

Design Report
**Springfield Rail
Improvements Project**
Springfield, Illinois

February 2013

Prepared for:
City of Springfield
800 East Monroe Street
Springfield, IL 62701

Volume 1 of 2
Including Appendices A-C

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1. Introduction

1.1 Description and Location of the Project

The Springfield Rail Improvements Project is one part of the proposed program to improve high-speed passenger rail service between Chicago, Illinois, and St. Louis, Missouri, that is assessed in Volume I of the Chicago to St. Louis High-Speed Rail Final Environmental Impact Statement.

The tiered environmental process is a phased environmental review commonly used in the development of complex projects. The Tier 1 EIS addressed broad issues and alternatives for the Chicago-St. Louis rail corridor. Volume II of the Final EIS was prepared as one of those Tier 2 documents for the Springfield Rail Improvements Project. A Record of Decision has been issued covering both the Tier 1 Chicago to St. Louis and Tier 2 Springfield Rail Improvements Project.

The project is accommodating the proposed high speed passenger trains from Chicago to St. Louis and the anticipated growth of Union Pacific, Norfolk Southern and other rail freight traffic through Springfield, Illinois (see Figure 1). The study area extends from approximately Stanford Avenue on the south to Sangamon Avenue on the north within the City of Springfield, Sangamon County, Illinois (see Figure 2).

1.2 History of the Project

The first railroad came to Springfield in 1842, five years after Abraham Lincoln. This railroad became the Great Western, then the Wabash, then the Norfolk & Western, and is now the Norfolk Southern (NS). Eleven years later the Chicago and Alton Railroad also came to Springfield, forming only the third railroad crossing in the state. That crossing was at Iles Junction. The Chicago and Alton line is now owned by the Union Pacific (UP).

Springfield's location contributed to its continued development as a railroad center and by the early part of this century a network of rail lines served the city. The railroads were originally located in the central city area to serve the needs of the community at the time of their construction. As the city grew, so did the conflicts between the operations of the railroads and the function of the community.

These concerns led to efforts to eliminate most of the 139 ground level crossings as early as 1924, with a plan that called for elevated tracks throughout the city and an extensive system of yard tracks in the central city area. The cost in 1925 was estimated at \$1.5 million. This plan was never implemented.

The years up to the 1960's saw significant changes in both rail and auto traffic and significant changes in the city. At one time, Springfield was a mining and manufacturing center with heavy demands on freight rail service. Over the years, these industries began to decline. At the same time, state government, insurance, health care, and retailing began more and more to dominate the region's economy.

Passenger rail traffic declined sharply as auto traffic increased. These factors led to a decline in the need for direct rail service to the central business district and a sharp increase in the number of highway/rail conflicts.

Recognizing the need to reduce these conflicts, the Regional Planning Commission prepared a study report on the railroads in 1959 that included four alternative relocation plans. These early initiatives demonstrated that existing local governmental bodies were not structured to accomplish a railroad

relocation project. In recognition of this, the Illinois General Assembly enacted legislation in 1967 creating the Capital City Railroad Relocation Authority (CCRRA) for the specific purpose of relocating the railroads from central Springfield. The CCRRA was granted broad powers to achieve this goal, including the right of eminent domain, and to obtain financing for the project.

In 1968, the CCRRA initiated an extensive study to provide a long-range plan for the relocation of the railroads from central Springfield. This would allow for the improvement, expansion, and redevelopment of the central business district and residential areas. It would eliminate numerous dangerous at-grade crossings.

The study resulted in a 1970 report recommending a new multi-track railroad corridor located to the south and east of central Springfield. The corridor used neighborhood boundary and land use separations caused by existing highway and railroad right-of-way.

The project received a major impetus in 1972 when the Federal Railroad Administration began a national study of urban railroad relocation. Springfield was one of three cities originally selected as a demonstration city.

In 1973, CCRRA updated the 1970 report by making revisions that were made possible by the merger of two of the railroads. The location of the joint-use corridor was shifted further to the east.

Studies continued through the 1970's into the early 1980's. This culminated in 1982 with a final selected corridor that was shifted even further to the east, east of Interstate 55 (I-55). This became the selected alternative. A detailed study was made under the auspices of the Federal Highway Administration (FHWA) of right-of-way requirements, necessary grade separations, roadway improvements, and drainage studies. Intersection design studies were also completed, along with noise and other environmental studies. The estimated cost of the project, in 1980 dollars, was approximately \$237 million. The final design report and final environmental impact statement for this project were approved by the FHWA in March of 1983.

It soon became obvious that sufficient funds to construct the entire project would not be available. The FHWA then suggested that "usable segments" of the overall project be identified with the idea of targeting the most critical segments for completion.

Usable Segment 1 relocated the Norfolk and Western/Illinois Central Gulf car interchange and permitted the construction of a portion of Madison Street, a major thoroughfare in downtown Springfield.

Usable Segment 2 provided a railroad grade separation structure to carry the connection of Madison Street to Clear Lake Avenue over the Illinois Central tracks eliminating a grade crossing on Madison Street.

While rail company mergers and line abandonment had significantly reduced the number of tracks in Springfield, two lines on the southwest side of the city, the Norfolk & Western and the Illinois Central Gulf's Kansas City main, had always been a significant barrier to development in that part of the city. These lines also created some of the most dangerous at-grade crossings and a very narrow underpass at a major north-south street, Chatham Road.

In an effort to correct this problem, the CCRRA decided to study the possibility of constructing a segment of the project that would allow these two lines to be relocated. A summary report on Usable Segment 3 was completed in 1985, and the FHWA approved the project report and environmental assessment in 1986.

Useable Segment 3 was completed in 1994. The NS and UP tracks (formerly the N&W tracks and the ICG tracks, respectively) south and west of Iles Avenue were combined into a joint corridor that extends south to Interstate 72 (I-72). From I-72, the UP's St. Louis line continues south and the NS's and UP's Kansas City lines turn west along the north side of I-72. After completion of Useable Segment 3, the Capital City Railroad Relocation Authority was dissolved.

In 2002 the Regional/Urban Design Assistance Team (R/UDAT) was invited to Springfield by the City of Springfield and the Springfield Section of the American Institute of Architects to focus on "*New Dimensions for Downtown Springfield: preserving the past and building the future.*" The goals included better planning in downtown, improving directional and visual cohesiveness, and improving the linkages between downtown Springfield and its surrounding neighborhoods. The R/UDAT study provided a series of recommendations for the revitalization of downtown Springfield. This included an urban design framework for the downtown and connected areas, specific recommendations for the Capitol Complex area, and recommendations for transportation and parking programs. This document, along with the MPO's Comprehensive Plan and SATS 2025 Long Range Transportation Plan (March 31, 2000), serve the City as a guide for redevelopment.

Among its transportation proposals, R/UDAT recommended that consolidation of the UP and NS in the NS corridor should be a long term objective. In response to this recommendation, the City of Springfield applied for and received an Illinois Tomorrow Corridor Planning Grant to study consolidation of all three north-south corridors.

The 2005 study was an evaluation of the Third Street (UP), Tenth Street (NS), and Nineteenth Street (CN/I&M) corridors to explore options of consolidating them into a unified corridor. It also examined the resulting development, redevelopment, open space, and recreational opportunities that may result from abandoning currently active track. The study also evaluated anticipated project costs, identified an implementation strategy, and formulated options for public-private partnerships to advance the plan.

The study determined that consolidating the railroads into a single unified corridor has the potential to provide a number of benefits including:

- Reduce traffic congestion. Train blockages produce delays and congestion and contribute to air pollution. Some of the City's most heavily traveled arterials have at-grade crossings. Stopped trains can result in gridlock on intersecting streets.
- Reduce the barrier effect that the railroad corridors have on the City.
- Allow redevelopment of abandoned corridors into bicycle and pedestrian paths, greenways, and recreation corridors. These corridors could be used to connect other bike trails in the City. The corridors that currently serve as barriers could be transformed into paths that link diverse segments of the community.
- Eliminate at-grade railroad crossings and the hazards associated with them.
- Allow for crossing improvements to create a quiet zone for rail traffic by eliminating train horns in the city.

The consolidation feasibility study recommended that the railroads be consolidated in the Tenth Street corridor and was completed in 2005. During the same period, IDOT was working toward establishing high speed rail service between Chicago and St. Louis.

The Chicago – St. Louis corridor is part of the Midwest Regional Rail System plan to develop and implement a regional passenger rail system. In January 2003, IDOT completed an Environmental Impact Statement (EIS) for the Chicago – St. Louis corridor. The Preferred Alternative from the EIS included the provision of 110 miles per hour service, along the existing Chicago – St. Louis Amtrak route south of Dwight, Illinois. No action was proposed between Chicago and Dwight. A record of Decision (ROD) was signed in January 2004. The proposed service consisted of three round trips per day.

Since the ROD, IDOT has made significant progress on the Chicago – St. Louis corridor in cooperation with the Union Pacific Railroad, which owns the right-of-way south of Joliet and operates rail freight services in the corridor. Extensive rehabilitation of the Chicago – St. Louis corridor track and signal systems have been implemented and four quadrant gates installed at many grade crossings in the corridor. Total costs since the signing of the ROD have exceeded \$110 million.

Meanwhile, the UP has been developing a new intermodal facility near Joliet, Illinois. Their intention is to increase freight traffic on their line through Springfield. The result is that a total of 40 trains per day (22 freight, 18 passenger) will be operating on the UP in 2020 which will require the installation of a second track. Since the City and County have long desired to consolidate all of the local rail traffic into one corridor they requested that IDOT evaluate alternatives to investing in a second track on Third Street. This report and its accompanying environmental document are the result of that evaluation.

The current and projected number of trains on each of the rail lines is shown in Table 1.

Table 1. Number of Trains

	Current (2010) Rail Traffic	Projected (2030) Rail Traffic² (No-Build)	Projected (2030) Rail Traffic³ (Build)
Union Pacific	10 Passenger 5 Freight	10 Passenger 27 Freight	18 Passenger 27 Freight
Norfolk Southern	16 Freight	27 Freight	27 Freight
Canadian National ¹	4 Freight	9 Freight	9 Freight
TOTAL	35 Trains	73 Trains	81 Trains

¹ Includes I&M and KCS traffic on CN.

² Projected 2020 rail traffic was furnished by each railroad company. UP – 22F, NS – 24F, CN – 8F.

³ Projected 2030 rail traffic for NS and CN assumes a freight growth of 1.2 percent per year between 2020 and 2030. The UP projected rail traffic assumes a freight growth of two percent per year between 2020 and 2030.

As shown in Table 1, the total projected trains through Springfield will more than double.

1.3 Design Criteria

Criteria for the design of new or reconstructed rail line will be in accordance with the requirements of the operating railroad company, the Federal Railroad Administration (FRA), or the American Railway Engineering and Maintenance of Way Association (AREMA). See Tables 2 and 3.

Criteria for the design of city streets will be in accordance with the requirements for new construction/reconstruction in IDOT's Bureau of Local Roads Manual. See Table 4.

Criteria for the design of state highways will be in accordance with requirements for new construction/reconstruction in IDOT's Bureau of Design and Environment Manual. See Table 5.

Table 2. UPRR Criteria


				Comp. By: GCN Check By: JAD Date: Feb. 2010 Sheet: 1 of 2 CRITERIA - UPRR	Loc. Proj. Subj. Springfield, Illinois 09L0179 - Springfield Railroad Consolidation Design Criteria
RR Approved (init)	Checked by Hanson (init)	Current Criterion (✓)	Superseded (X)	CRITERIA - UPRR	SOURCE
				Overall	
				Mainline Horizontal Geometry	
	✓	X		Max. Degree of Curve = UP tables	UP Dwg 0021C
	✓	✓		Max. Degree of Curve = 2.0 with 2.5 in. superelevation and 1 in. imbalance (at 50 mph)	Meeting Minutes 11-10-09
	✓	✓		Min. Desired Spiral Length: $L_s = S(\text{mph})^3 / (5280/3600)^3 (Ea/1.25)$ and $L_s \geq (33"Ea)/(.75")$	UP Dwg 0019A
	✓	✓		Min. Absolute Spiral Length: 1.5"/sec and 3/4" / 33' max.	UP Dwg 0019A
	✓	X		Max. Superelevation = UP tables, 6" max., 1" imbalance (E) for $Ea < -4"$, 2" imb for $Ea > 4"$	UP Dwg 0019A
	✓	✓		Max. Superelevation = 2.5" with 1" imbalance	Meeting Minutes 11-10-09
	✓	X		Min distance between curves: 500 ft for ≥ 60 mph, 300 ft for 40-59 mph, 150 ft for < 39 mph	UP Dwg 0018
	✓	✓		Min distance between curves = 500 ft	Meeting Minutes 11-10-09
	✓	✓		Track Centers - UP Mainline = 20 ft	UP Memo 9-16-09
	✓	✓		Track Centers - UP Side Tracks =	
	✓	✓		Track Centers - UP Mainline in Constricted ROW Areas in 3rd Street Corridor = 13.5 ft	UP email from T. L. Cheney 11-12-2009
	✓	✓		Track Centers - Other RR tracks = 25 ft	UP Memo 9-16-09
	✓	✓		Track Centers - UP Siding at Amtrak Station in 10th Street Corridor = 25 ft	Meeting Minutes 11-10-09
	✓	✓		Length from POS to PC/TS or PT/ST ≥ 200 ft.	UP Dwg 0018
				Mainline Vertical Geometry	
	✓	✓		Rate of vertical curve change sag/crest $(g_2 - g_1)/L \geq 0.06 / 0.10$ (% per station)	UP Dwg 0016
	✓	✓		Length of vertical curve: use above equation, round up to nearest 100 ft.	UP Dwg 0016 example calculation
	✓	✓		No vertical curves within limits of horizontal curves or turnouts w/o approval	UP Dwg 0016
	✓	✓		Max. Grade = 0.65	Max. Existing Grade from UPRR Track Chart sheet 5 of 15, dated 2/19/09
	✓	✓		Compensated gradient: $G_c = G - 0.04D$, D=decimal degrees, G=%	AREMA Vol 1, Ch 5, Part 3.7.1 (pp. 5-3-20)
	✓	✓		Max. Grade on car spotting track = 0.4%	UPRR Industrial Track Standards and Specifications 2004, 4.02
				Mainline Track and Roadbed Section Design	
				Track Section	
	✓	✓		Min. Rail size 136 RE premium	UP Memo 9-16-09; UP/BNSF Common Standard Dwg 176000
	✓	✓		Jointed or CWR = CWR	Assumed
	✓	✓		Tie Pads = Abrasion Sandwich Assembly for Safelok Fastening Systems	UP/BNSF Common Standard Dwg 130122
	✓	✓		Conc. Ties = Mfg by CXT, drawing no. 505S-50. Thickness at Rail Seat = 9.29 in.	Same Ties Used in Existing UP 3rd Street Corridor
	✓	✓		Distance from Top of Rail to Bottom of Tie = 1.40 ft.	Hanson Calculation dated 1-7-2010
	✓	✓		Crosstie center-center spacing preferred/max. = (inches)	
	✓	✓		Rail Fasteners = Safelok	Compatible with CXT 505S tie and Same as Used in Existing UP 3rd Street Corridor
				Roadbed Section	UP Dwg 0002B
	✓	✓		Min. Ballast Depth = 12 in. at min. clearance point between tie and subballast	UP Dwg 0002B
	✓	✓		Min. Subballast Depth = 6 in. min, 12 in. max.	UP Dwg 0002B
	✓	✓		Subballast pad width from centerline (top) (tangent track) = 14.0 ft.	UP Dwg 0002B

Table 2. (continued)


		Comp. By: GCN Check By: JAD Date: Feb. 2010 Sheet: 2 of 2 CRITERIA - UPRR	Loc. Proj. Subj. Springfield, Illinois 09L0179 - Springfield Railroad Consolidation Design Criteria
✓	✓	Subballast pad width from centerline (top) (curved, outside shldr) = 14.0 ft + 6 in. per inch of	UP Dwg 0002B
✓	✓	Access Road width from centerline (toe) = subballast width + 8 ft.	UP Dwg 0001
✓	✓	Min. subgrade stabilization depth = as required	UP Dwg 0002B
✓	✓	Min. Ballast Shoulder Width tangent/curve = 18 in. min. / 18 in. min.	UP Dwg 0002B
✓	✓	Ballast Shoulder Slope (feet): 3h:1v	UP Dwg 0002B
✓	✓	Subballast Shoulder Slope (feet): 3h:1v	UP Dwg 0002B
✓	✓	Subgrade Slope: 2%	UP Dwg 0002B
		Turnouts	
✓	✓	Min. turnout size for lead track = No. 20	Existing TOs at Ridgely. 11-10-2009 Mtg. stipulated No. 20s for Amtrak Siding at 10th
✓	✓	Length between RH-RH No. 20 turnouts => 122 ft.	UP Dwg 0017
✓	✓	Length between RH-LH No. 20 turnouts => 118 ft.	UP Dwg 0017
✓	✓	No turnouts to Industrial Sidings from UP Mainlines	Meeting Minutes 11-10-09
		Hydrology & Ditches	
		Design Storm recommended/minimum	
✓	✓	50 year flood < crown of culvert or low chord	UP Drainage and Waterway Hydrology Study Guide
✓	✓	100 year flood < track subgrade at structure (2 ft. 3 in. min. below top of tie)	UP Drainage and Waterway Hydrology Study Guide
		Mainline Track	
✓	✓	Min. ditch slope = 0.2%	UP Dwg 0001
✓	✓	Min. ditch depth from toe of subballast = 3 ft.	UP Dwg 0001 & 0002A
✓	✓	Front slope = 2h:1v	UP Dwg 0001
✓	✓	Bottom width = 10 ft.	UP Dwg 0001
		Pipes:	
		Drainage Culverts	
✓	✓	Minimum pipe diameter under mainline track = 24 in.	AREMA Vol 1, Ch 1, Part 4.1.2 (pp. 1-4-6)
		Pipe type allowed =	
		Pipe type not allowed =	
		Clearance:	
✓	✓	Horizontal to obstruction from CL = 9.0 ft. + 1.5 in. per degree of curve within 80 of curve or turn	UPRR Industrial Track Standards and Specifications 2004, 5.01
✓	✓	Vertical underpass structures = 14.75 ft.	IDOT BLRS (Bureau of Local Roads and Streets) Manual, Fig. 36-41
✓	✓	Vertical OH structures from T/R = 23 ft.	UP Dwg 0035 & UP Guidelines for Design of Highway Sep. Structures over RR, p. 5
✓	✓	Temporary Vertical OH structures from T/R = 21 ft.	UP Guidelines for Design of Highway Separation Structures over Railroad, p. 7
✓	✓	Temporary Horizontal Clearance from CL = 12 ft.	UP Guidelines for Design of Highway Separation Structures over Railroad, p. 7
✓	✓	Vertical over culverts = 2.5 ft. from bottom of tie to top of pipe	AREMA Vol 1, Ch 1, Part 4.1.2.b (pp. 1-4-6)
✓	✓	Pipelines (flam/non-flam) under track from base of rail to top of casing pipe = 4.5 ft. min. / 20 ft. r	UPRR forms DR-0404-A and -B
✓	✓	Pipelines (flam/non-flam) under track from bottom of ditch to top of casing pipe = 3.0 ft. min.	UPRR forms DR-0404-A and -B
✓	✓	Pipelines (gas) under track from base of rail to top of carrier pipe = 10 ft. min.	UPRR forms DR-0404-C
✓	✓	Pipelines (gas) under track from bottom of ditch to top of carrier pipe = 6 ft. min.	AREMA Vol 1, Ch 1, Part 5.2 (pp. 1-5-21)
✓	✓	Pipelines over track from top of rail to bottom of structure = 25 ft. (50 ft. for cable supported spar	AREMA Vol 1, Ch 1, Part 5.4.4.2.2 (pp. 1-5-30)
✓	✓	Wirelines over track from top of rail to bottom of wire (feet)	See UP wireline clearance chart in Real Estate & Utility Specs
✓	✓	Wireline under track => 4.5 ft below base of rail, 5.0 ft bbr for fiber optic	See UP wireline clearance chart in Real Estate & Utility Specs
✓	✓	Wireline on row => 4 ft below natural grade, 5.0 ft bng for fiber optic	See UP wireline clearance chart in Real Estate & Utility Specs
✓	✓	OH Communications Line => 50 ft from end of bridge, centerline of culvert, or switch area	See UP wireline clearance chart in Real Estate & Utility Specs
✓	✓	OH Power Line => 500 ft from end of bridge, 300 ft from end of culvert or switch area	See UP wireline clearance chart in Real Estate & Utility Specs
✓	✓	Centerline of Track to Pole => 50 ft (=> 200 ft for pole/structure for => 100 kV line)	See UP wireline clearance chart in Real Estate & Utility Specs
✓	✓	UG Wireline crossing => 50 ft from end of bridge, centerline of cluvert, or switch area	See UP wireline clearance chart in Real Estate & Utility Specs
✓	✓	ROW: 35 ft from centerline of Main 1 to West row, 20 ft from centerline Main 2 to East row	UP Memo 9-16-09

