City of Effingham, Illinois

South Interchange Feasibility Study

Effingham, IL
Effingham County

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HANSON
Engineering | Planning | Allied Services

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Appendices

1. Introduction

The City of Effingham is considering the addition of a new interchange along Interstate 57 and the development of a multimodal freight facility south of the city. A multimodal freight facility would most likely be located in the area bounded between Interstate 57 to the west, US Route 45 to the east, County Road 1200 / W. Jaycee Ave. to the north, and the Village of Watson to the south. The interchange will support the function of the freight facility by improving access from the interstate to the center, as well as promote further development in the area.

1.1 Location of Study

Effingham is located at the crossroads of Interstate 57 (I-57) and Interstate 70 (I-70). As such, it has direct access to Chicago IL, St. Louis MO, Indianapolis IN, Nashville TN, and Memphis TN. From a logistics viewpoint, the location is extremely good for consolidation and distribution. However, this must be understood and rationalized within the overall manufacturing, distribution, and consumption regions and markets within the Midwest. A map of the study area and the study area with respect to the target cities can be found in Figures 2 and 3, Appendix A.

1.2 History of Interstate Study Area

I-57 is predominantly a four lane divided highway with full access control constructed to interstate standards. It was constructed in the 1960's and is part of the National Highway System (NHS). The portion of I-57 between Greenup and Watson was opened to traffic in the summer of 1965. The widening to six lanes of the portion of I-57 where it runs adjacent to the City of Effingham and concurrently with I-70 was completed in 2016. This section of I-57 / I-70 was constructed with full depth portland cement concrete (PCC) pavement. The section of I-57 from the Watson interchange, north to the south I-70 system interchange is PCC pavement with a hot mix asphalt overlay and asphalt shoulders. No records have been found of any completed planning studies involving this section of I-57, or an I-57 Exit interchange between I-70 and the Watson Exit since its original construction.

1.3 Discussion of Design Criteria

The roadway geometry presented in this study follow the geometric design provided by the Illinois Department of Transportation (IDOT) - Bureau of Design and Environment (BDE) manual, Chapter 44, Figure 44-5.A, Figure 44-5.D, and the applicable criteria of Figure 44-5.B and 5.C. Appendix E shows the design criteria tables. New construction and reconstruction design elements were evaluated using the WB-65 truck as the design vehicle.

A new interchange request must include an Interchange Design Type (ITS) and an Access Justification Report (AJR) which submitted to the FHWA after it is reviewed and approved by the Illinois Department of Transportation – Bureau of Design & Environment through the IDOT - District 7 office It will provide alternate interchange designs that provide a connection to US Route 45, the individual policy considerations and requirements shown below must be included within the access justification request completed during a Phase I study.

The Federal Highway Administration (FHWA) has developed requirements that need to be addressed when evaluating changes to access points on interstate facilities (Federal Register, Volume 74, Number 165, August 27, 2009). This policy was modified on May 22, 2017.

Policy on Access to the Interstate System (May 22, 2017)
It is in the national interest to preserve and enhance the Interstate System to meet the needs of the 21st Century by assuring that it provides the highest level of service in terms of safety and mobility. Full control of access along the Interstate mainline and ramps, along with control of access on the crossroad at interchanges, is critical to providing such service. Therefore, the FHWA's decision to approve new or revised access points to the Interstate System under Title 23, United States Code (U.S.C.), Section 111, must be supported by substantiated information justifying and documenting that decision. The FHWA's decision to approve a request is dependent on the proposal satisfying and documenting the following requirements:

Considerations and Requirements

1. An operational and safety analysis has concluded that the proposed change in access does not have a significant adverse impact on the safety and operation of the Interstate facility (which includes mainline lanes, existing, new, or modified ramps, and ramp intersections with crossroad) or on the local street network based on both the current and the planned future traffic projections. The analysis should, particularly in urbanized areas, include at least the first adjacent existing or proposed interchange on either side of the proposed change in access (Title 23, Code of Federal Regulations (CFR), paragraphs 625.2(a), 655.603(d) and 771.111(f)). the crossroads and the local street network, to at least the first major intersection on either side of the proposed change in access, should be included in this analysis to the extent necessary to fully evaluate the safety and operational impacts that the proposed change in access and other transportation improvements may have on the local street network (23 CFR 625.2(a) and 655.603(d)). Requests for a proposed change in access should include a description and assessment of the impacts and ability of the proposed changes to safely and efficiently collect, distribute, and accommodate traffic on the Interstate facility, ramps, intersection of ramps with crossroad, and local street network (23 CFR 625.2(a) and 655.603(d)). Each request should also include a conceptual plan of the type and location of the signs proposed to support each design alternative (23 U.S.C. 109(d) and 23 CFR 655.603(d)).

2. The proposed access connects to a public road only and will provide for all traffic movements. Less than "full interchanges" may be considered on a case-by-case basis for applications requiring special access, such as managed lanes (e.g., transit or high occupancy vehicle and high occupancy toll lanes) or park and ride lots. The proposed access will be designed to meet or exceed current standards (23 CFR 625.2(a), 625.4(a)(2), and 655.603(d)). In rare instances where all basic movements are not provided by the proposed design, the report should include a full-interchange option with a comparison of the operational and safety analyses to the partial-interchange option. The report should also include the mitigation proposed to compensate for the missing movements, including wayfinding signage, impacts on local intersections, mitigation of driver expectation leading to wrong-way movements on ramps, etc. The report should

describe whether future provision of a full interchange is precluded by the proposed design.

1.4 Purpose of Study

This study was conducted to determine the feasibility of an I-57 interchange near Effingham, Illinois. If built, a multimodal freight facility would likely bring economic growth to the city and surrounding areas. The study is meant to analyze the potential market for a facility based on the industrial transportation demands and compare that to the actual transportation options which would support a multimodal freight facility. The study is also meant compare multiple designs and locations for the potential interchange to find which option best supports a freight facility.

2. Existing Conditions

2.1 Description of Study Area

The study area, shown in Figure 2 of Appendix A, surrounds the proposed freight facility location and the proposed interchange locations. Three main transit routes run through this study area; the Canadian National Railroad, US Route 45, and I-57. The study locations for the interchange alternatives are both outside the Effingham City Limits. The location of the proposed freight center is just on the southwest edge of the Effingham City Limits and within the Extra Territorial Limit boundary.

2.2 Study Limits

This study is limited to the area that will be directly affected by the construction of the proposed interchange. This area includes Effingham and the surrounding area within a 30 minute travel time radius. In terms of crash analysis, I-57 and I-70, as well as U.S., state, and local arterial routes within Effingham County will be considered as part of the study within its limits.

2.3 Existing Land Use, Population, and Transportation System

The City of Effingham is located within and is the county seat of Effingham County. The city is a non-home rule unit which operates under a commission form of government. The City Council is comprised of the Mayor and four Commissioners who are elected for four-year terms. The City Clerk, the City Treasurer, and the Department Heads are all appointed by the Mayor with the consent of the City Council. The city currently has 102 full-time employees and 62 part-time workers and an (FY 2016) operating budget of $82,232,955.00.

Effingham was first settled in 1814 and was known from then until 1859 as Broughton. The community was named after General E. Effingham, a local surveyor. In the late 1880s, Austin College was founded, which eventually became the Illinois College of Photography, also known as Bissel College. Unfortunately, it closed during the depression in the 1930s. As the result of the St. Anthony's hospital fire on April 4, 2019, killing 74 people, which resulted in a “Life Magazine” cover story, fire codes were improved nationwide.

In 2018 Effingham, Illinois had a population estimate of 12,627 according to the United States Census Bureau website. The U.S. Census Bureau last did a population census in 2010, at

which time they counted a total population of 12,328. The area of Effingham was 9.86 mi² in 2010 with a population density of 1,249.8 p/mi². The City of Effingham is the county's largest incorporated area followed by Altamont, with a 2010 population of 2,319. Other nearby incorporated communities (population) include Teutopolis (1,530), Watson (754), Dieterich (617), Beecher City (463), Edgewood (440), Mason (345), Shumway (202), and Montrose (201).

The racial makeup of the city was 92.5% White, 1.2% African American, 0.1% Native American, 0.4% Asian, 0.1% from other races, and 1.9% from two or more races. Hispanic or Latino of any race were 3.8% of the population.

There were a total of 5,574 housing units with 5,239 occupied households out of which 26.8% had children under the age of 18 living with them, 39.7% were married couples living together, 11.9% had a female householder with no husband present, 57% were families and 42.8% were non-families. 37.0% of all households were made up of individuals and 18.3% had someone living alone who was 65 years of age or older. The average household size was 2.32 and the average family size was 3.1.

In the city, the population was spread out with 23.9% under the age of 18, 8.6% from 18 to 24, 36.8% from 25 to 44, 25.4% from 45 to 64, and 18.0% who were 65 years of age or older. The median age was 36.1 years. For every 100 females, there were 87.8 males.

The median income for a household in the city was $44,284, and the median income for a family was $62,719. Males had a median income of $33,586 versus $22,963 for females. The per capita income for the city was $27,316. About 14.9% of families and 17.9% of the population were below the poverty line, including 31.2% of those under age 18 and 8.3% of those age 65 or over.

The median property value in Effingham is $123,800. The homeownership rate is 62.9% and home renter rate is 37.1%. Most people in Effingham commute to work by driving alone (85.9%), and the average commute time is 12.9 minutes. The average car ownership in Effingham is 2 cars per household (43.3%).

The Effingham Unit #40 School District operates three elementary schools, a junior high, and a high school. Effingham is also home to two parochial grade schools, Sacred Heart Grade School and St. Anthony Grade School, and one parochial high school, St. Anthony High School. For advanced degrees and ongoing adult education, Effingham is home to Kluthe Center for Higher Education. This branch of Lake Land College offers local classes in a modern computer networked facility. The Kluthe Center provides a way for area residents to update their skills, and industry leaders to find a well-trained, readily available workforce.

The City of Effingham is one of the largest communities in the region with the 23 colleges and universities within a 75 mile radius. Including Eastern Illinois University, the University of Illinois-Champaign, University of Illinois-Springfield, Indiana State University, Vincennes University, Millikin University and Rose Hulman Institute of Technology along with several other smaller colleges and universities.

The community was built on agriculture, railroads, coal and oil. Currently, the Effingham economy consists of a wide mixture of business sectors such as agriculture, architecture & engineering, automotive, aviation, financial / banking, business, construction, consulting, education, events & recreation, government, healthcare, hospitality, insurance, legal services, light industrial, railroad, retail, real estate, manufacturing, mass media, oil, social services,

scientific & technical services, telecommunications, transportation & logistics, utilities, and waste disposal. See the most current Effingham zoning map in Appendix A.

The most common industries in Effingham by % are: Printing & related support activities (10.6%); Accommodation & food services (9.9%); Health care (9.8%); Educational services (7.2%); Construction (4.1%); Public administration (3.7%); Machinery (3.4%). While the most common occupations by % are: Other sales and related occupations, including supervisors (5.0%); Driver/sales workers and truck drivers (4.4%); Building and grounds cleaning and maintenance occupations (4.3%); Other production occupations, including supervisors (4.3%); Laborers and material movers, hand (4.2%); Other management occupations, except farmers and farm managers (4.1%); Printing workers (3.4%).

There are 4 main modes of transportation in the Effingham area such as highway, rail, bus and air that connect to destinations nationwide.

Effingham is located at the intersection of two major Interstate highways: I-57 running from Chicago to Sikeston, Missouri, and I-70 running from Utah to Maryland. The city is also served by U.S. Route 45, which runs from Ontonagon, Michigan to Mobile, Alabama; U.S. Route 40, the Historic National Road, which stretches from Silver Summit, Utah to Atlantic City, New Jersey; and Illinois Routes 32, 33 and 37 also run through the city. Effingham is home to a 198 foot tall cross near the junction of concurrent section of I-57 / I-70. The Cross at the Crossroads is the tallest cross in the United States.

The City of Effingham is a major railroad junction. The Canadian National (CN) Railroad line runs through the city from Chicago to Memphis and Maxon, Kentucky. The line splits south of Effingham with both lines being single track with maximum speeds of 60 mph for freight and maximum speeds of 79 mph for passenger trains.

The CSX Transportation runs through the City of Effingham with a rail yard near the Effingham Business Park and South Route 45 Park and has an extensive rail network that covers 23 states east of the Mississippi River. It serves nearly every major economic and population center in the eastern U.S. and provides connectivity to western U.S. markets at Chicago, St. Louis, Memphis and New Orleans. CSX serves all major Atlantic ports with major intermodal operations connecting the ports of New York, New Jersey, Philadelphia, Baltimore and Norfolk, with Midwest markets. The CSX Railroad line extends approximately 224 miles from Indianapolis, Indiana, to East St. Louis. The line provides access to CSX's Rose Lake Yard near East St. Louis. The line is primarily single track with maximum speeds of 50 mph for freight and 60 mph for intermodal trains.

The Indiana Railroad (INRD) operates over current CN Railroad tracks between Indianapolis, Indiana, and Effingham, and over trackage rights between Terre Haute, Indiana, and Chicago. Rail switching and train building operations for the INRD will on occasion block the highway crossing on Banker Street (US Route 45) for extended periods of time.

The Effingham Railroad is a small switching railroad. It currently has approximately 1.7 miles of trackage located to the south of the CSX Railroad line and west of the CN Railroad line. The commodities currently being hauled are crushed stone, printing paper, lumber, particle board and vegetable oil.

Amtrak, the national passenger rail system, provides service to Effingham along the CN alignment from Chicago to Carbondale via the Illini and Saluki Routes. It also provides service

through Effingham from Chicago to the New Orleans, Louisiana via the City of New Orleans route.

The CN Railroad has a railyard aligned north to south in the middle of the City, between Raney Street and Banker Street. The CSX Railroad also has a rail yard aligned east to west, between Fayette Avenue and Wabash Avenue. These two facilities are very close together and cross one another around Raney Street and Wabash Avenue.

The amount and frequency of rail traffic in the heart of the City causes traffic delays and safety concerns. There is significant backup on Banker Street where trains have blocked traffic due to switching in the yard. In 2018, there was a reported backup at this location of over a mile. The public has been very outspoken about these blockages, delays, and the resulting safety issues.

Effingham County Public Transportation provides a demand-response, door-to-door public transportation service which serves all populations of the county. There is no municipal mass transit, or bus service operating solely within the City of Effingham.

The Effingham County Memorial Airport is located to the south of Effingham immediately east of US Route 45. In 2013, the airport served as home for 14 single-engine and 2 jet aircrafts. For the 12-month period ending June 31, 2013 an average of 68 aircraft operations per day occurred, of which 48% were transient general aviation flights. Another 32% of the airport's typical flights were attributed to local general aviation purposes and 20% to air taxi flights. Effingham Memorial Airport includes airport tenants that are businesses with employees, such as Fixed Based Operations, flight schools, concessionaries, and airport restaurants. Also included in these groups are governmental agencies, such as public airport sponsors, air traffic controllers, and other state and federal agencies. General Aviation visitors are non-local passengers arriving via private or business aircraft. General aviation visitors make up the portion of each of the airport's general aviation operation that leave the airport. Some are residents who fly their planes to a distant location and subsequently return. There is regional air service at the Lambert-St. Louis International Airport or Mid-America St. Louis Airport.

The City of Effingham has four formally established truck accessible business/industrial parks. The Effingham Business Park and South Route 45 Park are located on the southwest corner of town bordered by US Route 45, I-57 and US Route 40. They include businesses such as the FedEx Freight, Hitachi Metals, Versatech LLC., Koerner Distributor, Inc., Mid-Illinois Concrete, Sherwin Williams Distribution Center, Continental Mills, Hodgson Mill, Southeastern Container, Joint Active Systems, Krispy Kreme Doughnuts, Crossroads Truck Equipment, Pepsi Mid-America, Village Square Mall, Bunge Foods, Irving Paper, Fraser Paper, Pactiv, Stevens Industries, TQW, Quad Graphics, Pinnacle Foods, John Boos, and Kingery Printing.

The American Way Business Park is located on the northwest corner of town along Illinois Route 32 / Illinois Route 33, on the north side of I-57 / I-70 and currently includes businesses such as Ameren Illinois, Kohl's, Menards, Northside Ford, Walmart Supercenter, Thelma Keller Convention Center, Travel America Truck Stop and a strip mall.

The Network Centre is located on the north end of town along US Route 45 on the south side of I-57 / I-70 and currently includes businesses such as Heartland Dental, Midland State Bank, Agracel, the Patterson Technology Center, the Kluthe Center, and a Business Center.

These industrial parks include a total acreage of around 382 with around 80 acres still available for business growth and expansion. All of the parks are located with direct access to I-57 and I-70.

Zoning and Development

The City of Effingham has an established and Opportunity Zone. A census tract located within the City and County of Effingham has been designated as an Opportunity Zone. The Tax Cuts and Jobs Act passed at the end of December 2017 allowed Governors in each state to designate certain census tracts as Opportunity Zones. On April 20, 2018, the State of Illinois submitted this census tract to the federal government for inclusion in the Opportunity Zone program.

Opportunity Zones are designed to spur economic development by providing tax benefits to investors. First, investors can defer tax on any prior gains invested in a Qualified Opportunity Fund (QOF) until the earlier of the date on which the investment in a QOF is sold or exchanged, or December 31, 2026. If the QOF investment is held for longer than 5 years, there is a 10% exclusion of the deferred gain. If held for more than 7 years, the 10% becomes 15%. Second, if the investor holds the investment in the Opportunity Fund for at least ten years, the investor is eligible for an increase in basis of the QOF investment equal to its fair market value on the date that the QOF investment is sold or exchanged.

When an investment is sold, investors can take the proceeds and invest them in a business or property within Effingham's Opportunity Zone. This investment allows investors to defer paying tax on the proceeds of their gain by reinvesting it in Opportunity Zone property. If investors keep their investment in the Opportunity Zone property or businesses for ten years, they would become eligible for an increase in basis equal to the fair market value of the investment when they sell or exchange it.

Effingham's Enterprise Zone offers the following incentives:

- Property Tax Abatement - 100% abatement on the increase to the base amount. (3 years for commercial projects and 7 years for industrial projects). Property located in one of Effingham's TIF Districts does not qualify for the property tax abatement.
- Sales Tax Exemption on Building Materials - Full exemption (6.5%) on building materials incorporated into real property.
- Machinery and Equipment Sales Tax Exemption, Pollution Control Equipment Sales Tax Exemption, and Utility Tax Exemption - These are state incentives structured for large projects of $5 million and 200 jobs created or $40 million and 2,000 jobs retained.

The Department of Commerce and Economic Opportunity (DCEO) has chosen a site in Effingham to be featured as a Super Site. The 263-acre Hawickhorst-Jones property located on South U.S. Route 45 is one of only 15 sites highlighted throughout Illinois as a location that provides businesses a pre-selected sites which provide all of the desired attributes for very large industrial projects.

The Hawickhorst-Jones property super site within the southern interchange feasibility study area is located on the south edge of Effingham and has undergone a rigorous pre-qualification process to assure it fits the following IDCEO criteria investors commonly require for very large industrial projects:

1. Site Size: 250+ acres
2. Minimum developable acreage: 200 acres (80%)
3. Zoning: Industrial or the local government comprehensive plan has designated the Super Site for industrial use. If located outside of a Comprehensive Plan area, zoned agricultural.
4. Distance to Interstate or Four Lane Divided Highway: no more than 10 miles
5. Utilities: To property line or direct access to the site.
    a. Electric Service: 69kV or 138kV transmission line adjacent to the site or within 1 mile of the site. If an extension is necessary, there is a direct path to extend service with limited property owners in between (fewer than 5) and can be accomplished within 18-24 months.
    b. Water Service: 300,000 gallons per day additional capacity presently available or can be made available within 12 months.
    c. Wastewater Service: 200,000 gallons per day additional capacity presently available or can be made available within 12 months.
    d. Natural Gas Service: 4" steel main to the site or can be extended within 12 months.
    e. Telecommunication Service: Fiber is to the site or can be extended within a 12-month timeframe.
6. Property owners: 1-2 owners
7. Rail service: Site is adjacent to a Class 1 or short-line rail line and service to the site is feasible within a 12-month timeframe.

The Hawickhorst-Jones property super site is a 263 acre tract adjacent to the City limits and is not currently zoned. It has a flat topography, not in a flood plain and is currently in use as farm ground. It is located along US Route 45, less than five miles from I-57 and I-70 and is less than one mile from the Effingham County Memorial Airport. The property is adjacent to a Class I railroad. The Canadian National (CN) railroad line and just south of a CN rail yard. The property is capable of being subdivided and it is located within an Opportunity Zone and an Enterprise Zone.

Maps and other supporting information for the Hawickhorst-Jones Property Super Site can be found in Appendix H and at the websites below. For more information about this site, either connect with the contact on the website or contact the Illinois Department of Commerce and Economic Opportunity.

https://www2.illinois.gov/dceo/SmallBizAssistance/Pages/IllinoisSuperSites.aspx

https://app.locationone.com/sites/5cc9f2fcb48c6d1a899d74cc?organization=59eaba35bec80e09b4bbf0df

The proposed I-57 interchange locations are south of Effingham. They are currently outside the City's zoning limits and are primarily being used as farmland. The location of a proposed freight center is just on the southwest edge of the Effingham City Limits. The land immediately adjacent to the proposed facility is zoned as manufacturing (M-2). The land within the limits of the freight center are primarily farmland with some manufacturing.

2.4 Preliminary Environmental Inventory

A preliminary environmental inventory of the project study area was conducted. This cursory review of environmental resources and issues concentrated a single geographical area based on the two proposed interchange location options and the Hawickhorst-Jones DCEO-Super Site location. The two interchange location options are located along I-57 south of the City of Effingham between the existing system interchange of I-57 and I-70 and the Watson interchange

(Exit 151). In addition to the two interchange locations, environmental resources and issues were reviewed for the possible extensions of Raney Street, Dutch Road, Airport Road, and Main Street. The results of the inventory of environmental resources are reported below, followed by a discussion of potential impacts of each proposed interchange location and roadway extensions. In Appendix G, Exhibits A and B depict the potential environmental resources in the project study area.

Socioeconomic

The project study area is composed of I-57, local roads, county roads, agricultural land, vegetative land, and residential properties in a rural environment. Both of the proposed interchange locations and the four roadway extensions occur in rural settings. Based on aerial photography and Google Maps, several public service and community facilities are located in the vicinity of the project study area. These include: the Illinois State Police District 12 headquarters, the Watson Fire Protection District, Effingham Assembly Church, Central Grade School, the Watson Baptist Church, the Watson United Methodist Church, Cornerstone Christian Church, the Emergency Services Disaster Agency, Effingham County Memorial Airport, and Percival Springs Airport and RV.

Efforts must be taken during transportation planning of federally funded projects to avoid disproportionate impacts to low-income and minority populations (Executive Order 12898 on Environmental Justice, DOT Order 5610.2 and DOT Order 6640.23) and prohibit discrimination on the basis of race, color, national origin, age, sex and disability (Title VI of the 1964 Civil Rights Act). Based on a U.S. Environmental Protection Agency's EJScreen Report dated December 26, 2019, alternatives occurring in the project study area do not have the potential for disproportionate impacts to low-income or minority populations. This rural area is reported to have a low-income population of 29%, compared to the State of Illinois average of 30%, and a minority population of 4%, compared to the State of Illinois average of 38%.

Agricultural Land

Based on aerial photography, the locations of the Hawickhorst-Jones DCEO-Super Site and the interchange alternative options are composed of agricultural land. The Raney Street extension and the Airport Road extension would be new roadways crossing agricultural land. For state and/or federally funded or assisted roadway projects, consideration must be given to the impacts that will cause conversion of farmland to non-farmland uses. Coordination may be required with the United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) and/or the Illinois Department of Agriculture (IDOA) to evaluate the impacts on farmland and to solicit comments from those agencies on alternatives to the proposed action. Impacts to agricultural lands can be minimized through use of existing right-of-way, use of design standards that minimize the need for right-of-way, and limiting the creation of uneconomical remnants, severed parcels, and landlocked parcels.

Cultural Resources

Cultural resources, including historic structures and historic and prehistoric archaeological sites, are protected under the following federal authorities: Section 106 of the National Historic Preservation Act of 1966; Executive Order 11593, Protection and Enhancement of the Cultural Environment; and Section 4(f) of the Department of Transportation Act of 1966. These resources are protected by the State of Illinois under the provisions of the Illinois State Agency Historic Resource Preservation Act. These laws require state and federal agencies to consider the effects

of their actions on historic properties listed on or eligible for the National Register of Historic Places.

The Historic and Architectural Resources Geographic Information System (HARGIS) was reviewed to identify potential cultural resources within the project area. HARGIS is an electronic database of Illinois' historic properties and is maintained by the Illinois Historic Preservation Agency (IHPA). The HARGIS database identified no historic or potentially historic properties within the project study area. HARGIS is a preliminary reference of potential historic resources; additional surveys and review would be needed for structures and facilities greater than 40 years old.

Floodplain areas and bluffs located near streams and lakes are typically high potential areas for archaeological resources. Therefore, areas more likely to contain archaeological resources include the riparian and floodplain corridors associated with Little Wabash River, Fulfer Creek, Salt Creek, Little Salt Creek, and tributaries to Salt Creek. Depending on funding sources and permitting requirements, selected alternatives may require field archaeological surveys.

