRR	$9,750,000	$13,500,000
Harry Street	7,305	Overpass	UPRR	$9,250,000	$12,750,000
			Subtotal	$68,000,000	$95,250,000

*Since the publication of the Wichita/Sedgwick County Alternative Analysis in 1997, further design has been completed on these projects including updated construction costs. Therefore, the standard multiplier used by KDOT to reflect inflation rates was not used here.

**This figure does not include right-of-way costs. Preliminary construction cost estimates with right-of-way could reach approximately $30,000,000.

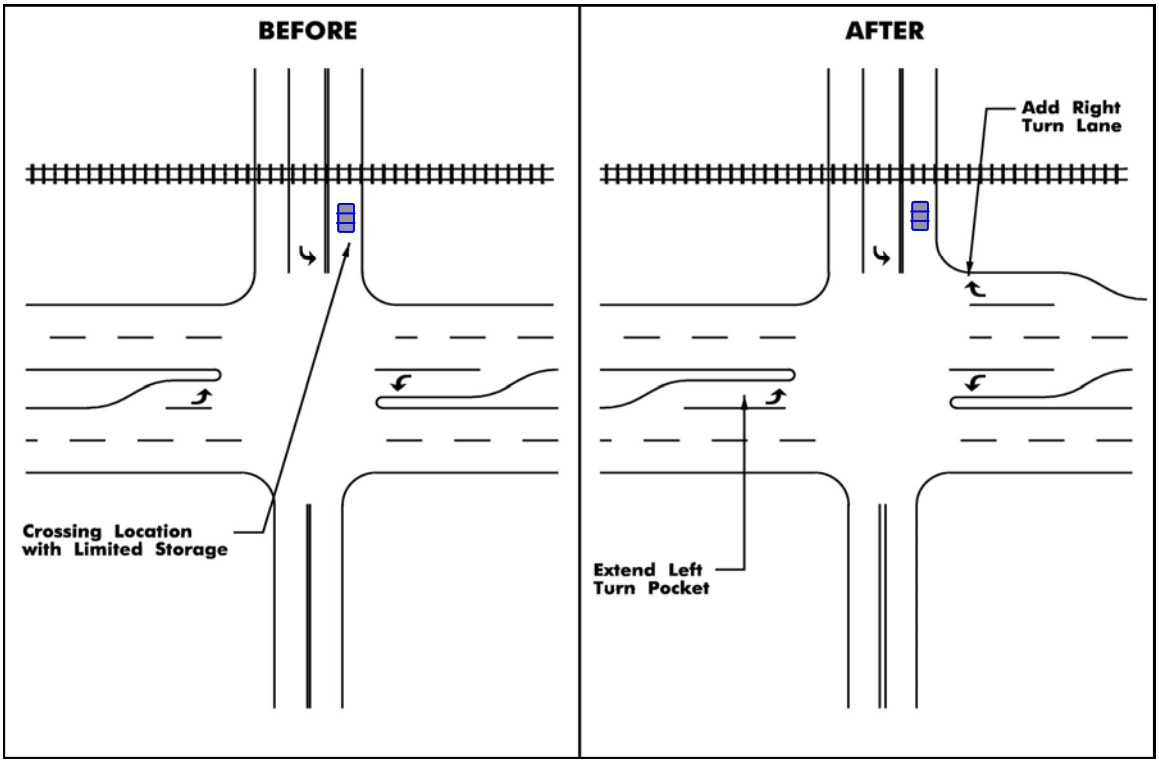
4.6 Turn Lane Extensions

A left-turn lane should be of adequate length to provide vehicular storage for those vehicles turning left without overflowing into an adjacent through-lane. When left-turning vehicles overflow into the through-lane, through traffic is forced to stop or change lanes. This is escalated further when the intersection is located parallel to railroad tracks.

The figure below (see Exhibit 36-left) depicts an intersection with a short left-turn pocket and limited vehicular storage approaching the railroad tracks. When a train approaches the crossing, those vehicles wanting to make left turns and proceed over the crossing must wait until the train has passed. This can create congestion in adjacent through lanes. Similarly, those vehicles wishing to make a right turn over the crossing may also create congestion in the through lane until the train has passed. By extending the left-turn pocket to allow for more vehicular capacity and by adding a right-turn lane (see Exhibit 36-right), the flow of through traffic is improved during the passage of a train. This design can be applied to several crossing locations in the WAMPO region including 37th Street on the BNSF, Broadway Street on the K&O and Zoo Boulevard on the K&O.

