Section

4 AFFECTED ENVIRONMENT

4.0 Affected Environment

This section describes the existing environmental conditions in the Springfield Rail Improvements Project area. The project area is defined as the area of potential impact by the project alternatives carried forward for more detailed study (i.e., Alternatives 2A and 2B). The project area for the retained alternatives is about four blocks wide (about 1,000 feet) along the 10th Street railroad corridor (two blocks on either side of the existing railroad tracks). The project area extends about 4 miles from Stanford Avenue north to Sangamon Avenue. Environmental resources and issues of the affected environment are land use, social and economic conditions, energy, agriculture, cultural resources, natural resources, air quality, noise and vibration, water quality and resources, floodplains, wetlands, special waste and special lands. Environmental resources not affected by this project include coastal zone management since the project is located over 650 miles from the nearest coastline.

4.1 Existing Land Use

Notable land uses within the project area are commercial and residential along with community and government facilities. The project area lies exclusively within Sangamon County and is contained within the City of Springfield. Land uses in Springfield, the state capital, are generally mixed around the railroad, with a high concentration of government buildings and commercial businesses in the downtown district. The Springfield train station is also in the downtown district. The concentration of Abraham Lincoln historic sites, government institutions, and research and conference facilities generates high levels of tourist activity throughout Springfield. Abraham Lincoln historic sites within Springfield consist of the Abraham Lincoln Presidential Library, Lincoln Home, Lincoln Tomb, Lincoln Depot (Great Western Railroad Depot), Lincoln Pew, and the Old State Capitol. Only the Lincoln Depot is located in the project area along the 10th Street rail corridor. Table 4-1 summarizes the land uses adjacent to the retained alternatives, and Exhibit 4-1 depicts the listed land uses within the project area.

Table 4-1. Land Uses Within the Project Area

Land Use	Percentage Within Project Area
Residential	27.8
Commercial	21.3
Industrial	0.3
Institutional/Government	18.4
Farmland	3.1
Railroad	5.5
Roadway	23.6

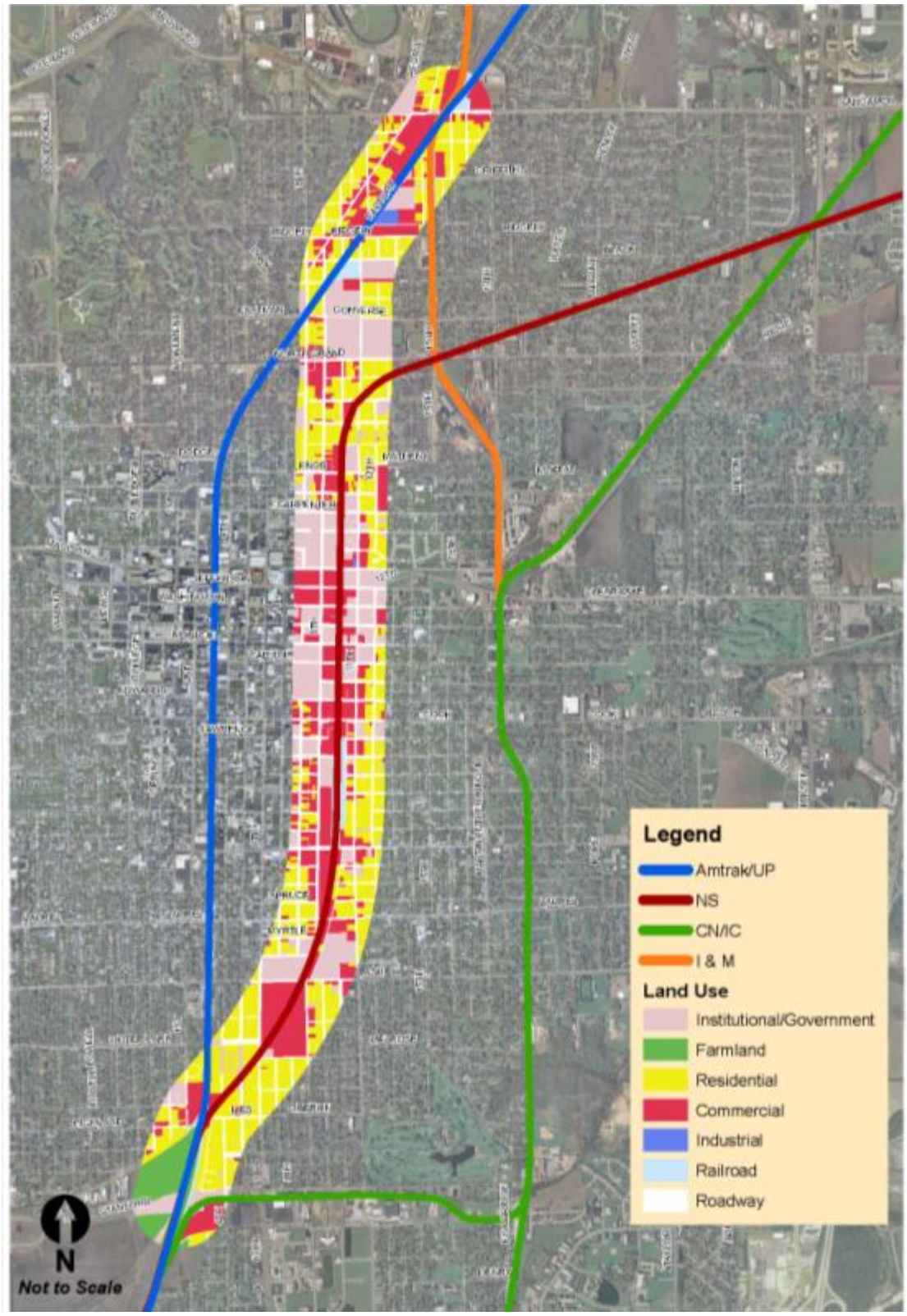


Exhibit 4-1. Existing Land Use

Several local comprehensive and land use plans have been prepared and implemented by local agencies. The Springfield-Sangamon County Regional Planning Commission (SSCRPC) serves as the joint planning body for the City of Springfield and Sangamon County and as the Metropolitan Planning Organization for the Springfield Metropolitan Planning Area (MPA). The Springfield Metropolitan Planning Area (MPA) lies within Sangamon County and is comprised of the cities and villages of Springfield, Chatham, Clear Lake, Curran, Grandview, Jerome, Leland Grove, Riverton, Rochester, Sherman, Southern View, Spaulding, and surrounding unincorporated areas. The project corridor is entirely contained within the Springfield city limits. The SSCRPC is currently developing a regional long range comprehensive plan that is intended to provide planning and land use guidance through the year 2030. The SSCRPC prepared the Springfield Comprehensive Plan 2020, which was adopted by the City of Springfield in 2001 and amended in 2002, 2003, and 2007 (SSCRPC, 2000).

4.2 Socioeconomic and Community Characteristics

4.2.1 Population and Population Distribution

Table 4-2 lists the 2010 and 2000 population data for the project area and City of Springfield. The table also includes the percentage of change in population between the 2000 census and 2010 census. The project area and the City of Springfield experienced a population growth between the 2000 census and the 2010 census.

Table 4-2. Populations and Households

	Project Area 10th Street Corridor (1)	City of Springfield
Land Area (square miles)	1.9	54
Total Population 2010	9,367	116,250
Total Population 2000	8,337	111,454
Percent Change 2000-2010	12.4 percent	4.1 percent
Population Density per square mile	4,930	2,152
Total Households 2010	3,842	50,714

(1)Census Block Level

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

4.2.2 Racial Composition

The racial composition within the project area and the City of Springfield is predominantly white, as illustrated in Table 4-3 below. Within the project area minority populations are concentrated within the City of Springfield.

Table 4-3. Population by Racial Composition (2010)

	Project Area 10th Street Corridor (1)		City of Springfield	
	Total	Percent	Total	Percent
White	6,016	64.2	88,092	75.8
Black or African American	2,781	29.7	21,510	18.5
American Indian or Alaska Native	31	0.3	239	0.2
Asian	60	0.6	2,555	2.2
Native Hawaiian or Other	0	0.0	25	0.0
Some Other Race	78	0.9	766	0.7
Two or More Races	401	4.3	3,063	2.6

(1)Census Block Level

Source: U.S. Census Bureau, 2010 Census

4.2.3 Economics and Employment

The City of Springfield had a lower unemployment rate in 2010 than the national unemployment rate of 9.6 percent. The unemployment rate within the project area was about 70 percent higher than the City of Springfield as a whole. Details of the 2010 labor force are shown in Table 4-4.

Table 4-4. Labor Force Estimates for 2010

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

(1)Census Tract Level

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

Employment in Sangamon County is high in wholesale and retail trade, health care and public administrations professions (Illinois Department of Employment Security, 2011). Springfield is the state capital and state government is the largest employer for the county. Healthcare accounts for five of the top ten employment providers in Sangamon

County. Regional healthcare in Sangamon County serves over 1.6 million people in over 40 counties throughout the state. Within the City of Springfield the one square mile medical district has over two million square feet of hospital space. Tables 4-5 and 4-6 detail the employment by industry and the top employers within Sangamon County in 2009. Not only do the types of businesses across the project area vary, the geographic diversity of the employment areas in the project area vary, as illustrated in Exhibit 4-2.

Table 4-5. Employment by Industry Category for Sangamon County for 2009

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

Source: Greater Springfield Chamber of Commerce, 2010.

Table 4-6. Major Employers in Sangamon County (November 2009)

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

Source: Greater Springfield Chamber of Commerce, 2010.

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

4.2.4 Income and Wages

Table 4-7 shows the median income per household in the project area and the City of Springfield in 1999 dollars and inflation-adjusted 2010 dollars. The projected median income in the City of Springfield was expected to rise by about 18 percent between 2000 and 2009. The actual increase in median income (about 20 percent) for the city was slightly higher than the projection. Since the American Community Survey eliminate the need for the decennial census long-form questionnaire, the 2010 census does not provide income estimates. Therefore, American Community Survey estimated comparisons to Census 2000 and earlier estimates should be used with caution. Median income in the project area was lower than the City of Springfield median income.

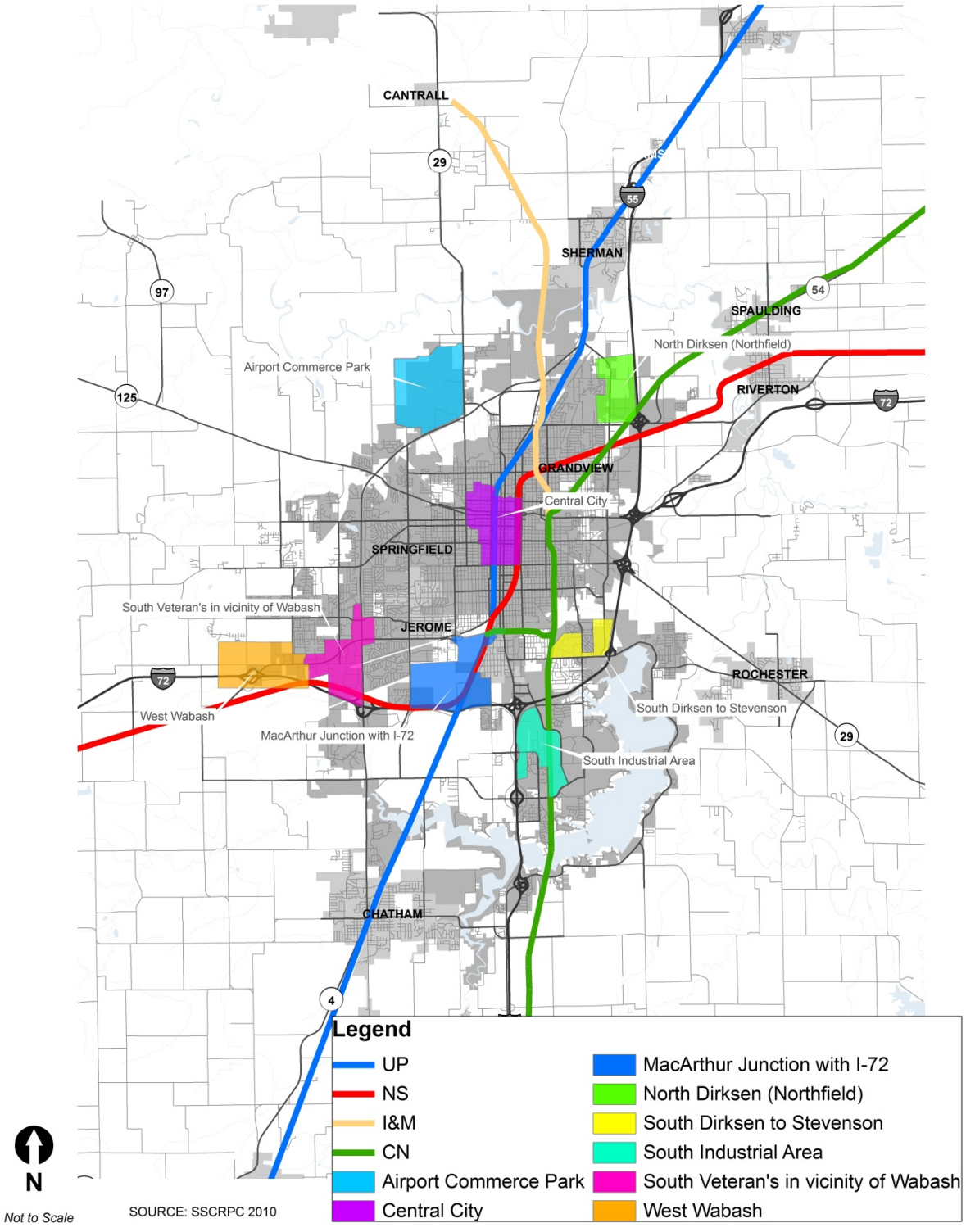


Exhibit 4-2. Economic Activity Centers

Table 4-7. Median Household Income

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

[(1)]Block Group Level
[(2)]Census Tract Level
Source: U.S. Census Bureau, American Community Survey (2006-2010) and the Census 2000

4.2.5 Environmental Justice and Title VI

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.

EO 12898 does not define the terms "minority" or "low-income." However, guidance provided by the Council on Environmental Quality (CEQ) describes the terms in the context of an environmental justice (EJ) analysis. These definitions are unique to EJ analysis and are the basis for the methodology that follows:

- Minority Individual – A minority individual is classified by the U.S. Census Bureau as belonging to one of the following groups, American Indian or Alaskan Native, Asian or Pacific Islander, Black (not of Hispanic Origin) and Hispanic.
- Minority Populations – According to the CEQ guidelines, minority populations should be identified where either (a) the minority population of the affected area exceeds 50 percent or (b) the minority population percentage of the affected area is

meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis.

- Low-income population – Low-income populations are identified where individuals have incomes below the U.S. Department of Health and Human Services poverty guidelines. A low-income population is either a group of low-income individuals living in proximity to one another or a set of individuals who share common conditions of environmental exposure or effect.

The DOT Environmental Justice Order 5610.2 is a key component of DOT's June 21, 1995 Environmental Justice Strategy (60 FR 33896). The Order sets forth a process by which DOT and its Operating Administrations will integrate the goals of the Executive Order into their operations. This is to be done through a process developed within the framework of existing requirements, primarily the National Environmental Policy Act (NEPA), Title VI of the Civil Rights Act of 1964 (Title VI), the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended (URA), the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA), and other DOT applicable statutes, regulations and guidance that concern planning; social, economic, or environmental matters; public health or welfare; and public involvement. The Order is an internal directive to the various components of DOT and does not create any right to judicial review for compliance or noncompliance with its provisions.

Detailed information regarding minority and low-income populations in the project area was compiled from the 2010 Census and the American Community Survey 2006-2010 data. Table 4-8 provides the percentage of the population in the project area and the City of Springfield comprised of minority and low-income persons. The project area contains racial minorities and people living below the poverty line. However, the project area does not contain over 50 percent of minority or low-income populations based on U.S. Census data. Percentages greater than 50 percent could constitute an environmental justice impact.

Table 4-8. Minority Population and Poverty Level

	Project Area 10th Street Corridor	City of Springfield
Estimated Percent of Racial Minority Persons	35.8(1) percent	24.2 percent
Estimated Percent Hispanic or Latino (of any race)	2.1 percent(1)	2.0 percent
Estimated Percent of People Below the Poverty Line	27.0(2) percent	16.2 percent

[1]Census 2010, Block Level
[2]ACS (2006-2010), Census Tract level
Source: U.S. Census Bureau, Census 2010 and American Community Survey (2006-2010)

The number of census block areas (from 2010 census data) where minority populations exceed 50 percent (see Exhibit 4-3), and which would experience an increase in rail traffic, is shown in Table 4-9. The number of census tracts where low income populations exceed 50 percent, and which would experience an increase in rail traffic is also shown in Table 4-9. If a tract contained over 50 percent of the population with incomes below the poverty level it was considered to be a low-income tract.

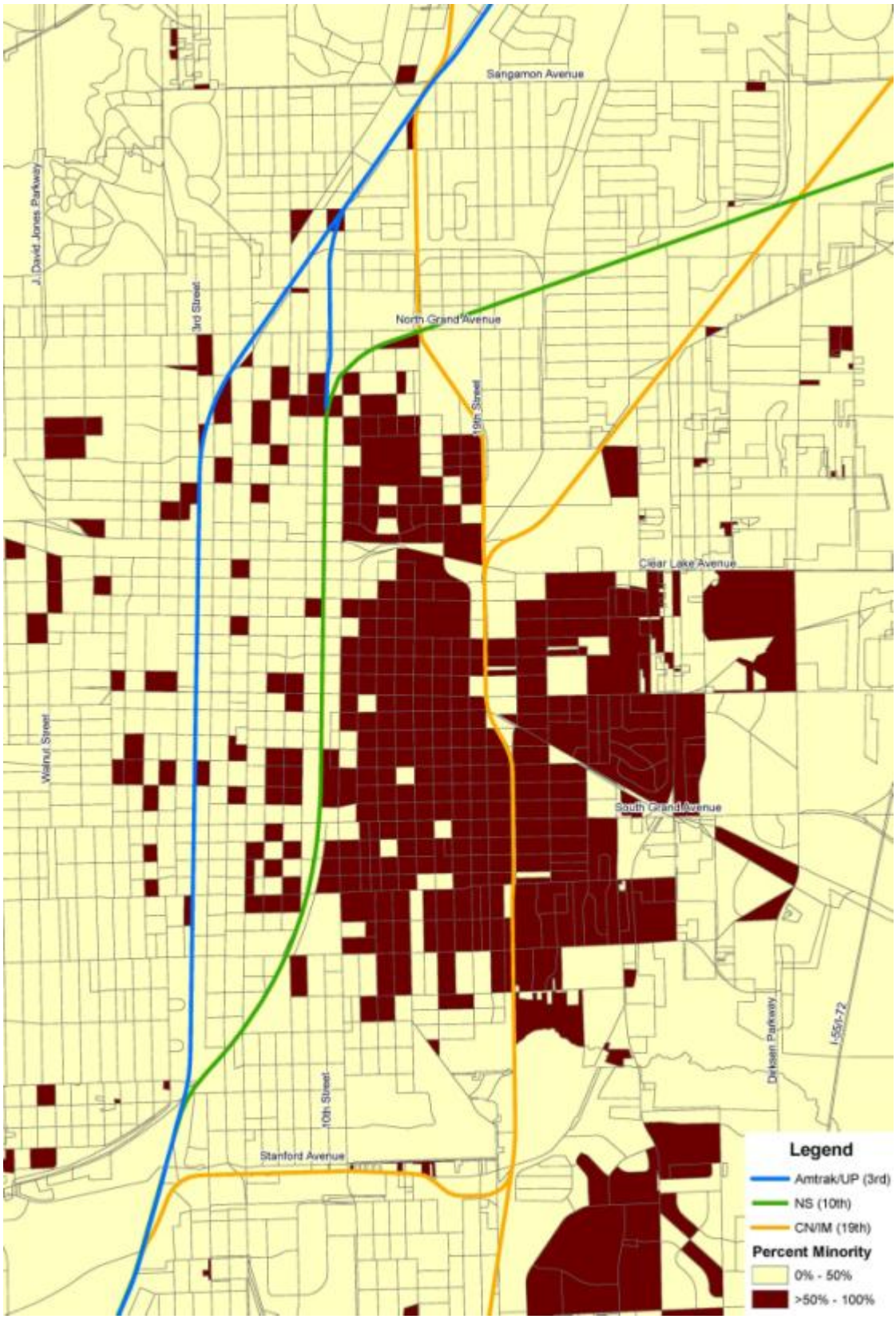


Exhibit 4-3. Census Blocks with Minority Populations > 50 Percent

Table 4-9. Environmental Justice Populations

Alternative	Environmental Justice Populations			
	Minority Blocks	Total Blocks	Low Income Tracts	Total Tracts
No-Build	**208**	**807**	0	20
2A	178	607	0	17
2B	178	607	0	17

Considerations regarding environmental justice as required by Executive Order 12898, and the U.S. DOT Order, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations" have been reviewed. Minority and low-income populations are known to occur on the retained alternatives based on the most recent census data. Each of the alternatives would affect some of these populations. Railroad traffic currently exists within each of the corridors. Both the 3rd Street (UP) and 10th Street (NS) rail lines pass through more non-minority than minority communities, and through more non-low-income than low-income communities, so the impacts from any of the build alternatives are not disproportionate from that perspective as compared to the No-Build Alternative.

