Section 5

ENVIRONMENTAL CONSEQUENCES

5.0 Environmental Consequences

The environmental impacts for the Preferred Alternative and Alternative 2B were assessed in compliance with FRA's Procedures for Considering Environmental Impacts, resource agency input, and public comments. 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 and archaeological sites, 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. Section 6.3 provides additional information on the public involvement program.

Table 5-1 summarizes the environmental impacts of the Preferred Alternative and Alternative 2B.

Table 5-1. Environmental Impact Summary of the Preferred Alternative and Alternative 2B

Impact Category	Alternative		No-Build Alternative
	Preferred	*2B*	
Right-of-Way Acquisition (Acres)	42.0	42.6	0
Displacements			
Residential	117	117	0
Commercial	53	56	0
Access Changes	28	40	0
Farmland Conversion (Acres)	0	0	0
Cultural Resources			
National Register Listed (or Eligible) Sites	0	1[(3)]	0
Known Archaeological Sites	0	0	0
Natural Resources			
Threatened/Endangered Species (Number of Species)	0	0	0
Natural Areas (Number)	0	0	0
Native Vegetation (Acres)	0	0	0
Affected Lakes and Streams	0	0	0

Impact Category	Alternative		No-Build Alternative
	Preferred	*2B*	
100-yr. Floodplains Crossings	0	0	0
Wetlands (Acres)	0	0	0
Parks (Number)	0	0	0
Special Waste Sites (Number within one block)			
CERCLIS(1)	2	2	0
LUST(2)	20	20	0

(1)Comprehensive Environmental Response, Compensation and Liability Information System.
(2)Leaking Underground Storage Tank.
(3) Current access to the Great Western Railroad Depot will be relocated to the west along the same block. Therefore, there will be no permanent impact to this structure.

The Preferred Alternative and Alternative 2B are shown in Appendix B, Exhibits B-1 and B-2. Exhibit B-2 only includes the sheets where the Preferred Alternative and Alternative 2B differ. The differences for Alternative 2B are noted on the Exhibits.

5.1 Land Use Impacts

5.1.1 No-Build Alternative

Rail service for the No-Build Alternative would continue along the existing three rail corridors that are present today (i.e., 3rd Street, 10th Street and 19th Street). New development opportunities would remain more limited with three active railroad corridors than with either the Preferred Alternative or Alternative 2B because of the continued increases in traffic congestion, delay times, safety, and noise impacts as freight traffic in Springfield grows. In addition, with rail traffic remaining on the 3rd Street corridor, as with the No-Build Alternative, expansion of the Medical District would be hindered with this rail corridor bisecting future plans for additional facilities.

Access and close proximity to National Register Historic sites such as the Dana-Thomas House also could result in a negative impact to tourism growth because of safety of crossing the tracks and its associated noise from train horns. This alternative is not supported by the Greater Springfield Chamber of Commerce and negatively impacts the area's Long Range Transportation Plan, the R/UDAT Downtown Redevelopment Plan, as well as the state commissioned Mid-Illinois Medical District's Master Plan since all of these plans indicate a long-term desire to eliminate rail traffic in the 3rd Street corridor.

5.1.2 The Preferred Alternative and Alternative 2B

The relocation of the 3rd Street Corridor to the 10th Street Corridor with the Preferred Alternative and Alternative 2B would allow for the expansion of businesses and the

Medical District along 3rd Street. Other Springfield improvement opportunities also would 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. For example, restaurants and other outdoor food vendors could become established for bicyclists touring the downtown attractions or passing through the Springfield. 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 the city's Downtown Redevelopment Plan and Springfield's 2030 Comprehensive Plan.

5.2 Socio-economics, Environmental Justice, and Community Impacts

5.2.1 Relocation

The No-Build Alternative would not result in any residential or commercial displacements.

Table 5-1 depicts the number of residential and commercial displacement for each of the build alternatives. Table 5-2 lists all of the proposed residential and commercial displacements of the retained alternatives. The displacement numbers can be referenced in Exhibit B-1 and B-2 in Appendix B. The potential impacts of these displacements, for each of the retained alternatives, are discussed in subsequent sections of this document.

Table 5-2. Residential and Commercial Displacements

Displacement No. (Preferred Alternative & 2B)	Street Address
R160	1731 S 9th Street
C87	900 E Laurel
C88	1716 S 10 1/2 Street
C89	1013 E Laurel
R161	1015 E Laurel
R162	1017 E Laurel
R163	1019 E Laurel
R164	1021 E Laurel
R165	1023 E Laurel
C90	1011 E Laurel
Displacement No. (Preferred Alternative & 2B)	**Street Address**
C42	906 E Ash
C43	1008 E Ash

Displacement No. (Preferred Alternative & 2B)	Street Address
R14	1020 E North Grand Avenue
C6	1024 E North Grand Avenue
R15	1010 E North Grand Avenue
Displacement No. (Preferred Alternative & 2B)	**Street Address**
R54	1308 E North Grand Avenue
R55	1310 E North Grand Avenue
R56	1320 E North Grand Avenue
R57	1322 E North Grand Avenue
R58	1326 E North Grand Avenue
R59	1328 E North Grand Avenue
R60	1330 E North Grand Avenue
R61	1332 E North Grand Avenue
R62	1334 E North Grand Avenue
R63	1336 E North Grand Avenue
R64	1338 E North Grand Avenue
R65	1340 E North Grand Avenue
R66	1404 E North Grand Avenue
R67	1408 E North Grand Avenue
R68	1412 E North Grand Avenue
C50	1613 E North Grand Avenue
C51	1615 E North Grand Avenue
R69	1627 E North Grand Avenue
R70	1633 E North Grand Avenue
R71	1631 E North Grand Avenue
R72	1321 N 15th Street
R171	1302 E North Grand Avenue
R173	1326 E North Grand Avenue
R174	1234 E North Grand Avenue
R175	1132 E North Grand Avenue
R176	1130 E North Grand Avenue
Displacement No. (2B)	**Street Address**
C84	1028 E Monroe
C85	1028 E Monroe
C86	1028 E Monroe
Displacement No. (Preferred Alternative & 2B)	**Street Address**
R94	1917 E Ash

R95	1952 S Wirt
R96	1954 S Wirt
R97	1904 E Ash
R103	2101 S Wirt
R98	2100 S Wirt
R99	2108 S Wirt
R100	2112 S Wirt
R101	2107 E Ash
C53	2103 E Ash
R102	2100 E Ash
Displacement No. (Preferred Alternative & 2B)	**Street Address**
R73	1905 E South Grand Avenue
R74	1913 E South Grand Avenue
R75	1917 E South Grand Avenue
R76	1921 E South Grand Avenue
R77	1929 E South Grand Avenue
R78	1910 E South Grand Avenue
R79	1912 E South Grand Avenue
R80	1918 E South Grand Avenue
R81	1922 E South Grand Avenue
R82	1924 E South Grand Avenue
R83	1926 E South Grand Avenue
R84	1930 E South Grand Avenue
R85	2005 E South Grand Avenue
R86	2009 E South Grand Avenue
R87	2001 E South Grand Avenue
R88	2008 E South Grand Avenue
R89	2010 E South Grand Avenue
R90	2012 E South Grand Avenue
R91	2016 E South Grand Avenue
R92	2020 E South Grand Avenue
R93	2028 E South Grand Avenue
Displacement No. (Preferred Alternative & 2B)	**Street Address**
C1	1645 N 11th Street
R1	1005 Black Avenue
R104	1613 N 11th Street
C3	1630 N 11th Street
R2	1622 N 11th Street
R3	1108 Ridgley

R4	1110 Ridgley
R5	1118 Ridgley
R6	1620 N 11th Street
R7	1618 N 11th Street
R8	1612 N 11th Street
R9	1608 N 11th Street
R10	1602 N 11th Street
R11	1600 N 11th Street
C4	1527 N 11th Street
C5	1220 N 9th Street
R12	1006 E North Grand Avenue
R13	1003 Reservoir Street
R16	1132 N 10th Street
R17	1130 N 10th Street
R18	1128 N 10th Street
R19	1126 N 10th Street
R20	1124 N 10th Street
R21	1122 N 10th Street
R22	1110 N 10th Street
R23	1108 N 10th Street
R24	1106 N 10th Street
R25	1017 Division
R172	1029 N 10th Street
R26	1023 N 10th Street
R27	1011 N 10th Street
R28	1005 N 10th Street
R29	1003 N 10th Street
C7	1020 N 10th Street
R30	933 N 10th Street
R31	931 N 10th Street
R32	927 N 10th Street
R33	925 N 10th Street
R34	923 N 10th Street
R35	921 N 10th Street
R36	921 Phillips
R37	923 Phillips
R38	929 N 10th Street
C8	920 Phillips
C9	915 E Enos Avenue
C10	918 E Enos Avenue
C11	718 N 9th Street
C12	1004 E Enos Avenue

C13	929 E Carpenter
C14	1015 E Madison Street
C17	221 N 11th Street
C18	1000 E Washington
C19	1001 E Monroe
C21	1000 E Adams
C22	1000 E Monroe
C23	1028 E Monroe
C24	1015 E Capitol Avenue
C26	1001 E Edwards Street
C28	1010 E Edwards Street
C29	709 Barrett
C30	1311 S 11th Street
C31	1403 S 10 1/2 Street
C32	1425 S 10 1/2 Street
R39	1515 S 10 1/2 Street
R40	1517 S 10 1/2 Street
R41	1601 S 10 1/2 Street
R42	1609 S 10 1/2 Street
R43	1617 S 10 1\2 Street
R44	1619 S 10 1\2 Street
C34	1905 S 10 1/2 Street
C35	1925 S 10 1/2 Street
C37	1935 S 10 1/2 Street
C38	1947 S 10 1/2 Street
C39	1000 E Laurel
C40	1943 S 10 1/2 Street
C41	901 E Ash
C46	2264 S 6th Street
C44	2121 S 9th Street
C45	2141 S 9th Street
C47	631 Princeton
C48	830 E Ash
R49	2342 S 5th Street
R166	2403 S 5th Street
R167	2279 S 6th Street
R168	2413 S 5th Street
R169	2409 S 5th Street
R50	2405 S 5th Street
R51	2407 S 5th Street
R52	401 E Iles Avenue
R53	2500 Burton Drive

C49	300 E Iles Avenue
R170	2513 Burton Drive

R=Residential
C= Commercial

About 117 residences and 53 or 56, (respectively) commercial businesses may be relocated as a result of the construction of the Preferred Alternative and Alternative 2B. 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.

5.2.2 Environmental Justice and Title VI

In accordance with the U. S. DOT Order 1510.2, compliance with Executive Order (EO) 12898, Federal Actions to Address Environmental Justice in Minority and Low-Income Populations (EA 1994) 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 on, 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 efforts 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.

Environmental Justice communities are known to occur along the Preferred Alternative and Alternative 2B based on the most recent census data.

No-Build Alternative

The No-Build Alternative will not directly affect minority or low-income populations with displacements; however, increasing train frequency and longer duration of train horn noise would continue to affect minority communities. Also, the railroad crossings along at-grade crossings for vehicles and pedestrians cause increased safety concerns, as does illegal pedestrian crossings at other than designated road crossing locations. Vehicle delays will also increase due to the projected increase in train traffic along all three rail corridors in Springfield.

Build Alternatives

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 for the Environmental Justice Analysis Technical Report). Included in the commercial designation for both the Preferred Alternative and Alternative 2B are three government or non-profit establishments: the Illinois Environmental Protection (EPA), the Salvation Army, and Planned Parenthood (see Section 4.2.7). 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 or Alternative 2B 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 or Alternative 2B 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.

Table 5-3 summarizes the conclusions of this Environmental Justice analysis regarding the presence of communities of concern, as Environmental Justice areas, identified adverse effects to Environmental Justice populations, identified beneficial effects to Environmental Justice populations, identified whether adverse impacts are disproportionately borne by Environmental Justice populations, identified appropriate mitigation for adverse effects, and summarized coordination and outreach activities.

Table 5-3. Environmental Justice Analysis Summary

Communities of Concern	• Racial minorities in the study area - 75 of 325 blocks having greater than 50 percent minorities consisting predominantly of black or African American race. Percent racial minority of the study area is 36 percent compared to 24 percent in Springfield. • Minority and low income populations are identified in the study area and within the project area.