When a highway-railroad grade crossing is near an intersection, traffic signals should be interconnected with railroad signals to clear vehicles from the crossing at the detection of an approaching train. In most cases, signal preemption activity begins at least 20 seconds before the train crosses the highway. This type of signal interconnection project or other Intelligent Transportation System (ITS) may be eligible for state funding with railroad coordination.

EXHIBIT 36: TURN LANE EXTENSION/SIGNAL INTERCONNECTION DEMONSTRATION PROJECT



4.7 KDOT Warning Device Upgrade Projects

Active warning device systems inform motorists and pedestrians of the approach or presence of trains on or near highway-railroad grade crossings. Active warning devices include flashing lights, bells and gates. Each year, Section 130 funds are distributed nationwide for warning device upgrades. The table below (see Exhibit 37) lists the number of projects and total KDOT Section 130 allocations from Fiscal Years 2003-2008 for the WAMPO region. Warning device upgrades are most often the combination of flashing lights and gates; crossing surface upgrades may be done in conjunction with warning device upgrades.

EXHIBIT 37: TOTAL KDOT PROJECTS FUNDED BY SECTION 130 (FY 2003-2008)

Total $ Spent	2003	2004	2005	2006	2007	2008
	$230,570	$171,658	$278,222	$323,804	$975,303	$1,650,000
# of Projects	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**
BNSF	1	0	0	2	0	2
UPRR	1	1	2	0	3	0
K&O	0	0	0	0	3	7

Exhibit 38 depicts the crossings slated for KDOT warning device upgrades for Fiscal Years 2007-2008 in the WAMPO region that are also located on the Top 50 Hazard Index list.

EXHIBIT 38: KDOT PROJECTS FUNDED BY SECTION 130 (FY 2007-2008)

Street	DOT #	City	Rail-road	Project #	Cost Estimate	Program Year	Hazard Index	Existing Warning Device
Seneca St.	009368H	Wichita	K&O	X-2557-01	$250,000	2007	18,459	Lights
Douglas St.	445161B	Wichita	K&O	X-2628-01	$170,000	2008	12,856	Lights
Maple St.	445167S	Wichita	K&O	X-2627-01	$220,000	2008	8,935	Lights
Meridian Ave	445187D	Wichita	K&O	X-2629-01	$180,000	2008	8,984	Lights

4.8 Non-Programmed Warning Device Upgrades

The following table (see Exhibit 39) shows crossing locations on the Top 50 Hazard Index list where warning device upgrades could potentially occur. These locations are not currently listed on KDOT's Section 130 program (FY 2003-2008) nor are they listed in WAMPO's TIP through Fiscal Year 2010. Several alternatives were identified in the RRCP consisting of crossing surface upgrades, capacity improvements or other construction projects in which warning device upgrades could possibly be done in conjunction with such improvements. Funding for warning device upgrades may be negotiated through the Section 130 program or through other state programs. 17th Street is listed as a crossing condition project example (see Section 4.1). Maize Road and Woodlawn Boulevard are listed as Quiet Zone project examples (see Exhibits 17 and 18, respectively).

EXHIBIT 39: NON-PROGRAMMED WARNING DEVICE UPGRADES

Street	DOT #	City	Railroad	ADT	Trains Per Day	Hazard Index	Existing Warning Device
*31st Street	009290R	Wichita	BNSF	1,287	38	48,906	Crossbucks
K-15 Hwy	009377G	Wichita	BNSF	31,407	2	37,688	Lights
K-15 Hwy	009382D	Wichita	BNSF	29,319	2	35,183	Lights
17th Street	009315J	Wichita	WUT/ WTA	4,515	3	13,545	Crossbucks
29th Street	445179I	Wichita	K&O	10,851	1	10,851	Crossbucks
Maize Road	445210V	Maize	K&O	5,335	2	6,402	Lights
Woodlawn Blvd	439344F	Bel Aire	UPRR	10,299	1	6,179	Lights

*As of March 2007, a diagnostic review has been done at 31st Street and will be placed on KDOT's Section 130 funding list (Fiscal Year currently unknown).