Comparable housing for 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. The relocation of public services and facilities is discussed in Section 5.1.2.

Alternatives screening compared the number of census tracts/blocks containing over 50 percent minority or low income populations which allowed for a probability of EJ impacts for each alternative. Screening compared the number of census tracts/blocks containing over 50 percent minority or low-income populations which allowed for a probability of EJ impacts for each alternative. Alternatives 2A and 2B avoid disproportionately high and adverse human health and environmental effects, including social and economic effects, on minority populations and low-income populations by maintaining increased rail service on existing rail corridors. Also, the public engagement process has ensured the full and fair participation by all potentially affected communities in the transportation decision-making process (see Section 6.3).

Title VI of the Civil Rights Act of 1964 addresses discrimination issues associated with federally funded projects. No groups or individuals have been or would be excluded from participation in public involvement activities, denied the benefit of the project or subjected to discrimination in any way on the basis of race, color, age, sex, national origin, disability or religion.

4.2.6 Transportation Network

Overall, the Springfield area has a well-developed transportation system. Access to interstates and rail is good and sufficient to support current freight transportation. Three federal and six state highways, including Interstates 55 and 72 provide a well-developed highway system with access to key large markets north, south, east, and west. I-55 runs from north to south along the eastern edge of Springfield connecting to Chicago and St. Louis. I-72 runs from east to west providing access to Indiana and points east as well as access to the Mississippi River. The interstate system is also supplemented by various state routes and county roads providing connectivity outside the project area. Interstates and other major high volume roadways in the Springfield area are shown in Exhibit 4-4. Thirty-five intrastate and 74 interstate trucking companies serve Springfield and the city currently supports 41 truck terminals.

Greyhound Lines provides bus service to and from Springfield. Because of its tourism industry, Springfield supports a large number of non-resident travelers, most of whom arrive by auto, with a smaller number coming by bus, air and rail. A substantial portion of Springfield's morning and evening vehicular traffic is made up of commuters from surrounding communities who work in the city.

Within the city, public bus services are provided by the Springfield Mass Transit District (see Exhibit 4-5). Nine regular bus routes operate Monday through Saturday between 6:00 A.M. and 6:00 P.M. The current system covers all sectors of the city and carries over 2 million passengers a year, providing more than 9,000,000 vehicle miles of service. Mass transit bus routes cross all of the rail lines several times a day. The central transfer point (where passengers may transfer between busses that serve different areas) consists of an area in downtown Springfield near 5th and Capitol Streets. East-west bus routes frequently enter and exit the transfer point by way of at-grade crossings of the 3rd and 10th Street rail corridors at Jefferson, Washington, Adams, Monroe, and Capitol.

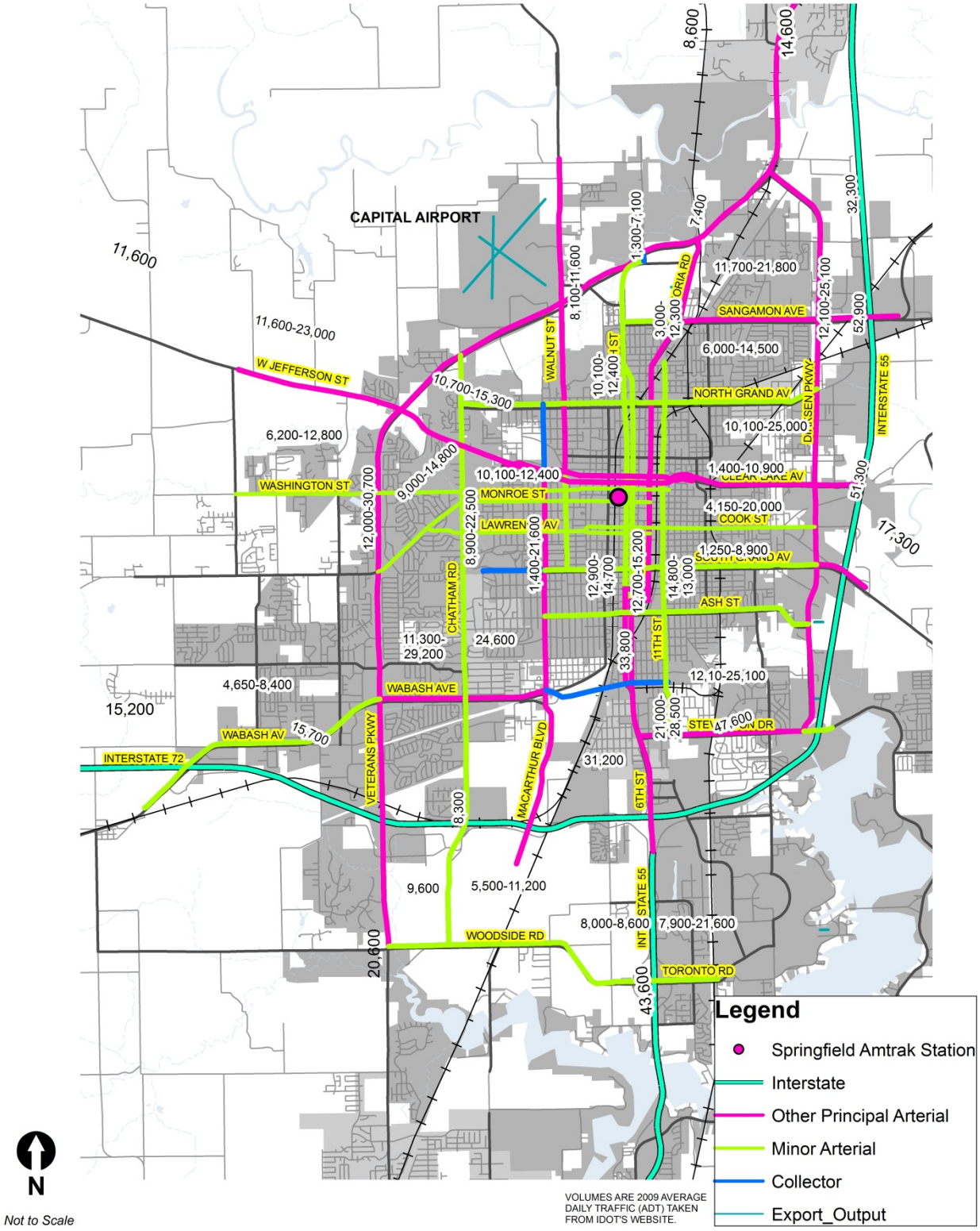


Exhibit 4-4. Roadways

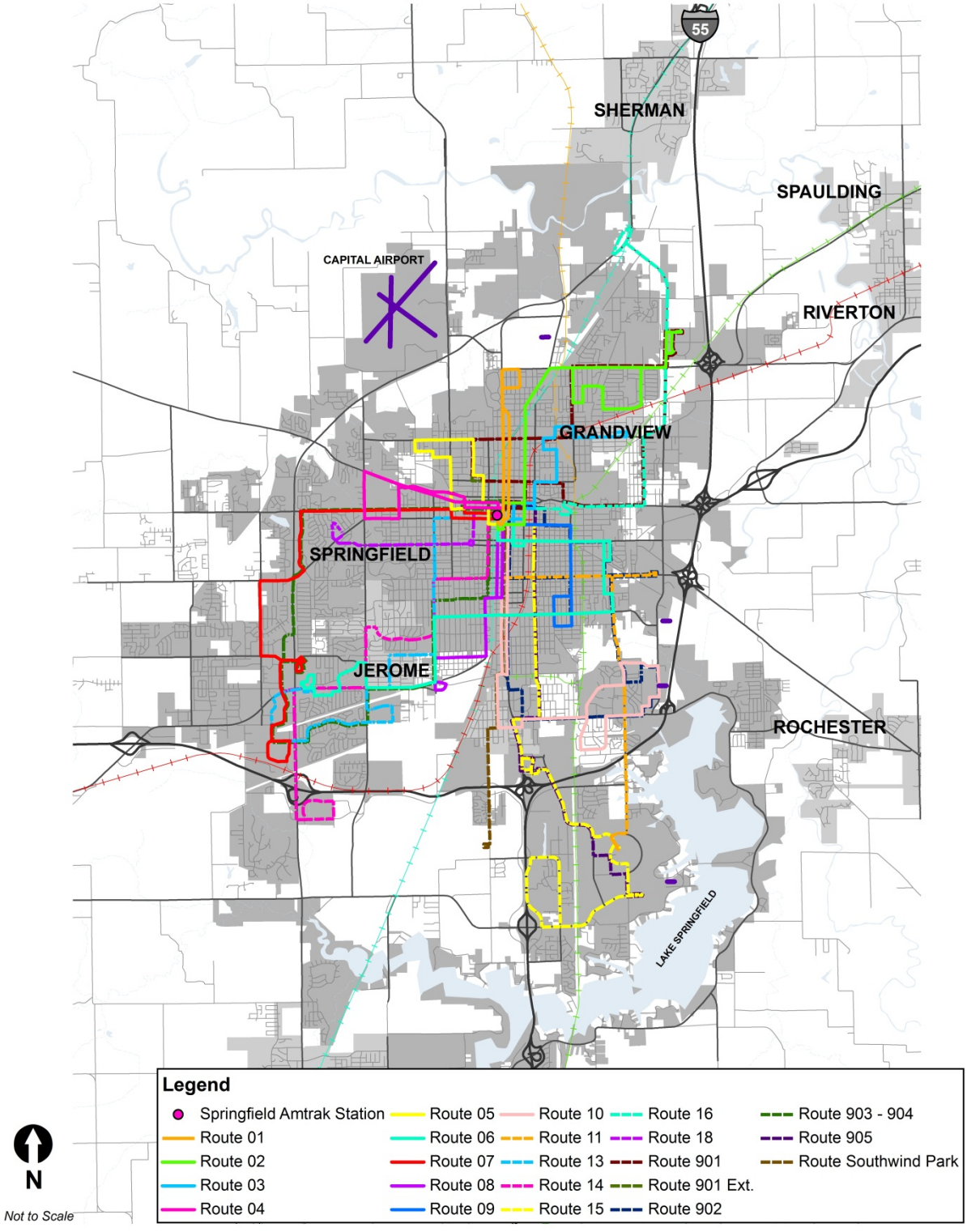


Exhibit 4-5. Bus Routes

Five railroads serve Springfield and Sangamon County. These include the Norfolk Southern, the Canadian National-Illinois Central, Kansas City Southern, the Illinois Midland, and the Union Pacific. Passenger rail service is provided by Amtrak trains operating on UP tracks, which operates from Chicago to St. Louis and beyond on the UP rail line which runs along 3rd Street.

The Abraham Lincoln Capital Airport (SPI) is a joint civil-military public airport in the northwest portion of Springfield. There are no dedicated cargo or freight carriers that operate out of the Airport. Minimal freight transport of high value critical cargo or perishable goods does occur on commercial carriers only. The airport is currently served by three scheduled passenger airlines: American Airlines and United Express Airlines providing daily flights to O'Hare International Airport, and DirectAir which provides twice weekly service to Myrtle Beach, South Carolina during portions of the year and to Fort Meyers/Punta Gorda, Florida during opposite periods.

4.2.7 Communities, Facilities, and Services

The project area is contained within Sangamon County and lies entirely within the municipality of Springfield. The project area affects about five neighborhood associations (see Table 4-10 and Exhibit 4-6).

Schools, fire stations and hospitals serve the daily needs of residents within the project area (Exhibit 4-7). The project area provides access to and from education, medical and commercial businesses and plays a critical role in providing these services and in serving the health, safety and general welfare of those who use them.

Total enrollments for Lanphier High School, located on North Grand Avenue, during the 2010-2011 school year was 1,300 students. Within the City of Springfield, students either walk to the local schools or take a bus. In general school bus routes are the shortest and most direct distances from the service area to the school. Bus routes are redrawn each academic year to reflect changes in the distribution of the student population. The proposed project is not anticipated to affect bus or emergency services routes.

Table 4-10. Neighborhood Associations along the Project Area

Pillsbury
Downtown Springfield
Iles Park
Harvard Park
Springfield South Corridor

Most of the City of Springfield is served by its own police and fire departments. Unincorporated communities and rural areas are served by the Sangamon County sheriff's departments and fire districts. In times of emergency, fire district teams from adjacent jurisdictions share equipment and personnel. Private ambulance companies also operate in communities within the project area.

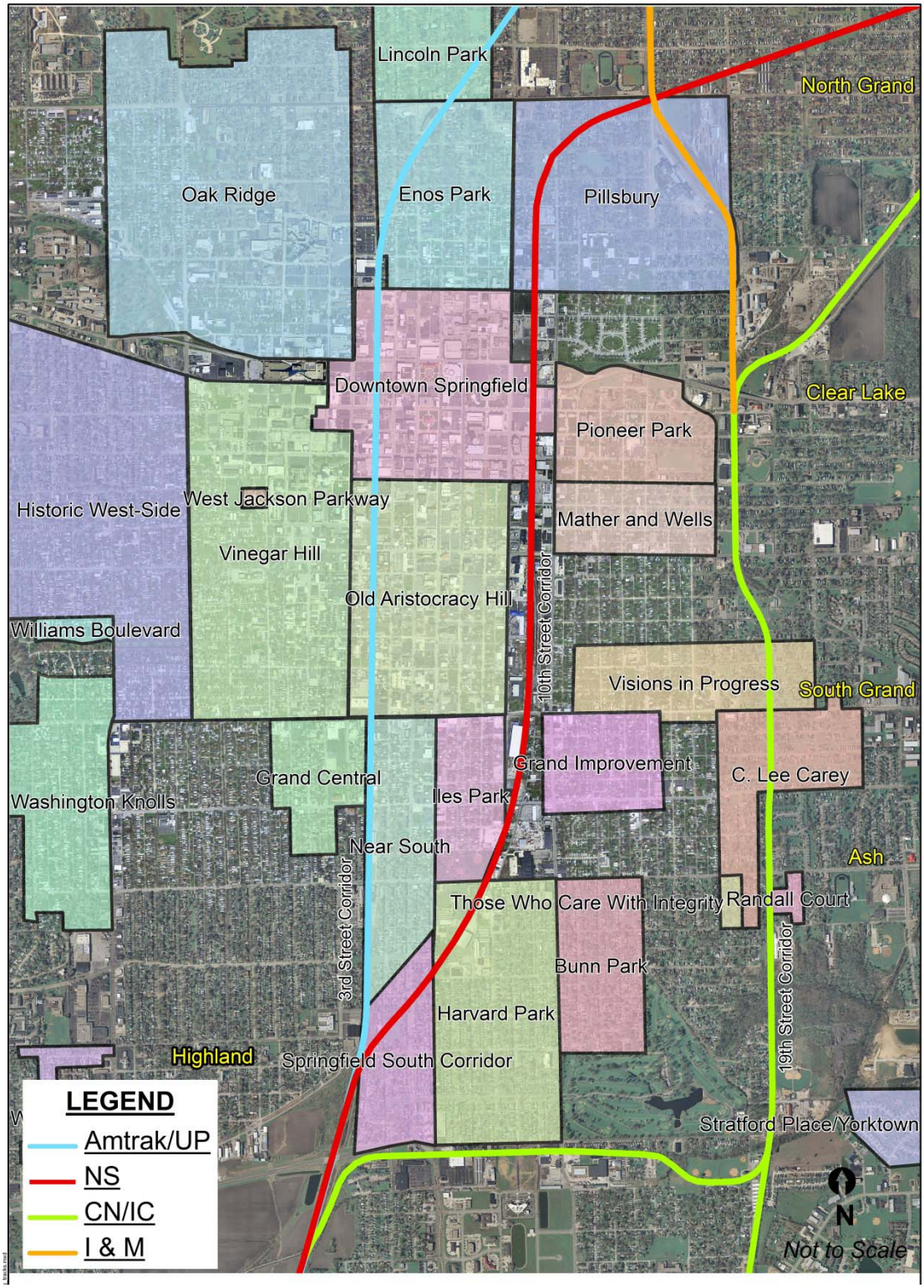


Exhibit 4-6. Neighborhood Associations

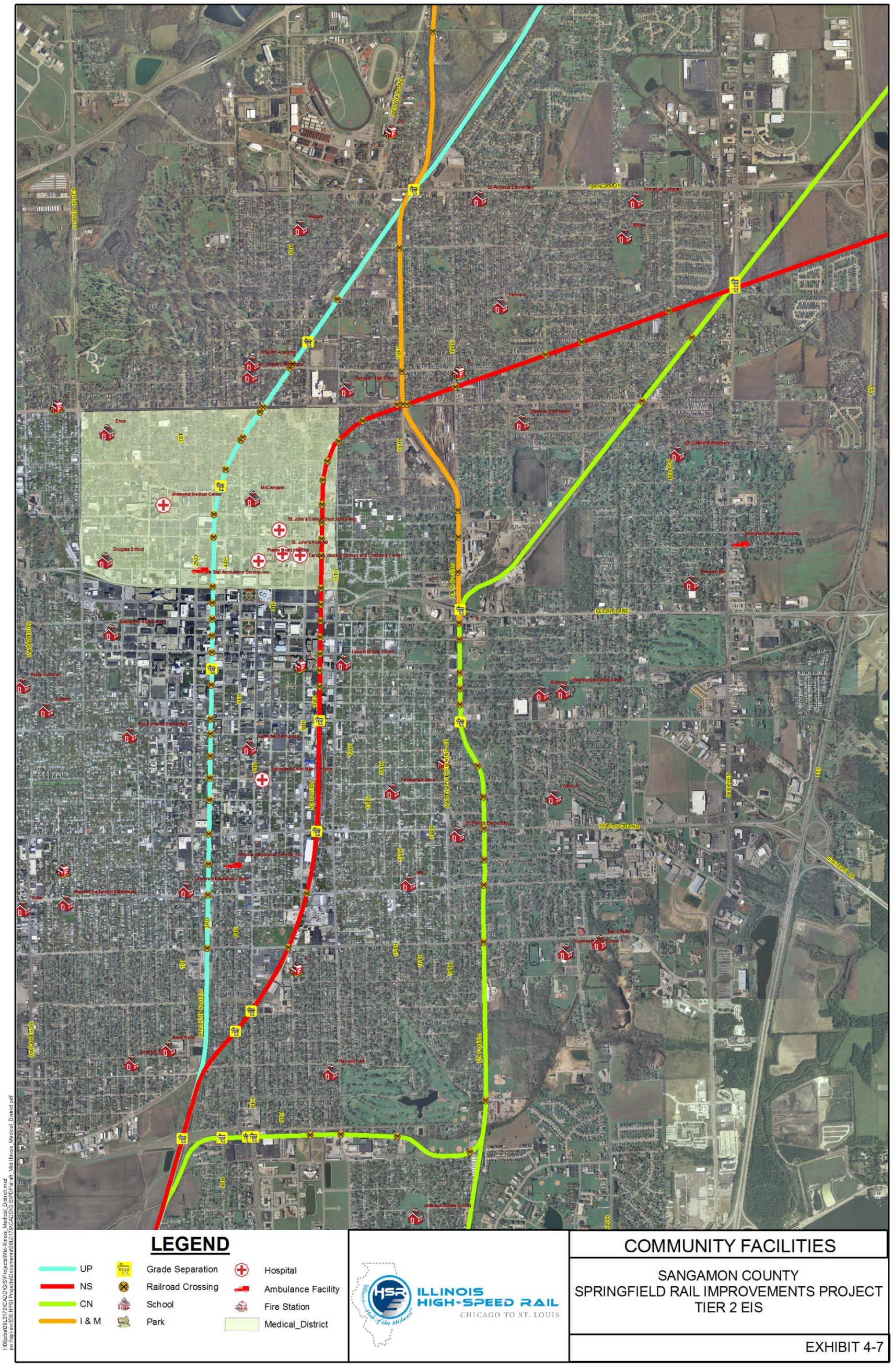


Exhibit 4-7. Community Facilities

The City of Springfield is considered a premier health care and medical center within central Illinois. The city has three major hospitals and over 40 clinics. These health centers include: St. John's Hospital, Prairie Heart Institute, Carol Jo Vecchie Women's and Children Center, Southern Illinois Trauma Center (located at both St. John's and Memorial Hospitals), St. John's College Department of Nursing, Memorial Medical Center and the Springfield Clinic. The State of Illinois created the Mid-Illinois Medical District to support the advancement of health service and serves within medical facilities in a one-square-mile area of Springfield (Benson and Fulgenzi, 2009).