Based on a review of aerial mapping and Esri USA Cemeteries GIS, there are five cemeteries within the project study area: Rinehart Cemetery, Immanuel Lutheran Cemetery, Loy Chapel Cemetery, Old Loy Cemetery, and Watson Cemetery. The nearest cemeteries to the proposed interchange locations are Immanuel Lutheran Cemetery, which is located approximately 0.8 mile east of proposed interchange at Location 1 and Watson Cemetery, which is located approximately 0.9 mile northeast of proposed interchange at Location 2. The Immanual Lutheran Cemetery is immediately adjacent to the proposed Dutch Road roadway extension on the north side of 1000th Avenue.

Threatened and Endangered Species/Natural Resources

Information on the presence of state-listed threatened and endangered species and natural areas in the vicinity of the alternatives was requested from the Illinois Department of Natural Resources (IDNR) on November 29, 2018, through their Ecological Compliance Assessment Tool (EcoCAT). The EcoCAT report summarizes information existing in the Illinois Natural Heritage Database regarding natural features within an identified area known to the IDNR at the time of the inquiry.

According to the EcoCAT report results, the Illinois Natural Heritage Database reports the bigeye shiner (*Notropis boops*) and ornate box turtle (*Terrapene ornata*) as potentially occurring in the vicinity of the project study area. The bigeye shiner is a small, ray-finned, freshwater fish, which prefers flowing pools of moderately clear creeks and small to medium rivers with large permanent pools over bottom of clear sand, gravel, or rock. The species eats small insects and is presumed to spawn in late spring and summer. The ornate box turtle is a turtle with a high, dome-like upper shell. The shell is dark with markings on the upper and lower shells. The species lives in sand prairies in the northern part of Illinois and prairies in the southern part of the state. This turtle is a terrestrial species and feeds primarily on insects, berries and other plant material.

There are no records of Illinois Natural Area Inventory (INAI) sites, dedicated Illinois Nature Preserves or registered Land & Water Reserves in the vicinity of the project alternatives.

Regarding federally-threatened and endangered species, the U.S. Fish and Wildlife Service (USFWS) lists the Indiana bat (*Myotis sodalis*), northern long-eared bat (*Myotis septentrionalis*), rattlesnake-master borer moth (*Papaipema eryngii*) and eastern prairie fringed orchid (*Platanthera leucophaea*), as potentially occurring in Effingham County. During the summer, the

Indiana bat and northern long-eared bat frequent the corridors of streams with well-developed riparian woods, as well as mature upland forests. These bats roost and rear young beneath the loose, exfoliating bark of many tree species, including large, dead or dying trees. The rattlesnake-master borer moth is found in undisturbed prairie and woodland openings that contain their only food plant, which is the rattlesnake-master. The eastern prairie fringed orchid occurs in tall grass silt-loam or sand prairies, sedge meadows, fens, and occasionally sphagnum bogs.

Suitable habitat for the Indiana bat and northern long-eared bat is likely to be present in the forested tracts to the west of proposed interchange at Location 1 and the forested tracts in the vicinity of the Dutch Road and Raney Street roadway extensions. Suitable habitat for the rattlesnake-master borer moth and the eastern prairie fringed orchid in the vicinity of the project alternatives is unlikely based on their need for higher quality prairie and wetland habitats.

Surface Water Resources

Based on a review of topographic and aerial mapping and the U.S. Geological Survey's National Hydrography Dataset, streams in the project study area include the Little Wabash River and its tributaries, Fulfer Creek and its tributaries, Salt Creek, and tributaries to Salt Creek. Several lakes and ponds are scattered throughout the project study area as well. The Hawickhorst-Jones DCEO-Super Site, both proposed interchange locations, and the Dutch Road and Raney Street roadway extensions would involve the potential for impacts to streams.

A Section 404 permit from the U.S. Army Corps of Engineers (USACE) and Section 401 Water Quality Certification from the Illinois Environmental Protection Agency (EPA) would be required under the Clean Water Act for discharge of fill material into waters of the United States. Any of the alternatives would require a National Pollutant Discharge Elimination System (NPDES) permit from the Illinois EPA and a Storm Water Pollution Prevention Plan (SWPPP) for storm water discharges from construction activities that disturb one acre or more of land area.

Floodplains

Regulatory floodplains are the floodplains that are mapped on National Flood Insurance Rate Maps (FIRM) by the Federal Emergency Management Agency (FEMA). Floodplains provide important wildlife habitat, food chain support, nutrient retention and removal through plant uptake, erosion control through sediment trapping, and flood desynchronization. The FEMA has identified the base (100-year) flood as the flood having the one percent probability of being equaled or exceeded in any given year. The regulatory floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 100-year discharge can be conveyed without increasing the base flood elevation more than a specified amount.

According to the December 23, 1977 FIRMs for Effingham County, Map Numbers 1702270003A and 1702270004A, the project study area contains two mapped floodplains associated with the Little Wabash River and an unnamed tributary to Salt Creek and no mapped regulatory floodway. Neither the Hawickhorst-Jones DCEO-Super Site location nor the proposed interchange locations occur within these floodplains. A roadway extension associated with interchange alternative Location 1 (Dutch Road) would occur within the floodplain associated with Little Wabash River, and is discussed in Appendix G, Table 1 - "Potential Impacts of the Project Alternatives".

Wetlands

According to the National Wetlands Inventory (NWI) developed by the U.S. Department of the Interior's Fish and Wildlife Service, several pond wetlands and freshwater, forested-scrub wetlands are in the vicinity of the project study area (see Appendix G). The NWI depicts wetlands near both of the proposed interchange locations, but not at the location of the Hawickhorst-Jones DCEO-Super Site Wetlands depicted on NWI maps are potential wetland areas; however, these areas may have been altered since being mapped. For suspect areas, field surveys would be required to determine and delineate jurisdictional wetland areas.

Impacts to wetlands are regulated under Section 404 of the Clean Water Act. Section 404 states that the placement of dredge or fill material into a waters of the United States, including wetlands, requires a permit, which is issued by the USACE. In addition to Section 404, federally funded or assisted highway projects must comply with Executive Order 11990 regarding protection of wetlands.

Within Illinois, state-funded or assisted projects must also conform to the requirements of the Interagency Wetland Policy Act of 1989. Permitting and mitigation of wetland impacts from roadway construction must be coordinated through the Illinois Department of Natural Resources (IDNR).

Potentially Contaminated Properties

Avoidance of acquiring contaminated property is recommended in order to avoid potential liability for site clean-up or worker safety exposure. The Illinois EPA's Source Water Assessment Program (SWAP) maintains a web mapping tool that contains several databases of environmental concerns. These include active landfills, Toxic Release Inventory (TRI), Resource Conservation and Recovery Act (RCRA), National Pollutant Discharge Elimination System (NPDES), Leaking Underground Storage Tanks (LUSTs), Voluntary Site Remediation, Comprehensive Environmental Response Compensation and Recovery Act (CERCLA) and Potential Sources of Contamination (WSSR). Based on a December 27, 2019 review of the SWAP Web Mapping Tool, four LUST sites are depicted in the vicinity of the project study area. These sites do not occur at or near the location of the Hawickhorst-Jones DCEO-Super Site or the proposed interchange locations. No other special waste database sites were depicted within or in the vicinity of the project study area. A Phase I Environmental Site Assessment is recommended during a project planning phase to more accurately determine any alternative's potential involvement with contaminated properties.

Parks and Recreational Areas

Public parks and recreational areas are protected under Section 4(f) of the U.S. Department of Transportation (U.S. DOT) Act of 1966. Section 4(f) mandated that U.S. DOT agencies avoid using and minimize harm to significant publicly owned park and recreational lands, wildlife and waterfowl refuges, and publicly or privately-owned historic sites in the development of transportation projects.

On-line references, the U.S. Geological Survey (USGS) quadrangle map and aerial photography were reviewed to determine the presence of park and recreational areas within the project area. Based on this review, Willow Park is located on the north side of Watson. No parks and recreational areas are located in the vicinity of the project alternatives.

Section 6(f) is part of the Land and Water Conservation Fund (LWCF) Act, which was designed to provide restrictions for conversion of public recreation facilities funded with LWCFs. The LWCF

program provides matching grants to states and local governments for the acquisition and development of public outdoor recreation areas and facilities. The program is intended to create and maintain a nationwide legacy of high quality recreation areas and facilities and to stimulate non-federal investments in the protection and maintenance of recreation resources across the United States. Conversion of lands or facilities acquired with LWCF must be approved by the National Park Service and requires mitigation that incudes replacement land of at least equal value and recreation utility.

The LWCF list for Effingham County was reviewed to determine the presence of funded projects within the project area. No LWCF projects were identified within the project study area.

Noise

Vehicular and rail traffic noise and vibration are considered unwanted effects of sound and energy from cars, trucks and trains that may interfere with normal human activities. Traffic noise can affect noise-sensitive land uses, called receptors, which typically are homes, parks, schools and other noise sensitive areas where frequent outdoor human use occurs. Where occupants can detect vibration in buildings, quality of life or working efficiency may potentially be impacted. Noise and vibration are often major concerns regarding the effects of transportation projects on the surrounding community.

Noise and vibration impact assessments would be required for this project should it be federally funded or approved. For initial screening of receptors and land uses near a proposed transportation project, land uses within 500 feet of the proposed improvements are normally reviewed and evaluated for noise. And building receptors within 100 feet of proposed improvements of rail projects are normally reviewed for vibration. Sensitive noise and vibration receptors are present within and adjacent to the proposed interchange locations. Therefore, the proposed interchange alternatives and roadway extensions have the potential to cause increased noise and vibration levels to sensitive land uses within the project area.

Potential Impacts of the Project Alternatives

Potential environmental impacts were assessed for two proposed interchange location options (Location 1 and Location 2), for the Hawickhorst-Jones DCEO-Super Site location, and for the extension of existing roadways that would be associated with these developments. Their potential impacts to and involvement with environmental resources is summarized and presented in Appendix G.

Location 1 for a proposed interchange occurs in a rural setting at the intersection of 1000th Avenue and I-57. Two alternative interchanges are being considered at this location: Alternative Location 1A (Partial Cloverleaf) and Alternative Location 1B (dog bone). There is one residential property in the vicinity of this location, which could potentially be displaced by Alternative Location 1A. Other residences are near the east tie-in along 1000th Avenue, but would not be displaced by either interchange alternative. One stream might be affected by either interchange alternative. This forested headwater stream is north of 1000th Avenue along I-57. Suitable habitat for the federally endangered Indiana bat and northern long-eared bat occurs adjacent to the west of this location. Any tree removal may require avoidance and minimization strategies to minimize potential impacts to the bats during the roosting season. A site reconnaissance would be required to determine the presence of these species. One open water wetland is identified on the NWI map in the vicinity of this location. A field survey would be required to verify the presence of these features. Alternative Location 1A would require substantially more farmland conversion than

Alternative Location 1B. Several sensitive noise receptors are within 500 feet of the proposed interchange location. A traffic noise analysis would be needed to determine potential noise impacts occurring from either interchange alternative. Three roadway extensions and possible expansions are also being considered as part of interchange alternative Location 1. An extension of Dutch Road (1000th Avenue) would involve the extension of this road from the proposed interchange west to County Road 24 and east to IL 45. The extension of Raney Street would involve extending the roadway south to intercept Dutch Road (1000th Avenue). The final extension would occur on Airport Road, extending this route west to intersect with the extended South Raney Street and provide a connection from Airport Road to interchange alternative Location 1. These extensions would involve additional impacts to streams, floodplains, agricultural land and residential properties (Appendix G, Table 1). Due to construction on a new alignment and the proximity of sensitive noise receptors (within 500 feet), all roadway extensions would require a noise analysis.

Location 2 for the proposed interchange occurs in a rural setting along I-57 approximately 0.5 mile north of the intersection with 700th Avenue. Two alternative interchanges are being considered at this location: Alternative Location 2A (Partial Cloverleaf) and Alternative Location 2B (Trumpet). There are no residential properties in the vicinity of this location. According to the NHD, one intermittent stream occurs within the vicinity of this location on the east side of I-57. Both interchange alternatives would likely require placement of a culvert to span this drainageway. A field survey would be required to determine the presence of this feature. Both interchange alternatives would require substantial acreage of farmland. Several sensitive noise receptors are within 500 feet of the Main Street roadway connection. However, future noise levels of a build condition are not anticipated to cause noise impacts. One roadway extension and possible expansion is being considered as part of interchange alternative Location 2. Main Street (IL 37) would be extended west to intersect interchange alternative Location 2. Several residences occur on both sides of Main Street in Watson. Public facilities at the east end of the proposed Main Street extension are the Watson Fire Protection District and the U.S. Postal Service. The Watson Baptist Church is also located at the west end of Main Street, but would not be adversely impacted. Impacts to natural resources are not anticipated for this extension. Willow Park in the Village of Watson occurs one block north of Main Street, but would likely not be impacted. Additionally, a noise analysis would need to be conducted due to the proximity of sensitive noise receptors and construction on a new alignment.

The Hawickhorst-Jones DCEO-Super Site location involves one perennial stream identified on the National Hydrography Dataset (NHD) by the U.S. Geological Survey. A field survey would be required to verify the presence of this feature. Relocation or encapsulation of the stream could be necessary for constructing the Hawickhorst-Jones DCEO-Super Site at this location, which could present Section 404 and Section 401 permitting challenges. There are several residential and commercial properties within and adjacent to the proposed location that may require removal or relocation. Construction of this facility would involve the conversion of 200 or more acres of farmland. Several sensitive noise receptors are within 500 feet of the proposed facility boundary.

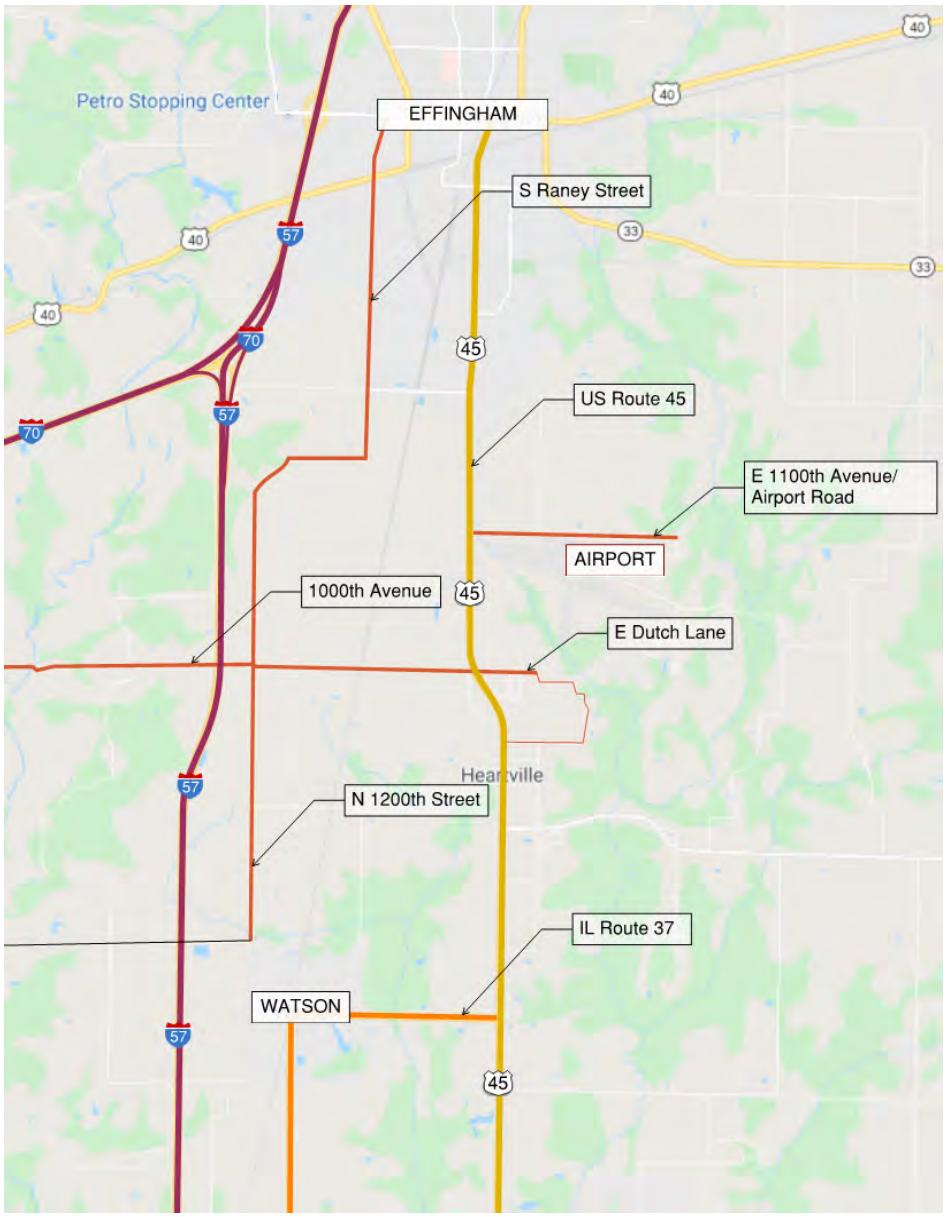
2.5 Existing Roadway Geometry and Speeds

The proposed interchange alternatives are to be located on I-57 between Effingham and Watson, Illinois. This segment of I-57 runs northbound and southbound. A reverse curve, approximately 1 mile long, is located near the center of the segment. The roadway has four 12-foot lanes, two running in each direction, separated by a 170-foot wide grass median. There are 10-foot outside shoulders and 6-foot inside shoulders in each direction.

At an interchange just south of Effingham, I-57 merges with the northeast-southwest bound interstate, I-70. Once north of Effingham, the two interstates separate into their original configurations.

To the east US Route 45 runs north-south, parallel to this segment of I-57. US Route 45 runs through Effingham and is connected to Watson by IL- 37. Main Street, which is the eastbound/ westbound segment of IL-37, ends at a T- intersection with Old Watson Road, half a mile away from intersecting with I-57. Further north, Dutch Lane and E 100th Avenue run west from US Route 45 and over I-57, and 1100th Street runs east from US Route 45 to Effingham County Memorial Airport. The last major roadway that carries traffic north-south within the project limits is 1200th Street/ Raney Road.

The discussion on the proposed roadway systems created under the location 1 and location 2 alternatives can be found in Section 4 and the exhibits can be found in Appendix F of this report.



2.6 Existing Traffic Volumes

The existing volumes at each of the proposed locations come from the ADT values found on IDOT's website. IDOT ADTs are provided only for entire roadways and not per direction. Therefore, a directionality constant of 50% was used for the north and southbound traffic on I-57 as well as for the east and westbound traffic of the intersecting roads. At Location 1, I-57 passes over East 1000th Avenue. However, Location 2 does not cross any east-west roadways.

The existing northbound and southbound ADTs along I-57 at both locations is 10,150 vehicles and the eastbound and westbound ADT at Location 1 is 62 vehicles. All existing volumes can be seen in figure 1 of Appendix D. The discussion of the proposed traffic volumes and potential traffic volume changes can be found in Section 5 and Appendix C and D of this report.

2.7 Existing Crash Data

Appendix B contains heat maps showing the concentration of injuries and fatalities on I-57 and I-70 as well as on U.S., state, and local arterial routes in Effingham County. The crash data from these maps was recorded from 2012 through 2016, and interstates I-57 and I-70 were being widened from the year 2010 to 2016. It is worth noting that the presented crash data may have been affected by these construction conditions.

Most injuries and fatalities shown in the crash maps are concentrated at the roadway segment within the city, where traffic volumes are the highest. There are other points of injury concentration throughout the system, mainly at locations where there is a change in driving conditions such as at an interchange or an overpass. Due to the nature of the proposed multi-modal facility, much of the trip generation will be multi-unit vehicles. Therefore, Figures 2 and 3 in Appendix B specifically focus on multi-unit vehicle crashes on the interstates. The discussion of the alternatives' impacts on the crash analysis can be found in Section 5.2 of this report.

3. Market Analysis

To support a multimodal freight facility, an analysis of the potential for markets is required. Therefore, Hanson has conducted a high-level market analysis to determine the feasibility of the potential multimodal freight facility. The analysis begins with an understanding of the various logistic demands to and from Effingham based on the industrial transportation demands, as well as the logistics opportunities to support manufacturing and distribution activities in Chicago, St. Louis, Indianapolis, Nashville, and Memphis. This information is then overlaid on the actual transportation options to support a multimodal freight facility, both in the Midwest and nationally. Once these areas have been analyzed, these independent studies are synthesized into an overall market assessment for the demand for a multimodal freight facility. The complete Effingham Market analysis report can be found under separate cover.

4. Build Alternatives Considered

Two locations have been proposed for a potential interchange on I-57. There are two possible interchange designs for each of the two locations, resulting in a total of four alternatives as shown in Appendix F. This feasibility study is used to provide the advantages and disadvantages of each alternative and determine their feasibility.

4.1 Location 1

The first location is just south of Effingham and intersects with 1000th Avenue (Dutch Lane). This location marks the beginning of a reverse curve on I-57. An interchange at Location 1 could also include construction of multiple two-lane roadways that would improve connectivity to the surrounding roadway networks and access to the interstate. These sideroads are described in Section 4.3 along with the costs associated with the additional improvements. See Appendix F, Exhibit D for the sideroad layout.

4.1.1 Alternative 1A

The first design for Location 1 is a semi-cloverleaf. The interchange contains four ramps, northbound to east bound, southbound to northbound, and vice versa, and two loop ramps, southbound to eastbound and eastbound to southbound. Northbound to westbound and southbound to eastbound movements can be made using mid-ramps from the northbound to eastbound and southbound to westbound ramps respectively. The intersections at the ramp terminals would likely be stopped controlled at the mid-ramps. The cost estimate to construct this interchange and the extension of Dutch Lane is $11.99 million.

Some of the advantages and disadvantages of this alternative are:

Advantages

- Connects an existing segment of roadway to I-57 and a direct route into the City of Effingham.
- This interchange location is closer to any potential freight centers developed near the southern edge of the City of Effingham.
- Provides multiple semi-direct access routes to the Hawickhorst-Jones Super Site location.
- Provides multiple semi-direct access routes to the Effingham County Memorial Airport.
- Provides an interchange design which motorists are accustomed to navigating. Provides a durable paved connection to between US Route 45 and County Road 24 west of I-57.

Disadvantages

- Requires land acquisition from multiple parcels of farmland.
- Impacts the developed property on the southwest side of the interchange, whereas the other locations do not.
- Has a larger footprint than the dog bone interchange proposed at this location as Alternative 1B.
- Has a higher cost estimate than Alternative 1B.

4.1.2 Alternative 1B

The second alternative for Location 1 is a typical dog bone interchange. The dog bone configuration includes four ramps between the intersecting roadways, northbound to eastbound, southbound to northbound, and vice versa with two circulating segments of roadway on the minor road to access and connect the ramps. The cost estimate to construct this interchange and the extension of Dutch Lane is $9.28 million.

Some of the advantages and disadvantages of this alternative are:

Advantages

- Connects an existing segment of roadway to I-57 and a direct route into the City of Effingham.
- This interchange location is closer to any potential freight centers developed near the southern edge of the City of Effingham.
- Provides multiple semi-direct access routes to the Hawickhorst-Jones Super Site location.
- Provides multiple semi-direct access routes to the Effingham County Memorial Airport.
- Provides a durable paved connection to between US Route 45 and County Road 24 west of I-57.
- Provides free-flow of traffic at the ramp terminals as opposed to stop control or signals.
- Has a smaller footprint than the semi-cloverleaf in Alternative IA.
- Has a lower cost estimate than Alternative 1A.

Disadvantages

- Requires land acquisition from multiple parcels of farmland.
- As with the implementation of most circulating roadways, the layout would take some adjustment for drivers to comfortably maneuver through the interchange. But once drivers become comfortable with the roadway, it would provide smooth traffic operations to and from the interstate.

4.2 Location 2

Location 2 is further south than Location 1 and lies just west of Watson, Illinois. This location does not intersect any existing east-west roadways. Therefore, a new roadway that connects with W Main Street must be constructed with both of the Location 2 designs. The segment of W. Main Street between Old Watson Road and East Street is approximately 0.34 miles long. The improvement to this section of roadway requires the addition of $375,200 to both alternatives at this location. Another requirement for Location 2 is the need to construct a new roadway bridge over I-57. The new bridge for both alternatives has been estimated as $2.70 million.

4.2.1 Alternative 2A

The first alternative for Location 2 is a partial cloverleaf which includes northbound to eastbound and eastbound to northbound ramps and southbound to eastbound and eastbound to southbound loops. The cost estimate to construct this interchange and the proposed roadway improvements to W Main Street is $9.25 million.

Some of the advantages and disadvantages of this alternative are:

Advantages

- Provides a direct connection of Illinois Route 37 to I-57.
- Provides direct interstate access to the residents and employees in Watson, IL.
- The two loop ramps allow for a smaller footprint on the west side of the interchange as opposed to the ramps in Alternative 2B.

- Has a lower cost estimate than Alternative 1A.