Table 3. NS Criteria


					Comp. By: GCN Check By: JAD Date: Feb. 2010 Sheet: 1 of 3 CRITERIA - NSRR	Loc. Proj. Subj. Springfield, Illinois 09L0179 - Springfield Railroad Consolidation Design Criteria
RR-Approved (init)	Checked by Hanson (init)	Current Criterion (✓)	Superseded (X)	CRITERIA - NS		SOURCE
				Overall		
				Mainline Horizontal Geometry		
	✓	✓		Max. Degree of Curve = NS tables		NS Design Criteria & Guidelines for Main Tracks and Detours, Plan 7-2
	✓	✓		Min. Spiral Length: $S \leq 60$ mph, $L_s = 31 * E_a / 0.5$; $S \leq 40$ mph, $L_s = 31 * E_a / 0.625$		NS Design Criteria & Guidelines for Main Tracks and Detours, Plan 7-2
	✓	✓		Max. Superelevation = NS tables, 4 in. max. (F)		NS Design Criteria & Guidelines for Main Tracks and Detours, Plan 7-2
	✓	✓		Max. Unbalance (F) = 2 in.		Assumed
	✓	✓		Min. distance between curves = 220 ft		NS Design Criteria & Guidelines for Main Tracks and Detours, Pg. 1
	✓	✓		Track Centers - NS Mainline = 15 ft		Meeting Minutes 11-12-2009
	✓	✓		Track Centers - NS Side Tracks =		
	✓	✓		Track Centers - Other RR tracks = 25 ft		Meeting Minutes 11-12-2009
	✓	✓		Track Centers adjustment for Curved Track = 1 in. / 30 min.		Plate 29
				Mainline Vertical Geometry		
	✓	✓		Rate of vertical curve change sag/crest $(g_2 - g_1) / L \leq 0.05 / 0.10$ (% per station)		Design Criteria & Guidelines for Main Tracks and Detours, Pg. 1
	✓	✓		Length of vertical curve: use above equation		Design Criteria & Guidelines for Main Tracks and Detours, Pg. 1
	✓		X	Max. Grade = 1.00 %		Design Criteria & Guidelines for Main Tracks and Detours, Pg. 1
	✓	✓		Max. Grade = 0.60 %		per Dave Orrison, Meeting with NS dated 11-12-2009
	✓	✓		Compensated gradient: $G_c = G - 0.04D$, D=decimal degrees, G=%		AREMA Vol 1, Ch 5, Part 3.7.1 (pp. 5-3-20)
	✓	✓		Max. Grade on car spotting/loading/unloading track = 0.0%		NS Guidelines for the Design and Construction of Privately Owned Industrial Tracks, 3.04
				Mainline Track and Roadbed Section Design		
				Track Section		
	✓	✓		Min. Rail size: 136 RE		assumed
	✓	✓		Jointed or CWR = CWR		assumed
	✓	✓		Tie Plates = AREMA Plan 13		assumed
	✓	✓		Tie Size, Type = 7"x9"x8.5' wood		assumed
	✓	✓		Distance from Top of Rail to Bottom of Tie = 1.27 ft.		Hanson Calculation dated 1-7-2010
	✓	✓		Crosstie center-center spacing preferred/max. = (inches)		
	✓	✓		Rail Fasteners = spikes		Same as Used in Existing NS 10th Street Corridor
				Roadbed Section		
	✓	✓		Min. Ballast Depth = 12 in. at end of ties		Design Criteria & Guidelines for Main Tracks and Detours, Plans 1-19 & 1-20
	✓	✓		Subballast Depth = 12 in.		Design Criteria & Guidelines for Main Tracks and Detours, Plans 1-19 & 1-20
	✓	✓		Subballast pad width from centerline (top) (tangent track) = 14 ft.		Design Criteria & Guidelines for Main Tracks and Detours, Plan 1-19
	✓	✓		Access Road width from centerline (toe) = 18 ft. min.		NS Overhead Grade Separation Design Criteria, Sheet 3 - Standard OH Bridge Details
	✓	✓		Min. subgrade stabilization depth = as required		Design Criteria & Guidelines for Main Tracks and Detours, Plan 1-19
	✓	✓		Min. Ballast Shoulder Width tangent/curve, jointed = 0 in. / 6 in.		Design Criteria & Guidelines for Main Tracks and Detours, Plan 1-19
	✓	✓		Min. Ballast Shoulder Width tangent/curve, CWR = 6 in. / 12 in.		Design Criteria & Guidelines for Main Tracks and Detours, Plan 1-19
	✓	✓		Ballast Shoulder Slope (feet): 2h:1v		Design Criteria & Guidelines for Main Tracks and Detours, Plan 1-19
	✓	✓		Subballast Shoulder Slope (feet): 2h:1v		Design Criteria & Guidelines for Main Tracks and Detours, Plan 1-19
	✓	✓		Subgrade Slope: 40h:1v		Design Criteria & Guidelines for Main Tracks and Detours, Plan 1-19

Table 3. (continued)


				Comp. By: Check By: Date: Sheet:	GCN JAD Feb. 2010 2 of 3 CRITERIA - NSRR	Loc. Proj. Subj.	Springfield, Illinois 09L0179 - Springfield Railroad Consolidation Design Criteria
				Heavy Tonnage Track other than main and Roadbed Section Design			
				Same as Mainline except:			
✓	✓			Min. Ballast Depth = 9 in. at end of ties			NS Guidelines for the Design and Construction of Privately Owned Industrial Tracks Plan 1-21
✓	✓			Subballast Depth = 9 in.			NS Guidelines for the Design and Construction of Privately Owned Industrial Tracks Plan 1-21
✓	✓			Min. subgrade stabilization depth = 6 in. min. if required			NS Guidelines for the Design and Construction of Privately Owned Industrial Tracks Plan 1-21
				Turnouts			
✓	✓			Min. turnout size for main track = No. 20			assumed
				Length between RH-RH No. 20 turnouts => ft.			
				Length between RH-LH No. 20 turnouts => ft.			
				Hydrology & Ditches			
				Design Storm recommended/minimum			
✓	✓			Design Culvert based on 100 year storm event			NS Guidelines for Under Track Culverts
✓	✓			100 year flood: HW/D=1.5 and HW < toe of ballast			NS Guidelines for Under Track Culverts
✓	✓			Rational Method for Drainage Area <= 500 acre			NS Guidelines for Under Track Culverts
				Mainline Track			
✓	✓			Closed Drainage System			NS Memo dated 11-12-2009
				Min. ditch slope = %			
				Min. ditch depth from toe of subballast = ft.			
✓	x			Front slope = 2h:1v			Design Criteria & Guidelines for Main Tracks and Detours, Plan 1-19
✓	x			Bottom width = 10 ft., sloped away (2 ft min. per OH Bridge Details Sheet 3)			Design Criteria & Guidelines for Main Tracks and Detours, Plan 1-19
				Heavy Tonnage Track other than main			
✓	x			Bottom width = 2 ft. min.			NS Guidelines for the Design and Construction of Privately Owned Industrial Tracks, Plan 1-21
				Pipes:			
				Drainage Culverts			
✓	✓			Minimum pipe diameter under mainline track = 36 in.			NS Guidelines for Under Track Culverts
✓	✓			Corrugated Metal pipes, galvanized and asphalt coated, preferred			NS Guidelines for Under Track Culverts
✓	✓			Concrete culverts not allowed under NS owned or maintained track			NS Guidelines for Under Track Culverts
✓	✓			Open cut limited to fill <= 10 ft. (pipe flow line to base of rail)			NS Guidelines for Under Track Culverts
✓	✓			Size > 72 in. diameter requires approval of Chief Engineer Line Maintenance			NS Guidelines for Under Track Culverts
				Clearance:			
✓	✓			Horizontal to obstruction from CL = 9.0 ft. + 1.5 in. per degree of curve within 80 of curve or turn			AREMA Vol 4 Ch 28, Part 28.1.1 (p. 28-1-2)
✓	✓			Vertical OH structures from T/R = 23 ft.			NS Overhead Grade Separation Design Criteria & Plan 7-1
✓	x			Vertical underpass structures = 14.5 ft.			per Dave Orrison, Meeting with NS dated 11-12-2009
✓	✓			Vertical underpass structures = 14.75 ft.			IDOT BLRS (Bureau of Local Roads and Streets) Manual, Fig. 36-4I
✓	✓			Temporary Vertical OH structures from T/R = 22 ft.			NS Overhead Grade Separation Design Criteria
✓	✓			Temporary Horizontal from CL = 13 ft. tangent track / 14 ft. curved track			NS Overhead Grade Separation Design Criteria
✓	✓			Temporary Horizontal Shoring from CL = 10 ft.			NS Overhead Grade Separation Design Criteria
✓	✓			Vertical over culverts = 2.5 ft. from bottom of tie to top of pipe			AREMA Vol 1, Ch 1, Part 4.1.2.b (pp. 1-4-6)
✓	✓			Pipelines (flam/non-flam) under track from base of rail to top of casing pipe = 5.5 ft. min.			Specifications for Pipeline Occupancy of NS Property 5-16-01, NS CE-8 Sec. 2.3
✓	✓			Pipelines (flam/non-flam) under track from bottom of ditch to top of casing pipe = 3.0 ft. min.			Specifications for Pipeline Occupancy of NS Property 5-16-01, NS CE-8 Sec. 2.3
✓	✓			Pipelines (gas) under track from base of rail to top of carrier pipe = 10 ft. min.			Specifications for Pipeline Occupancy of NS Property 5-16-01, NS CE-8 Sec. 2.3
✓	✓			Pipelines (gas) under track from bottom of ditch to top of carrier pipe = 6 ft. min.			Specifications for Pipeline Occupancy of NS Property 5-16-01, NS CE-8 Sec. 2.3
✓	x			Pipelines over track from top of rail to bottom of structure = 26 ft. (50 ft. for cable supported spans)			AREMA Vol 1, Ch 1, Part 6.4.4.2.2 (pp. 1-6-30)
✓	✓			Pipelines over track from top of rail to bottom of structure = 23 ft. (measured 6 ft from CL)			Specifications for Pipeline Occupancy of NS Property 5-16-01, NS CE-8 Sec. 4.14
✓	✓			Wirelines over track from top of rail to bottom of wire (feet)			NS Clearance Requirements for Cable and Wire Crossings, SP-1621
✓	✓			Cased Wire Under Track = 5.5 ft. below base of rail, 4 ft. below ground within row			Specifications for Wire, Conduit and Cable Occupations of NS Property 5-16-01, NS CE-4 p.11
✓	✓			Centerline Track to Pier Face < 25 ft. requires crash wall protection designed per NS OH Grade			NS Overhead Grade Separation Design Criteria
✓	✓			Centerline Track to Edge of Footing => 13 ft			NS Overhead Grade Separation Design Criteria

Table 3. (continued)


				Comp. By: GCN Check By: JAD Date: Feb. 2010 Sheet: 3 of 3 CRITERIA - NSRR	Loc. Proj. Subj.	Springfield, Illinois 09L0179 - Springfield Railroad Consolidation Design Criteria
	✓	✓		Centerline Track to Pier Face => 26 ft. with service road, 22 ft. without service road	NS Overhead Grade Separation Design Criteria, Sheet 1	
	✓	✓		Horizontal Pipe location constraints	Specifications for Pipeline Occupancy of NS Property 5-16-01, NS CE-8 Sec. 2.2	
	✓	✓		Centerline Main Track to East ROW = 35 ft.	Meeting Minutes 11-12-2009	
	✓	✓		Skew: Max. skew of Underpass Structure = 30 degrees	NS Underpass Grade Separation Design Criteria II (4) p.2	

Table 4. Design Criteria – City Streets

	Arterial BLRS 32-2D, 32-2B	Collector BLRS Fig. 32-2F, 32-3C	Local BLRS Fig. 32-2H, 32-3C
Design Speed	30 mph	30 mph	30 mph
Level of Service	C	D	D
Travel Lane (minimum)	11 ft	10 ft	11 ft (10 ft ADT < 1,000)
Parking Lane (minimum) (include gutter)	8 ft	8 ft	8 ft
Auxiliary Lane (minimum)	11 ft	10 ft	10 ft
Curb and Gutter	B6.18	B6.18	B6.18
Sidewalk Width (minimum)	4 ft	4 ft	4 ft
Sidewalk Width (City minimum)	5 ft	4 ft	4 ft
Minimum Total Width F to F	30 ft	30 ft	30 ft
Two Way Left Turn Lane	10 ft		
Median Width (raised)	18 ft		
Median Width (flush)	4 ft-14 ft		
Clear Zone	1.5 ft	1.5 ft	1.5 ft
Stopping Sight Distance	200 ft	200 ft	200 ft
Intersection Sight Distance	335 ft	335 ft	335 ft
Minimum Radii	230 ft	230 ft	230 ft
Crest Vertical Curve (k)	19	19	19
Sag Vertical Curve (k)	37	37	37
Sag Vertical Curve Fully Lighted (k)	20	20	20
Maximum Grade	8%	9%	9%
Minimum Grade	.30%	.30%	.30%
Minimum Vertical Curve Length (Fig. 30-2D)	90 ft	90 ft	90 ft
Maximum Sidewalk Grade	5%	5%	5%
Minimum Vertical Clearance (Fig. 36-4I)	14 ft-9 in.	14 ft-9 in.	14 ft-9 in.
Minimum Vertical Sidewalk Clearance (42-3.02 (h))	8 ft-0 in.	8 ft-0 in.	8 ft-0 in.
Storage Platform length (maximum slope 5%)	120 ft	120 ft	120 ft

Table 5. Design Criteria – State Highways
BDE Fig. 48-6B, Fig. 48-6C

Design Speed	30 mph
Level of Service	C
Lane Width (minimum)	11 ft
Lane Width (existing)	12 ft
Curb	B6.24
Clear Zone	1.5 ft
Sidewalk Width	5 ft
Sidewalk Vertical Clearance (Fig. 17-2N)	8 ft
Minimum Vertical Clearance	14 ft-9 in.
Stopping Sight Distance	200 ft
Intersection Sight Distance	335 ft
Crest Vertical Curve (k)	19
Sag Vertical Curve (k)	37
Sag Vertical Curve Fully Lighted (k)	20
Maximum Sidewalk Grade	5%
Maximum Grade	8%
Minimum Grade	.3%

2. Purpose and Need

2.1 Purpose of the Project

2.1.1 Chicago to St. Louis High Speed Rail

The purpose of the proposed Chicago to St. Louis High Speed Rail (HSR) Project is to enhance the passenger transportation network in the Chicago to St. Louis corridor by improving high speed passenger rail service, resulting in a more balanced use of different corridor travel options by diverting trips made by automobile and air to rail. The Chicago to St. Louis High-Speed Rail Final Environmental Impact Statement (Volume 1) covers the Tier 1 analysis of this project.

2.1.2 Springfield Rail Improvements Project

The purpose of the Springfield Rail Improvements Project is to enhance rail line capacity to accommodate and reduce the effects of the existing and increasing passenger and freight train traffic on the three north-south rail corridors that pass through Springfield: the Union Pacific (UP), Norfolk Southern (NS), and Canadian National (CN)/Illinois & Midland (I&M), see Figure 3. The purpose includes reducing rail line

effects by improving safety, reducing congestion, and reducing the impact of existing and projected train traffic while enhancing the livability and commercial activity within the community. Improvements in Springfield along the UP corridor support the overall Chicago to St. Louis HSR Corridor Project by enhancing the passenger rail infrastructure through the City. This includes reducing the number of at-grade crossings and reducing the noise from HSR trains in the City.

2.2 Need

2.2.1 Chicago to St. Louis Need

As discussed in Volume 1 of the Final EIS, the following items summarize the need for the Chicago to St. Louis High Speed Rail Project:

- There is currently a modal imbalance within the corridor. Rail travel represents only 1.1 percent of the 35 million annual person trips within the Chicago-St. Louis corridor.
 - Automobile and bus travel between Chicago and St. Louis is limited primarily to I-55. Travel by this one route can often be unreliable because of traffic congestion, weather, roadway construction, and accidents, which can significantly increase travel times.
 - Automobile travel, which represents 95.5 percent of the trips within the corridor, is the least safe mode of transportation when compared to air, rail, and bus travel.
- The sections of single track between St. Louis and Joliet cannot accommodate existing and projected freight and passenger trains.
 - The new Joliet Intermodal Terminal would double the number of freight trains using the Chicago-St. Louis corridor from six to 12. The number of freight trains is projected to increase to 22 by the year 2017, which could affect the performance and capacity for high-speed passenger rail.
 - On time performance from 2007 to 2010 for rail passenger service between Chicago and St. Louis ranged from 38 to 75 percent.

High Speed Rail improvements in the Chicago to St. Louis corridor, including the section through Springfield, are consistent with the Illinois State Transportation Plan (ISTP) and the individual policies in the ISTP (IDOT, 2007).

2.2.2 Springfield Need

The need for the Springfield Rail Improvements Project reflects the need for the Chicago to St. Louis High-Speed Rail Program and includes needs to address track capacity, safety, congestion, and community livability and commercial activity in Springfield.

2.2.2.1 Track Capacity

The UP anticipates an increase in freight traffic on its line through Springfield. The number of daily freight trains is expected to increase from about five to about 27 by 2030. The existing single track does not have sufficient capacity to carry these freight trains and the high-speed trains and meet the minimum service requirements.

The other freight rail carriers through Springfield also anticipate increases in traffic on their rail lines. The current and projected number of trains on each of the rail lines through Springfield is shown in Table 1. Current rail traffic is based on field counts of the number and duration of trains in late 2009. The railroads furnished projected 2020 rail traffic. One of the results of increased freight and passenger trains on the UP corridor will be diminished service to passenger rail as reflected in decreased on-time performance.

2.2.2.2 Safety

In addition to the needs developed in the EIS for the Chicago – St. Louis corridor, there are unique needs inherent to the Springfield study area which apply to this study. There are 68 at-grade crossings in the Springfield study area. Each one of these represents a dangerous point of conflict between rail traffic, including high speed rail traffic, and roadway traffic. Each crossing is a safety concern for the railroads, the public, and the authorities who maintain them. Table 6 below shows the at-grade crossings and grade separations in the Springfield study area by railroad.

Table 6. Springfield At-Grade Crossings and Grade Separations

	UP	I&M	CN	NS	Total
At-Grade	24	6	18	20	68
Grade Separations	4	0	6	5	15
Total	28	6	24	25	83

Illinois Commerce Commission (ICC) records show the total number of crashes at highway grade crossings for Springfield for all years (1955-2010) is:

Table 7. Springfield Illinois ICC Accident Data for all Years (1955-2010)

Crashes	Fatalities	Injuries
339	26	139

There are 24 miles of unfenced railroad right-of-way in the study area providing numerous opportunities to trespass in dangerous areas. ICC records (ICC, 2001-2010) show trespassing incidents in Springfield for the last 10 years are:

Table 8. Springfield Illinois ICC Trespassing Incidents, 2000-2010

Incidents	Fatalities	Injuries
23	8	15

While each of the corridors passes through residential and commercial areas, the UP (3rd Street) (Amtrak) corridor is most subject to trespass because 3rd Street is parallel and immediately adjacent to the tracks.

As shown on Photo 1, the UP tracks are centered in 3rd Street and the public street exists on one or both sides and immediately adjacent to the tracks through much of the city. Numerous homes and businesses front on 3rd Street. Aside from a periodic curb, there is little physical separation between the street and

the railroad. North of South Grand Avenue and through downtown, the UP right-of-way is approximately 30 feet wide. Pedestrians can easily and unknowingly infringe on railroad clearance, putting them in danger of being struck by a train.

Since most of the 3rd Street corridor is in dense commercial and residential areas, there are numerous pedestrians using the area at all times. The presence of 3rd Street adjacent to the tracks results in pedestrians crossing the tracks at locations other than at cross streets. Friends, family, jobs, parking, services, and shopping are frequently right across the tracks and are reached without walking the extra distance to the next intersection. In addition to numerous homes, apartments, churches, and businesses, the public buildings immediately along 3rd Street that are attractions to pedestrians are:



Photo 1 – Existing Tracks on 3rd Street

- Supreme Court Building
- State Library
- Amtrak Passenger Station
- Dana-Thomas House Historic Structure
- YMCA
- Memorial Medical Center
- Illinois Public Health Association
- Numerous parking lots and ramps

2.2.2.3 Congestion

All major east-west streets across Springfield have an at-grade railroad crossing. Many busy streets such as North Grand Avenue, Carpenter, Adams, Washington, Laurel, and Ash Streets cross all three railroads at-grade (see Figure 3). A long train on any of these tracks can delay vehicle traffic through much of the city since it can simultaneously block almost all of the crossings on that track, and traffic queues can block vehicles on intersecting north-south streets. The I&M, NS and CN all have active rail yards in the City. Switching operations in these yards frequently block adjacent crossings with stopped trains or trains involved in back and forth movements (Wheeland, et al, 2009).

Vehicle delays can result in a number of problems which reduce livability and inhibit economic activity, especially in an urban area. These include:

- Blocked traffic may interfere with emergency vehicles traveling to their destinations.
- Traffic congestion reduces regional economic health and is a lost time non-productive activity for most people.
- Increased air pollution and carbon dioxide emissions owing to increased idling, acceleration and braking.
- Late arrival for employment, meetings, and education, resulting in lost business or other personal losses.
- Drivers allocating more time for travel and less time on productive activities because of an inability to forecast travel time.
- Congested main arteries lead to increased use of secondary roads and side streets as alternative routes which may negatively affect neighborhoods with unwanted additional vehicle traffic on local streets.

Based on train volume data provided by the railroads, including high speed rail trains, and traffic volume data from IDOT and the City of Springfield, the existing and projected vehicle delays per day in the study area are:

- Existing (2010 train and vehicle traffic) – 13,800 vehicle-minutes
- Projected (2020 train and 2010 vehicle traffic) – 36,000 vehicle-minutes
- Projected (2030 train and vehicle traffic) – 60,000 vehicle-minutes

Vehicle delay was calculated by multiplying the number of vehicles delayed by a blocked crossing by the average delay per delayed vehicle. This calculation was done for all trains at all grade crossings in Springfield to determine the total vehicle delay per day. The projected delay using 2020 train volumes and 2010 vehicle traffic was developed to isolate the effect of increased trains (see Figure 4).

2.2.2.4 Livability and Commercial Activity

Noise

Train noise comes from the locomotive engines, air brakes, side to side car movement, slack and bunch car movement, wheels on rail joints, and locomotive horns blown by trains as they approach at grade crossings. This noise is generated by both freight and passenger (including high speed rail) trains. Of these, train horns are the most disturbing. Because of the short distances between at-grade crossings in the rail corridors, trains must blow their horns almost constantly when moving through Springfield. The total duration of train horn noise in the study area is 207 minutes per day. Federal regulations provide public authorities the option to maintain and/or establish quiet zones provided certain supplemental or alternative safety measures are in place. There are no quiet zones in Springfield.

The L_{dn} values (the day-night sound level, which weights night-time noise levels to generate this daily average to reflect night-time listener sensitivity) ranged from around 73 dBA L_{dn} to 80-81 dBA L_{dn} at locations near grade crossings where horns were being blown. These are very high L_{dn} values, and would be comparable to living directly next to a major highway, or just off the end of the runway at a busy airport. The HUD threshold for an unacceptable outdoor house environment is 75 dBA L_{dn} .

Each of the existing corridors passes through some residential areas, but the CN (Nineteenth Street) and UP (3rd Street) corridors have the most adjacent residential development. The UP corridor passes near many sensitive receptors in the Mid-Illinois Medical District.

Community Division

The UP, NS, and CN/I&M railroads operate on separate north-south corridors through the city, at 3rd Street, 10th Street and 19th Street, respectively. These rail lines present physical and psychological barriers that split downtown and divide neighborhoods. These barriers have created a set of development patterns that work against a healthy downtown and neighborhoods by isolating portions of the community and restricting access. Attracting residential and commercial redevelopment adjacent to the tracks is also very difficult. Home buyers see neighborhoods that are frequently blocked from access to schools, shopping and services by rail traffic as less desirable. The rail corridors, especially when the crossings are occupied by trains, inhibit neighborhood connectivity (Walker, et al, 2009).

Critical community buildings exist along each of the three corridors. While some of these buildings provide services on a city wide basis, many are neighborhood specific. Closed streets and blocked crossings inhibit access to these buildings and places or make access less safe by requiring the crossing of tracks or encouraging walking along the tracks.

Medical District Division

The 3rd Street corridor runs directly through Springfield's Medical District cutting between the campuses of the city's major hospitals. This can result in threats to health and safety because of delays in emergency vehicles traveling to the hospitals, and difficulties encountered by physicians moving from one hospital to the other for both routine and emergency purposes.

St. John's and Memorial Hospitals provide emergency services for a multi county area and provide the only Class One Trauma Center in the region, rotating the Trauma Center between them on an annual basis.