Two hospitals, two ambulance services and one fire station are less than six blocks from the UP corridor (3rd Street). One hospital, one ambulance service, and three fire stations are less than six blocks from the NS corridor (10th Street). One hospital, one ambulance service, and one fire station are between the 3rd and 10th Street corridors. One fire station is less than six blocks from the CN corridor (19th Street) (Lewis and Bergeron, 2010).

Ten schools are less than six blocks from the UP corridor (3rd Street). Seven schools are less than six blocks from the NS corridor (10th Street). Three schools are between the 3rd and 10th Street corridors. Nine schools are less than six blocks from the CN corridor (19th Street).

The Springfield Park District provides a year-round community recreational programs at its 30 public parks. Springfield's historic sites are the attraction for more than one million visitors annually. The national, state and local Abraham Lincoln sites are the most popular attraction and include Lincoln's home, tomb and law office. The Abraham Lincoln Presidential Library and Museum is a world class attraction that informs all who visit about the life of this great President and the historic period in which he lived. Other historic sites in Springfield include: the Illinois State Museum, the Old State Capitol, the current State Capitol and Capitol Complex, the Governor's Mansion, Frank Lloyd Wright's Dana-Thomas House, and the Thomas Rees Carillon.

A number of Sangamon County municipal streets have sidewalks on one or both sides of the roadway, although many municipal and unincorporated areas lack sidewalks or have sidewalks in need of repair. The greater Springfield area currently has about 35 miles of bikeway, consisting of about 21 miles of trail and 14 miles of bike lanes or wide shoulders. Existing trails and routes are shown in Exhibit 4-8.

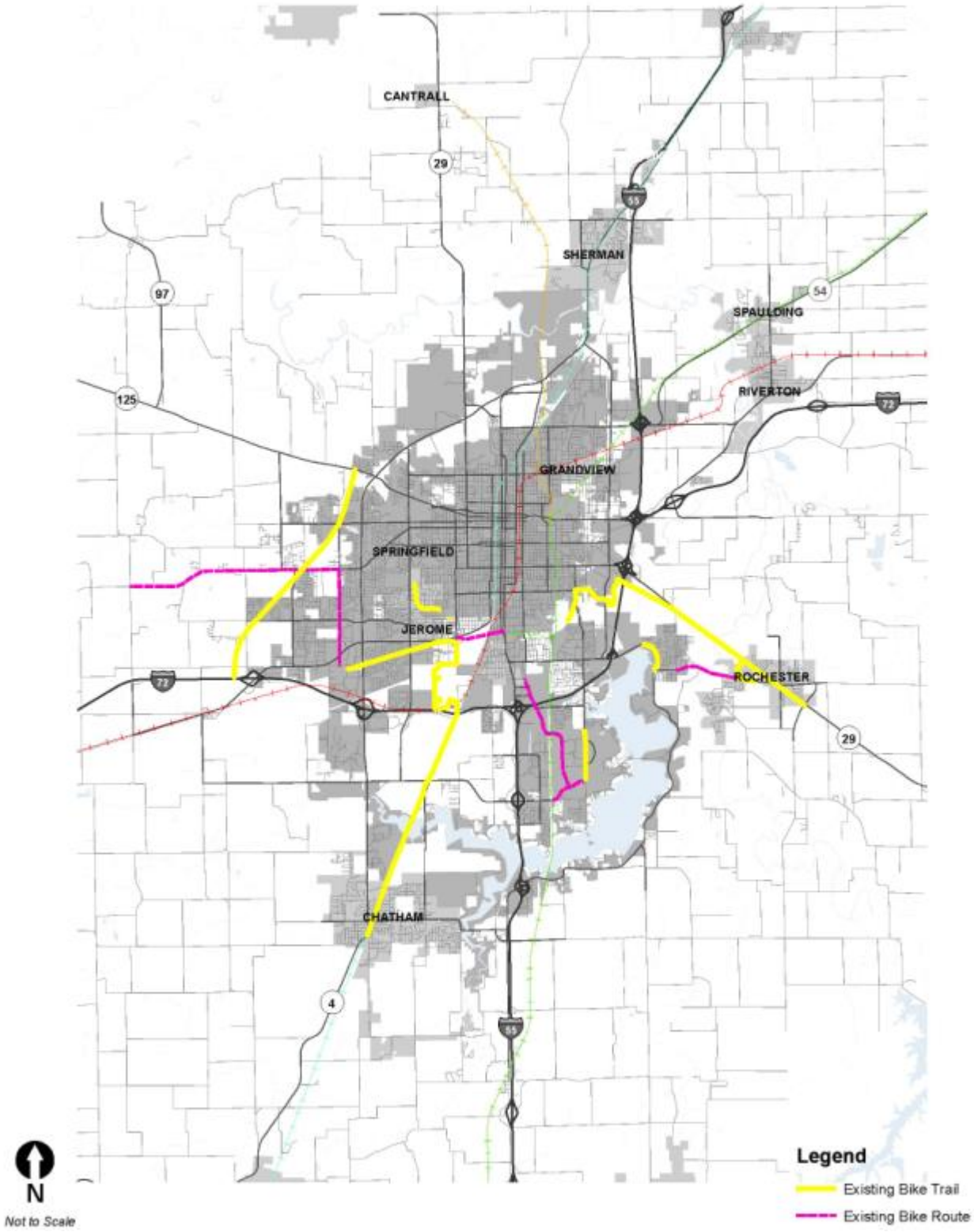


Exhibit 4-8. Bike Trails

4.3 Energy

Transportation energy consumption within the project area occurs with four basic modes of travel: air, rail, bus, and automobile. Each of the four modes of transportation utilizes a different type of fuel. Travel by automobile, is generally the most prevalent mode of transportation in the Springfield area and therefore, would be expected to have the highest energy expenditures of all modes. Travel by rail is generally known to be more energy efficient than travel by air or private automobile, although intercity bus travel can often rival or exceed energy efficiencies of rail travel.

Between 1990 and 2006, rail fuel efficiency improved by about 20 percent, or 1.1 percent per year (ICF International, 2009). This is the net outcome of multiple changes in railroad traffic mix, technological improvements, and operating practices. Rail traffic is expected to nearly double in the Springfield area by 2020 because of increased freight traffic and implementation of high-speed rail passenger service; therefore, fuel consumption would increase accordingly. However, several efficiency factors, such as technological improvements in locomotives, freight cars, signal, train control and dispatching systems, track systems, and changes in operating practices may offset energy consumption increases.

4.4 Cultural Resources

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

The National Register of Historic Places, which is administered by the National Park Service, recognizes historically significant buildings, structures, sites, objects and districts. Several historic districts within the City of Springfield have been listed in the National Register of Historic Places. The Central Springfield Historic District—anchored around the historic Old State Capitol—was listed on the National Register in 1978. The District extended its boundaries in 1986. Multiple other properties in Springfield have also been individually listed on or determined eligible for the National Register, a number of which are within the project area. A total of 17 properties listed on the National Register are within the study area, mostly in urban Springfield (Exhibit 4-9). Numerous other sites are potential historic resources with regard to National Register eligibility.

A Phase I cultural resource evaluation was conducted for alternatives of the Springfield Rail Improvements Project that were carried forward for detailed analysis. The Area of Potential Effects (APE) includes properties within two blocks of the existing 10th Street tracks.

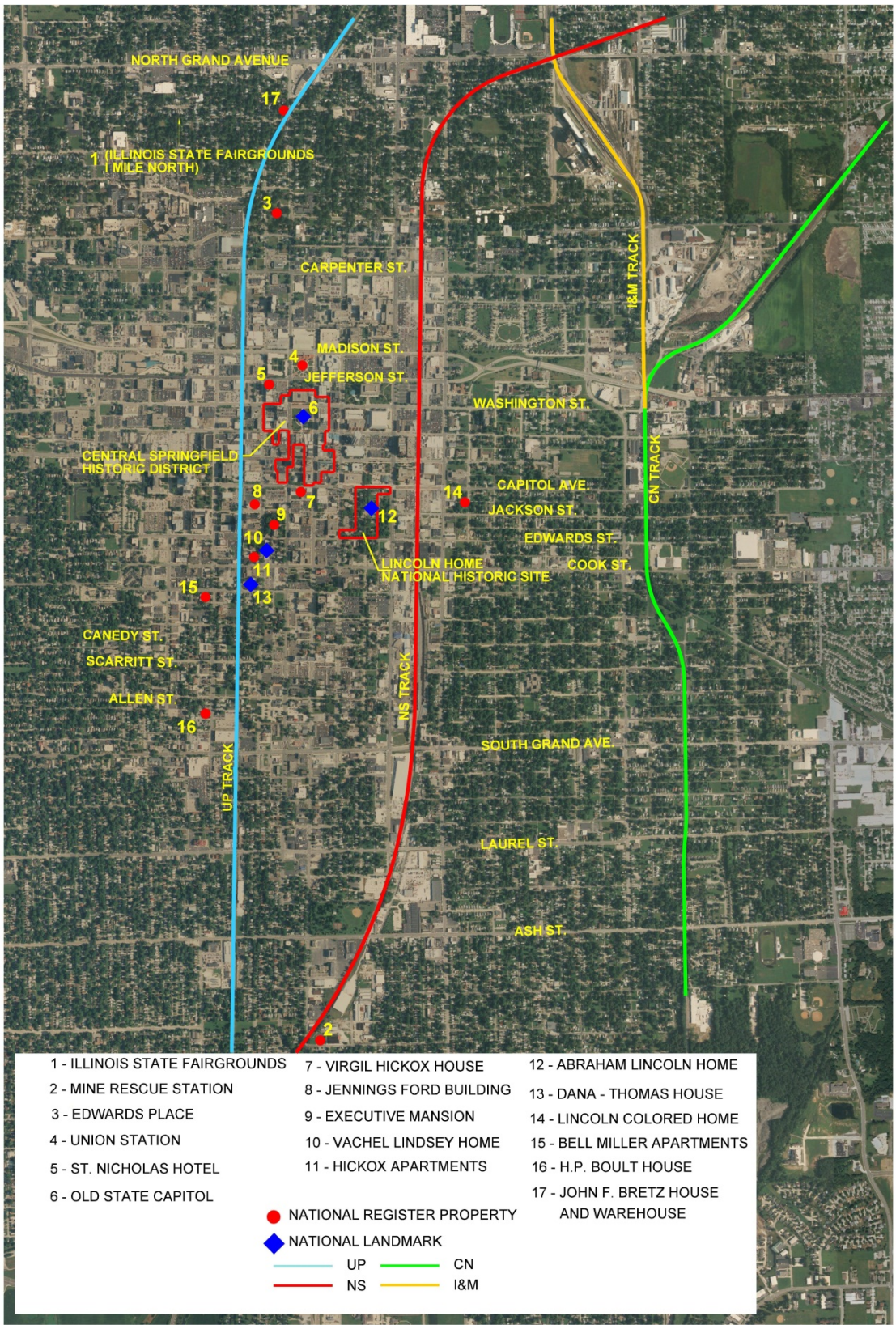


Exhibit 4-9. National Register Sites

Architectural resources were the focus of the evaluation, but archaeological resources were considered as well. The results of the resource review are documented in a Technical Report entitled Phase I Cultural Resources Evaluation: Springfield Rail Improvements Project, Springfield, Sangamon County, Illinois (Fever River Research, 2011). Correspondence on eligibility determinations, for directly affected properties, from the Illinois Historic Preservation Agency (IHPA) is included in Appendix A.

4.4.1 Project Area – 10th Street Corridor

A total of 56 properties have been identified as architecturally significant or of architectural interest are within the Area of Potential Effect along the 10th Street Corridor (Table 4-11).

One National Register property is also a National Historic Landmark. This property is the Abraham Lincoln Home at the corner of the 8th and Jackson Streets (see Exhibit 4-9). It is the centerpiece of the Abraham Lincoln Home National Historic District, which covers much of the two-block area bounded by Capitol, Edwards, 7th and 9th Streets and is administered by the National Park Service. The historic district lies on the western edge of the project area. The Lincoln Home itself is nearly two blocks west of the NS tracks.

Aside from the Lincoln Home, the two other National Register properties along the 10th Street Corridor are the Lincoln Colored Home at 427 South 12th Street and the Mine Rescue Station at 609 East Princeton Avenue. The Lincoln Colored Home is well removed from the NS tracks, being on the eastern edge of the corridor. The Mine Rescue Station, however, is situated a short distance from railroad, close to the 6th Street viaduct. The Illinois State Fairgrounds is also a National Register listed property, but this property is located north of Sangamon Avenue outside of the project limits.

There are 14 properties listed on the National Register as contributing properties to a historic district. All of these properties are within the Lincoln Home National Historic Site. All are former residences and most front 8th Street, the exceptions being the James Morse House on Capitol Avenue and the Bernard Stuve House facing 7th Street. The contributing buildings to the historic district presently are utilized for interpretive purposes and administrative office space.

Eight potentially eligible properties (designated as City Landmarks) lie within the 10th Street Corridor. Six of these are within the east half (east of 8th Street) of Lincoln Home neighborhood and are contributing resources to the National Historic District. Another is the Lincoln Colored Home, which—as noted above—also is listed on the National Register of Historic Places. The two remaining in the APE are the Old Southtown Marque at 1110 East South Grand Avenue and the Claus Grocery Store at 1700 South 11th Street. Both of these properties lie at least one block east of the 10th Street tracks.

Table 4-11. Properties of National Register Eligibility within the Area of Potential Effect - 10th Street Corridor (1)

Exhibit ID	Property Name	Address	National Register	Potentially National Register Eligible
1	Illinois State Fairgrounds(3)	Sangamon & Peoria Rd.	X	
2	Ridgely Interlocking Tower(2)	1501 Percy Avenue		X
3		1120 East Ridgely		X
4	Lanphier HS Gymnasium	1121 East North Grand		X
5	[Brick Italianate Commercial]	1001 North 9th		X
6	Springfield Furniture Factory(2)	819 North 11th		X
7	Concordia Seminary	North 12th & Enos		X
8	[Queen Anne Cottage]	1021 East Phillips		X
9	[Frame Queen Anne Cottage]	919 North 9th		X
10	[Frame House]	901 North 9th		X
11	[Frame House]	809 North 9th		X
12		1105 East Miller		X
13		1106 East Miller		X
14		1122 East Miller		X
15	Municipal Substation	1013 East Reynolds		X
16		1121 East Reynolds		X
17		801 East Miller		X
18	St. John's Hospital	800 East Carpenter		X
19	GIPS Co. General Warehouse	217 North 9th		X
20	Great Western RR Depot(2)	East Monroe & 10th		X
21	Fireproof Storage House No. 3(2)	1000 East Monroe		X
22	Lincoln School	1115 East Capitol		X
23	Lincoln Colored Home	427 South 12th	X	
24		1201 East Edwards		X
25	Sacred Heart Rectory	722 South 12th		X
26	Sacred Heart RC Church	South 12th & Lawrence		X
27	Morse, James, House	818 East Capitol		X
28	Abraham Lincoln Home	South 8th & Jackson	X	
29	Charles Arnold House	810 East Jackson		X
30	Cook House	508 South 8th		X

Exhibit ID	Property Name	Address	National Register	Potentially National Register Eligible
31	Henson Robinson House	520 South 8th		X
32	Solomon Allen Barn	530 South 8th		X
33	[Frame Queen Anne House]	814 East Edwards		X
34		810 East Edwards		X
35	[Frame Queen Anne House]	802 East Edwards		X
37	[Italianate Frame House]	718 South 8th		X
38		612 South 8th		X
39		805 South 12th		X
40		809 South 12th		X
41		902 South 12th		X
42		920 South 11th		X
43		1019 South 11th		X
44		1104 South 11th		X
45		1122 South 11th		X
46		1124 South 11th		X
47		1209 South 12th		X
48		1219 South 12th		X
49	Old Southtown Theater Marquee	1110 East South Grand		X
50	[Victorian Frame House]	1314 South 8th		X
51	Claus Grocery Store	1700 South 11th		X
52	First Brethren Church	2117 South Yale		X
53	Iles Park Shelter	East Ash & 6th		X
54	Peabody Coal Company Office(2)	2135 South 9th		X
55	Weaver Building	2150 South 9th		X
56	Mine Rescue Station(2)	609 Princeton Avenue		X

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

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

3) Large property with multiple components. Some buildings are on the National Register, some are potentially eligible. The complex has different areas of historic significance. The property is outside the project limits.