Disadvantages

- The loop ramps present merging conflicts with the accelerating and decelerating traffic entering and exiting on southbound I-57.
- Has a much further travel distance between I-57 and the Effingham County Memorial Airport, existing rail yards, the Hawickhorst-Jones Property and any potential multimodal freight centers developed near Jaycee Avenue.

4.2.2 Alternative 2B

The second design for Location 2 is a typical trumpet interchange with an eastbound to southbound loop and ramps for the remaining three movements. The cost estimate to construct this interchange and the proposed roadway improvements to W Main Street is $9.99 million.

Some of the advantages and disadvantages of this alternative are:

Advantages

- Will provide a direct connection of Illinois Route 37 to I-57.
- Will provide direct interstate access to the residents and employees in Watson, IL.
- The two ramps on the west side of the interchange eliminate merging conflicts between exiting and entering traffic on the southbound corridor, as compared to Alternative 2A.

Disadvantages

- The ramps on the west side of the interchange require a larger footprint that the loops in Alternative 2A at this location.
- Has a much further travel distance between I-57 and the Effingham County Memorial Airport, existing rail yards, the Hawickhorst-Jones Property and any potential multimodal freight centers developed near Jaycee Avenue.

4.3 Local Road System Improvements

As part of this study, any improvements may include construction of multiple two-lane roadways that would improve connectivity to the surrounding roadway networks and access to the interstate. These roadways would include:

- An east-west roadway starting at N 1000th Road (County Road 24) which would connect from the west side of the I-57 interchange.
- A north-south roadway that could extend 1150th Avenue (Raney Street) down to N 1000th Avenue (Dutch Lane) east of the interchange.
- E 1100th Avenue (Airport Road) would be extended to the west to connect to the proposed extension of Raney Street, thus providing alternate access from I-57 to the Effingham County Memorial Airport.

These connections would require the construction of approximately 4.0 miles of roadway which adds $5.28 million to the construction costs.

4.4 Cost Estimate Summary

The cost estimates for each alternative were based on roadway improvements which included earthwork, erosion control, pavement, pavement markings and signing, structures, and traffic control. Also included were land acquisition costs based off the amount of required right-of-way for each alternative. The estimates do not specifically include costs for Phase I, II, or III engineering, or utility relocation. However; a 20% contingency was added to each total for other miscellaneous costs. The roadway extensions discussed at location 1 in Section 4.3 were estimated separately from the interchange construction. Below is a table summarizing the cost estimates:

Summary of Cost Estimates	
Alternative	**Cost**
Location 1A - Partial Cloverleaf Interchange	$11,990,000
Location 1B - Dogbone Interchange	$9,280,000
Location 2A - Partial Cloverleaf Interchange	$9,250,000
Location 2B - Trumpet Interchange	$9,990,000
Sideroad Cost Estimates for Location 1	
S. Raney Street	$2,671,822
Airport Road	$1,006,507
1000th Avenue (west of I-57)	$1,602,098

5. Traffic Analysis

5.1 Projected Traffic Volumes

As part of this study, the volumes for the two potential interchange locations were projected to the year 2040 and compared. Volumes for surrounding US routes, Illinois routes, and major local roadways were also projected. The projected volumes considered existing volumes, additional volumes due to traffic rerouting, and volumes generated by a potential freight facility. The rerouting and existing volumes were adjusted to reflect the Effingham population growth rate over the 20-year analysis period. The method of attaining the rerouted volumes and generated volumes is summarized below.

5.1.1 Rerouted Volumes

Adding an interchange on I-57 will likely cause vehicle rerouting. In order to estimate the number of vehicles added to the system due to rerouting, some assumptions were made. The number of through movements on the interstate would not be affected by the interchange, movements would be made in pairs (for each departure trip there is a similar return trip in the opposite direction), the directionality constant is 50% and all rerouted trips originate or end somewhere between the closest existing interchanges. Average daily reroute volumes were found using the equation shown below.

$$ADRT = \sum(ADT * D * R)$$

In this equation, D represents the directionality constant, which is the proportion of vehicles on a roadway going in a single direction, R represents the percentage of vehicles that would benefit by rerouting through the proposed interchange and ADT is the average daily traffic on existing routes that would directly compete with the new potential routes created by the interchange.

The Average daily reroute volumes were calculated for the proposed interchanges per movement based on assumptions made about the changes in traffic caused by the addition of the new routes. In theory, the only roads that would compete with the new I-57 routes are those that offer northbound and southbound travel ways to and from the cities of Effingham or Watson, because these are the locations of the two nearest interchanges serving I-57. The only roads that match said criteria are S Raney Street, N Old Watson Road and US Route 45. Aside from roads, the interchanges adjacent to those proposed would also likely be in competition with the new routes. Therefore, for each movement on each proposed interchange the ADT (average daily traffic on the competing roadways) and R (the probability that the new routes are preferential) were calculated and used with the above equation.

The resultant rerouted volumes can be found in Appendix C.

5.1.2 Generated Volumes

The 10th edition ITE trip generation manual was used to estimate traffic volumes generated by the construction of a multimodal freight facility. A peak hour constant K=0.12 was used to convert the peak hour volumes obtained from the trip generation manual to ADT's. It was assumed that, of the acres of land to be used for a multimodal freight facility, only about one sixth of that will be occupied by the freight facility buildings. The land use descriptions chosen to model the predicted traffic growth include four high-cube transload and short-term storage warehouses, one general light industrial building, and three manufacturing plants.

To predict traffic patterns on the proposed interchange, the types of trips generated by this project were split into two groups, local and national. Local trips mostly include people coming from the surrounding areas for work and national trips are all trips leaving the surrounding area to ship commodities to and from the freight facility. Trips from the manufacturing plants were assumed to be 80% local and 20% national, trips from the general light industrial building were assumed to be 90% local and 10% national, and trips from the high- cube transload and short-term storage warehouses was assumed to be 30% local and 70% national.

It is assumed that people making local trips to the facility will commute no more than half an hour each way. More than half of the cities within the 30-minute radius are located near the interstate, and people commuting from those locations would make use of the interchange. However, the most populous city in the area is Effingham, and residents of Effingham would not use the interchange to commute to the freight facility. Therefore, it is assumed that approximately 50% of the local trips in each direction will use the interchange.

National trips are assumed to go to and from the seven cities identified as "target" cities in the market analysis. The table below shows a list of the target cities and the percentage of trips associated with each one.

City	Trip Percentage	
	Incoming	Outgoing
Chicago, IL	80%	20%
Cincinnati, OH	3%	12%
Indianapolis, IN	7.4%	29%
Louisville, KY	1.3%	6%
Memphis, TN	0.8%	2%
Nashville, TN	1.3%	5%
St. Louis, MO	6.2%	26%

Trips highlighted in blue and green would head north and south respectively on the proposed interchange, and trips highlighted in red would not use the interchange at all. The resultant generated volumes can be found in Appendix C.

5.1.3 Total Volumes

The 2040 projected volumes are a sum of existing, rerouted, and generated volumes. The generated volumes are automatically projected to the design year whereas the existing and rerouted volumes are representative of the current year. To adjust these values, they were multiplied by a growth rate based on the current population growth of the City of Effingham (0.25%). The final traffic volume growth rate that was used to project current year volumes to the year 2040 is 1.051206. The maximum projected ADT volume of any of the proposed locations is 7,717 vehicles per lane. This volume lies well below the interstate volume capacity of 25,000 cars per lane. The maximum projected ramp volume is 4,700 vehicles which is also below the ramp volume capacity of 12,500 cars per lane. The existing and total projected volumes can be found in Appendix D. Based on the volume to capacity ratios of the projected interchange conditions, all lanes meet a planning level of service of A.

5.2 Crash Impact

The increased interstate traffic caused by a freight facility will likely affect crash concentrations. Four interstate crash concentration heat maps are displayed in Appendix B. The heat maps include one that covers all injuries and fatalities, two that cover multi-unit truck injuries and fatalities separately, and one that covers all crashes.

According to the traffic generation model being used, local trips will mostly generate passenger vehicle volumes, while national trips will mainly generate multi-unit (MU) truck volumes. Therefore, the overall injuries and fatalities heat map trends will be compared with the total added vehicle volumes, and the MU Injuries and fatalities heat map trends will be compared with the added truck volumes only.

Four main crash trends were found on the interstates by comparing the injuries and fatalities heat map to geographical points of interest. Of the high-risk points on the interstate heat map in the figure below, 9 are near interchanges, 7 are at underpasses, and 9 are near median U-turns.

Figure Above: High-Risk Points Heat Map

Of the high-risk points on the MU truck crash map, 5 were at median U-turns, 6 were near an interchange, and 2 were near an underpass. In both maps, the highest risk locations are those where traffic volumes are highest. Although all the high-risk crash locations may be affected by the generated and rerouted traffic volumes, only the areas caused by high traffic volumes will be directly affected by the increase.

As seen in the figures in Appendix B, the most concentrated interstate crash location within the project limits is the segment of roadway that overlaps I-57 with I-70. This crash concentration is most likely caused by higher traffic volumes on that segment of roadway. There are also five interchanges within that segment that may be further increasing the crash risk. The crash rate in this location was found to be 110 crashes per hundred million vehicle miles traveled, which is higher than the state average for interstates. However, the available crash data is not very

conclusive as it was likely negatively influenced by the construction occurring on I-57 and I-70 at the time. It was found that approximately 25% of the crashes on this roadway segment were classified as “work zone related”. Therefore, additional crash analysis will need to be completed during a Phase 1 study when updated crash data is available for the current interstate configuration.

Figure Above: High-Risk Points for MU Trucks Heat Map

According to the trip generation calculations, added traffic to that segment would include 25% of local trips, 90.4% of incoming national trips, and 61% of outgoing national trips, almost 40% of all generated trips. The total projected volumes, including rerouted volumes, will cause an approximate 6% increase in traffic on this segment of roadway.

Figure 1 in Appendix B shows a point of mild concentration of injuries and fatalities at Location 1 for the proposed interchange. This point of concentration is at an underpass which is a common trend. There would be no substantial increased crash risk at Location 1 with a proposed interchange that is designed to current standards. There are no abnormal crash trends at Location 2.

Overall crash rates for the US, state, and local arterial routes are represented in the heat map below. Many of the factors correlated to high crash rates on the interstates do not occur on US, state, and local roads. However, traffic volume is still the largest contributing factor to crash risk on the non-interstate routes. The US route that will be affected most by the added interchange is US Route 45 which currently has the highest crash risk amongst non-interstate roads in the project area. According to traffic projections, US Route 45 traffic volumes will decrease as a result of the new interchange, meaning the crash risk on this road will likely decrease as well. Other major roadways that will potentially be affected by the new construction are Dutch Lane, Airport Road, Raney Street, and US 37. Although the volumes on all these roads, aside from Raney Street, are expected to increase, the crash risks of these roads are currently negligible.

Figure Above: Overall Crash Rates on US, State, and Local Roads Heat Map

5.3 Travel Times

Travel times for the generated and rerouted trips will differ based on the interchange location. Location 1 is closer to a proposed freight facility, making generated trips more convenient. Whereas, Location 2 is closer to the city of Watson, making many rerouted trips more convenient.

For trips headed to a freight facility, Location 2 would add 2 minutes to a northbound commute and 6 minutes to a southbound commute. This results in 1,363 lost vehicle hours per day if Location 2 is used. For rerouted trips it is not as simple to compare travel times because the origins and destinations of these trips are scattered. However, the demand of rerouted vehicles for Location 1 is 443 vehicles per day greater than that for Location 2.

6. Conclusions / Recommendations

The results of this study conclude that the construction of a new Effingham southern interchange along I-57 to promote economic development by improved industrial/commercial traffic access and improved traffic flow characteristics is feasible and recommends that the project move forward with further in-depth Phase I studies. These studies would be completed to refine and document the purpose and need, enhance the alternatives refinement, interchange and bridge alternatives (Type, Size & Location drawings), alternatives refinement & selection, Interchange Type Study, Access Justification Report, develop specific logical termini, land acquisition issue development, refined cost estimates and funding sources, drainage reports, in-depth social, economic and environmental reviews, agency coordination, railroad coordination, utility coordination, enhanced public involvement, enhanced traffic projections, work zone traffic management studies, and intersection design studies in compliance with the IDOT – Bureau of Design & Environment Manual, Chapters 11 & 12.

Both interchange locations (1 & 2) would provide greater access from I-57 and I-70 to the area between I-57 and US Route 45 immediately south of the city boundaries of Effingham. However; Location 1 would provide the most logical connection to an existing segment of roadway (Dutch Lane) from I-57 with a direct route into the City of Effingham. It is closer to any proposed freight centers developed near the southern edge of the City of Effingham and provides multiple semi-direct access routes to the Hawickhorst-Jones Super Site location and the Effingham County Memorial Airport.

In addition to the two interchange locations, environmental resources and issues were reviewed for the possible extensions of Raney Street, Dutch Road, Airport Road, and Main Street. The results of the inventory of environmental resources were researched and summarized. In Appendix G, Exhibits A and B depict the potential environmental resources in the project study area.

The development of a new south interchange along I-57 south of Effingham would not have a negative impact on any of the surrounding US routes, Illinois routes, or major local roadways. The average daily traffic on I-57 near Location 1 is projected to increase to 15,434 vehicles per day from an existing 10,150 vehicles per day for Alternative 1A. However, based on the volume to capacity ratios of the projected interchange conditions, all lanes would meet a planning level of service of A.

Assuming a direct correlation between traffic volume and crash risk along the segment of I-57 that runs concurrently with I-70 (mile marker 157 to mile marker 164) this location, the added vehicle volumes may increase the likelihood of crashes. However, the available crash data is not very conclusive as it was likely negatively influenced by the construction occurring on I-57 and I-70 at the time. It was found that approximately 25% of the crashes on this roadway segment were classified as "work zone related". Therefore, additional crash analysis will need to be completed during a Phase 1 study when updated crash data is available for the current interstate configuration. There would be no substantial increased crash risk at Location 1, or Location 2 with a proposed interchange designed to current standards.

It is anticipated that the crash risk along US Route 45 would decrease due to reduced exposure from reduced traffic volumes. Further, the crash risks on Dutch Lane, Airport Road, Raney Street, and US 37 would not change significantly.

The next steps for the City of Effingham are to work with IDOT to identify and actively pursue funding for the preliminary engineering phases. In particular, a comprehensive Phase I study. Interactions with the IDOT should continue to enable the incorporation of this work into the IDOT Transportation Improvement Program (TIP) and the IDOT Multi-Year Program.

Potential funding could be from the following list of sources:

- The United States Department of Transportation Programs
  - BUILD America Transportation Program (FHWA) - $7.1 Billion for 10 rounds of investments.
    - ❖ The 2019 project awards have been distributed. The 2020 program application announcement and deadline has not yet been announced; however, available funding has been established for the next several years. This program replaced the TIGER program.
  - INFRA Grant Program (FHWA)
    - ❖ The $856 million of the 2019 round of project awards were announced in July of 2019, however, it is expected that further rounds of funding may be made available.

- The Illinois Department of Transportation Local Program (traditional funds)
  - Surface Transportation Program (STP)
  - Surface Transportation Urban (STU)
  - Transportation and Community and System Preservation Pilot Program (TCSP)
  - Economic Development Program (EDP)
  - County Consolidated Program
  - Motor Fuel Tax Fund Distribution
  - Transportation Renewal Fund Distribution (New)

- The Illinois Department of Transportation State Program (traditional funds)
  - Highways for LIFE Program (HfL) (FHWA thru IDOT & must use innovative technologies, manufacturing processes, or contracting methods that improve safety, reduce congestion due to construction, and improve quality.
  - National Highway Performance Program (NHPP) (FHWA thru IDOT)
  - Surface Transportation Block Grant Program (STBG) (FHWA thru IDOT)
  - Competitive Freight Funding Program (FHWA – National Highway Freight Program (NHFP) thru IDOT).

- ❖ The projects announced in 2018 are for the next 5 years, however, it is always possible that a funded project could drop out making additional funds available.

- The Transportation Funding Protection Act of 2019 (PA101-0032), Rebuild Illinois Capital Financing Program Act of 2019 (PA101-0030), and FY2020 Budget Implementation Act (PA101-0010) provided additional funding revenue for infrastructure improvements. In addition to providing additional revenue to the Illinois Road Fund, it created a new Transportation Renewal Fund. Funding for the City of Effingham projects may potentially be obtained by the Budget Appropriations Act for FY 2020 (PA101-0029) which provided the following additional funding for infrastructure:

  - *Section 75.* The sum of $1,500,000,000, or so much thereof as may be necessary, is appropriated from the Transportation Bond Series A Fund to the Department of Transportation for grants to counties, municipalities, and road districts for planning, engineering, acquisition, construction, reconstruction, development, improvement, extension, and all construction related expenses of the public infrastructure and other transportation improvement projects which are related to economic development in the State of Illinois.

    - For Municipalities the portion would be $736,500,000. We are not sure how this will be distributed. It may be distributed as was the previous funding bills by MFT formula over a few years, or it may be distributed project by project. If it were to be distributed by MFT formula, it is anticipated that Effingham would receive approximately $811,500.

  - *Section 80.* The sum of $78,000,000, or so much thereof as may be necessary, is appropriated from the Multi-Modal Transportation Bond Fund to the Department of Transportation for the installation of grade crossing protection or grade separations at places where a public highway crosses a railroad at grade, as ordered by the Illinois Commerce Commission, as provided by law. This is an additional amount appropriated beyond the normal $39,000,000 deposited from MFT collections. It has not been determined how this will be distributed, but it may be through a competitive grant process.

  - *Section 10.* The sum of $175,000,000, or so much thereof as may be necessary, is appropriated from the Build Illinois Bond Fund to the Department of Commerce and Economic Opportunity for the purpose of making grants and loans to local governments for planning, engineering, acquisition, construction, reconstruction, development, improvement and extension of the public infrastructure, and for any other purposes authorized in subsection (a) of Section 4 of the Build Illinois Bond Act and for grants to State agencies for such purposes, including prior incurred costs. It has not been determined how this will be distributed, but it may be through a competitive grant process.

  - *Section 15.* The sum of $175,000,000, or so much thereof as may be necessary, is appropriated from the Build Illinois Bond Fund to the Department of Commerce and Economic Opportunity for the purpose of making grants and loans to foster economic development and increase employment and the well-being of the citizens of Illinois, and for any other purposes authorized in subsection (b) of Section 4 of

the Build Illinois Bond Act and for grants to State agencies for such purposes, including prior incurred costs. It has not been determined how this will be distributed, but it may be through a competitive grant process.

- *Section 20.* The sum of $20,000,000, or so much thereof as may be necessary, is appropriated from the Build Illinois Bond Fund to the Department of Commerce and Economic Opportunity for purposes authorized in subsection (c) of Section 4 of the Build Illinois Bond Act and for grants to State agencies for such purposes, including prior incurred costs. It has not been determined how this will be distributed, but it may be through a competitive grant process.

- *Section 25.* The sum of $30,000,000, or so much thereof as may be necessary, is appropriated from the Rebuild Illinois Projects Fund to the Department of Commerce and Economic Opportunity for purposes authorized in subsection (c) of Section 4 of the Build Illinois Bond Act and for grants to State agencies for such purposes, including prior incurred costs. It has not yet been determined how this will be distributed, but it may be through a competitive grant process.