Adverse Effects	• Residential displacements – 23 of 113 (20 percent) occur in blocks having greater than 50 percent racial minorities. • Commercial displacements – 5 of 50 (10 percent) are estimated to be minority-owned and employ an estimated 10 employees total of unknown race. • Public facilities/agencies displaced: Illinois EPA, Salvation Army, and Planned Parenthood. • Adverse travel of a maximum of 0.6 mile for motorists would occur at Reservoir Street, Division Street, Enterprise Street, Miller Street, Reynolds Street, Adams Street, and Jackson Street. • Adverse travel up to no greater than one block for residents affected by proposed road closures. • Adverse travel for pedestrians no longer allowed unlimited access across tracks used to access neighborhoods and communities in and along the study area. • Potential temporary affects to police, fire and emergency response times during construction.
Disproportionate Adverse Impacts to EJ Populations	• No disproportionate adverse impacts were identified after review of all impacts to resource and issue categories assessed in the Volume II document. The adverse effects to communities of concern identified in this analysis do not appear to be disproportionate when considering the magnitude of the existing congested and unsafe conditions in the project study area as well as the degree of benefits to the communities of concern resulting from project implementation.
Beneficial Impacts to EJ Populations	• Elimination of 3rd Street train traffic, vehicular traffic delays and overall congestion. • Improved safety conditions for all pedestrians and motorists in the study area: elimination of 32 at-grade crossings and safety improvements to remaining at-grade crossings; and new grade separations and fencing eliminates unsafe, unlimited pedestrian access points across track. • Net positive effect on access and response times for

	emergency, fire and police responders due to grade separations and the elimination of the 3rd Street rail corridor. • Creation of quiet zones by eliminating train horn noise for all residents, businesses, and community facilities occurring along the 3rd Street, 10th Street, and 19th Street corridors. • Indirect economic and employment benefits from the planned multimodal facility on the 10th Street corridor.
Coordination/Outreach Activities	• 17 stakeholder interviews. • 4 Stakeholder Advisory Groups including the Community Advisory Group which represented local neighborhood associations and several civic and minority organizations. • Project website. • 3 project newsletters were distributed to about 2,800 people by mail and about 500 people by e-mail. • E-mail and mail correspondence for comments and questions. • 29 community presentations reaching more than 1,100 people and included locations at neighborhood associations, minority faith-based groups, the local school district, and civic organizations. • 4 informational kiosks at various locations in and around the project area. • 2 public open houses and 1 public hearing.
Mitigation Measures	• 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 allowing unrestricted pedestrian and vehicular passage at grade separations during the presence of freight and passenger rail traffic, and increased safety from new quad-gate at-grade crossings. • Displaced persons and businesses would receive just compensation and relocation assistance for property

	acquisitions • Compensation and relocation assistance would be given to the three public facilities/agencies that would be displaced. Adequate replacement property appears to be available nearby for the Illinois EPA and Planned Parenthood. The Salvation Army plans to move to a recently purchased location independent of this project. • Coordination with public response agencies serving the project area during construction to avoid and minimize disruptions to emergency response. • Providing access to all businesses and residences that are not displaced. • Mitigation for adverse travel from the elimination of access by constructing grade separations and fencing: installation of sidewalks, lighting, landscaping, kiosks, bus station amenities and pedestrian overpasses at grade separations.

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.

5.2.3 Public Services/Facilities

The No-Build Alternative would not displace any public services or affect any public facilities.

As discussed above, public services and facilities that would be displaced by Alternatives 2A and 2B are the Illinois EPA, the Salvation Army, and Planned Parenthood. The Illinois EPA headquarters is at 1021 North Grand Avenue East. The Illinois EPA is an Illinois agency whose mission is to safeguard environmental quality, consistent with the social and economic needs of the state, so as to protect health, welfare, property, and the quality of life. The agency's primary function is to enforce the environmental laws of the state. The proposed project would dissect the headquarters building, and displace the north entrance, office space, and parking north and south of the building, all of which is leased by the Illinois EPA. Adequate replacement is nearby. Office space could be replaced through the addition of floors, or construction of additional buildings or add-ons to the north of the existing headquarters. Acquiring property to the north may also be possible for replacing lost parking space.

The Salvation Army is at 221 N. 11th Street. The Salvation Army is an evangelical Christian denomination known for charitable work. This parcel is the site for their Main Thrift Store and Adult Rehabilitation Center. Construction of the proposed underpasses on Madison Street and Jefferson Street with either the Preferred Alternative or Alternative 2B would eliminate access to the existing Salvation Army lot. Currently, the Salvation Army has plans to move to a recently purchased location at 100 N. 9th Street.

The Planned Parenthood Springfield Health Center at 1000 E. Washington Street is a provider of sexual and reproductive health care, education, and information. Their services include family planning, birth control services, HIV and other STD testing, and men and women's health services. The proposed project would displace the structure. There are comparable locations within the same vicinity for relocation of this facility. It could be relocated on the same block lot or at other vacant facilities that are available in the area.

The Preferred Alternative and Alternative 2B would have a net positive effect on access and response times for emergency vehicles serving the Springfield communities once construction is complete. Response time for emergency vehicles would improve as a result of improved roadway system linkage with elimination of the UP Railroad on the 3rd Street Corridor, construction of eight grade separations, crossing closures along the 10th and 19th street corridors, and consolidation of UP and NS railroad traffic into one corridor. Police, fire, and emergency response times may be temporarily affected during construction. Coordination with public response agencies serving the project area would continue during construction to avoid and minimize disruptions to emergency response.

5.2.3.1 Road Closures

Road closures along the retained alternatives are primarily in industrial areas where the business would be displaced and moved to a new location or access would not result in adverse travel. Adverse travel is the additional length of roadway a motorist or pedestrians must travel as a result of a closed road. Adverse travel would be limited to no more than one block, except for the area between Reservoir Street and Enterprise Street, Exhibits 5-1A to 5-1C. Residents within this area may encounter up to a maximum of eight blocks of adverse travel under Alternative 2B if their destination is located immediately across the 10th Street rail corridor, Exhibits 5-2A to 5-2C. This adverse travel would only be borne by local residential visits. Adverse travel resulting from road closures would not be a factor for residents going shopping or for emergency services, or access to public facilities since the primary east-west arterial is North Grand Avenue one block north of Reservoir Street.

5.2.4 Community Impacts

Each of the three existing rail corridors through Springfield would remain in service for the No-Build Alternative. These corridors create barriers that divide the city neighborhoods and isolate portions of the community. Trains that block crossings also reduce accessibility to certain neighborhoods.