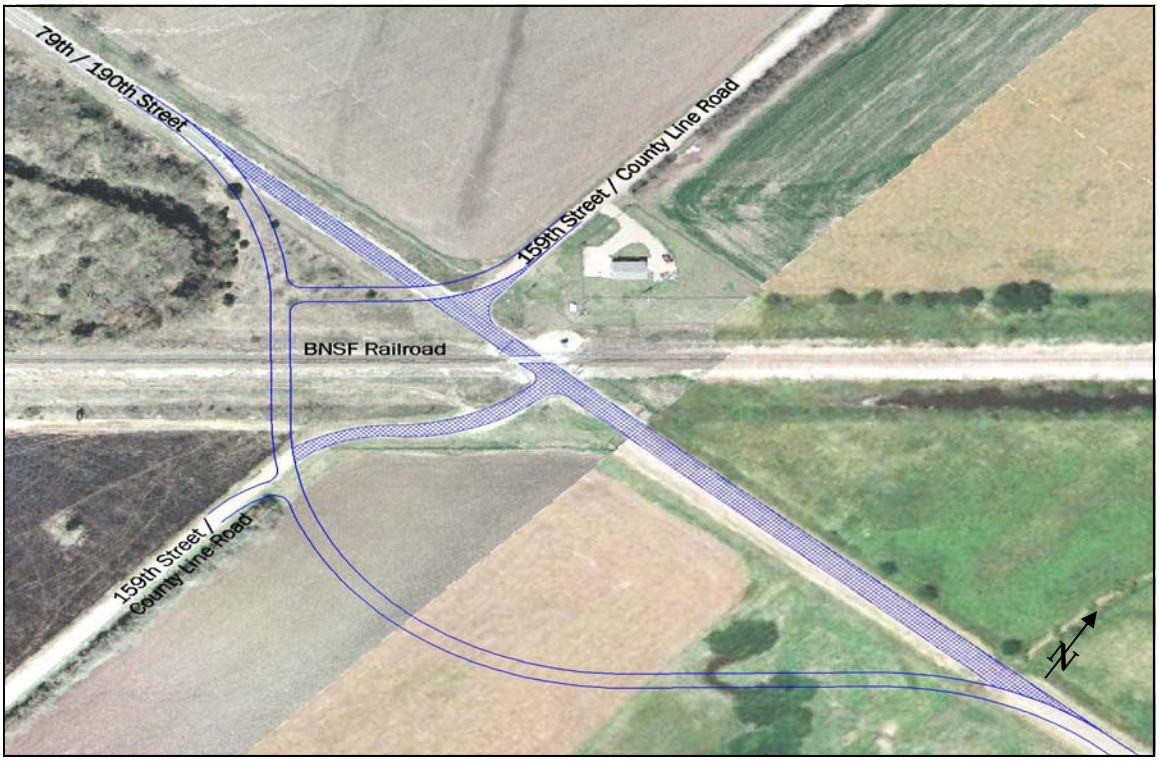
4.9 Crossing Geometry

Sight distance at the approach of a highway-railroad grade crossing can be an issue for motorists, pedestrians and the locomotive engineer when the highway is not perpendicular to the railroad tracks at the crossing. This creates a "skewed" crossing; skewed crossings should be avoided when possible. By aligning a highway-railroad grade crossing at a ninety-degree angle with the railroad tracks, a larger visibility triangle is formed. Assistance for crossing realignment may come from local funds or federal programs with the cooperation of the railroad.

79th/190th Street (DOT #009628Y)

The 79th/190th Street crossing is located on the border of Sedgwick and Butler Counties, on the BNSF. This crossing could be realigned; doing so will create a perpendicular crossing approach at 79th/190th Street (see Exhibit 40). The diagram shows a curved alignment for 79th/190th Street designed to achieve a 100-foot tangent on each approach to the crossing and to minimize impacts to the structure north of 79th/190th Street. A design speed of 35 mph was used for the curves on 79th/190th Street. For a roadway that likely operates at 55 mph, these speeds in advance of the crossing may not be suitable. It is important to note that 79th/190th Street is located on the boundary of the WAMPO planning area and would therefore require a bi-county program for implementation. 79th/190th Street crossing is also listed as a grade separation project example (see Exhibit 29).

EXHIBIT 40: 79TH/190TH STREET CROSSING GEOMETRY PROJECT EXAMPLE



The preliminary construction cost estimate for the 190th Street crossing geometry project as of 2007 totals approximately $750,000.

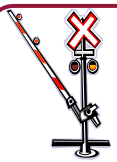
4.10 Crossing Approach Improvements

A high-profile or "hump" crossing occurs when the crossing's approach grade is relatively steep, causing the crossing to be the high point of the intersection. High-profile crossings should be corrected whenever possible to improve the safety of motorists, pedestrians and the locomotive engineer. Vehicles with long wheelbases (such as semi trucks and school buses) or low-hanging equipment may get caught on such a crossing. Sight distance at the approach is also a concern at high-profile crossings.

Cherry Street (DOT #009392J)

The Cherry Street crossing is located in Derby on the BNSF (see Exhibit 41). The City of Derby has plans for railroad signal and crossing improvements at this location. These improvements will close the Cherry Street crossing and make Madison Avenue a through street at the tracks. The existing Cherry Street crossing surface is high-profile; sight distance at the approach is also limited by its steep grade. By closing the Cherry Street crossing and making Madison Avenue a through street, safety concerns regarding the crossing's approach are mitigated at Cherry Street.