The Mid-Illinois Medical District was created by Illinois Public Act 95-693 in 2003. The Illinois General Assembly recognized that the health and medical care sector of the local economy represents the greatest potential for creating jobs, tax base and other economic benefits for the citizenry of the Springfield area for many years to come. The Act specifically defines the District's charge as follows: "... to attract and retain academic centers of excellence, viable health care facilities, medical research facilities, emerging high technology enterprises, and other facilities and uses as permitted by this act."

Given the setbacks from active rail lines typically expected by developers to minimize noise and vibrations for medical, academic, and research related structures, finding suitable building sites for medical development is severely hindered because of the rail traffic on the UP rail line.

Downtown Division

The 3rd Street corridor also passes through the midst of the downtown area. Development and redevelopment in Springfield's downtown is currently restricted by the 3rd Street corridor. Previous studies have noted this limitation, the most recent being the independent Regional/Urban Design Assistance Team (R/UDAT) study of the downtown (R/UDAT, 2002). Because of its location and use, the 3rd Street rail corridor creates a barrier to redevelopment moving west and creates an additional hurdle for residential redevelopment throughout the downtown.

Downtown residential redevelopment is seriously impeded because of the congestion, noise and vibrations caused by rail traffic. Expected future increases in rail traffic on the 3rd Street corridor would most likely further limit opportunities for residential redevelopment, resulting in a loss of opportunity for new retail-commercial development that would be expected to be drawn to the downtown area to serve additional residential growth.

2.2.3 Goals and Objectives

Based on the purpose and need for the Springfield Rail Improvements Project, the following goals and objectives were established.

- Provide a route through Springfield that supports achieving the purpose and need and services outcomes of the Chicago to St. Louis High Speed Rail corridor as documented in the Tier 1 EIS.
- Improve safety and reduce congestion by reducing the number of at-grade street crossings in the study area with a focus on those streets with the highest traffic volumes (see Tables 9-12).
- Improve livability and commercial activity by reducing train horn noise throughout the City and reducing the barrier effect of the rail lines on neighborhoods, Downtown and the Medical District.

- Minimize rail operational issues, impacts to existing development, lifecycle and capital costs, and impacts to social and economic resources due to the recommended alternative.

Table 9. ADT at At-Grade UP Crossings

Railroad	Cross Street	Roadway Classification	2009 ADT
UP	Sangamon	Principal Arterial	GS
UP	Ridgely	Collector	1,400
UP	9th	Principal Arterial	GS
UP	8th	Local	1,850
UP	Eastman/Converse	Collector	2,150
UP	North Grand	Minor Arterial	14,500
UP	6th	Minor Arterial	2,600
UP	5th	Minor Arterial	4,050
UP	4th	Collector	1,200
UP	Dodge	Collector	GS
UP	Union	Local	950
UP	Carpenter	Minor Arterial	11,500
UP	Madison	Principal Arterial	13,700
UP	Jefferson	Principal Arterial	13,100
UP	Washington	Minor Arterial	2,000
UP	Adams	Local	3,050
UP	Monroe	Minor Arterial	4,950
UP	Capitol	Collector	GS
UP	Jackson	Local	1,500
UP	Cook	Minor Arterial	7,100
UP	Lawrence	Minor Arterial	5,700
UP	Canedy	Local	650
UP	Scarritt	Local	600
UP	Allen	Local	1,100
UP	South Grand	Minor Arterial	20,000
UP	Cedar	Local	375
UP	Laurel	Collector	7,600
UP	Ash	Minor Arterial	8,900
Total			130,525

Table 10. ADT at At-Grade NS Crossings

Railroad	Cross Street	Roadway Classification	2009 ADT
NS	Dirksen	Principal Arterial	GS
NS	Wolfe	Collector	2,000
NS	Albany	Collector	3,300
NS	19th	Minor Arterial	6,200
NS	North Grand	Minor Arterial	9,900
NS	13th (Reservoir)	Local	900
NS	11th (Division)	Minor Arterial	6,000
NS	Enterprise	Local	1,150
NS	Enos	Collector	800
NS	Miller	Local	500
NS	Carpenter	Minor Arterial	7,700
NS	Reynolds	Local	700
NS	Madison	Principal Arterial	11,000
NS	Jefferson	Principal Arterial	10,600
NS	Washington	Minor Arterial	1,700
NS	Adams	Local	2,250
NS	Monroe	Local	2,450
NS	Capitol	Collector	1,600
NS	Jackson	Local	350
NS	Cook	Minor Arterial	GS
NS	South Grand	Minor Arterial	GS
NS	Laurel	Collector	5,500
NS	Ash	Minor Arterial	7,400
NS	6th	Principal Arterial	GS
NS	5th	Principal Arterial	GS
Total			82,000

Table 11. ADT at At-Grade CN Crossings

Railroad	Cross Street	Roadway Classification	2009 ADT
CN	Dirksen	Principal Arterial	GS
CN	Keys	Local	200
CN	North Grand	Minor Arterial	9,900
CN	Clear Lake	Minor Arterial	GS
CN	Washington	Local	100
CN	Adams	Local	1,400
CN	Capitol	Local	1,650
CN	Jackson	Local	1,750
CN	Edwards	Local	650
CN	Cook	Minor Arterial	GS
CN	Clay	Local	800
CN	Stuart	Local	850
CN	South Grand	Minor Arterial	14,600
CN	Cedar	Local	350
CN	Laurel	Collector	4,750
CN	Ash	Minor Arterial	7,900
CN	Truman	Local	100
CN	4th	Collector	GS
CN	5th	Principal Arterial	GS
CN	6th	Principal Arterial	GS
CN	11th	Minor Arterial	11,500
CN	15th	Local	400
CN	Fox	Collector	1,200
Total			56,900

Table 12. ADT at At-Grade I&M Crossings

Railroad	Cross Street	Roadway Classification	2009 ADT
I&M	Griffiths	Collector	1,950
I&M	Converse	Collector	1,850
I&M	North Grand	Minor Arterial	9,900
I&M	Moffat	Local	1,700
I&M	Carpenter	Minor Arterial	7,200
I&M	Mason	Local	30
Total			22,630

3. Existing Conditions

3.1 Description of Project Area

The project is located in the City of Springfield and Sangamon County, Illinois. Springfield's railroad connections are shown on Figure 3. Relevant community facilities are shown on Figure 5. The area is older, urban in character, includes large areas of residential and commercial development, and some light industrial areas along the NS corridor. Downtown Springfield, including the State Capitol and adjoining

Capitol Complex falls within the study area. There is very little undeveloped land in the project area and minimal agricultural land.

The area is served by tracks owned by four railroad companies, the UP, NS, CN, and I&M. Their operations and facilities are described below.

3.2 Union Pacific (UP)

The Union Pacific Railroad operates in 23 states in North America and moves approximately 546 billion ton-miles of goods per year. It has four major gateways near the project location: Chicago, St. Louis, Memphis and New Orleans. Major commodities transported in Illinois include coal, corn, soybeans, finished automobiles, auto parts, and general merchandise. The UP's east-west transcontinental route terminates in Proviso Yard in the Chicago suburb of Northlake. The UP also has four large intermodal terminals in and near Chicago. There is a new intermodal facility near Joliet.

The UP line through Springfield is the former Gulf, Mobil and Ohio Railroad corridor. The line enters Springfield diagonally from the northeast and curves to the south in the Third Street corridor from Carpenter Street to Iles Avenue. South of Iles Avenue, the UP and NS tracks were reconfigured in 1994 as part of the CCRRA's Useable Segment 3 project. The two railroads run parallel to each other in the same corridor from approximately Iles Avenue to I-72 (see Photo 11).

3.2.1 Track Layout, Sidings, Turnout, Yards

The UP's Ridgely Yard is located north of Sangamon Avenue near Nineteenth Street. Just south of Ridgely Yard, the UP and the I&M tracks cross each other. Sangamon Avenue is grade separated beneath the two railroads at this point.

The UP line runs parallel to Peoria Road from approximately Sangamon Avenue and Sixteenth Street to North Grand and Sixth Street. It curves southward through a neighborhood and runs down Third Street from approximately Union Street to Iles Avenue. The Amtrak passenger station is located on the east side of Third Street between Jefferson and Washington. Third Street parallels the track on one or both sides through much of the corridor.

South of Iles Avenue, the UP and NS corridors merge, then the tracks cross over each other through a pair of crossovers. The UP line continues south toward Girard/St. Louis and the NS line continues west toward Jacksonville/Kansas City. The CN's Airline Connection track also merges into the UP/NS corridor south of Iles Avenue.

3.2.2 Daily Operations, Number of Trains, Speed

Current freight operations are five freight trains per day. The trains are locals and through trains. Local trains come from Bloomington to Ridgely Yard where pickups, drop offs and train building takes place. Operations are automatically controlled in Omaha. The desired operating speed through Springfield is 40 mph, though the current operating speed is less than 25 mph.

Amtrak currently runs 8 to 10 trains per day through Springfield on the UP tracks.

3.2.3 Amtrak Station

The Amtrak station is located along the Third Street rail corridor on Third Street between Jefferson and Washington Streets, see Photo 2. Four to Five round trip daily trains stop at the station (8 to 10 times per day).



Photo 2 – Amtrak Station

3.2.4 Ridgely Yard

Ridgely Yard is the former 100 car, 23 track classification yard of the Gulf, Mobile and Ohio Railroad. The UP uses the yard to make up trains and to pick up and drop off cars.

3.2.5 Service to Outside the Project Area

The UP line runs from Chicago to St. Louis, through Bloomington-Normal, Lincoln, Elkhart, Williamsville, Springfield, Chatham, Auburn, Thayer, Virden, and Carlinville.

3.2.6 Trackage Rights

Amtrak operates on the UP track. The UP has trackage rights on the I&M to South Pekin in a consolidated corridor.

3.2.7 Customers

The UP has no customers within the Springfield corridor.

3.2.8 Right-of-Way

North of South Grand Avenue and through downtown, the UP right-of-way is only approximately 30 ft wide. Third Street continues to exist on one or both sides of the railroad, with homes and businesses fronting on Third Street, see Photo 3. Aside from sporadic curb, there is little physical separation between the street and the railroad. Vehicles and pedestrians can infringe on railroad clearance, putting them in danger of being struck by a train.



Photo 3 – UP/Third Street

This narrow right-of-way also makes expansion of railroad operations and track maintenance difficult. Placement of traffic control devices at grade crossings perpendicular to Third Street and the tracks is also complicated by the limited room between Third Street and the track, see Photo 4.



Photo 4 – UP/Third Street

3.3 Norfolk Southern (NS)

Norfolk Southern operates in 22 eastern states and Ontario, Canada. It moves approximately 198 billion ton-miles of revenue goods each year, mostly coal and intermodal. The rail line from Decatur to Kansas City (through Springfield) is considered a key line. The NS is the busiest corridor in Springfield, with well-maintained tracks and roadbed, and high operating speeds.

3.3.1 Track Layout, Sidings, Turnout, Yards

The NS enters the project area from the northeast. A siding east of Dirksen Parkway is for storage and is not controlled. The NS crosses CN track at the Starnes crossing located just west of where Dirksen Parkway overpasses the two lines, see Photo 5. The line then crosses I&M track at North Grand Avenue and Fifteenth Street, see Photo 6. Due to the rail crossings and a connection between the two rail lines (including the diamond controlled by I&M just south of North Grand), three railroad-roadway at-grade crossings exist at this location on North Grand within approximately 300 ft of each other. NS exchanges cars with I&M in the I&M yard immediately south of North Grand Avenue.



Photo 5 – Starnes Crossing



Photo 6 – I&M/NS Crossing

From North Grand Avenue, the NS main line curves southward through the adjacent neighborhood. It runs south through the Tenth Street corridor from Phillips Street to South Grand Avenue, see Photo 7. NS's Tenth Street rail yard is located between Cook Street and South Grand Avenue. Three tracks exit from the south end of the yard, and they are reduced to one track prior to crossing Laurel Street. The track then begins to curve westward, crossing Ash Street at Ninth Street, crossing over Fifth and Sixth Streets, to meet with the UP tracks in the Third Street corridor south of Iles Avenue. The UP and NS corridors merge, then the tracks cross over each other through a pair of crossovers, see Photo 8. The NS line continues west toward Jacksonville/Kansas City, and the UP line continues south toward Girard/St. Louis.



Photo 7 – NS in Tenth Street



Photo 8 – UP/NS Crossings

3.3.2 Daily Operations, Number of Trains, Speed

The NS runs approximately 16 freight trains per day through Springfield. Traffic may continue to grow and the NS may consider future double tracking. Most of the commodities are automobiles and grain.

3.3.3 Tenth Street Yard

NS has three major classification yards that are near the project area: Chicago, Decatur, and St. Louis. In Springfield, the NS has a yard in the Tenth Street corridor between Cook and South Grand. The yard is an 11 track, 418 car yard with weighing scales and offices. Trains are received from Decatur to be dispersed.

A siding track connects to the main track north of Cook Street. The main track and the siding track cross over Cook Street. South of Cook Street, yard tracks begin diverging on the east side. The yard opens up to 11 tracks, and is approximately 60 grain cars long. The yard converges to three tracks and passes over South Grand Avenue. The three tracks converge to one track just north of Laurel Avenue.

Train building operations overflow onto the main line track approximately three to four hours per day. However, yard operations do not block Jackson Street.

The NS interchanges frequently with the I&M. Interchange operations entail the NS train traveling north across North Grand Avenue on the switch track to connect to I&M track, then backing up, across North Grand Avenue, into the I&M rail yard. When the car exchange is complete, the train exits the I&M yard and crosses North Grand Avenue, then backs up on the switch track, across North Grand Avenue to connect to NS track. The train then proceeds across North Grand Avenue on the NS track. Because of the slow type of movement and the switching involved, the grade crossing signals at North Grand Avenue are activated for several minutes at a time, sometimes without a train occupying the crossing.

The NS has little or no interchange with the CN or UP.

3.3.4 Service to Outside the Project Area

The NS line runs from Decatur to Kansas City, through Illiopolis, Riverton, Springfield, Curran, New Berlin, Jacksonville, and Naples.

3.3.5 Grade Crossings/Grade Separations/Crossing Protocol

The NS would like to eliminate as many at-grade crossings as possible, especially the crossings of Division Street at Eleventh and Thirteenth Street at Reservoir Street. Grade separations at Laurel and Ash Streets would increase track length available to pass trains.

3.3.6 Trackage Rights

Kansas City Southern (formerly Gateway Western Railway trackage) has agreements with NS in the study area.

3.3.7 Customers

The NS services the State Journal-Register approximately once per week. A siding on the west side of the NS main is used for this service, see Photo 9.



Photo 9 – NS Siding for State Journal Register

3.3.8 Right-of-Way

The NS right-of-way through most of the corridor is 66 ft. Right-of-way widens to 200 ft through the rail yard between Cook Street and South Grand Avenue.

3.4 Illinois & Midland (I&M)

The Illinois & Midland Railroad (I&M) is a subsidiary of Genesee & Wyoming, Inc. I&M was created in 1996 to purchase assets of the former Chicago & Illinois Midland Company, whose history dates back to 1889. The railroad was built on coal shipments to power plants for generating electricity. Over 100,000 carloads of goods are delivered each year. It delivers all of the coal for the Kincaid and Havana, Illinois power stations. The I&M has its headquarters, shops and yard in Springfield, located south of North Grand Avenue between Fifteenth and Nineteenth Streets. I&M serves Peoria, Springfield, Havana and many other communities in central Illinois.

3.4.1 Track Layout, Sidings, Turnout, Yards

I&M track enters the project area from the north. The line crosses the Sangamon River, passes over Veteran's Parkway, then meets UP track at the southern end of the UP's Ridgely yard. I&M crosses over

Sangamon Avenue with the UP tracks, see Photo 10, and then crosses over the UP tracks through an interlocking controlled by I&M. The line continues with a siding south to North Grand Avenue. I&M crosses NS just south of North Grand through an interlocking controlled by I&M.



Photo 10 – Tracks over Sangamon Avenue

The I&M yard facility begins just south of North Grand between Fifteenth and Nineteenth Streets. The line continues south from the yard facility and connects to CN track near Clear Lake Avenue.

The UP controls the crossing at Ridgely Yard (near Sangamon Avenue). The tower is manned 24 hours a day; the I&M pays half of the cost. The I&M would be interested in an arrangement that eliminates the need for this tower.

3.4.2 Daily Operations, Number of Trains, Speed

In addition to the deliveries of coal to Kincaid, about one train per day originates in Springfield. There are no passenger operations on the I&M.

3.4.3 Yard

These facilities serve as headquarters to the I&M's operations. The 20 track, 647 car rail yard serves to make up trains and serves as a car exchange location for all of the railroads in Springfield. Facilities include offices, mechanical, shops, storage buildings, scales, warehouse, and transload.

Other railroads in the area frequently use the I&M yard to exchange cars. The NS, for example, brings northbound cars onto the I&M and backs south into the I&M yard to drop off cars. The UP brings cars south from Ridgely Yard to the I&M yard for other railroads to pick up. KCS also interchanges cars with I&M.

3.4.4 Service to Outside the Project Area

I&M serves Peoria, Springfield, Havana, Kincaid, and many other communities in central Illinois. The I&M hauls unit coal trains to the power plant in Kincaid, Illinois. Approximately 4 million tons of coal was delivered to Kincaid last year. The cars come from Wyoming and are delivered by the UP to the I&M at Pekin, Illinois. Five or six trains per week make the round trip. Cars go south full and come back north empty.

3.4.5 Grade Crossings/Grade Separations/Crossing Protocol

The I&M believes that any consolidation that increases rail traffic across North Grand Avenue would require a grade separation at that location. I&M considers Moffat Avenue a high priority for closure.

3.4.6 Trackage Rights

I&M uses trackage rights on the CN from the junction near Clear Lake Avenue south to Kincaid. Through trackage rights and other agreements, I&M connects directly to UP, BNSF, NS, and CN. I&M connects to CSX through KCS. They also interchange cars with the Toledo, Peoria & Western and the Iowa Interstate Railroad, and KCS.

The UP has trackage rights on the I&M north of Sangamon Avenue.

3.4.7 Customers

I&M does not currently serve any rail customers in the study area.

3.4.8 Right-of-Way

Right-of-way in the I&M corridor between Sangamon Avenue and North Grand Avenue varies from approximately 100 ft to 50 ft wide. I&M owns the area south of North Grand and north of Philips Street, between Fifteenth and Nineteenth Streets.

If the CN ever abandoned their track in Springfield, the I&M would probably attempt to purchase it to maintain their service to the power plant in Kincaid. The CN track is signalized and controlled out of Homestead.

3.5 Canadian National (CN)

The Canadian National Railroad operates in 12 states, Canada and Mexico with almost 79 billion tons-miles of goods moved last year. The rail line from Chicago to St. Louis (through Springfield) moved approximately 22.5 million gross tons last year. The CN owns track from Chicago to Farmersville, through Springfield, and CN has trackage rights on Kansas City Southern (KCS) (formerly Gateway Western) from Springfield to St. Louis.

The CN track in the project limits enters the city from the northeast, near Sangamon Avenue and I-55. CN's East Springfield rail yard is located at Clear Lake Avenue and Nineteenth Street. CN track runs south from the yard in the Nineteenth/Twentieth Street corridor. The southbound CN track serves Farmersville and Kincaid. The Airline Connection track diverges from the southbound main track south of Stanford Avenue. The Airline Connection provides access to KCS tracks to serve Midstates

Warehouse and Curran. South of Stevenson Drive is the Lake Springfield Spur connection which is CWLP owned track that services the power plant. CWLP does not currently utilize rail service.

3.5.1 Track Layout, Sidings, Turnout, Yards

The CN enters the project area from the northeast. It crosses NS track at Starnes immediately west of where Dirksen Parkway overpasses the two lines, see Photo 5. The East Springfield Yard north of Clear Lake Avenue near Twenty-Second Street is still used. I&M track from the north merges with CN track at Clear Lake Avenue (Clear Lake Avenue passes over the tracks). CN track then runs south in the Nineteenth Street (East Grand Avenue) corridor. Between Lawrence and Kansas Avenues, it shifts one block east to the Wirt Avenue corridor.

The Airline Connection track diverges from the main line south of Stanford Avenue and Hobbs Park. It runs around the park then parallel to Stanford Avenue on the south. The Airline Connection track merges into the UP/NS corridor south of Iles Avenue and crosses over to connect to the UP track. No customers are served from the Airline Connection. It allows CN to connect to UP track to exchange cars, service Midstate Warehouse and to connect to KCS tracks to service Curran. The Airline Connection requires low speed due to steep grades and a curved alignment (a 7.5 degree curve).



Photo 11 – Looking North from Stanford Avenue

The CN mainline continues south to provide service to Farmersville. The CN mainline has a train controlled automatic block system. It is not dispatch controlled.

3.5.2 Daily Operations, Number of Trains, Speed

The CN runs two to four trains per day, depending on whether there is a coal train to Farmersville. The railroad picks up coal at the mine in Farmersville, so southbound cars are empty and northbound cars are full. Other trains are locals.

3.5.3 East Springfield Yard

The 250 car East Springfield Yard is located on CN track north of Clear Lake Avenue. CN and KCS (formerly Gateway Western) interchange cars in the yard. Facilities include ten tracks and offices.

3.5.4 Service to Outside the Project Area

The CN line runs from Chicago to Farmersville, through Mt. Pulaski, Spaulding, Springfield, Glenarm, and Divernon. CN operates on KCS track from Springfield to St. Louis through Prouty, Clements, Murrayville, and Manchester. CN services Curran, which is a small town southwest of Springfield. Service is also provided to the coal mine at Farmersville.

3.5.5 Grade Crossings/Grade Separations/Crossing Protocol

Closing grade crossings is attractive to the CN. It would like to eliminate crossings at Clay, Stewart or Cedar, between Cook Street and Laurel Street. The Truman Road crossing is a problem due to poor visibility. It is a private crossing, but it is used by the public. It has no crossing signals.

3.5.6 Trackage Rights

The KCS has trackage rights in the project area. The I&M has trackage rights from Clear Lake Avenue southward in the project area.

3.5.7 Customers

CN delivers rock to Sankey, north of Clear Lake Avenue. During construction season, deliveries may be made every day. The CN provides service to the plastic pipe plant south of Stevenson Drive. The CN uses the Airline Connection track for connection to UP track to exchange cars with the UP, to make deliveries to Midstate Warehouse and to make deliveries in Curran. Additionally, the Lake Springfield Spur (owned by CWLP) that diverges from CN track just south of Stevenson Drive could provide service to the power plant.

3.5.8 Right-of-Way

The rail yard north of Clear Lake Avenue, has approximately a 160-ft right-of-way. The mainline corridor north of the yard is generally 60 ft wide. South of the yard, the right-of-way is generally 60 ft but varies from 50 ft to 120 ft.

The NS owns the portion of the Airline Connection track from east of Fourth Street to west of Fourteenth Street. CN leases it. NS also owns the at-grade crossing at Eleventh Street. CN maintains it.

3.6 Traffic

Streets within the study area include the following urban types: local streets, collectors, and arterials. Local streets provide access within neighborhoods and to higher order systems. Collector streets serve as intermediate links between the arterial system and neighborhoods or point of origin trips. Collector streets may penetrate neighborhoods. Minor arterials interconnect the principal arterial system and provide service for moderate length trips, while maintaining more property access than major arterials. Roadway classifications for streets crossing the rail lines are shown in Tables 9 through 12 in Section 2.2.