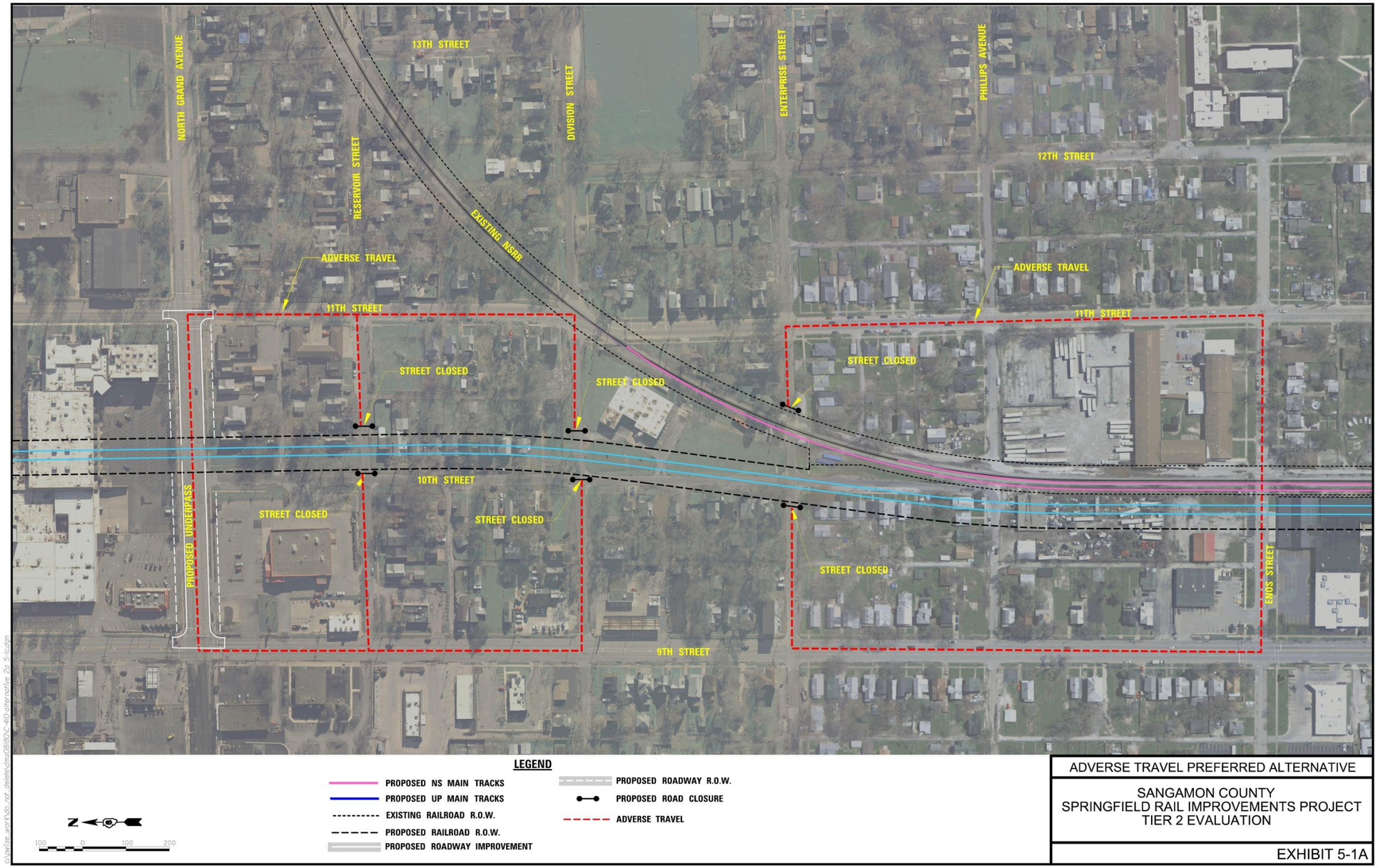

Exhibit 5-1A. Adverse Travel Preferred Alternative

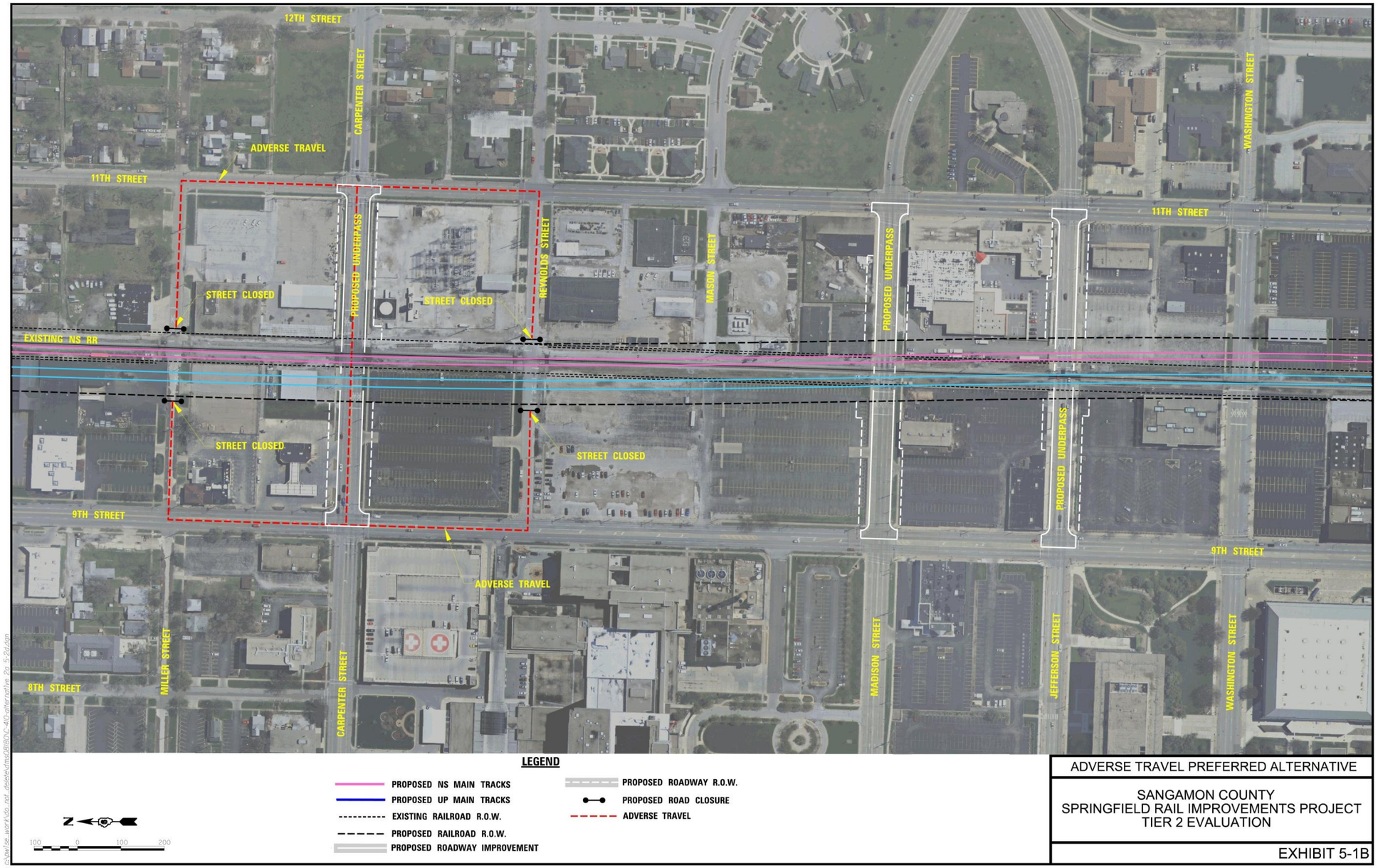

Exhibit 5-1B. Adverse Travel Preferred Alternative

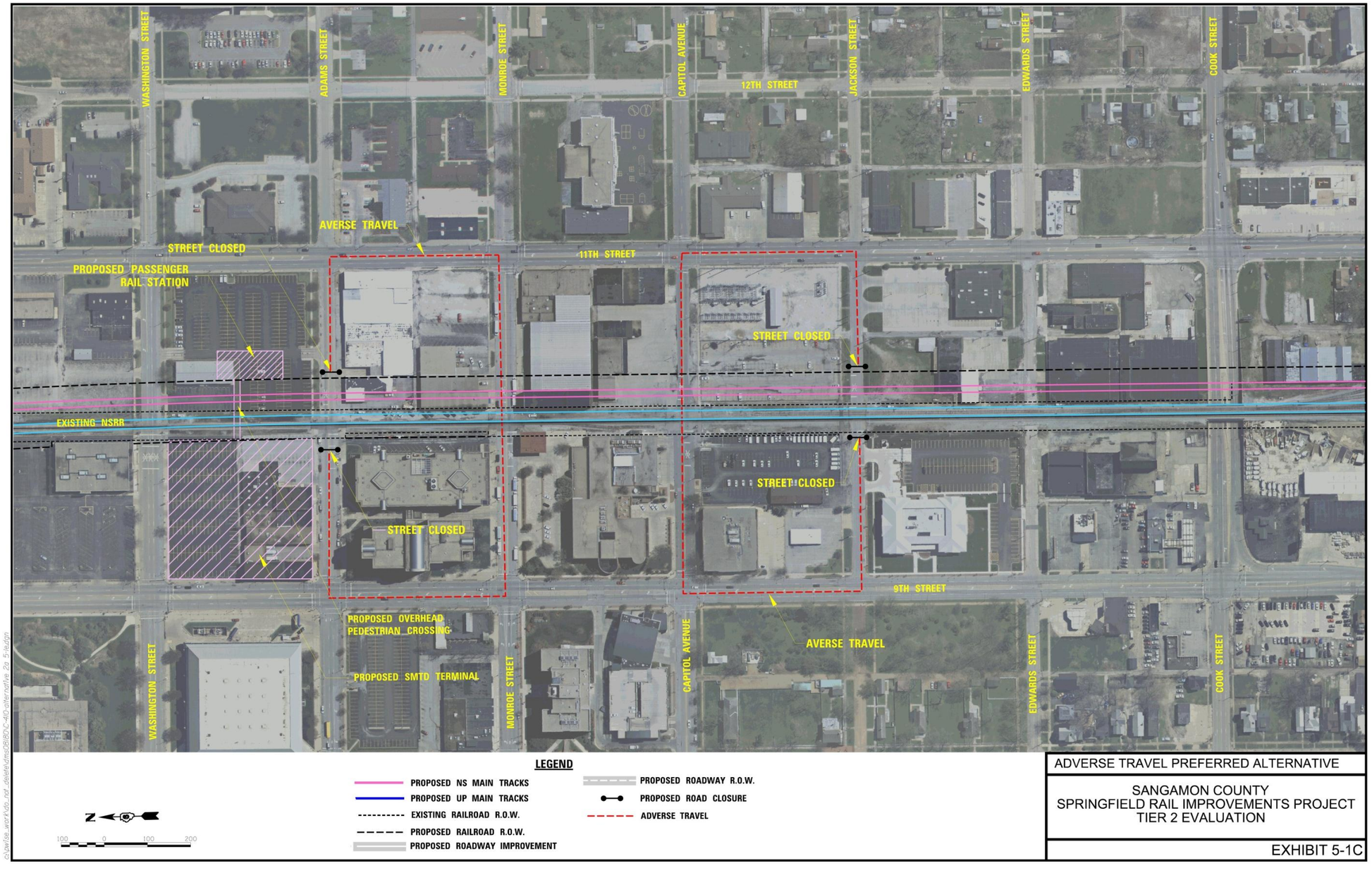

Exhibit 5-1C. Adverse Travel Preferred Alternative

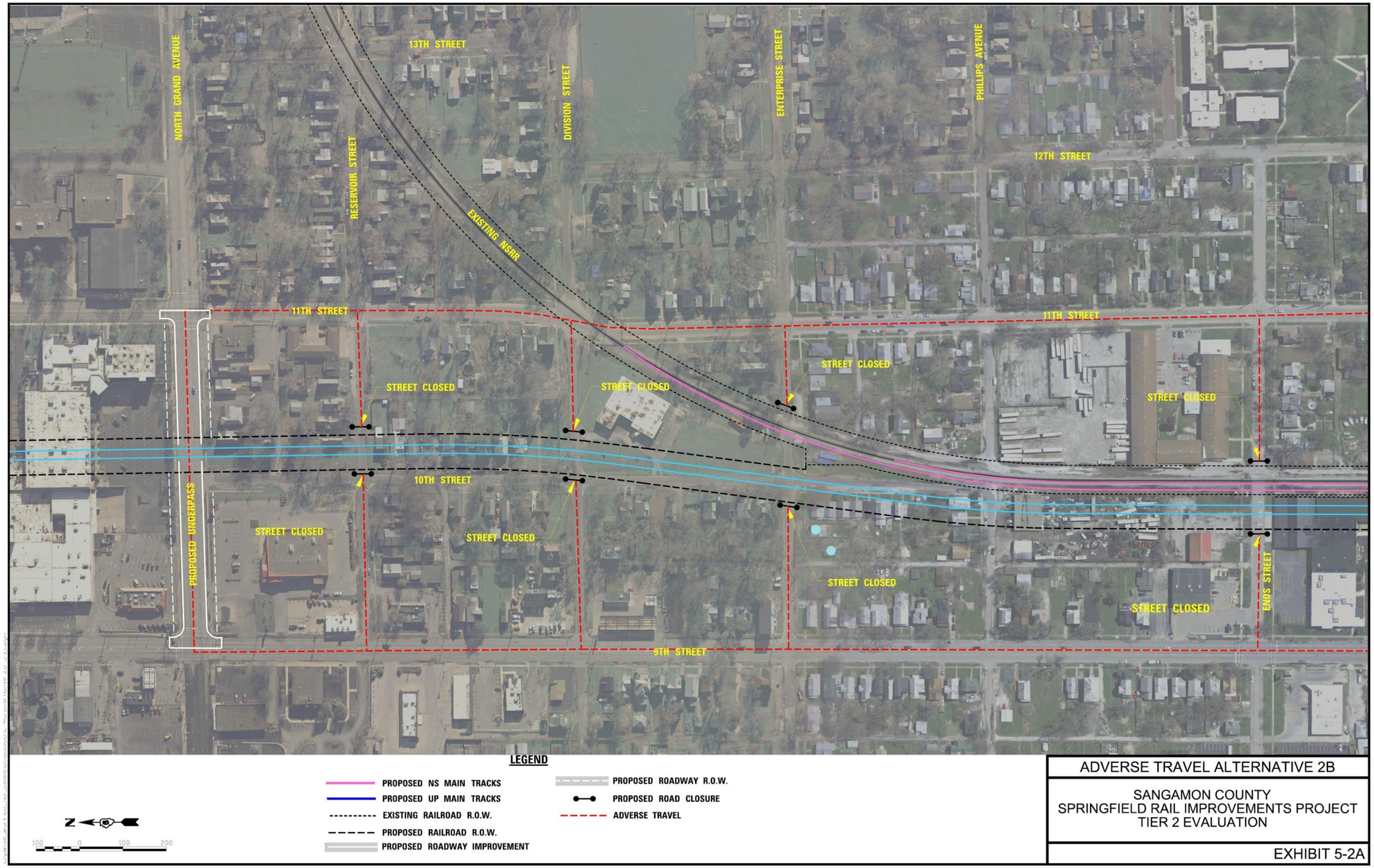

Exhibit 5-2A. Adverse Travel Alternative 2B

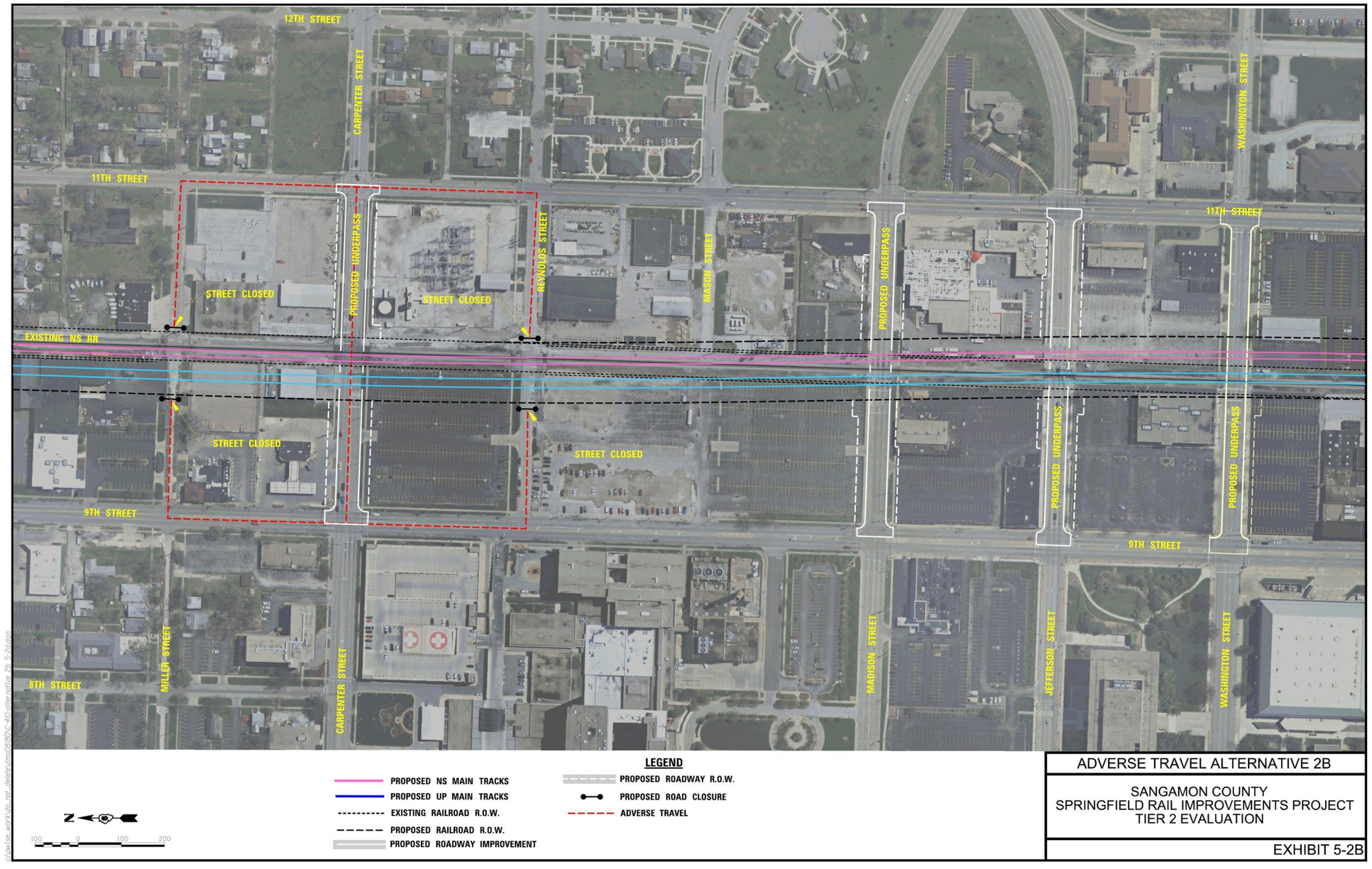

Exhibit 5-2B. Adverse Travel Alternative 2B

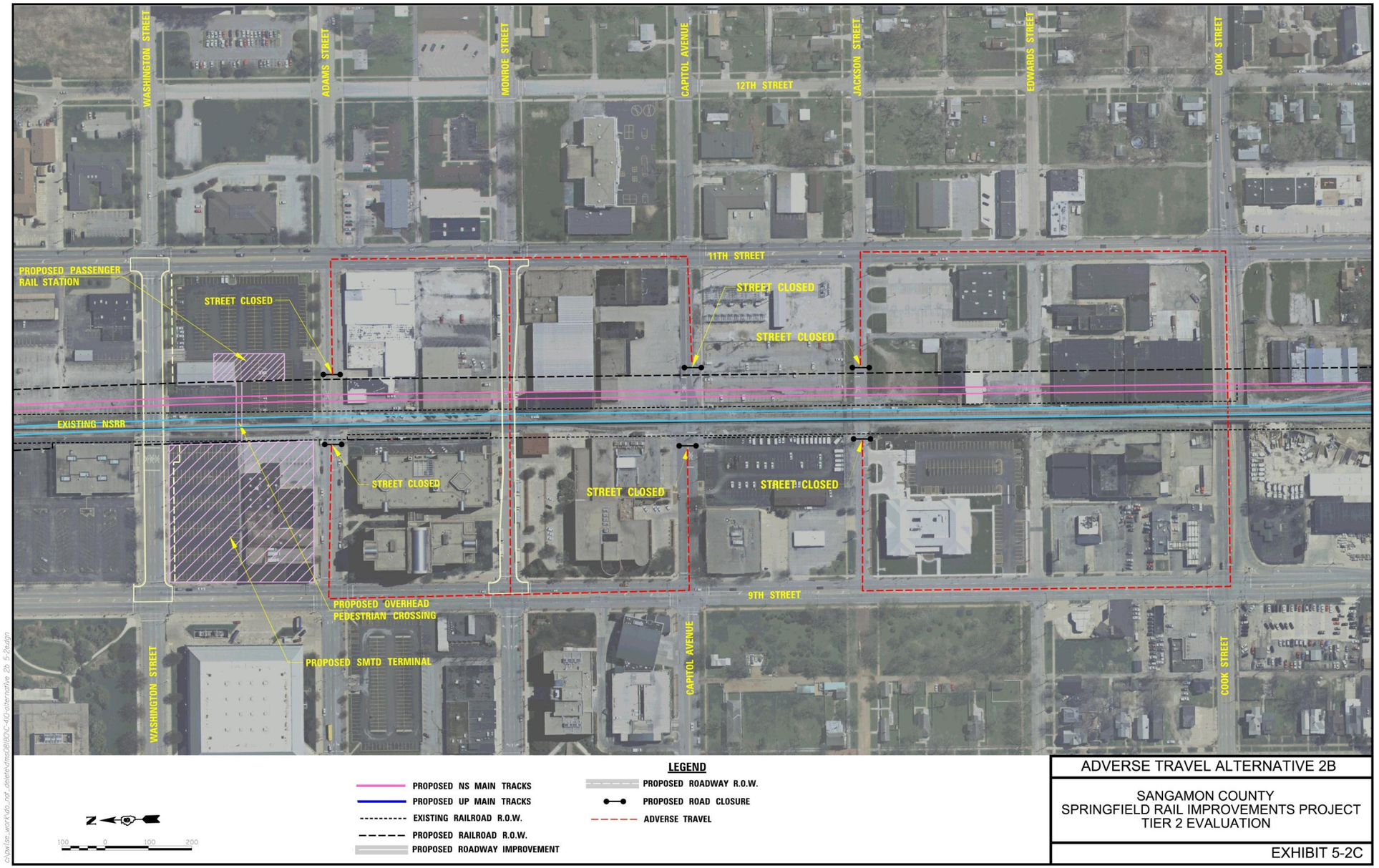

Exhibit 5-2C. Adverse Travel Alternative 2B

The Preferred Alternative and Alternative 2B would consolidate rail traffic to fewer corridors, which would eliminate neighborhood barriers, promote community cohesion and reduce the length of rail lines that go through residential areas along 3rd Street. The Springfield Project improves safety and quality of life to the surrounding communities by eliminating substantial train horn noise and limiting the amount of unsafe access and resulting fatalities. The Springfield Project will provide a safer way to cross with various mitigative components like an overpass, etc. that will compensate for the loss of crossings and potential neighborhood barriers from road closures and fencing. The miles of corridor with rail traffic passing through residential neighborhoods for each alternative is shown in Table 5-4.

Table 5-4. Miles of Rail Corridor Through Residential Neighborhoods

Alternative	Miles of Corridor in Residential Areas
No-Build	9.1
Preferred	5.4
2B	5.4

The Preferred Alternative and Alternative 2B would pass through or are adjacent to the Springfield neighborhoods of Pillsbury, Downtown Springfield, Pioneer Park, Mather and Wells, Iles Park, Grand Improvement, Harvard Park, and Springfield South Corridor (see Exhibit 4-6).

Consolidating UP rail traffic onto the 10th Street Corridor is not expected to result in adverse disruption and further division of these communities. Rail traffic has long existed on the 10th Street Corridor, and the proposed action, while accommodating the negative community reactions to the proposed action have been received regarding local road closures and changes in travel patterns. The recommendations for grade crossing locations, grade crossing treatments and street closures have been accepted by the greater Springfield community. All grade crossing and street closures were evaluated as part of the EIS process.

Positive impacts to the Springfield communities 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 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, due to fencing along the railroad right-of-way and four quadrant gates at crossings to prohibit vehicles from entering during train crossings. The proposed at-grade crossing treatments would support elimination of blaring noise from train horns traveling through Springfield's communities.

5.2.4.1 Grade Separations

Under the Preferred Alternative and Alternative 2B grade separations would be constructed or upgraded at the locations shown in Table 5-5. A benefit/cost ratio greater

than 1.0 indicates that the grade separation has benefits such as decreased delays and accidents exceeding its construction and maintenance cost over the life of the project.

Table 5-5. Grade Separations

			Preferred	2B	Overpass/ Underpass	Benefit/Cost Ratio
New Grade Separations	10th St.	North Grand Avenue (NS)	X	X	O	1.04
		North Grand Avenue (UP)	X	X	U	1.41
		Carpenter Street	X	X	U	1.09
		Jefferson Street	X	X	U	4.24
		Madison Street	X	X	U	1.60
		Washington Street		X	U	.75
		Monroe Street		X	U	.49
		Laurel Street	X	X	U	1.0
		Ash Street	X	X	U	.96
	19th St.	South Grand Avenue	X	X	U	1.76
		Ash Street	X	X	U	1.20
Upgrade Existing Grade Separations		Cook Street	X	X	U	
		South Grand Avenue	X	X	U	
		5th Street	X	X	U	
		6th Street	X	X	U	

All of the grade separations would be underpasses (road under railroad) except for North Grand Avenue at the NS which would be an overpass because of the length required for crossing both the NS and I&M tracks. Exhibits 5-3 and 5-4 show the anticipated appearance of the 10th Street 19th Street grade separations.

These grade separations would reduce the barrier effect of the railroad tracks by eliminating trains blocking streets, allowing vehicles and pedestrians to cross the tracks safely and without delays. These bridges would tie together neighborhoods and communities now divided by the rail lines. The cost of these grade separations are shown in Table 3-8 and their Benefit/Cost ratios are in Table 5-4. The impacts are included in the impacts for the alternatives.

5.2.4.2 Access Changes Associated With the Preferred Alternative

Each of the proposed street closures associated with the Preferred Alternative would result in changes in travel patterns and adverse travel (see Exhibit 5-1A to 5-1C for

Exhibit 5-3. Underpass – 10th Street

Exhibit 5-4. Underpass Separation – 19th Street

specific adverse travel routes). Adverse travel is the additional distance individual vehicles and pedestrians would need to travel because the street is closed.

Abandonment of the 3rd Street Corridor and construction of new grade separations in 10th and 19th streets would mitigate the delays resulting from adverse travel by eliminating delays due to trains blocking crossings. Locations within the combined 10th Street corridor would be within 0.4 miles of a grade separation as opposed to 1.4 miles under the No-Build Alternative. Even those areas affected by street closures would see improved emergency vehicle access since the risk of crossings being blocked by trains would be eliminated on 3rd Street and reduced on both 10th Street and 19th Street.

Access would be provided to all businesses and residences that remain.

Specific information regarding adverse travel associated with the proposed street closures is described below.

Reservoir Street

Traffic using Reservoir Street would reroute one block north to North Grand Avenue where a grade separation would be constructed. The current Average Daily Traffic (ADT) on Reservoir Street is 900. The maximum adverse travel for any vehicle or pedestrian would be 0.4 miles. There are no important community facilities on Reservoir Street, and closure would not affect emergency vehicle access.

Division Street

Traffic using Division Street would reroute two blocks to the north to North Grand Avenue where a grade separation would be constructed. The current ADT is 800. The maximum adverse travel for any vehicle would be 0.6 miles. There are no important community facilities on Division Street, and closure would not affect emergency vehicle access or pedestrian travel.

Enterprise Street

Traffic using Enterprise Street would reroute three blocks to the north and use the proposed grade separation at North Grand Avenue or two blocks to the south to the at-grade crossing at Enos Street. The current ADT is 1,150. The maximum adverse travel is shown in Table 5-6.

Table 5-6. Maximum Adverse Travel for Enterprise Street

Alternative	Adverse Travel (miles)
No-Build	0.0