EXHIBIT 41: CHERRY STREET CROSSING APPROACH PROJECT EXAMPLE



A preliminary construction cost estimate for the Cherry Street crossing approach project as of 2007 totals approximately $500,000. The City of Derby's Capital Improvement Program (CIP) has allocated funding for these improvements through General Obligation (GO) bonds.

SECTION 5—IMPLEMENTATION STRATEGIES

The WAMPO RRCP was initiated to help the MPO further define and measure specific goals in the LRTP, including the safe and efficient movement of goods on the region's highway and rail systems. Additionally, the WAMPO RRCP Advisory Committee chose to work toward attaining the measurable goal of reducing the region's overall Hazard Index.

It is important to note that large-scale, high-impact projects may take time to put into place, such as a multiple-crossing grade separation. However, the RRCP has also suggested methods to implement relatively simple improvements, such as turn lane extensions or land use planning, which will progress toward WAMPO's goals much more quickly. All projects must garner the cooperation of local communities, state and federal agencies and railroads for project implementation. The following implementation strategies will assist WAMPO in achieving these goals.

5.1 Strategy: Integrate into Planning Process

In support of the RRCP, the WAMPO Policy Body should adopt railroad-specific Project Selection Criteria (PSC) to ensure regional consideration of a proposed project when programming the TIP. Such PSC could serve as a method of evaluating major railroad projects with other Surface Transportation Program (STP) or Congestion Mitigation and Air Quality (CMAQ) projects for funding. Railroad-specific PSC and a corresponding instruction manual with scoring examples has been developed in conjunction with the RRCP.

When the PSC is in place, WAMPO staff would review all project requests for consistency with the LRTP and functional classification maps (project must be located on a major collector or above) before proceeding. Eligible highway-railroad grade crossing improvement projects would be assigned points through the Railroad Crossings PSC in the same manner as other major projects. The Railroad Crossings PSC would be a 100-point scale, consistent with the STP, CMAQ and Bridge Rehabilitation and Replacement (BR) PSC. The Railroad Crossings PSC would incorporate the Hazard Index equation as a method of evaluating the hazard potential at each grade crossing, the number of minutes per day in which a grade crossing is blocked by a train, the severity index of collisions at each grade crossing, the roadway functional classification, the implementation of corridor strategies, other considerations and the cost effectiveness of each improvement project.

Through the adoption of a railroad-specific PSC, each grade crossing improvement project would be fairly evaluated for funding with other projects. It is important to note, however, that the PSC score is only one element of the overall selection process. A PSC score for each crossing improvement project in addition to its application, would be presented to the TAC for a hearing and review, and recommendation must be given by the Policy Body before inclusion on WAMPO's TIP.

5.2 Strategy: Encourage Local Application of Project Toolbox

The RRCP's project toolbox contains nine tools which are applicable in many locations throughout the region. Project examples shown in the toolbox were chosen with regard to operational and feasibility considerations, however it is important to recognize that many of

these project tools may be used at other locations as focus shifts to other crossings in the future. The majority of project examples presented in the toolbox are located at highway-railroad grade crossings which have a current Hazard Index in the Top 50 list and have great potential to lessen the regional Hazard Index if implemented.

The project toolbox contains the following project tools: crossing condition, Quiet Zones, land use planning, crossing consolidation, grade separation, turn lane extension, installation of active warning devices, crossing geometry and crossing approach improvements. Additional tools may also be included in the project toolbox as they develop.

This strategy should be emphasized as it addresses the core goals of the RRCP. It is important to foster community support from citizens, local organizations, business leaders and elected officials, as local implementation is a "ground up" approach. Community leaders should review the project toolbox to discover what project types may be appropriate for their community, and work to implement them with all vested partners.

5.3 Strategy: Build Partnerships

It is exceptionally important to build partnerships with all public and private entities from the early planning stages in order to successfully complete proposed projects. Although WAMPO is responsible for the region's transportation planning and for allocating federal and state funds for transportation improvements, projects must have the support of local communities to be implemented effectively.

A Quiet Zone designation in the WAMPO region, for example, must have the support of the FRA, KDOT, the operating railroad, and the local jurisdiction. It may also be beneficial for neighboring communities to work together to implement a Quiet Zone along a corridor. In the event of a crossing consolidation, the state and operating railroad will work with the community to close redundant grade crossings. A grade separation is a costly project that would require the financial assistance of federal, state and/or local agencies as well as the cooperation of the railroads.