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

One property in the APE has been previously identified as being potentially eligible to the National Register, this being the old store building at 622 South 8th Street. Other potential candidates for National Register eligibility are present within the APE, one example being the Queen Anne residence at 1500 South 8th Street. The number of potential National Register properties is more limited than that other portions of the City as a result of a number of factors, including: a higher percentage of modest vernacular buildings; a relative scarcity of high-style or architect-designed institutional and commercial buildings; and the lack of historic integrity evident in large sections of the study area.

The overall condition in the APE is variable between and within its composite neighborhoods. A high percentage of buildings on the northern end of the study area, east of 19th Street, are less than 50 years old. The integrity of the northern end of the Pillsbury neighborhood included within the corridor ranges from moderate to good, but the integrity declines towards the neighborhood's southern end. The northern half of the East Side has very poor integrity because of the widespread clearing of historic buildings and subsequent redevelopment that has occurred. Modern commercial development and demolition have also had a significant impact on the southern half of the neighborhood, particularly along 11th Street. The historic integrity along 10th Street also is relatively poor overall as a result of the large-scale removal of the historic buildings once present here. Industrial complexes occupied large tracts of ground on 10th Street in the past (i.e., the Wabash Railroad shops, Sattley Manufactury, etc.), and these facilities have since been demolished, been redeveloped, or simply left vacant. The portions of the Far South and Harvard Park neighborhoods included within the project area have good integrity overall.

The integrity of the buildings along the South Grand Avenue underpass location of the CN on 19th Street ranges from moderate to poor. There are no buildings of architectural significance within the APE for this proposed grade separation.

The integrity of the buildings along the Ash Street underpass location of the CN on 19th Street is poor overall. Much of the housing on the east side of the railroad crossing is less than 50 years old. Only one property of architectural interest in the APE was identified, a Queen Anne residence at 2101 South 19th Street.

A Phase I cultural resource evaluation was conducted for the retained alternatives along the APE of the 10th Street Corridor. Architectural and historic structures within the APE of the retained alternatives are shown in Exhibits 5-1 and 5-2. A total of 56 architecturally significant properties or properties that are of architectural interest are within the corridor for Alternatives 2A and 2B.

4.4.2 Archaeological Resources

All of the archaeological investigations undertaken to date in the project area along the 10th Street Corridor have been centered in the Lincoln Home National Historic Site, which has been scene of extensive archaeology since the middle 1950s. In 1985, archaeological investigations were conducted adjacent to the Lincoln Home in conjuncture with the restoration then being undertaken. Subsequent investigations in the neighborhood have been driven by the National Park Service's on-going restoration program, which is directed at restoring the streetscape and surviving homes on the 400 and 500 blocks of South 8th Street to their circa 1860 appearance. The National Park Service's Midwest Archaeological Center excavated on multiple lots during the 1980s and 1990s. Since that time, archaeological investigations occurred within the historic district—beginning with the Sprigg Site in 1997 with the Aitken Barn at the DuBois Site in the winter of 2009-2010. Eighteen of the lots in the neighborhood have been investigated to some extent to date.

No archaeological surveys or testing were conducted as part of this project because these areas are on private property. As right-of-way is purchased for construction, archaeological surveys will be conducted, as necessary, per a Memorandum of Understanding with the SHPO. However, some general assessments can be made regarding the potential for archaeological resources in the different corridors considered, based on prior experience. Springfield is a mature urban center with nearly 200 years of Euro-American settlement. Previous investigations have amply demonstrated the presence of significant historical archaeological resources with good integrity in the city. That this has been illustrated in residential areas like the Lincoln Home neighborhood is perhaps not that surprising. However, it also was proven in the Abraham Lincoln Presidential Library investigations, where multiple components were documented with good integrity—despite successive rebuilding episodes on their respective lots. This illustrates the high potential for significant archaeological resources being present elsewhere in the Central Business District and adjoining areas comprising early Springfield. The 3rd Street Corridor passes directly through the heart of the frontier-era settlement, which was centered on Iles Store at the intersection of Jefferson and 2nd Streets. Prior to 1860, a diverse range of residential, commercial, institutional, and industrial properties were developed within the boundaries of the 3rd Street Corridor, for which subsurface archaeological remains may yet exist. The same is true to some extent for the 10th Street Corridor, but the resources here are somewhat later in date and much less concentrated than those in the 3rd Street Corridor, therefore there is a much lower probability for significant findings along the 10th Street corridor.

4.5.1 Geology and Soils

As shown in Exhibit 4-10, the Springfield Rail Improvements Project area lies in the central part of the Springfield Plain Section. The Springfield Plain Section is a subdivision of the Central Lowlands Physiographic Province. According to Thornburn (1963), the Springfield Plain is underlain almost continuously by Illinoian and older glacial drift, which is thick enough to obscure all but the major variations in topography of the bedrock.

The bedrock within the project area is Pennsylvanian-aged sedimentary rock (ISGS, 2005). The Pennsylvanian bedrock in the project area is of the Bond, Modesto, and Carbondale Formations and consists of cyclic sequences of sandstone, siltstone, shale, limestone, and coal (see Exhibit 4-11). Bedrock outcrops are not uncommon along the Sangamon River and its tributaries.

The topography of the Springfield Plain is a relatively flat-lying glacial till plain moderately dissected by dendritic drainage systems. Upland landscapes predominate in Sangamon County. These landscapes range from broad, relatively undissected drainage divides to dissected areas adjacent to river bluffs. Shallow river valleys dissect the Springfield Plain. The natural drainage is westward. The Sangamon River and its tributaries drain all of the project area.

The soils in Sangamon County formed in a variety of parent materials. The majority of the soils formed in loess. A cover of loess occurs over the glacial drift in almost all of this area. Other soils formed in glacial drift, alluvium, sandy eolian deposits, bedrock residuum, or a combination of these (USDA, 2004). The project area is on glacial till and outwash deposits associated with the Illinoian glacier. Throughout Sangamon County a layer of loess exists at the surface, ranging from 15 feet thick in the northern part of the county to less than seven feet thick in the southern part. A modern soil horizon has developed within the upper few feet of loess. The loess is often absent within stream valleys because of erosion.

Mineral resources in the project area include petroleum, stone, coal, and clay. Small oilfields are in scattered areas throughout the east-central part of Sangamon County. Oil-producing strata consist of Devonian and Silurian rocks, mainly limestone or dolomite limestone, mostly within a depth of 2,000 feet. Quarries extract sand and gravel from the low terraces and floodplains along the Sangamon River east of Springfield.

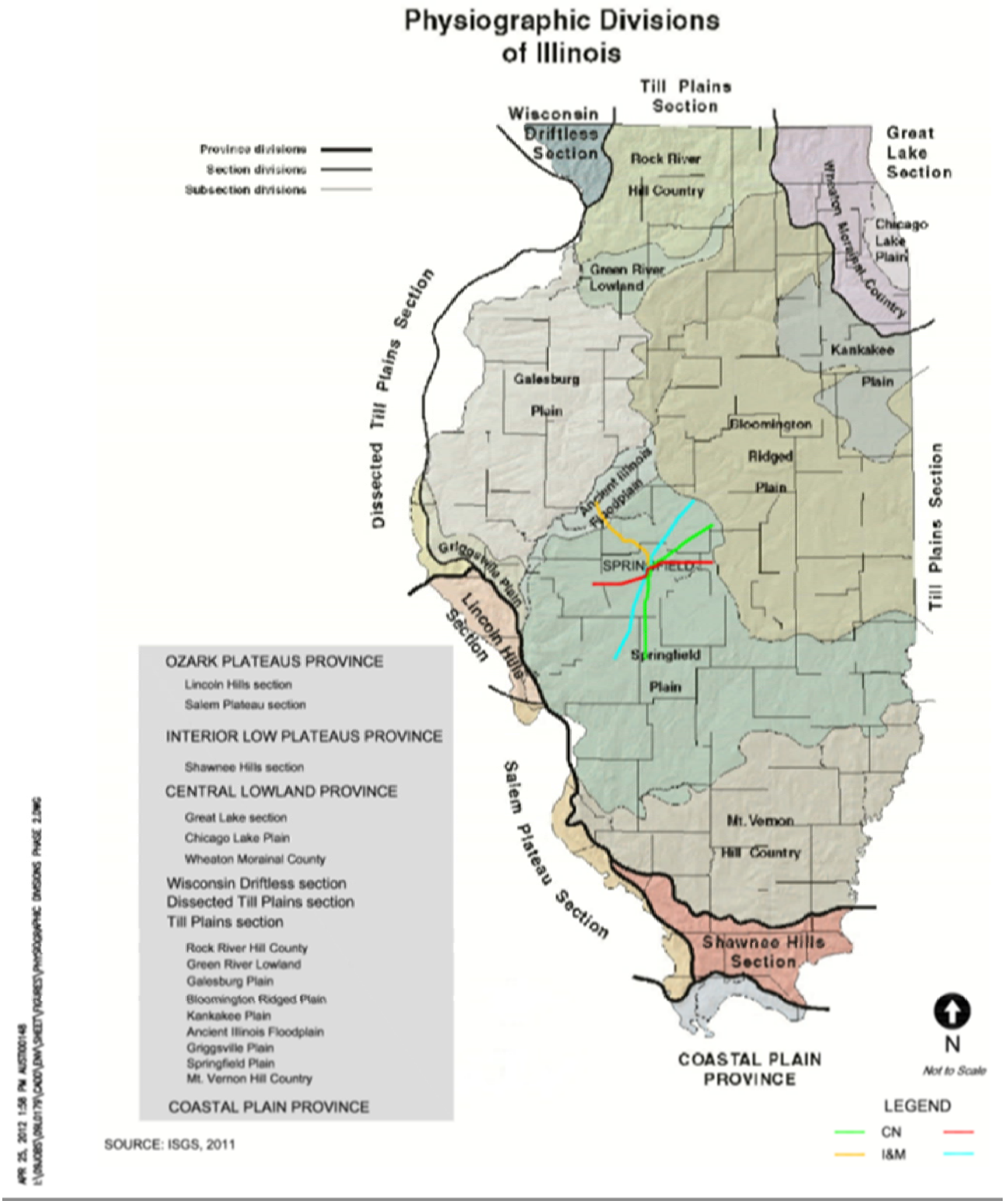


Exhibit 4-10. Physiographic Divisions

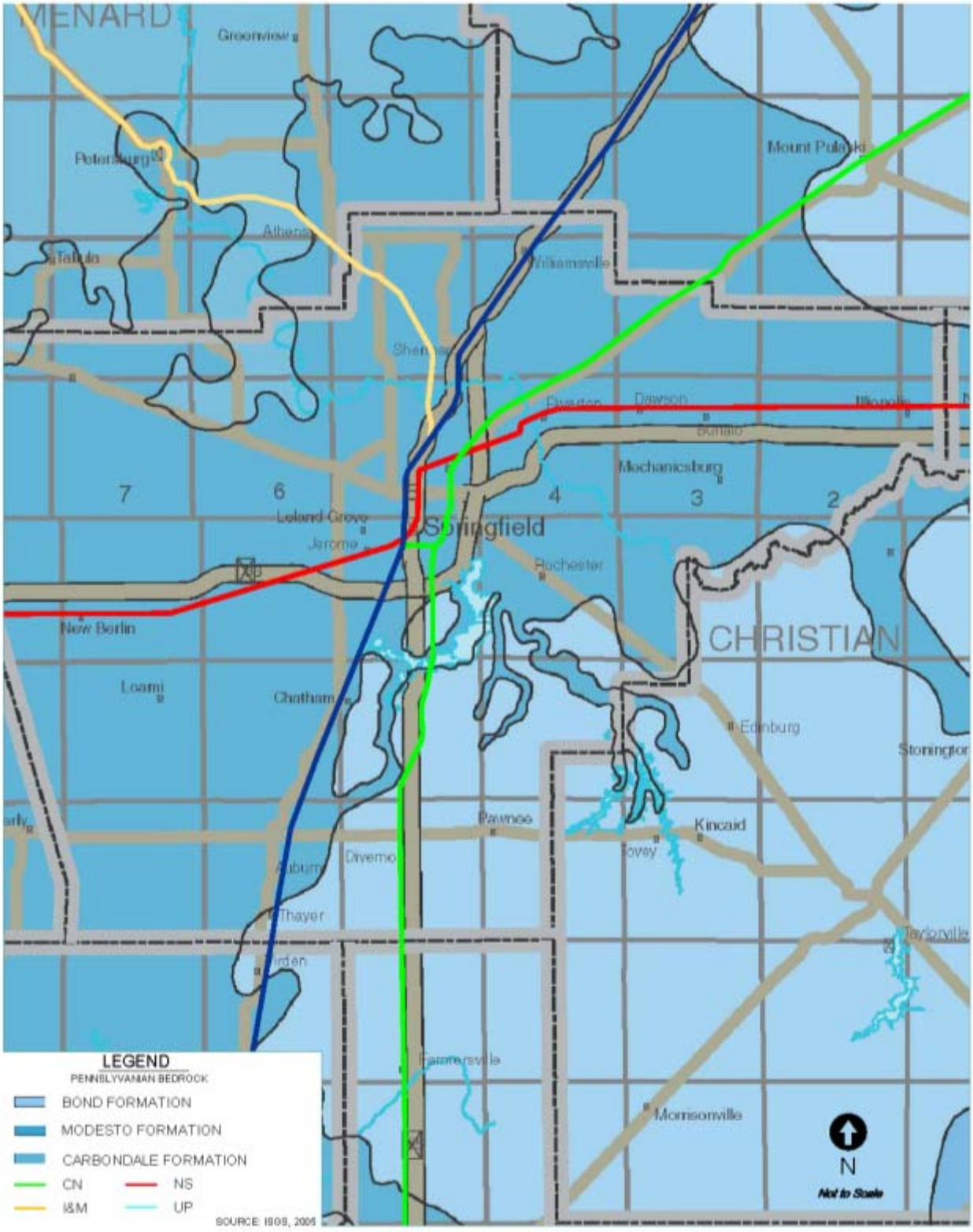


Exhibit 4-11. Bedrock Geology

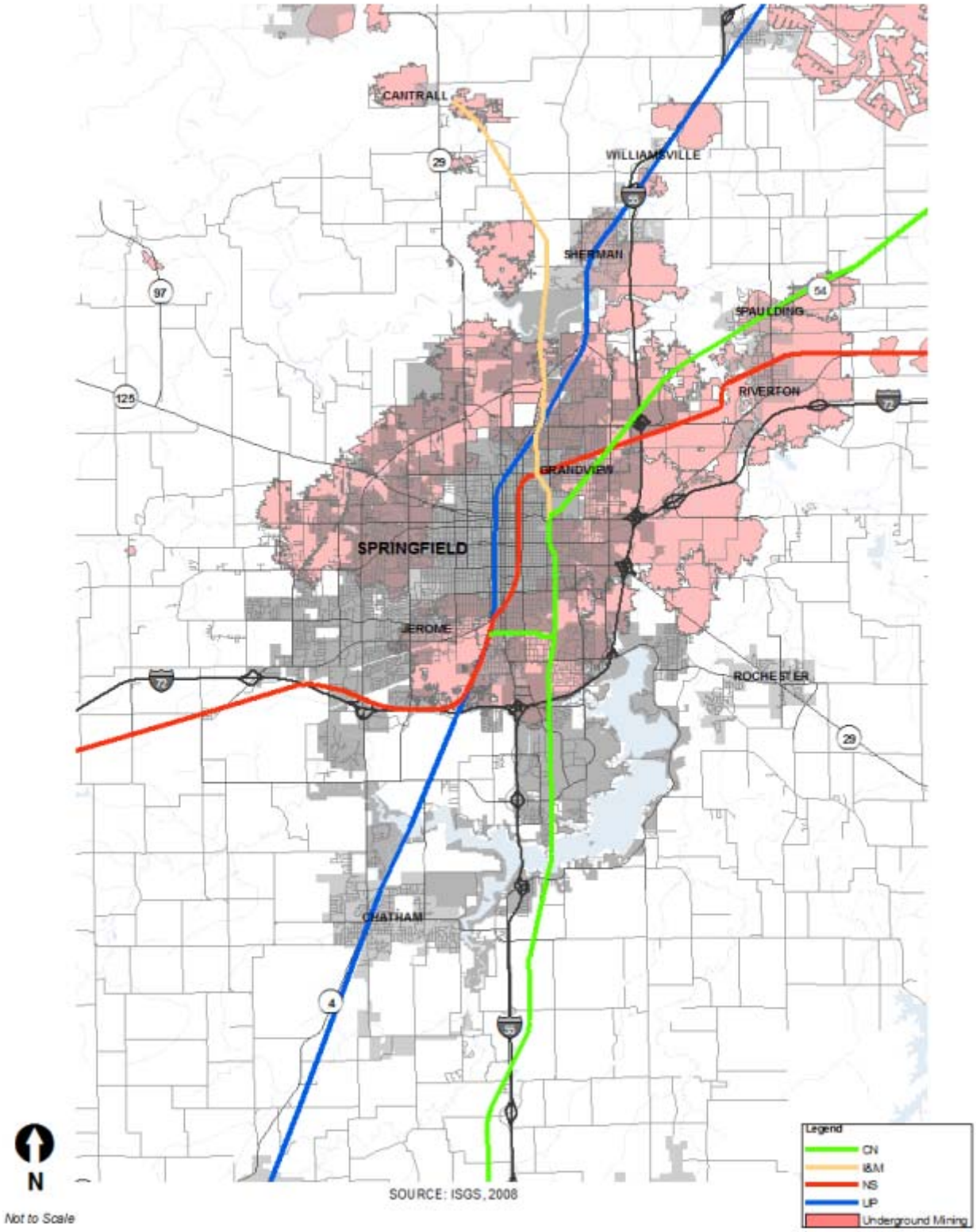


Exhibit 4-12. Underground Mining

The Carbondale geologic formation is a limited source of coal, most of which has been mined out by underground operations. Mine operators established underground coal mines, now abandoned, around the center of the City of Springfield and northeastward past Riverton (see Exhibit 4-12). Mining in Sangamon County began in 1867 and the last mine was abandoned in 1964 (SSCRPC, 2009). A total of 53 coal mines have operated in Sangamon County. The room-and-pillar technique was the primary method used to create the mines. This method which leaves pillars to support the mine roof after much of the coal has been extracted. The pillars do not provide permanent structural support and subsidence can occur when the pillars become weak and fail, the floor beneath the pillars fail causing the pillars to sink, or the mine roof collapses.

4.5.2 Ecological Resources

4.5.2.1 Vegetation and Habitat

Sangamon County is part of the Grand Prairie Natural Division of Illinois. The Springfield Section is part of the Grand Prairie Division that is covered by the Illinoian glaciation. Prairies developed on this land in presettlement times. About 97 percent of the land cover of the retained alternatives 2A and 2B is urban. About 3 percent of the project area is cropland, located at the southern end of the 10th Street corridor near Stanford Avenue. Natural areas within the project area are non-existent (Illinois Department of Natural Resources, 1996).

Railroad rights-of-way and their associated vegetative cover can provide habitat for many wildlife species. The linear characteristics of a rail line offers not only localized habitat value, but also continuity of open space, linking diverse habitat features. This linkage can be important, especially where the right-of-way passes through predominantly agricultural or urban areas that otherwise offer limited habitat value and diversity. However, FRA has regulations for vegetation control of track. Railroad ROW has a cleared portion of trackbed and track and brush and trees are controlled to prevent overhang and intrusion into the track area.