Preferred	0.7
2B	0.9

There are no important community facilities on Enterprise Street in this area, and closure would not affect emergency vehicle access or pedestrian travel.

Miller and Reynolds Streets

Traffic using both of these streets would be diverted one block to the proposed grade separation at Carpenter Street. The current ADT is 500 for Miller Street and 700 for Reynolds Street. The maximum adverse travel for any vehicle would be 0.4 miles. There are no important community facilities on Miller or Reynolds Streets in this area, and closure would not affect emergency vehicle access or pedestrian travel.

Adams Street

Traffic using Adams Street would be rerouted to the at-grade crossing of Washington Street one block to the north or Monroe Street one block to the south. The current ADT is 2,250. The maximum adverse travel for any vehicle would be 0.4 miles. The Sangamon County Complex, including county offices, courtrooms and jail is on the south side of Adams Street between 9th Street and the rail corridor. Visitor parking is west of 9th Street. Employee parking is on the east side of the rail corridor. Some employees would have a longer (up to 600 feet) walk from their parking to the county building. There are no other important community facilities on Adams Street, and closure would not affect emergency vehicle access or pedestrian travel.

Jackson Street

Traffic using Jackson Street would be rerouted one block to the north of the Capitol Avenue at-grade crossing or two blocks to the south to the Cook Street grade separation. The current ADT is 350. The maximum adverse travel for any vehicle would be 0.4 miles. There are no important community facilities on Jackson Street in this area, and closure would not affect emergency vehicle access or pedestrian travel.

5.2.4.3 Access Issues Associated with Alternative 2B

Alternative 2B was developed in response to a request from the UP to consider a fully grade separated corridor where UP tracks would be immediately adjacent to NS tracks. This was accomplished by modifying the Preferred Alternative along 10th Street as follows:

- Close Capitol Avenue
- Grade Separate Monroe Street
- Grade Separate Washington Street
- Close Enos Street

These modifications would result in closure or grade separation of all of the crossings in the project area south of North Grand Avenue (see Exhibit 5-2A to 5-2C for adverse travel associated with Alternative 2B). See Exhibits B-2A, B-2B, and B-2C in Appendix B for these locations.

Each of these additional street closures and grade separations for Alternative 2B create specific access issues for individual properties as described below. A benefit/cost ratio was calculated for the grade separations using the costs described in Section 3.4.4.

Benefits were calculated using these assumptions to compare the savings due to reductions in delays, accidents, emissions, and fuel.

Specific information regarding adverse travel and other impacts associated with the four additional crossing changes with Alternative 2B are described below and shown in Appendix B.

- Capitol Avenue (Average Daily Traffic – ADT = 1,600) – The Federal, State and City governments have made a major investment to create a monumental corridor along Capitol Avenue between Martin Luther King Drive and the Capitol Building with 10th Street tracks in the middle of the corridor. This monumental corridor serves as a stage for community events such as parades, festivals, and civic ceremonies. Closing Capitol Avenue would eliminate much of the intended benefit of this completed construction.

- Monroe Street – A grade separation would cut off current delivery access to the County Building and jail as well as the historic Great Western Depot. Access to the Great Western Depot would be provided by constructing a new entrance from 9th Street through what is currently a private parking lot. This would result in additional land acquisition, but not an adverse effect to the historic resource. ADT = 2,450. The benefit/cost ratio for this grade separations = 0.49.

- Washington Street – A grade separation of Washington Street would make access to the future Amtrak station and bus transfer facility difficult and inefficient since it would eliminate access to and from the north side of the facility. ADT = 1,700. The benefit/cost ratio for this grade separation = 0.75.

- Enos Street – Closure would seriously hamper emergency access and neighborhood connectivity for residents along Enos Street east of 10th Street as the nearest crossings would be North Grand Avenue to the north and Carpenter Street to the south. Adverse travel distance would be approximately ½ mile. The affected area is blocked to the east by the I&M rail yard with no other access to school or emergency services. The anticipated ADT on Enos Street is 1,800. Grade separation of Enos street would not be cost effective.

5.2.5 Economic Benefits and Impacts

The expenditure of funds for transportation infrastructure has both direct and indirect economic impacts to Springfield. The economic impacts of the Preferred Alternative and Alternative 2B would be dispersed through Springfield and Sangamon County.

The direct impacts include jobs created both in production of materials and equipment used in the project and in actual on-site construction activities. Construction of the project would involve demolition of existing structures, widening and preparing the road bed, placement of new track, installation of signal and safety devices, and construction of grade separations. Firms that produce the signal and safety devices,

steel rails, and rolling stock for the Preferred Alternative and Alternative 2B would create additional jobs.

Wages individuals receive would then recycle throughout the economy as new workers buy/rent houses, furniture, groceries, and other merchandise. These expenditures, in turn, create new jobs. While much of this benefit would be within Springfield, the total geographic distribution impact would depend upon the location of firms supplying the labor and materials needed on the project.

The predicted increase in train traffic by 2020 from about 35 trains per day to 72 trains per day through Springfield would create some new railroad jobs. The precise location of economic impacts would depend on which companies receive contracts to conduct the construction activity.

The Preferred Alternative and Alternative 2B would require the purchase of about 41 acres of additional right-of-way. The increased benefits of increased passenger rail traffic through the city and the redevelopment potential of the abandoned 3rd Street railroad corridor is expected to counter the loss of property tax revenue as a result of the conversion of property to transportation use.

5.3 Energy

Construction of the Preferred Alternative or Alternative 2B would require consumption of energy for processing materials, construction activities, and maintenance for grade separation bridges and miles of rail added within the project area.