Constructive partnerships between different sectors and interests often provide significant progress toward creating sustainability and will guide efforts to achieve WAMPO's goals. Contributions made from all partners will create a mutually beneficial opportunity for regional collaboration during each stage of the process.

5.4 Strategy: Promote Proactive Integration

Highway-railroad grade crossing improvements should be incorporated into future capacity improvements, major construction or in conjunction with other improvement projects at early stages. Most often, it is more costly to retrofit a completed project with grade crossing improvements than to integrate improvements into the initial planning and design phase of a project.

For example, crossing surface upgrades are typically done in conjunction with regularly-scheduled railroad maintenance projects or with crossing signal upgrades completed by KDOT. Likewise, a Quiet Zone is a useful tool which can be operational on a corridor-wide scale by taking the necessary steps now for future application. This could include the installation of

medians in conjunction with roadway widening or the permanent closure of a crossing in the corridor. Although such improvements may not necessarily guarantee a Quiet Zone, it is valuable to plan ahead for such designation.

Anticipating and planning for local and regional needs is a proactive approach toward implementing the goals of the WAMPO RRCP. This strategy stresses the importance of preparing for highway-railroad grade crossing improvement projects during initial planning stages for application in the future.

5.5 Strategy: Support Efforts to Educate and Enforce

Education and enforcement are tools used to create awareness and change behavior. Education is used to convey messages to the public in order to understand the issue and solution; enforcement programs are used to put education into practice. Methods of education and enforcement can be relatively less expensive to implement than engineered projects while still providing a significant benefit.

A map of the region's highway-railroad grade crossings was made in conjunction with the RRCP to illustrate the location of each crossing in addition to the type of existing warning device at each crossing. Existing grade separations and railroad mileposts are also depicted on the map. The regional map will provide an awareness on railroad crossing locations for emergency responders and local representatives.

Operation Lifesaver is a public education program established in the early 1970s to increase safety at highway-railroad grade crossings. Operation Lifesaver is a non-profit organization sponsored by federal, state and local government agencies, highway safety organizations, law enforcement and railroads. The program's certified volunteers give free railroad safety presentations to all age groups and affiliations. Exhibit 42 shows the number of Kansas Operation Lifesaver presentations given in 2005 and 2006 for the WAMPO region as well as statewide.

EXHIBIT 42: KANSAS OPERATION LIFESAVER PRESENTATIONS

OPERATION LIFESAVER® Kansas	WAMPO Region		Statewide	
	2005	2006	2005	2006
Presentations Given	31	35	936	1,254
# of Attendees	1,693	1,472	43,955	66,608

Positive enforcement is another aspect of Operation Lifesaver. The Kansas Highway Patrol and other law enforcement agencies partner with KDOT and Sonic Drive-In throughout the state as part of Operation Lifesaver's Look, Listen and Live campaign to distribute safety information to drivers and pedestrians at highway-railroad grade crossings. State troopers issued state highway maps, litter bags, Operation Lifesaver brochures, coloring books and Sonic Drive-In coupons at many locations throughout Kansas.

In July 2006, a positive enforcement lane was set up at 47th Street and K-15 Highway in Wichita with six Kansas Highway Patrol troopers present. In thirty minutes, state troopers made contact

with 100 drivers to distribute coupons and safety information. The Wichita Police Department also set up a positive enforcement lane in September 2006 at the intersection of Walker Street and Seneca Street; 129 drivers and two pedestrians were contacted in one hour.[12]

It is important for WAMPO and local communities to stay involved in education and enforcement campaigns as they relate to highway-railroad grade crossings. This can include requesting Operation Lifesaver presentations at community events to educate members of the community on grade crossing safety tips. Likewise, communities in the WAMPO region can affirmatively recognize the Kansas Highway Patrol, local law enforcement agencies, businesses and other companies participating in enforcement campaigns through public relations, press releases and other marketing tactics.

5.6 Strategy: Identify Funding

Obtaining the resources necessary to implement the WAMPO RRCP project toolbox will require a variety of funding sources. The most utilized source of funding for railroad crossing improvements comes from federal Section 130 funds administered by KDOT to fund protective device installation and hazard elimination at crossings. These funds are limited, used throughout the entire state of Kansas, and can only be used for designated project types. The state of Kansas, through previous transportation bills, has provided funding for grade separations, crossing surface upgrades and other improvements. Some of these funding programs are no longer available and some funds can only be used for specific applications. Additionally, WAMPO funding is a product of federal, state and local governments. Despite the potential eligibility a railroad crossing project may have, WAMPO has limited funds that likely cannot support all needed improvements.

Understanding that funding constraints do exist for WAMPO and state programs, other funding programs that could be used for railroad crossing projects do exist. The following categories may be ways to creatively fund projects in the region.