Appendix A

Background Information

Figure 1: Hawickhorst-Jones Property Super Site Location

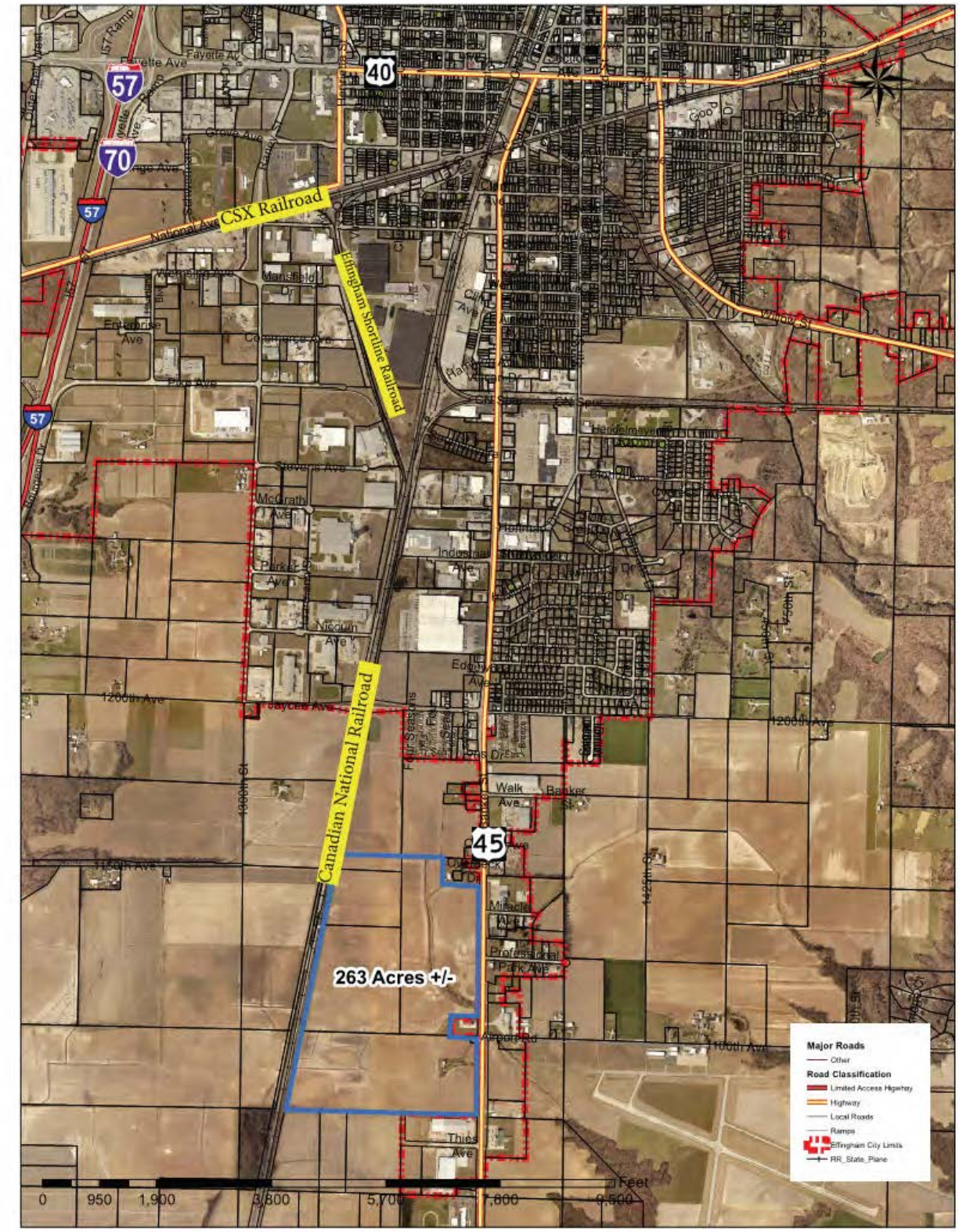


Figure 2: Study Area

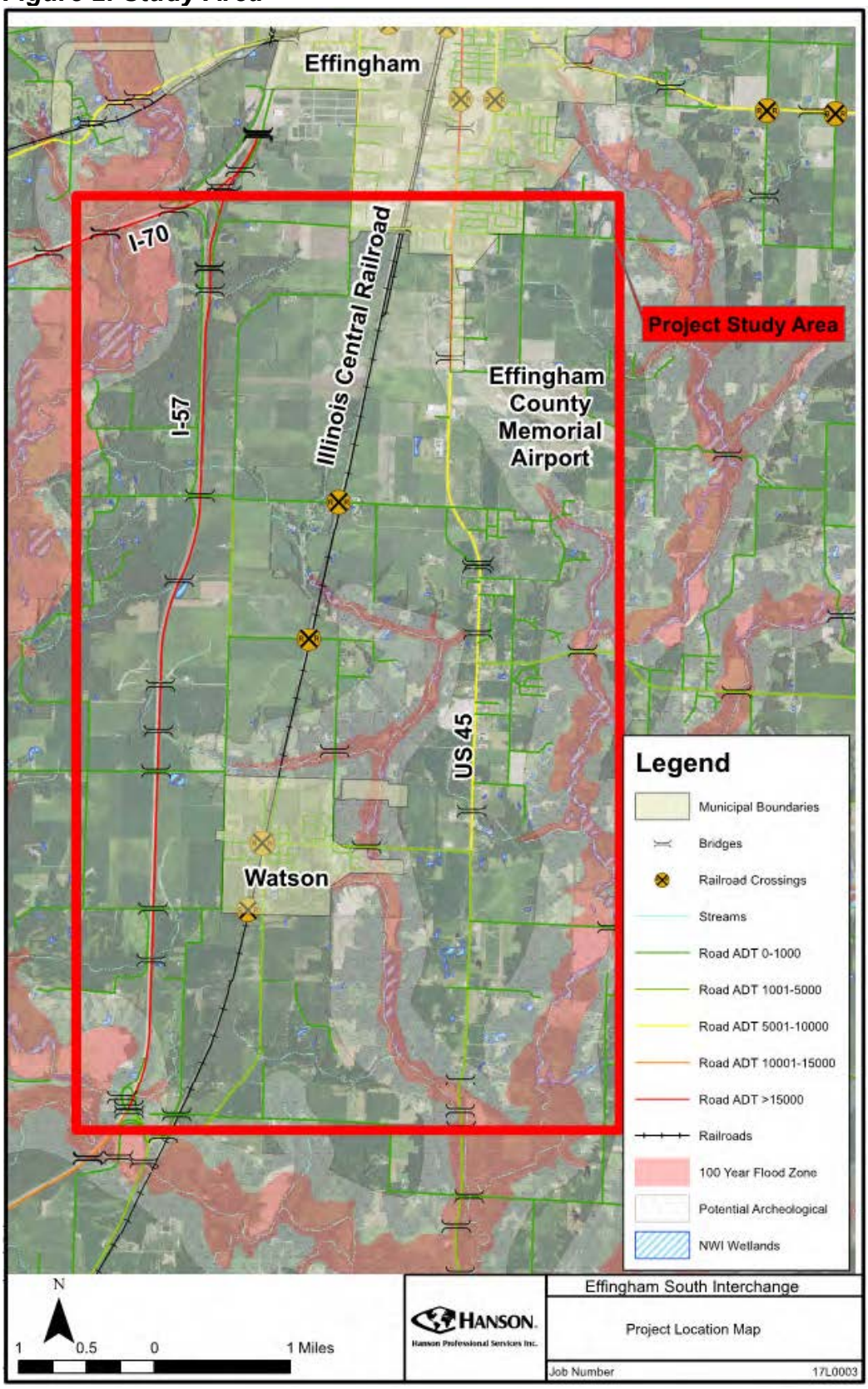


Figure 3: Freight Facility Location in the Midwest

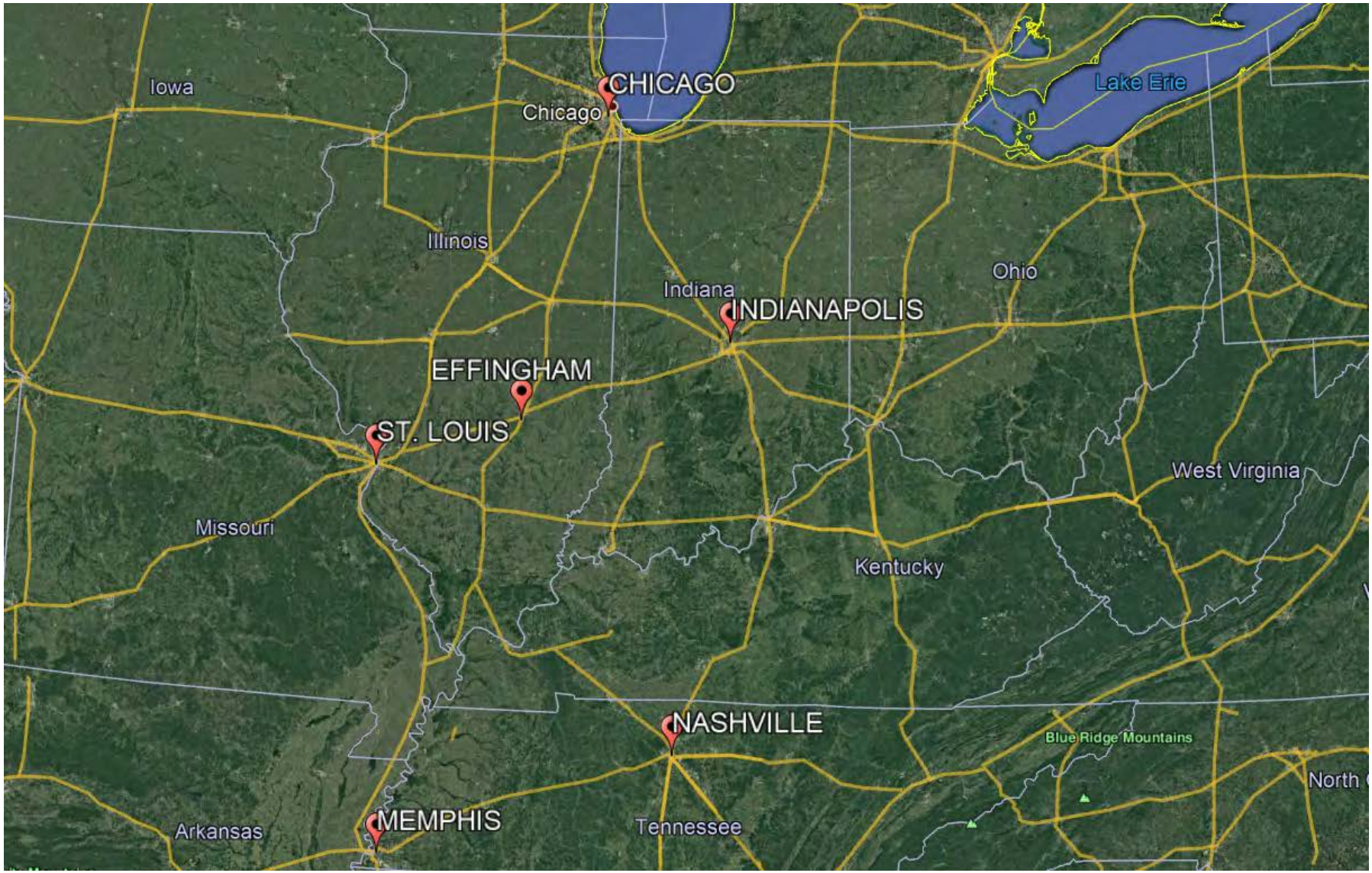
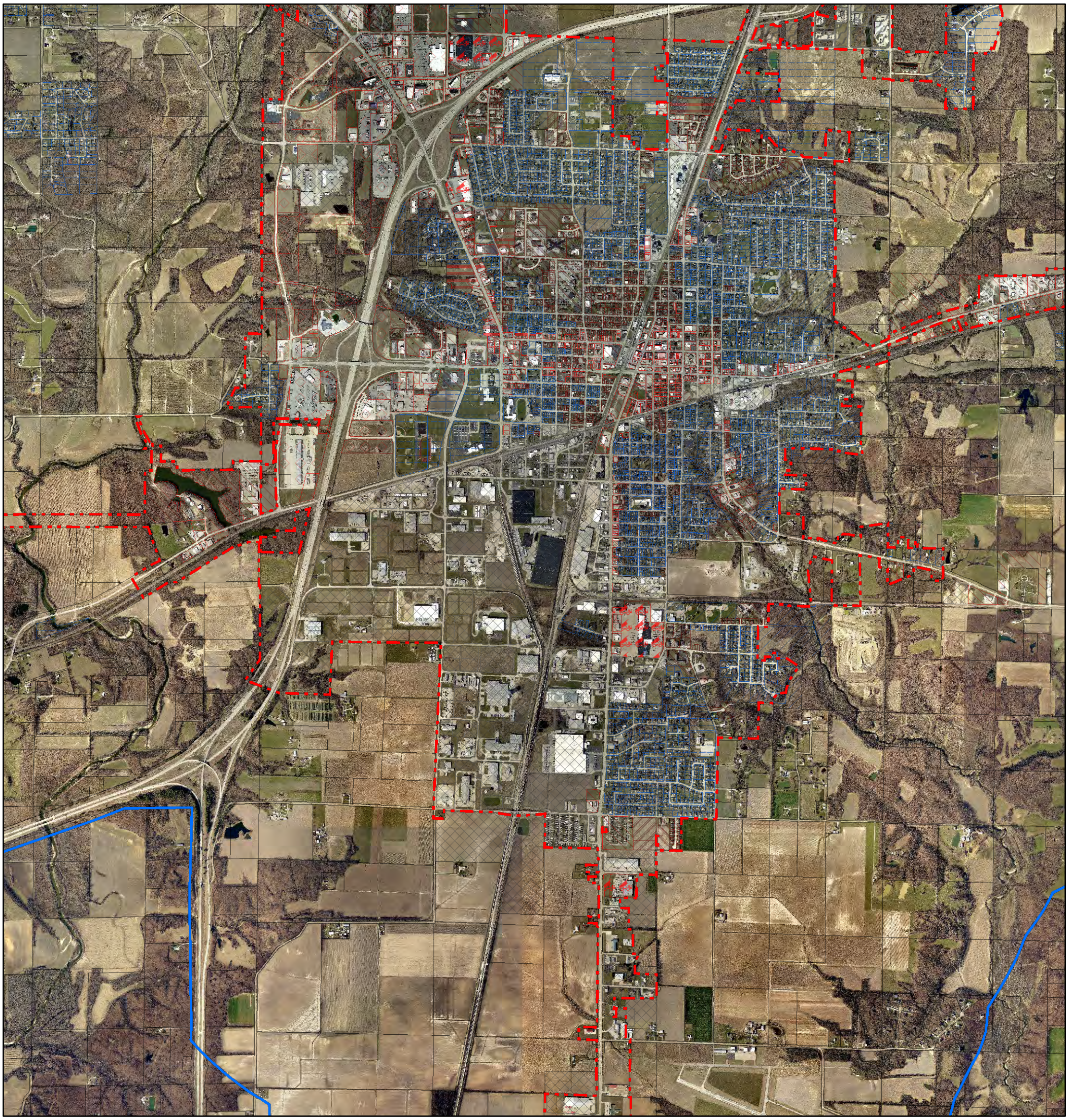


Figure 4

The City of Effingham Zoning Map



12/19/2019 10:40:24 AM

1:36,112

0 0.33 0.65 1.3 mi

0 0.5 1 2 km

Zoning

- Not Zoned
- B-1
- B-2
- B-3
- B-4
- B-5
- M-1
- M-2
- NU
- POM
- PRD
- R-1
- R-2
- R-3A
- R-3B
- R-3C
- R-3D
- R-4
- Extra Territorial Limit
- Effingham City Limits

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community, The

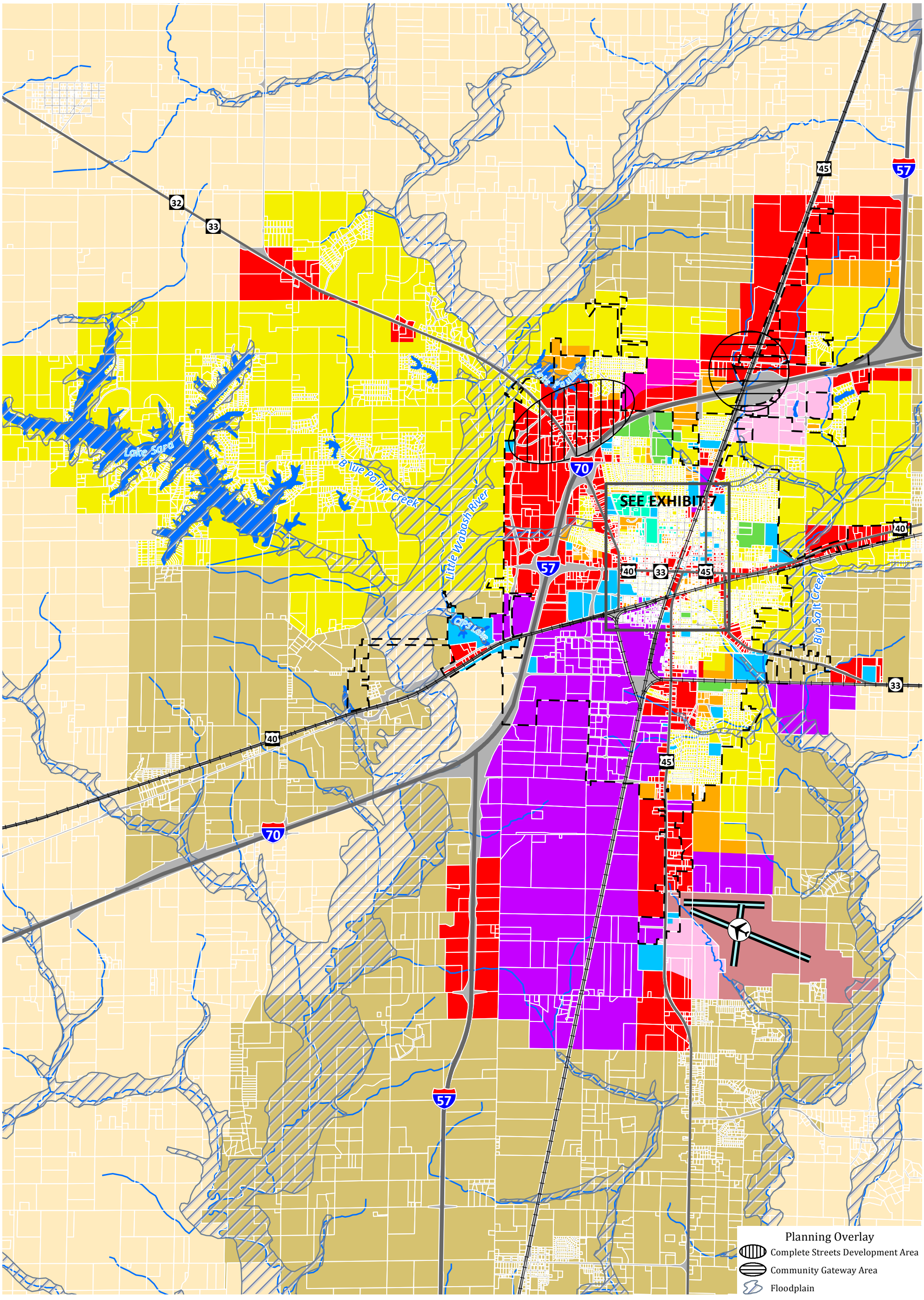


Figure 5

Future Land Use
City of Effingham, Illinois

Data Source: City of Effingham, Illinois
Effingham County, Illinois
IL State Water Survey

Municipal Boundary

- Airport Planning Area
- Business Park
- Planned Unit Development - Commercial
- Commercial
- Industrial
- Rural / Agricultural
- Suburban Residential
- Low Density Residential
- Medium / High Density Residential
- Planned Medical Park
- Park
- Public / Semi-Public

N

0 1 2 Miles

EDR
Economic Development Resources

Appendix B

Raw Crash Data

Figure 1: Interstate Injuries and Fatalities

Figure 2: Interstate MU Injuries

Figure 3: Interstate Overall

Figure 4: Interstate MU Fatalities

Figure 5: Non-Interstate Injuries and Fatalities

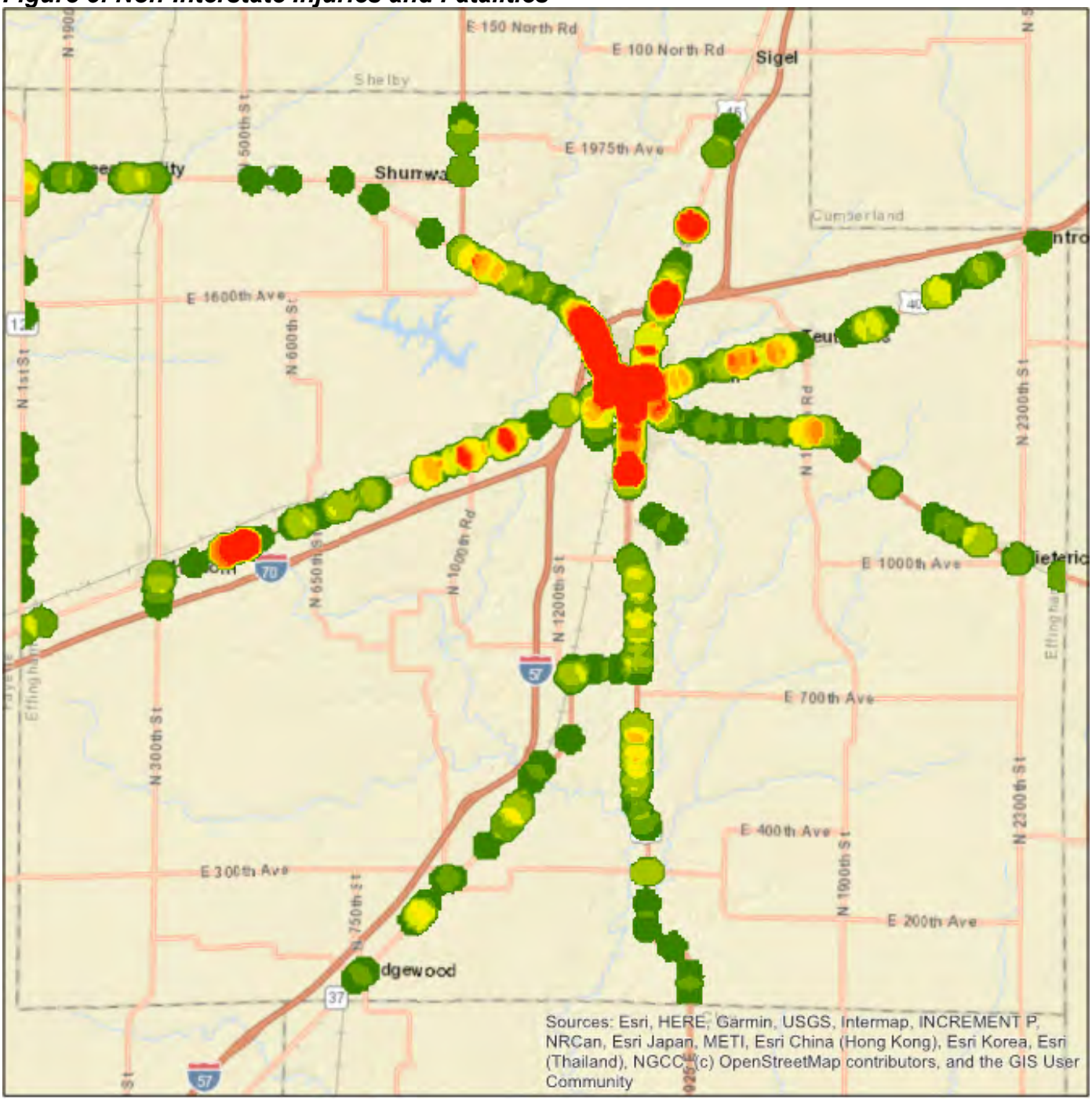


Figure 6: Non-Interstate Overall

Appendix C

Generated Volumes
Rerouted Volumes

Figure 1: Generated Volumes

Figure 1.1 Location 1

Figure 1.2 Location 2

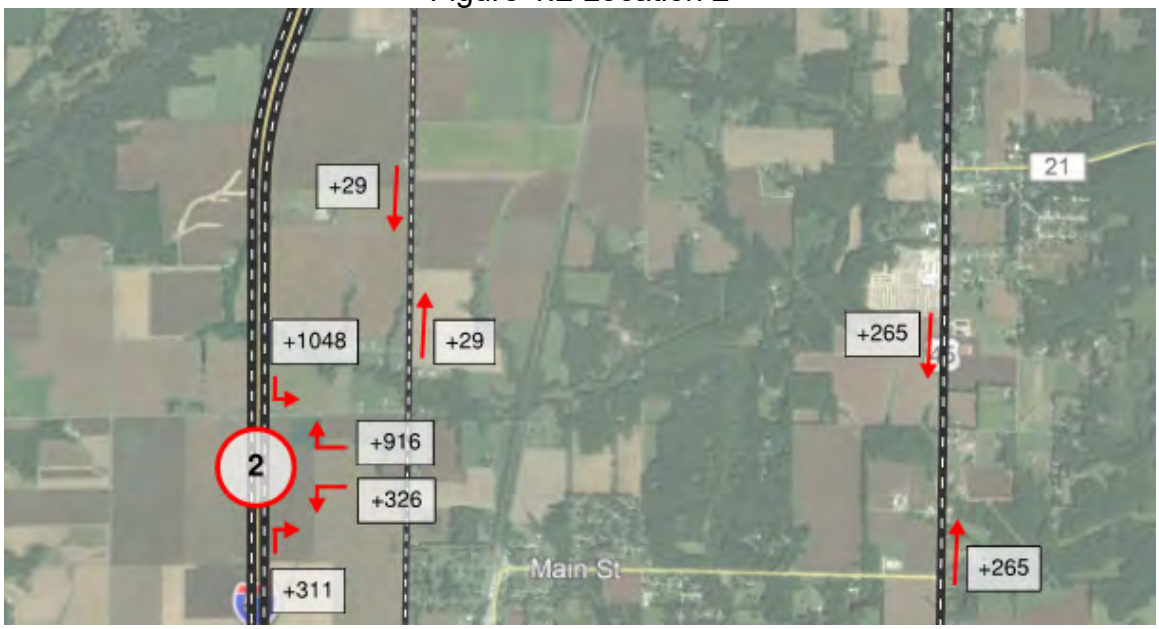


Figure 2: Rerouted Volumes

Figure 2.1 Location 1

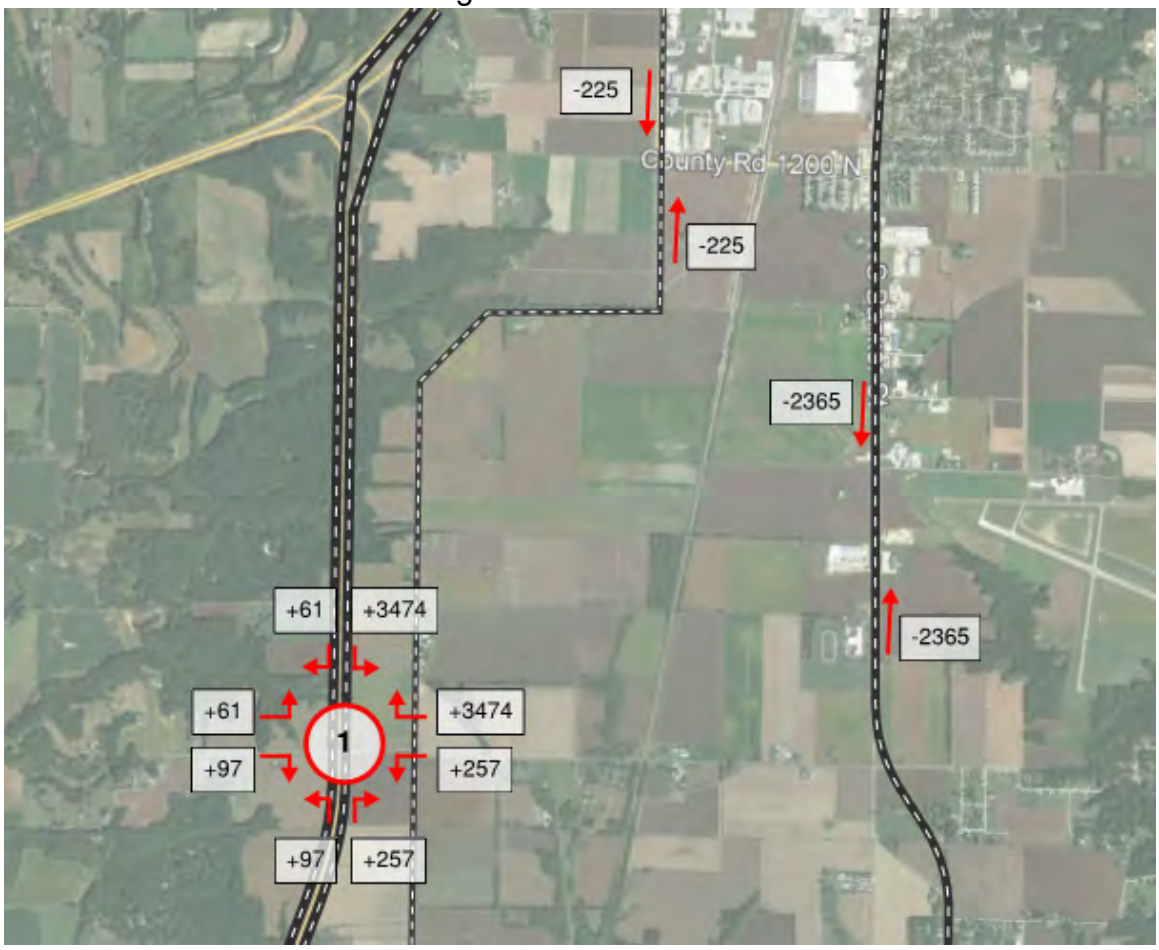
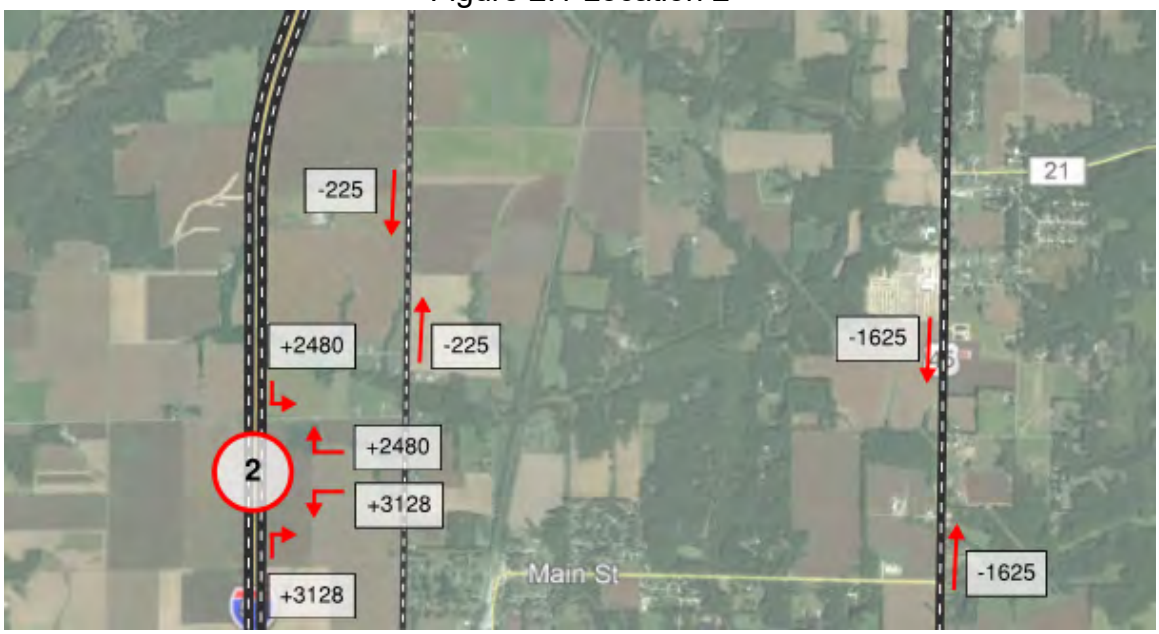