3.6.1 Existing Conditions

Streets within the project area are typical urban roadways. Street layout is generally a grid system numbered outward from the City center. Railroad corridors run primarily north-south through the center of the project area, but are skewed in the northern project area.

All east-west streets through the City cross at least one railroad corridor at grade. Major east-west thoroughfares include: Sangamon Avenue, North Grand Avenue, Carpenter Street, Madison/Jefferson (Clear Lake Avenue), Cook Street, South Grand Avenue, Laurel, and Ash. Only five grade separations exist for the three rail lines crossing these streets.

3.7 Grade Crossings

The number of grade crossings in the study area has decreased by almost half in the years since the CCRRA project in the 1970s. Additionally, a large number of remaining crossings have received upgrades to the warning device systems. The current grade crossings in the study area are listed in Table 6 in Section 2.2.

3.8 Transit Service

Mass transit bus routes cross all of the rail lines several times a day. Figure 5 shows locations of bus routes and bicycle trails in the project area. The central transfer point (where passengers may transfer between busses that serve different areas) consists of an area in downtown Springfield near Fifth and Capitol Streets. East-west bus routes frequently enter and exit the transfer point by way of at-grade crossings of the Third and Tenth Street rail corridors at Jefferson, Washington, Adams, Monroe, and Capitol.

3.9 Hospitals/Ambulance/Fire Stations

Two hospitals, two ambulance services and one fire station are less than six blocks from the UP corridor (Third Street). One hospital, one ambulance service, and three fire stations are less than six blocks from the NS corridor (Tenth Street). One hospital, one ambulance service, and one fire station are between the Third and Tenth Street corridors. One fire station is less than six blocks from the CN corridor (Nineteenth Street). Figure 5 shows locations of these facilities.

The Mid-Illinois Medical District is located immediately north of Downtown Springfield. The District is bisected by the Union Pacific tracks and the Norfolk Southern tracks from its eastern boundary. The Medical District has repeatedly expressed concerns regarding any increases in the frequency, speed and length of trains through the District.

3.10 Schools

Ten schools are less than six blocks from the UP corridor (Third Street). Seven schools are less than six blocks from the NS corridor (Tenth Street). Three schools are between the Third and Tenth Street corridors. Nine schools are less than six blocks from the CN corridor (Nineteenth Street). Figure 5 includes locations of schools in the project area.

4. Alternatives Considered

4.1 No-Build Alternative – (2030)

The No-Build Alternative consists of maintaining the existing rail and street facilities after completion of the improvements approved by the FRA in the 2004 Record of Decision (ROD Improvements). No additional grade separation or quiet zone would be constructed. Traffic delays and anticipated crashes would increase with growing rail and vehicle traffic. The No-Build rail traffic on the Union Pacific Railroad consists of 27 freight and 10 passenger trains daily. No-Build rail traffic on the other rail lines is the same as the Build Alternatives since rail traffic on these lines will increase whether the project is built or not. The crossing improvements include quad gates and quiet zone on the Union Pacific.

4.2 Preliminary Alternatives

Preliminary alternatives were considered based on input from the Steering Committee, advisory groups, and the first public meeting. The following preliminary alternatives were eliminated from further study based on their ability to meet the purpose and need of the project, impacts to railroad operations and safety, costs, environmental impacts as defined by the Federal Railroad Administration's Procedures for Considering Environmental Impacts, resource agency input, and public comments.

4.2.1 1980's Railroad Relocation Corridor

In the late 1970's and early 1980's, it was proposed to relocate the NS, I&M and CN tracks to a new corridor along I-72 on the south side of the City and along I-55 on the east side (see Figure 6). The UP corridor would remain for passenger train use only, allowing access to downtown. The Capital City Railroad Relocation Authority was established to undertake this study. A Record of Decision was issued for the project in 1983 but only three useable segments were ever constructed. The bulk of the project was never completed. This alternative would achieve the project purpose and need but was eliminated for the following reasons:

- High initial cost - \$1,200,000,000.
- A 2,400 ft longitudinal encroachment on the Sugar Creek floodplain.
- Potential for wetland impacts.
- Many areas that were vacant land at the time of the 1980's study have undergone considerable development.
- The length of operation for each of the railroads would increase.

4.2.2 Abandoned CNW Corridor West of City

An alternative of relocating freight traffic west of the City using the abandoned CNW corridor was considered (see Figure 7). This alternative would achieve the project purpose and need but was eliminated for the following reasons:

- High cost - \$800,000,000.

- Impact new segments of the City that have undergone considerable development.
- The number of horizontal curves in the rail alignment would increase significantly.
- The length of operation for the railroads would increase causing higher fuel, labor, and maintenance costs.
- The abandoned corridor has been converted to a public recreational trail.

4.2.3 Elevate the UP Tracks

An alternative of reconstructing the UP tracks in the Third Street corridor at an elevation about 20 ft above the existing streets was considered (see Figure 8). The intent of the alternative was to simplify grade crossings and minimize the impacts on vehicle and pedestrian traffic. The tracks would be constructed on an embankment supported on both sides by mechanically stabilized earth walls. A bridge would be built at each street to carry the tracks and a service road over the street. The embankment would need to be about 70 ft wide to accommodate the double tracks and service road. While it would achieve the project purpose and need, this alternative was eliminated from further consideration for the following reasons:

- High cost - \$600,000,000.
- Visual impacts to downtown and adjacent historic structures.
- Requires that the passenger station platform be located 20 ft above street level.
- Construction staging that would require UP traffic to relocate for about two years.
- Does not address issues on 10th or 19th Street tracks.

4.2.4 Lower UP Tracks

An alternative of reconstructing the UP tracks in the Third Street corridor at an elevation about 30 ft below the existing street level was considered (see Figure 9). This alternative would also simplify grade crossings but without causing the visual barrier impacts to the community that elevating the UP tracks would cause. The tracks would be constructed in a trench about 70 ft wide and supported on both sides by tangent pile walls. Each of the City streets would cross the trench on a bridge at street level. This alternative would achieve the project purpose and need but was eliminated for the following reasons:

- High cost - \$800,000,000.
- Requires that the passenger station terminals be located 30 ft below street level.
- Continuous maintenance costs for a system of pumping stations and back-up power supplies.
- Construction staging that would require UP traffic to relocate for about two years.
- Does not address issues on 10th or 19th Street tracks.

4.2.5 Consolidation Using I&M Tracks

An alternative of consolidating the UP tracks onto 10th Street and using the I&M corridor from North Grand Avenue was considered (see Figure 10). This alternative was eliminated for the following reasons:

- Unwanted changes to I&M operations.
- High construction costs

4.2.6 Shift UP Freight to Tenth Street

At the request of the Federal Railroad Administration, the concept of leaving Amtrak and High Speed Rail passenger traffic on the existing Third Street corridor and shifting UP freight traffic to the Tenth Street corridor was considered.

The Union Pacific's proposed operation plan anticipates that northbound and southbound high speed trains will regularly meet each other in Springfield and, in fact, will stop in Springfield to load and unload at the same time. One of Amtrak's project goals has been to accommodate simultaneous loading for northbound and southbound trains. These requirements will necessitate two tracks in the Third Street corridor to accommodate passenger trains.

Construction of a two track corridor with quiet zones on Third Street will require abandonment of existing Third Street, and the initial cost and impact of this would be essentially the same as alternatives of putting both freight and passengers on Third Street.

The Union Pacific's operation plan also anticipates that northbound and southbound freight trains will meet in Springfield. This would require that two tracks be constructed exclusively for the Union Pacific freight in the Tenth Street corridor. Constructing two new tracks along Tenth Street along with grade separations at principal streets is essentially the same as alternatives of shifting both freight and passenger service to Tenth Street.

Constructing only a single track in Third Street for passenger trains or along Tenth Street for freight trains would leave Springfield as the only location in the Chicago to St. Louis corridor where two freight trains or two passenger trains could not meet. In addition to the higher cost of construction, splitting the corridor complicates switching north and south of the City and doubles the length of track to be maintained.

The alternative of shifting rail freight traffic to Tenth Street while leaving passenger traffic on the Third Street corridor was eliminated for the following reasons:

- Higher initial cost than either leaving both freight and passenger on Third Street or shifting freight and passenger to Tenth Street.
- Higher long term maintenance costs for four UP tracks through the City instead of two. Complicated switching operations.
- Does not eliminate the disruptions to Downtown or the Medical District caused by rail traffic.
- Higher accident frequency than shifting passenger and freight trains to Tenth Street.
- More residential and commercial displacements than shifting freight and passenger trains to Tenth Street.
- Does not eliminate the concern of Tenth Street residents regarding increased rail traffic in that corridor.

4.2.7 Consolidate UP and CN to Tenth Street

This alternative would shift UP freight trains and Amtrak passenger trains from Third Street to Tenth Street as well as CN, I&M and KCS freight trains from the Nineteenth Street corridor to the Tenth Street corridor. The Third Street corridor from near Ridgely Avenue to south Iles Avenue would be abandoned as would the Nineteenth Street from north of Clear Lake Avenue to near Stanford Avenue. A quiet zone would be provided along the Tenth Street corridor through a combination of grade separations, quad gate installations, and crossing closures.

This alternative was eliminated for the following reasons:

- High construction costs
- Not supported by the CN
- Large right-of-way requirements
- Large number of displacements

4.3 Alternatives Retained for Further Study

The following Build Alternatives were retained for analysis.

4.3.1 Alternative 1

Alternative 1 – Double track the existing 3rd Street corridor to accommodate UP freight & passenger (HSR) traffic. This alternative includes three subalternatives, each of which includes an alternative specific combination of grade separations and grade crossing closures (see Table 13).

- 1A – Double track UP on 3rd – grade separation at passenger station (Figure 11).
- 1B – Double track UP on 3rd – some grade separations on UP corridor only (Figure 12).
- 1C – Double track UP on 3rd – some grade separations on all corridors (Figure 13).

Alternatives 1A, 1B, and 1C include closure of 3rd Street parallel to the UP tracks from Ash Street to Union Street. This consists of abandoning 3rd Street in areas where it is immediately adjacent to the track and the existing UP right-of-way width is less than 66 feet. This would require that the street right-of-way and any property with access only from 3rd Street be purchased. There are several reasons for this requirement as detailed below.

- From approximately Monroe Street to south of Laurel Street the UP right-of-way is approximately 30 feet wide. Two tracks at 13.5 foot centers would leave only about 8 feet from the centers of the track to the right-of-way line. In other areas north of Monroe Street, the right-of-way is wider but would not accommodate UP's design requirements for spacing and clearance.
- Illinois legal horizontal clearance requirement (Title 92 I.A.C.) is 8 feet in general and 9 feet for poles. The UP requirement is 9 feet. There is insufficient width within the existing right-of-way to provide these clearances with two tracks.
- Since 3rd Street exists on both sides of the track in most of the segment from Monroe Street to Laurel Street, there are vehicles and pedestrians immediately adjacent to the railroad right-of-way. There are also numerous residences and businesses that front directly onto 3rd Street.

- Springfield requested that a concrete barrier and chain link fence be constructed on both sides of the UP track in the 3rd Street corridor to prevent vehicle and pedestrian encroachment onto the UP right-of-way in areas where residences and businesses front directly on 3rd Street. To provide the minimum clearances listed above, it would be necessary to place this fence and barrier on 3rd Street, off of existing railroad right-of-way. This arrangement results in the following concerns:
 - A fence and barrier at the minimum clearance point from Monroe Street to Laurel Street could complicate UP track maintenance since there would be limited space for personnel, equipment, and materials.
 - Third Street would be reduced to a width less than 16 feet.
 - The barrier and fence on both sides of the track could trap trespassers with no easily accessible escape route or place of refuge.
 - Crossing signals and gates would need to be installed at each of the cross streets. The installation of vehicle and pedestrian gates would require that 3rd Street be relocated further away from the track at the at-grade crossings. This would require the acquisition of right-of-way and result in intersections on both sides of, and immediately adjacent to, the rail crossings.

Resolution of these issues results in other actions that are part of this alternative. Alternatives 1A, 1B, and 1C include abandoning 3rd Street in areas where it is immediately adjacent to the track and the existing UP right-of-way width is less than 66 feet. This would require that the street right-of-way and any property with access only from 3rd Street be purchased. Purchase and abandonment of 3rd Street provides the following advantages from the perspective of rail operations as well as pedestrian and vehicle circulation:

Table 13. Alternatives

Alternative			Double Track UP			Shift UP to 10th	
			1A	1B	1C	2A	2B
New Grade Separations	3rd St	Ash		X	X		
		South Grand		X	X		
		Jefferson	X	X	X		
		Madison		X	X		
		Carpenter		X	X		
		5th		X	X		
		6th at North Grand		X	X		
	10th St	Ash			X	X	X
		Laurel				X	X
		Monroe					X
		Washington					X
		Madison			X	X	X
		Jefferson			X	X	X
		Carpenter			X	X	X
		North Grand at UP				X	X
	North Grand at NS			X	X	X	
	19th St	Ash			X	X	X
		South Grand			X	X	X
Replace/Rehab Rail Bridges	UP	Capitol	X	X	X		
		Dodge	X	X	X		
		9th	X	X	X		
	10th St	6th				X	X
		5th				X	X
		South Grand				X	X
Rail Crossing Closure	10th St	Cook				X	X
		Jackson				X	X
		Capitol					X
		Adams				X	X
		Reynolds				X	X
		Miller				X	X
		Enos					X
Enterprise				X	X		
Street Closure	UP	3rd - Ash to Union	X	X	X		
		7th at North Grand		X	X		
		Bergen at 5th		X	X		
		2nd at Ash		X	X		
	10th St	Princeton at 6th			X	X	X
		9th at Ash			X	X	X
		10-1/2 at Ash			X	X	X
		9th at Laurel			X	X	X
		10-1/2 at Laurel				X	X
		Division at UP				X	X
		Reservior at UP				X	X
		10th at N. Grand				X	X
		Mich. at N. Grand			X	X	X
		Wirt at Ash			X	X	X
19th St	Wirt at S. Grand			X	X	X	
	McCreery at S. Grand			X	X	X	
Quiet Zone		UP	X	X	X		
		NS			X	X	X
		CN			X	X	X
Abandon UP Corridor						X	X

- Elimination of most of the concerns associated with pedestrian and vehicle traffic immediately adjacent to the railroad.
- A 15 foot track center and a service road could be provided for the UP, improving its maintenance activity and operations.
- Elimination of the 3rd Street intersections adjacent to the track at cross streets.
- Closing 3rd Street would not result in a noticeable increase in traffic on any other streets.

The passenger station along 3rd Street for Alternatives 1A, 1B and 1C would be at the site of the existing Amtrak Station and on the block immediately to the north. The alternatives include a grade separation at Jefferson Street to provide the required 500 feet station platform length (see Figure 16).

Alternative 2

Alternative 2 – Relocate UP freight and passenger (HSR) traffic to the 10th Street corridor. This alternative includes two subalternatives, each of which includes an alternative specific combination of grade separations and grade crossing closures. (See Table 13).

- 2A – Relocate UP to 10th – some grade separations on 10th and 19th (Figure 14).
- 2B – Relocate UP to 10th – grade separation or closure of all crossings on 10th south of North Grand Avenue, some grade separations on 19th (Figure 15).

Alternative 2B was developed at the request of the UP to evaluate the cost, impacts and benefits of eliminating all at-grade crossings where the NS and UP would operate in adjacent, parallel corridors (North Grand Avenue to Stanford Avenue).

The passenger station along 10th Street for alternatives 2A and 2B would be on the east side of the rail corridor on the block between Adams and Washington Streets. An overhead pedestrian crossing will provide access to the platforms. The alternatives include closing the Adams Street crossing to provide the required 500 feet station platform length (see Figure 17).

5. Analysis of Alternatives Retained for Further Study

5.1 Traffic Delays

Traffic delays at grade crossings were computed for the No-Build conditions and for various build alternatives. The delays were calculated using a spreadsheet and the Regional Planning Commission's (SATS) traffic model. The spreadsheet analyzed each crossing in the study area for each hour of an average day. Daily traffic and distribution for each hour of the day for City streets was taken from IDOT's website. Projected daily train information was obtained from the railroads. Where railroad timetables were not available, the train arrival times were distributed evenly throughout the day.

Crossing blockage time was calculated for each train as it moves through each crossing. This information, along with the vehicle traffic volume information, was used to calculate the number of vehicles blocked by the train, and the average time each vehicle was stopped. Total delays at all of the crossings in an average day could then be calculated.

The SATS traffic model was used to compute the queuing delays at each of the major streets included in the model. The queuing delays were added to the delays calculated in the spreadsheet to determine the total delay at each at-grade crossing. The results of this analysis are shown in Table 14.

The alternatives that consolidate corridors and provide grade separations at busy streets are most effective at reducing vehicle congestion resulting from trains blocking crossings. With three north-south rail corridors and limited grade separations, Springfield east-west streets are vulnerable to frequent delays because of trains blocking crossings.

Table 14. Vehicle Delays

Alternative	Vehicle Delay in veh-min per day (2030)
No-Build	47,500
1A	45,900
1B	28,500
1C	18,900
2A	13,500
2B	7,100

Alternatives 2A and 2B have the fewest delays of the Tier 2 alternatives. This is because of the consolidation of rail traffic on 10th Street and construction of grade separations at the busiest streets. Consolidation moves trains off of the 3rd Street corridor which is crossed by more vehicles than the 10th Street corridor. 10th Street also has more effective existing grade separations.

Alternatives 1C, 2A and 2B would result in fully grade separating Carpenter Street, Madison Street, Jefferson Street, Ash Street and South Grand Avenue, five of the busiest east-west arterials in the City. Traffic on these streets would no longer be stopped by trains.

5.2 Safety

Reducing the number of crossings and improving crossing protection are the primary ways to improve safety. As stated in the purpose and need, the 3rd Street Corridor (Alternatives 1A, 1B, and 1C) also has additional pedestrian safety concerns.

The anticipated number of vehicle-train crashes in the design year 2030 is shown for each alternative in Table 15. These were predicted using USDOT Grade Crossing Accident Prediction based on the method published in summary of the IDOT Rail-Highway Crossings Resource Allocation Procedure-Revised, June 1987 and Rail-Highway Crossing Resource Allocation Procedure: User's Guide, Third Edition, August 1987.

Table 15. Predicted Crashes

Alternative	Predicted Crashes per Year (2030)
No-Build	1.30
1A	1.42
1B	1.31
1C	0.58
2A	0.26
2B	0.08

Alternatives that consolidate rail traffic on corridors with grade separations at the busiest streets (2A and 2B) have the lowest projected number of crashes. Simply building more grade separations without consolidating (Alternatives 1B and 1C) is not as effective as consolidating and building grade separations (2A and 2B). Alternatives 1A, 1B and 1C would fence the UP right-of-way only, leaving the NS and CN corridors subject to existing level of trespass. Alternatives 2A and 2B would fence both of the City's remaining north-south corridors, reducing trespass opportunities throughout the City.

Alternatives 1A, 1B and 1C would not fully address the 3rd Street pedestrian safety issues because rail traffic would remain on the 3rd Street corridor. Closing 3rd Street would eliminate the problem of the street immediately adjacent and parallel to the tracks. The issue of the busy corridor through a dense residential area with numerous pedestrian attractions would remain however.

5.3 HAZMAT Incidences

Information on hazardous material releases from railroad cars is tabulated by the U.S. Department of Transportation. This information was used to compute an average of incidents, costs, injuries and deaths per train mile traveled. This was then used to predict the number and cost of incidents in the project area for the various scenarios and used in the lifecycle cost analysis. Since the travel length of each of the alternatives is similar there is little to no difference in the number of projected incidents among the retained alternatives.

5.4 Displacements

The number of residential and commercial displacements for each alternative is shown in Table 16. Also shown are the number of properties which will have their existing street access changed. Most of these changes are due to closure of Third Street or construction of grade separations. Most of these access changes will negatively affect the properties.

Table 16. Displacements and Changes in Access

<u>Alternative</u>	<u>Residential Displacements</u>	<u>Commercial Displacements</u>	<u>Changes in Access</u>
No-Build	0	0	0
1A	36	4	135
1B	102	31	219
1C	162	42	248
2A	117	53	28
2B	117	56	40

5.5 Train Horn Noise

Horn blowing frequency for each alternative is shown in Table 17. Due to the large number of at-grade crossings in the City, construction of grade separations will have a very small affect on horn frequency. Significant reduction in horn noise can only be accomplished through implementation of quiet zones.

**Table 17. Train Horn Noise Durations
in 2030 in all Corridors**

<u>Alternative</u>	<u>Minutes/Day</u>
No-Build	314
1A	151
1B	151
1C	0
2A	0
2B	0

5.6 Capital Costs

The capital cost of each alternative in 2011 dollars, was computed. This was based on an estimate of quantities for major construction items and also included engineering, land acquisition and utility relocation. The initial costs for the retained alternatives are shown in Table 18 below.

Table 18. Capital Cost for Retained Alternatives

<u>Alternative</u>	<u>Initial Cost</u>
No-Build	\$0
1A	\$113,000,000
1B	\$251,000,000
1C	\$377,000,000
2A	\$315,000,000
2B	\$338,000,000

5.7 Present Value Cost Analysis

In order to compare the various alternatives, a present value cost analysis was prepared. The assumptions used in this analysis are shown in Table 19.

Annual costs were computed for each year of anticipated project period. These include:

- Crossing maintenance.
- Delays based on the traffic delay calculations and an average hourly delay cost.
- Cost for collisions, injuries and fatalities at highway grade crossings as computed by the crash prediction model.
- Emissions and fuel costs due to delayed vehicles.
- Incident, injury and fatality costs for hazardous material releases.

These annual costs were increased due to inflation and any anticipated increases due to rail and vehicle traffic growth. The present value of these annual costs were computed using the discount rate and anticipated project period.

Rehabilitation costs were computed for significant publicly funded improvements that will require replacement or rehabilitation during the project period. These include overpass structures and grade crossings. A return interval and rehabilitation cost were assumed along with anticipated inflation. The present worth of the rehabilitation components was computed using the discount rate and project period. The total present value of initial costs, annual costs and rehabilitation costs of the various alternatives were compared for a project period of 75 years (see Table 20).