Capital Grants for Railroad Crossing Improvements

SAFETEA-LU, the current federal transportation bill, authorized this grant program to fund projects that involve the lateral or vertical relocation of a railroad. The grant program is intended to fund projects up to $20 million with a shared cost of 10% by the state or other non-federal entities. Although this grant program appears to address the funding needs of several toolbox elements, funding has not been appropriated to this grant.

Tax Increment Financing (TIF)

TIF is generally used as a means to entice business decision makers to move into certain designated areas of a community to invest, make improvements, and provide jobs. TIF will permit cities, towns, and counties to pledge future tax increments to the repayment of debt. Bonds are pledged and paid off by the incremental rising of ad valorem property taxes that increase each year due to redevelopment and increased jobs generated. As a result, TIF funds are invested back into the district for public improvements.

Transportation Development District (TDD)

A TDD is an entity responsible for planning, funding and developing transportation-related improvement projects within the District that may not be eligible for other funding programs. A TDD may be initiated by first filing a request petition within the proposed District and then must be approved by the local governing body. The TDD is funded by imposing its own taxes on District property owners in accordance with the idea that making public improvements may spur economic development. TDDs may be created to fund both local and regional projects.

Special Assessments

A special assessment is a method of financing public improvement projects which may provide only a local benefit, and is therefore paid by those property owners who will benefit from the proposed project. Special assessments may be initiated through a resolution by a city's governing body or at the request of a property owner within the proposed district. Property owners may petition for a special assessment district request and go through a series of reviews before final confirmation.

Since funding is a necessity to implement projects, the WAMPO region should work to build awareness of the RRCP and its positive safety and congestion impacts, and to relay the importance of funding at the state and federal levels. Concentrated efforts by the region and the legislative level on reestablishing the state of Kansas' programs in the next Comprehensive Transportation Plan or to seek appropriations in the federal Capital Grant program could result in a viable funding mechanism for the region.

Through the implementation of these strategies, WAMPO can increase safety and decrease congestion throughout the region, and can work toward attaining the measurable goal of reducing the region's overall Hazard Index.

APPENDIX A - PUBLIC COMMENTS

The following comments were taken directly from the WAMPO RRCP public information meeting which was held February 22, 2007. Forty-nine regional residents were in attendance at the open house meeting. They were asked to rank focus areas and project goals on a scale from 1 to 5; 1 denoted their highest priority while 5 denoted their lowest priority. Exhibits 43 and 44 are histograms showing residents' responses to both focus areas and project goals.

- If accidents are not a problem I do not see the need for crossbucks to have a high priority. I do think I should see more work being done on current plans at Central area rather than talking about it.
  Focus Area: Safety (1)
  Project Goal: Upgrade deteriorated crossing surfaces with concrete (1), Reduce the overall regional Hazard Index (0)

- Crossings are great if newly repaired but awful when in need of repairs. Lights and crossing arms are great for high volume streets. Extremely annoying on Seneca, Pawnee and West Streets when trains are switching cars and tracks. Seems as if they delay a lot instead of doing their job and getting out of the way. I really miss the caboose on the trains.
  Focus Area: Safety (1), Emergency Response (2), Congestion (3), Quality of life (4)
  Project Goal: Hazard Index (1), Upgrade crossing surfaces (2), Reduce the number of crossbucks (3), Efficient land use and facility planning (4)

- Businesses west of BNSF in Derby are isolated from fire protection and ambulance - sometimes 45 minutes. I would like to see an overpass at Market in Derby and just a double track from Mulvane to Derby so two trains could pass at normal speed and not side track speed.
  Focus Area: Emergency Response (1), Safety (2), Congestion (3), Quality of life (4)
  Project Goal: Hazard Index (1), Reduce the number of crossbucks (2), Efficient land use and facility planning (3)

- Bayley Street corridor needs review. Line is apparently used to switch cars resulting in traffic from river to St. Francis being blocked, often for as long as 30 minutes. This is a safety hazard because emergency vehicles can't get through. City should consider making Market, Main, Emporia, Topeka and St. Francis away from Lincoln to Pawnee.
  Focus Area: Safety (1), Emergency Response (2), Congestion (3), Quality of life (4)
  Project Goal: Hazard Index (1), Efficient land use and facility planning (2), Reduce the number of crossbucks (3), Upgrade crossing surfaces (4)

- Repair crossing surface on Hoover by 47th St. South.
  Focus Area: Emergency response (1), Safety (2), Congestion (3), Quality of life (5)
  Project Goal: Upgrade crossing surfaces (1), Efficient land use and facility planning (3), Reduce the number of crossbucks (5), Reduce the Hazard Index (5)

- I would like information on how to have trees along the tracks removed. Many trees along K-15 in Derby restrict driver's view of oncoming trains.