Figure 2.1 Location 2



Appendix D

Existing and Projected Traffic Counts

Figure 1: Existing Volumes

Figure 1.1 Location 1

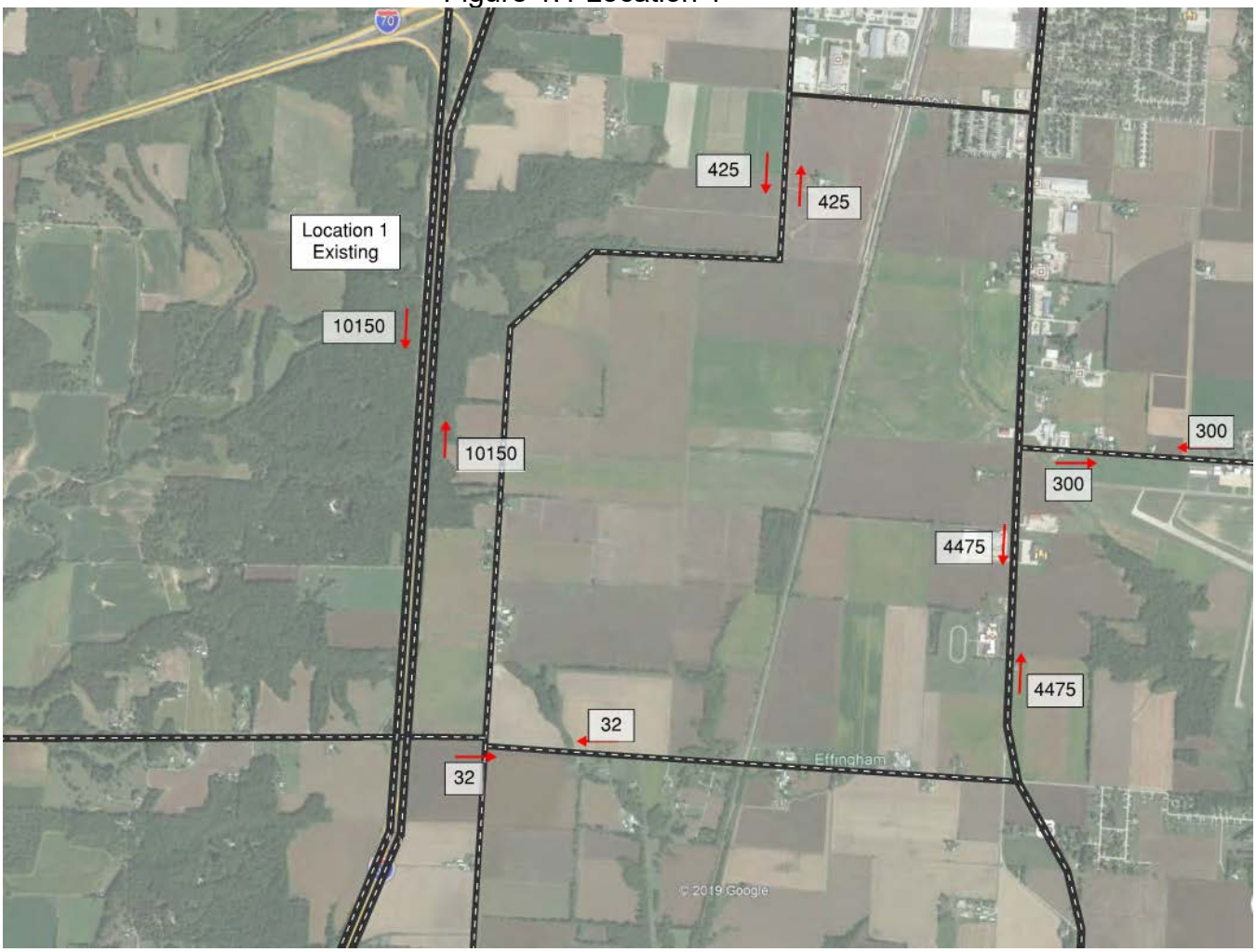


Figure 1.2 Location 2

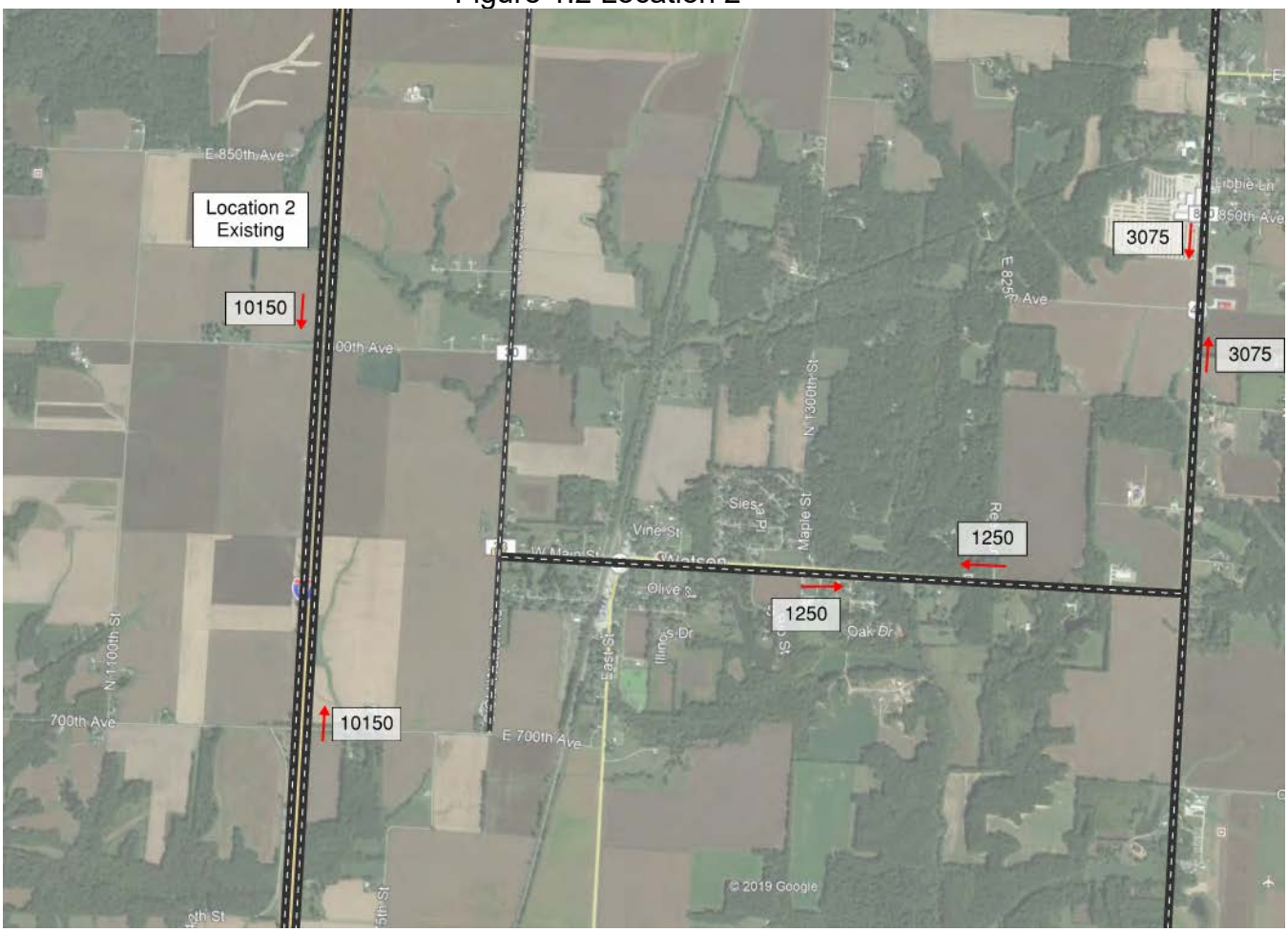


Figure 2: Projected Volumes

Figure 2.1 Location 1A

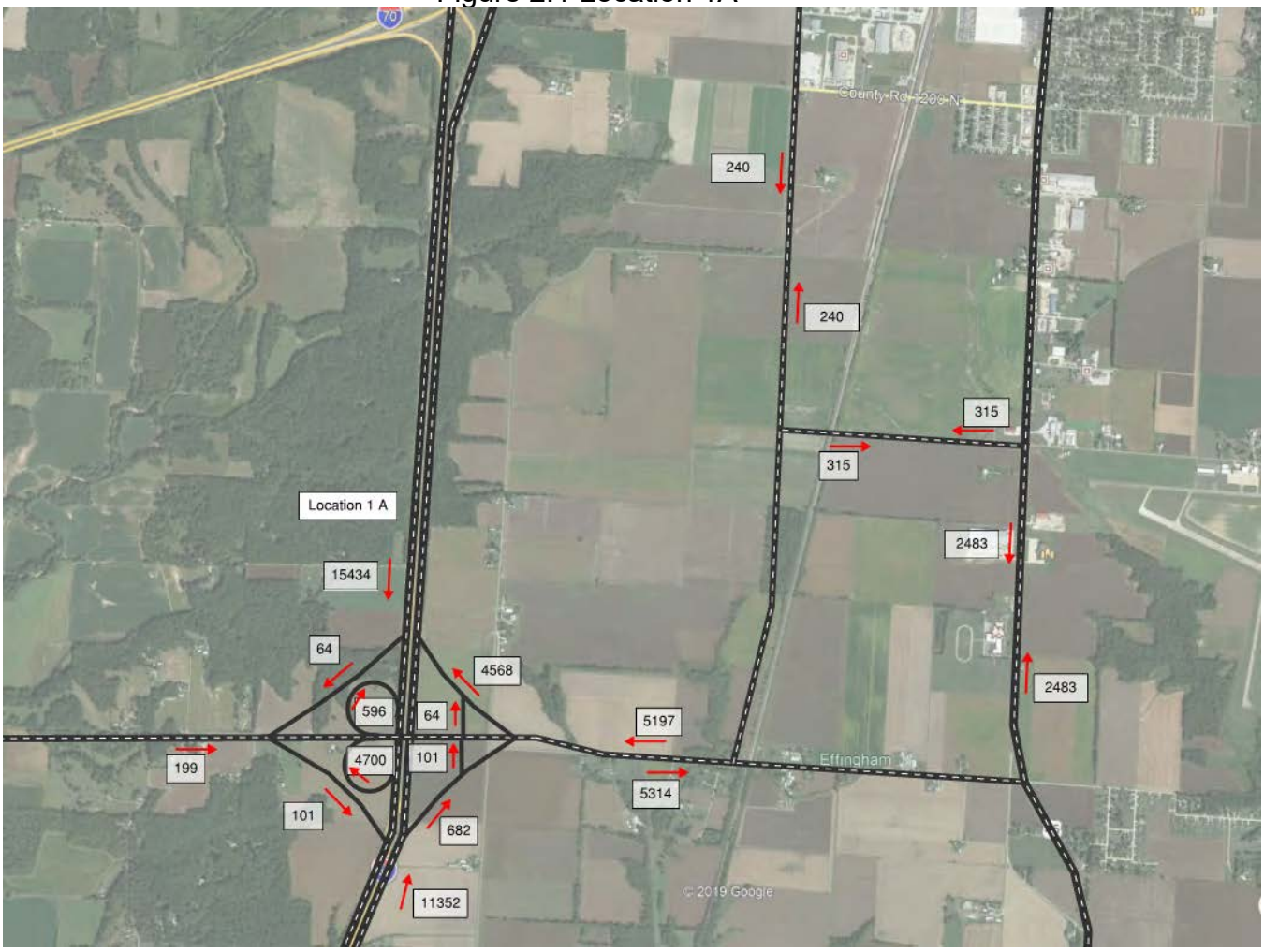


Figure 2.2 Location 1B

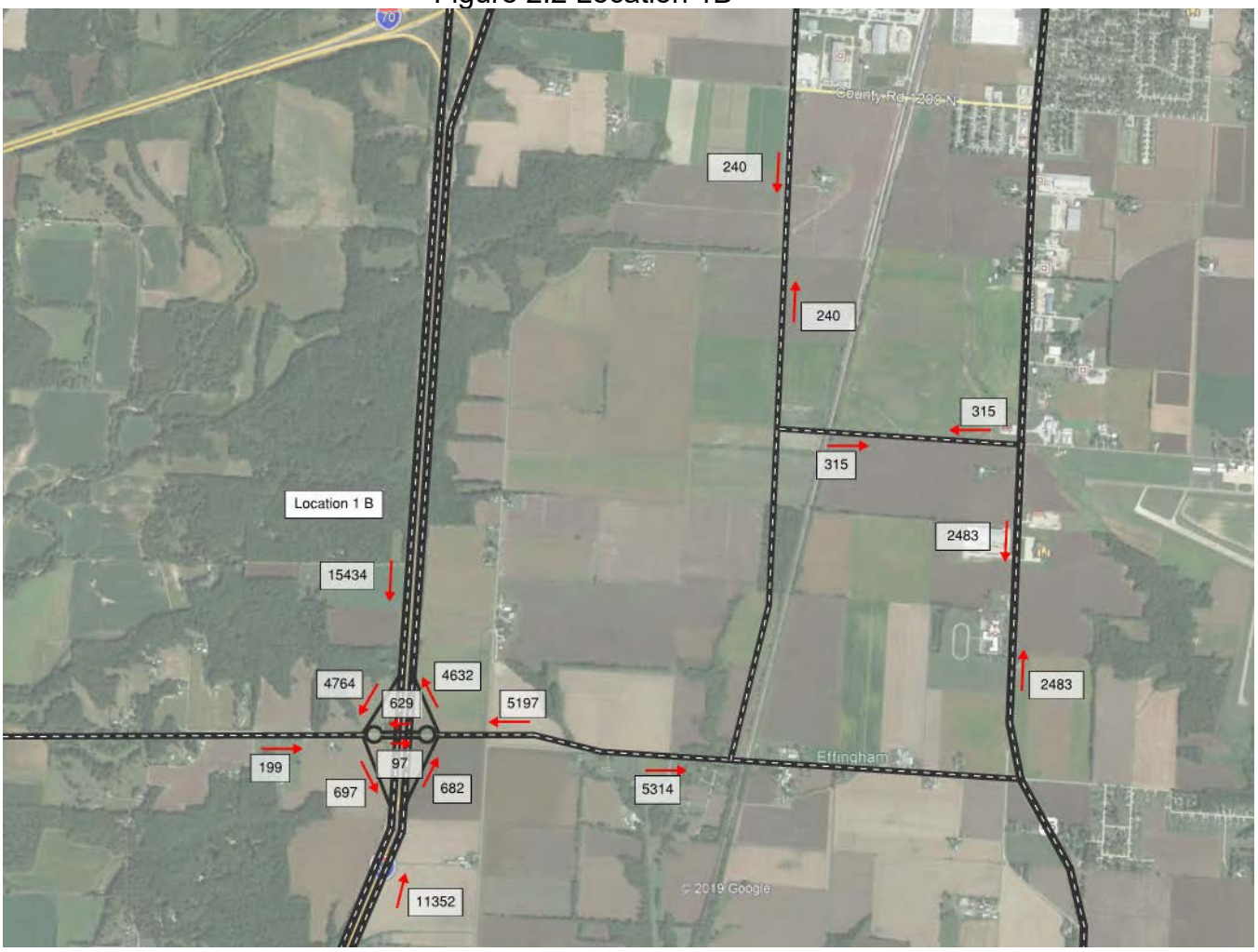


Figure 2.3 Location 2A

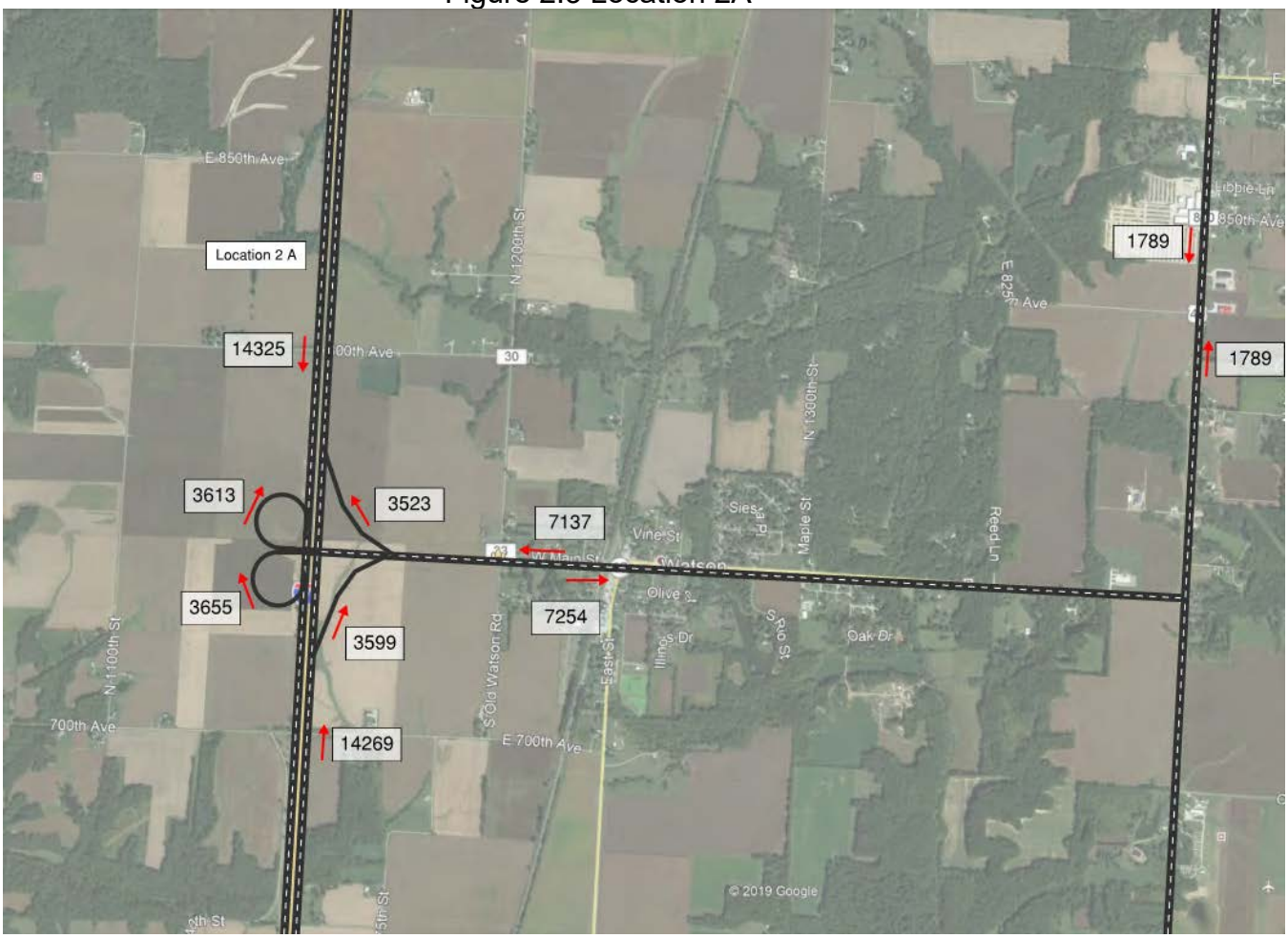
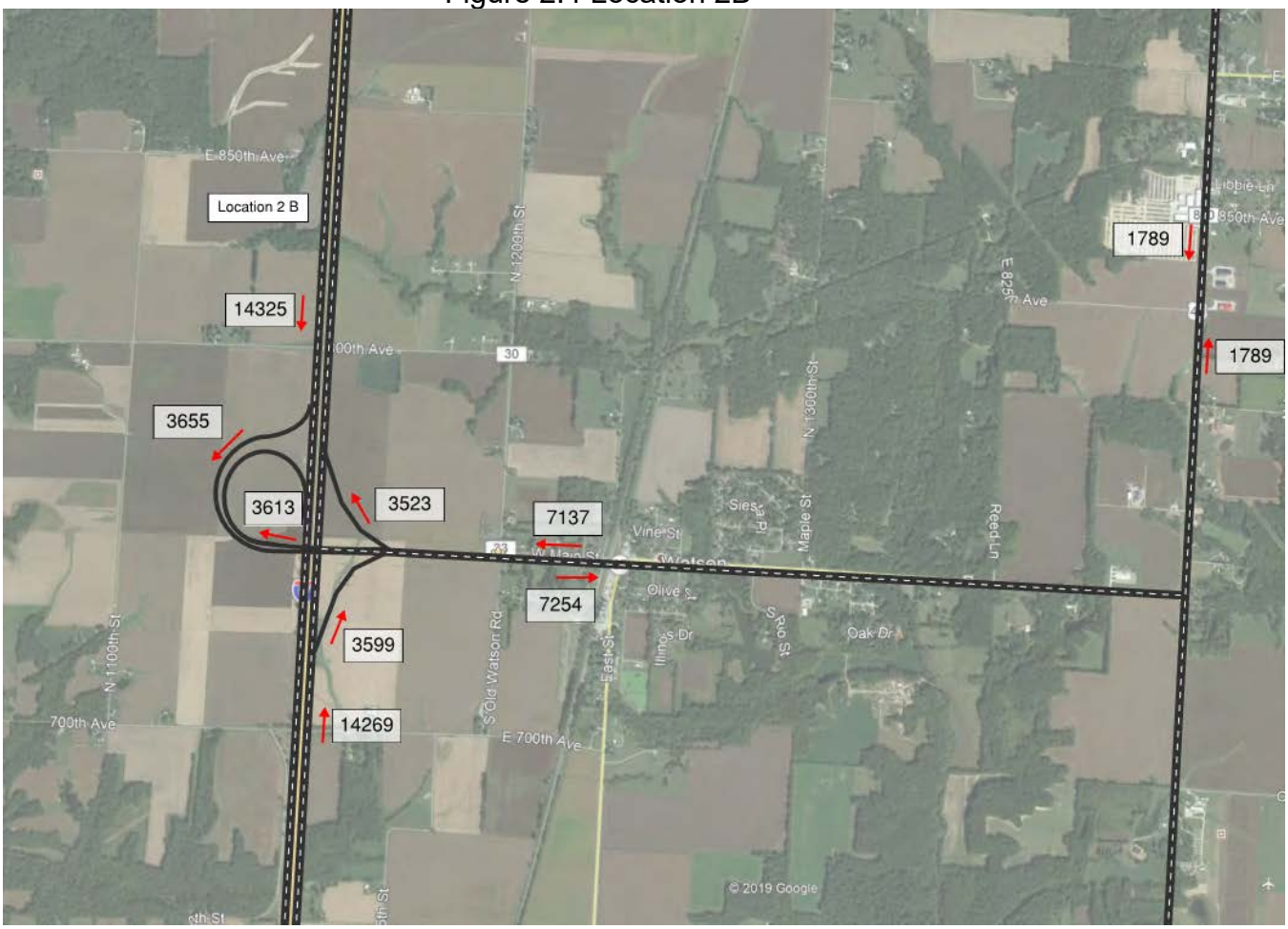


Figure 2.4 Location 2B



Appendix E

Design Criteria Tables

Design Element				Manual Section	Rural One-Way DHV: 2300 - 3400 (1) Urban One-Way DHV: 2800 – 4300 (1)	Rural One-Way DHV: Under 2300 (1) Urban One-Way DHV: Under 2800 (1)
Design Controls	Design Forecast Year			31-4.02	20 Years	
	*Design Speed			31-2	Rural: 75 mph **(2)** Urban: 60 mph	
	Access Control			35-1	Full Control	
	Level of Service			31-4.04	Rural: B Urban: C **(3)**	
Cross Section Elements	*Traveled Way Width			34-2.01	2 @ 36′	2 @ 24′
	Shoulder Width	Right	Total Width	34-2.02	10′	10′
			Paved		10′ **(4)**	10′ **(4)**
		Left	Total Width		10′	8′
			Paved		10′ **(5)**	6′
	Auxiliary Lanes	Lane Width		37-2.05	12′	
		Shoulder Width			Right: 10′ Left: 8′ (Minimum)	
	Cross Slope	*Travel Lane		34-2.01	3/16″/ft for lanes adjacent to crown **(6)**	
		Shoulder		34-2.02	1/2″ /ft	
	Median Width	Depressed		34-3	Minimum: 60′	Minimum: 56′
		Flush (Concrete Barrier)			23′ **(7)**	20′ **(7)**
	Clear Zone			38-3	**(8)**	
Roadway Slopes	Side Slopes	Cut Section	Front Slope	34-4.03	1V:6H	
			Ditch Bottom Width		4′ **(9)**	
			Back Slope		1V:3H **(10)**	
		Rock Cut		34-4.05	—	
		Fill Section		34-4.02	1V:6H to Clear Zone; 1V:3H max. to Toe of Slope **(11)**	
	Median Slopes			34-3	1V:6H	
Bridges	New and Reconstructed Bridges	*Structural Capacity		N/A	HS-20	
		*Clear Roadway Width **(12)**		39-6	56′ **(13)**	40′
	Existing Bridges to Remain in Place	*Structural Capacity		N/A	HS-20	
		*Clear Roadway Width **(14)**		39-6	56′	38′
	*Vertical Clearance (Freeway Under) **(15a)**	New and Replaced Overpassing Bridges **(15b)**		39-4	16′-9″ **(15c)**	
		Existing Overpassing Bridges			16′-0″ **(15c)**	
		Overhead Signs/ Pedestrian Bridges		33-5	17′-3″ **(15b)**	
	*Vertical Clearance (Freeway over Railroad)			39-4.06	23′-0″	

* Controlling design criteria (see Section 31-8).