Alternatives 2A and 2B are entirely in an urban setting along an existing railroad corridor. The vegetative communities impacted by the additional right-of-way required for the project include primarily non-native grasses, mostly residential lawns, and existing railroad right-of-way. The existing railroad right-of-way consists of non-native grasses as well, and also shrubs and trees common to the area. Common species include: silver maple, slippery elm, box elder, hackberry, wild cherry, blackberry, multi-flora rose, poison ivy, foxtail, and common fescue. The existing railroad right-of-way is also periodically sprayed with a contact herbicide to control vegetation growth. There are no native prairies or sensitive vegetation habitats within Alternatives 2A and 2B.

4.5.2.2 Agriculture

The State of Illinois is primarily an agricultural state. Eighty-two percent of Sangamon County is farmland used for the production of crops or livestock, (USDA NRCS, 2004). The main agricultural crops are row crops, primarily corn and soybeans. The major small grain crop is wheat. Prime farmland is one of several kinds of important farmland defined by the U.S. Department of Agriculture. It is a major importance in meeting the

nation's short- and long-range needs for food and fiber. Prime farmland is defined by the USDA as land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber and oilseed crops and is available for these uses. Nearly 83 percent of Sangamon County meets the requirements for prime farmland.

The project area is primarily urban, supporting government offices and attractions, commercial and industrial businesses, and residential neighborhoods, however about three percent of the project area is in agricultural production.

4.5.2.3 Forest

As discussed in Section 4.1 above, contiguous forested habitat is not present within the project area. Individual trees are present throughout the urban 10th Street corridor in residential yards, along streetscapes and in city parks. Typical dry to mesic tree species include shagbark hickory, white ash, white oak, red oak, black oak, sugar maple, shadbush, blue beech, hop hornbeam, redbud, black cherry, sassafras, slippery elm, bitternut hickory, bur oak, basswood, hackberry, black walnut, and Ohio buckeye. Typical mesic to wet tree species include American elm, slippery elm, hackberry, swamp white oak, bur oak, green ash, shingle oak, box elder, red mulberry, paw paw, silver maple, pin oak, honey locust, sycamore, sandbar willow, black willow, and cottonwood.

4.5.2.4 Birds

Bird species composition in the project area is expected to be fairly typical of the urban areas of Illinois. H. David Bohlen, A Study of the Birds of Sangamon County, Illinois, Illinois State Museum, lists 355 species of song birds, aquatic birds, game birds, and raptors known or likely to occur within or passing through the project area.

4.5.2.5 Mammals

The Illinois Natural History Survey lists 47 species of mammals (including those species that are threatened or endangered) known or likely to occur in the Lower Sangamon River Sub-basin (INHS, 2001). The 47 species represent about 80 percent of the mammal species that currently inhabit Illinois. Mammals such as mice, moles, voles, rats, squirrels, rabbits, raccoons, fox, and deer are likely to occur within the project area. Many mammal species are generalists that use a variety of habitat types and have adapted to living in landscapes that have been altered by human activity. Larger mammals that now commonly inhabit agricultural and urban areas include the Virginia opossum, eastern cottontail, fox and gray squirrels, coyote, red fox, raccoon, striped skunk, and white-tailed deer. Several small mammals, including the eastern mole, northern short-tailed shrew, thirteen-lined ground squirrel, deer mouse, and prairie and meadow voles, can occupy fence rows, pastures, and hay fields as well as maintained areas such as highway and railroad rights-of-way, cemeteries, parks, and lawns. Some bats, especially big brown and little brown bats, roost primarily in buildings and other small mammals such as the white-footed mouse sometimes enter buildings in search of food and shelter.

4.5.2.6 Reptiles and Amphibians

The Illinois Natural History Survey lists 16 amphibian species and 29 reptile species that are known or likely to occur within the Lower Sangamon River Sub-basin (INHS, 2001). Common amphibians typically occurring in the project area, including the City of Springfield, are the American toad, cricket frog, spring peeper, and bullfrog. Common reptiles typically occurring in the project area include the Eastern box turtle, common kingsnake, and the common garter snake. Most amphibian and reptile species are not restricted to a single habitat type. Reptiles are usually found in close proximity to aquatic habitats because they can find abundance of prey in these productive habitats.

4.5.2.7 Invasive Species

An invasive species is typically a non-native species whose introduction causes or is likely to cause economic or environmental harm or harm to human health, for example, by:

- out-competing native species for resources and pollinators
- altering the ecology of natural areas
- weakening or damaging equipment and infrastructure
- spreading pathogens and parasites

By reproducing rapidly, invasive species spread over large areas of the landscape and have few, if any, natural controls, such as predators or diseases, to keep them in check. Common invasive species found in Illinois and possibly in the project area include: Non-indigenous algaes, Rusty crayfish, Freshwater drum, Northern snakehead, Zebra mussel, Purple loosestrife, Water milfoil, Curly pondweed, Narrow leaved cattail, Multiflora rose, Japanese honeysuckle, garlic mustard, common reed, common chickweed, Emerald Ash borer, gypsy moth, Norway rat, and Asian carp.

4.5.3 Threatened and Endangered Species

The Federal Endangered Species Act (ESA) of 1973, as amended, was passed in an attempt to control the loss of at-risk birds, mammals, reptiles, mussels, fish, amphibians, invertebrates, and plants. Section 7 of the ESA requires the projects being authorized, funded, or carried out by federal agencies demonstrate that the action would not jeopardize the continued existence of any listed species or modify their critical habitat. If federally listed species are known to exist on a proposed site, the lead federal agency should initiate Section 7 consultation with the U.S. Fish and Wildlife Service (USFWS) to assure that the species and /or critical habitat would not be adversely affected by the project.

The Illinois Endangered Species Protection Act (IESPA) of 1972 (as amended) is similar to the ESA but is implemented at the state level. The state act protects state-listed animals and plants from unauthorized actions. This Act requires agencies of the state and local governments to enter into a consultation process with the Illinois Department of Natural Resources to evaluate whether actions authorized, funded or implemented by

these entities are likely to jeopardize the continued existence of state-protected species or are likely to result in the destruction or adverse modification of designated essential habitat of any listed species.

Through scoping with the Illinois Department of Natural Resources and the USFWS, the following list was developed that included federal and state threatened and endangered species potentially occurring in central Illinois (see Appendix A): **Birds** – Northern Harrier (*Circus cyaneus*), Peregrine Falcon (*Falco peregrinus*), Least Bittern (*Ixobrychus exilis*), Loggerhead Shrike (*Lanius ludovicianus*), Black-crowned Night Heron (*Nycticorax nycticorax*); **Mammals** – Indiana Bat (*Myotis sodalis*), Franklin's Ground Squirrel (*Poliocitellus franklinii*); **Reptiles** – Kirtland's Snake (*Clonophis kirtlandi*), Ornate Box Turtle (*Terrapene ornate*), Lined Snake (*Tropidoclonion lineatum*); **Invertebrates** – Sheepnose Mussel (*Plethobasus cyphyus*); and **Plants** – Virginia Bunchflower (*Melanthium virginicum*), Heart-leaved Plantain (*Plantago cordata*), Tubercled Blossom (*Epioblasma torulosa*), and the Eastern Prairie Fringed Orchid (*Platanthera leucophaea*). No further consultation has occurred for this project (Illinois Endangered Species Protection Board, 2011).

4.5.3.1 Threatened and Endangered Species Preferred Habitat

Birds

The Northern Harrier prefers open county, like grasslands, steppes, wetlands, meadows, pastures, croplands, and riparian woodlands.

The Peregrine Falcon prefers perching or nesting on tall structures near water such as bridges, skyscrapers, water towers, ledges of rocky cliffs, and power pylons.

The Least Bittern prefers dense emergent vegetation in freshwater marshes and occasionally saltwater or brackish marshes. Sometimes they are seen on the edges of mud flats in the marsh or on the edges of canal banks.

The Loggerhead Shrike prefers open woodlands, meadows, and grassy pastures that are well-grazed or mowed. They are often seen perched on dead branches, utility wires, or fences. Usually found nesting in dense trees or shrubs.

The Black-crowned Night Heron prefers fresh and salt-water wetlands, mudflats, ponds, rivers, reservoirs, and mangroves. They ambush prey at the water's edge mainly at night or early morning. Often found nesting or roosting in nearby trees or bushes during the day.

Mammals

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

The Franklin's Ground Squirrel prefers tallgrass prairie, weedy fields, wastelands, and railroad beds overgrown with weeds. They may also found in fence rows, old fields, roadsides (if not mowed frequently), cemetery prairies, and ditch banks. They spend the majority of their time in their burrows, and hibernate about seven months a year.

Reptiles

The Kirtland's Snake prefers moist, open meadows and wet prairies. Some of the largest known populations exist in parks and other urban setting in open grassy areas with a nearby water source, such as a creek, pond, or ditch. They may also be found under objects such as boards, logs, rocks, leaves, and even in rodent or crayfish burrows in wet grasslands, along ditches, ponds, lakes, creeks, and swamps.

The Ornate Box Turtle prefers mesic woodlands and grasslands.

The Lined Snake prefers prairies, grasslands, pastures, woodland edges, and even parks, city lots, cemeteries and backyards.

Invertebrates

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

Plants

The Virginia Bunchflower prefers wet areas of meadows, prairies, and savannas.

The Heart-leaved Plantain prefers swamps, floodplains, and streambanks shaded by mesic hardwood forests and are often found growing in rock crevices or gravel bars in shallow streams in heavily wooded areas.

Tubercled Blossoms prefer living in the sand or gravel bottoms of free-flowing, clean water streams and rivers.

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

Since no suitable habitat exists in the project area for any of the species mentioned above, no additional studies are anticipated.

There were no reports of occurrences from the Illinois Department of Natural Resources or the USFWS regarding previous sightings or the potential for suitable habitat for any of the state or federally threatened or endangered species (see Appendix A). However,

public comments were received about the state threatened Franklin's Ground Squirrel (*Spermophilus franklinii*) as potentially occurring within the project area.

A local environmental group (Friends of the Sangamon Valley) reported that the Franklin's ground squirrel is known to occur on abandoned railroad right-of-way on the far west side of Springfield. The preferred habitat at this location consists of abandoned, undisturbed railroad ballast for denning, with non-native grasses adjacent to the railroad embankment and large agricultural fields in close proximity for forage.

The project area was field surveyed in August 2010 for similar, suitable habitat and evidence of any active colonies. No suitable habitat or colony activity was observed. This is likely as a result of the active nature of the railroad line and the high disturbance from roadways, residents, and railroad right-of-way spraying for weed and brush control.

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 4.5.3), none of these species will be affected by the proposed action. 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.

4.5.4 Natural Areas

The only natural area in the vicinity of the project area is Carpenter Park Nature Preserve (Friends of the Sangamon Valley, 2004). This is an Illinois Natural Area Inventory (INAI) site according to the Illinois Department of Natural Resources. This natural area is north of Springfield and would not be affected by the proposed action.

According to the Illinois Natural Heritage Database there are no Illinois Natural Area Inventory (INAI) sites within the project area.

4.6 Air Quality

4.6.1 Air Quality Conformity

Air quality refers to the level of pollution in the air. Transportation sources produce several pollutants that can degrade the atmosphere. As required by the Clean Air Act and the 1990 Clean Air Act Amendments, the U.S. Environmental Protection Agency (USEPA) has established National Ambient Air Quality Standards (NAAQS) for six major air pollutants. These six criteria air pollutants are carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO2), particulate matter (PM10 and PM2.5), ozone (O3), and sulfur dioxide (SO2). Areas in which air pollution levels persistently exceed the NAAQS may be designated as "nonattainment." States with a nonattainment area must develop and implement a State Implementation Plan (SIP) containing policies and regulations that would bring about attainment of the NAAQS. Areas that had been designated as

nonattainment but that have attained the NAAQS for the criteria pollutant(s) associated with the nonattainment designation, would be designated as maintenance areas.

The Clean Air Act requires federal agencies to ensure that their actions conform to the appropriate SIP. Conformity regulations apply to federal actions occurring in air basins designated as nonattainment for criteria pollutants or in attainment areas subject to maintenance plans. Federal actions occurring in areas that are in attainment with criteria pollutants are not subject to the conformity rule. No portion of Sangamon County is within a designated nonattainment area or maintenance area.

4.6.2 Ambient Air Quality

The Illinois EPA and contributing local agencies maintain air quality monitors throughout Illinois. Monitors for sulfur dioxide, carbon monoxide, ozone, and particulate matter (PM2.5) are established in the City of Springfield. Table 4-12 lists the last three years of monitored data for Springfield. No exceedances of the NAAQS were reported for Springfield in years 2007, 2008, and 2009 (Illinois Environmental Protection Agency, 2008-2010).

Table 4-12. Air Quality Monitor Data for Springfield, Illinois (2007-2009)

Ozone	Number of Days			Highest Samples (ppm)					
	Greater Than			1-hr			8-hr		
Year	0.12 ppm(1)	0.08 ppm(2)	0.075 ppm(3)	1st	2nd	3rd	1st	2nd	3rd
2007	0	0	2	0.093	0.090	0.079	0.081	0.079	0.075
2008	0	0	0	0.073	0.073	0.071	0.064	0.061	0.059
2009	0	0	0	0.072	0.068	0.067	0.064	0.064	0.062
Particulate Matter ($PM_{2.5}$)	Number of Samples		98th Percentile Value	Highest Samples ($\mu g/m^3$)				Annual Arithmetic Mean	
Year	Total	>35µg/m³							
2007	102	0	34.3	34.6	34.3	34.3	32.0	13.0	
2008	112	0	24.1	29.9	27.3	24.1	23.8	11.0	
2009	115	0	21.7	23.0	22.4	21.7	21.5	10.6	
Carbon Monoxide	Number of Samples			Highest Samples (ppm)					
		1-hr	8-hr	1-hr Average			8-hr Average		
Year	Total	>35 ppm	>9 ppm	1st	2nd	3rd	1st	2nd	3rd
2007	8707	0	0	3.0	2.9	2.8	2.0	1.4	1.3
2008	8716	0	0	2.5	2.2	2.1	1.5	1.4	1.3
2009	8650	0	0	4.5	2.0	1.7	1.2	1.2	1.2
Sulfur Dioxide	Number of Samples			Highest Samples (ppm)					
		3-hr	24-hr	3-hr Average		24-hr Average		Annual Arithmetic Mean	
Year	Total	>0.5	>0.14	1st	2nd	1st	2nd		

2007	8672	0	0	0.122	0.120	0.053	0.051	0.003	
2008	8707	0	0	0.117	0.095	0.049	0.037	0.003	
2009	8707	0	0	0.032	0.021	0.005	0.005	0.001	

(1) USEPA revoked the one-hour ozone standard (0.12 parts per million (ppm)) in 1997.

(2) Although the current eight-hour ozone standard is 0.075 ppm, nonattainment designations currently only exist for the 1997 ozone standard (0.08 ppm).

(3) Two days having greater than the 0.075 ppm standard is acceptable since the fourth-highest daily maximum eight-hour concentration is used.

The Air Quality Index (AQI) is the national standard method for reporting air pollution levels to the general public. The AQI uses a single number and a short descriptor to define the air quality. The AQI is based on the short-term federal NAAQS, episode criteria, and significant harm levels for six of the criteria pollutants, namely ozone, sulfur dioxide, carbon monoxide, particulate matter (PM10), particulate matter (PM2.5), and nitrogen dioxide. The AQI number ranges from 0 to 301 and above and the corresponding descriptor categories are: Good (0-50), Moderate (51-100), Unhealthy for Sensitive Groups (101-150), Unhealthy (151-200), Very Unhealthy (201-300), and Hazardous (301 and above). The Springfield, Illinois sector (meaning the Springfield metropolitan area), had greater than 73 percent days in the Good air quality category for years 2007, 2008, and 2009; and no days in the sector were worse than the Moderate air quality category.

4.7 Noise/Vibration

In accordance with Federal Transit Administration and Federal Railroad Administration guidelines, a noise impact assessment was conducted for the proposed project. This section presents background information on noise and vibration, the criteria used to assess noise and vibration impact along with the methodology used to characterize the existing noise and vibration conditions for the project area in accordance with FTA and FRA guidelines. More information can be found in the Noise and Vibration Technical Report prepared for this project.

4.7.1 Noise and Vibration Impact Criteria

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

4.7.1.1 Rail Noise Criteria

FTA noise impact criteria are founded on well-documented research on community reaction to noise and are based on change in noise exposure using a sliding scale. Although higher rail noise levels are allowed in neighborhoods with high levels of existing noise, smaller increases in total noise exposure are allowed with increasing levels of existing noise. The FTA Noise Impact Criteria place noise sensitive land uses into the three categories as indicated in Table 4-13.

Table 4-13. FTA Land Use Categories

Land Use Category	Noise Metric (dBA)	Description of Land Use Category
1	Outdoor $L_{eq}(h)^{*(1)}$	Tracts of land where quiet is an essential element in their intended purpose. This category includes lands set aside for serenity and quiet, and such land uses as outdoor amphitheaters and concert pavilions, as well as National Historic Landmarks with significant outdoor use. Also included are recording studios and concert halls.
2	Outdoor $L_{dn}^{(2)}$	Residences and buildings where people normally sleep. This category includes homes, hospitals and hotels where a nighttime sensitivity to noise is assumed to be of utmost importance.
3	Outdoor $L_{eq}(h)^{*}$	Institutional land uses with primarily daytime and evening use. This category includes schools, libraries, theaters, and churches where it is important to avoid interference with such activities as speech, meditation and concentration on reading material. Places for meditation or study associated with cemeteries, monuments, museums, campgrounds and recreational facilities can also be considered to be in this category. Certain historical sites and parks are also included.
* L_{eq} for the noisiest hour of transit-related activity during hours of noise sensitivity.		
1) $L_{eq(h)}$ represents the noisiest level of sound measured during the sampling period. 2) L_{dn} represents the cumulative noise exposure levels for a 24-hour period (day-night).		
Source: FTA, May 2006		

Ldn is used to characterize noise exposure for residential areas (Category 2). For other noise-sensitive land uses, such as outdoor amphitheaters and school buildings (Categories 1 and 3), the maximum one-hour Leq during the operating period is used. Leq is the average noise level for the sampling period, and Leq(h) is the peak level of that same period of sampling.

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

- Severe Impact: Project-generated noise in the severe impact range can be expected to cause a significant percentage of people to be highly annoyed by the new noise and represents the most compelling need for mitigation. Noise mitigation would normally be specified for severe impact areas unless there are truly extenuating circumstances which prevent it.

- Moderate Impact: In this range of noise impact, the change in the cumulative noise level is noticeable to most people but may not be sufficient to cause strong, adverse reactions from the community. In this transitional area, other project-specific factors must be considered to determine the magnitude of the impact and the need for mitigation. These factors include the existing level, the predicted level of increase over existing noise levels, the types and numbers of noise-sensitive land uses affected, the noise sensitivity of the properties, the effectiveness of the mitigation measures, community views and the cost of mitigating noise to more acceptable levels.

According to FTA guidance, historically significant sites fall into noise-sensitive categories according to their land use activities. Sites where outdoor interpretation is

important fall into Category 1. Buildings in commercial or industrial areas that are significant for a particular style of architecture or for their designers are not intrinsically noise-sensitive. They may be protected under other legislation (Section 4(f) of the DOT Act and Section 106 of the National Historic Preservation Act), but do not fall into any of the land use categories associated with noise sensitivity.

The noise impact criteria are summarized in graphical form in Chart 4-1. This chart shows the existing noise exposure and the additional noise exposure from the rail project that would cause either "moderate" or "severe" impact. The future noise exposure would be the combination of the existing noise exposure and the additional noise exposure caused by the proposed rail project. Chart 4-2 expresses the same criteria in terms of the increase in total or cumulative noise that can occur in the overall noise environment before impact occurs.

