SECTION 1

Purpose of and Need for Improvements

1.1 Introduction

The IDOT and the FHWA are evaluating the transportation system in an area bounded by I-90 on the north, I-294 on the east, I-290/US 20 on the south, and the western terminus of the existing Elgin O'Hare Expressway (see Exhibit 1-1). The area contains critical local, regional and national transportation facilities with more than 18 percent of all trips in the six-county region occurring in the study area. However, mobility is adversely affected by severe congestion on 86 percent of the interstate and primary roads in the study area. The purpose of the EO-WB study is to identify multimodal transportation solutions that will help address major congestion and mobility problems in the study area.

The EO-WB study is being conducted in accordance with NEPA and its associated regulations. The NEPA process will be completed in two parts, or tiers. Tier One is a broad planning process that includes an examination of the transportation needs, transportation system alternatives that would satisfy the needs, and consideration of impacts of the alternatives using a database of existing and available data. Tier One will be developed in conformance with the SAFETEA-LU and IDOT's CSS policy and procedures. CSS is a process that seeks stakeholder input to transportation solutions that fit into and reflect their surroundings. Tier One will disclose the potential beneficial and adverse impacts of proposed system alternatives in a Draft and Final EIS. The Tier One EIS will conclude with a ROD identifying the preferred transportation system alternatives. The ROD will document the following decisions:

- Identify a conceptual plan for multimodal transportation improvements in the EO-WB study area
- Identify the locations where transportation improvements would be implemented
- Identify and consider funding options

Tier Two studies will commence after the conclusion of Tier One for elements of the conceptual plan that have operational independence. Tier Two studies will be undertaken at a more detailed level of engineering and environmental analysis and result in decisions regarding the following:

- Determine design details and specific environmental impacts for improvements with operational independence
- Conclude the NEPA process for improvements with operational independence
- Identify project funding strategies

1.2 Transportation Purpose and Need

A transportation needs analysis was conducted to evaluate the range of transportation issues and problems for the existing roadway and transit systems, as well as bicycle and pedestrian accommodations in the study area. This evaluation involved a detailed technical analysis and an extensive outreach to stakeholders (transportation agencies, regulatory agencies, elected officials, and the public) to obtain their perspective on transportation issues in the study area. See the *Transportation System Performance Report* (FHWA and IDOT, 2009), and *Stakeholder Problem Definition* (FHWA and IDOT, 2008) for details. The technical analysis and the stakeholder outreach approached the identification of issues and problems differently, but the findings have many similarities. The project needs in Table 1-1 have evolved as the major themes from the technical analysis and stakeholder problem identification.

TABLE 1-1
Technical and Stakeholder Problem Statements

Project Needs	Technical Analysis Findings	Stakeholder Problem Statement
Improve local and regional travel	88 percent of the area's interstates are congested, growing to 90 percent by 2030. Congestion on major roads will spill over to secondary roads with 92 percent congested on principal arterials by 2030.	Congestion on major routes. Reduced truck/freight mobility.
Improve travel efficiency	40 percent of the study area has the longest travel times to interstate connections. Lack of service interchanges along existing interstates results in poor access and inadequate connections with major regional corridors. System interchanges operate inefficiently because of traffic volumes exceeding capacity, lack all movements, inefficient loop style ramps, and short weaving sections. Freight rail traffic impedes the movement of vehicle traffic in the study area with 120 at-grade crossings, and 15 on major routes.	Poor access and connectivity in the study area. Travel delays caused by at-grade railroad crossings. Travel management strategies that could improve travel efficiency are minimally applied in the study area.
Improve O'Hare West access	Proposed O'Hare West Terminal reliant on high-capacity transportation connections from the west (i.e., roadway, rail transit, bus, shuttle) to serve an estimated year 2030 average daily traffic of 29,000. West terminal entrance would have the longest travel times in the study area to interstate connections. Western access would be required to serve the terminal need while maintaining local route continuity and supporting local community economic goals.	Lack of access to O'Hare Airport.
Improve modal opportunities and connections	Roughly four percent of the all trips in the study area are made by transit, increasing to five percent by 2030. Ridership is affected by gaps in service, inability to adequately serve the reverse commute or suburb-to-suburb commutes, lack of system capacity, inadequate bus/shuttle connections to rail transit and to employment centers, constrained parking capacity at rail stations, and inadequate pathways for pedestrians and bicyclists to transit.	Public transportation not being a realistic choice: enhanced service options and improved infrastructure are required. Fragmented pedestrian and bicycle system that impairs access to transit stations and major activity centers.

The transportation problems and issues outlined by stakeholders and technical analyses indicate improvements are needed to provide efficient, safe, environmentally sound, and cost-effective transportation facilities. The EO-WB EIS will focus on major system deficiencies and will also provide a foundation for planning by other transportation providers.

