



**Illinois Route 131: Russell Road to Sunset Avenue  
Phase I Study**

# **Purpose & Need**

# **1 PURPOSE AND NEED OF THE PROPOSED ACTION**

## **1.1 Purpose**

The Illinois Department of Transportation (IDOT) is considering improvements along IL Rte. 131 from Russell Road to Sunset Avenue in order to improve safety and functionality within the corridor. Specifically, transportation solutions may be necessary to address issues of roadway and intersection capacity and efficiency; enhance vehicular, pedestrian, and bicycle accommodation and safety; and bring the roadway into compliance with current IDOT design standards.

The 7.5 mile project is located in northeastern Lake County, Illinois, and the study limits and logical termini for the IL Rte. 131 improvements are Russell Road to the north and Sunset Avenue to the south. Russell Road serves as the jurisdictional boundary between Illinois and Wisconsin in this area. In Wisconsin, IL Rte. 131 becomes Wisconsin Rte. 31, the Average Daily Traffic (ADT) increases by approximately 10%, and the roadway becomes four lanes divided by a grass median. To the south, Sunset Avenue serves as the project's southern limit since the ADT on IL Rte. 131 increases 30% south of Sunset Avenue, and the roadway transitions to a four-lane section. These termini provide logical endpoints to the project since the existing cross section is two-lane undivided and the capacity of the roadway increases at these locations.

IL Rte. 131 is a main north-south route through the following municipalities within the project corridor: Waukegan, Beach Park, Wadsworth, Zion, and unincorporated Benton and Newport Townships. Communities near the project area but not directly adjacent include Gurnee to the southeast of the project area; Winthrop Harbor to the east; and Pleasant Prairie, Wisconsin to the north. Land uses within the project area generally consist of residential, commercial, and limited industrial development. The Waukegan Regional Airport is located directly east of IL Rte. 131 between Wadsworth Road and Yorkhouse Road. The project corridor directly borders the Waukegan Savanna Forest Preserve, located near the intersection of IL Rte. 131 and Yorkhouse Road, and two golf courses to the north. Trumpet Business Park is an industrial development located at the intersection of IL Rte 131 and 9<sup>th</sup> Street, which generates commercial vehicle and truck traffic. Other developments include several residential and commercial developments along the route.

The study limits include signalized intersections at Russell Road, IL Rte 173 (Rosecrans Road), 21<sup>st</sup> Street, Wadsworth Road, Yorkhouse Road, and Sunset Avenue. In addition, there are several unsignalized intersections including 9<sup>th</sup> Street, Kenosha Road, 29<sup>th</sup> Street, 33<sup>rd</sup> Street, and Beach Road. Other local streets also intersect IL Rte. 131 within the study limits, but they have significantly lower volumes and traffic demands.

In general, IL Rte. 131 currently consists of one lane in each direction with turn lane or additional through lane improvements at most signalized intersections and some unsignalized intersections. The right of way is typically 82.5-foot wide, with some widening at intersections and areas of new development. The posted speed limit along IL

Rte. 131 is 55 mph between Russell Road and IL Rte. 173, and is reduced to 45 mph from IL Rte. 173 to Sunset Avenue.

Throughout the study area, IL Rte. 131 is designated as a Strategic Regional Arterial (SRA) by the Illinois Department of Transportation (IDOT) and the Chicago Metropolitan Agency for Planning (CMAP). The SRA system forms a network of key routes intended to accommodate long-distance and high-volume automobile and commercial vehicle traffic as an alternate to the existing expressway system and regional transit alternatives. As a key supplement to Interstate 94, U.S. Rte. 41, and IL Rte. 137 (Sheridan Road), IL Rte. 131 must accommodate long-distance and high-volume traffic. Additionally, IL Rte. 131 is a Class II truck route between IL Rte. 173 and the Wisconsin state line. Although IL Rte. 131 is designated as a SRA, it currently does not meet all IDOT standards for SRA routes in developing suburban areas, including access restrictions, signal coordination, roadway lighting, and roadway geometry and alignment.