Chart 4-1. FTA Project Noise Impact Criteria

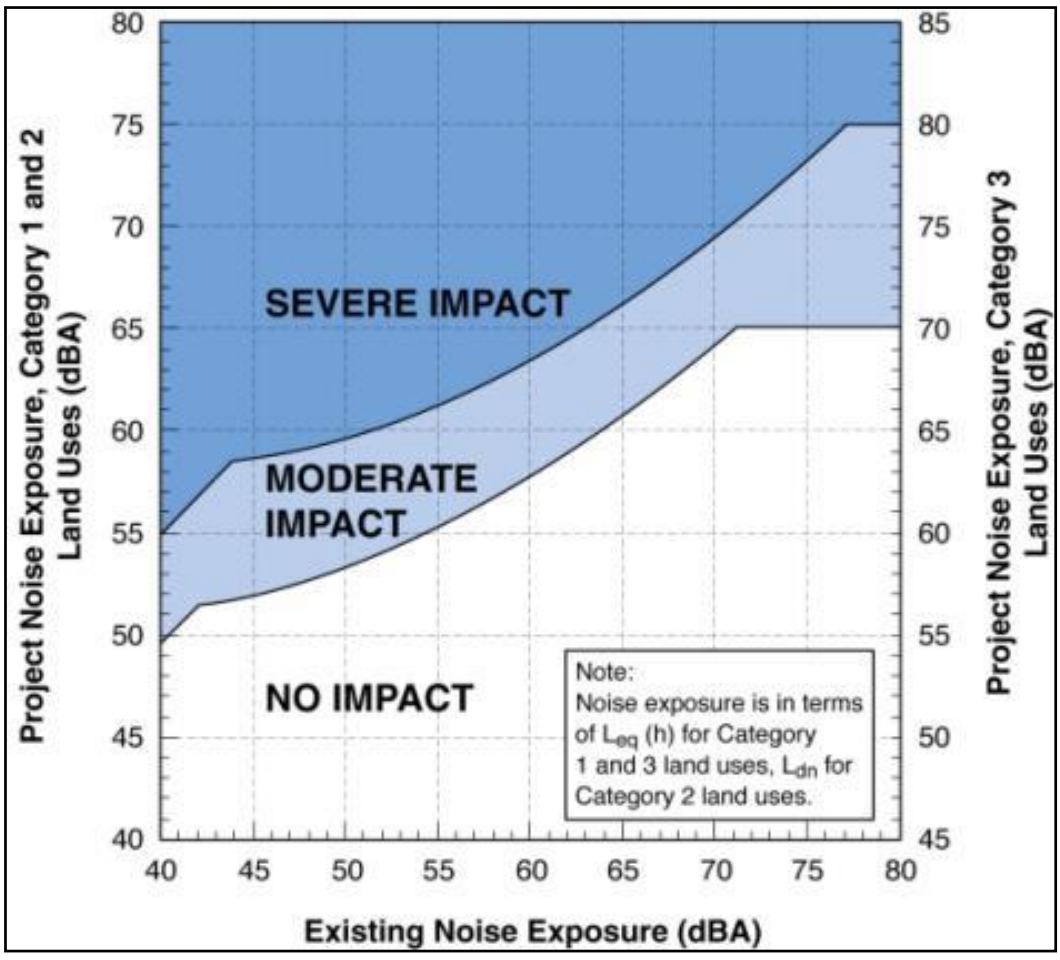
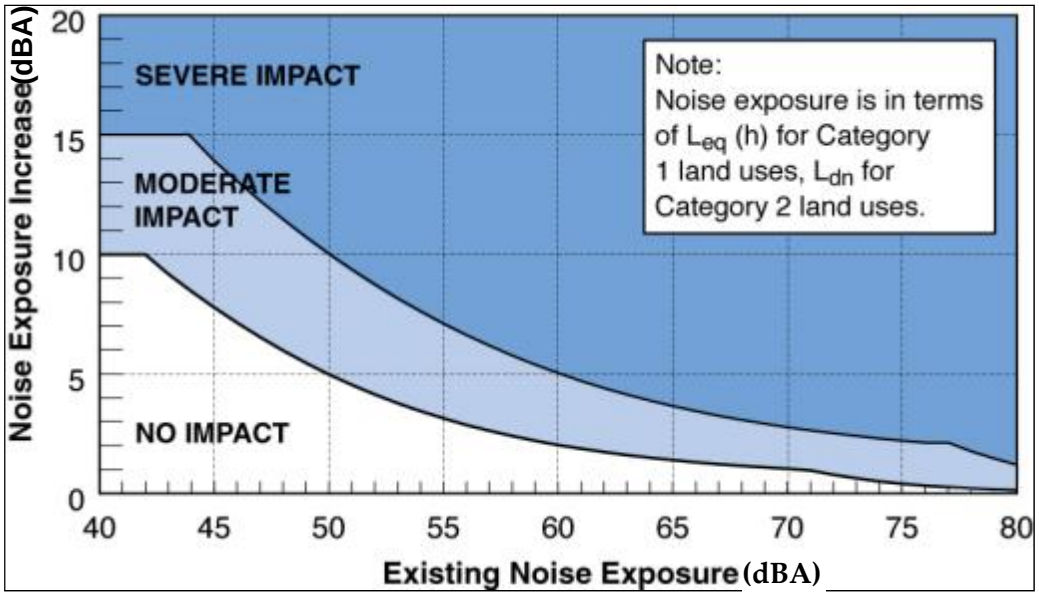


Chart 4-2. Increase in Cumulative Noise Exposure Allowed by FTA Criteria



4.7.1.2 Rail Ground-Borne Vibration Criteria (GBV)

The FTA GBV impact criteria are based on land use and operational frequency, as shown in Table 4-13 and are given in terms of the maximum root mean square amplitude (RMS) vibration level for an event. There are some buildings, such as medical facilities, concert halls, recording studios and theaters that can be very sensitive to vibration but do not fit into any of the three categories listed in Table 4-14. Because of the sensitivity of these buildings, they usually warrant special attention during the environmental assessment of a transit project. Table 4-15 gives criteria for acceptable levels of GBV for various types of special buildings.

It should be noted that Table 4-14 and Table 4-15 include separate FTA criteria for ground-borne noise; the "rumble" that can be radiated from the motion of room surfaces in buildings as a result of GBV. Although expressed in dBA, which emphasizes the more audible middle and high frequencies, the criteria are set significantly lower than for airborne noise to account for the annoying low-frequency character of ground-borne noise. Because airborne noise often masks ground-borne noise for above ground (i.e., at-grade or elevated) transit systems, ground-borne noise criteria are primarily applied to subway operations where airborne noise is not a factor. For above-grade transit systems, ground-borne noise criteria are applied only to buildings that have sensitive interior spaces that are well insulated from exterior noise.

Table 4-14. FTA Ground-Borne Vibration and Ground-Borne Noise Impact Criteria

Land Use Category	Ground-Borne Vibration Impact Levels (VdB re 1 micro-inch/sec)			Ground-Borne Noise Impact Levels (dB re 20 micro Pascals)		
	Frequent Events[1]	Occasional Events[2]	Infrequent Events[3]	Frequent Events[1]	Occasional Events[2]	Infrequent Events[3]
Category 1: Buildings where vibrations would interfere with interior operations.	65 VdB[4]	65 VdB[4]	65 VdB[4]	N/A[4]	N/A[4]	N/A[4]
Category 2: Residences and buildings where people normally sleep.	72 VdB[(6)]	75 VdB	80 VdB	35 dBA	38 dBA	43 dBA
Category 3: Institutional land uses with primarily daytime use.	75 VdB	78 VdB	83 VdB	40 dBA	43 dBA	48 dBA

(1) "Frequent Events" is defined as more than 70 vibration events of the same source per day. Most rapid transit projects fall into this category.
(2) "Occasional Events" is defined as between 30 and 70 vibration events of the same source per day. Most commuter trunk lines have this many operations.
(3) "Infrequent Events" is defined as fewer than 30 vibration events of the same kind per day. This category includes most commuter rail branch lines.
(4) This criterion limit is based on levels that are acceptable for most moderately sensitive equipment such as optical microscopes. Vibration-sensitive manufacturing or research would require detailed evaluation to define the acceptable vibration levels. Ensuring lower vibration levels in a building often requires special design of the HVAC systems and stiffened floors.
(5) Vibration-sensitive equipment is generally not sensitive to ground-borne noise.
(6) VdB represents vibration velocity levels in decibels.

Source: FTA, May 2006

Table 4-15. Ground-Borne Vibration and Noise Impact Criteria for Special Buildings

Land Use Category	GBV Impact Levels (VdB re 1 micro-inch/sec)		GBN Impact Levels (dB re 20 micro Pascals)	
	Frequent Events[1]	Occasional or Infrequent Events[2]	Frequent Events[1]	Occasional or Infrequent Events[2]
Concert Halls	65 VdB[(4)]	65 VdB	25 dBA	25 dBA
TV Studios	65 VdB	65 VdB	25 dBA	25 dBA
Recording Studios	65 VdB	65 VdB	25 dBA	25 dBA
Auditoriums	72 VdB	80 VdB	30 dBA	38 dBA
Theaters	72 VdB	80 VdB	35 dBA	43 dBA

(1) "Frequent Events" is defined as more than 70 vibration events of the same source per day. Most rapid transit projects fall into this category.
(2) "Occasional or Infrequent Events" is defined as fewer than 70 vibration events per day. This category includes most commuter rail systems.
(3) If the building would rarely be occupied when the trains are operating, there is no need to consider impact. As an example, consider locating a commuter rail line next to a concert hall. If no commuter trains would operate after 7 pm, it should be rare that the trains interfere with the use of the hall.
(4) VdB represents vibration velocity levels in decibels.

Source: FTA, May 2006

4.7.1.3 Construction Noise Criteria

Construction noise criteria are based on the guidelines provided in the FTA Guidance Manual. These criteria, summarized in Table 4-16 below, are based on land use and time of day and are given in terms of Leq for an 8-hour work shift.

Table 4-16. FTA Construction Noise Criteria

Land Use	Noise Limit, 8-Hour	
	Daytime	Nighttime
Residential	80	70
Commercial	85	85
Industrial	90	90
Source: FTA, May 2006		

4.7.2 Existing Conditions

4.7.2.1 Existing Noise Environment

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

To establish a base of existing environmental noise levels for the project noise impact assessment, a series of noise measurements was conducted within the study area. Existing ambient noise levels in the project area were characterized through direct measurements at selected sites along the project corridors during the period from March 29 through April 2, 2010. The measurements consisted of long-term (24-hour) and short-term (60-minute) monitoring of the A-weighted sound level at representative noise-sensitive locations. Twelve long-term and seven short-term noise measurements were conducted. The locations were selected to be representative of the noise environment in general and especially at locations most likely to be impacted by train noise. At each site, the measurement microphone was positioned to characterize the exposure of the site to the dominant noise sources in the area. Larson Davis noise monitors models 820 and 870 were used for gathering noise data. The noise measurement locations are shown in Exhibit 4-13.

The results of the existing ambient noise measurements, summarized in Table 4-17, serve as the basis for determining the existing noise conditions at all noise-sensitive receptors along the proposed rail alignment. For each site, the table lists the adjacent corridor(s), site location, measurement details, and the measured noise level. The results at each site are further described below. For each of the short-term measurement sites the measured Leq was used to estimate the Ldn by subtracting 2 decibels according to methodology in Appendix D: Determining Existing Noise, in the FTA guidance manual. The short-term sites are designated as (ST) in Table 4-17

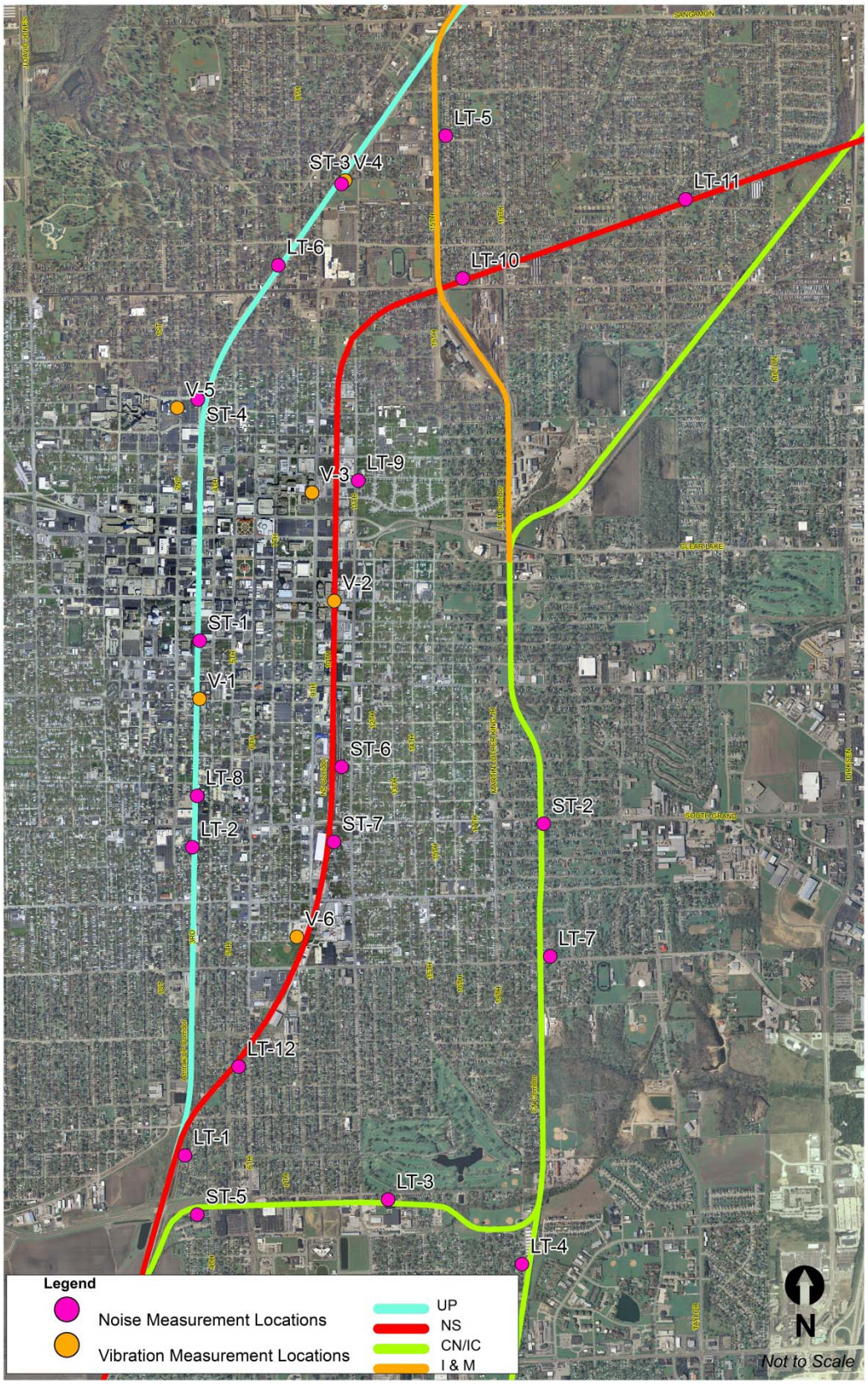


Exhibit 4-13. Noise and Vibration Locations

Table 4-17. Summary of Existing Ambient Noise Measurement Results

Site No.	Corridor	Measurement Location Description	Start of Measurement		Distance to Existing Track (ft)	Meas. Duration (hrs)	Noise Exposure[1] (dBA)	
			Date	Time			Ldn	Leq
LT-1	UP/NS	2553 Burton St	3-29-10	12:00	178	24	65	--
LT-2	UP	232 Pine St	3-29-10	13:00	42	24	76	--
LT-3	CN	1140 Stanford Ave	3-29-10	15:00	70	24	56	--
LT-4	CN	2949 Foxbridge St	3-29-10	16:00	144	24	63	--
LT-5	I&M	1819 Fairfield St	3-30-10	14:00	163	24	63	--
LT-6	UP	1307 Peoria St	3-30-10	15:00	41	24	75	--
LT-7	CN	2107 Ash St	3-30-10	17:00	198	24	71	--
LT-8	UP	1137 4th Court	3-30-10	18:00	40	24	78	--
LT-9	NS	1104 E Mason St	3-31-10	16:00	439	24	72	--
LT-10	NS/I&M	1516 Wieland Ave	3-31-10	16:00	46	24	81	--
LT-11	NS	2330 Ramsey Ave	3-31-10	19:00	51	24	80	--
LT-12	NS	2331 6th St	3-31-10	20:00	82	24	67	--
ST-1	UP	Central Baptist Church	3-30-10	11:43	41	1	56	58
ST-2	CN	S Grand Ave and McCreery Ave	3-31-10	9:50	58	1	61	63
ST-3	UP	Black St and 11th St	3-31-10	16:39	92	1	72	74
ST-4	UP	Dodge St and 3rd St	4-1-10	10:55	168	1	69	71
ST-5	CN	Scope Daycare	4-1-10	12:16	151	1	53	55
ST-6	NS	Barrett St and Kansas St	4-1-10	16:26	187	1	57	59
ST-7	NS	Pine St and 10 ½ St	4-2-10	9:44	115	1	64	66

1. For sites ST-1 through ST-7, the Leq measurements (highlighted in yellow) were used to estimate the Ldn at all locations using methodology in Appendix D of the FTA guidance manual for estimating noise exposure. This approach tends to be conservative and underestimate the existing noise levels, which can result in higher levels of noise impact for a project.

Site LT-1: 2553 Burton Street. The Ldn measured over a 24-hour period in the back yard of this single-family residence was 65 dBA. Freight and passenger trains on both the UP and NS rail lines contributed to the noise environment at this location. Local roadway traffic on Burton Street and residential community activity also contributed to the noise level.

Site LT-2: 232 Pine Street. The Ldn measured over a 24-hour period in the back yard of this single-family residence was 76 dBA. UP rail traffic and local roadway traffic on Pine Street, 3rd Street, South Grand Avenue, and Cedar Street contributed to the noise environment at this location. Residential community activity also contributed to the noise level.

Site LT-3: 1140 Stanford Avenue. The Ldn measured over a 24-hour period in the back yard of this single-family residence was 56 dBA. Local roadway traffic on Stanford Avenue and 11th Street and residential community activity contributed to the noise environment at this location. Although the site was located adjacent to the CN railroad, rail traffic did not contribute to the noise level as no train pass-bys occurred.

Site LT-4: 2949 Foxbridge Street. The Ldn measured over a 24-hour period in the front yard of this single-family residence was 63 dBA. Local roadway traffic on Foxbridge Street and rail traffic on the CN line contributed to the noise environment at this location. Residential community activity also contributed to the noise level.

Site LT-5: 1819 Fairfield Street. The Ldn measured over a 24-hour period in the back yard of this single-family residence was 63 dBA. Local roadway traffic on Fairfield Street and rail traffic on the I&M line contributed to the noise environment at this location. Residential community activity also contributed to the noise level.

Site LT-6: 1307 Peoria Road. The Ldn measured over a 24-hour period in the front yard of this single-family residence was 75 dBA. Local roadway traffic on Peoria Road, North Grand Avenue, and Eastman Avenue contributed to the noise environment at this location. UP rail traffic and residential community activity also contributed to the noise level.