The purpose and need for the project is to accomplish the following:

- Improve regional and local travel by reducing congestion
- Improve travel efficiency
- Improve access to O'Hare Airport from the west
- Improve modal opportunities and connections

The remainder of this section discusses the transportation needs supporting the project purpose.

1.2.1 Regional and Local Travel

A tremendous amount of traffic passes through, enters, leaves, or travels within the study area (see Table 1-2). In all, about 4,100,000 vehicle trips occur daily in the area, or 18 percent of all trips in the six-county region. By 2030, daily vehicle trips will grow to around 4,700,000, or about 19 percent. The volume of traffic in the study area is attributable to the major interstates and major traffic attractors including O'Hare Airport, an abundance of industrial and commercial development, and one of Chicago's largest retail malls (Woodfield Mall).

TABLE 1-2
Study Area Daily Trips by Trip Origin and Destination: 2007 and 2030

Trip Origin-Destination	2007		2030[a]	
	Trips	Percent	Trips	Percent
Internal-internal	1,364,000	33	1,526,000	33
Internal-external	913,000	23	1,045,000	23
External-internal	918,000	23	984,000	21
External-external	877,000	21	1,109,000	23
Total	**4,072,000**	**100**	**4,664,000**	**100**

[a] 2030 travel performance values presume improvements to the future transportation system that are identified in the 2030 Regional Transportation Plan, but without the Elgin O'Hare and West Bypass facilities. This level of improvement is referred to as the No-Action Alternative.

Long-distance travel (through trips) and trips originating or ending outside the study area represent a large component—67 percent—of all travel in the study area. In 2007, 877,000 vehicle trips in the study area were through trips, and 1,831,000 began or ended outside the study area. Through trips show the largest growth by 2030 among the four trip types (see Table 1-2). Most trips from outside the study area are to the major traffic attractors named above, and the more than 570,000 jobs in the area (CMAP, 2006).

Freeways and principal arterials (I-90, I-290, Thorndale Avenue, York Road, etc.) are used mainly for long distance trips, but represent only 46 percent of the total road system mileage

and carry 78 percent of all VMT in the peak period. Congestion has overwhelmed the roadway system in the study area (see Exhibit 1-2). In 2007, 88 percent of freeways and 79 percent of principal arterials operated at level of service (LOS) D, E, or F, generally defined as moderate, severe, and extreme congestion, respectively (see Table 1-3). By 2030, congestion will worsen, with LOS F being typical for 90 percent of all interstate and freeways, and the hours of travel delay will increase by about 37 percent (see Exhibit 1-3). The total annual hours of delay in 2030 would be equivalent to 6.5 million workdays, or 10 workdays for every employee in the study area in 2030 (680,000 persons). Extreme congestion on freeways and principal arterials will force traffic to use local roads (minor arterials and collectors) causing severe congestion on those facilities. By 2030, 90 percent of the minor arterials in the study area will be congested during the P.M. peak travel period.

TABLE 1-3
Traffic Congestion P.M. Peak Period: 2007 and 2030

	P.M. Peak Period Vehicle Miles of Travel (VMT)					
	2007 Existing VMT			2030 Baseline VMT[a]		
Road Type	Total	Congested	% Congested	Total	Congested	% Congested
Freeway	1,576,000	1,381,000	88	1,693,000	1,522,000	90
Principal arterial	434,000	344,000	79	529,000	489,000	92
Minor arterial	410,000	241,000	59	585,000	526,000	90
Collector	153,000	62,000	41	259,000	155,000	60
Total	**2,573,000**	**2,028,000**	**79**	**3,066,000**	**2,692,000**	**88**

[a] 2030 travel performance values presume improvements to the future transportation system that are identified in the 2030 Regional Transportation Plan, but without the Elgin O'Hare and West Bypass facilities. This level of improvement is referred to as the No-Action Alternative.

The study area is a key transportation hub for the region, and increasing congestion and travel delay has ramifications to a major portion of the traveling public and the economic well being of the area and the region. As traffic grows, the effectiveness of the system to move people and goods through and into the study area are degraded. Fundamentally, there is a need for transportation improvements that maintain longer distance travel on the appropriate type of facility, and assist in relieving travel congestion on the local road network to serve the travel needs of the region and those within the study area.

1.2.2 Travel Efficiency

Several factors other than congestion contribute to inefficient mobility in the study area including partial interchanges on the freeway system that impair access to and from the study area, poor accessibility to major business nodes in the study area, at-grade railroad crossings on major arterials, and operational issues at freeway system interchanges (see Exhibit 1-4).

Impaired accessibility to and from the interstate system was ranked among the top issues by stakeholders in the study area. Exhibit 1-5 shows 2030 travel times from a location on the west side of O'Hare Airport to locations inside and outside of the study area. Furthermore, it shows travel times begin to exceed 20 minutes before reaching connections with the

interstate system. In many cases these distances are relatively short – five miles or less. Thus, corresponding travel speeds are relatively slow with average speed ranging between 15 and 25 miles per hour. An examination of travel times to five interstate locations shows that times vary depending on the direction of travel (see Table 1-4).