Construction of the Preferred Alternative or Alternative 2B would reduce traffic congestion and wait times at crossings along the alignment and thereby reduce vehicle stopping and slowing conditions. As discussed in Section 3.4.2, vehicle delay minutes per day in year 2030 in the Springfield rail corridors are projected to decrease almost in half for the Preferred Alternative or Alternative 2B compared to the existing year 2010 delay times, and be nearly reduced by a third compared to the projected No-Build Alternative 2030 delays. Also, a reduction in present value and annual costs (see Section 3.4.4.1) from the No-Build Alternative reflects a measurable benefit of implementing the retained alternatives, primarily as a reduction of delays and accidents. This would result in less direct and indirect vehicle operational energy consumption for the retained alternatives than the No-Build Alternative. Additional energy savings may be possible from the indirect benefits of the redevelopment of the abandoned 3rd Street rail corridor, such as a pedestrian and bicycle accommodations which would increase non-motorized transportation usage. Thus, in the long term, post construction operational requirements should offset construction and maintenance energy requirements and result in new savings in energy usage.

5.4 Agriculture

The Preferred Alternative and Alternative 2B would require no farmland acquisition. All improvements would be constructed either within existing railroad right-of-way or adjacent to existing railroad right-of-way along the 10th Street corridor, except for the proposed grade separations on existing urban streets along the 10th Street and 19th Street corridors. The land required for these improvements is urban. Therefore, the Preferred Alternative and Alternative 2B would not affect prime, unique, or important farmland.

5.5 Cultural Resources

Section 106 of the National Historic Preservation Act of 1966 (NHPA) requires Federal agencies to take into account the effects of their undertakings on historic properties and afford the Advisory Council on Historic Preservation (ACHP) of reasonable opportunity to comment. The historic preservation review process mandated by Section 106 is outlined in regulations issued by ACHP. Revised regulations, "protection of Historic Properties" (36 CFR Part 800), became effective January 11, 2011.

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 5-6). 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 5-6). 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 and Alternative 2B 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 and Alternative 2B. 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 retained alternatives and there are no noise impacts to this property. However, Alternative 2B would provide an underpass along Monroe Street which would relocate the existing access to the Depot further to the west within the same block. Therefore, the eligibility determination on this property would likely be "No Adverse Effect." Also, the proposed underpass for Alternative 2B would not affect the visual setting of historic significance of this property.

The Preferred Alternative and Alternative 2B 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 (see Appendix A).

Table 5-7. Properties of Architectural Significance within the Area of Potential Effect- 10th Street Corridor [1]

Exhibit ID	Property Name	Address	National Register Listed	National Register Eligibility Criterion[4]	Effect
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 & 10th		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 5-7. (continued) Properties of Architectural Significance within the Area of Potential Effect- 10th Street Corridor [1]

Exhibit ID	Property Name	Address	National Register Listed	National Register Eligibility Criterion[4]	Effect
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

5.5.1 Archaeological Resources

The Preferred Alternative and Alternative 2B 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 5-6 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 (see SHPO coordination letter in Appendix A). The SHPO's concurrence to this opinion will be included in the Record of Decision for this project.

5.6 Natural Resources

5.6.1 Threatened and Endangered Species

Of the threatened and endangered species mentioned to potentially occur in central Illinois by USFWS and the Illinois Department of Natural Resources (listed in Section 4.6.2), none of these species would be affected by the Preferred Alternative or Alternative 2B. 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 as indicated in Section 4.6.2 of this report. 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.

5.6.2 Natural Areas

There are no environmental consequences to any Illinois Natural Areas as a result of the Springfield Project.

5.7 Air Quality

5.7.1 Conformity

All areas of Sangamon County affected by the project are classified as attainment areas for the six criteria air pollutants which include carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO_2), particulate matter (PM_{10} and $PM_{2.5}$), ozone (O_3), and sulfur dioxide (SO_2). Accordingly, a conformity determination of the project's capacity to cause or exacerbate exceedances of the National Ambient Air Quality Standards (NAAQS) is not required.

5.7.2 Mobile Source Air Toxics

In addition to determining criteria for pollutants for which there are NAAQS, the USEPA also regulates mobile source air toxics (MSATs). While diesel train emissions would be offset by decreases in regional roadway vehicle miles traveled (VMT) and vehicular congestion, MSAT sources would be produced from vehicular traffic, increases in diesel locomotive emissions from the additional 3rd Street freight and passenger rail traffic, idling passenger trains near the proposed station, and train operations at maintenance and/or storage facilities.

In February 2007, USEPA finalized a rule to reduce hazardous air pollutants from mobile sources. The rule will limit the benzene content of gasoline and reduce toxic emissions from passenger vehicles and gas cans. USEPA estimates that in 2030 this rule would reduce total emissions of mobile source air toxics by 330,000 tons and VOC emissions (precursors to ozone and $PM_{2.5}$) by over 1 million tons, including 61,000 tons of benzene.

USEPA has also adopted many mobile source emission control programs that will also result in large air toxic reductions. The control programs include the Locomotive and Commercial Marine Rule and the Clean Air Nonroad Diesel Rule. The Locomotive and Commercial Marine program will dramatically reduce pollution from locomotive diesel engines and apply to all types of locomotives, including line-haul, switch, and passenger. The program sets new near-term and long-term emission limits for newly built engines and existing locomotive engines when they are remanufactured. USEPA estimates that by 2030, this program will reduce annual emissions of NO_x and PM by 800,000 and 27,000 tons, respectively. The Clean Air Nonroad Diesel Rule sets new emission standards for nonroad diesel engines and sulfur reductions in nonroad diesel fuel that will dramatically reduce harmful emissions. USEPA estimates that by 2030, this program will reduce annual emissions of nitrogen oxides and particulate matter by 738,000 and 129,000 tons, respectively.

The Preferred Alternative and Alternative 2B are expected to be associated with higher levels of MSAT emissions in the project area, relative to the No-Build Alternative, along with benefit from improvements in rail movement and capacity, and from the additional grade separations. However, USEPA regulations for vehicle and locomotive engines and fuels will cause overall MSATs emissions to decline substantially over the next several decades. Future emissions likely would be lower than present levels as a result of USEPA's national control programs of MSAT emission-reduction technology and fuels.

5.7.3 Local Air Quality

The Preferred Alternative and Alternative 2B would combine existing 3rd Street corridor rail traffic with 10th Street corridor rail traffic; thereby, increasing the potential for local emission concentrations of air pollutants. Because the proposed project would better accommodate existing and projected rail traffic through Springfield and not result in new sources of rail traffic, substantial increases in the amount of emissions-producing traffic are not expected. The Preferred Alternative and Alternative 2B are not anticipated

to have a substantial impact on current or future air quality standards or lead to the establishment of a non-attainment area.

Microscale CO concentration analyses were performed for the 2003 Final Environmental Impact Statement, Chicago to St. Louis, High-Speed Rail Project. Microscale analyses were performed at a worst-case highway-railroad grade crossing in Springfield (Carpenter Street) and at the Amtrak station. The estimated CO concentrations were well below the NAAQS one-hour and eight-hour standards. Maximum one-hour concentrations were estimated to be no greater than 7.4 ppm, and estimated eight-hour concentrations were no greater than 4.6 ppm.

Recent air quality monitoring data from the Illinois EPA shows concentrations well below threshold levels and existing conditions have not changed enough to warrant additional analysis. The monitoring data reported a highest recorded one-hour CO concentration of 4.5 ppm at the 6th Street and Monroe Street intersection, a location with some of downtown Springfield's highest Average Daily Traffic (over 11,000), which is well below the current standard of 35 ppm. The highest eight-hour CO concentration at this location was no greater than 2.0 ppm, which is well below the 9 ppm standard.

For 4,000-horsepower locomotives emitting CO at the maximum rate permitted under federal regulation, total CO emissions per mile per day along this portion of the corridor would be equivalent to approximately 46 to 100 daily motor vehicles, well below the 16,000 ADT trigger for Carbon Monoxide Screen for Intersection Modeling (COSIM) analysis at roadway intersections. This means project-generated increases in wayside train activity would not be expected to be sufficiently large to cause or substantially contribute to a localized violation of the CO NAAQS.

In addition, the proposed construction of grade separations along the 10th Street and 19th Street corridors would decrease vehicular delay times. This decrease in vehicular delay time is anticipated to dramatically decrease the build-up of CO concentrations at locations currently served by at-grade crossings. Therefore, the Preferred Alternative and Alternative 2B are not anticipated to result in localized CO concentrations in excess of the one-hour or eight-hour NAAQS of 35 ppm and 9 ppm, respectively.

Similar reasoning would apply to PM2.5 – another criteria air pollutant that can be associated with localized impact—as well as air toxics. As discussed in Section 5.1.2, the USEPA finalized a three part program in 2008 that will dramatically reduce emissions from diesel locomotives of all types—line-haul, switch, and passenger rail. This rule will cut PM emissions from these engines by as much as 90 percent and NO_x emissions by as much as 80 percent when fully implemented. These standards will also yield sizeable reductions in emissions of CO and MSATs. Therefore, the spatial and temporal density of these emissions would not be nearly sufficient to cause or substantially contribute to localized violations of applicable NAAQS or increased MSAT.

5.7.4 Construction Impacts

Potential impacts to local air quality during construction are possible. Potential impacts include fugitive dust emissions, direct emissions from construction equipment and truck exhausts, increased emissions and dust from construction vehicles on the streets, and emissions from re-routed vehicular traffic. Fugitive dust emissions vary with the nature of the operations and the dust control methods employed. Fugitive dust generated during construction generally consists of large-sized particulates that settle on nearby buildings and vehicles. People near a construction site would be exposed to higher than average amounts of inhalable particulates. However, the impacts associated with construction activities are normally negligible, local, and temporary.

IDOT's Standard Specifications for Road and Bridge Construction include provisions on dust control. Under these provisions, dust, and airborne dirt generated by construction activities would be handled through dust-control procedures or a specific dust-control plan, when warranted. The contractor and the Department would meet to review the nature and extent of dust-generating activities and would cooperatively develop specific types of control techniques appropriate to the specific situation. Techniques that may warrant consideration include measures such as minimizing track-out of soil onto nearby publicly traveled roads, reducing speed on unpaved roads, covering haul vehicles, and applying chemical dust suppressants or water to exposed surfaces, particularly those on which construction vehicles travel. With the application of appropriate measures to limit dust emissions during construction, this project would not cause any notable, short-term particulate matter air quality impact.

5.8 Noise/Vibration

In accordance with FTA and FRA guidelines, a noise and vibration impact assessment was conducted for the Preferred Alternative and Alternative 2B. This section presents the information used in conducting the noise and vibration assessment, the results of the assessments and potential mitigation measures for both noise and vibration, where appropriate.

5.8.1 Noise and Vibration Projections

The Preferred Alternative and Alternative 2B include consolidation of the 3rd Street and 10th Street rail traffic onto the 10th Street corridor. The project also includes the construction of grade separations at select streets throughout Springfield, street closures at some grade crossings, and the establishment of quiet zones throughout Springfield. The noise and vibration assessment includes projections of the UP freight and Amtrak passenger train traffic, NS freight traffic, CN freight traffic, and I&M freight traffic throughout Springfield. This assessment also includes the No-Build Alternative which includes future projected growth in train traffic but does not include the relocation of any tracks or the establishment of quiet zones.

For the Preferred Alternative and Alternative 2B, UP and Amtrak trains were modeled on new tracks along the 10th Street corridor adjacent to the existing NS tracks from

Stanford Avenue in the south to Phillips Street in the north. From Phillips Street to Ridgely Avenue there would be a section of new UP track, which would connect with the existing UP tracks to the north of Ridgely Avenue. In addition, NS trains were modeled in their existing locations throughout the city with the track being shifted slightly in some areas along 10th Street to accommodate the new UP tracks. CN and I&M trains were modeled in their current locations with no proposed changes to the tracks.

For the No-Build Alternative, UP and Amtrak trains were modeled on the existing 3rd Street tracks, NS and CN trains were modeled on the existing 10th Street and 19th Street tracks, respectively, and I&M trains were modeled on the existing 19th Street tracks and I&M tracks north of East Clear Lake Avenue.

5.8.1.1 Noise Projections

The primary components of wayside noise from train operations are engine/exhaust noise for diesel locomotives and wheel/rail noise from the steel wheels rolling on steel rails for freight railcars and passenger cars. The projection of wayside noise was carried out using models specified in the FTA Guidance Manual, with the following assumptions:

- Existing noise levels were measured throughout the project area to determine existing noise levels. The existing noise measurements were used to determine an impact criteria for the project through Springfield.

- For the No-Build Alternative, all trains were assumed to sound the locomotive warning horns at at-grade crossings in the project area.

- For the Preferred Alternative and Alternative 2B at-grade crossings in the project area were assumed to be part of quiet zones where locomotive warning horns would not be sounded during normal operating conditions. Modeling for the Preferred Alternative and Alternative 2B omitted train horn noise.

- The UP operations were assumed to consist of a total of 21 daytime and six nighttime trains. UP trains were assumed to consist of two locomotives and 75 railcars, with an approximate total train length of 6,500 feet. UP trains were assumed to operate at 40 mph. UP operations on 3rd Street were assumed to increase from five existing trains per day to a total of 27 trains per day with the No-Build Alternative.

- The Amtrak passenger train operations were assumed to consist of a total of 17 daytime and one nighttime trains. Amtrak trains were assumed to consist of two locomotives and four passenger cars, with an approximate total train length of 500 feet. Amtrak trains were assumed to operate at 40 mph since they would all stop in Springfield. Amtrak operations on 3rd Street were assumed to consist of 10 trains per day for the No-Build Alternative. The UP freight operations would occupy all of the remaining No-Build track capacity. Additional passenger trains would require a second track.