Table 19. Economic Analysis Assumptions

Description	Value	Source
Value of Delay Time Per Hour	\$15.00 ⁽¹⁾	USDOT, Revised Departmental Guidance: Valuation of Travel Time in Economic Analysis, February 11, 2003
Fuel prices (average retail gasoline price per gallon, 2011-30)	\$3.33	NHTSA, Corporate Average Fuel Economy for MY 2011 Passenger cars and Light Trucks,
Annual Inflation Rate	1.80%	
Annual Inflation Rate for Construction	3.0%	
Volatile Organic compounds damage cost (\$/ton)	\$1,700	Economic Values for Benefits Computations (2007)
Nitrogen oxides damage cost (\$/ton)	\$4,000	
Value of Statistical Life (Fatality)	\$5.8 million	USDOT, Revised Departmental Guidance: Treatment of the Value of Preventing Fatalities and Injuries in Preparing Economic Analysis, February 5, 2008
Value of Reduced Injury	\$1,000,000 ⁽²⁾	
Cost of Property-damage-only crash	\$50,000	FRA Gradedec.net
Discount Rate	4.5%	Office of Management and Budget Circular No. A-94. Appendix C Revised December 2009
Vehicle Traffic Growth (per year)	2.00%	IDOT. Springfield Average
Rail Traffic Growth (per year)	1.20%	FRA. National Average
HAZMAT Incident Each	\$1,420	Office of Hazardous Materials Safety. National Average

Notes:

- (1) All costs in 2010 dollars.
- (2) Applied the scaling factors for injury crashes in USDOT Memo (February 11, 2003) to regional crash data.

Track and train signal maintenance costs are the same for all alternatives.
Train operations costs are the same for all alternatives.
Street maintenance costs are the same for all alternatives.

Structure life is 75 years.
Structure rehabilitation every 25 years at 20 percent of structure cost.

Grade crossing and signal rehab every 20 years.
A reduction in rehabilitation and annual costs from the baseline condition reflects a measurable benefit of each alternative, primarily as a reduction of delays and accidents.

Table 20. Present Value of Annual and Lifecycle Costs

<u>Alternative</u>	<u>Present Value of Annual and Rehabilitation Costs</u>
No-Build	\$467,000,000
1A	\$450,000,000
1B	\$341,000,000
1C	\$241,000,000
2A	\$173,000,000
2B	\$103,000,000

Since the annual and rehabilitation costs are reduced to a present value they can be directly compared to the capital costs, and a total cost can be computed for each alternative. This can be used to compare the various alternatives and provide a substantiation of benefits versus any monetary costs in order to weigh the alternatives to determine what is carried forward in the NEPA process.

Total costs, capital and annual costs, are shown in the table below.

Table 21. Total Cost

<u>Alternative</u>	<u>Total Cost</u>
No-Build	\$467,000,000
1A	\$563,000,000
1B	\$592,000,000
1C	\$618,000,000
2A	\$488,000,000
2B	\$441,000,000

5.8 Reduce Rail Traffic Through Medical District and Downtown

The City of Springfield has a long-held goal to eliminate rail traffic on 3rd Street and to consolidate rail traffic on 10th Street (see *Springfield Railroad Consolidation Study*, 2005; and *The 10th Street Solution*, 2011). The 3rd Street (UP) and 19th Street (CN) corridors are the most residential of the three corridors in the City; the 10th Street (NS) corridor is the least residential. The 3rd Street corridor passes through downtown, the State Capital Complex and the Mid-Illinois Medical District. The rail corridor inhibits planned development in the Medical District because of the reluctance to construct medical, academic or research structures too close to the tracks (Springfield Area Transportation Study, 2010). Development in downtown, especially residential development is restricted by the 3rd Street rail corridor. Much of the 10th Street corridor passes through the east edge of downtown and a warehouse and industrial area. The City's comprehensive plan calls for relocation of the 3rd Street corridor to 10th Street and construction of an intermodal station on 10th Street. Alternatives 2A and 2B achieve this goal and are consistent with the City's plan since they eliminate rail traffic on 3rd Street and consolidate on 10th Street.

Alternatives 1A, 1B and 1C would increase rail traffic through downtown and the heart of the Medical District. These alternatives also do not reduce the number of rail corridor barriers that divide the City. These alternatives leave rail traffic on the 3rd Street corridor which has a higher concentration of critical community facilities than the 10th Street Corridor.

Alternatives 2A and 2B eliminate rail traffic from downtown and shift it away from the center of the Medical District. These alternatives eliminate one of the rail corridor barriers and mitigate the effects of the other two by constructing grade separations at critical locations on both 10th and 19th Streets.

5.9 Drainage

Each of the alternatives will require drainage improvements for both track and grade separation construction. Each alternative will include underdrains in the track subballast connected to the City's storm sewers. New overpasses will also include inlets connected to enclosed drains which will run to the storm sewers.

The underpasses on Alternatives 1B, 1C, 2A, and 2B will require underdrains and pump stations connected to the storm sewers.

There will be no significant increase in paved area, so none of the alternatives will require stormwater detention. None of the alternatives cross any regulated floodplains.

5.10 Grade Separations

The location of proposed grade separations was based on the following criteria:

- Benefit/cost analysis (present value of savings for delay, emissions and maintenance reductions compared to initial cost)
- Arterial functional classification – major connectivity
- UPRR request for fully grade separated corridor where shared with NSRR
- Railroad operational efficiency (ability to store long trains on UPRR and NSRR)
- Environmental impacts
- Community input

The following locations are proposed in the UP corridor for alternatives 1B and 1C:

Table 22. Third Street Grade Separations

<u>Street</u>	<u>Corridor</u>	<u>Functional Classification</u>	<u>Benefit/ Cost ratio</u>	<u>Type</u>
Ash	3rd	Arterial	1.09	underpass
South Grand	3rd	Arterial	1.26	overpass
Jefferson	3rd	Arterial	3.51	overpass
Madison	3rd	Arterial	1.10	overpass
Carpenter	3rd	Arterial	.88	overpass
5th	3rd	Arterial	.53	overpass
North Grand at 6th	3rd	Arterial	.56	overpass

The primary environmental impacts of each of the grade separations are displacements and changes in access. These are tabulated for each grade separation below.

Table 23. Third Street Grade Separation Impacts

<u>Street</u>	<u>Residential Displacement</u>	<u>Commercial Displacement</u>	<u>Change in Access</u>
Ash	6	1	3
South Grand	0	1	19
Jefferson	0	3	15
Madison	0	0	11
Carpenter	0	0	18
5th	16	2	3
North Grand at 6th	44	21	21

Three of the grade separations listed above have a benefit/cost ratio less than 1.0. They are included based on community input for the reasons described below:

Fifth and Sixth Streets – One way couple that provides primary access from the north side to downtown and the hospitals.

Carpenter Street – the primary east-west link in the Medical District. It connects St. John’s and Memorial Hospitals with each other and the rest of the City. The hospitals consider Carpenter Street to be essential for doctor access for emergency services.

North Grand Avenue – Crossed by the UP tracks on a dangerous skew angle right at the intersection with Sixth Street and with Peoria Road, an at-grade crossing of North Grand Avenue has significant safety concerns. North Grand Avenue is an important commercial corridor that also is the only east-west arterial between Carpenter Street and Sangamon Avenue.

Discussions were held with the Union Pacific Railroad regarding their request for a fully grade separated corridor if they relocate to the 10th Street corridor under alternatives 2A or 2B. Based on these discussions the following six crossing on the 10th Street corridor and on the NSRR/I&MRR at 15th Street are proposed for grade separation:

Table 24. Tenth Street Grade Separations

<u>Street</u>	<u>Corridor</u>	<u>Functional Classification</u>	<u>Benefit/Cost Ratio</u>	<u>Type</u>
Ash	10th	Arterial	0.96	Underpass
Laurel	10th	Collector	0.99	Underpass
Jefferson	10th	Arterial	4.24	Underpass
Madison	10th	Arterial	1.60	Underpass
Carpenter	10th	Arterial	1.09	Underpass
North Grand	10th	Arterial	1.41	Underpass
North Grand	15th	Arterial	1.04	Overpass

The following seven streets are proposed to be closed in the 10th Street corridor:

- Jackson Street – ADT = 350
- Adams Street – ADT = 2,250 Traffic can readily divert to Washington and Monroe Streets, allows use for bus transfer facility
- Reynolds Street – ADT = 700
- Miller Street – ADT = 500
- Enterprise Street (west leg) – ADT = 1,150
- Division Street at new UPRR – ADT = 800
- Reservoir Street at new UPRR – ADT = 900

While the UPRR initially requested a completely grade separated corridor where it is shared with the NSRR, there are four streets where closure or grade separation is not cost effective or not practical and quad gates are proposed. This will allow implementation of a quiet zone along the 10th Street corridor and improve safety. They are:

- Capitol Avenue – The Federal, State, and City governments have made a significant investment to create a monumental corridor along Capitol Avenue between Martin Luther King Drive and the Capital Building. Closing Capitol Avenue would destroy most of the intended benefit of this project. Constructing a grade separation would destroy the intended views along Capitol Avenue and cut off access to the State Journal-Register newspaper. ADT = 1,600. B/C = .30.
- Monroe Street – A grade separation would cut off access to the County Building and jail as well as the historic Great Western Depot. Closing Monroe Street to vehicles and pedestrians would create a barrier for east side access to the Central Business District (CBD) and prevent future commercial growth to the east. ADT = 2,450 B/C = .49.
- Washington Street - A grade separation or closure of Washington Street would make access to the future Amtrak station and bus transfer facility difficult and inefficient. Closing Washington Street to vehicles and pedestrians would create a barrier for east side access to the CBD and prevent future commercial growth to the east. ADT = 1,700 B/C = .75.
- Enos Street – A grade separation for Enos Street would not be cost effective and would create numerous residential displacements. Closure would seriously hamper emergency access and neighborhood connectivity as the nearest crossings would be North Grand Avenue to the north and Carpenter Street to the south. The affected area is blocked to the east by the I&M yard with no other access to school or emergency services. The anticipated ADT on Enos Street is 1,800. B/C = .30.

The existing at-grade crossing of Converse Avenue at the UPRR will be shifted to the new alignment with quad gates for safety and to implement a quiet zone. ADT = 1,850.

The existing at-grade crossing at Ridgely Avenue would be realigned to improve sight distance. ADT = 1,400.

Two dangerous locations where the tracks cross two streets diagonally through an intersection will be eliminated:

- Eighth Street and Converse Street
- Sixth Street and North Grand Avenue

In addition, two grade separations on the 19th Street corridor (CNRR) are included in Alternatives 2A and 2B:

Table 25 Nineteenth Street Grade Separations

Street	Corridor	Functional Classification	Benefit/ Cost Ratio	Type
Ash	19th	Arterial	1.20	underpass
South Grand	19th	Arterial	1.76	underpass

5.11 Utilities

Each of the alternatives will require utility relocation, especially at any new underpass. The existing utilities in Third Street adjacent to the UP will need to be abandoned or relocated since the street will be transferred to UPRR ownership.

The most significant utility relocation at the grade separations will be the large diameter sewer on Ash Street. This will be relocated to behind the abutments and encased beneath the railroad tracks. The cost of utility relocation is included in the initial cost estimates.

5.12 Social, Economic and Environmental Effects

The environmental impacts for each alternative were assessed as defined by the Federal Railroad Administration's Procedures for Considering Environmental Impacts, resource agency input, and public comments. A complete analysis of these issues is contained in the Final EIS Volumes I and II. Field surveys were conducted for resources that have a potential for impacts. Surveys were conducted for ambient conditions for noise and vibration modeling, historic structures, endangered and threatened species, and wetlands. Newsletters, a project website, telephone call-in numbers and numerous community presentations were provided for interested neighborhood groups throughout the project area to solicit comments and feedback from the public.

The following tables summarize the potential environmental impacts of the alternatives retained for further study. The methodology used for the resources having potential impacts is discussed below.

**Table 26. Potential Environmental Impacts:
Double Track 3rd Street (UP) Alternatives 1A, 1B and 1C**

Socio-Economic Factors	<ul style="list-style-type: none"> • Residential displacements • Commercial displacements • Low-income and minority populations present
Historic Sites (National Register Listed or Eligible) <i>* Represents various homes throughout the neighborhood</i>	<ul style="list-style-type: none"> • Dana-Thomas House • H.P. Boulton House • Hickox Apartments • Central Springfield District • Enos Park Neighborhood * • Lincoln Park Neighborhood * • Near South Neighborhood * • Aristocracy Hill Neighborhood*
Noise & Vibration Sensitive Receptors	<ul style="list-style-type: none"> • Historic Sites (listed above) • Memorial Hospital • St. John's Hospital
Special Waste Sites	<ul style="list-style-type: none"> • No National Priority Listed sites identified • 12 Leaking Underground Storage Tank sites identified
Special Lands (Parks & Nature Preserves)	<ul style="list-style-type: none"> • 11th & Black Park (No right-of-way anticipated)
Endangered & Threatened Species	<ul style="list-style-type: none"> • No impacts to Endangered or Threatened species anticipated
Water Quality (Streams & Wetlands)	<ul style="list-style-type: none"> • No impacts to streams or wetlands anticipated

**Table 27. Potential Environmental Impacts:
3rd Street (UP) Shift to 10th Street (NS) Alternative 2A**

Socio-Economic Factors	<ul style="list-style-type: none"> • Residential displacements • Commercial displacements • Low-income and minority populations present • Adverse travel at street closures
Historic Sites (National Register Listed or Eligible) <i>* Represents various homes throughout the neighborhood</i>	<ul style="list-style-type: none"> • Lincoln Home Site • Lincoln Colored Home • Old Town Theater • Sacred Heart Church • Lincoln Depot • Pillsbury Mills Neighborhood * • Pioneer Park Neighborhood * • Harvard Park Neighborhood*
Noise & Vibration Sensitive Receptors	<ul style="list-style-type: none"> • Historic Sites (listed above) • St. John's Hospital
Special Waste Sites	<ul style="list-style-type: none"> • No National Priority Listed sites identified • 14 Leaking Underground Storage Tank sites identified
Special Lands (Parks & Nature Preserves)	<ul style="list-style-type: none"> • 11th & Black Park (No right-of-way anticipated) • Iles Park (No right-of-way anticipated)
Endangered & Threatened Species	<ul style="list-style-type: none"> • No impacts to Endangered or Threatened species anticipated
Water Quality (Streams & Wetlands)	<ul style="list-style-type: none"> • No impacts to streams or wetlands anticipated

**Table 28. Potential Environmental Impacts:
3rd Street (UP) Shift to 10th Street (NS) Alternative 2B**

Socio-Economic Factors	<ul style="list-style-type: none"> • Residential displacements • Commercial displacements • Low-income and minority populations present • Adverse travel at street closures
Historic Sites (National Register Listed or Eligible) <i>* Represents various homes throughout the neighborhood</i>	<ul style="list-style-type: none"> • Lincoln Home Site • Lincoln Depot • Lincoln Colored Home • Pillsbury Mills Neighborhood * • Old Town Theater • Pioneer Park Neighborhood * • Sacred Heart Church • Harvard Park Neighborhood*
Noise & Vibration Sensitive Receptors	<ul style="list-style-type: none"> • Historic Sites (listed above) • St. John's Hospital
Special Waste Sites	<ul style="list-style-type: none"> • No National Priority Listed sites identified • 14 Leaking Underground Storage Tank sites identified
Special Lands (Parks & Nature Preserves)	<ul style="list-style-type: none"> • 11th & Black Park (No right-of-way anticipated) • Iles Park (No right-of-way anticipated) • Hobbs Park (Right-of-way anticipated)
Endangered & Threatened Species	<ul style="list-style-type: none"> • No impacts to Endangered or Threatened species anticipated
Water Quality (Streams & Wetlands)	<ul style="list-style-type: none"> • No impacts to streams or wetlands anticipated

5.12.1 Socioeconomics

The number of residential and commercial displacement for each alternative is shown in Table 16. Also shown are the number of properties which will have their existing street access changed. Most of these changes are due to closure of Third Street or construction of grade separations. Most of these access changes will negatively affect the properties. Census data has been reviewed to determine population demographics. This information is currently being updated with 2010 data which has just become available. Various other documents prepared by the Chamber of Commerce and the Springfield Medical District have been reviewed for an economic analysis of the retained alternatives.

5.12.2 Environmental Justice

Considerations regarding environmental justice as required by Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations" have been reviewed. Minority and low-income populations are known to occur on all of the alternatives retained for further study based on census data. Efforts have been made to inform these groups of opportunities for public participation and community presentations. Railroad traffic currently exists within each of the alternatives retained for further study, and no organized groups have expressed disproportionate impacts of the railroad project to-date. In addition, some minority groups are preparing a Community Impacts Agreement for federal, state and local agencies' participation for further development of the preferred alternative.

The retained alternatives have avoided, minimized, and mitigated any potential for disproportionately high and adverse human health and environmental effects, including social and economic effects, on minority populations and low-income populations. The study team's public engagement process has ensured the full and fair participation by all potentially affected communities in the transportation

decision-making process. Efforts will also be made to prevent the denial of, reduction in, or significant delay in the receipt of any benefits agreed to as project commitments to minority and low-income populations.

5.12.3 Noise and Vibration

Noise and vibration studies are being conducted using TNM 2.5 and the FRA's Railroad Noise Emission Compliance Regulations. About 500 residences are located within one block of the Third Street corridor, and about 350 residences are located within one block of the Tenth Street corridor. About 450 residences have been identified along the Nineteenth Street corridor. Field measurements were conducted along the retained alternatives for ambient noise and vibration levels. Sensitive receptors have been identified and detailed modeling will be conducted for the preferred alternative.

5.12.4 Historical Sites

An historical and archaeological investigation of the retained alternatives was conducted to identify significant historic resources within the project area. Numerous sites have been identified throughout the project area, which are either listed or eligible for listing on the National Register of Historic Places. A total of 179 properties have been identified as architecturally significant and/or of architectural interest within or adjacent to the Third Street corridor. A total of 69 properties have been identified as architecturally significant and/or of architectural interest within or adjacent to the Tenth Street corridor. We will be coordinating with the State Historic Preservation Office and the Advisory Council on Historic Preservation for any adverse impacts that may be associated with the preferred alternative.

5.12.5 Wetlands/Water Quality/Floodplains

Wetlands and waters of the United States were identified through the U.S. Fish and Wildlife Service's National Wetland Inventory Mapping and followed up with a field survey of the retained alternatives. No wetlands or waters of the United States have been identified within any of the retained alternatives. Surface drainage of the retained alternatives will enter the city's stormwater sewer system for treatment prior to outflow to a receiving stream. No 100 year floodplains were identified within the project area on Federal Emergency Management Agency (FEMA) mapping.

5.12.6 Endangered and Threatened Species

The U.S. Fish and Wildlife Service and the Illinois Department of Natural Resources were contacted regarding the potential presence of any state or federally listed endangered or threatened species. Responses from these agencies did not indicate any known species or preferred habitat within any of the retained alternatives. A response was received from our public outreach from the Friends of the Sangamon Valley. They had concerns about the possible occurrence of the Franklin's ground squirrel which has been identified on abandoned railroad right-of-way on the west side of Springfield. Hanson biologists surveyed the known locations and habitat requirements of the ground squirrel with local researchers and conducted a habitat survey along the retained alternatives. No preferred habitat was identified along any of the alternatives retained for further study.

5.12.7 Recreational Areas

Recreational lands and parks were identified from available mapping and field surveys. Information was collected to determine if funding from the Land and Water Conservation Fund (Section 6(f)) or from the Department of Housing and Urban Development's "open space" funds were used to purchase any recreational lands and parks. No such properties were located along any of the retained alternatives.

5.12.8 Special Wastes

Various federal, state and local databases were queried for previous histories of spills, clean-ups or other reports of hazardous materials near the retained alternatives. A number of Leaking Underground Storage Tanks in various degrees of clean-up were reported throughout the study area. There are nearly an equal number of sites along both the Third Street and Tenth Street corridors. These sites do not pose a significant risk to project development and will be further investigated for the preferred alternative. There were no National Priority Listed sites identified in the study area.

The social, economic and environmental effects of each of the alternatives are discussed in detail in the Tier II Environmental Impact Statement for the project.

6. Coordination Activities

A complete discussion of coordination activities is included in Section 6 of the Final EIS, Volume II.

6.1 Local Governments

The project was initially directed by a Steering Committee composed of representatives of the City, County, IDOT and Senator Durbin's office. This Committee met monthly and as needed. The study was later directed by IDOT.

6.2 State and Federal Agencies

IDOT Bureau of Railroads representatives served on the Steering Committee and later directed the study. Meetings were held to update the Federal Railroad Administration (FRA) on the progress of the study. See Appendix A for meeting minutes. Coordination with State and Federal environmental agencies is included in the Final EIS, Volume II.

6.3 Technical Committee

A Technical Committee met quarterly in the early stages of the study to discuss the project. Members of this Committee included representatives of:

- Norfolk Southern Railroad
- Illinois Midland Railroad
- Kansas City Southern Railroad
- Union Pacific Railroad
- Canadian National Railroad
- Amtrak
- Illinois Commerce Commission

Minutes of the Technical Committee meetings are included in Appendix B.

7. Public Involvement Activities

An extensive public engagement program was a vital component of this project. A description of the process along with analysis, outcome and correspondence is included in Section 6 of the Final EIS, Volume II.

The study alternatives were presented at an open house for public comments. The Preferred Alternative was presented at the Public Hearing.

8. Conclusions/Recommendations

All of the build alternatives would provide for a two track High Speed Rail route through Springfield with no differences in operations or travel time. Other than socio-economic and train noise there are no significant environmental differences among the alternatives.

8.1 Alternatives Eliminated

The No-Build Alternative is recommended for elimination because it was the least effective in achieving the project purpose and need. It has the highest traffic delays, the second highest expected crash frequency and the highest train noise. It also has the highest lifecycle cost. The No-Build Alternative fails to address any of the project needs along 10th Street or 19th Street. Safety and congestion concerns will not be addressed with the No-Build Alternative. Noise and community division will still exist.

Alternative 1A is recommended for elimination because it was the least effective of the Build Alternatives in achieving the project purpose and need. It has the highest traffic delays, expected crash frequency and train horn frequency of the Build Alternatives. It also has the highest lifecycle cost of the Build Alternatives. Alternative 1A fails to address any of the project needs on Tenth Street or Nineteenth Street. This alternative has the potential for increased noise and vibration impacts to more residences and sensitive noise receptors, including the Dana Thomas House and the hospitals. The public has not supported this alternative based on comments received from the open houses and community presentations. This alternative also has the highest impacts to potential development in the Medical District and the Central Business District and maximizes the number of trains through residential areas.

Alternative 1B is recommended for elimination because it was not as successful as other alternatives in achieving the project purpose and need. It has the second highest delays, expected crash frequency, train horn noise and lifecycle cost of the Build Alternatives. The lengthy overpasses in the downtown area cause serious access and visibility impacts to businesses and also will impact more historic structures. The number of displacements and parcels with access changes is higher than other alternatives. Alternative 1B also fails to address any of the project needs on Tenth Street or Nineteenth Street. This alternative has the potential for increased noise and vibration impacts to more residences and sensitive noise receptors, including the Dana Thomas House and the hospitals. The public has not supported this alternative based on comments received from the open houses and community presentations. This alternative also has the highest impacts to potential development in the Medical District and the Central Business District and maximizes the number of trains through residential areas.

Alternative 1C is recommended for elimination because it has higher anticipated delays, crash frequency and train horn frequency than Alternatives 2A or 2B. It also has a higher initial cost than Alternative 2A or 2B and a higher total cost than Alternative 2A or 2B. The number of displacements and access changes is higher than other alternatives. This alternative has the potential for increased noise and vibration impacts to more residences and sensitive noise receptors, including the Dana Thomas House and the hospitals; and the potential for more historic structure impacts associated with the grade separations. The public has not supported this alternative based on comments received from the open houses and community presentations. This alternative also has the highest impacts to potential development in the Medical District and the Central Business District and maximizes the number of trains through residential areas.