- I note no consideration of [hazardous] material types carried. A lot of chemicals cross the city, particularly on main lines. This should be included as accidents or derailments could be more serious.
  Focus area: Emergency response (1), Safety (2), Quality of life (3), Congestion (4)
  Project goal: Hazard Index (1), Upgrade crossing surfaces (2), Efficient land use and facility planning (3), Reduce the number of crossbucks (4)

- I would like to see wayside horns installed.
  Focus area: Emergency response (1), Safety (2), Congestion (3), Quality of life (4)
  Project goal: Hazard Index (1), Reduce the number of crossbucks (2), Upgrade crossing surfaces (3), Efficient land use and facility planning (4)

- I'm referring to the Pawnee tracks - the amount of trains on both tracks presents many problems for our south end area.
  Focus area: Emergency response (1), Congestion (2)

- We need quiet zones if we are going to have trains running through the main part of town. Most people who live in the areas affected need to know they don't have to have the noise pollution associated with trains nor have safety features compromised because of quiet zones. The cost could be nominal for the returns.
  Focus area: Quality of life (1), Safety (2), Emergency response (3), Congestion (4)
  Project goal: Efficient land use and facility planning (1), Hazard Index (2), Upgrade crossing surfaces (3), Reduce the number of crossbucks (4)

- I am anxious for the project at Pawnee and Mead to be completed soon please! We have been waiting for years! Please tear down Kice industries instead of leaving it vacant; it's a real problem to our neighborhood. Thanks!
  Focus area: Emergency response (1), Congestion (2), Quality of life (3), Safety (4)
  Project goal: Efficient land use and facility planning (1), Hazard Index (2), Upgrade crossing surfaces (3), Reduce the number of crossbucks (4)

- It seems we can never leave the house anymore without being stopped by a train. Sometimes we are stopped 2-3 times in a single hour-long outing. We are awakened repeatedly by train horns many nights. We should have a right to sleep! Also the area next to the track at Southeast Boulevard and Wassall Street is always filling with water so that we have a lot of mosquitoes. There needs to be a drainage system installed there because it fills up with water after every snow and rain. If someone were to get West Nile virus I think the railroad would be liable, or at least should be. I have called the City, State, and railroad about this, but no one does anything to fix this problem.
  Focus area: Emergency response (1), Safety (1), Congestion (1), Quality of life (1)
  Project goal: Hazard Index (1), Other: Noise pollution (1), Reduce the number of crossbucks (3), Upgrade crossing surfaces (3), Efficient land use and facility planning (3)