Site LT-7: 2107 Ash Street. The Ldn measured over a 24-hour period on the property of this single-family residence was 71 dBA. Local roadway traffic on Ash Street and rail traffic on the CN line contributed to the noise environment at this location. Residential community activity also contributed to the noise level.

Site LT-8: 1137 4th Court. The Ldn measured over a 24-hour period on the property of this single-family residence was 78 dBA. Freight and passenger trains on the UP rail line and local roadway traffic on 4th Street and 4th Court contributed to the noise environment at this location. Residential community activity also contributed to the noise level.

Site LT-9: 1104 East Mason Street. The Ldn measured over a 24-hour period on the property of this multi-family residence was 72 dBA. Local roadway traffic on Mason Street, 11th Street, and Reynolds Street contributed to the noise environment at this location. NS rail traffic and residential community activity also contributed to the noise level.

Site LT-10: 1516 Wieland Avenue. The Ldn measured over a 24-hour period on the property of this single-family residence was 81 dBA. Rail traffic on both the NS and I&M lines contributed to the noise environment at this location. The noise environment was also added to by local roadway traffic on North Grand Avenue, Wieland Avenue, 16th Street, and other nearby local roads. Residential community activity and industrial activity also contributed to the noise level. This site is across from Lanphier High School

Site LT-11: 2330 Ramsey Avenue. The Ldn measured over a 24-hour period in the back yard of this single-family residence was 80 dBA. NS rail traffic and local roadway traffic on Ramsey Avenue contributed to the noise environment at this location. Residential community activity also contributed to the noise level, including outdoor activity at Learning Nook Preschool (approximately 300 feet away).

Site LT-12: 2331 6th Street. The Ldn measured over a 24-hour period in the back yard of this single-family residence was 67 dBA. Rail traffic on the NS line and local roadway traffic on 6th Street contributed to the noise environment at this location. Residential community activity also contributed to the noise level.

Site ST-1: Central Baptist Church – 501 South 4th Street. The Leq measured over a one-hour period on the property of this church was 58 dBA, resulting in a predicted Ldn of 56 dBA. Local roadway traffic on Jackson Street, 3rd Street, and 4th Street contributed to the noise environment at this location. The site was adjacent to the UP rail line, but no train pass-bys occurred during the measurement. Urban community activity also contributed to the noise level.

Site ST-2: South Grand Avenue and McCreery Avenue. The Leq measured over a one-hour period at this intersection was 63 dBA, resulting in a predicted Ldn of 61 dBA. Local roadway traffic on South Grand Avenue and residential community activity contributed to the noise environment at this location. The site was adjacent to the CN rail line, but no train pass-bys occurred during the measurement.

Site ST-3: Black Street and 11th Street. The Leq measured over a one-hour period at this intersection was 74 dBA, resulting in a predicted Ldn of 72 dBA. Local roadway traffic on 11th Street and passenger trains on the UP rail line contributed to the noise environment at this location.

Site ST-4: Dodge Street and 3rd Street. The Leq measured over a one-hour period at this intersection near Memorial Medical Center was 71 dBA, resulting in a predicted Ldn of 69 dBA. Freight train traffic on the UP rail line and local roadway traffic on 3rd Street and Dodge Street contributed to the noise environment at this location. Residential community and hospital activity also contributed to the noise level.

Site ST-5: Scope Daycare – 2715 South 4th Street. The Leq measured over a one-hour period on the property of this daycare and school was 55 dBA, resulting in a predicted Ldn of 53 dBA. The noise environment at this location was contributed to by local roadway traffic on Stanford Avenue and 4th Street. There were no train passby events during the measurement period.

Site ST-6: Barrett Street and Kansas Street. The Leq measured over a one-hour period at this intersection was 59 dBA, resulting in a predicted Ldn of 57 dBA. NS rail yard traffic, local roadway traffic on 11th Street, and residential community activity contributed to the noise environment at this location.

Site ST-7: Pine Street and 10 ½ Street. The Leq measured over a one-hour period at this intersection was 66 dBA, resulting in a predicted Ldn of 64 dBA. NS trains and rail yard traffic, local roadway traffic on 10 ½ Street and 11th Street, and residential community activity contributed to the noise environment at this location.

4.7.2.2 Existing Vibration Environment

The existing vibration environment in Springfield varies depending on proximity to rail lines and frequency of rail traffic. To characterize existing vibration levels, vibrations from freight and Amtrak trains were measured on the UP and NS rail lines. Vibration levels were also measured at several vibration-sensitive locations, including the Dana Thomas House, St. John's Hospital and Memorial Medical Center to determine the potential for vibration impact from increased rail traffic. Measurements were made using PCB 393A and 393C accelerometers and a TEAC LX-110 digital recorder. The vibration measurement locations are shown in Exhibits 5-1 and 5-2. The existing vibration locations are shown in Table 4-18 and described in detail below.

Vibration levels for a number of trains were measured in Springfield. The measured data are consistent with the typical locomotive vibration level versus distance curve in the FTA guidance manual.

Site V-1: Dana Thomas House – 301 East Lawrence Avenue. Vibration levels were measured on the sidewalk next to this National Historic Landmark at four distances from the UP tracks at 45 feet, 75 feet, 105 feet and 130 feet. The edge of the building sits 105 feet from the existing tracks.

Site V-2: Lincoln Depot – 10th Street and Monroe Street. Vibration levels were measured in the parking lot of this National Historic Landmark at three distances from the existing NS tracks at 30 feet, 55 feet and 70 feet. The edge of the building sits 30 feet from the tracks.

Site V-3: St. John's Hospital – 800 East Carpenter Street. Vibration levels were measured from the building edge of this hospital at 450 feet from the existing NS tracks.

Site V-4: Black Street and 11th Street. Vibration levels were measured in a field by this intersection at five distances from the existing UP tracks at 60 feet, 85 feet, 110 feet, 135 feet and 160 feet.

Site V-5: Memorial Medical Center – 701 North 1st Street. Vibration levels were measured from the building edge of this hospital at 595 feet from the existing UP tracks.

Site V-6: Oak Street and 8th Street. Vibration levels were measured on a concrete lot by this intersection at five distances from the existing NS tracks at 45 feet, 75 feet, 95 feet, 120 feet and 145 feet. This site is adjacent to Iles Park.

Table 4-18 Existing Vibration Measurement Locations (1)

Site No.	Corridor	Measurement Location Description	Date
V-1	3rd	Dana Thomas House - 301 East Lawrence Avenue	3-29-10
V-2	10th	Lincoln Depot - 10th Street and Monroe Street	3-30-10
V-3	10th	St. John's Hospital - 800 East Carpenter Street	3-31-10
V-4	3rd	Black Street and 11th Street	3-31-10, 4-1-10

V-5	3rd	Memorial Medical Center - 701 North 1st Street	4-1-10
V-6	10th	Oak Street and 8th Street	4-1-10
Source: Harris Miller Miller & Hanson Inc., 2011			
(1) Vibration measurements were taken from multiple locations at each site, therefore the measurement data is not included in this table.			

4.8 Water Quality/Resources

4.8.1 Surface Water Resources

The project area is within the Lower Sangamon River Sub-basin of the larger Sangamon River Drainage Basin (see Exhibit 4-14) (McConkey, et al, 2011). This basin forms the largest watershed of any tributaries to the Illinois River. The Sangamon River Basin ultimately drains an area of 5,419 square miles to the Mississippi River via the Illinois River (IEPA, 2011).

The surface water resources in Sangamon County include Lake Springfield, the Sangamon River, the South Fork of the Sangamon River, Cantrall Creek, Fancy Creek, Wolf Creek, Spring Creek, Sugar Creek, Lick Creek, Panther Creek, Brush Creek, Horse Creek, an extensive network of smaller tributary streams and ditches, several natural and man-made lakes, ponds and scattered remnants of marshes and other wetlands (Illinois Department of Natural Resources, 2000). The surface water resources and 100 year floodplains near the project area are shown on see Exhibit 4-15. None of these surface water resources are within the project area, however surface water from the project area eventually flows into the resources mentioned below.

4.8.1.1 Lake Springfield

Lake Springfield is a 4,260 acre reservoir southwest of the City of Springfield. It was formed in 1931-1935 by building Spaulding Dam across Sugar Creek. The reservoir is the municipal water supply for the City of Springfield and is a cooling source for the City Water, Light & Power coal-fired electrical generating plant. It serves as a focus of local recreation for fishing and boating. Usual fish species include largemouth bass, bluegill, blue catfish, flathead catfish, and crappie.

4.8.1.2 Sangamon River

The Sangamon River and tributaries drain most of Sangamon County, including the project area, and the natural drainage is westward. The Sangamon River is the principle tributary of the Illinois River and is approximately 250 miles long. It drains an area of some 5,400 square miles, mostly rural agricultural lands in central Illinois. Its headwaters run from southeast of Bloomington, Illinois in southern McLean County east into Champaign County before flowing south and west towards Springfield, then north-northwest into Menard and Cass counties before joining the Illinois River north of Beardstown, Illinois. Salt Creek and the South Fork Sangamon River are its main tributaries.

One hundred fish species are supported within the lower Sangamon River system (IDNR, 2001). The headwaters of the Sangamon River and some small tributaries near the mouth of the Sangamon support particularly rich assemblages of fishes. Some of the unusual species include the rosy face shiner, silver redhorse, and freckled madtom. Habitats for aquatic animals in this river system include shallow and deep water pools, submerged aquatic vegetation, and riffles.

Exhibit 4-14. Watersheds

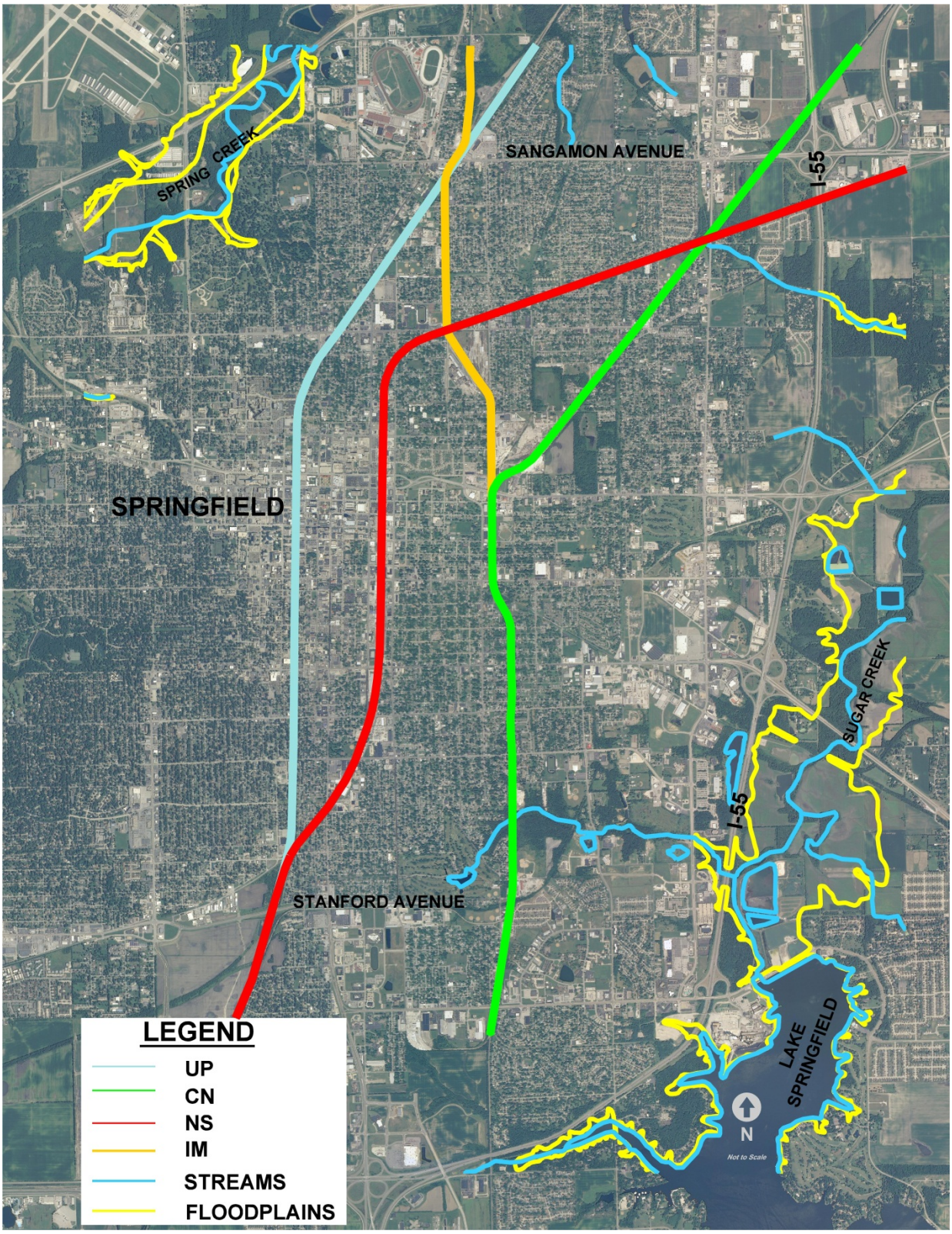


Exhibit 4-15. Streams and Floodplains

4.8.2 Water Quality

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

The major surface waters in Sangamon County, Lake Springfield and the Sangamon River, did not fully support all their designated uses in 2010. Lake Springfield fully supported aquatic life, fish consumption, and public and food processing water supply uses, but did not fully support the use of aesthetic quality. Listed causes for this impairment include elevated concentrations of total suspended solids, total phosphorus, and aquatic algae. Sources for these causes were golf courses, littoral shore area modifications, other recreational pollutions sources, and runoff from forest/grassland/parkland areas.

The Sangamon River did not support the designated uses of fish consumption and primary contact but did fully support aquatic life use. Causes for these impairments include elevated concentrations of polychlorinated biphenyls and fecal coliform. The sources for these pollutants are unknown.

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

4.8.3 Groundwater

Groundwater occurs in water-bearing units called aquifers. In Illinois, aquifers are sand-and-gravel aquifers, shallow bedrock aquifers, or deep bedrock aquifers. There are no shallow bedrock or deep bedrock aquifers in the project area (Brown, 2004). There are community water supply wells associated with the sand-and-gravel aquifer within the Sangamon River floodplain. The City of Springfield has community water supply wells (see Exhibit 4-16) (Wehrmann and Hlinka, 2006). At this time, there are no sole source aquifers in Illinois. No regulated groundwater recharge areas are within the project area.

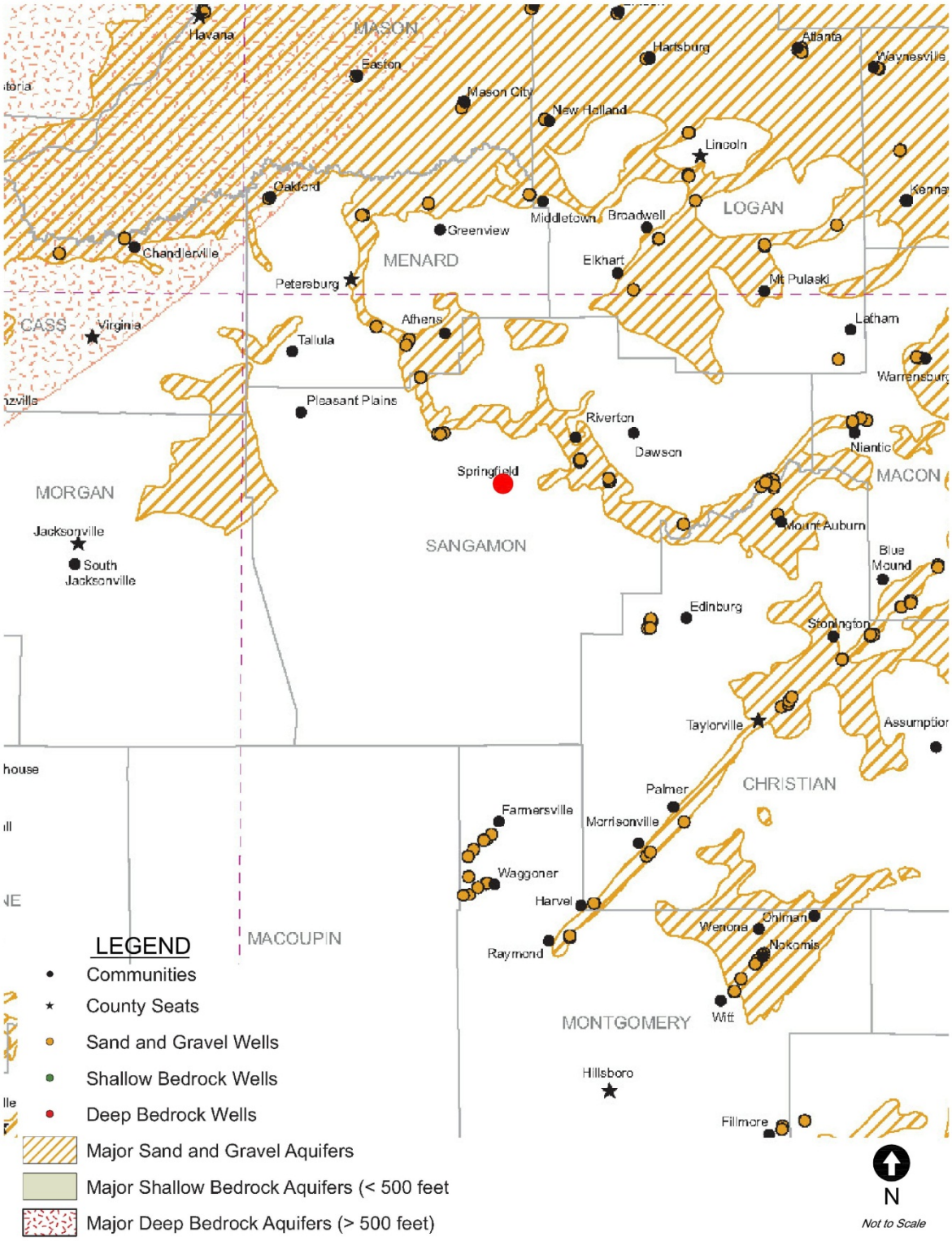


Exhibit 4-16. Wells and Aquifers

Alternatives 2A and 2B will 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.

4.9 Floodplains

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

Federal Emergency Management Agency (FEMA) mapping for the Springfield, Illinois area was reviewed to determine if 100 year floodplains were present in the project area.

Based on the floodplain mapping maintained by the Federal Emergency Management Agency, no work would be performed below the 100-year flood elevation, and as a result this improvement would not encroach upon any base floodplain. Therefore, there would be no impacts to floodplains, and no floodplain map revisions would be required. Alternatives 2A and 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.

4.10 Wetlands

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

Wetlands Inventory (NWI) mapping depicts a limited number of wetlands within the project area (see Exhibit 4-17).

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

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

No jurisdictional wetlands or waters of the United States were identified within the project limits of the retained alternatives. Therefore, none of the retained alternatives would require any right-of-way from any wetland areas, nor would any construction activities impact any wetlands.

4.11 Special Waste

EDR DataMap® - Area Study reports from Environmental Data Resources, Inc. (EDR) were obtained in January 2010 for information on regulated environmental sites within the corridors of the Springfield Rail Improvements Project (EDR, 2010). The EDR report summarizes publicly available information on sites listed in certain federal, state, and local regulatory databases and within search distances recommended by ASTM International Practice E 1527-05. The EDR Report includes a radius map that illustrates the approximate locations of the reported sites relative to the 3rd and 10th Street Corridors. Appendix B includes the radius maps and summary of sites reported within the 3rd and the 10th Street Corridors.