GEOMETRIC DESIGN CRITERIA FOR FREEWAYS
(New Construction/Reconstruction)
(US Customary)

Figure 44-5.A

Design Element				Manual Section	Rural One-Way DHV: 2300- 3400 (1) Urban One-Way DHV: 2800 - 4300 (1)	Rural One-Way DHV: Under 2300 (1) Urban One-Way DHV: Under 2800 (1)
Design Controls	Design Forecast Year			31-4.02	20 Years	
	*Design Speed			31-2	Rural: 120 km/h **(2)** Urban: 100 km/h	
	Access Control			35-1	Full Control	
	Level of Service			31-4.04	Rural: B Urban: C **(3)**	
Cross Section Elements	*Traveled Way Width			34-2.01	2 @ 10.8 m	2 @ 7.2 m
	Shoulder Width	Right	Total Width	34-2.02	3.0 m	3.0 m
			Paved		3.0 m **(4)**	3.0 m **(4)**
		Left	Total Width		3.0 m	2.4 m
			Paved		3.0 m **(5)**	1.8 m
	Auxiliary Lanes	Lane Width		37-2.05	3.6 m	
		Shoulder Width			Right: 3.0 m Left: 2.4 m (Minimum)	
	Cross Slope	*Travel Lane		34-2.01	1.5% for lanes adjacent to crown **(6)**	
		Shoulder		34-2.02	4%	
	Median Width	Depressed		34-3	Minimum: 18 m	Minimum: 17 m
		Flush (Concrete Barrier)			7.0 m **(7)**	6.0 m **(7)**
	Clear Zone			38-3	**(8)**	
Roadway Slopes	Side Slopes	Cut Section	Front Slope	34-4.03	1V:6H	
			Ditch Bottom Width		1.2 m **(9)**	
			Back Slope		1V:3H **(10)**	
		Rock Cut		34-4.05	—	
		Fill Section		34-4.02	1V:6H to Clear Zone; 1V:3H max. to Toe of Slope **(11)**	
	Median Slopes			34-3	1V:6H	
Bridges	New and Reconstructed Bridges	*Structural Capacity		N/A	MS-18	
		*Clear Roadway Width **(12)**		39-6	16.8 m **(13)**	12.0 m
	Existing Bridges to Remain in Place	*Structural Capacity		N/A	MS-18	
		*Clear Roadway Width **(14)**		39-6	16.8 m	11.4 m
	*Vertical Clearance (Freeway Under) **(15a)**	New and Replaced Overpassing Bridges **(15b)**		39-4	5.1 m **(15c)**	
		Existing Overpassing Bridges			4.9 m **(15c)**	
		Overhead Signs/ Pedestrian Bridges		33-5	5.25 m **(15b)**	
	*Vertical Clearance (Freeway over Railroad)			39-4.06	7.0 m	

* Controlling design criteria (see Section 31-8).

GEOMETRIC DESIGN CRITERIA FOR FREEWAYS
(New Construction/Reconstruction)
(Metric)

Figure 44-5.A

(1) Traffic Volumes. The design hourly volumes (DHV) are calculated assuming base conditions (except for 16% heavy vehicles) and a PHF = 1.0. Adjust these values using local factors.

(2) Design Speed. In rolling terrain, a minimum design speed of 60 mph (100 km/h) may be considered with study and justification.

(3) Level of Service. In major urban areas, a level of service D may be considered with study and justification.

(4) Shoulder Width (Right). Where the directional distribution of trucks exceeds 250 DDHV, consider providing a 12 ft (3.6 m) paved shoulder.

(5) Shoulder Width (Left). Where there are three or more lanes in one direction and the directional distribution of trucks exceeds 250 DDHV, consider providing a 12 ft (3.6 m) paved shoulder.

(6) Travel Lane Cross Slope. For each additional lane away from the crown lanes, increase the cross slope by 1/16″/ft (0.5%) per additional lane up to a maximum of 5/16″/ft (2.5%).

(7) Flush Median Width. Consider providing wider medians where required for snow storage.

(8) Clear Zone. The clear zone will vary according to design speed, traffic volumes, side slopes, and horizontal curvature.

(9) Ditch Bottom Width. Provide a wider outside ditch bottom where detention storage of storm water is a consideration.

(10) Back Slope. Where the height of cut exceeds 10 ft (3 m), consider using a 1V:2H back slope beyond the clear zone. Also, for heights greater than 30 ft (9 m), consider the use of benching.

(11) Fill Slope. For fill heights greater than 30 ft (9 m), use a 1V:2H uniform slope with a roadside barrier. Also, for heights greater than 30 ft (9 m), consider the use of benching.

(12) New and Reconstructed Bridge Widths. Clear roadway bridge widths are measured from face to face of parapets or rails. Bridge widths are normally defined as the sum of the approach traveled way width and the width of the paved shoulders.

(13) Bridge Width. Where the directional distribution of trucks exceeds 250 DDHV, consider providing 12 ft (3.6 m) right and left shoulders. Total width equals 60 ft (18.0 m).

(14) Existing Bridge Widths to Remain in Place. Clear roadway bridge widths are measured from face to face of parapets or rails. Implies elements allowed to remain in place without a design exception approval when cost effective and when safety record is satisfactory.

(15) Vertical Clearance (freeway under).

a. The clearance must be available over the traveled way and any paved shoulders.
b. Make allowances to maintain 16 ft- 0 in (4.9 m) minimum vertical clearance in anticipation of for future overlays.
c. In urban areas, a 15 ft 0 in (4.5 m) clearance may be used where a single routing interstate with a 16 ft 0 in (4.9 m) clearance is available. See Section 44-6 for maps of the single routing in urban areas of Illinois.

GEOMETRIC DESIGN CRITERIA FOR FREEWAYS
(New Construction/Reconstruction)

Footnotes to Figure 44-5A

	Design Element			Manual Section	Rural One-Way DHV: 2300 - 3400 (2)	Rural One-Way DHV: Under 2300 (2)
Design Controls	Design Forecast Year			31-4.02	20 Years	
	*Design Speed			31-2	70 mph **(3)**	
	Access Control			35-1	Full Control	
	Level of Service			31-4.04	B	
Cross Section Elements	*Traveled Way Width			34-2.01	2 @ 36′	2 @ 24′ **(4)**
	Shoulder Width	Right	Total Width	34-2.02	10′	10′
			Paved		10′ **(5)**	10′ **(5)**
		Left	Total Width		8′	6′
			Paved		8′ **(6)**	4′
	Auxiliary Lanes	Lane Width		37-2.05	11′	
		Shoulder Width			Right: 10′ Left: 4′ (Minimum)	
	Cross Slope	*Travel Lane		34-2.01	3/16″/ft for lanes adjacent to crown **(7)**	
		Shoulder		34-2.02	1/2″/ft to 3/4″/ft	
	Median Width	Depressed		34-3	Minimum: 54′ **(8)**	Minimum: 50′ **(8)**
		Flush (Concrete Barrier)			22′ **(9)**	18′-6″ **(9)**
	Clear Zone			38-3	**(10)**	
Roadway Slopes	Side Slopes	Cut Section	Front Slope	34-4.03	1V:4H	
			Ditch Bottom Width		2.0′ **(11)**	
			Back Slope		1V:3H **(12)**	
		Rock Cut		34-4.05	—	
		Fill Section		34-4.02	1V:4H to Clear Zone; 1V:3H max. to Toe of Slope **(13)**	
	Median Slopes			34-3	1V:4H	
Bridges	Existing Bridges to Remain in Place	*Structural Capacity		N/A	HS-20	
		*Clear Roadway Width **(14)**		39-6	54′	38′
	*Vertical Clearance (Freeway Under) **(15a)**	Existing Overpassing Bridges		39-4	16′-0″ **(15c)**	
		Overhead Signs/ Pedestrian Bridges		33-5	17′-00″ **(15b)**	
	*Vertical Clearance (Freeway over Railroad)			39-4.06	21′-6″	

* Controlling design criteria (see Section 31-8).

GEOMETRIC DESIGN CRITERIA FOR EXISTING CROSS-SECTION ELEMENTS TO REMAIN IN PLACE ON RURAL FREEWAYS[1]
(Reconstruction)
(US Customary)

Figure 44-5.B

Design Element				Manual Section	Rural One-Way DHV: 2300 - 3400 (2)	Rural One-Way DHV: Under 2300 (2)
Design Controls	Design Forecast Year			31-4.02	20 Years	
	* Design Speed			31-2	110 km/h **(3)**	
	Access Control			35-1	Full Control	
	Level of Service			31-4.04	B	
Cross Section Elements	* Traveled Way Width			34-2.01	2 @ 10.8 m	2 @ 7.2 m **(4)**
	Shoulder Width	Right	Total Width	34-2.02	3.0 m	3.0 m
			Paved		3.0 m **(5)**	3.0 m **(5)**
		Left	Total Width		2.4 m	1.8 m
			Paved		2.4 m **(6)**	1.2 m
	Auxiliary Lanes	Lane Width		37-2.05	3.3 m	
		Shoulder Width			Right: 3.0 m Left: 1.2 m (Minimum)	
	Cross Slope	*Travel Lane		34-2.01	1.5% for lanes adjacent to crown **(7)**	
		Shoulder		34-2.02	4% to 6%	
	Median Width	Depressed		34-3	Minimum: 16.2 m **(8)**	Minimum: 15 m **(8)**
		Flush (Concrete Barrier)			6.7 m **(9)**	5.5 m **(9)**
	Clear Zone			38-3	**(10)**	
Roadway Slopes	Side Slopes	Cut Section	Front Slope	34-4.03	1V:4H	
			Ditch Bottom Width		600 mm **(11)**	
			Back Slope		1V:3H **(12)**	
		Rock Cut		34-4.05	—	
		Fill Section		34-4.02	1V:4H to Clear Zone; 1V:3H max. to Toe of Slope **(13)**	
	Median Slopes			34-3	1V:4H	
Bridges	Existing Bridges to Remain in Place	*Structural Capacity		N/A	MS-18	
		*Clear Roadway Width **(14)**		39-6	16.2 m	11.4 m
	* Vertical Clearance (Freeway Under) **(15a)**	Existing Overpassing Bridges		39-4	4.9 m **(15c)**	
		Overhead Signs/ Pedestrian Bridges		33-5	5.2 m **(15b)**	
	* Vertical Clearance (Freeway over Railroad)			39-4.06	6.6 m	

* Controlling design criteria (see Section 31-8).

GEOMETRIC DESIGN CRITERIA FOR EXISTING CROSS-SECTION ELEMENTS TO REMAIN IN PLACE ON RURAL FREEWAYS(1)
(Reconstruction)
(Metric)

Figure 44-5.B

(1) Design Criteria. The minimum cross-section elements in this figure are allowed to remain in place for reconstruction of an existing freeway provided it is cost effective and the safety record is satisfactory.

(2) Traffic Volumes. The design hourly volumes (DHV) are calculated assuming base conditions (except for 16% heavy vehicles) and a PHF = 1.0. Adjust these values using local factors.

(3) Design Speed. Existing alignment elements may be allowed to remain in place, provided the comfortable operating speed for level and rolling terrain is a minimum of 65 mph (105 km/h) and 60 mph (100 km/h) respectively.

(4) Traveled Way Width. In existing 22′ (6.7 m) traveled way width may be allowed to remain with concurrence of a design exception.

(5) Shoulder Width (Right). Where the directional distribution of trucks exceeds 250 DDHV, consider providing a 12 ft (3.6 m) paved shoulder.

(6) Shoulder Width (Left). Where there are three or more lanes in one direction and the directional distribution of trucks exceeds 250 DDHV, consider providing a 12 ft (3.6 m) paved shoulder.

(7) Travel Lane Cross Slope. For each additional lane away from the crown lanes, increase the cross slope by 1/16″/ft (0.5%) per additional lane up to a maximum of 5/16″/ft (2.5%).

(8) Depressed Median Width. Median width based on paved shoulder width 1V:6H median slope, and 2 ft (600 mm) ditch bottom width.

(9) Flush Median Width. Only use flush medians with concrete barrier where right-of-way or topography restricts the use of a depressed median. Consider providing wider medians where required for snow storage.

(10) Clear Zone. The clear zone will vary according to design speed, traffic volumes, side slopes, and horizontal curvature.

(11) Ditch Bottom Width. Provide a wider outside ditch bottom where detention storage of storm water is a consideration.

(12) Back Slope. Where the height of cut exceeds 10 ft (3 m), consider using a 1V:2H back slope beyond the clear zone. Also, for heights greater than 30 ft (9 m), consider the use of benching.

(13) Fill Slope. For fill heights greater than 30 ft (9 m), use a 1V:2H uniform slope with a roadside barrier. Also, for heights greater than 30 ft (9 m), consider the use of benching.

(14) Existing Bridge Widths to Remain in Place. Clear roadway bridge widths are measured from face to face of parapets or rails. Implies elements allowed to remain in place without a design exception approval when cost effective and when safety record is satisfactory.

(15) Vertical Clearance (Freeway Under).

a. The clearance must be available over the traveled way and any paved shoulders.
b. Make allowances to maintain 16 ft- 0 in (4.9 m) minimum vertical clearance in anticipation of future overlays.
c. In urban areas, a 15 ft 0 in (4.5 m) clearance may be used where a single routing interstate with a 16 ft 0 in (4.9 m) clearance is available. See Section 44-6 for maps of the single routing in urban areas of Illinois.

GEOMETRIC DESIGN CRITERIA FOR EXISTING CROSS-SECTION ELEMENTS TO REMAIN-IN-PLACE ON RURAL FREEWAYS (Reconstruction)

Footnotes to Figure 44-5.B

Design Element				Manual Section	Urban One-Way DHV: 2800 - 4300 (2)	Urban One-Way DHV: Under 2800 (2)
Design Controls	Design Forecast Year			31-4.02	20 Years	
	*Design Speed			31-2	60 mph (3)	
	Access Control			35-1	Full Control	
	Level of Service			31-4.04	C (4)	
Cross Section Elements	*Traveled Way Width			34-2.01	2 @ 36′	2 @ 24′ (5)
	Shoulder Width	Right	Total Width	34-2.02	10′	10′
			Paved		10′ (6)	10′ (6)
		Left	Total Width		8′	6′
			Paved		8′ (7)	4′
	Auxiliary Lanes	Lane Width		37-2.05	11′	
		Shoulder Width			Right: 6′ Left: 4′ (Minimum)	
	Cross Slope	*Travel Lane		34-2.01	3/16″/ft for lanes adjacent to crown (8)	
		Shoulder		34-2.02	1/2″/ft to 3/4″/ft	
	Median Width	Depressed		34-3	Minimum: 42′ (9)	Minimum: 40′ (9)
		Flush (Concrete Barrier)			16′ (10)	18′-6″ (10)
	Clear Zone			38-3	(11)	
Roadway Slopes	Side Slopes	Cut Section (12)	Front Slope	34-4.03	1V:4H	
			Ditch Bottom Width		2.0′	
			Back Slope		1V:3H (13)	
		Rock Cut		34-4.05	—	
		Fill Section		34-4.02	1V:4H to Clear Zone; 1V:3H max. to Toe of Slope (14)	
	Median Slopes			34-3	1V:4H	
Bridges	Existing Bridges to Remain in Place	*Structural Capacity		N/A	HS-20	
		*Clear Roadway Width (15)		39-6	54′	38′
	*Vertical Clearance (Freeway Under) (16a)	Existing Overpassing Bridges		39-5	16′-0″ (16c)	
		Overhead Signs/ Pedestrian Bridges		33-5	17′-00″ (16b)	
	*Vertical Clearance (Freeway over Railroad)			39-4.06	21′-6″	

* Controlling design criteria (see Section 31-8).

GEOMETRIC DESIGN CRITERIA FOR EXISTING CROSS-SECTION ELEMENTS TO REMAIN IN PLACE ON URBAN FREEWAYS(1)
(Reconstruction)
(US Customary)

Figure 44-5.C

Design Element				Manual Section	Urban One-Way DHV: 2800 - 4300 (2)	Urban One-Way DHV: Under 2800 (2)
Design Controls	Design Forecast Year			31-4.02	20 Years	
	*Design Speed			31-2	100 km/h (3)	
	Access Control			35-1	Full Control	
	Level of Service			31-4.04	C (4)	
Cross Section Elements	*Traveled Way Width			34-2.01	2 @ 10.8 m	2 @ 7.2 m (5)
	Shoulder Width	Right	Total Width	34-2.02	3.0 m	3.0 m
			Paved		3.0 m (6)	3.0 m (6)
		Left	Total Width		2.4 m	1.8 m
			Paved		2.4 m (7)	1.2 m
	Auxiliary Lanes	Lane Width		37-2.05	3.3 m	
		Shoulder Width			Right: 1.8 m Left: 1.2 m (Minimum)	
	Cross Slope	*Travel Lane		34-2.01	1.5% for lanes adjacent to crown (8)	
		Shoulder		34-2.02	4% to 6%	
	Median Width	Depressed		34-3	Minimum: 12.8 m (9)	Minimum: 12.0 m (9)
		Flush (Concrete Barrier)			4.8 m (10)	5.5 m (10)
	Clear Zone			38-3	(11)	
Roadway Slopes	Side Slopes	Cut Section (12)	Front Slope	34-4.03	1V:4H	
			Ditch Bottom Width		600 mm	
			Back Slope		1V:3H (13)	
		Rock Cut		34-4.05	—	
		Fill Section		34-4.02	1V:4H to Clear Zone; 1V:3H max. to Toe of Slope (14)	
	Median Slopes			34-3	1V:4H	
Bridges	Existing Bridges to Remain in Place	*Structural Capacity		N/A	MS-18	
		*Clear Roadway Width (15)		39-6	16.2 m	11.4 m
	*Vertical Clearance (Freeway Under) (16a)	Existing Overpassing Bridges		39-5	4.9 m (16c)	
		Overhead Signs/ Pedestrian Bridges		33-5	5.2 m (16b)	
	*Vertical Clearance (Freeway over Railroad)			39-4.06	6.6 m	

* Controlling design criteria (see Section 31-8)

GEOMETRIC DESIGN CRITERIA FOR EXISTING CROSS-SECTION ELEMENTS TO REMAIN IN PLACE ON URBAN FREEWAYS(1)
(Reconstruction)
(Metric)

Figure 44-5.C

(1) Design Criteria. The minimum cross-section elements in this figure are allowed to remain in place for reconstruction of an existing freeway provided it is cost effective and the safety record is satisfactory.

(2) Traffic Volumes. The design hourly volumes (DHV) are calculated assuming base conditions (except for 16% heavy vehicles) and a PHF = 1.0. Adjust these values using local factors.

(3) Design Speed. With restricted conditions, a minimum design speed of 55 mph (90 km/h) may be considered to remain-in-place with study and justification. Also, consider the existing posted speed limits.

(4) Level of Service. In major urban areas, a level of service D may be considered on a reconstruction project with study and justification.

(5) Traveled Way Width. In existing 22 ft (6.7 m) traveled way width may be allowed to remain with concurrence of a design exception.

(6) Shoulder Width (Right). Where the directional distribution of trucks exceeds 250 DDHV, consider providing a 12 ft (3.6 m) paved shoulder.

(7) Shoulder Width (Left). Where there are three or more lanes in one direction and the directional distribution of trucks exceeds 250 DDHV, consider providing a 12 ft (3.6 m) paved shoulder.

(8) Travel Lane Cross Slope. For each additional lane away from the crown lanes, increase the cross slope by 1/16″/ft (0.5%) per additional lane up to a maximum of 5/16″/ft (2.5%).

(9) Depressed Median Width. Median width based on 1V:4H median slope, and 2 ft (600 mm) ditch bottom width (3 – Lanes/Direction) or 4ft. (1.2 m) ditch bottom width (2-Lanes/Direction).

(10) Flush Median Width. Only use flush medians with concrete barrier where right-of-way or topography restricts the use of a depressed median. Consider providing wider medians where required for snow storage.

(11) Clear Zone. The clear zone will vary according to design speed, traffic volumes, side slopes, and horizontal curvature.

(12) Cut Section. In restricted right-of-way, the typical design will have mountable curb and gutter behind the shoulder and an enclosed drainage system.

(13) Back Slope. Where the height of cut exceeds 10 ft (3 m), consider using a 1V:2H back slope beyond the clear zone. Also, for heights greater than 30 ft (9 m), consider the use of benching.

(14) Fill Slope. For fill heights greater than 30 ft (9 m), use a 1V:2H uniform slope with a roadside barrier. Also, for heights greater than 30 ft (9 m), consider the use of benching.

(15) Existing Bridge Widths to Remain in Place. Clear roadway bridge widths are measured from face to face of parapets or rails. Implies elements allowed to remain in place without a design exception approval when cost effective and when safety record is satisfactory.

(16) Vertical Clearance (Freeway Under).

a. The clearance must be available over the traveled way and any paved shoulders.
b. A 15 ft 0 in (4.5 m) clearance may be used where a single routing interstate with a 16 ft 0 in (4.9 m) clearance is available.
c. In urban areas, a 15 ft 0 in (4.5 m) clearance may be used where a single routing interstate with a 16 ft 0 in (4.9 m) clearance is available. See Section 44-6 for maps of the single routing in urban areas of Illinois.

GEOMETRIC DESIGN CRITERIA FOR EXISTING CROSS-SECTION ELEMENTS TO REMAIN-IN-PLACE ON URBAN FREEWAYS (Reconstruction) Footnotes to Figure 44-5.C

Design Element		Manual Section	Design Speed		
			60 mph	70 mph	75 mph
*Stopping Sight Distance **(1)**		31-3.01	570′	730′	820
Decision Sight Distance **(2)**		31-3.02	Rural: 990′ Urban: 1280′	1105′	1180'
*Minimum Radii	e_{max} = 6% (New)	32-2.03	Desirable: > 3000′ Minimum: 1330′	Desirable: > 3000′ Minimum: 2040′	Desirable: > 3000′ Minimum: 2500′
	e_{max} = 8% (Reconstruction)		Minimum: 1200′ **(3)**	Minimum: 1810′ **(3)**	Minimum: 2210′ **(3)**
*Superelevation Rates		32-3	New: e_{max} = 6% Reconstruction: e_{max} = 8% **(3)**		
*Horizontal Sight Distance		32-4	**(4)**		
*Vertical Curvature (K-values)	Crest	33-4	151	247	312
	Sag		136	181	206
*Maximum Grade **(5)**	Level	33-2.02	New: 3% Remain in Place: 4%		
	Rolling		New: 4% Remain in Place: 5%		
Minimum Grade	Rural	33-2.03	Desirable: 0.5% Minimum: 0.0% (with Special Ditching)		
	Urban		Desirable: 0.5% Minimum: 0.3% (with Curb and Gutter) **(6)**		

* Controlling design criteria (see Section 31-8).

(1) Stopping Sight Distance. Table values are for passenger cars on level grade.

(2) Decision Sight Distance. Table values are for the avoidance maneuver (speed/path/direction change).

(3) Minimum Radii/Superelevation Rates. Values are only allowed for remain-in-place elements.

(4) Horizontal Sight Distance. For a given design speed, the necessary middle ordinate will be determined by the radius of curve and the required sight distance.

(5) Maximum Grade.

a. Rural. With wide medians where two roadways are on independent alignments, downgrades may be 1% steeper.
b. Urban. Grades 1% steeper may be used for restricted conditions.

(6) Minimum Grades. Where curb and gutter is required due to restricted right-of-way, use M-4.24 curb and gutter and locate it no closer than the outer edge of shoulder.