- The NS operations were assumed to consist of a total of 18 daytime and nine nighttime trains. NS trains were assumed to consist of two locomotives and 57 railcars, with an approximate total train length of 5,000 feet. NS trains were assumed to operate at 40 mph. For the No-Build Alternative, the NS operations were assumed to be the same as the Preferred Alternative and Alternative 2B.

- The CN operations for the Preferred Alternative and Alternative 2B, as well as the No-Build Alternative, were assumed to consist of a total of six daytime and three nighttime trains. CN trains were assumed to consist of two locomotives and 57 railcars, with an approximate total train length of 5,000 feet. CN trains were assumed to operate at 10 mph. CN operations were assumed to increase from the existing four to the nine trains per day used in the analysis.

- The I&M operations for the Preferred Alternative and Alternative 2B, as well as the No-Build Alternative, were assumed to consist of a total of six daytime and three nighttime trains. I&M trains were assumed to consist of two locomotives and 57 railcars, with an approximate total train length of 5,000 feet. I&M trains were assumed to operate at 10 mph. I&M operations were assumed to increase from the existing four to the nine trains per day used in the analysis.

- Based on FTA guidance, the predictions assume that a single diesel locomotive operating at 50 mph on ballast and tie track with continuous welded rail (CWR) generates a Sound Exposure Level (SEL) of 92 dBA at a distance of 50 feet from the track centerline.

- Based on FTA guidance, the predictions assume that a single freight railcar or passenger car operating at 50 mph on ballast and tie track with continuous welded rail (CWR) generates an SEL of 82 dBA at a distance of 50 feet from the track centerline.

- Warning bells, generating a sound level of 73 dBA at 50 feet (FTA-VA-90-1003-06, May 2006), were assumed to be sounded at all gated crossings before and during each train pass-by for a total duration of 30 seconds. Train horn noise was measured for this project and not assumed (see Noise and Vibration Technical Report, June 2012).

- Wheel impacts at turnouts typically cause localized noise increases of 6 dB (HMMH measurement data).

- Noise modeling was assessed for cultural and Section 4(f) properties along the Preferred Alternative and Alternative 2B.

5.8.1.2 Vibration Projections

The potential vibration impact from trains in the project area was assessed on an absolute basis using the FTA criteria rather than a comparative basis to the No-Build condition. The No-Build Alternative would not cause a significant increase in train

events or the addition of new tracks. The following factors were used in determining potential vibration impacts along the proposed rail alignment:

- Existing ground-borne vibration measurements were conducted at six sites in the project area. These measurement results were compared with the typical locomotive maximum vibration level versus distance curve in Section 2.8 of the FTA Guidance Manual (FTA-VA-90-1003-06, May 2006). This curve was used to model vibration levels at all sensitive receptor locations along the 10th Street corridor and the section of new UP track between Phillips Street and Ridgely Avenue.

- Because the only changes to the CN, NS and I&M operations would be the establishment of quiet zones outside the 10th Street corridor, vibration was not assessed for the CN, I&M, or on the NS tracks north of Phillips Street. For the No-Build Alternative, no impact is assessed for the 10th Street corridor because there would not be a significant increase in the number of events (doubling of events) and there are no new or relocated tracks (FTA-VA-90-1003-06, May 2006).

- The existing vibration conditions in the project area were assumed to be in the category of a "Heavily Used Rail Corridor," as defined in the FTA Guidance Manual (FTA-VA-90-1003-06, May 2006).

- In locations where the existing train vibration exceeds the impact criteria, the project would cause additional impact with an approximate doubling of train events. If there is not a doubling of events, there would only be impact if the project vibration is 3 VdB or more higher than existing vibration levels.

- In locations where the existing train vibration does not exceed the impact criteria, or for locations with new track, such as the UP between Phillips Street and Ridgely Avenue, impact is assessed based on an exceedance of the vibration criteria.

- Because of the length of freight trains and the amount of time that the vibration events last, freight operations were assessed using the "Frequent Events" category in the vibration impact criteria, as defined by the FTA Guidance Manual (FTA-VA-90-1003-06, May 2006).

- The vibration projections assumed that all UP freight, Amtrak passenger, and NS freight trains are operating at a speed of 40 mph in the 10th Street corridor.

- Wheel impacts at turnouts typically cause localized increases in vibration of 10 VdB (FTA-VA-90-1003-06, May 2006).

5.8.2 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.

Table 5-8 presents the combined results of the No-Build Alternative noise impact assessment at residential and institutional locations. 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.

The results of the No-Build Alternative noise impact assessment indicate that there would be 1,789 severe noise impacts and 5,978 moderate noise impacts at residential locations. Impacts for the No-Build Alternative would generally occur at residential locations. Other types of locations affected would be five hotels and nine hospital/medical buildings and the Sangamon County Jail. These noise impacts for the No-Build Alternative are along the UP, NS, CN, and I&M tracks throughout Springfield and are a result of the projected additional UP, NS, CN, and I&M trains in areas where the existing noise levels are relatively high. All trains in the No-Build Alternative would be sounding the horns. The primary driver of noise impacts are the train horns.

5.8.2.1 Noise Impact Assessment

Proposed Project Compared to No-Build

Table 5-8 also presents the results of the noise impact assessment for the Preferred Alternative and Alternative 2B at residential and institutional locations. For Alternative 2A and 2B, 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 and Alternative 2B 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 and Alternative 2B.

With the Preferred Alternative and Alternative 2B there would be six severe noise impacts and eight moderate noise impacts at residential locations from the Springfield Project. These noise impacts are limited to one area as shown in Exhibit B-1I. 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 recommended alternatives because of the proposed quiet zone. The retained alternatives (the Preferred Alternative and Alternative 2B) 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.

Table 5-8 presents a summary of noise impact results between the No-Build Alternative and the Preferred Alternative and Alternative 2B.

Table 5-8. Summary of Noise Impact Results

Receptor Location	No-Build		The Preferred Alternative and Alternative 2B	
	Number of Impacts		Number of Impacts	
	Moderate	Severe	Moderate	Severe
UP/I&M Intersection	210	21	0	0
UP 3rd Street Corridor from UP/I&M Intersection to UP/NS Intersection	2,248	632	N/A[2]	N/A[2]
Relocated UP from I&M to NS	N/A[1]	N/A[1]	0	0
10th Street Corridor from Relocated UP/NS Intersection to East Stanford Avenue	2,083	113	8	6
NS from East Sangamon Avenue to Relocated UP	716	233	0	0
I&M from UP to CN	388	63	0	0
19th Street Corridor from I&M/CN Intersection to East Stanford Avenue	130	522	0	0
CN from East Sangamon Avenue to I&M	203	205	0	0
TOTAL	**5,978**	**1,789**	**8**	**6**

1. This location is outside of the project area.
2. This location is outside of the project area.
Source: Harris Miller Miller & Hanson Inc., 2011

5.8.2.2 Vibrations Impact Assessment

No vibration impacts would occur with the No-Build Alternative. The 10th Street corridor is currently defined as "heavily-used" (more than 12 trains per day). For the No-Build Alternative, there is no change to the train speeds or track locations, only an increase in the number of trains per day. Because the number of trains per day is not doubling on the 10th Street corridor in the No-Build Alternative, there would be no vibration impacts.

Tables 5-9 and 5-10 presents the results of the vibration impact assessment for the Preferred Alternative and Alternative 2B at residential (Category 2) and institutional (Category 3) locations, respectively. The tables provide information by track location,

Table 5-9. The Preferred Alternative and Alternative 2B Land Use Category 2 Vibration Impact Summary

Receptor Location	Distance To Near Track (feet)		Train Speed (mph)	Existing/No-Build Vibration Level[1]	Projected Vibration Level[1]	Vibration Impact Criterion[1]	Number of Vibration Impacts[(3)]
	Existing/No-Build	Future					
UP/I&M Intersection							
E Sangamon Ave to E Griffiths Ave	65-260	65-220	10-40	70-84	72-84	72	10
UP from I&M to NS							
E Griffiths Ave to E Black Ave	100-170	70-125	40	70-75	73-80	72	5
E Black Ave to N Grand Ave E[2]	95	300	40	76	61	72	0
N Grand Ave E to E Division St	80-710	45-135	40	55-78	72-85	72	19
UP/NS Intersection							
E Division St to E Phillips St	40-280	40-185	40	63-85	72-85	72	23
10th Street Corridor from UP/NS Intersection to Existing UP (East Iles Avenue/West Highland Avenue)							
E Phillips St to E Carpenter St	35-85	40-95	40	77-86	76-85	72	3
E Madison St to E Monroe St	70-95	45-75	40	76-80	79-84	72	2
E Cook St to E Kansas/E Scarritt St[2]	230	155	40	67	71	72	0
E Kansas/E Scarritt St to E Cedar St	195-200	100-105	40	68	75	72	3
E Cedar St to E Ash St	130-200	95-140	40	68-73	72-76	72	5
E Ash St to E Princeton/Broad Pl	185-200	115-130	40	68-69	73-74	72	3
E Princeton/Broad Pl to E Iles/W Highland Ave	35-205	40-135	40	68-86	72-86	72	44
UP/NS from Existing UP Track to East Stanford Avenue							
E Stanford to E Iles/W Highland Ave	100-190	40-145	40	69-75	73-85	72	12
TOTAL							**129**

[1] Vibration levels are measured in VdB referenced to 1 µ-inch/second.
[2] There are no vibration impacts in this section. Data are for closest receptor in this location.
[3] Vibration impacts are limited to human annoyance and are below thresholds for structural damage.
Source: Harris Miller Miller & Hanson Inc., 2011

Table 5-10. The Preferred Alternative and Alternative 2B Land Use Category 3 Vibration Impact Summary

Receptor Name	Receptor Location	Distance To Near Track (feet)		Train Speed (mph)	Existing Vibration Level[1]	Projected Vibration Level[1]	Vibration Impact Criterion[1]	Number of Vibration Impacts[(2)]
		Existing/No-Build	Future					
UP from I&M to NS								
Caritas Hall Association	E Black Ave to N Grand Ave E	400	65	40	42	80	75	1
10th Street Corridor from UP/NS Intersection to Existing UP (East Iles Avenue/West Highland Avenue)								
Lincoln Depot	E Monroe St to E Cook St	25	30	40	88	87	75	1
TOTAL								**2**

[1] Vibration levels are measured in VdB referenced to 1 µ-inch/second.

[2] Vibration impacts are limited to human annoyance and are below thresholds for structural damage.

Source: Harris Miller Miller & Hanson Inc., 2011

including the distance to the nearest existing and future tracks, train speeds in each location, existing and projected future vibration levels, impact criterion, and number of vibration impacts. The "number of vibration impacts" means the number of vibration-sensitive receptors that would experience vibration impacts. Where vibration impacts are predicted, the tables provide the range of vibration levels for those impacted receptors.

The results of the vibration impact assessment for the Preferred Alternative and Alternative 2B 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 and Alternative 2B. 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 and Alternative 2B.

The Preferred Alternative and Alternative 2B 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.

5.8.3 Construction Noise Impact Assessment

Construction noise varies greatly depending on the construction process, type and condition of equipment used, and layout of the construction site. Many of these factors are traditionally left to the contractor's discretion, which makes it difficult to accurately estimate levels of construction noise. Overall, construction noise levels are governed primarily by the noisiest pieces of equipment. For most construction equipment, the engine, which is usually diesel, is the dominant noise source. This is particularly true of

engines without sufficient muffling. For special activities such as impact pile driving and pavement breaking, noise generated by the actual process dominates.

Construction noise at a given noise-sensitive location depends on the magnitude of noise during each construction phase, the duration of the noise, and the distance from the construction activities. Projecting construction noise requires a construction scenario of the equipment likely to be used and the average utilization factors or duty cycles (i.e., the percentage of time during operating hours that the equipment operates under full power during each phase). The noise impact assessment for a construction site is based on:

- An estimate of the type of equipment that would be used during each phase of the construction and the average daily duty cycle for each category of equipment,
- Typical noise emission levels for each category of equipment, and
- Estimates of noise attenuation as a function of distance from the construction site.

Construction noise estimates are always approximate because of the lack of specific information available at the time of the environmental assessment. Decisions about the procedures and equipment to be used are made by the contractor. Project designers usually try to minimize constraints on how the construction would be performed and what equipment would be used so that contractors can perform construction in the most cost effective manner. The project sponsor would evaluate potential construction noise impact during engineering and design of the project, as more details of the construction scenarios are known, including potential haul routes for excavated material.

5.8.4 Noise and Vibration Mitigation

5.8.4.1 Train Noise Mitigation Measures

Quiet zones are proposed to be established throughout the project area. Train horns sounded near at-grade crossings are the major noise source in the project area. Quiet zones would eliminate this major noise source from freight train activities throughout the project area. For the 18 moderate and severe noise impacts still remaining in the recommended alternative, payments for noise easements are recommended since other mitigation forms are too costly and impracticable.

5.8.4.2 Train Vibration Mitigation Measures

The assessment assumes that the vehicle wheels and track are maintained in good condition with regular wheel truing and rail grinding. Beyond this, there are several approaches to reduce ground-borne vibration from train operations. They are:

- Ballast Mats: A ballast mat consists of a pad made of rubber or rubber-like material placed on an asphalt or concrete base with the normal ballast, ties, and rail on top. The reduction in ground-borne vibration provided by a ballast mat is strongly dependent on the vibration frequency content and the design and support of the mat.