Lake County has experienced significant population growth and economic development since 1990, due to its convenient highway and commuter rail access to Chicago and its abundance of open space. CMAP projects that traffic volumes will increase by an average of 22% along the corridor by the year 2030. In particular, the municipalities in the vicinity of the project area are anticipated to attract new residential and commercial development as a result of a continually growing population, further increasing traffic volumes and requiring an efficient transportation system.

## **1.2 History**

IL Rte. 131 was originally constructed to provide a link between northeastern Illinois and Wisconsin. In 1938 the road was designated as IL Rte. 131. Widening and reconstruction of IL Rte. 131 was completed in 1955, when each through lane was widened from 9 feet to 11 feet. It is noteworthy that this was the last comprehensive reconstruction project along the corridor as a whole to date; subsequent improvements have primarily been made only to specific intersections or as part of private development projects. In 1994, as part of a SRA report for IL Rte. 173, it was recommended that IL Rte. 131 from IL Rte. 173 north to Russell Road be designated as a SRA in order to provide an important connection to Wisconsin State Route 31 for traffic using the SRA network. A SRA Corridor Study was undertaken in 2002-2004, encompassing IL Rte. 131 from IL Rte. 173 south to IL Rte. 120. This study represents conceptual planning and did not include detailed engineering plans or environmental approval. Recommendations of the 2002-2004 SRA study include widening IL Rte. 131 to three through lanes in each direction and a 30-foot barrier median to accommodate dual left turn lanes. Currently, a safety improvement project is being undertaken at the intersection of IL Rte. 131 and Yorkhouse Road as a supplement to the larger corridor Phase I study.

The project planning process implements IDOT's Context Sensitive Solutions (CSS) process, a public involvement program which synthesizes the needs of many stakeholders in order to discern the most appropriate course of action for the project.

Currently the project is not funded beyond the Phase I Study for IDOT's Fiscal Year 2010 to 2015 Proposed Highway Improvement Program. IDOT will consider the project in future programs based on funding availability.

### **1.3 Need for the Proposed Action**

The need for this project is driven by the absence of improvements consistent with IDOT's current standards. The demands on the roadway and the purpose that it serves have changed significantly since its last reconstruction. Any improvements will have independent utility and will function without requiring additional work beyond the project limits. The following sections address the specific needs identified for the project, including capacity, operations and mobility, and safety.

#### **1.3.1 Capacity Deficiencies**

Current ADT volumes along IL Rte. 131 range from 10,400 between Kenosha Road and IL Rte. 173 to 23,100 between Yorkhouse Road and Sunset Avenue. These volumes represent 2007 ADT data, the most recent data available. The maximum capacity of a roadway with characteristics similar to IL Rte. 131 is between 14,000 to 18,000 vehicles per day. In several areas, IL Rte. 131 already exceeds the recommended capacity with existing traffic volumes.

Since the IL Rte. 131 study corridor is located within an area that is already experiencing major growth and development, with further growth anticipated in the future, it is projected that traffic volumes will increase accordingly. In addition, IL Rte. 131 serves as an important alternative to I-94, US Rte. 41, and IL Rte. 137 in its role as part of the SRA network of roadways. CMAP traffic volume projections predict an average growth rate of 22% throughout the corridor by the year 2030. The projected growth ranges from 1.4% to the north of Sunset Avenue to over 40% to the north of IL Rte. 173. This projected growth yields ADT volumes between 13,000 to 25,000 along IL Rte. 131 by the year 2030. Major growth is also expected on many roadways which intersect IL Rte. 131, thus increasing the demand and congestion at these intersections.

Several large planned developments near the project area will require increased capacity along IL Rte. 131. At the northern end of the project, a major traffic generator will be Trumpet Business Park, located west of IL Rte. 131 in the area bounded by Russell Road and 9<sup>th</sup> Street. This development, in conjunction with existing industrial use in the area, will continue to generate commercial and industrial traffic. Another major traffic generator will be the Waukegan Park District's Waukegan Community Sports Complex, which is planned for construction on the former location of the Orchard Hills Golf Course, just west of IL Rte. 131 and south of Beach Road. The Waukegan Regional Airport is studying a future runway extension. This study is being completed separately from the IL Rte. 131 study, but coordination is required as the two projects will affect each other. Large residential and commercial developments have been steadily locating along or in close proximity to IL Rte. 131, with numerous future developments planned. Such growth can be expected to continue along the corridor.

