

## Purpose and Need

### 1.0 Introduction

This Environmental Assessment is being conducted to assess potential impacts that could result from a proposed widening of Illinois Route 47 (IL 47). The study area extends approximately eight miles along IL 47 from Reed Road to U.S. Route 14 (US 14) through the communities of Huntley, Woodstock, Lake in the Hills, Lakewood, and unincorporated McHenry County. The proposed work would widen the existing roadway to two lanes in each direction, with a grassy median. It is located within the Kishwaukee River Watershed, an ecologically diverse watershed that contains sensitive plant and animal species, as well as highly permeable soils.

IL 47 is classified as a rural Strategic Route Arterial and is included as part of the National Highway System. IL 47 is important to the north-south transportation linkage because it provides access to residential, retail, commercial, agricultural, and recreational lands throughout the region, including Wisconsin. The nearest parallel state highway is IL Route 31 located seven miles east of IL 47. Other transportation studies along IL 47 have taken place or are ongoing. South of Reed Road, a Phase I Study/Categorical Exclusion was previously completed; the roadway was completed in the summer of 2011. North of US 14, a separate Phase I Study/Environmental Assessment has been initiated that will study improvements to IL 47 from US 14 to Charles Road. Therefore, the logical termini of Reed Road and US 14 are verified. In addition, an "Illinois Tomorrow" grant was awarded that provides a land use based study of the IL 47 corridor from within Kane County northward to the Wisconsin State line. This latter study is intended to evaluate current land use and provide a planning document that combines the comprehensive planning efforts of the communities along the corridor.

The speed limit along IL 47 within this study area is 45 mph south of Rainsford Drive, 55 mph between Rainsford Drive and Hercules Road, and 40 mph north of Hercules Road. The roadway consists of two twelve foot through lanes, widening to four twelve foot lanes in some commercial and residential subdivision areas, with gravel shoulders. The existing right of way is 80 feet throughout except for just south of US 14, where the right of way expands to 200 feet. There are four signalized intersections throughout the project area located at Reed Road, US 14, and both intersections with Illinois Route 176 (IL 176). In addition to these intersections, there are a number of intersecting roads that are controlled by stop signs.

#### What is an Environmental Assessment?

An Environmental Assessment (EA) is a document prepared for a proposed project under the National Environmental Policy Act. The EA describes the purpose and need for the project, the alternatives considered, the existing socioeconomic and environmental conditions in the project vicinity, and any anticipated impacts on socioeconomic or environmental resources. The EA serves to advise the public and stakeholders on the project and help make a decision as to the desirability of the project.

If the EA determines that there are no significant impacts anticipated from the project, a Finding of No Significant Impacts (FONSI) can be issued. If a FONSI cannot be concluded, additional studies or an Environmental Impact Statement may be warranted.

## 1.1 Purpose and Need

## 1.2 Purpose of the Project

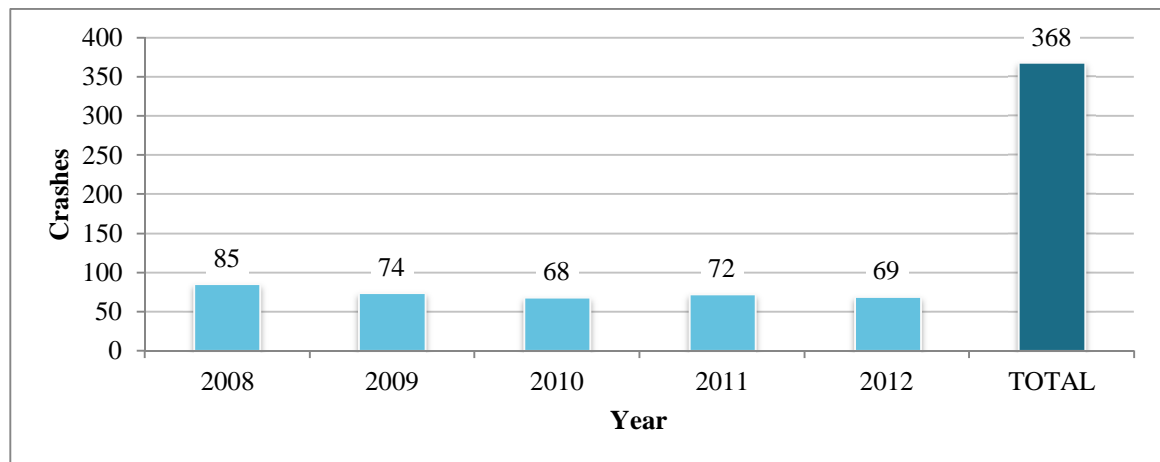
The purpose of the proposed action is to provide an improved transportation system for IL 47 from Reed Road to US 14. Improvements to this route are needed to address vehicular and pedestrian safety, enhance traffic mobility and capacity, and facilitate planned economic growth.