ALIGNMENT CRITERIA FOR FREEWAYS (US Customary)

Figure 44-5.D

Design Element		Manual Section	Design Speed		
			100 km/h	110 km/h	120 km/h
*Stopping Sight Distance **(1)**		31-3.01	185 m	216 m	250 m
Decision Sight Distance **(2)**		31-3.02	Rural: 315 m Urban: 400 m	330 m	360 m
*Minimum Radii	e_{max} = 6% (New)	32-2.03	Desirable: > 1000 m Minimum: 437 m	Desirable: > 1000 m Minimum: 560 m	Desirable: > 1000 m Minimum: 756 m
	e_{max} = 8% (Reconstruction)		394 m **(3)**	501 m **(3)**	667 m **(3)**
*Superelevation Rates		32-3	New: e_{max} = 6% Reconstruction: e_{max} = 8% **(3)**		
*Horizontal Sight Distance		32-4	**(4)**		
*Vertical Curvature (K-values)	Crest	33-4	52	74	95
	Sag		45	55	63
*Maximum Grade **(5)**	Level	33-2.02	New: 3% Remain in Place: 4%		
	Rolling		New: 4% Remain in Place: 5%		
Minimum Grade	Rural	33-2.03	Desirable: 0.5% Minimum: 0.0% (with Special Ditching)		
	Urban		Desirable: 0.5% Minimum: 0.3% (with Curb and Gutter) **(6)**		

* Controlling design criteria (see Section 31-8 and Form BDE 31-8).

(1) Stopping Sight Distance. Table values are for passenger cars on level grade.

(2) Decision Sight Distance. Table values are for the avoidance maneuver (speed/path/direction change).

(3) Minimum Radii/Superelevation Rates. Values are only allowed for remain-in-place elements.

(4) Horizontal Sight Distance. For a given design speed, the necessary middle ordinate will be determined by the radius of curve and the required sight distance.

(5) Maximum Grade.

a. Rural. With wide medians where two roadways are on independent alignments, downgrades may be 1% steeper.
b. Urban. Grades 1% steeper may be used for restricted conditions.

(6) Minimum Grades. Where curb and gutter are required due to restricted right-of-way, use M-10.60 curb and gutter and locate it no closer than the outer edge of shoulder.

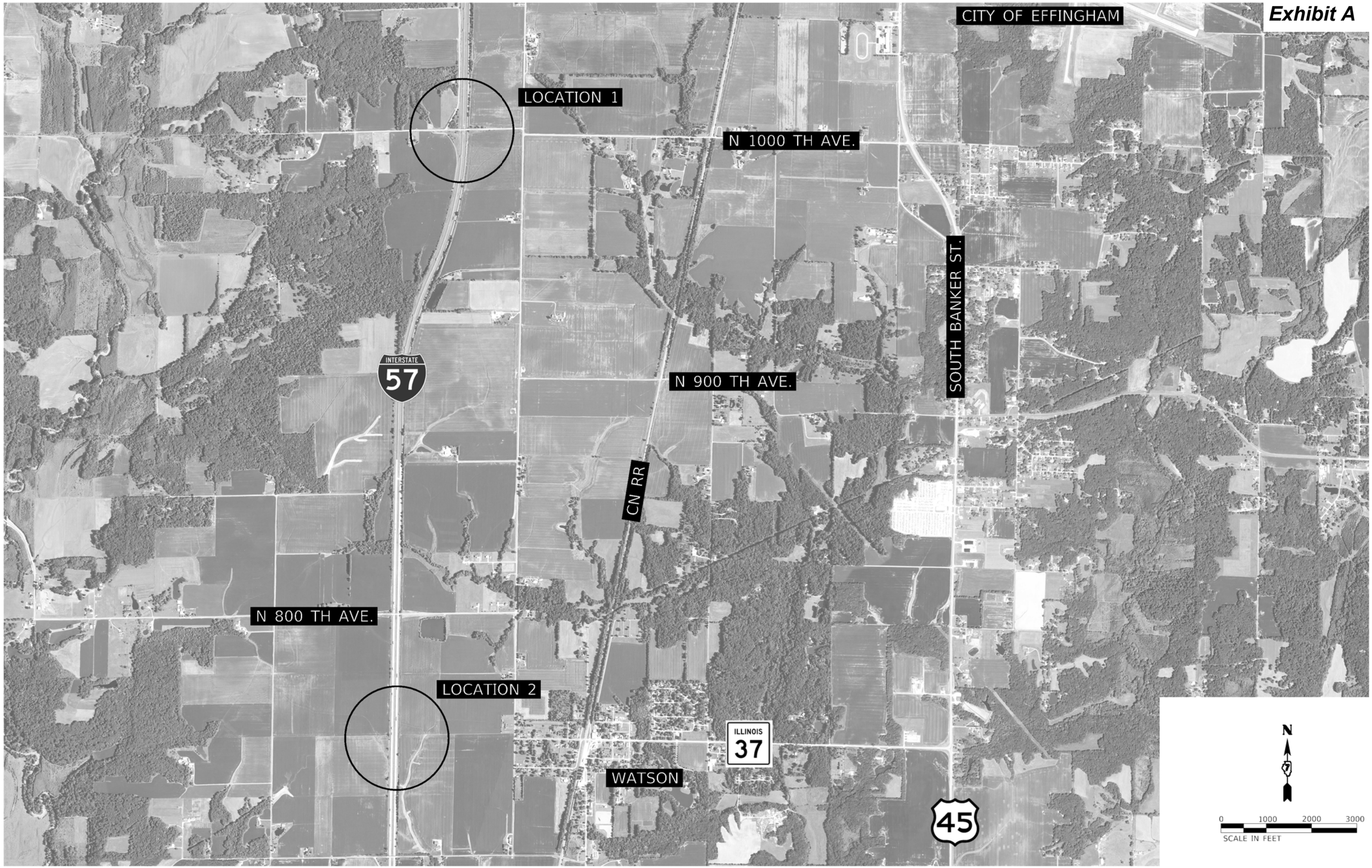
ALIGNMENT CRITERIA FOR FREEWAYS (Metric)

Figure 44-5.D

Appendix F

Build Alternatives

Exhibit A



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STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

SOUTHERN INTERCHANGE
FEASIBILITY STUDY
OVERALL PLAN

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	ILLINOIS	FED. AID PROJECT x		

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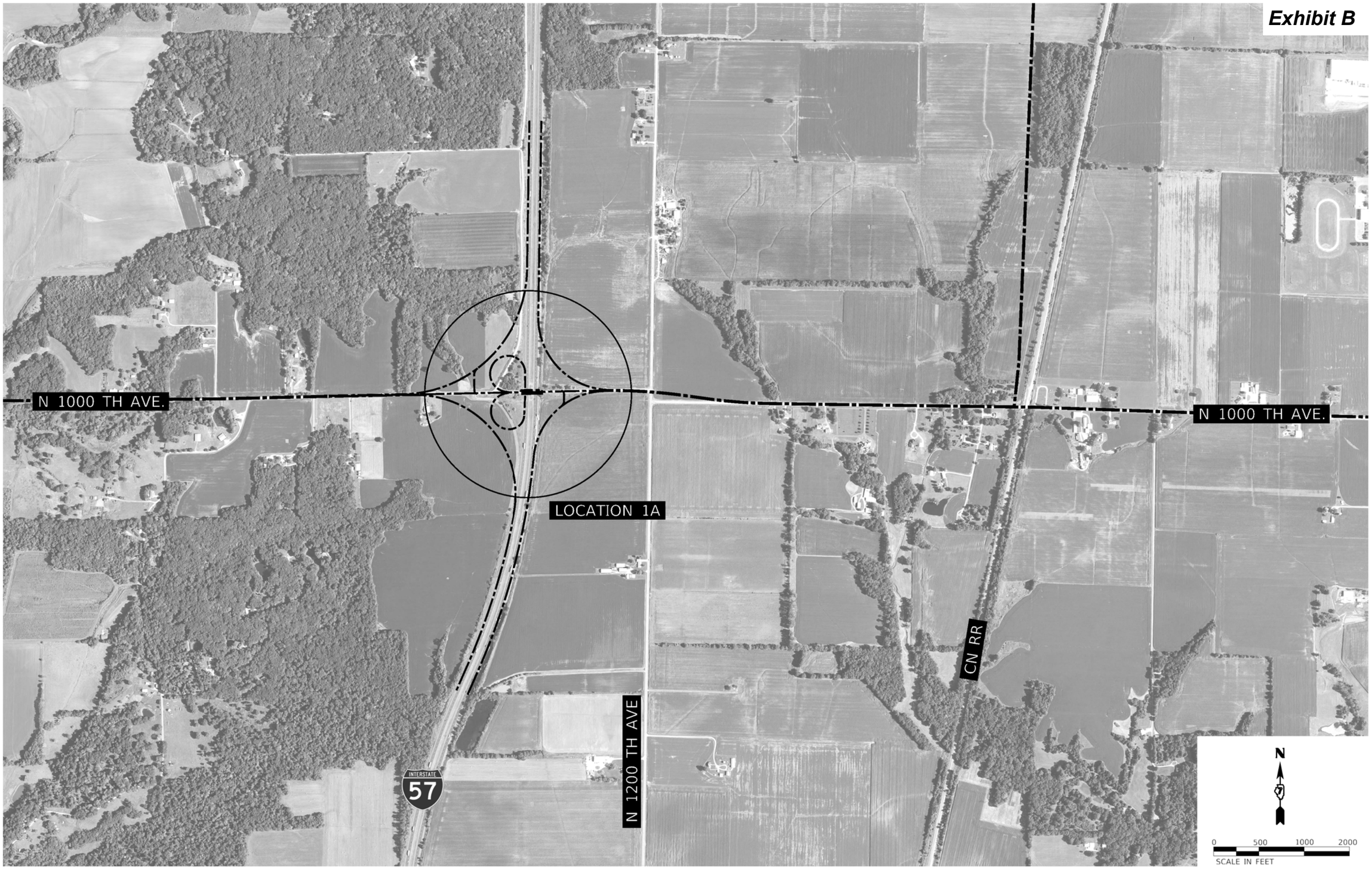

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STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

SOUTHERN INTERCHANGE
FEASIBILITY STUDY
LOCATION 1A – PARTIAL

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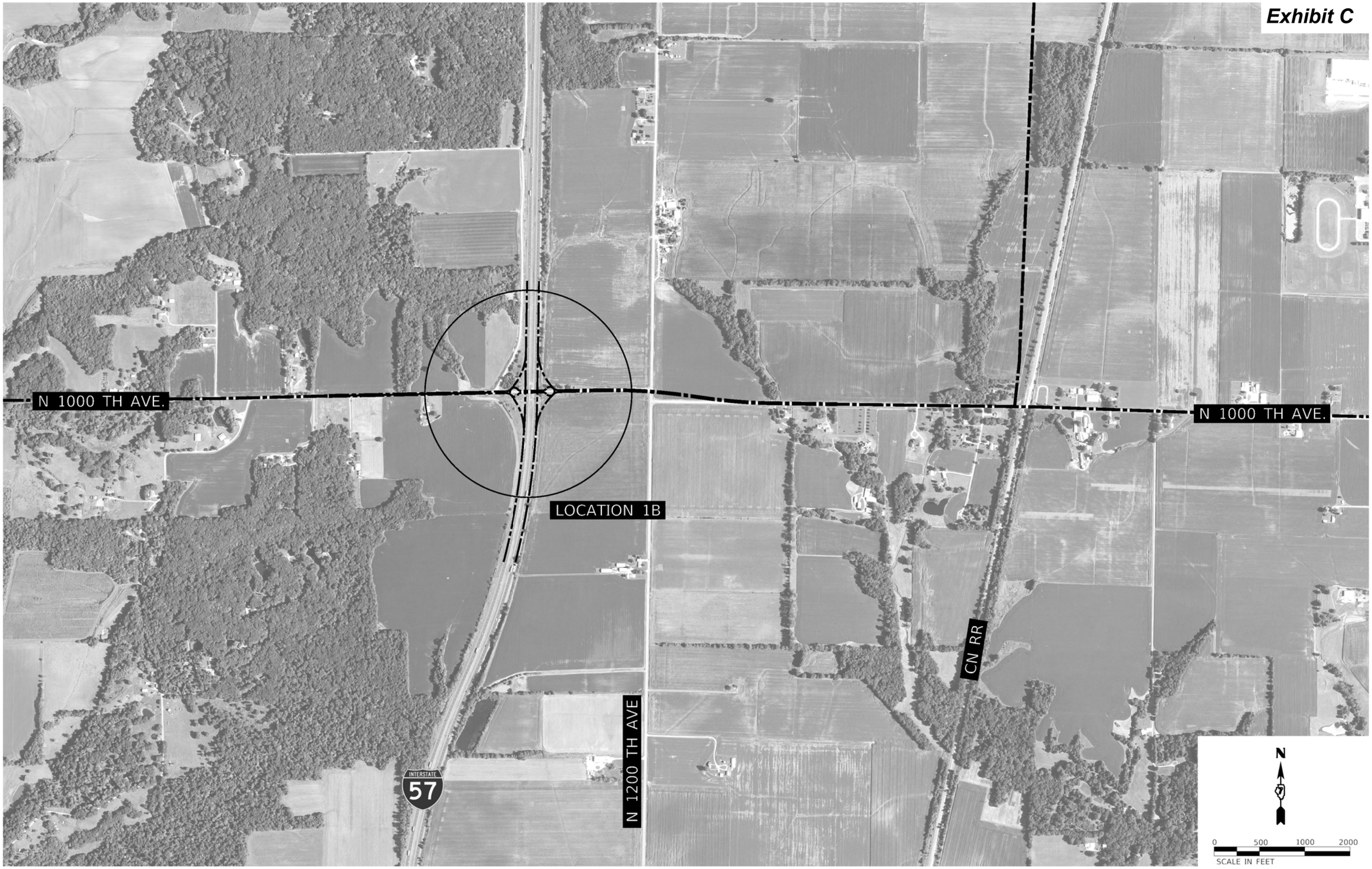
	ILLINOIS	FED. AID PROJECT X		

Exhibit C



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STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

SOUTHERN INTERCHANGE
FEASIBILITY STUDY
LOCATION 1B – DOGBONE

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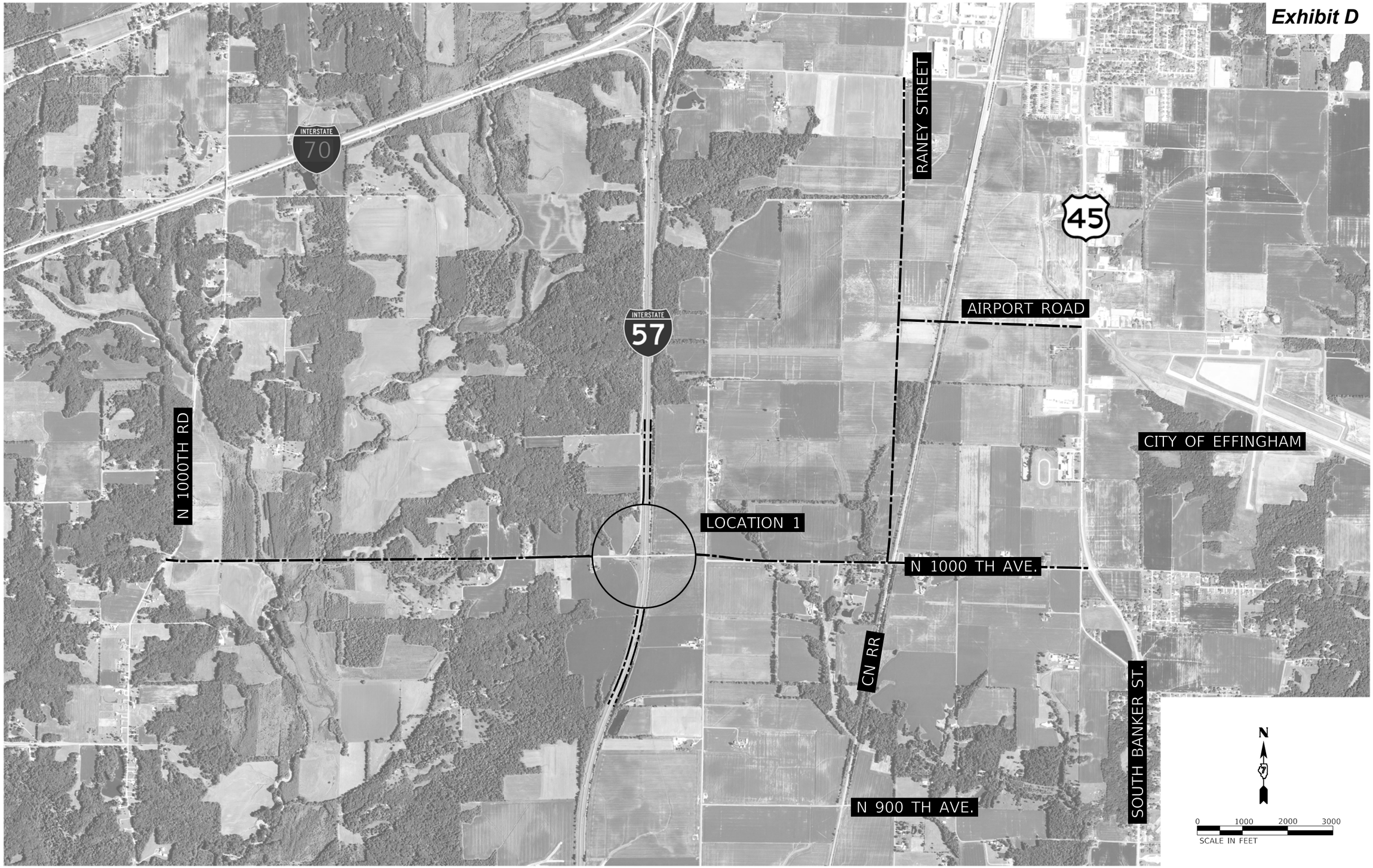
	ILLINOIS	FED. AID PROJECT X		

Exhibit D



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STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

SOUTHERN INTERCHANGE
FEASIBILITY STUDY
LOCATION 1 – SIDEROADS

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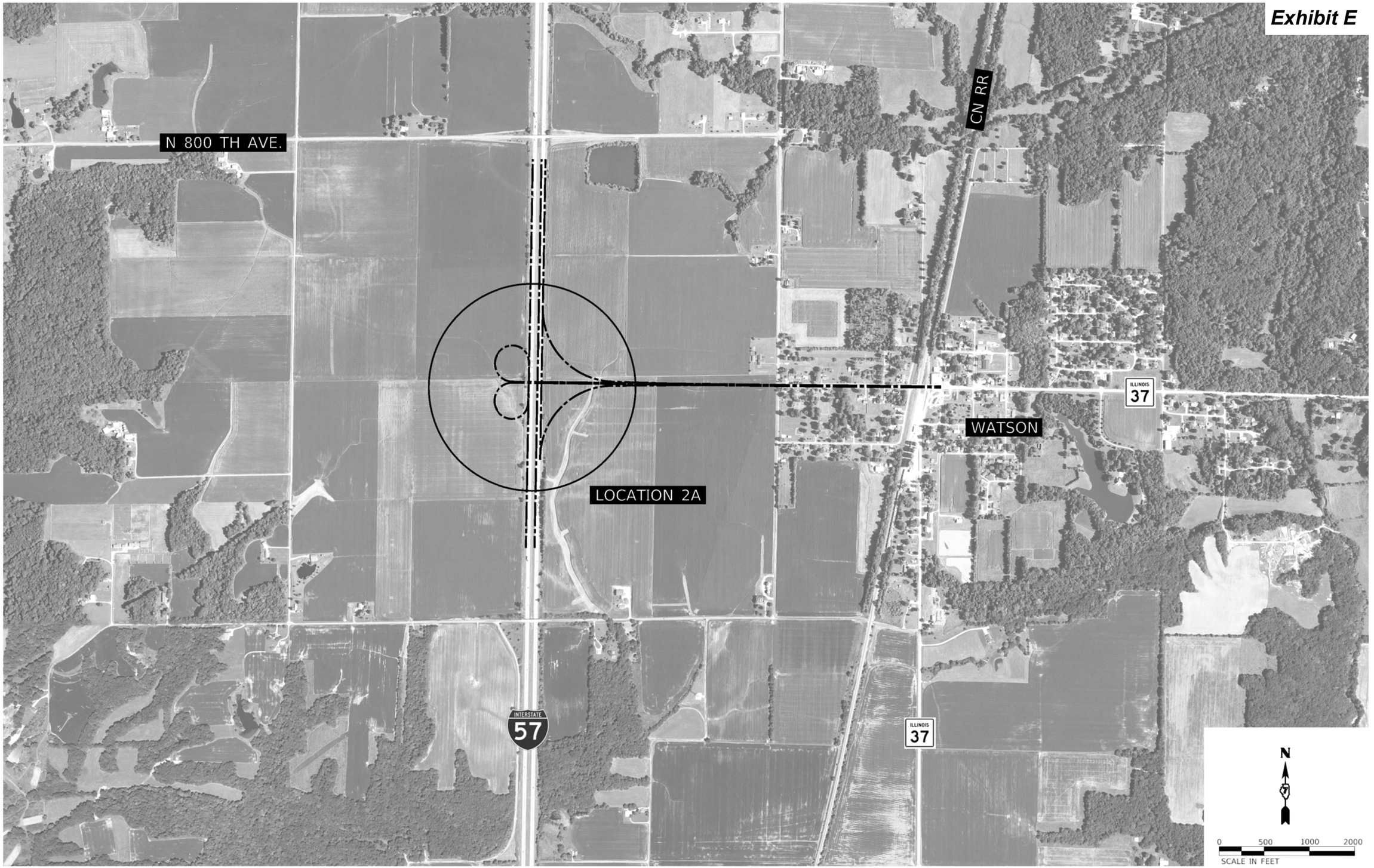
	17L0003	CONTRACT NO.		
	ILLINOIS	FED. AID PROJECT X		

Exhibit E



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STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

SOUTHERN INTERCHANGE
FEASIBILITY STUDY
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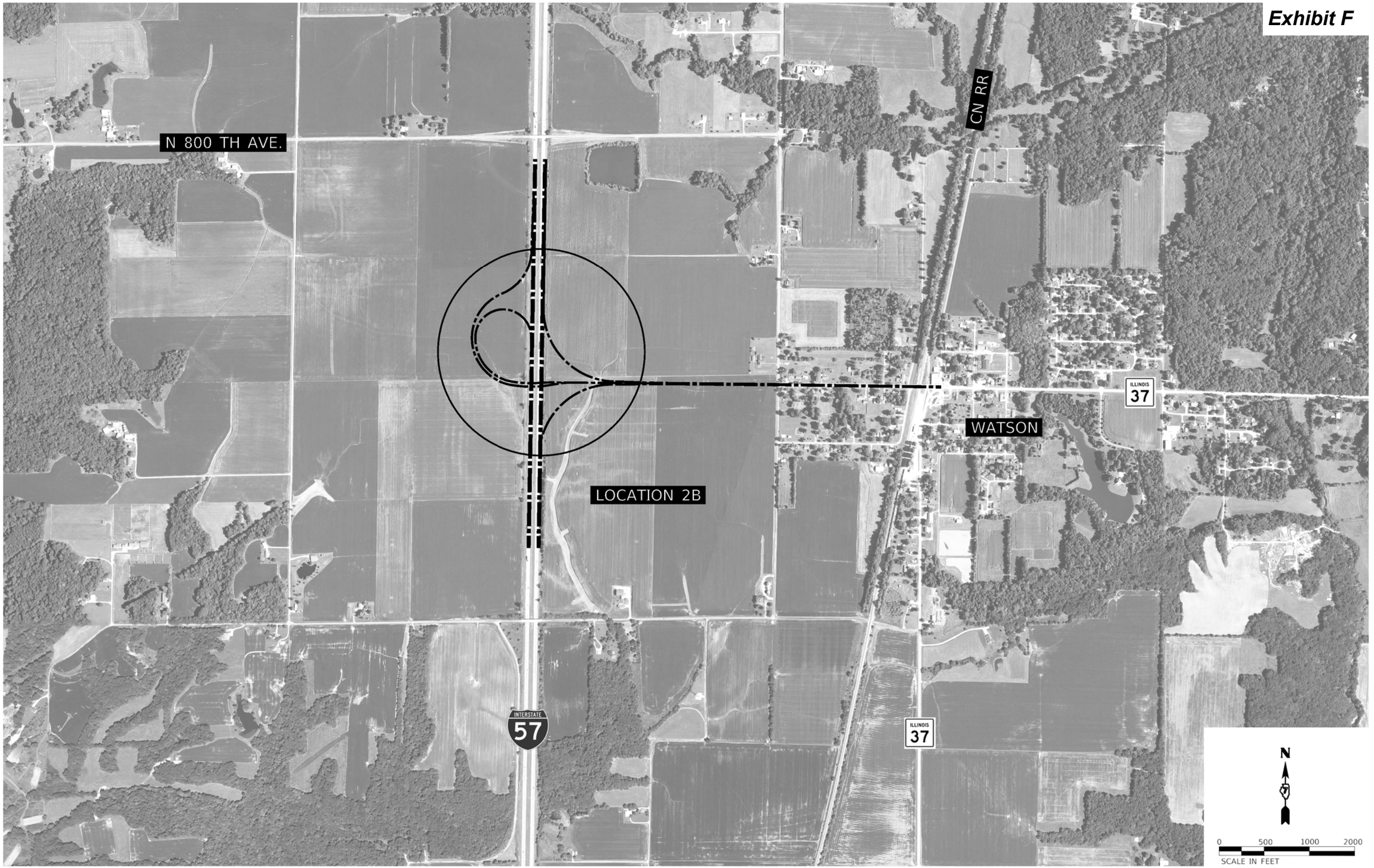
		ILLINOIS FED. AID PROJECT X		