Growth rates on the intersecting roadways generally exceed the growth rates along mainline IL Rte. 131 according to CMAP 2030 projections. These growth rates range from a negligible increase on the eastern leg of Sunset Avenue to a growth of 525% on the eastern leg of Beach Road. The average projected growth on the cross roads is 96%.

The following table summarizes growth rates along the cross roads, and provides reasoning for the growth.

<u>Cross Road</u>	<u>Growth Rate (Eastern leg)</u>	<u>Growth Rate (Western leg)</u>	<u>Reason for Projected Growth</u>
Russell Road	126%	70%	Trumpet Park, commercial developments, minor league baseball park
IL Rte. 173	47%	59%	Commercial development
21 <sup>st</sup> Street	76%	74%	Commercial development
Kenosha Road	22%		Residential development
29 <sup>th</sup> Street	54%	82%	Planned residential development and expansion of existing developments
33 <sup>rd</sup> Street	32%	82%	Planned residential development and expansion of existing developments
Wadsworth Road	117%	78%	Potential commercial development, planned residential development, Waukegan Community Sports Complex
Beach Road	525%	270%	Waukegan Community Sports Complex
Yorkhouse Road	32%	96%	Waukegan Community Sports Complex, potential commercial developments
Sunset Avenue	0.7%	23%	Commercial developments

The quality of traffic flow along a roadway section or an intersection can be quantified by its Level of Service (LOS), which is determined by its operating speed, traffic density (vehicles per mile per lane), and flow rate (vehicles per hour per lane). The LOS of a segment is graded on a letter scale from A to F, where A represents near free flow speeds with low density and flow rates, while F represents extremely low speeds and heavy congestion.

Based on the functional and design categories outlined in the Highway Capacity Manual (HCM), 2000 Edition, IL Rte. 131 is considered a Suburban Principal Arterial, and therefore a Class II Urban Street. Roadways in this category serve traffic making long trips between major points, and connect important activity centers and major traffic

generators. Mobility is very important on these types of routes and access to adjacent properties is controlled. The HCM indicates that a minimum LOS C is desirable for this type of route. In addition, SRA regulations require a minimum LOS C for through movements on the SRA route in suburban areas. Turning movements from the SRA may operate at an LOS D, and non-SRA routes are required to have a minimum level of service D for all movements. The overall intersection Level of Service for a suburban SRA Route must be an LOS D or better.

Under existing conditions, most signalized intersections along the project corridor operate at an overall LOS D or better, with the exception of Sunset Avenue and Wadsworth Road, both of which operate at a LOS E during the PM peak hour. LOS D is considered an acceptable delay for intersections according to IDOT's SRA regulations. Overall most through movements on IL Rte. 131 operate at a LOS C or better. However, several through movements operate at LOS D, including:

- Northbound IL Rte. 131 at Yorkhouse Road (PM)
- Northbound IL Rte. 131 at Wadsworth Road (PM)
- Northbound IL Rte. 131 at IL Rte. 173 (PM)

In addition, two through movements operate at LOS F:

- Southbound IL Rte. 131 at Wadsworth Road (AM)
- Northbound IL Rte. 131 at Sunset Avenue (PM)

When projected 2030 traffic volumes are applied to the existing roadway geometry, analyses indicate that IL Rte. 131 will no longer efficiently support the volume of traffic using the roadway. The Highway Capacity Manual estimates 20,000 vpd as the maximum acceptable capacity for a Class II Urban Street with one lane in each direction. A majority of the project corridor will approach or exceed this design capacity based on 2030 volume projections. Many major signalized intersections will operate at an unacceptable LOS F during peak hours, including:

- Russell Road (PM)
- IL Rte. 173 (PM)
- Wadsworth Road (AM and PM)
- Yorkhouse Road (PM)
- Sunset Avenue (PM)

In the AM peak hour, the intersection at Yorkhouse Road will operate at LOS E. Several intersections will operate at a LOS D, including the following:

- Russell Road (AM)
- IL Rte. 173 (AM)
- 21<sup>st</sup> Street (AM)
- Sunset Avenue (AM)

While LOS D is considered acceptable, these levels of service generally represent increased delay. Such conditions will result in longer delays, limited maneuverability, and continued congestion along the corridor.

### **1.3.2 Operational and Mobility Deficiencies**

Several geometric and design deficiencies along IL Rte. 131 impede its ability to operate efficiently. Several such deficiencies occur at the intersection of IL Rte. 131 with Kenosha Road. At this intersection, Kenosha Road meets IL Rte. 131 at a skewed angle of approximately 50° from perpendicular. IDOT recommends that an angle of no more than 15° from perpendicular be used for intersecting roadways in order to allow proper visibility. The alignment of Kenosha Road includes a short radius near the intersection with IL Rte. 131 so a short perpendicular approach is provided. In addition, the alignment of IL Rte. 131 curves horizontally at the intersection. The skewed angle of Kenosha Road in conjunction with the horizontal curve impedes visibility for vehicles approaching the intersection.

Several locations on IL Rte. 131 do not meet IDOT's design standards for vertical curve design. The length and difference between tangent grades on a vertical curve are important for ensuring proper stopping sight distance on the curve. Many of the deficient vertical curves occur north of IL Rte. 173, where the speed limit increases to 55mph.

Observation of the current operation of the roadway system indicate that congestion on IL Rte. 131 may hinder the ability of traffic approaching from unsignalized intersections or driveways to cross or turn onto IL Rte. 131. One cause of this lack of operational efficiency is that existing traffic signals along the project corridor are not interconnected and therefore do not provide synchronized gaps for cross-traffic.

At several unsignalized intersections, the conditions may be such that a traffic signal is the best solution to alleviate congestion related issues. In order to install a traffic signal, one or more of the eight Traffic Signal Warrants described in the Manual on Uniform Traffic Control Devices (MUTCD), 2003 edition must be met.

Several sections of IL Rte. 131 have safety hazards due to poor drainage. Water ponding and ice on the shoulders and side of the road create hazards. A section of the roadway near the intersection of IL Rte. 131 and Taylor Lane particularly requires attention to drainage due to flooding on the roadway.

Sub-standard geometric design plays a role in decreasing the efficiency with which an intersection operates. Since IL Rte. 131 has not been comprehensively improved for over 50 years, many intersections do not have the capacity to handle the current or projected traffic volumes efficiently and safely. Narrow lanes, lack of separate left turn lanes, insufficient turn lane lengths, sub-standard vertical curves, drainage, lack of access management, and deteriorating pavement and shoulders all contribute to decreased efficiency along the corridor. These concerns are addressed in IDOT's SRA guidelines, which indicate that SRA routes must be consistent with the standards to the extent

possible in order to ensure safe and efficient travel along these routes. Based on the deficiencies listed above, improvements are needed to bring IL Rte. 131 to SRA standards.

### 1.3.3 Safety Deficiencies

The Lake County Department of Transportation (LCDOT) crash data has been reviewed for the years 2004 through 2007. Over this period of time, 803 crashes occurred along IL Rte. 131 within the project limits. These crashes resulted in 108 injuries and 3 fatalities. Of the total 803 crashes, 479 occurred at major intersections, equivalent to 60% of the total crashes. The greatest number of crashes at an intersection occurred at the intersection of IL Rte. 131 with Sunset Avenue. One hundred thirty eight crashes occurred at this intersection over the four years analyzed, which is 17% of the corridor's total number of crashes. Other intersections with a major proportion of crashes include Wadsworth Road (97 crashes) and Yorkhouse Road (86 crashes).