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

Federal CERCLIS (Comprehensive Environmental Response, Compensation and Liability Information System) – This database contains information on potential hazardous waste sites that have been reported to the USEPA by states, municipalities, private companies and private persons. CERCLIS contains sites which are either proposed to or on the National Priorities List (NPL) and sites which are in the screening and assessment phase for possible inclusion on the NPL.

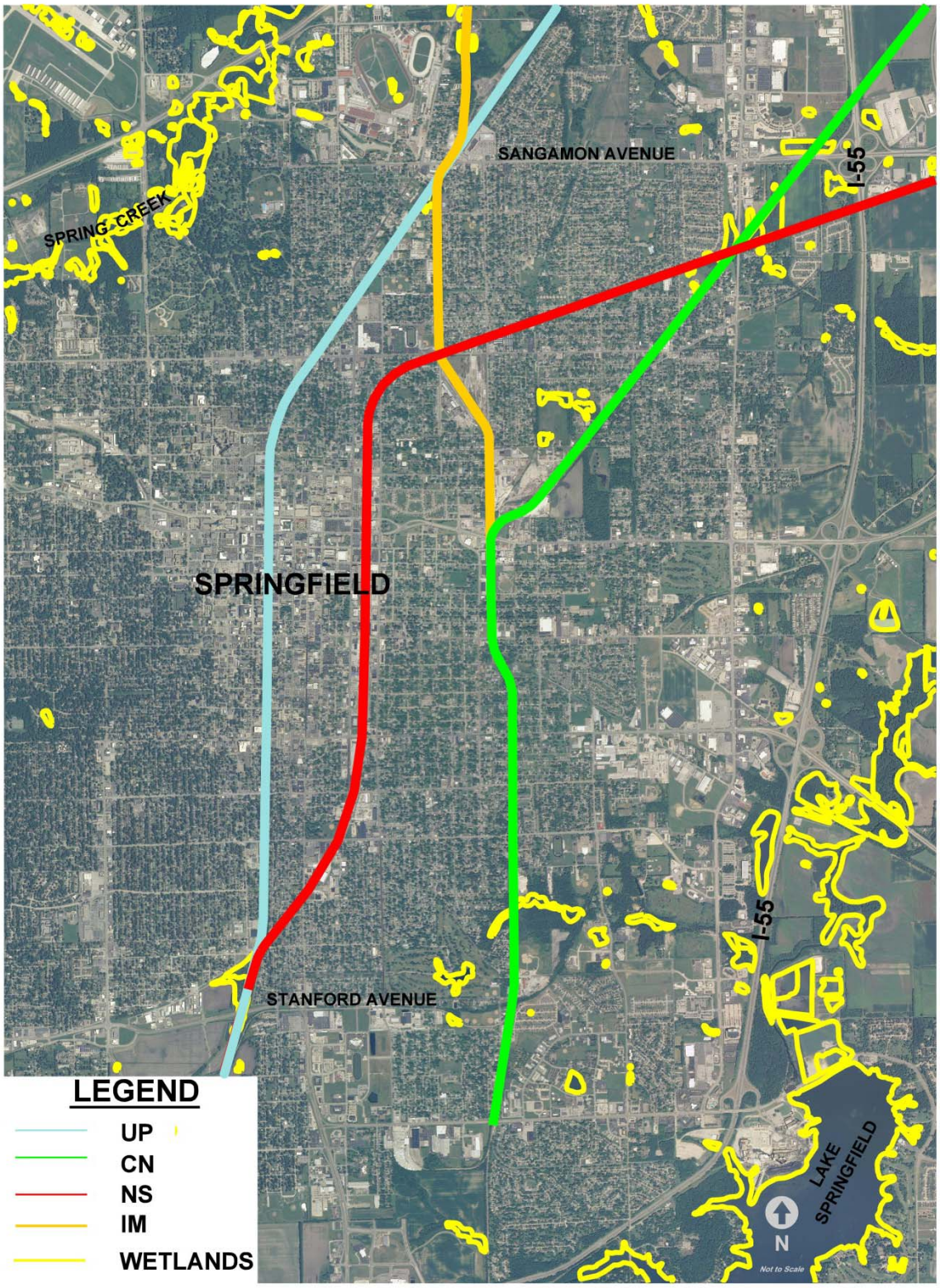


Exhibit 4-17. NWI Mapped Wetlands

CERCLIS-NFRAP (No Further Remedial Action Planned) – This database includes sites that have been removed and archived from the inventory of CERCLIS sites. Archived status indicates that, to the best of EPA's knowledge, assessment at a site has been completed and that EPA has determined no further steps would be taken to list the site on the NPL.

RCRA-LQG (Resource Conservation and Recovery Act – Large Quantity Generators) – This database includes sites that generate, transport, store, treat and/or dispose of hazardous waste. Large quantity generators (LQG) generate over 1,000 kg of hazardous waste, or over 1 kg of acutely hazardous waste per month.

RCRA-SQG (Resource Conservation and Recovery Act – Small Quantity Generators)– This database includes sites that generate, transport, store, treat and/or dispose of hazardous waste. Small quantity generators (SQG) generate between 100 kg of hazardous waste and 1,000 kg of hazardous waste per month.

ERNS (Emergency Response Notification System) – This database records and stores information on reported releases of oil and hazardous substances.
SHWS (State Hazardous Waste Sites) – This database includes state hazardous waste sites that may or may not be listed in the federal CERCLIS database.

SWF/LF (Solid Waste Facilities/Landfill Sites) – This database includes solid waste disposal facilities or landfills.

LF (Landfill) SPECIAL WASTE – This database includes landfills that accept non-hazardous special waste.

LUST (Leaking Underground Storage Tank) – This database includes reported leaking underground storage tank incidents.

UST (Underground Storage Tank) – This database includes registered underground storage tanks.

SRP (Site Remediation Program) – This database identifies the status of all voluntary remediation projects administered through the site remediation program.

DRYCLEANERS – This database includes dry cleaning facilities that are required to apply for a license through the Illinois Drycleaner Environmental Response Fund.

MGP (Manufactured Gas Plant) – This database includes records of former manufactured gas plants that were used in the 1800's to the 1950's to produce a gas that could be used as fuel.

The USEPA listing of potential, suspected, and known hazardous waste or hazardous substances sites in the project area (i.e., CERCLIS list) was reviewed on February 10, 2012, to ascertain whether any listed sites occur within the project area. Two CERCLIS sites are within or adjacent to the project area and are shown in Table 4-19.

Table 4-19. CERCLIS Sites within the Project Area

Site Name	Address	Distance from Alternatives 2A and 2B (feet)
Nutronics, Inc.	1703 Peoria Road, Springfield, IL 62702	Adjacent to project area
Springfield Iron Company	NE corner of Ridgely and Factory Street, Springfield, IL 62794	Within project area

4.11.1 Project Area – 10th Street Corridor

Table 4-20 contains a summary of environmental sites that may indicate potential hazardous or special waste within the project area (10th Street corridor).

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

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

Most of the LUST sites have completed remediation activities; 14 LUST sites do not have No Further Remediation (NFR) letters issued, indicating that remediation activities have not been completed. The individual listing of an environmental site within the corridor does not necessarily indicate that contamination associated with that site would be encountered during construction. Additional information would need to be gathered to

determine if a reported site may have produced contamination that may be encountered during the construction project.

Table 4-20. Hazardous Materials Sites within Project Area (10th Street Corridor)

Number of Sites	Database
2	Federal CERCLIS
4	CERC NFRAP
1	RCRA-LQG
38	RCRA-SQG
3	ERNS
5	SHWS
4	SWF/LF
1	LF Special Waste
91	LUST
101	USTs
12	SRPs
2	Drycleaners
3	MGP

Based on the information reviewed at this time, rail construction may encounter petroleum-contaminated soils at several locations within the corridor. Construction activities may require coordination with the responsible parties of the LUST sites and other reported sites concerning the disposal of excavated materials. However, these sites should not present major impairments to rail improvements within the railroad corridor.

4.12 Special Lands

4.12.1 Section 4(f) Resources

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

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

1) there is no feasible and prudent alternative to using that land; and

2) the program or project includes all possible planning to minimize harm to the park, recreation area, wildlife and waterfowl refuge, or historic site resulting from the use.

A *de minimis* finding can also be determined for minor impacts to Section 4(f) resources. For publicly owned public parks, recreation areas, and wildlife and waterfowl refuges, a *de minimis* impact is one that will not adversely affect the activities, features, or attributes of the property. For historic sites, a *de minimis* impact means that either no historic property is affected by the project or that the project will have "no adverse effect" on the historic property. A *de minimis* impact determination does not require analysis to determine if avoidance alternatives are feasible and prudent, but consideration of avoidance, minimization, mitigation or enhancement measures should occur.

Impacts to Section 4(f) resources require a separate evaluation, which must be approved by the federal transportation agency involved. The Section 4(f) statute requires all possible planning to minimize harm, which should be determined through consultation with the official or agency owning or administering the land. The replacement of Section 4(f) land used for transportation projects is not required; however, mitigation measures can involve replacement of land and facilities of comparable value and function or monetary compensation which could be used to enhance the remaining land.

An inventory of parks within the project area was conducted based on mapping and coordination from the Springfield Park District. Three parks are within the project area (i.e, 11th and Black, Lanphier, and Iles Parks) (SSCRPC, 2009). Exhibit 4-18 depicts the locations of the parks within the project area.

Springfield's historic sites include the national, state and local Abraham Lincoln's home, tomb and law office. The Abraham Lincoln Presidential Library and Museum is a world class attraction that informs all who visit about the life of this great President and the historic period in which he lived. Refer to Table 4-11 for potentially historic resources within the project area.

The greater Springfield area currently has about 35 miles of bikeway, consisting of about 21 miles of trail and 14 miles of bike lanes or wide shoulders. Existing trails and routes are shown in Exhibit 4-8. Recreational trails are only protected if they are part of a park and not solely a transportation facility.

4.12.2 Section 6(f) Lands

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

> . . . No property acquired or developed with assistance under this section or Section 1010 of the Urban Park and Recreation Recovery Act of 1978) shall, without the approval of the Secretary (Secretary of the U.S. Department of Interior), be converted to other than public outdoor recreation uses. The Secretary shall approve such conversion only if he finds it to be in accord with the then existing comprehensive statewide outdoor recreation plan and only upon such conditions as this deems necessary to assure the substitution of other

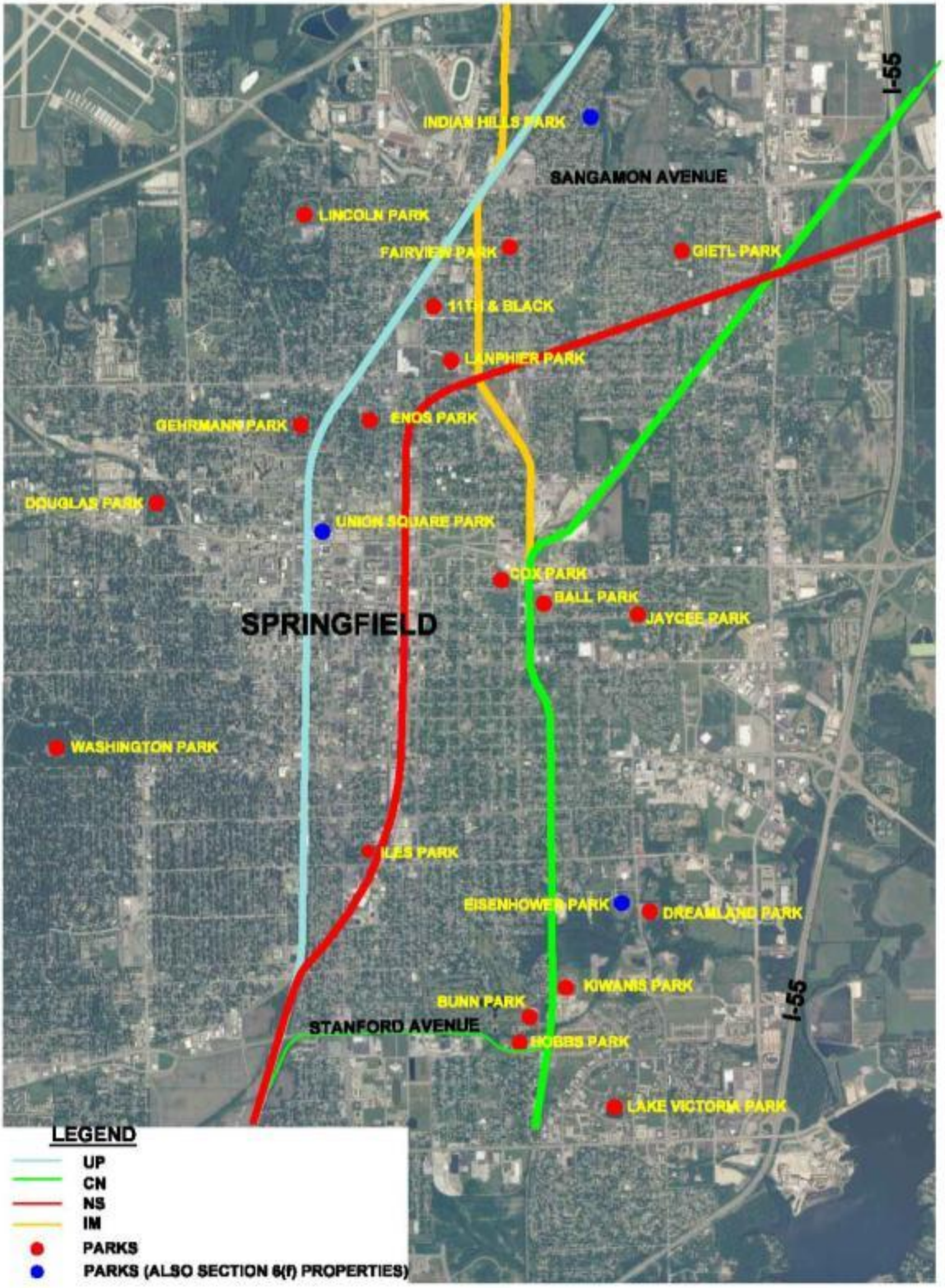


Exhibit 4-18. Parks

recreation properties of at least equal fair market value and of reasonably equivalent usefulness and location. Impacts to Section 6(f) properties must be coordinated through the regional director of the National Park Service (NPS).

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

4.13 Public Health, Safety and Security

FRA has primary authority over railroad safety. FRA's regulations, which apply to all railroads, govern most aspects of railroad safety, including rail operations, track, and signaling, as well as rolling stock, such as locomotives and freight cars (49 CFR 200-299). The states also have an important role in freight rail safety, especially at highway/rail at-grade crossings. Other groups that establish standards and practices for the industry include the Association of American Railroads (AAR), the American Short Line and Regional Railroad Association (ASLRRA), and the American Railway Engineering and Maintenance-of-Way Association (AREMA).

4.13.1 Rail Operations Safety and Security

4.13.1.1 Train Operations

FRA's Track Safety Standards (49 CFR 213) are based on classifications of track that determine maximum operating speed limits, inspection frequencies, and standards of maintenance, among other issues. Higher track classes require more stringent maintenance standards to support higher allowable maximum operating speed. The existing passenger service is designated Class 4, allowing maximum speeds up to 79 mph. Existing maintenance and inspection requirements, as documented in the existing service plan, meet FRA Class 4 standards.

In the current security climate, rail line security continues to be a prominent concern. Access points are of particular concern. Each of the corridors through Springfield is accessible from many miles of arterial and secondary roadways where no security measures are practicable.

4.13.1.2 Passenger Areas

Passengers interact with the rail system at stations, on platforms, and within passenger trains. These facilities are susceptible to a range of safety and security threats ranging from personal accidents (e.g., slips or trips) to criminal activity (e.g., theft or terrorism Passenger Areas). Platform areas add risks associate with moving trains and train boarding. Finally, once on the train, passengers are at risk for these same incidents.

Amtrak has previously reviewed the Springfield passenger station to ensure that appropriate safety measures, tailored to the specific setting, are in place. Each station

and train includes a set of security infrastructure to deter or respond to safety or security incidents that may include:

- Lighting
- Fire/life safety systems
- Video cameras
- Public address systems

Amtrak, along with the Amtrak Police Departments, has a range of behind-the-scenes and front-line security measures in place to ensure passenger rail security. Among these security measures, some of which are conducted on an unpredictable or random basis, passengers may notice any of the following in stations or onboard trains:

- Uniformed police officers and Special Operations Units
- Random passenger and carry-on baggage screening and inspection
- K-9 units
- Checked baggage screening
- Onboard security checks
- Identification checks

These measures are customized to each setting based on reviews of potential incidents and occurrence risk.

4.13.2 Crossing Safety

4.13.2.1 Rail-Rail Crossings

The existing alignment utilized for passenger service from Chicago to St. Louis includes two locations in the Springfield project area where it crosses another rail line at –grade – the I&M crossing south of Sangamon Avenue and the NS crossing north of Stanford Avenue. The movement of rail traffic through these intersections, called interlocking, is governed similarly to a highway intersection. Traffic signals show a green light in one direction and a red light in another direction to eliminate conflicting movements. Railroad interlockings differ slightly in the priority can be assigned by the interlocking controller.

A dispatcher controls the movement of both passenger trains and freight trains on the same track or tracks. Redundant safeguards are in place to avoid conflicting movements that could result in a collision. Nevertheless, the risk does exist for accidents to occur that could impact the safety of passengers aboard trains or train crews. Potential risks include two types of accidents: either a collision of two trains on the same track, or a

derailed train on one track being struck by a moving train on the adjacent track. All such accidents are reported to FRA, who has jurisdiction over safety and maintains a database of such accidents.

4.13.2.2 Highway-Rail Crossings

There are two kinds of highway/rail crossings. Where the roadway crosses the track at the same elevation, this is called an "at-grade" crossing. Where a roadway passes over the tracks via an "overpass" bridge structure, these crossing are referred to as "grade separated."

The Federal Highway Administration (FHWA) and FRA have regulatory jurisdiction over safety at crossings, pursuant to the Highway Safety Act of 1966 (HSA) (23 USC 401 et seq.). The HSA governs the distribution of funds to states aimed at eliminating hazards at highway/rail at-grade crossings. USDOT has issued regulations that address crossing safety and provides funding for the installation and improvement of warning devices through the states. In addition to federal oversight and funding, states also monitor crossings and, in many cases designate funding to complement the federal funds.

Jurisdiction over highway/rail at-grade crossings falls primarily to the states. This authority is set forth in the Railroad-Highway Grade Crossing Handbook (FHWA 2007a). Each state is required to periodically inspect highway/rail at-grade crossings and to determine the adequacy of warning devices at each location, as well as to order safety improvements. USDOT oversees and approves the state determinations.

All warning devices installed at crossings must comply with FHWA's *Manual on Uniform Traffic Control Devices* (MUTCD) (23CFR 646.214[b][1[). The MUTCD provides standards for the types of warning devices that must be installed at all highway/rail at-grade crossings (FHWA 2007b). FRA issued regulations under its railroad safety authority that impose minimum standards for highway/rail at-grade crossings (49 CFR 234-236). FRA maintains information for each highway/rail at-grade crossing based on information provided by the states and the railroads. FRA and FHWA coordinate research efforts related to highway/rail at-grade crossing accidents and provide guidance and solutions to problems.

Information on the number and location of grade crossings in Springfield can be reference in Section 2.2.2.2.