TABLE 1-4
Travel Time/Speed from the West Side of O'Hare Airport to Study Area Locations

	Thorndale Avenue/I-290		Arlington Heights Road/ I-90		Elmhurst Road/ I-90		Irving Park Road/I-294		IL 83/I-290		US 20	
	2007	2030[a]	2007	2030[a]	2007	2030[a]	2007	2030[a]	2007	2030[a]	2007	2030[a]
Travel time (min)	18.5	22.6	17.2	19.3	11.2	12.5	9.8	12.2	11.2	13.3	22	28
Distance (mi)	4.5	4.5	6.4	6.4	2.8	2.8	4.60	4.60	5.0	5.0	11	11
Travel speed (mph, avg)	15	12.0	22	20	15.0	14	28	23	27	23	30	24

[a] 2030 travel performance values presume improvements to the future transportation system that are identified in the 2030 Regional Transportation Plan, but without the Elgin O'Hare and West Bypass facilities. This level of improvement is referred to as the No-Action Alternative.

Travel times for even the shortest trips are 10 minutes or more. These include connections at Elmhurst Road/I-90 to the north, Irving Park Road/I-294 to the east, and IL 83/I-290 to the south. At those locations, future travel times will increase by 10 to 25 percent, and average travel speed will be slower by 10 to 20 percent. The longest travel times will be as follows:

- To the west, more than 22 minutes in 2007, growing to 28 minutes by 2030
- To the northwest, more than 17 minutes, growing to 20 minutes by 2030

Travel time to and from the west along the Elgin O'Hare corridor will increase 27 percent by 2030 at US 20 and 22 percent at I-290. Travel to and from the west and northwest has been the topic of repeated comments by stakeholders, who declare that improved travel is needed to and from these directions.

Another analysis examined the travel time requirements to reach freeway access from any location within the study area (see Exhibit 1-6). Considerable time is required to travel a short distance to the nearest freeway access during the P.M. peak period. This is clearly evident for locations at Elmhurst Road/I-90, Thorndale Avenue/I-290, Lee Street/I-90, Higgins Road/I-290, Arlington Heights Road/I-90, and Lake Street/I-290. For these locations, travel distances of two miles or less require travel times of more than 10 minutes with average speeds less than 15 miles per hour. Over 40 percent of the study area has the longest travel times to a freeway connection. Much of the area with the longest travel time to an interstate connection is also the location of the area's prime industrial and commercial land use, which relies on convenient access to interstate roadways (see Exhibit 1-6). Commercial/industrial land use in the study area is oriented largely to the transportation/distribution business, a growing business sector in the region that accounts for 50 percent of all occupied space in the Chicago metropolitan area. Ready interstate

access for these business types in the study area would have a direct relationship to the area's long-term economic vitality.

Adding to accessibility concerns is the number of service interchanges on the interstate system that do not provide movement in all directions. There are 21 locations on the interstate system that connect with local roads in the study area, and of those, eight are partial interchanges that do not allow full access between the interstate and the local road system (see Exhibit 1-7). Stakeholders' comments have referenced the number of partial interchanges as contributing to out-of-direction travel and inefficient travel. Considering that 48 percent of all vehicle trips in the area have origins and destinations outside the study area, the availability of convenient access into and from the area is important.

The more than 120 at-grade railroad crossings in the study area further degrade the efficiency of the system. Fifteen of the at-grade railroad crossings are on major roads (see Exhibit 1-7). Delays at some locations are lengthy (greater than 15 minutes) and can double the length of an average local trip.

Stakeholder input ranked improving interstate connectivity as one of their top issues. There are large volumes of traffic switching from one interstate to another at each of the three major system interchanges in the study area (I-90/I-294, I-90/I-290, and I-290/I-294; see Exhibit 1-7), and each interchange has operational issues that contribute to the system congestion. Generally, the system interchanges display the following problems:

- Operating capacity is exceeded
- Movements in all directions are not provided
- Loop style ramps are inefficient for the volume of traffic
- Interchange configurations have many short weaving sections where vehicles enter or exit the interstate system

All these issues contribute to inefficient movement through these interchanges resulting in congestion at the interchange, as well as congestion on the mainline. Further, the absence of directional movements in some locations requires out-of-direction travel and results in increased VMT.

1.2.3 Access to O'Hare from the West

The O'Hare Airport is the second busiest airport in the world and until recently held the rank of number one. The airport has only one major access road. Discussions have been ongoing about how improved access to O'Hare would reduce the roadway operational problems that occur with primary access only on I-190. Further emphasis is now being placed upon this issue with the development of the O'Hare Modernization Program (OMP).