## 1.3 Project Need

### 1.3.1 Safety

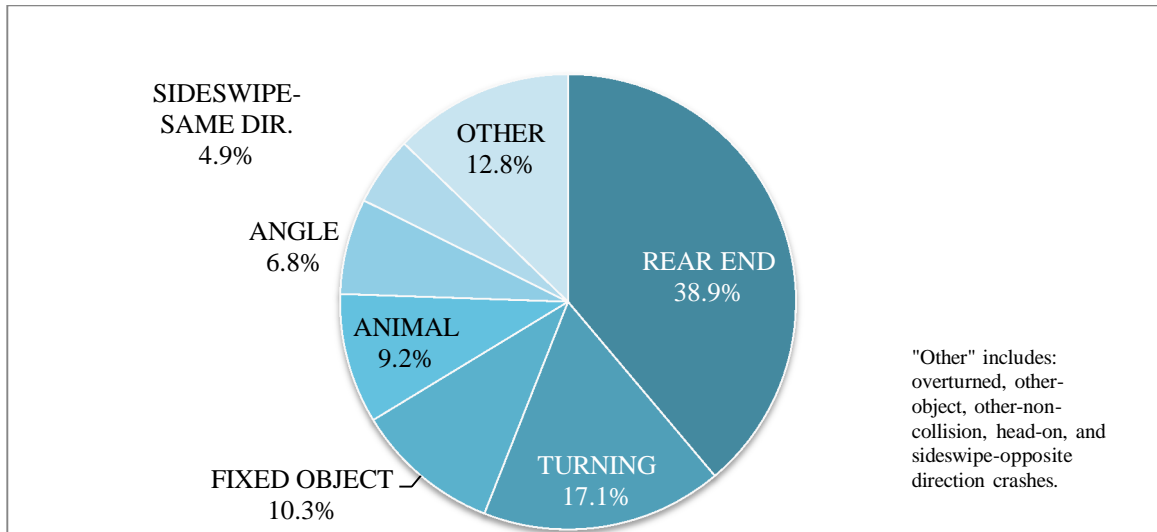
#### Vehicular Crash Data

The crashes within the project area have been recorded using the Illinois Traffic Crash Report. During the five-year study period from 2008-2012, a total of 368 crashes occurred along IL 47 as shown in **Figure 1**.



**Figure 1: Total Crashes 2008 - 2012**

**Figure 2** presents the 368 crashes by crash type. The predominant crash types for the five year study period were rear-end followed by turning, fixed object, animal, angle, and sideswipe same direction crashes. Other crash types accounted for less than 13% of total crashes. Lighting, weather, and wet pavement conditions do not appear to be a primary influence of the crashes within the project area.



**Figure 2: Crash Type (2008 – 2012)**

During 2008-2012, a total of 191 injuries and three fatalities were recorded. **Table 1** presents the crash severity data for the five year period. One crash involving a fatality occurred in 2008 between Conley Road and Foster/Union Road. A second crash involving two fatalities occurred in 2012 at the IL 47 and IL 176 (West Leg) intersection.