EXHIBIT 43: PUBLIC MEETING FOCUS AREAS

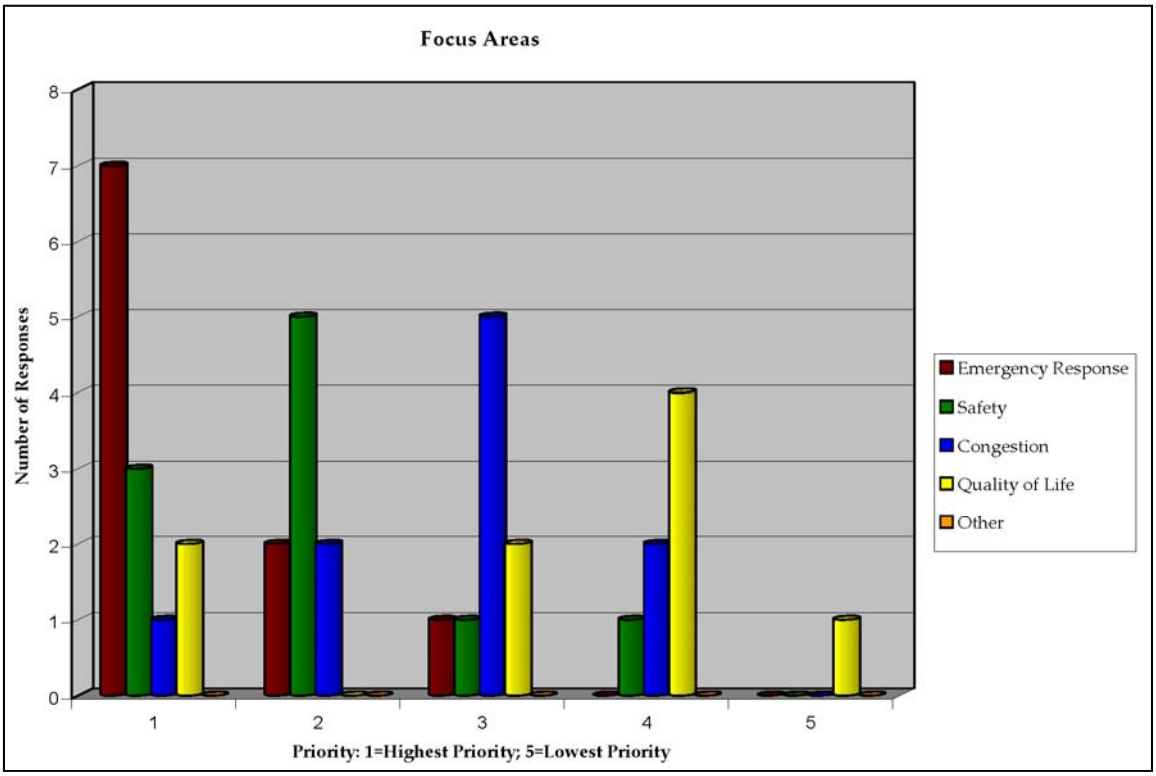
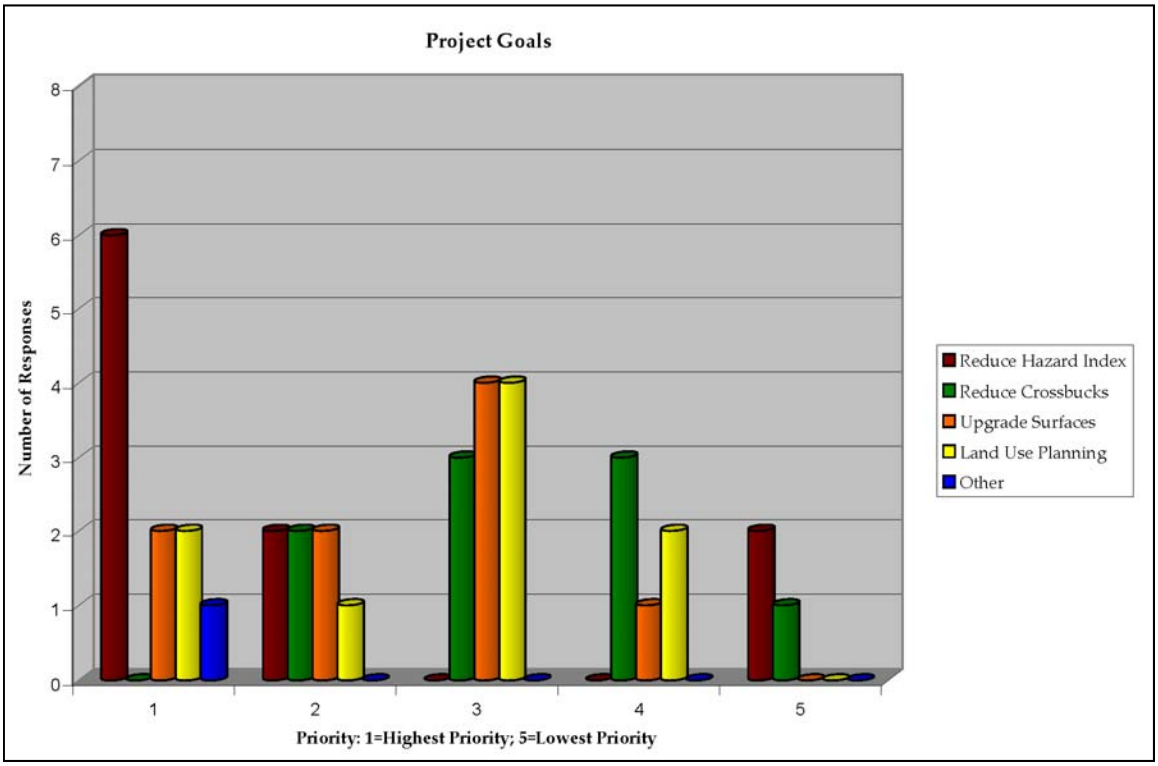


EXHIBIT 44: PUBLIC MEETING PROJECT GOALS



Endnotes

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[10] "The Wichita/Sedgwick County Comprehensive Plan." 1999 Update to the 1993 Wichita/Sedgwick County Comprehensive Plan. Section 3: Wichita Land Use & Sedgwick County Development Guides. 06 March 2007 http://www.wichita.gov/.

[11] "Pawnee Underpass and Overpass." Wichita/Sedgwick County Railroad Alternative Analysis Supplement to the October 1997 Final Report. HNTB Corporation. April 1998: 2, A-5.

[12] "2006 Positive Enforcement Lanes Newsletter." Operation Lifesaver. January 2007.