In 2001, the City of Chicago announced a modernization plan for O'Hare Airport and began preparation of an EIS. In 2005, the Federal Aviation Administration (FAA) issued its ROD. The approved plans include a western terminal and a western airport entrance near the intersection of Thorndale Avenue and York Road. Construction on the OMP began in 2005, and the west terminal complex is anticipated to be completed in 2014.

In 2030, the average daily traffic projected for the west side of O'Hare Airport is 29,000 vehicles, based on 2030 baseline assumptions that will be added to an already congested system. Examination of appropriate access to the west side of O'Hare Airport is a focus of the EO-WB, as well as other recent studies by others. It is evident worldwide that major airports rely on efficient regional access with the provision of major highway and transit facilities to serve terminal and cargo complexes, and this is clearly the case on the east side of the airport with freeway, tollway, arterial and transit access. Stakeholders rank improvement in access to O'Hare Airport from the west and northwest suburbs as a top issue. The location of the west entrance is another important consideration. As discussed under subsection 1.2.2, Travel Efficiency, the proposed west entrance to the airport is in a location with the longest travel times in the study area to interstate access. By 2030, some of those times will be more than 20 percent greater, especially to and from the west and northwest. The object of western access is to provide a gateway to both the airport and the study area that balances efficient travel to and from the airport while improving local mobility needs and local economic opportunity.

1.2.4 Modal Opportunities and Connections

Stakeholders in the study area rank establishing transit as a valid mode choice and increasing mode share as an important need associated with the project. Regional and local transportation planning and operating agencies continue to examine associated transit issues, including: better intermodal connections; adjusting the systems to serve the needs of reverse and suburb-to-suburb commuters; more direct and faster service; making "last mile" connections (linking rail stations to employment and activity centers with bus and shuttle service); and reducing transit travel times to trip lengths that compare to auto travel times.

The proportion of all transit trips made wholly within the study area is small even with the 2030 planned transit system improvements included in the 2030 baseline assumptions. Since much of the transit travel in the area originates or ends elsewhere, using regional transit data provides the best understanding of transit trips (see Table 1-5).

TABLE 1-5
Transit Mode Split

	2007		2030	
	EO-WB Study Area	**Northeast Illinois**	**EO-WB Study Area**	**Northeast Illinois[a]**
Work trips	1.5%	12%	2.3%	13%–21%
All trips	4.3%	9%	5.2%	8%–11%

[a] The range in transit market share relates to the type of upgrades in the system (e.g., higher investment will yield higher market share).

In 2030, the proportion of regional transit trips will not have changed substantially from 2007. Given the magnitude of highway congestion and opportunities for enhancing transit in the study area, there is a need to improve not just the number, but also the percentage, of trips made by transit.

Dispersed suburban employment and housing challenges the transit system to compete more effectively with the auto in connecting origins to destinations, linking home to work,

shopping, recreation, and professional services. More than 60 percent of the Chicago region's 5.1 million jobs are in the suburbs, with over 20 percent of them (570,000) within the EO-WB study area, a proportion that compares to downtown Chicago's employment of 680,000 (CMAP, 2006). The challenges of enhancing transit market share in the study area require an approach that gives importance to both rail and bus transit as part of the solution. The absence of reliable, fast, and direct connections to employment and activity centers by bus and rail accounts for lower than desired ridership. Lack of reliable rail transit schedules is attributed to a need for more capacity. Transit service between suburbs is underdeveloped, and a faster and more direct transit service that would establish needed connections between travel modes and home to work trips would be facilitated by a bus backbone system. The mobility gap (the last mile) between commuter rail stations and employment centers is a major issue, and, as of June 2009, that connection is lacking at many locations. The study area has an abundance of employers who are relatively close to transit service; however, the absence of convenient, fast, and direct connections to employment and activity centers by bus or shuttle affects ridership.

Easy access to transit is critical to maintaining and increasing ridership. One important element of access is parking availability, on average affecting 52 percent (62 percent on one study area line) of Metra's commuters who drive to the station and park. In a few years, parking will be largely unavailable to new users unless supply is increased. Other accessibility issues are safety and attractiveness of pedestrian paths and bikeways and connectivity of the paths. For example, IDOT classifies 45 percent of more than 550 miles of bike routes and trails in the study area as "not recommended" for biking. There are also substantial gaps in the system where bike routes are either completely interrupted or unavailable within one-half mile of transit stations. Improving accessibility is key to increasing the percentage of cyclists (as of 2005, two percent) who access Metra on bikes. Finally, safe connections linking pedestrian paths or sidewalks to transit facilities is important, and directly affects the 21 percent of Metra riders who access the system by walking. The absence of lighting, signage, safe crossings at major roads, and dedicated paths compromise safety for the transit riders in the study area that walk to stations.