Alternative 2B is recommended for elimination because it has higher initial costs than Alternative 2A, requires more right-of-way and results in more commercial displacements and more parcels with a change in access. Alternative 2B has lower delays, crash rates and lifecycles costs, but this results primarily from constructing new grade separations at Monroe and Washington Streets and closing Capitol Avenue and Enos Streets. The grade separations both have a benefit/cost ratio much less than 1.0. The additional grade separations and street closures create undesirable access and adverse travel issues.

8.2 Preferred Design Alternative

Alternative 2A is the preferred alternative (see Figure 14). It has the second lowest traffic delays, second lowest crash frequency, lowest train horn noise, second lowest number of displacements, lowest number of access changes, and the second lowest total cost of the Build Alternatives. This alternative does not cause additional noise and vibration impacts to the Medical District, or a severance to their long-term plans. Impacts to historic structures will be minimized and no Section 4(f) impacts are anticipated. Fewer residences are within one block of the Tenth Street corridor. This alternative has also received public support through the public engagement process. It fulfills the project purpose and need with the second lowest total cost of the Build Alternatives while minimizing environmental impacts. Track charts (Appendix E), typical sections (Appendix F), and plan and profile drawings (Appendix E), proposed bridge drawings (Appendix G), and stage construction (Appendix H) for track construction are included in Volume 2.

8.3 Track Arrangement

The two track UP corridor will be constructed west of the NS corridor. Track spacing will be 20 ft with 35 ft to the right-of-way on the west side and 20 ft on the east side for a total right-of-way width of 75 ft. A service road will be constructed on the west side. The NS corridor will consist of a single track with room for a future track at 15 ft spacing. Total right-of-way width will be 65 ft with a service road on the east side.

There are no connections between UP and NS north of Stanford Avenue and no industry sidings or turnouts planned for either railroad. The existing NS yard will be purchased as part of the project and these operations relocated by the NS.

All track will be constructed to the design criteria shown in Section 1. The track profile will be raised in most areas to accommodate underpasses. Existing track structure will be replaced or relocated.

8.4 Grade Separations

New grade separations will be constructed at the locations listed below:

Table 29. Proposed Grade Separations

<u>Corridor</u>	<u>Railroad</u>	<u>Street</u>	<u>Type</u>
10 th Street	UP/NS	Ash	underpass
10 th Street	UP/NS	Laurel	underpass
10 th Street	UP/NS	Jefferson	underpass
10 th Street	UP/NS	Madison	underpass
10 th Street	UP/NS	Carpenter	underpass
10 th Street	UP	North Grand	underpass
15 th	NS	North Grand	overpass
19 th	CN	Ash	underpass
19 th	CN	South Grand	underpass

At each location the grade separation will be constructed to the design standards shown in Section 1.0 and will include at least as many traffic lanes as the existing street. All streets will provide pedestrian accommodations. It is anticipated that underpasses in the 10th Street corridor will be constructed using tangent pile retaining walls to minimize right-of-way. This will be determined after completion of the foundation borings and geotechnical study in Phase 2.

Each underpass will require a pump station to handle stormwater. The outlet will be connected to the City storm sewer system. Utilities in the street will be buried beneath the underpass pavement or relocated. Utilities directly beneath the railroad tracks will be encased if required by the railroad companies.

8.5 At-Grade Crossings

At grade crossings for the relocated Union Pacific railroad tracks will be located as follows:

Table 30. Proposed At-Grade Crossings

<u>Street</u>	<u>ADT</u>
Capitol	1,600
Monroe	2,450
Washington	1,200
Enos	1,800
Converse	1,850
Ridgely	1,400

The profile of these streets will be adjusted as necessary to accommodate the raised track. (See plan and profile sheets in Appendix E.)

These crossings will be protected by four quadrant gates as shown on the plan and profile drawings and will be incorporated in the city-wide quiet zone.

Factory Street will be realigned at the Ridgely Avenue crossing to improve sight distance and provide adequate space to install crossing signals. This improvement is shown in Appendix F.

The remaining at-grade crossings on the NS and CN corridors will have four quadrant gates installed and will be part of a city-wide quiet zone.

8.6 Street Closing

The following existing railroad crossings will be closed:

Table 31. Proposed Closed Crossings

<u>Street</u>	<u>ADT</u>
Jackson	300
Adams	2,250
Reynolds	700
Miller	500
Enterprise	1,150

In each case there are nearby streets with adequate capacity to accommodate the diverted traffic.

In addition, there are two locations where existing streets will be closed at the new UPRR corridor.

Table 32. Existing Streets Closed

<u>Street</u>	<u>ADT</u>
Division	800
Reservoir	700

Traffic on these streets will be diverted to North Grand Avenue or to Enos Street.

Construction of new grade separations will also require closing some streets that currently intersect the grade separated street in the vicinity of the tracks.

- Princeton at 6th
- 9th at Ash
- 10 ½ at Ash
- 10 ½ at Laurel
- 10th at North Grand
- Michigan at North Grand
- Wirt at Ash
- Wirt at South Grand
- McCreery at South Grand

These are all low volume streets and their closure will not adversely affect the adjacent street system.

8.7 Grade Crossing Warning System and Pedestrian Treatments

The grade crossing warning system costs assume that a FRA compliant “quiet zone” will be implemented. For a quiet zone to be qualified under the FRA regulation promulgated in 49 CFR Part 222, it must be shown that the lack of a train horn does not present a significant risk with respect to loss of life or serious injury, or that the significant risk has been compensated for by other means. The regulation identifies five Supplemental Safety Measures (SSM) that can be implemented at grade crossings to compensate for the

risk and to establish a quiet zone. The first, permanent closure of the grade crossing, is achieved by grade crossing elimination or grade separation. This SSM is proposed at nine locations. The next three SSMs identified as viable for this project include: four-quadrant (4Q) gates, two-quadrant (2Q) gates with medians, and 2Q gates on one-way streets. In all cases, the goal is to completely prevent encroachment from the approaches to the crossing. The final SSM, which is not viable for this project, is temporary closure during night time hours. If every public grade crossing is treated with a SSM, the quiet zone will remain qualified regardless of changes in the Nationwide Significant Risk Threshold (NSRT) or Quiet Zone Risk Index (QZRI).

The FRA allows Alternative Safety Measures (ASM), which may be a modification of SSMs, non-engineering ASMs, such as programmed enforcement or video enforcement, or engineering ASMs that include geometric and sight distance improvements. However, ASM established quiet zones are subject to analysis prior to the establishment and periodic analysis thereafter. The ASM established quiet zone is not deemed a viable solution for this project because there is no guarantee that the quiet zone will remain qualified if the NSRT or QZRI change.

Where 4Q gates are used, dynamic exit gate operating mode is required by the Illinois Commerce Commission. In the dynamic mode, the intent of the vital loop based vehicle detection system is to detect vehicles in the track area between the entrance gate and exit gate and keep the exit gates raised until the vehicle clears the area. The exit gates shall be AREMA compliant Exit Gate mechanisms designed to “fail up” if the control circuit is compromised.

On two-way roadways, crossings with multiple approach lanes will be supplemented with cantilever signals that provide a pair of flashing light signals for each approach lane. On one-way roadways with multiple approach lanes, a left hand signal, or a combination of a left-hand signal and cantilever will be used to provide a pair of flashing light signals for each approach lane.

While 2Q gates and medians have a lower installation cost, their use is generally limited to driveways and other geometric issues near the crossing. In addition to the installation cost of the 2Q gates and medians, the costs of driveway relocations (real and perceived – loss of or disruption to business) were factored in the total cost.

Similarly to 2Q gates and medians, the installation cost of 2Q gates on a one-way roadway is lower than 4Q gates. However, if a roadway is changed from two-way to one-way, the total costs must be factored in the cost.

As recommended by the staff of the Railroad Section of the Illinois Commerce Commission, pedestrian treatments at the grade crossings are based on automatic pedestrian gates across each sidewalk, supplemented by fencing and manual ADA compliant “swing-gates” that provide egress from the track area. Where necessary, sidewalks will be realigned to cross the tracks at, or near, a right angle to minimize the crossing clearance distance. Fencing will be used along the railroad right of way to minimize trespassers from crossing the tracks.

8.8 Grade Crossing Signals

Wayside Signal Systems

The signal system on both railroads is a Centralized Traffic Control system controlled by their respective train dispatcher.

The track realignment requires the removal of a power operated turnout and relocation of the home signals at the existing Ridgely Interlocking on the UP RR. On the NS RR, the interlocking at Mile 413 will be upgraded by the addition of two dual-controlled power operated switches. At the southern end of the project a new power operated turnout will be required to connect the 2nd UP main into the existing Iles control point. At Mile 414.50 on the NS, a single-track double-direction intermediate signal will be required.

To facilitate the Amtrak station stops on the UP and expedite train movements, a set of double-track double-direction intermediate signals will be located north and south of the proposed station. The General Code of Operating Rules adopted by UP require a train that is delayed within a signal block to “proceed prepared to stop at the next signal until the next signal is visible and that signal displays a proceed indication”. Since the next signals are around curves, the two intermediate signal locations are needed to avoid delays.

Signal control points include dual-control power switch machines and helper machines on long turnouts, color light signals and microprocessor control circuits that are Positive Train Control, PTC, compatible.

Each railroad will install the equipment at the interlocking in accordance with any existing interlocking or joint-facilities agreements. At the intermediate signals, each railroad will install and maintain its own facilities.

Implementation of Positive Train Control (PTC) in accordance with the federal mandate assumes that microprocessor based signal control systems are used in the wayside signal system and that these control systems are PTC compatible. Proposed wayside locations include the wayside interface units and the necessary communications packages.

8.9 Stage Construction and Traffic Maintenance

All of the necessary track work will need to be constructed prior to relocation of rail traffic from Third Street to 10th Street. This work will need to be completed in stages as shown in the drawings in Appendix H. The underpasses on the 10th Street corridor should be constructed concurrent with the track work to minimize disruption of rail and street traffic.

Norfolk Southern Rail traffic will use a combination of existing and proposed tracks as shown on the construction staging plans. Union Pacific traffic will remain on Third Street until cutover to the new corridor.

Construction of grade separations will be staged to minimize street closures. This will be accomplished primarily by closing the outside lanes during retaining wall and bridge abutment construction while maintaining traffic on the inside lanes. Street closures should be limited to four to six months for underpass excavation and placement of new street pavement. The adjacent parallel streets will be used for detour traffic during street closures.

The overpass at 15th Street and North Grand Avenue, and the underpasses at 19th Street and Ash, and 19th Street and South Grand Avenue can be constructed separately from the track work based on the availability of funding.

8.10 Socio-economic, Environmental Effects

8.10.1 Socio-economics

8.10.1.1 Population and Population Distribution

Table 33 lists the 2010 and 2000 population data for the project area and Springfield. The table also includes the percentage of change in population between the 2000 census and 2010 census. The project area and Springfield experienced a population growth between the 2000 census and the 2010 census.

Table 33. Populations and Households

	Project Area 10 th Street Corridor	Springfield
Land Area (square miles)	1.9	54
Total Population 2010	9,367	116,250
Total Population 2000	8,337	111,454
Percent Change 2000-2010	12.4	4.1
Population Density per square mile	4,930	2,152
Total Households 2010	3,842	50,714

Source: U.S. Census Bureau, Census 2000 and Census 2010

8.10.1.2 Demographics

The demographics within the project area and Springfield is predominantly white, as illustrated in Table 34 below. Within the project area, minority populations are concentrated within Springfield.

Table 34. Population by Racial Composition (2010)

	Project Area 10 th Street Corridor		City of Springfield	
	Total	Percent	Total	Percent
White	6,016	64.2	88,092	75.8
Black or African American	2,781	29.7	21,510	18.5
American Indian or Alaska Native	31	0.3	239	0.2
Asian	60	0.6	2,555	2.2
Native Hawaiian or Other	0	0.0	25	0.0
Some Other Race	78	0.9	766	0.7
Two or More Races	401	4.3	3,063	2.6

Source: U.S. Census Bureau, 2010 Census, block level

8.10.1.3 Economics and Employment

Springfield had a lower unemployment rate in 2010 than the national unemployment rate of 9.6 percent. The unemployment rate within the project area was about 70 percent higher than Springfield as a whole. Details of the 2010 labor force are shown in Table 35.

Table 35. Labor Force Estimates for 2010

	Project Area 10 th Street Corridor	Springfield
Labor Force (civilian)	14,147	61,366
Employed	12,303	56,468
Unemployed	1,844	4,898
Unemployment Rate (percent)	13.7	8.1

Source: U.S. Census Bureau, American Community Survey, 2006-2010

Employment in Sangamon County is predominately wholesale and retail trade, health care and public administrations professions (Illinois Department of Employment Security, 2011). Springfield is the state capital and state government is the largest employer for the county. Health care accounts for five of the top 10 employment providers in Sangamon County. Regional health care in Sangamon County serves over 1.6 million people in over 40 counties throughout the state. Within the City of Springfield the one square mile Medical District has over two million square feet of hospital space. Tables 36 and 37 detail the employment by industry and the top employers within Sangamon County in 2009.

Table 36. Employment by Industry Category for Sangamon County for 2009

	Number of Firms	Number of Workers	Percent of Workers
Agriculture, Forestry & Hunting	33	242	0.2
Mining and Utilities	20	593	0.5
Construction	650	3,539	2.8
Manufacturing	146	3,287	2.6
Wholesale & Retail Trade, Transportation & Warehousing	1,032	16,063	12.7
Finance, Insurance, Real Estate & Management	555	7,794	6.2
Information, Professional & Technical	711	7,735	6.1
Administrative Support and Other Services	865	9,744	7.7
Educational Services	83	9,231	7.3
Health Care & Social Assistance	408	17,389	13.8
Accommodations, Food & Entertainment	562	9,648	7.7
Public Administration	162	40,706	32.3
Unclassified	32	33	0.0

Source: Greater Springfield Chamber of Commerce, 2010.

Table 37. Major Employers in Sangamon County (November 2009)

Company	Product	Number Employed
State of Illinois	Government	17,300
Memorial Health System	Health Care	5,899
St. John's Hospital	Health Care	3,267
Springfield Public Schools	Education	2,240
University of Illinois Springfield	Education	2,092
Springfield Clinic, LLC	Health Care	1,847
Illinois National Guard	Government	1,819
City of Springfield	Government	1,726
SIU School of Medicine	Education/ Health Care	1,661
AT&T	Telecommunications	1,254

Source: Greater Springfield Chamber of Commerce, 2010.

Springfield has been evolving from having a single central urban core of economic activity to having multiple areas of concentrated economic activity. These economic activity centers serve many functions and support a broad array of land uses, ranging from residential to commercial to industrial and governmental activities. Many of these corridors function as essential parts of commercial districts, providing a marketplace of goods and services that serve users ranging from the local neighborhoods to regional populations.

8.10.1.4. Income and Wages

Table 38 shows the median income per household in the project area and Springfield in 1999 dollars and inflation-adjusted 2010 dollars. The projected median income in Springfield was expected to rise by about 18 percent between 2000 and 2009. The actual increase in median income (about 20 percent) for the city was slightly higher than the projection. Since the American Community Survey eliminates the need for the decennial census long-form questionnaire, the 2010 census does not provide income estimates. Median income in the project area was lower than Springfield median income.

Table 38. Median Household Income

	Project Area 10 th Street Corridor	Springfield
Median Household Income (1999 dollars)	\$29,250 ⁽¹⁾	\$39,388
Median Household Income (2009 inflation adjusted)	\$30,476 ⁽²⁾	\$47,209
Percent Change in Median Household Income	4.2	19.9

⁽¹⁾Block Group Level

⁽²⁾Census Tract Level

Source: U.S. Census Bureau, American Community Survey (2006-2010) and the Census 2000

About 117 residences and 53 commercial businesses may be relocated as a result of the construction of the Preferred Alternative. These relocations are a result of about 42 acres of right-of-way required for the

additional railroad tracks necessary for the Springfield Project. Springfield has sufficient comparable housing and commercial space available for these relocatees. Right-of-way purchases would be conducted in compliance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Uniform Relocation Act) (Title 42 United States Code Sections 4601-4655), as amended, and the U.S. Department of Transportation implementing regulations, which apply to all federal or federally assisted activities that involve the acquisition of real property or the displacement of residences or businesses. In compliance of the Uniform Relocation Act, property owners would receive just compensation for property acquisitions required for the selected alternative as well as relocation expenses. IDOT would implement the provisions of the State of Illinois Relocation Assistance Plan in accordance with the Uniform Relocation Act.

8.10.2 Environmental Justice

Executive Order 12898 (EO 12898), Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations (February 11, 1994), directs FRA to identify and address any disproportionate and adverse impacts on minority and/or low-income populations that could result from the implementation of the Preferred Alternative. In addition, this environmental justice analysis was prepared pursuant to the U.S. Department of Transportation (DOT) Order 5610.2(a), Final DOT Environmental Justice Order, issued May 2, 2012.

The DOT Environmental Justice Order 5610.2(a) is a key component of DOT's June 21, 1995 Environmental Justice Strategy (60 FR 33896). The Order reaffirms a process by which DOT and its Operating Administrations will integrate the goals of the Executive Order into their operations. This is to be done through a process developed within the framework of existing requirements, primarily the National Environmental Policy Act (NEPA), Title VI of the Civil Rights Act of 1964 (Title VI), the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended (URA), the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA), and other DOT applicable statutes, regulations and guidance that concern planning; social, economic, or environmental matters; public health or welfare; and public involvement.

The Order is an internal directive to the various components of DOT and does not create any right to judicial review for compliance or noncompliance with its provisions. However, it directs federal agencies to "promote nondiscrimination in federal programs substantially affecting human health and the environment, and provide minority and low-income communities access to public information, and an opportunity for public participation in matters relating to human health or the environment." The EO directs agencies to use existing laws to ensure that when they act:

- They do not discriminate on the basis of race, color, or national origin;
- They identify and address disproportionately high and adverse human health or environmental effects of their actions on minority and low-income communities; and
- They provide opportunities for community input during the National Environmental Policy Act (NEPA) process, including input on potential efforts and mitigation measures.

EO 12898 also requires federal agencies to work to ensure greater public participation in the decision-making process. For the Preferred Alternative, this requirement has been satisfied by the review process under the National Environmental Policy Act (NEPA).

Consolidating UP rail traffic onto the 10th Street Corridor would result in adverse disruption to communities of concern, in that unlimited access across the track would no longer exist in the study area and road closures would cut off access. Rail traffic has long existed on the 10th Street Corridor, and the proposed action, while accommodating the predicted increase in rail traffic, would remain on an existing rail alignment except for the section between Ridgely Avenue and Phillips Street.

Improvements at remaining at-grade crossings and construction of new grade separations would offset adverse impacts from road closures along the 10th Street corridor by creating safer railroad crossings for vehicles and pedestrians with four quadrant gates that won't allow crossing while trains are present. Grade separations will eliminate delays caused by train traffic, as well as safer crossings.

Relocations likely would affect about 23 minority residences and five minority-owned businesses; comparable housing for the displaced residents is available within close proximity to the railroad corridor. Available space is also within close proximity for businesses which choose to relocate in the same vicinity.

Minority displacements are about 20 percent of the total residential displacements, and minority-owned businesses likely to be displaced are about 10 percent of total business displacements (see Appendix C of the Final EIS for the Environmental Justice Analysis Technical Report). Included in the commercial designation for the Preferred Alternative are three government or non-profit establishments: the Illinois Environmental Protection (EPA), the Salvation Army, and Planned Parenthood. Nearby property appears to be available for these facilities to relocate. The Salvation Army is moving to a new location at 100 N. 9th Street independently of this project.

Positive impacts to Springfield, the communities of concern and neighborhoods would result from the elimination of 32 at-grade crossings, improvements to remaining at-grade crossings, and the elimination of train horn blowing. Benefits from these actions center on increased safety, reduced delays and general noise reduction city-wide. New grade separations would increase safety not only for vehicular traffic but also pedestrians traveling across these railroad crossing locations. Safety would also increase for vehicular and pedestrian traffic from proposed improvements to at-grade crossings remaining along the 10th and 19th Street Corridors. The proposed at-grade crossing treatments would support elimination of blaring noise from train horns traveling through Springfield's communities.

The Preferred Alternative would allow for the creation of quiet zones throughout Springfield that would greatly enhance livability for all residents. Safety will also be enhanced for motorists, bicyclists and pedestrians by the construction of nine grade separations on the most highly traveled roadways. The remaining at-grade crossings would have four-quadrant railroad crossing gates so that access across the track is secured while trains are present. The construction of the nine grade separations and the abandonment of the 3rd Street tracks would greatly reduce delay times for traffic traveling east or west through Springfield.

The relocation of the 3rd Street Corridor to the 10th Street Corridor under the Preferred Alternative would encourage potential opportunities for commercial expansion and development of businesses around the Medical District along 3rd Street. Other opportunities would also be possible along the abandoned 3rd Street Corridor, such as a city-wide pedestrian/bike path or parkway for additional green space. This enhancement to the community could provide the opportunity for businesses to cater to needs of additional visitors to the Downtown area and the Lincoln sites.

In addition, a multimodal facility, consisting of a train station and transit hub for buses and taxi service, has been planned by Springfield for the 10th Street Corridor. This facility is intended to provide services

and jobs to Springfield's east side. This complex is proposed to be constructed on about four city blocks and may contain restaurants, shops, office space, a daycare facility, meeting rooms, and parking. This facility conforms to Springfield's Downtown Redevelopment Plan and Springfield's 2030 Comprehensive Plan.

Therefore, because the benefits to communities of concern in the project area were determined to outweigh the adverse effects to these communities, no disproportionately high and adverse human health and environmental effects to Environmental Justice populations are anticipated to result from implementation of the project.

8.10.3 Noise/Vibration

In accordance with Federal Transit Administration (FTA) and Federal Railroad Administration (FRA) guidelines, a noise impact assessment was conducted for the proposed project. This section presents background information on noise and vibration, the criteria used to assess noise and vibration impact along with the methodology used to characterize the existing noise and vibration conditions for the project area in accordance with FTA and FRA guidelines. More information can be found in the noise and vibration technical report (Harris Miller Miller & Hanson, 2011) prepared for this project.

8.10.3.1 Noise and Vibration Impact Criteria

Noise and vibration impact for this project is based on the criteria as defined in the FTA guidance manual Transit Noise and Vibration Impact Assessment (FTA-VA-90-1003-06, May, 2006). The FRA has adopted the criteria and methodology used in the FTA guidance manual for use on freight rail projects.