- Resiliently Supported Ties: Resiliently supported ties have a rubber or other resilient material placed between the ties and the ballast. These ties may be effective in reducing vibration 10 VdB at frequencies above 15 Hz.

- Resilient Rail Fasteners: Resilient rail fasteners which are specially-designed fasteners between the rails and the ties. Resilient rail fasteners may reduce vibration by 5 to 10 VdB at frequencies above 30 to 40 Hz.

- Tire Derived Aggregate (TDA): Also known as shredded tires, a typical TDA installation consists of an underlayment of 12 inches of nominally 3-inch size tire shreds or chips wrapped with filter fabric, covered with 12 inches of sub-ballast and 12 inches of ballast above that to the base of the ties. Tests suggest that the vibration attenuation properties of this treatment are midway between that of ballast mats and floating slab track. While this is a low-cost option, it has only been installed on two U.S. light rail transit systems (San Jose and Denver).

- Floating Slabs: Floating slabs consist of thick concrete slabs supported by resilient pads on a concrete foundation; the tracks are mounted on top of the floating slab. Most successful floating slab installations are in subways, and their use for at-grade track is less common. Although floating slabs are designed to provide vibration reduction at lower frequencies than ballast mats, they are extremely expensive.

- Special Trackwork at Crossovers and Turnouts: Because the impacts of vehicle wheels over rail gaps at track turnout locations increases ground-borne vibration by about 10 VdB, turnouts are a major source of vibration impact when they are located in sensitive areas. If turnouts cannot be relocated away from sensitive areas, another approach is to use spring-rail, flange-bearing or moveable-point frogs in place of standard rigid frogs at turnouts. These devices allow the flangeway gap to remain closed in the main traffic direction for revenue service trains.

- Property Acquisitions or Easements: Additional options for avoiding vibration impacts (and noise impacts also) would be to purchase receptors likely to be affected by train operations or to acquire easements for such receptors by paying the homeowners to accept the future train vibration conditions. These approaches would usually be taken only in isolated cases where other mitigation options are infeasible, impractical, or too costly.

- Vibration impacts are projected along the 10th Street corridor at the new UP tracks between Phillips Street and Ridgely Avenue, and on the new double-track portion of the UP north of Ridgely Avenue. A mix of special trackwork and other vibration mitigation measures could reduce vibration levels at some locations. However, vibration mitigation generally does not perform well for freight trains because of the high axle loads. Some vibration mitigation measures would have limited effects at reducing vibration levels from freight trains, but would not reduce vibration levels to below the impact thresholds at all locations. Also, the vibration impacts

assessed for the Preferred Alternative and Alternative 2B are only for human annoyance levels and not for any structural damage to homes or businesses.

5.8.4.3 Construction Noise Mitigation Measures

Temporary noise during construction has the potential of being intrusive to residents near the construction sites. Construction activities would be carried out in compliance with all applicable local noise regulations. In addition, specific residential property line noise limits would be developed during final design and included in the construction specifications for the project, and noise monitoring would be performed during construction to verify compliance with the limits. This approach allows the contractor flexibility to meet the noise limits in the most efficient and cost-effective manner. Noise control measures that would be applied as needed to meet the noise limits include the following:

- Avoiding nighttime construction in residential neighborhoods.
- Using specially quieted equipment with enclosed engines and/or high-performance mufflers.
- Locating stationary construction equipment as far as possible from noise-sensitive sites.
- Constructing noise barriers, such as temporary walls or piles of excavated material, between noisy activities and noise-sensitive receivers.
- Re-routing construction-related truck traffic along roadways that would cause the least disturbance to residents.

5.9 Water Quality/Resources

5.9.1 Surface Water Impacts

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. The No-Build Alternative also has its stormwater runoff collected in Springfield's combined sewers.

Construction and maintenance can potentially affect water resources in a variety of ways. Short-term and long-term impacts to surface waters as a result of construction

should be minimal because there are no waters of the U.S. (streams or lakes) within the railroad right-of-way where construction is proposed.

Short-term construction impacts can result most directly from clearing, excavation, and fill activities that expose soils to erosion and elevate turbidity levels and siltation in receiving waters. Increases in suspended solids also can result in elevated levels of coliform bacteria, total phosphorus, heavy metals, and organic chemicals, such as pesticides and herbicides. Most of the discharges associated with construction activities would be as temporary stormwater runoff into Springfield's combined sewer system and treated.

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 either the Preferred Alternative or Alternative 2B 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.

5.9.2 Groundwater

The Preferred Alternative and Alternative 2B would not measurably alter groundwater flow patterns since all improvements would lie adjacent to and parallel with existing railroad facilities. During construction, there is the potential for the release of motor fuel, oils, or other contaminants onto the ground within the project area. The proposed project is not in proximity to any aquifer, aquifer recharge areas, public or private drinking water wells, or wellhead protection zones. Therefore, the project is not anticipated to impact any groundwater resources or quality.

5.10 Floodplains

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 and Alternative 2B 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.

5.11 Wetlands

Based on the wetlands reconnaissance survey and the National Wetland Inventory mapping, the Preferred Alternative and Alternative 2B do not affect any wetlands regulated under the Clean Water Act of 1972.

5.12 Utilities

Both the Preferred Alternative and Alternative 2B would require utility relocation, especially at any new underpass. Each of the Springfield streets that are to be reconstructed as grade separations includes both overhead and underground utilities including gas, water, sewer, telephone, cable TV, and electric. These utilities are located within public right-of-way and will remain within public right-of-way after construction. Cost and impacts for utility relocation are included in the overall project. The existing utilities in 3rd Street adjacent to the UP would need to be abandoned or relocated since the street would be transferred to UP ownership to provide the required minimum right-of-way width for a second track.

The most significant utility relocation at the grade separations would be the large diameter sewer on Ash Street. This would be relocated to behind the abutments and encased beneath the railroad tracks. The cost of utility relocation is included in the initial cost estimates. The No-Build Alternative would require no utility relocation.

5.13 Visual and Aesthetic Quality

There is one sensitive visual resource that would be visible from the Preferred Alternative and Alternative 2B —the Great Western Railroad Depot—a historic structure that was the location of President Lincoln's departure to Washington. This resource would also be visible from the No-Build Alternative with existing rail traffic on the 10th Street tracks.

Since no vertical elements, such as overpasses, would be added or removed at this location, the change in the view would be minor since the view of the structure would not be obscured by an overpass.

The NS overpass at North Grand Avenue would present a visual impact to the surrounding homes and businesses. Most homes and businesses are one or two stories and the overpass would be 30 feet high.

5.14 Special Waste

The USEPA listing of potential, suspected, and known hazardous waste or hazardous substances sites in the project area (i.e., the Comprehensive Environmental Response Compensation and Liability Information System of CERCLIS list) was reviewed on February 10, 2012, to ascertain whether the proposed project would involve any listed sites. Based on this review, the proposed improvements associated with this project

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 (see Exhibit 5-1B). Another CERCLIS site, Nutronics, Inc., located at 1703 Peoria Road, would be within one block of the proposed improvements. More information regarding these sites is located in Section 4.14 and Appendix C.

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 (see Appendix B, Exhibits B-1 and B-2 for LUST site locations). The Preferred Alternative and Alternative 2B both affect the same number of CERCLIS and LUST sites. However, these sites are not anticipated to present significant impairments to rail improvements associated with the Preferred Alternative and Alternative 2B. 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.

5.15 Section 4(f)/6(f) and Parklands

The proposed action is adjacent to three Section 4(f) properties. These properties include 11th and Black Park, Iles Park, and Lanphier Park (see Exhibits B-1 and B-2 in Appendix B). 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 no 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 and Alternative 2B, no Section 4(f) uses are anticipated (Table 5-11). 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.

Table 5-11. Section 4(f) Resource and Parkland Impacts

Site Designation	Site ID[(1)]	Type	Description	Potential 4(f) Impact
11th and Black Park	B-1B	City Park	Adjacent to proposed project	No right-of-way required and no substantial impairment to recreational activities; therefore, no Section 4 (f) use.
Iles Park	B-1G	City Park	Adjacent to proposed project	No right-of-way required and no substantial impairment to recreational activities; therefore, no Section 4(f) use.
Lanphier Park	B-1J	City Park	Adjacent to proposed project	No right-of-way required and no substantial impairment to recreational activities; therefore, no Section 4(f) use.
Springfield Furniture Factory	B-1C	Structure	Adjacent to proposed project	No right-of-way required and no substantial impairment; therefore, no Section 4 (f) use.
Great Western Railroad Depot	B-1E	Structure	Adjacent to proposed project	No right-of-way required and no substantial impairment; therefore, no Section 4 (f) use.
Mine Rescue Station	B-1H	Structure	Adjacent to proposed project	No right-of-way required and no substantial impairment; therefore, no Section 4 (f) use.

[(1)]Refer to Appendix B exhibit number for location.

5.16 Safety and Security

Reducing the number of crossings and improving crossing protection are the primary ways to improve safety. The anticipated number of vehicle-train crashes in the design year 2030 is shown for each alternative in Table 5-12. 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 5-12. Predicted Crashes

Alternative	Predicted Crashes per Year (2030)
No-Build	1.30
Preferred	0.26
2B	0.08

Alternatives that consolidate rail traffic on corridors with grade separations at the busiest streets (the Preferred Alternative and Alternative 2B) have the lowest projected number of crashes. Simply building more grade separations without consolidating is not as effective as consolidating and building grade separations (the Preferred Alternative and Alternative 2B). The No-Build Alternative would also not fully address the 3rd Street pedestrian safety issues because rail traffic would remain on the 3rd Street corridor.

Each of the existing rail corridors through Springfield creates barriers to emergency access during grade crossing closures. Alternatives that consolidate rail traffic and construct grade separations on future corridors (the Preferred Alternative and Alternative 2B) are most effective in eliminating the barriers to emergency vehicle access.

The 10th Street corridor would be fenced for each of the alternatives to minimize trespassing on railroad property. The Preferred Alternative and Alternative 2B result in the fewest miles of unfenced railroad property through Springfield.

The passenger station would be in a well-lighted, highly visible location for each of the alternatives.

5.17 Permits

The following permits are anticipated for the construction of the Preferred Alternative and Alternative 2B:

- National Pollutant Discharge Elimination System (NPDES) permit

It is anticipated this project would result in the disturbance of one or more acres of total land area. Accordingly, it is subject to the requirements for a National Pollutant Discharge Elimination System (NPDES) permit for stormwater discharges from the construction sites. The NPDES program requires a Notice of Intent, the development of a Storm Water Pollution Prevention Plan, and the submission of a Notice of Termination when final stabilization of the construction site has been achieved. The Storm Water Pollution Prevention Plan would identify potential sources of pollution which may reasonably be expected to affect the quality of stormwater discharges from the construction site and would describe and ensure the implementation of practices which would be used to reduce the pollutants in discharges associated with construction site activities and assure compliance with the terms of the permit.

Since no waters of the U.S. or wetlands would be impacted by the proposed action, it is not anticipated that a Section 404 permit of the Clean Water Act would be necessary.

5.18 Construction Impacts

All of the necessary track work likely would need to be constructed prior to relocation of rail traffic from 3rd Street to 10th Street. This work would be completed in stages. The underpasses on the 10th Street corridor could be constructed concurrent with the track work to minimize disruption of rail and street traffic. NS traffic likely would use a combination of existing and proposed tracks and UP traffic would remain on 3rd Street until cutover to the new corridor.

Construction of grade separations could be staged to minimize street closures. This could be accomplished primarily by closing the outside lanes during retaining wall and bridge abutment construction while maintaining traffic on the inside lanes. Street

closure could be limited to four to six months for underpass excavation and placement of new street pavement. The adjacent parallel streets would be used for detour traffic during street closure. The contractor would work with the railroads and Springfield to develop a construction staging plan that minimizes impacts to motorists and businesses.

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

5.19 Indirect and Cumulative Impacts

5.19.1 Indirect Impacts

Indirect impacts are defined as reasonably foreseeable future consequences to the environment that are caused by the proposed action, but that would occur either in the future (later in time) or near, but not in the same location as, direct impacts associated with implementation of a build alternative. Under the CEQ regulations, indirect impacts are defined as those that are "… caused by the action and are later in time or farther removed in distance but are still reasonably foreseeable. Indirect effects would include growth-inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems" (40 CFR 1508.8b).

Indirect impacts can be associated with the consequences of land-use development that would be indirectly supported by changes in local access or mobility. Indirect impacts differ from those directly associated with the construction and operation of a project itself and are often caused by what is commonly referred to as "induced development." Induced development would include a variety of alterations such as changes in land use, economic vitality, property values and/or population density. The potential for indirect impacts to occur is determined in part by local land-use and development-planning objectives and the physical location of a proposed action.

With the No-Build Alternative, the existing rail service along the project corridor would continue. Over time, continued and increasing delays of vehicular traffic at roadway crossings, air quality would worsen in the rail crossing vicinity.

The Preferred Alternative and Alternative 2B would result in indirect impacts as the additional passenger train service could stimulate further development in the vicinity of the station. The train station and associated parking would be located on the block east of 10th Street (see Exhibit 3-7). Access would be from Adams Street and 11th Street. The impacts are included with overall project impacts. This development would be transit-oriented and occur in already built-up areas and would be consistent with local plans. The Sangamon County Regional Planning Commission has proposed a multi-use transportation facility and surrounding residential housing and recreational areas for the area around the proposed train station. Local planning agencies would be responsible for investigating the impacts to water, sewer, traffic, and other environmental factors from any future development.