**Table 1: IL 47 Corridor Crashes by Crash Injury Category (2008-2012)**

Crash Injury	Total	%
Type A - Incapacitating	27	14.1
Type B - Non-Incapacitating	97	50.8
Type C - Report/Not Evident	64	33.5
Type K – Fatality	3	1.6
<b>Total</b>	<b>191</b>	<b>100</b>

*Signalized Intersection of IL 47 and IL 176 (Split Intersection)*

The Illinois Department of Transportation (IDOT) listed this split intersection in the 2010 Selected Arterial 5% Segments due to the high number of crashes that have occurred at the south (East Leg) and north (West Leg) intersections. The majority of the crashes occurring at these locations are rear-end crashes and turning crashes. See **Table 2** for information on these crashes.

**Table 2: IL 47 at IL 176 Intersection Crashes by Crash Type (2008-2012)**

Crash Type	East Leg Intersection Totals	West Leg Intersection Totals	Combined Total	Combined %
REAR END	20	33	53	52.5
TURNING	18	21	39	38.6
OTHER (Animal, Fixed Object, Sideswipe-same direction, Angle, Sideswipe-opposite direction)	4	5	9	8.9
<b>TOTALS</b>	<b>42</b>	<b>59</b>	<b>101</b>	<b>100</b>

Potential contributory factors to rear-end crashes include heavy approach traffic volumes, and high vehicle approach speeds. Potential contributory factors to turning crashes include heavy turning volumes and high vehicle approach speeds, which result in the misjudgment of gaps in opposing through movements.

### 1.3.2 Capacity and Mobility

#### Level of Service

Level-of-Service (LOS) classification is used to classify how well traffic flows through signalized intersections. LOS A describes operations with very low delay, up to an average of 10 seconds per vehicle, while LOS F describes operations with very high delay, in excess of 80 seconds. In general, IDOT targets a minimum LOS C for roadways similar in classification to IL 47. **Figure 3** demonstrates LOS.

For the No-Action alternative, the design year 2040 LOS at the signalized intersections range from C to D and individual movements experience LOS E and F, that indicates poor intersection operations. The intersection of IL 47/Reed Road, a four-legged intersection, will have a LOS of C in both the a.m. and p.m. peak periods. IL 47/IL 176 (West Leg), a three legged intersection, will have a LOS of D in both the a.m. and p.m. peak periods. The intersection of IL 47/IL 176 (East Leg), a three legged intersection, will have an a.m. LOS of C and p.m. LOS of D, LOS E occurs on the left turn movement from southbound IL 47 to IL 176 (East Leg), and LOS F occurs on the northbound IL 47 through movement.

Under these conditions, the backups along IL 47 will extend approximately 1550 feet in the northbound direction. These backups block safe access to side streets and

#### **What is Level of Service?**

Level of Service (LOS) is a measurement used to describe traffic flow or the amount of congestion a section of roadway experiences. It can be used to determine speed and travel time, the amount of delay, and traffic-related safety issues can be implied.

There are six LOS, each given a letter designation.

LOS A represents low volumes and higher speeds of traffic associated free flowing traffic.

LOS B has stable flow but operating speeds are beginning to be restricted due to traffic conditions.

LOS C still has stable flow but speeds and maneuverability are restricted.