There are two levels of impact included in the FTA criteria. The interpretation of these two levels of impact is summarized below:

- **Severe Impact:** Project-generated noise in the severe impact range can be expected to cause a significant percentage of people to be highly annoyed by the new noise and represents the most compelling need for mitigation. Noise mitigation would normally be specified for severe impact areas unless there are truly extenuating circumstances which prevent it.
- **Moderate Impact:** In this range of noise impact, the change in the cumulative noise level is noticeable to most people but may not be sufficient to cause strong, adverse reactions from the community. In this transitional area, other project-specific factors must be considered to determine the magnitude of the impact and the need for mitigation. These factors include the existing level, the predicted level of increase over existing noise levels, the types and numbers of noise-sensitive land uses affected, the noise sensitivity of the properties, the effectiveness of the mitigation measures, community views, and the cost of mitigating noise to more acceptable levels.

8.10.3.2 Existing Noise Environment

The existing noise environment in Springfield varies depending on proximity to rail lines and frequency of rail traffic. Sources of existing noise include local roadway traffic, local community noise, air traffic, and freight and passenger trains. The majority of the land use within the study area is Category 2, which includes all residential land use, along with hotels and other land use with nighttime sensitivity. There are scattered Category 3 land uses, including primarily churches and schools.

To establish a base of existing environmental noise levels for the project noise impact assessment, a series of noise measurements was conducted within the study area. Existing ambient noise levels in the project area were characterized through direct measurements at selected sites along the project corridors during the period from March 29 through April 2, 2010. The measurements consisted of long-term (24-hour) and short-term (60-minute) monitoring of the A-weighted sound level at representative noise-sensitive locations. Twelve long-term and seven short-term noise measurements were conducted. The locations were selected to be representative of the noise environment in general and especially at locations most likely to be impacted by train noise. At each site, the measurement microphone was positioned to characterize the exposure of the site to the dominant noise sources in the area. Larson Davis noise monitors models 820 and 870 were used for gathering noise data.

The results of the existing ambient noise measurements serve as the basis for determining the existing noise conditions at all noise-sensitive receptors along the proposed rail alignment. For each site, the table lists the adjacent corridor(s), site location, measurement details, and the measured noise level. The results at each site are further described below. For each of the short-term measurement sites the measured Leq was used to estimate the Ldn by subtracting 2 decibels according to methodology in Appendix D: Determining Existing Noise, in the FTA guidance manual.

8.10.3.3 Existing Vibration Environment

The existing vibration environment in Springfield varies depending on proximity to rail lines and frequency of rail traffic. To characterize existing vibration levels, vibrations from freight and Amtrak trains were measured on the UP and NS rail lines. Vibration levels were also measured at several vibration-sensitive locations, including the Dana Thomas House, St. John's Hospital and Memorial Medical Center to determine the potential for vibration impact from increased rail traffic. Measurements were made using PCB 393A and 393C accelerometers and a TEAC LX-110 digital recorder.

8.10.3.4 Noise and Vibration Impact Assessment

No-Build Alternative

A report titled Springfield Railroad Consolidation Study—Noise and Vibration Technical Report, Harris Miller Miller & Hanson, June 1, 2012, was prepared for this project and can be referenced for additional information.

The term “number of noise impacts” means the number of noise-sensitive receptors that would experience moderate or severe noise impacts. Moderate impacts are the result of the cumulative change in noise that is noticeable to most people, but may not cause adverse reactions. Severe impacts can be expected to cause a majority of the people to be highly annoyed by the new level of noise. For the No-Build Alternative, the noise levels include locomotive warning horns. No noise impacts would occur at institutional locations with the No-Build Alternative.

Proposed Project Compared to No-Build

For the Preferred Alternative, future noise levels do not include horn noise because of the establishment of quiet zones. The grade separations and grade crossing improvements included in the Preferred Alternative allow quiet zones to be established. No noise impacts would occur at institutional receivers, cultural sites or Section 4(f) properties with the Preferred Alternative.

With the Preferred Alternative there would be six severe noise impacts and eight moderate noise impacts at residential locations from the Springfield Project. The noise impacts are located in the southern portion of the study area near the intersection of the NS tracks and the existing UP tracks.

The noise impacts would result from the projected additional UP and NS trains in the 10th Street corridor in an area where streets crossing the tracks are grade separated, so existing trains do not sound their horns. Thus, the increase in the number of trains in the 10th Street corridor would be the primary factor in the change in noise levels.

Overall noise impacts would be reduced throughout the rail corridor of the preferred alternative because of the proposed quiet zone. The Preferred Alternative would eliminate train horns from being sounded throughout Springfield on all three rail corridors. This would have a positive effect on residents who live and work along the 10th Street corridor. Residents citywide also would benefit from the proposed action—even with an increase in the overall number of trains.

The results of the vibration impact assessment for the Preferred Alternative indicate that there would be 129 impacts at residential (Category 2) locations and two impacts at institutional (Category 3) locations. The vibration impacts would be on the 10th Street corridor, the new UP tracks between Phillips Street and Ridgely Avenue, and on the new double-track portion of the UP north of Ridgely Avenue. The vibration impacts along the 10th Street corridor would result from the new tracks and the increase in train traffic along the corridor. The impacts between Phillips Street and Ridgely Avenue would result from the introduction of the new UP tracks in this location. The vibration impacts on the existing UP corridor north of Ridgely Avenue would result from the changes in the tracks and the presence of a number of crossovers. Vibration impacts also would occur at the Caritas Hall Association and the Great Western Railroad Depot. The Great Western Railroad Depot currently experiences vibration impacts with existing rail traffic, and the proposed project would reduce vibration levels from the No-Build condition. All vibration impacts are limited to human annoyance, and the projected vibration levels are below the criteria for potential damage to any building structures.

No vibration impacts would occur on the section of the NS track north of Phillips Street, or on the CN or I&M tracks because there would be no change in the vibration levels in those locations with the Preferred Alternative. Future operations would be on the existing tracks with no change in speed. Therefore, there would not be any change in the ground-borne vibration levels at sensitive receptors adjacent to these portions of the Preferred Alternative.

The Preferred Alternative would reduce existing vibration levels and would result in no train-related vibration impacts at sensitive receptors located along 3rd Street, including the historic Dana Thomas House, and Memorial Medical Center, and Springfield Clinic. In addition, the proposed Medical District expansion between Memorial Medical Center and St. John's Hospital would not be affected by vibration impacts. These facilities are located approximately 3,000 feet from the 10th Street tracks and the existing 3rd Street train traffic would be relocated to the 10th Street corridor.

8.10.4 Historical Sites

Cultural resources include historic, architectural, and archaeological sites and structures within the project area. Section 106 of the National Historic Preservation Act of 1966 (as amended) and Section 707 of the Illinois State Agency Historic Resource Preservation Act requires federal and Illinois state agencies to consider the effects of their projects on historic, architectural, and archaeological resources that are either listed in or have been determined to be eligible for listing in the National Register of Historic Places.

The National Register of Historic Places (NRHP), which is administered by the National Park Service, recognizes historically significant buildings, structures, sites, objects, and districts. Eligibility to the National Register is based on four broad criteria that are defined by the National Park Service and used to guide the evaluation process. These criteria state that:

The quality of significance in American history, architecture, archaeology, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and

- A. that are associated with events that have made a significant contribution to the broad patterns of our history; or
- B. that are associated with the lives of persons significant to our past; or
- C. that embody the distinctive characteristics of a type, period, or method of construction or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
- D. that have yielded, or may be likely to yield, information important in prehistory or history (36CFR60.4 Criteria for Evaluation).

A Phase I cultural (historical) resource evaluation was conducted for the Area of Potential Effects, for the Preferred Alternative. The Area of Potential Effects (APE) includes properties within two blocks of the existing 10th Street tracks and within two blocks of the proposed grade separations on the 19th Street track and at the NS grade separation on North Grand Avenue.

The results of the resource review are documented in a technical report titled *Phase I Cultural Resources Evaluation: Springfield Rail Improvements Project, Springfield, Sangamon County, Illinois* (Fever River Research, 2011).

8.10.4.1 Historic Resources in the Area of Potential Effect

Fifty-six properties identified as architecturally notable are within the APE along the 10th Street corridor (Table 39).

One National Register property is also a National Historic Landmark. This property is the Abraham Lincoln Home at the corner of the 8th and Jackson streets. It is the centerpiece of the Abraham Lincoln Home National Historic District, which covers much of the two-block area bounded by Capitol, Edwards, 7th and 9th streets and is administered by the National Park Service. The historic district lies on the western edge of the APE. The Lincoln Home itself is nearly two blocks west of the NS tracks.

Aside from the Lincoln Home, the two other National Register properties along the 10th Street corridor are the Lincoln Colored Home at 427 South 12th Street and the Mine Rescue Station at 609 East Princeton Avenue. The Lincoln Colored Home is well removed from the NS tracks, being on the eastern edge of the APE. The Mine Rescue Station, however, is situated a short distance from the railroad, close to the 6th Street viaduct.

There are 14 properties listed on the National Register as contributing properties to the Lincoln Home National Historic Site. All are former residences and six of the 14 are in the APE. The contributing buildings to the historic district presently are utilized for interpretive purposes and administrative office space.

Eight potentially eligible properties (designated as City Landmarks) lie within the APE. Six of these are within the east half (east of 8th Street) of the Lincoln Home neighborhood and are contributing resources to the National Historic District. Another is the Lincoln Colored Home, which—as noted above—also is

listed on the National Register of Historic Places. The two remaining in the APE are the Old Southtown Marque at 1110 East South Grand Avenue and the Claus Grocery Store at 1700 South 11th Street. Both of these properties lie at least one block east of the 10th Street tracks.

There are 34 residences within the APE that are thought to predate 1861. Eleven of these properties are in the Lincoln Home National Historic Site itself, while three more lie in close proximity to it. Thirteen others are on the 800-1200 blocks of South 11th and 12th streets. Another concentration of pre-1861 residences lies on the southern end of the Pillsbury neighborhood. Although many of the pre-1861 homes in the 10th Street corridor outside of the Lincoln Home area have poor integrity, they nonetheless represent the earliest generation housing in their respective neighborhoods (and indeed are amongst the oldest surviving in Springfield) and may offer significant data regarding construction methods and materials.

One property in the APE has been previously identified as being potentially eligible for listing on the National Register, this being the old store building at 622 South 8th Street. Other potential candidates for National Register eligibility are present within the APE as indicated in Table 39.

Table 39. NHRP and NHRP-Eligible Resources within the APE - 10th Street Corridor ⁽¹⁾

<u>Exhibit ID</u>	<u>Resources</u>	<u>Address</u>	<u>National Register</u>	<u>Preliminary National Register Eligible</u>
1	Illinois State Fairgrounds	Sangamon & Peoria Rd.	X	
2	Ridgely Interlocking Tower ⁽²⁾	1501 Percy Avenue		X
3		1120 East Ridgely		X
4	Lanphier HS Gymnasium	1121 East North Grand		X
5	[Brick Italianate Commercial]	1001 North 9th		X
6	Springfield Furniture Factory ⁽²⁾	819 North 11th		X
7	Concordia Seminary	North 12th & Enos		X
8	[Queen Anne Cottage]	1021 East Phillips		X
9	[Frame Queen Anne Cottage]	919 North 9th		X
10	[Frame House]	901 North 9th		X
11	[Frame House]	809 North 9th		X
12		1105 East Miller		X
13		1106 East Miller		X
14		1122 East Miller		X
15	Municipal Substation	1013 East Reynolds		Not Eligible
16		1121 East Reynolds		X
17		801 East Miller		X
18	St. John's Hospital	800 East Carpenter		X
19	GIPS Co. General Warehouse	217 North 9th		X
20	Great Western RR Depot ⁽²⁾	East Monroe & 10 th		X
21	Fireproof Storage House No. 3 ⁽²⁾	1000 East Monroe		Not Eligible
22	Lincoln School	1115 East Capitol		X
23	Lincoln Colored Home	427 South 12th	X	
24		1201 East Edwards		X
25	Sacred Heart Rectory	722 South 12th		X
26	Sacred Heart RC Church	South 12th & Lawrence		X
27	Morse, James, House	818 East Capitol		Contributing Resource ⁽³⁾
28	Abraham Lincoln Home	South 8th & Jackson	X	
29	Charles Arnold House	810 East Jackson		Contributing Resource ⁽³⁾
30	Cook House	508 South 8th		Contributing Resource ⁽³⁾

Table 39. (continued) NHRP and NHRP-Eligible Resources within the APE - 10th Street Corridor ⁽¹⁾

<u>Exhibit ID</u>	<u>Resources</u>	<u>Address</u>	<u>National Register</u>	<u>Preliminary National Register Eligible</u>
31	Henson Robinson House	520 South 8th		Contributing Resource ⁽³⁾
32	Solomon Allen Barn	530 South 8th		Contributing Resource ⁽³⁾
33	[Frame Queen Anne House]	814 East Edwards		X
34		810 East Edwards		X
35	[Frame Queen Anne House]	802 East Edwards		X
37	[Italianate Frame House]	718 South 8th		X
38		612 South 8th		X
39		805 South 12th		X
40		809 South 12th		X
41		902 South 12th		X
42		920 South 11th		X
43		1019 South 11th		X
44		1104 South 11th		X
45		1122 South 11th		X
46		1124 South 11th		X
47		1209 South 12th		X
48		1219 South 12th		X
49	Old Southtown Theater Marquee	1110 East South Grand		X
50	[Victorian Frame House]	1314 South 8th		X
51	Claus Grocery Store	1700 South 11th		X
52	First Brethren Church	2117 South Yale		X
53	Iles Park Shelter	East Ash & 6th		X
54	Peabody Coal Company Office ⁽²⁾	2135 South 9th		Not Eligible
55	Weaver Building	2150 South 9th		X
56	Mine Rescue Station ⁽²⁾	609 Princeton Avenue	X	

1) The Area of Potential Effect represents two blocks on either side of the tracks.

2) Denotes properties within or adjacent to NS right-of-way.

3) A Contributing Resource to the Abraham Lincoln Home National Register Historic District.

8.10.4.2 Archaeological Resources

The archaeological investigations undertaken in the APE in the past have been centered in the Lincoln Home National Historic Site, which has been scene of extensive archaeology since the middle 1950s. In 1985, archaeological investigations were conducted adjacent to the Lincoln Home in conjunction with the restoration then being undertaken. Subsequent investigations in the neighborhood have been driven by the National Park Service's ongoing restoration program, which is directed at restoring the streetscape and surviving homes on the 400 and 500 blocks of South 8th Street to their circa 1860 appearance. The National Park Service's Midwest Archaeological Center excavated on multiple lots during the 1980s and 1990s. Since that time, archaeological investigations occurred within the historic district—beginning with the Sprigg Site in 1997 and with the Aitken Barn at the DuBois Site in the winter of 2009-2010. Eighteen of the lots in the neighborhood have been investigated to some extent to date. None of these lots are in the APE. Furthermore, there are no known/previously identified archaeological sites within the APE.

No archaeological surveys or testing were conducted as part of this project because these areas are on private property. As right-of-way is purchased for construction, archaeological surveys will be conducted, as necessary, per a Programmatic Agreement with the SHPO. However, some general assessments can be made regarding the potential for archaeological resources in the APE based on prior experience. Springfield is a mature urban center with nearly 200 years of Euro-American settlement. Previous investigations have amply demonstrated the presence of significant historical archaeological resources with good integrity in the city. That this has been illustrated in residential areas like the Lincoln Home neighborhood is perhaps not that surprising. However, it also was proven in the Abraham Lincoln Presidential Library investigations, where multiple components were documented with good integrity—despite successive rebuilding episodes on their respective lots. This illustrates the high potential for significant archaeological resources being present elsewhere in the Central Business District along 3rd Street and adjoining areas comprising early Springfield. The resources along the 10th Street corridor were developed later in time (early 1900s) and are much less concentrated than those in the 3rd Street corridor; therefore, there is a much lower probability for significant findings along the 10th Street corridor.

The APE is defined as two blocks on either side of the existing 10th Street tracks, or about 1,500 feet. This distance encompasses any grade separations that might be constructed.

Three sites within the APE are currently listed on the National Register individually (Table 40). One of these—the Abraham Lincoln Home—is also a National Historic Landmark. The other two sites include the Lincoln Colored Home and the Mine Rescue Station. The Illinois State Fairgrounds is adjacent to the project area at the northern terminus and is located north of Sangamon Avenue.

The Mine Rescue Station at 609 East Princeton Avenue is listed on the National Register of Historic Places and is about 75 feet from the existing railroad right-of-way, but this presents no change from its historic setting. This property also has no noise or vibration impacts to the structural integrity of the building; therefore, the eligibility determination on this property is “No Effect.”

Numerous properties inventoried as Lincoln-era structures (pre-1861) are preliminarily eligible for the National Register and are located within the APE (Table 40). Many of these houses, although they retain fairly poor architectural integrity, are preliminary eligible for listing on the National Register because of their archaeological significance (and thus would be eligible due to Criteria A, C, and/or D). The Preferred Alternative would have *No Effect* on these properties because of their distance (over 400 feet) from the proposed action, except for the four properties mentioned below. Train noise, vibration, and

visual effects would have a *No Effect* determination beyond this range. None of these properties are negatively affected from excessive noise levels.

National Register-eligible properties adjacent to existing 10th Street tracks are the Springfield Furniture Factory, the Great Western Railroad Depot and the Mine Rescue Station.

The former Springfield Furniture Factory at 819 North 11th Street at the northwest corner of Eleventh Street and Enos Avenue consists of a complex of attached two-story, brick buildings arranged in a C-shaped plan. The facility was constructed in the late 19th century as a furniture factory and later occupied by the Desnoyer Shoe Company (1903-1910) and International Shoe Company (1910-1964). The present occupant is Goodwill Industries. The Springfield Furniture Factory retains good integrity and is considered eligible to the National Register under Criteria A (industry) and C. The property abuts the existing proposed railroad right-of-way, but this represents no change from its historic setting. Moreover, vibration studies have assessed no structural impact to the property for the Preferred Alternative. Therefore, the eligibility determination on this property is “No Effect.”

The Great Western Railroad Depot at Monroe Street and 10th Street is a two-story, brick, Italianate-style structure. It was constructed in the 1850s with only one story and later raised to two. It was from this site that Abraham Lincoln departed his hometown for Washington, D.C., on February 11, 1861. It also represents the oldest surviving rail depot in Springfield. The Great Western Railroad Depot is considered eligible for the National Register under Criteria A (commerce), B (in relation to Lincoln), and C. The property abuts the existing railroad right-of-way, but this presents no change from its historic setting. Vibration studies have assessed no structural impact to the property for the preferred alternative are no noise impacts to this property.

The Preferred Alternative would displace the former Fireproof Storage House No. 3 at 1000 East Monroe Street (see photo below)(No. 21), directly across from the Great Western Depot (No. 20) on the opposite side of the existing NS tracks and the Peabody Coal Company Office building at 2135 South 9th Street (see photo below) (No. 54). These properties were identified during the Illinois Historic Structures Survey prepared by Fever River Research as potentially eligible for the National Register. Both were considered potentially eligible for listing on the NRHP under Criterion A (Social History) and/or C (Architecture). However, the Illinois Historic Preservation Agency has determined that these structures do not retain sufficient integrity to be eligible for the NRHP.

Table 40. Properties of Architectural Significance within the Area of Potential Effect- 10th Street Corridor ⁽¹⁾

<u>Exhibit ID</u>	<u>Property Name</u>	<u>Address</u>	<u>National Register Listed</u>	<u>National Register Eligibility Criterion⁽⁴⁾</u>	<u>Effect</u>
1	Illinois State Fairgrounds ⁽⁵⁾	Sangamon & Peoria Rd.	X	Listed	No Effect
2	Ridgely Interlocking Tower ⁽²⁾	1501 Percy Avenue		A and C	No Effect
3	Frame Queen Anne Cottage ⁽⁵⁾	1120 East Ridgely		C	No Effect
4	Lanphier HS Gymnasium	1121 East North Grand		A and C	No Effect
5	[Brick Italianate Commercial]	1001 North 9th		A and C	No Effect
6	Springfield Furniture Factory ⁽²⁾	819 North 11th		C	No Effect
7	Concordia Seminary	North 12th & Enos		A and C	No Effect
8	[Queen Anne Cottage]	1021 East Phillips		C	No Effect
9	[Frame Queen Anne Cottage]	919 North 9th		C	No Effect
10	[Frame House]	901 North 9th		C	No Effect
11	[Frame House]	809 North 9th		C	No Effect
12		1105 East Miller		A, C and/or D	No Effect
13		1106 East Miller		A, C and/or D	No Effect
14		1122 East Miller		A, C and/or D	No Effect
15	Municipal Substation	1013 East Reynolds		Not Eligible	No Effect
16		1121 East Reynolds		A, C and/or D	No Effect
17		801 East Miller		A, C and/or D	No Effect
18	St. John's Hospital	800 East Carpenter		A and C	No Effect
19	GIPS Co. General Warehouse	217 North 9th		C	No Effect
20	Great Western RR Depot ⁽²⁾	East Monroe & 10 th		A, B and C	No Effect
21	Fireproof Storage House No. 3⁽³⁾	1000 East Monroe		Not Eligible⁽⁶⁾	N/A
22	Lincoln School	1115 East Capitol		A and C	No Effect
23	Lincoln Colored Home	427 South 12th	X	Listed	No Effect
24		1201 East Edwards		A, C and/or D	No Effect
25	Sacred Heart Rectory	722 South 12th		A and C	No Effect
26	Sacred Heart RC Church	South 12th & Lawrence		A and C	No Effect
27	Morse, James, House	818 East Capitol		Contributing Resource ⁽⁷⁾	No Effect
28	Abraham Lincoln Home	South 8th & Jackson	X	Listed	No Effect
29	Charles Arnold House ⁽⁵⁾	810 East Jackson		Contributing Resource ⁽⁷⁾	No Effect
30	Cook House	508 South 8th		Contributing Resource ⁽⁷⁾	No Effect
31	Henson Robinson House ⁽⁵⁾	520 South 8th		Contributing Resource ⁽⁷⁾	No Effect
32	Solomon Allen Barn	530 South 8th		Contributing Resource ⁽⁷⁾	No Effect
33	[Frame Queen Anne House]	814 East Edwards		C	No Effect
34		810 East Edwards		A, C and/or D	No Effect

Table 40. (continued) Properties of Architectural Significance within the Area of Potential Effect- 10th Street Corridor ⁽¹⁾

<u>Exhibit</u>			<u>National</u> <u>Register</u> <u>Listed</u>	<u>National Register Eligibility</u> <u>Criterion</u> ⁽⁴⁾	<u>Effect</u>
<u>ID</u>	<u>Property Name</u>	<u>Address</u>			
35	[Frame Queen Anne House]	802 East Edwards		C	No Effect
37	[Italianate Frame House]	718 South 8th		C	No Effect
38		612 South 8th		A, C and/or D	No Effect
39		805 South 12th		A, C and/or D	No Effect
40		809 South 12th		A, C and/or D	No Effect
41		902 South 12th		A, C and/or D	No Effect
42		920 South 11th		A, C and/or D	No Effect
43		1019 South 11th		A, C and/or D	No Effect
44		1104 South 11th		A, C and/or D	No Effect
45		1122 South 11th		A, C and/or D	No Effect
46		1124 South 11th		A, C and/or D	No Effect
47		1209 South 12th		A, C and/or D	No Effect
48		1219 South 12th		A, C and/or D	No Effect
49	Old Southtown Theater Marquee ⁽⁵⁾	1110 East South Grand		A and C	No Effect
50	[Victorian Frame House]	1314 South 8th		C	No Effect
51	Claus Grocery Store ⁽⁵⁾	1700 South 11th		A and C	No Effect
52	First Brethren Church	2117 South Yale		A and C	No Effect
53	Iles Park Shelter	East Ash & 6th		A and C	No Effect
54	Peabody Coal Company Office⁽³⁾	2135 South 9th		Not Eligible⁽⁶⁾	N/A
55	Weaver Building	2150 South 9th		A and C	No Effect
56	Mine Rescue Station ⁽²⁾	609 Princeton Avenue	X	Listed	No Effect

1) The corridor represents two blocks on either side of the tracks.