Exhibit F



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STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

SOUTHERN INTERCHANGE
FEASIBILITY STUDY
LOCATION 2B – TRUMPET

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F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
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	17L0003	CONTRACT NO.		
		ILLINOIS FED. AID PROJECT X		

Appendix G

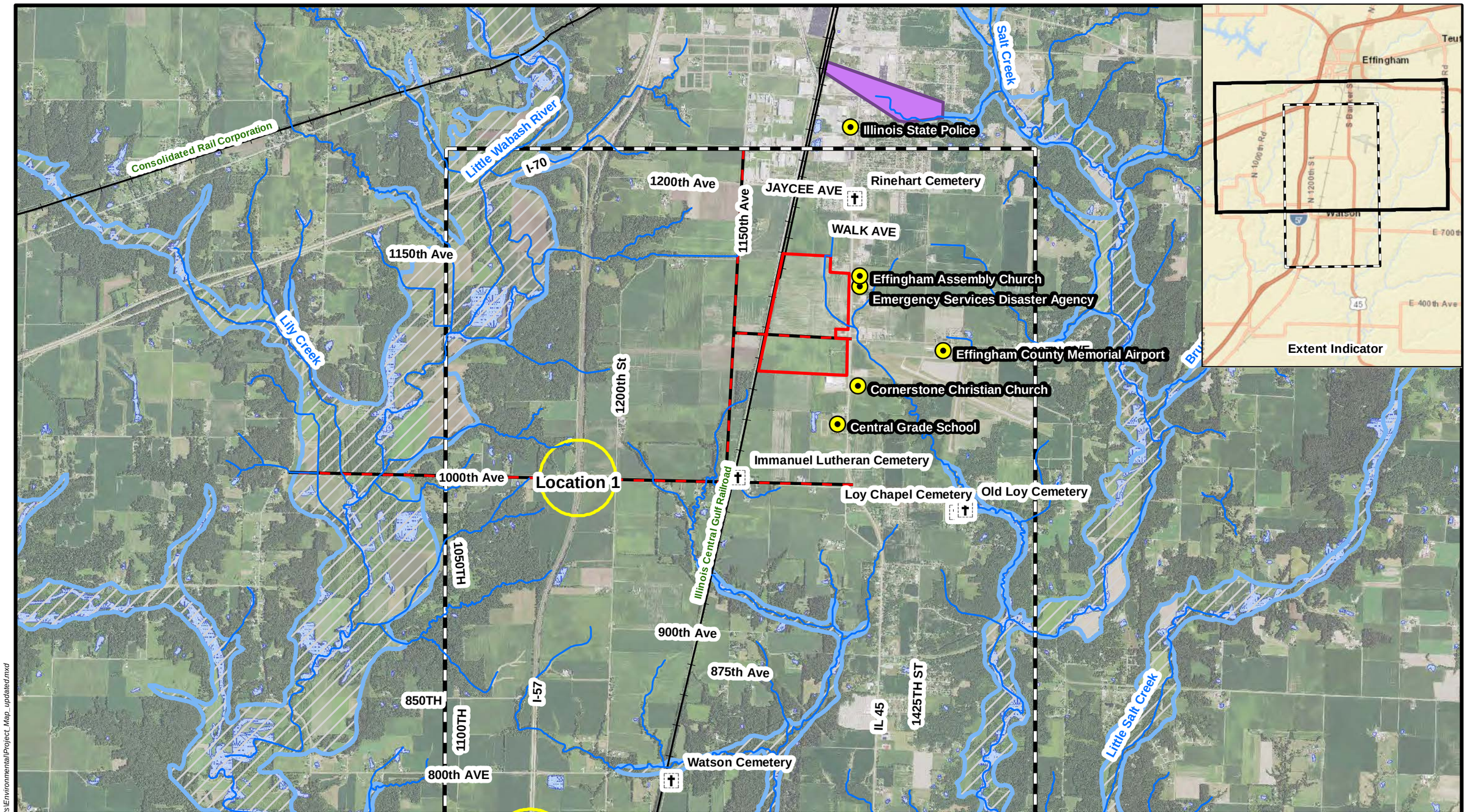
Environmental Impacts

Table 1. Potential Impacts of the Project Elements

Resource	Proposed Interchange Location 1	Raney Street Extension	Dutch Road Extension	Airport Road Extension	Proposed Interchange Location 2	Main Street Extension	Hawickhorst-Jones DCEO-Super Site
Displacements	<2	0	<5	~1	0	<2	<5
Public/Community Facilities	0 Facilities	0 Facilities	0 Facilities	0 Facilities	0 Facilities	3 Facilities	0 Facilities
Environmental Justice/Title VI							
Agriculture	22 acres	~25 acres	<10 acres	<10 acres	25 acres	<10 acres	200 acres
Historic Structures			1 Cemetery				
Archaeological Resources			Within a Floodplain				
Noise Receptors within 500 feet	2 Receptors	6 Receptors	>20 Receptors	1 Receptor	0 Receptors	>10 Receptors	6 Receptors
Threatened and Endangered Species	Bat species	Bat Species	Bat Species				
Streams	1 Stream	2 Streams	8 Streams		1 Stream		1 Stream
100-yr Floodplain			3,600 feet				
Regulatory Floodway							
Wetlands	1 NWI Wetland		8 NWI Wetlands				
Parks and Recreational Areas						1	
Special Waste							

Impact Potential Key:

High	
Medium	
Low	
None	



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HANSON
Hanson Professional Services Inc.

SOUTH EFFINGHAM I-57 INTERCHANGE FEASIBILITY STUDY

EXHIBIT A
ENVIRONMENTAL INVENTORY

HANSON NO. 17L0003 Sheet 1

Location 1
Old Loy Cemetery
Loy Chapel Cemetery
1050TH
Little Wabash River
900th Ave
875th Ave
I-57
850TH
1100TH
Illinois Central Gulf Railroad
IL 45
1425TH ST
Watson Cemetery
800th AVE
Little Salt Creek
Salt Creek
Watson Baptist Church
Location 2
Willow Park
IL 37/MAIN
Watson Fire Protection District
Watson United Methodist Church
1200th St
700th Ave
St
675TH
1140th St
Big Creek
700th Ave
Percival Springs Airport and RV
Bishop Creek
650th Ave
IL 37
1240th St
175TH
550th Ave
1100th St
Fulfer Creek
Little Wabash River
1350th St

Effingham
Watson
Extent Indicator

Project Study Area
Proposed Multimodal Facility
Proposed Interchange Locations
New or Reconstructed Roadways
Publice Service & Community Facilities
Cemetery
Railroads
NHD Streams
NWI Wetlands
FEMA Floodplain

0 1 2 Miles

N

HANSON
Hanson Professional Services Inc.

SOUTH EFFINGHAM I-57 INTERCHANGE FEASIBILITY STUDY

EXHIBIT A
ENVIRONMENTAL INVENTORY

HANSON NO. 17L0003 Sheet 2

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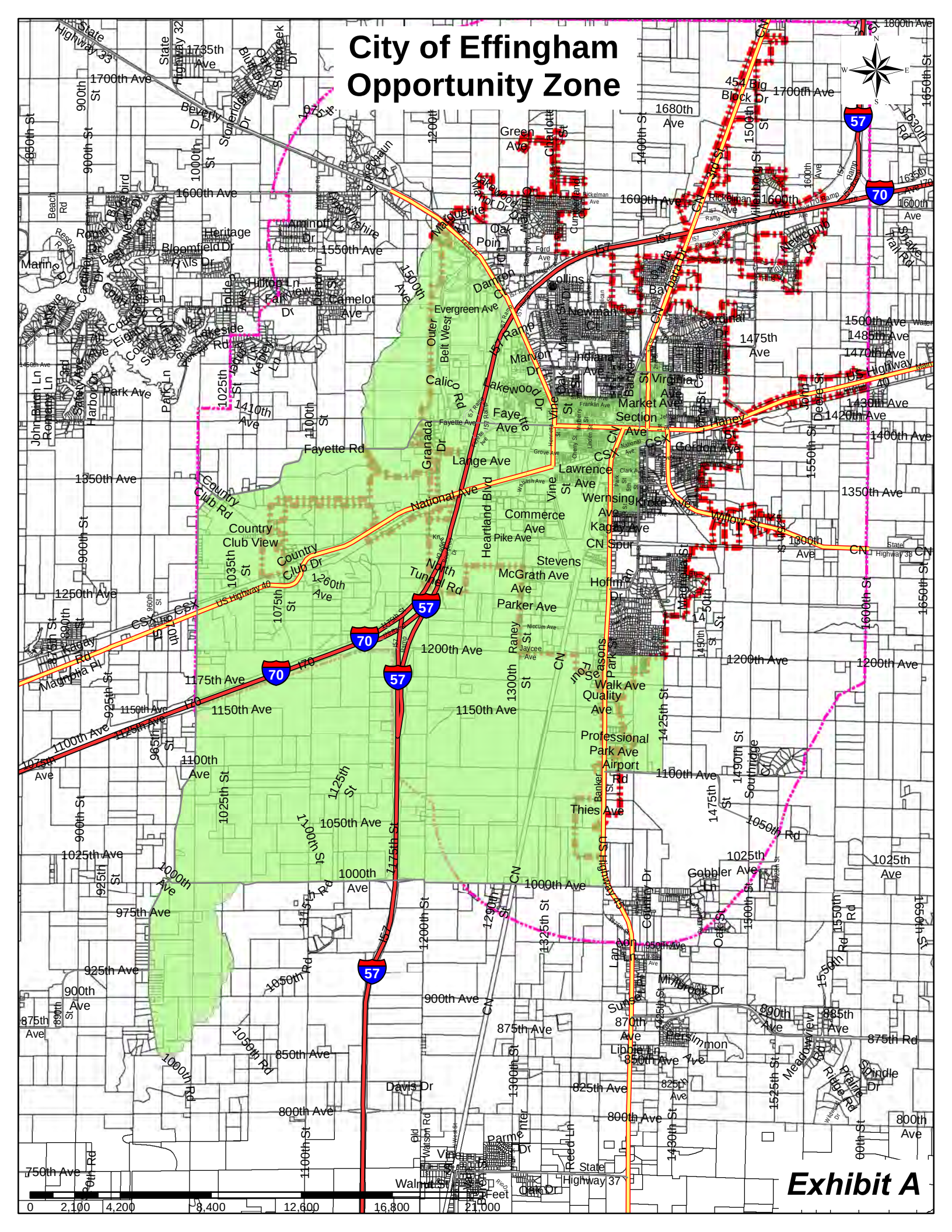
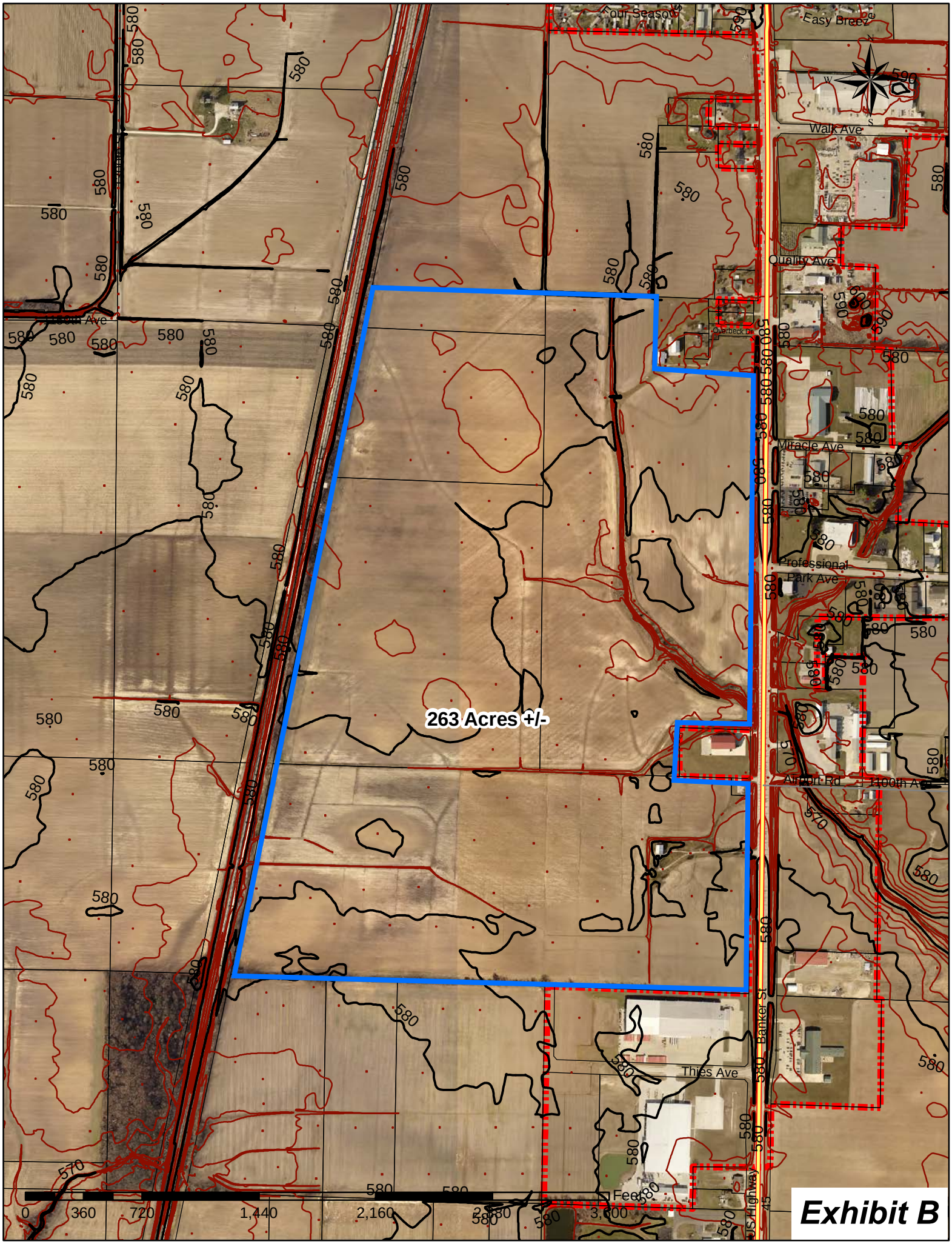
Appendix H

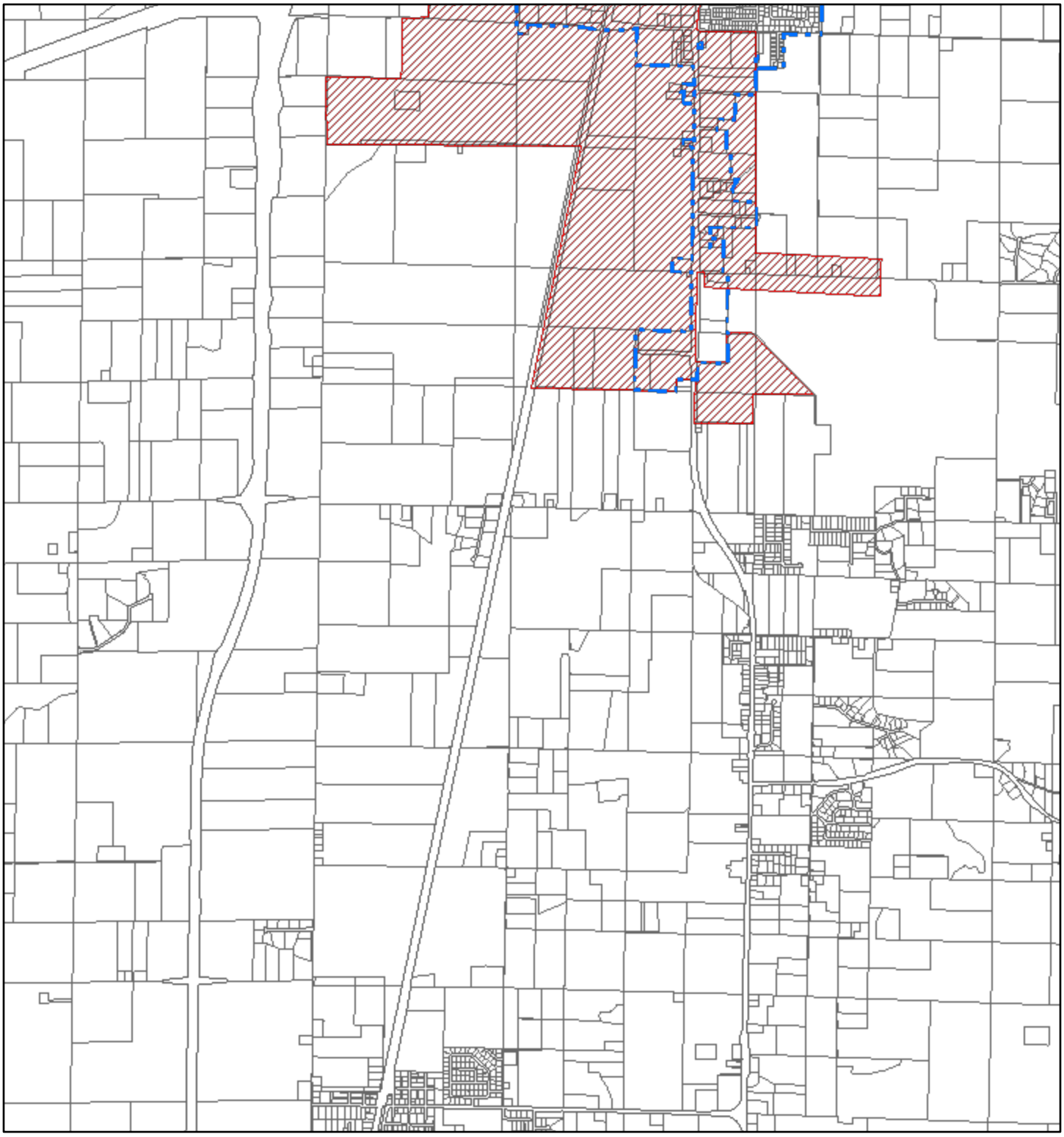
Super Site Maps

City of Effingham Opportunity Zone




263 Acres +/-
Our Season
Easy Breez
Walk Ave
Quality Ave
Overbeck Dr
Miracle Ave
Professional Park Ave
Airport Rd
1100th Ave
Banker St
Thies Ave
U.S. Highway 45
580
590
570
0
360
720
1,440
2,160
2,880
3,600
Feet
Exhibit B

The City of Effingham Enterprise Zone



12/17/2019, 9:27:18 AM

1:37,612

0 0.33 0.65 1.3 mi

0 0.5 1 2 km

Street Centerlines

Enterprise Zone

Effingham City Limits

Effingham City, The City of Effingham, Effingham County, Civil Design Inc.

Exhibit C

The City of Effingham

The City of Effingham, Effingham County, Civil Design Inc. | Effingham City |

Appendix I

Alternative Cost Estimates

Location 1A - Partial Cloverleaf Interchange				
Pay Item Description	***Unit***	***Quantity***	***Unit Price***	***Cost***
Roadway Items				
Earthwork	CU YD	$ 158,799	$ 16	$ 2,540,776
Tree Removal	ACRES	$ 3	$ 7,000	$ 17,500
Deck Replacement and Structure Widening	EACH	$ 1	$ 1,400,000	$ 1,400,000
Roadway Bridge	EACH	$ -		$ -
Erosion Control	L SUM	$ 1	$ 120,000	$ 120,000
Roadway Pavement	L FT	$ 37,821	$ 80	$ 3,025,680
Pavement Marking	L FT	$ 75,642	$ 1	$ 68,078
Signing	L SUM	$ 1	$ 24,000	$ 24,000
Entrances	EACH	$ 1	$ 4,000	$ 4,000
Temporary Road Closure	EACH	$ 1	$ 30,000	$ 30,000
1000th Avenue (east of I-57)	L SUM	$ 1	$ 1,736,000	$ 1,736,000
Land Acquisition				
	ACRES	$ 69	$ 15,000	$ 1,027,500
			20% Contigency	**$ 1,999,000**
			TOTAL LOCATION 1A	**$ 11,990,000**
Sideroad Improvements				
S. Raney Street	L SUM	$ 1	$ 2,226,519	$ 2,226,519
Airport Road	L SUM	$ 1	$ 838,756	$ 838,756
1000th Avenue (west of I-57)	L SUM	$ 1	$ 1,335,081	$ 1,335,081
			20% Contigency	**$ 880,000**
			SIDEROADS TOTAL LOCATION 1	**$ 5,280,000**

Location 1B - Dogbone Interchange				
Pay Item Description	***Unit***	***Quantity***	***Unit Price***	***Cost***
Roadway Items				
Earthwork	CU YD	$ 102,875	$ 16	$ 1,645,992
Tree Removal	ACRES	$ 2	$ 7,000	$ 13,300
Deck Replacement and Structure Widening	EACH	$ 1	$ 1,400,000	$ 1,400,000
Roadway Bridge	EACH	$ -		$ -
Erosion Control	L SUM	$ 1	$ 100,000	$ 100,000
Roadway Pavement	L FT	$ 25,951	$ 80	$ 2,076,080
Pavement Marking	L FT	$ 51,902	$ 1	$ 46,712
Signing	L SUM	$ 1	$ 24,000	$ 24,000
Entrances	EACH	$ -	$ 4,000	$ -
Temporary Road Closure	EACH	$ 1	$ 30,000	$ 30,000
1000th Avenue (east of I-57)	L SUM	$ 1	$ 1,736,000	$ 1,736,000
Land Acquisition				
	ACRES	$ 44	$ 15,000	$ 663,000
			20% Contigency	**$ 1,547,000**
			TOTAL LOCATION 1B	**$ 9,280,000**
Sideroad Improvements				
S. Raney Street	L SUM	$ 1	$ 2,226,519	$ 2,226,519
Airport Road	L SUM	$ 1	$ 838,756	$ 838,756
1000th Avenue (west of I-57)	L SUM	$ 1	$ 1,335,081	$ 1,335,081
			20% Contigency	**$ 880,000**
			SIDEROADS TOTAL LOCATION 1	**$ 5,280,000**

Location 2A - Partial Cloverleaf Interchange				
Pay Item Description	***Unit***	***Quantity***	***Unit Price***	***Cost***
Roadway Items				
Earthwork	CU YD	119,617	$ 16	$ 1,913,877
Tree Removal	ACRES	2	$ 7,000	$ 10,500
Structure Modification	EACH	0	$ 60,000	$ -
New Roadway Bridge	EACH	1	$ 2,700,000	$ 2,700,000
Erosion Control	L SUM	1	$ 50,000	$ 50,000
Roadway Pavement	L FT	28,700	$ 80	$ 2,296,000
Pavement Marking	L FT	57,400	$ 1	$ 51,660
Signing	L SUM	1	$ 12,000	$ 12,000
Entrances	EACH	2	$ 4,000	$ 8,000
Road Closure	EACH	1	$ 30,000	$ 30,000
W. Main Street	L SUM	1	$ 375,200	$ 375,200
Land Acquisition				
	ACRES	17.3	$ 15,000	$ 259,500
			20% Contigency	**$ 1,541,000**
			TOTAL LOCATION 2A	**$ 9,250,000**

Location 2B - Trumpet Interchange				
Pay Item Description	***Unit***	***Quantity***	***Unit Price***	***Cost***
Roadway Items				
Earthwork	CU YD	131,600	$ 16	$ 2,105,598
Tree Removal	ACRES	2	$ 7,000	$ 10,500
Structure Modification	EACH	0	$ 60,000	$ -
New Roadway Bridge	EACH	1	$ 2,700,000	$ 2,700,000
Erosion Control	L SUM	1	$ 50,000	$ 50,000
Roadway Pavement	L FT	30,787	$ 80	$ 2,462,960
Pavement Marking	L FT	61,574	$ 0.90	$ 55,417
Signing	L SUM	0		$ -
Entrances	EACH	2	$ 4,000	$ 8,000
Road Closure	EACH	1	$ 30,000	$ 30,000
W. Main Street	L SUM	1	$ 375,200	$ 375,200
Land Acquisition				
	ACRES	35	$ 15,000	$ 525,000
			20% Contigency	**$ 1,665,000**
			TOTAL LOCATION 2B	**$ 9,990,000**

Summary of Cost Estimates	
Alternative	**Cost**
Location 1A - Partial Cloverleaf Interchange	$11,990,000
Location 1B - Dogbone Interchange	$9,280,000
Location 2A - Partial Cloverleaf Interchange	$9,250,000
Location 2B - Trumpet Interchange	$9,990,000
Sideroad Cost Estimates for Location 1	
S. Raney Street	$2,671,822
Airport Road	$1,006,507
1000th Avenue (west of I-57)	$1,602,098