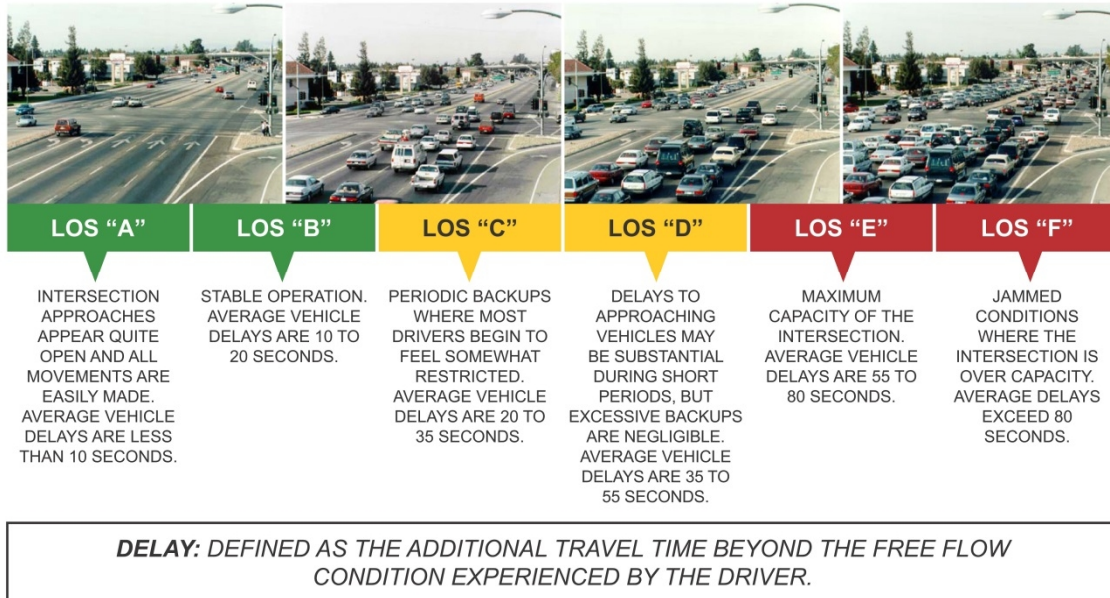
LOS D is the level of service where traffic becomes unstable. There is little freedom to maneuver and there are substantial drops in speed.

LOS E has lower operating speeds, the flow is unstable, and there may be momentary halts in traffic.

LOS F has low operating speeds and traffic often stops, forming vehicle backups.

retail establishments. IL 47/US 14, a four-legged intersection, will have a LOS of D in both the a.m. and p.m. peak periods.

WHAT IS A LEVEL OF SERVICE?



**Figure 3: Level of Service Diagram**

Capacity

Currently (2011), the route carries between 14,300 and 22,300 vehicles per day, averaging 17,100 vehicles per day over the length of the project. In 2040 the projected traffic levels are between 21,000 and 29,000 vehicles per day, averaging 24,600 vehicles per day over the length of the project. A two lane roadway can safely and efficiently accommodate between 14,000 and 18,000 vehicles per day. Current traffic volumes exceed that level and are projected to increase at every intersection along the project. Crashes throughout the study area appear to be caused primarily by a lack of capacity and safe turning accommodations. The existing two lane roadway typically does not provide channelized turn lanes. During peak hours, lengthy queues are formed when vehicles attempt to make left turns at unsignalized intersections. The congestion and stopped traffic results in driver frustration and an increased potential for rear-end and turning type crashes. Slow moving vehicles from adjacent agricultural and quarrying activities further compound the turning deficiencies. These slow moving vehicles, that create the potential for collisions, are concentrated near the intersections of Conley Road, Ballard Road, and Foster/Union Road.