Rear-end crashes were most prevalent in the four-year study, comprising 42% of total number of crashes. The second most common type of crash was turning, comprising 24% of the total. Angle collisions accounted for 11% and crashes with fixed objects accounted for 9%. All other types of crashes accounted for 5% or less. The types and numbers of crashes recorded along IL Rte. 131 are included in the following table.

Type of Crash	Number of Crashes (2004-2007)	Percent of Total Crashes
Rear End	338	42.1%
Turning	191	23.8%
Angle	84	10.5%
Fixed Object	72	9.0%
Sideswipe – Same Direction	37	4.6%
Sideswipe – Opposite Direction	22	2.7%
Overtaken	17	2.1%
Head On	13	1.6%
Other Object	10	1.2%
Animal	8	1.0%
Parked Vehicle	5	0.6%
Other Non-Collision	3	0.4%
Cyclist	2	0.2%
Other	1	0.1%
Pedestrian	0	0.0%

Out of the total 803 crashes along IL Rte. 131 during the years studied, 108 crashes resulted in an injury. One fatality occurred at each of the following intersections: Yorkhouse Road, 33<sup>rd</sup> Street, and IL Rte. 173. The fatality that occurred at Yorkhouse Road in 2004 resulted from a left-turning crash. At 33<sup>rd</sup> Street, the fatal crash occurred in 2006 and resulted from an out of control vehicle. At IL Rte. 173, the fatal crash also occurred in 2006 and resulted from a head-on collision.



Only two crashes throughout the corridor and within the analysis period of 2004 through 2007 involved a vehicle and a cyclist. There were no crashes involving a vehicle and a pedestrian. While initially this appears to indicate a safe area for pedestrians and cyclists, further analysis and observation of the corridor demonstrate otherwise. There are few accommodations along the corridor for pedestrians and bicyclists, amounting primarily to the shoulders of the roadway. The existing lane widths in several areas of the corridor are 11 feet, and lack of a median results in little maneuverability for motorists attempting to give space to pedestrians or bicyclists.

The reason for the low number of crashes involving vehicles and pedestrians or cyclists is that there are few pedestrians and cyclists that use the corridor. This may be caused by the fact that there are few accommodations to promote the safety of the pedestrians and bicyclists and that these users would likely choose an alternate safer route. With increasing development along IL Rte. 131, an increased demand on all types of infrastructure is likely, including infrastructure specifically for pedestrians and/or bicyclists. In addition, as development increases in density, walking or bicycling along the route becomes a more feasible option as distances between destinations will be decreased.

In addition, the approximately 0.25-mile-long section of IL Rte. 131 just north of 9<sup>th</sup> Street is listed as a 5% Location by FHWA and IDOT. As part of the Highway Safety Improvement Program (HSIP) introduced in the Federal Transportation Reauthorization Safe Accountable Flexible Efficient Transportation Equity Act – A Legacy for Users (SAFETEA-LU), each State Department of Transportation will identify not less than the top 5% of their highway locations exhibiting the most severe safety needs based on crashes, injuries, deaths, traffic volume levels, and other relevant data.

#### **1.4 Summary**

To address the specific needs outlined previously, improvements to IL Rte. 131 will be necessary. Proposed improvements will need to address the roadway facilities needs and increase compliance with current IDOT design standards. The roadway has not been comprehensively reconstructed for over 50 years and the needs and demands on the infrastructure have changed. IL Rte. 131 is located in an area that will continue to experience high rates of growth and will therefore require more efficient transportation options. As a designated SRA route, the roadway must be able to service long-distance and high-volume traffic; however, IL Rte. 131 currently lacks many improvements that are required for SRA routes. Safety, capacity, and operations must be addressed via improvements to the roadway geometry, alignment, signal location and timing, pavement design, and roadway drainage. The proposed improvements will serve to bring the roadway into compliance for a SRA route within a developing suburban area, and will address the stated purpose and need of the project by improving specific deficiencies within the corridor. Improvements will ensure that IL Rte. 131 continues to address the traveling public's transportation needs into the future.