The Preferred Alternative and Alternative 2B would eliminate rail traffic on the 3rd Street corridor encouraging renewed economic development in both the downtown area and the Medical District. Growth in these areas has long been inhibited by the presence of an active rail line. Removal of that rail line would increase the attractiveness of the downtown to a variety of businesses, especially commercial and retail. It would also make the downtown area more desirable for residential development.

The Medical District's master plan calls for growing the Memorial Medical Center and St. John's Hospital campuses towards one another along Carpenter Street to ultimately create an integrated medical community serving patients from central and southern Illinois. The master plan envisions a combined live-work campus where residential development supports the expansion of medical facilities and professional employment.

Relocating the corridor would open up the opportunity for new construction and the jobs associated with building new facilities, such as permanent, high-wage medically related jobs normally associated with new clinical facilities.

This growth in the corridor would likely result in an increase in property values, economic vitality and population density. Since the project area is primarily urban, other environmental resources will not be significantly affected. Small areas of undeveloped land and agriculture will likely be developed for commercial or multi-residential use.

Eliminating rail traffic in the 3rd Street corridor and train horn noise in all of the corridors would improve the attractiveness of residential property in those neighborhoods. The new grade separations along 10th Street and 19th Street would improve safety and access, especially for emergency vehicles and reduce the barrier effect of the rail lines along 3rd Street. This would work to increase property values and aid in encouraging the trend toward a population increase in these communities.

5.19.2 Cumulative Impacts

The consideration of cumulative effects consists of an assessment of the total effect on a resource, ecosystem, or community from past, present, and future actions that have altered the quantity, quality, or context of those resources within a broad geographic scope. Under the CEQ regulations, cumulative effects are defined as "… the impact on the environment which results from the incremental impact of the action when added to other past, present and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time" (40 CFR 1508.7). The cumulative effects analysis considers the aggregate effects of direct or indirect impacts—from federal, non-federal, public, or private actions —on the quality or quantity of a resource.

The intent of a cumulative-effects analysis is to determine the magnitude and significance of cumulative effects, both beneficial and adverse, and to determine the construction of the proposed action of those aggregate effects. Contributions to

cumulative effects associated with the No-Build Alternative on the resources analyzed would be limited to those derived from the direct and indirect impacts of the action.

The No-Build Alternative would have a negative contribution to cumulative impacts. This alternative would not provide as many benefits to safety, traffic congestion, and delay times as the Preferred Alternative and Alternative 2B primarily because trains would continue to run along two independent corridors and there would not be as many grade separations constructed. In addition, with increasing delay times at at-grade crossings, air quality would worsen in the vicinity of rail crossings.

The construction of the Preferred Alternative and Alternative 2B would allow for the continued planning and future construction of a multimodal facility on 10th Street between Washington and Adams Street (see Exhibit B-1E in Appendix B). This multimodal facility would facilitate transit between trains, busses (both intercity and city), and taxi service. This facility would be a catalyst for growth on Springfield's east side. The proposed complex would provide small shops, restaurants, office space for new businesses, daycare, meeting rooms, mini-parks and parking. This facility would create much needed jobs in the neighborhood, including environmental justice populations. Additional information for this proposed development can be found on the Sangamon County Regional Planning Commission's website at: www.co.sangamon.il.us/Departments/RegionalPlanning/Special_Projects_Programs/ThinkingBeyondTransit: Transit Oriented Development in Springfield, IL: A Planning and Urban Design Exercise.

The proposed improvement to freight and passenger rail service, in conjunction with the proposed grade separations, would have beneficial contributions to the cumulative impact to air quality of previous projects and foreseeable future projects along the 10th Street corridor. The largest anticipated contribution to air quality is the implementation of grade separations at several high-traffic crossings. Free flow of vehicular traffic along the rail line would reduce concentrated build-ups of air pollutants such as CO. Also, the proposed project would have an overall reduction in impacts to natural resources resulting from the reduction of sprawl into undeveloped areas around the perimeter of Springfield.

5.20 Other Impacts

5.20.1 Railroad Operations

The Preferred Alternative and Alternative 2B would have identical length, travel time, and switching requirements; the only difference would be the number of at-grade street crossings. Neither of the alternatives would require additional switching at turnouts or crossovers. There would be no appreciable change in length from existing operations for any of the railroads. Each of these alternatives would require the same number of tracks through Springfield. None of the affected railroad companies have expressed opposition to these alternatives.

At-grade street crossings provide conflict points for rail traffic, safety concerns, and vehicle delays. Minimizing these conflicts benefits both street and rail users. The number of at-grade street crossings, length, and travel time for each alternative is shown in Table 5-13.

Table 5-13. Number of At-Grade Street Crossing for each Alternative

Alternative	Number of At-Grade Street Crossings	Length (miles)	Travel Time at 40 MPH (minutes)
No-Build	68	4.77	7.1[(1)]
Preferred	32	4.77	7.1
2B	28	4.77	7.1

[(1)] The improvements to the UP line that are currently being constructed (the No-Build Alternative) will allow UP freight and passenger traffic to operate at 40-50 mph through Springfield. The passenger operations will continue to operate at the same average speed through Springfield under the Recommended Alternative, due to the need to stop at the Springfield station.

5.20.2 Reduce Train Horn Blowing

The large number of at-grade street crossings in Springfield produces frequent train horn blowing, which can affect livability. The most effective ways to reduce the frequency of train horns is to consolidate rail traffic to corridors that have fewer at-grade crossings or to create quiet zones. A quiet zone is a segment of track where normal train horn blowing is eliminated. This is typically achieved with the installation of four quadrant gates or raised medians to prevent vehicles from entering the crossing when the gates are down.

The predicted duration of train horn blowing in minutes per day is shown in Table 5-14. This was calculated based on the number and duration of horn blowing for each train as it approaches each crossing in Springfield. Horn blowing sequences are prescribed by law. The Preferred Alternative and Alternative 2B assume that quiet zones are established.

Table 5-14. Horn Blowing

Alternative	Horn Blowing min/day (2030)
No-Build	314
Preferred	0
2B	0

Under the Preferred Alternative and Alternative 2B, the ability to establish quiet zones would be created along both the 10th Street and 19th Street corridors by installing four quadrant gates or raised medians to prevent vehicles from driving around the gates. Quiet zones will reduce the persistent, nuisance noise from train horns for the adjacent communities along the rail corridors, and create safe locations for pedestrian crossings.

5.21 The Relationship Between Local Short-Term Uses and Man's Environment and the Maintenance and Enhancement of Long-Term Productivity

National Environmental Policy Act (NEPA) regulations [40 CFR 1502.16] require a discussion of the "relationship between short-term uses of the environment and the maintenance and enhancement of long-term productivity" as part of an Environmental Impact Statement (EIS). NEPA requires the evaluation of a project to determine whether long-term benefits are worth the short-term adverse effects.

Short-term effects are anticipated with the construction of any of the build alternatives. These effects include, but are not limited to, energy use during construction, travel delays, traffic congestion, restricted access to residences, visual intrusions to residents and motorists, and dust and noise to residents.

Construction mitigation would reduce short-term effects, but temporary construction-related disruptions would still occur. In the long-term, any of the build alternatives would increase the railroad's system capacity and passenger services and improve safety, traffic congestion, and delays through Springfield.

While the project would require a commitment of resources in the short-term railroad construction, it would conform to national and regional planning and would result in long-term benefits by accommodating anticipated train and vehicular traffic volumes, reducing air emissions through an efficient flow of rail and vehicular traffic, and limiting encroachment into sensitive environmental resources by utilizing existing right-of-way to the extent possible.

5.22 Irreversible and Irretrievable Commitments of Resources

To facilitate a comparison of project alternatives, NEPA requires a consolidated discussion of environmental consequences to focus on any irreversible and irretrievable commitments of resources. Irreversible resource commitments represent a loss of future options. It applies primarily to the use of nonrenewable resources, such as cultural resources or fossil fuels, and to factors that are renewable only over long time spans. An irretrievable commitment of resources represents opportunities that are foregone for the period of the proposed action. It relates to the use of renewable resources, such as timber or human effort, as well as other utilization opportunities that are foregone in favor of the proposed action.

Implementation of the proposed action would result in the irreversible and irretrievable commitment of natural and man-made resources to the construction and operation of the proposed action. The primary commitment of resources would come from the construction phase, but there would be some commitment of resources for operation of the rail line. In general, the commitment of resources would be common for all of the build alternatives.

The Preferred Alternative and Alternative 2B would result in the irreversible and irretrievable commitment of construction materials, such as steel, concrete, ballast rock, and wood. Though largely irretrievable, these resources are not in short supply and many of the materials could be recycled for other projects when they no longer meet the design needs of the passenger or freight rail service. In addition, energy resources (fuel) and financial resources would be committed to the project for construction, operation, and maintenance. Some land for additional right-of-way would also be irretrievably and irreversibly committed for conversion to the railroad.

Human effort would be irretrievably committed during the planning, construction, and operation phases of the project. The commitment of time and available labor in the construction of the proposed action would also represent an irretrievable commitment of resources.

5.23 Transportation Impacts

5.23.1 Service Development Plan

There are no differences among the Springfield alternatives regarding:

- Rail service alternatives
- Service levels/frequencies
- Ridership/revenue

These issues are evaluated at the overall Chicago to St. Louis corridor level.

5.23.2 Capital Cost

Capital costs for each alternative were estimated based on the required infrastructure improvements, including station improvements and grade separations necessary to accommodate increased freight and high-speed passenger traffic (Table 5-15). These costs include construction, right-of-way, engineering, and utility relocations. Construction quantities were computed for each of the major items of construction, and average unit prices were applied to these quantities. An appropriate contingency varying from 20 percent to 25 percent of construction cost, depending on the complexity of construction, was added along with engineering costs. Land acquisition costs were based on assessed values. Costs were estimated in 2011 dollars.

Table 5-15. Capital Cost for each Alternative

Alternative	Cost in Millions (2011)
No-Build	0
Preferred	$315
2B	$338

5.23.3 Travel Benefits

There are no differences among the Preferred Alternative or Alternative 2B regarding:

- Rail travel time
- Rail reliability
- Passenger train operational capacity
- Improvements in travel, more choices

The No-Build Alternative would not provide the same rail reliability as the Preferred Alternative or Alternative 2B since passenger trains would operate on the single track UP line. There is not sufficient capacity on the single track to accommodate 27 UP freight trains and the proposed high-speed rail service.

These issues are evaluated at the overall Chicago to St. Louis corridor level, Volume 1.

5.23.4 Additional Impacts to Rail, Air, and Bus Service

The Preferred Alternative and Alternative 2B would not impact commuter rail services. Under the No-Build Alternative, UP freight rail would continue to operate, along with passenger service, on a single-track corridor. The Preferred Alternative and Alternative 2B include two tracks for UP freight and passenger service. The UP line would relocate from 3rd Street to 10th Street and would be the same length as existing. NS freight would relocate to a corridor immediately adjacent to the existing NS corridor. No change in length or operations is anticipated. CN freight operations would remain unchanged. Springfield plans to construct a multimodal (rail, bus and airport shuttle) station on 10th Street. This would improve access to air service by providing additional service to the airport. Public transit riders will have improved access to rail service since the bus station would be adjacent to the rail station. This corresponds to the Preferred Alternative and Alternative 2B.

5.24 Mitigation Commitments

Table 5-16 summarizes proposed mitigation commitments as they apply to each resource.

Table 5-16. Mitigation Commitments

Resource Impacted	Mitigation
Land Use	IDOT would implement the provisions of the State of Illinois Relocation Assistance Plan in accordance with the Uniform Relocation Act as mitigation action where ROW acquisitions and land use changes occur.
Social/Economic	Any adverse impacts of the proposed project would not be disproportionately borne by minority or low-income populations yielding no need for mitigation action. However, noise will be reduced through the implementation of quiet zones.
Environmental Justice Populations	Create quiet zones and safer rail crossings via grade separations and four quadrant gates at at-grade crossings for vehicles and pedestrians. Enhance job opportunities and services with the proposed Multimodal Center.
Cultural	The Section 106 process would continue with Programmatic Agreements for any adverse effects to National Register or National Register eligible sites pending SHPO's review of additional Section 106 correspondence during land acquisition and prior to construction.
Section 4(f)	The Section 4(f) process will continue to be reviewed until the SHPO concurs on historic properties.
Natural Resources	Avoidance, minimization, and best management practices implementation would reduce adverse impacts. Section 7 of the Endangered Species Act consultation would be ongoing to protect threatened and endangered species in the project area.
Air Quality	IDOT's Standard Specification on dust control would be implemented during construction to limit dust emissions during construction.
Noise and Vibration	Quiet zones would be created throughout Springfield on all rail corridors traversing the Springfield. Noise easements are recommended to be purchased for moderate and severe receptors, all of which are residential, non-historic properties.
Water Quality/Resources	BMPs would be utilized to protect water quality. Almost all runoff from construction would be diverted directly into Springfield's combined sewer system during and after construction and treated by the Springfield Metro Sanitary District.
Visual and Aesthetic Quality	Views of trains and new rail lines would be considered a minor adverse visual impact. IDOT would determine potential ways to help reduce minor impacts, such as planting vegetation screens or providing aesthetically pleasing features as part of the design.
Special Waste	Special waste sites purchased for additional right-of-way would be remediated prior to construction of the proposed action.