Mobility

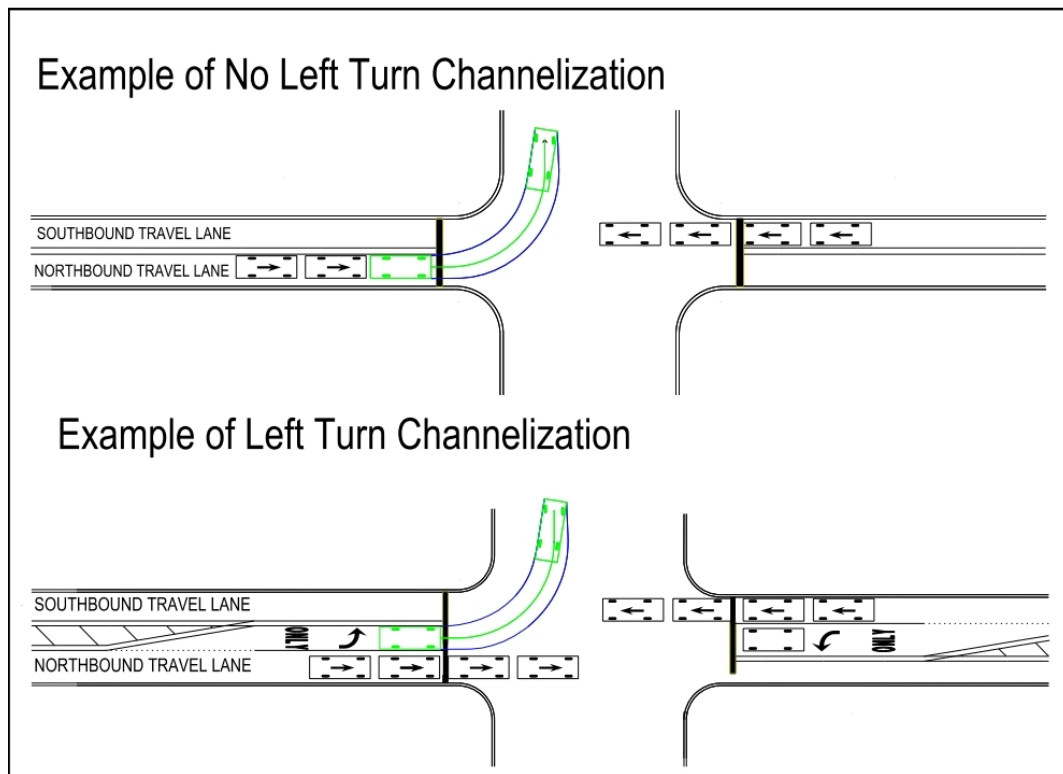
The northern mile of the project is characterized by numerous existing commercial properties with additional commercial properties in the planning stages. These properties generate turning vehicles that slow the flow of traffic. Access to the properties should be consolidated to reduce conflict points. The lack of pedestrian and bicycle

accommodations do not afford alternate means to travel between the commercial properties, increasing the number of vehicles entering and exiting the roadway. Separating the pedestrians and bicycles from vehicle traffic would reduce conflicts between them.

The southern end of the project is much more rural in nature. Access points are spread out with few vehicles entering or exiting the roadway. There are few destinations for pedestrians or bicycles in this portion of the project. Pedestrian and bicycle accommodations will, however, be provided.

### 1.3.3 Economic Development

Locally, IL 47 serves as a transportation corridor in the Cities and Villages of Huntley, Woodstock, Lake in the Hills, and Lakewood, that consist of mixed use, multi-family residential, public/institutional, and commercial land uses. The current traffic queues and level of service contribute to poor and unsafe access for the land uses that exist throughout the project area. Left turn channelization is sporadic throughout the project area and access to adjacent properties is limited (see [Figure 4](#) for a demonstration on channelization). These problems will continue to increase as more residential and commercial facilities are built.



**Figure 4: Left Turn Channelization**

The communities along the corridor have tools in place, such as formal comprehensive plans and zoning restrictions, to allow for planned residential and commercial growth. IDOT has been and will continue to work with the local communities to select the most appropriate places for access points to IL 47. Currently, two major residential developments are planned within the project area; the Huntley Village Center North, located between Talamore Boulevard and Ackman Road, and the properties formerly known as Apple Creek Estates, located between Lucas Road and Hercules Road. A commercial center is planned for the intersection area near the East Leg of IL 176 and IL 47 intersection. Smaller commercial and residential developments are planned as well throughout the corridor. In sum, the generation of traffic by these planned future developments will compound the current conditions. The local communities are cooperating with IDOT's access permitting efforts that will help to maintain thoughtful growth.

IL 47 also serves travelers who use the route to travel to Wisconsin and the Lake Geneva area. The viability of current and future economic development along the IL 47 corridor is restricted under current traffic operations. A safe and efficient transportation system would better serve and maintain the viability of current land uses in and around the business areas along the route.