2) Denotes properties adjacent to existing NS right-of-way. No new ROW acquisition is anticipated. See Cultural Resource Evaluation Report.

3) Properties in bold would be displaced by the Preferred Alternative and Alternative 2B.

4) See Section 4.4.1 for National Register criteria.

5) Adjacent to project area or No Effect.

6) Finding confirmed by the IHPA, see coordination in Appendix A.

7) A Contributing Resource to the Abraham Lincoln Home National Register Historic District.



Former Fireproof Storage House No. 3 (No. 21) at left, 1000 E. Monroe Street



Peabody Coal Company Office (No. 54), 2135 South 9th Street

The Preferred Alternative would avoid the Lincoln Home National Historic District; therefore, the project would not impact any known archaeological sites. No archaeological surveys or testing were conducted during the Phase I cultural resources evaluation because of the previous disturbance of the railroad corridors. New right-of-way would be subjected to a Phase I archaeological survey to identify potentially significant archaeological resources. Potentially significant archaeological resources could be found associated with the former coal-mining communities of Starne and Iles Junction, the rail yard and shops of the Great Western/Wabash Railroad, as well as pre-Civil War domestic neighborhoods of downtown Springfield with further investigations. The evaluation of potential impacts to unknown archaeological resources within the project area requires continued coordination with the Illinois Historic Preservation Agency (IHPA) under the requirements of Section 106 of the Historic Preservation Act of 1966.

FRA has made a preliminary determination that all of the properties listed in Table 40 will have a *No Effect* determination finding as a result of the implementation of the Preferred Alternative. In addition, it is FRA's opinion that areas requiring new right-of-way should be subjected to a Phase I archaeological survey to identify potentially significant archaeological resources. FRA has determined that the proposed undertaking will have a conditional *No Effect* finding, pending a future archaeological investigation that must be completed prior to project construction. The SHPO's concurrence to this opinion will be included in the Record of Decision for this project.

8.10.5 Water Quality/Floodplains/Wetlands

8.10.5.1 Surface Water Resources

The project area is within the Lower Sangamon River Sub-basin of the larger Sangamon River Drainage Basin (McConkey, et. al, 2011). This basin forms the largest watershed of any tributaries to the Illinois River. The Sangamon River Basin ultimately drains an area of 5,419 square miles to the Mississippi River via the Illinois River (IEPA, 2011).

The surface water resources closest to the project area are Lake Springfield, the Sangamon River, Spring Creek, and Sugar Creek. None of these surface water resources are within the project area; however, treated surface water from the project area eventually flows into the Sangamon River via Sugar Creek and Spring Creek.

The Sangamon River and tributaries drain most of Sangamon County, including the project area, and the natural drainage is westward. It drains mostly rural agricultural lands in Sangamon County, and then drains north-northwest into Menard and Cass counties before joining the Illinois River north of Beardstown, Illinois. Sugar Creek and Spring Creek are two of its main tributaries.

The consolidation of rail to the 10th Street corridor would require re-grading existing drainage ditches alongside the additional rail alignments. Stormwater runoff in the project area would be collected and treated in the same manner as the existing system. Over 90 percent of stormwater in the project area would be collected in city combined sewers and routed for treatment to the Sugar Creek Treatment Plant (for areas south of South Grand Avenue) or the Spring Creek Treatment Plant (for areas north of South Grand Avenue). Stormwater runoff near the project limits at Stanford Avenue and Sangamon Avenue are collected in city storm sewers and routed to detention basins prior to discharge to waterways. Treatment and detainment of stormwater runoff would prevent further impairment of any receiving waters as a result of the project.

Stormwater runoff from the Springfield Project limit areas at Sangamon Avenue and Stanford Avenue are collected in ditches and would be detained in stormwater basins and eventually discharge to Spring Creek and Sugar Creek which flow to the Sangamon River.

The Springfield Project would require a construction site activity National Pollutant Discharge Elimination System (NPDES) permit. A Stormwater Pollution Prevention Plan would be prepared and implemented by the contractor building the Preferred Alternative pursuant to the requirements of that permit. Implementing erosion control measures outlined in a Stormwater Pollution Prevention Plan before, during, and after construction would minimize impacts to the water quality of receiving waters as a result of stormwater discharges from construction sites.

8.10.5.2 Water Quality

Water quality standards set by the Illinois Pollution Control Board (IPCB) are based on the degree to which a water feature provides the “designated use.” The Illinois Environmental Protection Agency’s Illinois Integrated Water Quality Report and Section 303(d) List - 2010 (IEPA, 2011) summarize water quality features of perennial streams within the project area. The IEPA report provides an evaluation of the water quality on the state’s aquatic resources. This report describes water quality conditions in terms of degree to which the various waters attain their designated uses. For each designated use, an IEPA assessment concludes one of two possible use-support levels: “Fully Supporting” or “Not Supporting.” Fully Supporting means that the designated use is attained; Not Supporting means the use is not attained. Waters in which at least one applicable use is not fully supported are called “impaired.”

The Sangamon River did not support the designated uses of fish consumption and primary contact but did fully support aquatic life use. Causes for these impairments include elevated concentrations of polychlorinated biphenyls and fecal coliform. The sources for these pollutants are unknown. Spring Creek did not support the designated uses of aquatic life, fish consumption, and primary contact. Causes for these impairments are elevated levels of sedimentation/siltation, polychlorinated biphenyls, and fecal coliform. The sources for these pollutants are crop production, urban runoff/storm sewers, and other unknown sources. Sugar Creek did not support aquatic life use due to elevated levels of boron from industrial point source discharges.

Section 303(d) of the Clean Water Act requires states to submit to USEPA a list of water quality-limited waters (i.e., waters where uses are impaired), the pollutants causing impairment to those waters and a priority ranking for the development of Total Maximum Daily Load (TMDL) calculations. This list is often called the 303(d) List. Because of the impairments to the Sangamon River, Spring Creek, and Sugar Creek, these water bodies are included on the 2010 303(d) List.

8.10.5.3 Floodplains

Floodplains function as wildlife habitat, food chain support, nutrient retention and removal through plant uptake, erosion control through sediment trapping, and most importantly floodwater storage. Floodwater storage and erosion control are important functions that benefit human populations primarily during storms events. The dissipation of stormwater over floodplains reduces flow velocity and results in the retention of waterborne silt. Floodplains also serve as important wildlife corridors for larger animal species such as white-tailed deer. Wildlife use the cover of riparian habitat along streams to roam within their home range. The deposition of nutrient rich silt is also a valuable resource to farmers for agricultural production. Impacts to floodplains have the potential to affect these resources and to alter the natural elevations of seasonal flooding.

Federal Emergency Management Agency (FEMA) mapping for the Springfield area was reviewed. There are no 100-year floodplains present in the project area.

Based on the floodplain mapping maintained by the Federal Emergency Management Agency, no work would be performed below the 100-year flood elevation, and as a result this improvement would not encroach upon any base floodplain. Therefore, there would be no impacts to floodplains, and no floodplain map revisions would be required. The Preferred Alternative would not result in any significant adverse impact on natural and beneficial floodplain values; any significant change in flood risks or damage; or significant potential for interruption or termination of emergency service or emergency evacuation routes.

8.10.5.4 Wetlands

There are nearly 13,000 acres of wetlands within Sangamon County that accounts for 2.3 percent of the total land cover in the county. A field reconnaissance survey to identify wetlands within the project area of the retained alternatives was conducted in accordance with the Corps of Engineers Wetlands Delineation Manual (1987) and Regional Supplement (2010) during the spring of 2011. Only areas that met the three parameters required by the manual, i.e., hydrophytic vegetation, hydric soils, and wetland hydrology, were identified as jurisdictional wetlands. The USFWS's National Wetlands Inventory (NWI) mapping depicts a couple of potential wetlands areas within the project area at the north and south limits of the corridor.

One area, near Stanford Avenue is described by the NWI as a palustrine, forested, broad-leaved deciduous, temporarily-flooded area (PF01A). An adjacent area to the north is classified by the NWI as a palustrine, emergent/scrub-shrub, temporarily-flooded area (PEM/SS1A) (Cowardin, et al, 1979). The PF01A area extends about 860 feet along the existing railroad tracks, and the PEM/SS1A extends another 580 feet to the north. Both of these areas did not meet the hydric soils and hydrologic criteria for jurisdictional wetlands at the time of the survey.

One additional area, near Sangamon Avenue, is also depicted by the NWI as a PF01A, and is about 700 feet along the east side of the existing rail line. This area has been drained and developed for residential housing. Therefore, this area no longer meets the jurisdictional criteria for a wetland.

No jurisdictional wetlands or waters of the United States were identified within the project limits of the Preferred Alternative.

Based on the wetlands reconnaissance survey and the National Wetland Inventory mapping, the Preferred Alternative does not affect any wetlands regulated under the Clean Water Act of 1972.

8.10.6 Threatened and Endangered Species

The Federal Endangered Species Act (ESA) of 1973, as amended, was passed in an attempt to control the loss of at-risk birds, mammals, reptiles, mussels, fish, amphibians, invertebrates, and plants. Section 7 of the ESA requires the projects being authorized, funded, or carried out by federal agencies demonstrate that the action would not jeopardize the continued existence of any listed species or modify their critical habitat. If federally listed species are known to exist on a proposed site, the lead federal agency initiates Section 7 consultation with the US Fish and Wildlife Service (USFWS) to ensure that the species and /or critical habitat would not be adversely affected by the project. The FRA fulfilled their Section 7(a)(2) obligations through early coordination with USFWS and by utilizing their technical assistance website tool to identify endangered, threatened, proposed and candidate species, and proposed and designated critical habitat within the project area.

Federally-listed species included within Sangamon County are listed below. There are no Candidate species or designated Critical Habitat occurring within the vicinity of the project area.

- Mammals
 - Indiana Bat (*Myotis sodalis*) – Endangered
- Plants
 - Eastern Prairie Fringed Orchid (*Platanthera leucophaea*) – Threatened

- Invertebrates
 - Sheepnose Mussel (*Plethobasus cyphus*) - Endangered

The Indiana Bat hibernates during winter in caves or occasionally in abandoned mines. During the summer they roost under the peeling bark of dead and dying trees in hardwood forests. They prefer hunting flying insects along rivers, lakes, or open grasslands and croplands.

The Eastern Prairie Fringed Orchids prefer mesic prairies and wetlands such as sedge meadows, marsh edges, even bogs. It requires full sun for optimum growth and flowering and a grassy habitat with little or no woody encroachment. A symbiotic relationship between the seed and soil fungi, called mycorrhizae, is necessary for seedlings to become established. This fungi helps the seeds assimilate nutrients in the soil.

The Sheepnose Mussel prefers living in the coarse sand and gravel bottoms of larger freshwater rivers and streams. They are usually found in shallow areas with moderate to swift currents.

The Illinois Endangered Species Protection Act (IESPA) of 1972 (as amended) is similar to the ESA but is implemented at the state level. The state act protects state-listed animals and plants from unauthorized actions. This act requires agencies of the state and local governments to enter into a consultation process with the Illinois Department of Natural Resources to evaluate whether actions authorized, funded or implemented by these entities are likely to jeopardize the continued existence of state-protected species or are likely to result in the destruction or adverse modification of designated essential habitat of any listed species.

Through scoping with the Illinois Department of Natural Resources (IDNR), the following list was developed that included state threatened and endangered species potentially occurring in central Illinois:

- **Birds**
 - Northern Harrier (*Circus cyaneus*) - Endangered
 - Peregrine Falcon (*Falco peregrinus*) - Threatened
 - Least Bittern (*Ixobrychus exilis*) - Threatened
 - Loggerhead Shrike (*Lanius ludovicianus*) - Endangered
 - Black-crowned Night Heron (*Nycticorax nycticorax*) - Endangered
- **Mammals**
 - Franklin's Ground Squirrel (*Poliocitellus franklinii*) - Threatened
- **Reptiles**
 - Kirtland's Snake (*Clonophis kirtlandi*) - Threatened
 - Ornate Box Turtle (*Terrapene ornate*) - Threatened
 - Lined Snake (*Tropidoclonion lineatum*) - Threatened
- **Plants**
 - Virginia Bunchflower (*Melanthium virginicum*) - Threatened

- Heart-leaved Plantain (*Plantago cordata*) - Endangered
- Tubercled Blossom (*Epioblasma torulosa*) - Threatened

No further consultation has occurred for this project with USFWS or IDNR (Illinois Endangered Species Protection Board, 2011).

Of the threatened and endangered species mentioned to potentially occur in central Illinois by USFWS and the Illinois Department of Natural Resources, none of these species would be affected by the Preferred Alternative. No suitable habitat or species occurrences are known to exist and have not been reported by any of the resource agencies since the project area is entirely located in a developed, urban environment.

The Springfield Project will have a finding of “no effect” on any of the species known to occur within central Illinois. There is no evidence of correspondence with the USFWS providing documentation of the “no effect” determination although USFWS provided directions on the process and preparation of this document.

8.10.7 Recreational Areas

8.10.7.1 Section 4(f) Resources

It is national policy that special effort should be made to preserve public park and recreation lands, wildlife and waterfowl refuges, and historic sites. 49 USC 303, commonly known as Section 4(f) of the Department of Transportation Act of 1966 (Public Law 89-665), provides that the Secretary of the U.S. Department of Transportation:

. . . may approve a transportation program or project requiring the use of publicly owned land of a public park, recreation area, or wildlife and waterfowl refuge, or land of an historic site of national, state, or local significance (as determined by the federal, state, or local officials having jurisdiction over the park, recreation area, refuge, or site) only if:

- 1) there is no feasible and prudent alternative to using that land; and
- 2) the program or project includes all possible planning to minimize harm to the park, recreation area, wildlife and waterfowl refuge, or historic site resulting from the use.

An inventory of parks within the project area was conducted based on mapping and coordination from the Springfield Park District. Three parks are within the project area (i.e., 11th and Black, Lanphier, and Iles Parks) (SSCRPC, 2009).

The proposed action is adjacent to three Section 4(f) properties. These properties include 11th and Black Park, Iles Park, and Lanphier Park. There are also three historic properties adjacent to the proposed rail right-of-way. These properties include the Springfield Furniture Factory, Great Western Railroad Depot, and the Mine Rescue Station. No right-of-way would be purchased from any of these properties and there is no noise, vibration or aesthetic impacts resulting in Constructive Use; therefore, these properties do not result in any Section 4(f) impacts.

Eleventh and Black Park is two blocks north of North Grand Avenue. Eleventh Street borders its west side with Black Avenue along the north and a dead-end street along the east side. This park has four

baseball diamonds that are primarily used for league play. A pavilion and restroom facilities are on the north side of the park. Parking is provided along the north side of the park.

A modified intersection at 11th and Black Avenue would be constructed. This intersection is at the northwest corner of the park and is not anticipated to impact the park access, parking, or require any right-of-way.

Iles Park is along South 6th Street between Oak and Ash streets. Iles Park is city-owned and is one of the oldest city parks in Springfield, having been acquired in 1903. To the north are residences and to the east and south are commercial offices and warehousing. This 10.5-acre park has a variety of recreational facilities and features including many mature trees that provide an attractive visual quality to the park and surrounding area. The park is a popular lunch location for people in nearby offices.

The park contains a stone picnic shelter, a smaller picnic shelter, and restrooms. There is also a playground, a lighted ball field, tennis courts, and horseshoe courts provided in the park.

On-street parking is provided along Oak Street and along 9th Street. The park is accessible to pedestrians from the surrounding residential neighborhoods by city sidewalks. Two primary walkways are provided diagonally through the park.

The existing 10th Street railroad tracks are along the east side of the park separated by 9th Street. The 9th Street access onto Ash Street would be closed. However, no impacts or access changes to this park are anticipated.

Robin Roberts Stadium is located in the south portion of Lanphier Park immediately north of North Grand Avenue and is included in the park property. This 5,200-seat baseball stadium is served by a 100-vehicle parking lot, an office and maintenance building, and a players' club house. The stadium is owned by the Springfield Park District. This irrigated ball field is home of two collegiate level baseball programs and several annual baseball tournaments.

Lanphier Park includes Robin Roberts Stadium and the area north of the stadium between North Grand Avenue and Converse Avenue just east of Lanphier High School and Memorial Stadium. The north part of the park has a picnic shelter, six lighted tennis courts, a paddle tennis court, two full-size basketball courts and small facilities including a shuffleboard and horseshoe courts. The courts north of the stadium are used by adjacent Lanphier High School and the surrounding neighborhoods.

The proposed overpass at North Grand and the NS and I&M tracks would not require any additional right-of-way or other impacts to Lanphier Park.

Since there are no property takes from any of the three parks by the Preferred Alternative, no Section 4(f) uses are anticipated. In addition, there would be no impairment to any recreational activity of any of these parks as well; therefore, no substantial proximity effects would occur.

8.10.7.2 Section 6(f) Lands

In addition, 16 USC 4601-8(f)(3), commonly known as Section 6(f) of the Land and Water Conservation Fund (LWCF) Act of 1965 (Public Law 88-578), requires that:

... No property acquired or developed with assistance under this section or Section 1010 of the Urban Park and Recreation Recovery Act of 1978) shall, without the approval of the Secretary

(Secretary of the U.S. Department of Interior), be converted to other than public outdoor recreation uses. The Secretary shall approve such conversion only if he finds it to be in accord with the then existing comprehensive statewide outdoor recreation plan and only upon such conditions as this deems necessary to assure the substitution of other recreation properties of at least equal fair market value and of reasonably equivalent usefulness and location. Impacts to Section 6(f) properties must be coordinated through the regional director of the National Park Service (NPS).

There are three known special lands within Springfield that have Land and Water Conservation (LAWCON) funds involved in their purchase or development. These include Cornell Avenue Park (presently Eisenhower Park), Indian Hills Park, and Union Square Park. None of these properties are within the project area affected by the Preferred Alternative.

8.10.8 Special Wastes

EDR DataMap® - Area Study reports from Environmental Data Resources, Inc. (EDR) were obtained in January 2010 for information on regulated environmental sites within the three railroad corridors (EDR, 2010). The EDR report summarizes publicly available information on sites listed in certain federal, state, and local regulatory databases and within search distances recommended by ASTM International Practice E 1527-05. The EDR Report includes a radius map that illustrates the approximate locations of the reported sites relative to the railroad corridors.

Some of the databases list regulated environmental sites that may indicate potential hazardous or special waste within the corridors. Various other special waste sites were also reported. Records that do not indicate potential hazardous or special waste that may be encountered during construction were excluded from further consideration.

Based on a February 10, 2012, review, two CERCLIS sites are within or adjacent to the project area and are shown in Table 41.

Table 41. CERCLIS Sites within the Project Area

Site Name	Address	Distance from the Preferred Alternative
Nutronics, Inc.	1703 Peoria Road, Springfield, IL 62702	Adjacent to project area
Springfield Iron Company	NE corner of Ridgely and Factory Street, Springfield, IL 62794	Within project area

Table 42 contains the number of hazardous material sites that may indicate potential hazardous or special waste within the project area (10th Street corridor). Additional information on these sites can be referenced in Appendix C of the Final EIS.

Table 42. Hazardous Materials Sites within Project Area (10th Street Corridor)

Number of Sites	Database
2	Federal CERCLIS
4	CERC NFRAP
1	RCRA-LQG
38	RCRA-SQG

Number of Sites	Database
3	ERNS
5	SHWS
4	SWF/LF
1	LF Special Waste
91	LUST
101	USTs
12	SRPs
2	Drycleaners
3	MGP

The two CERCLIS sites are Nutronics, Inc. and the Springfield Iron Company. Nutronics, Inc., located at 1703 Peoria Road, contains an abandoned brick building and was a metal plating and metal finishing facility, which primarily manufactured circuit boards. This site met the criteria for a time-critical removal action upon discovery by the Illinois EPA in March 2010. The site contained over 100 drums, vats, and other miscellaneous containers of hazardous wastes. The CERCLIS database lists Nutronics, Inc. as a removal-only site (no site assessment work needed). Removal action of the wastes was completed in July 2011.

The Springfield Iron Company historically occupied approximately 50 acres of property at the northeast corner of the intersection of Ridgely Avenue and Factory Street from 1871 to 1900. The facility manufactured steel rail, iron, fish plates, and track bolts. During the years of operation, four manufactured gas houses and at least one coal tar disposal area were present. In 2010, several areas located near the old facility were observed to have coal tar migrating to the surface. A preliminary assessment was completed in March 2012. The CERCLIS database listing for the Springfield Iron Company indicates that the site has been referred to removal – no further remedial action planned (NFRAP).

Most of the LUST sites have completed remediation activities; 14 LUST sites do not have No Further Remediation (NFR) letters issued, indicating that remediation activities have not been completed. The individual listing of an environmental site within the corridor does not necessarily indicate that contamination associated with that site would be encountered during construction. Additional information would need to be gathered to determine if a reported site may have produced contamination that may be encountered during the construction project. The other sites listed in Table 42 have been previously remediated and closed, or constitute newer facilities operating under current regulations and do not pose an unknown threat for contamination. Based on the information reviewed at this time, construction may encounter petroleum-contaminated soils at several locations within the corridor. Construction activities may require coordination with the responsible parties of the LUST sites and other reported sites concerning the disposal of excavated materials. However, these sites should not present major impairments to improvements within the project corridor.

The proposed project's preferred alternative would require right-of-way from one listed CERCLIS site, the Springfield Iron Company at the northeast corner of the intersection of Ridgely Avenue and Factory Street. Another CERCLIS site, Nutronics, Inc., located at 1703 Peoria Road, would be within one block of the proposed improvements.

Based on the information reviewed at this time, rail construction may encounter petroleum-contaminated soils at several locations within the project area. Construction activities may require coordination with the responsible parties of the CERCLIS and LUST sites and other reported sites concerning the disposal of excavated materials. However, these sites are not anticipated to present significant impairments to rail improvements associated with the Preferred Alternative. A Preliminary Environmental Site Assessment

(PESA) for special waste is recommended prior to construction to determine risks and liabilities prior to land acquisition and construction activities.

8.11 Cost Estimate

Detailed cost estimates for the various components of the preferred alternative are included in Appendix C.

8.12 Design Exceptions

No design exceptions have been identified for this project.