2. Alternatives Development and Evaluation Process

This section describes the alternatives development and evaluation process associated with the Elgin O'Hare-West Bypass (EO–WB) project, including objectives and the general principles, procedures, and criteria the project team used.

2.1 Alternatives Development Objectives

The alternatives development process for the EO–WB study considered potential multimodal solutions to support identification of a preferred transportation system alternatives which addresses the purpose of and need for the project. The process had four objectives:

- Alternatives should be consistent with and follow from the stated purpose of and need for the project (see Section 2.4.2).
- Alternatives should be comprehensive and multimodal, to provide a solution to the major transportation issues in the study area.
- Alternatives should be developed through a collaborative process with all stakeholders, including transportation providers in the study area, to ensure that recommendations are feasible, practical, and consistent with the project context.
- Given the mobility demands in this major regional transportation hub, the project should focus on major regional and local transportation issues employing innovative methods for moving people and goods.

2.2 Alternatives Process Overview

The alternatives development and evaluation process was structured to encourage consideration of a full range of multimodal transportation improvement strategies within the study area. Build alternatives were developed on the basis of technical analysis, environmental constraints, and stakeholder input, with the focus on developing consensus on a Preferred Alternative that addresses the identified issues and meets the purpose of and need for the project. The build alternatives were evaluated through an iterative process that allowed the project team and stakeholders to consider a full range of alternatives. The alternatives evolved through four interrelated modules, or steps, described in the following subsections and depicted in Exhibit 2-1.

2.2.1 Module 1—Modal Strategies

The alternatives development process began by identifying a range of improvement strategies to consider in order to address diverse transportation issues in the study area. Strategies included physical improvements to the transportation infrastructure aimed at serving travel demand and improving mobility, such as improving existing corridors and building new

corridors (both road and transit); operational improvements aimed at improving the efficiency of the transportation system; and demand management strategies aimed at reducing travel demand on area roadways. Transportation system management and demand management strategies were introduced, but will be evaluated in future Tier Two studies. Working with stakeholders, the project team identified a list of improvement strategies to consider, along with locations where the various strategies should be used. Strategies were developed for various travel modes, including roadway, transit, bicycle, pedestrian, and freight service.

2.2.2 Module 2—Initial System Strategies

The objective of Module 2 was to identify complete sets of roadway and transit corridor improvements termed "Initial System Strategies," and improvements to carry forward for further consideration. Roadway and transit system strategies were developed separately. With stakeholder input, the project team developed three categories of improvement strategies: (1) improve the transportation system, (2) expand the transportation system by providing new facilities, and (3) combine improvements to the existing system with new facilities. Initial Roadway System Strategies identified the general corridor location, improvement type, and potential interchange locations. With the aid of a travel demand model, the project team tested the ability of the proposed alternative roadway strategies to address purpose and need. Strategies that would not address purpose and need were dropped from consideration. Similarly, Initial Transit System Strategies were developed identifying the general improvement corridor locations, potential transit mode, and potential multimodal transportation hubs. Transit was not be tested as a stand alone alternative, given stakeholder interest and the study commitment to a multi-modal solution. The overall feasibility and performance of identified transit system strategies were then evaluated in more detail during Module 3.

2.2.3 Module 3—Finalist System Alternatives

Module 3 consisted of three steps, the first focusing on an initial evaluation of environmental and social impacts of the alternatives, the second on developing and evaluating Finalist System Alternatives on the basis transportation performance, financial (initial cost), and environmental/socioeconomic factors, and the third on refining and evaluating the remaining multimodal Build Alternatives for detailed consideration in the Tier One Draft EIS. In the first step, an initial evaluation of environmental and social impacts of roadway alternatives carried forward from Module 2 was performed. In the second step, the remaining roadway alternatives were developed and evaluated in more detail with continued stakeholder input. Transit improvements were evaluated separately by a two-step process: Level One, Conceptual and Fatal Flaws Screening, and Level Two, Detailed Screening.

Roadway improvements were developed to a conceptual level of design detail, identifying representative layout plans for corridor mainline improvements and interchanges, major intersection improvements, required improvements to connecting roadways, bridge and retaining wall locations, and corresponding construction footprint requirements. For transit improvements, the project team identified the improvement components and defined conceptual service routes/operating characteristics, station locations, connecting services between modes, and associated pedestrian and bicycle access features. For bicycle/pedestrian facilities, a conceptual plan for improved regional and local trail systems was developed, identifying locations of proposed new trail links and crossings. The overall performance of the

Build Alternatives was then evaluated using transportation performance, cost, and environmental and social impact measures. The outcome of the analysis was used to support the evaluation of Build Alternatives in the Tier One Draft EIS.

2.2.4 Module 4—Preferred System Alternative

The purpose of Module 4 was to identify a Preferred System Alternative based on results of the Tier One Draft EIS review and stakeholder input. At that point, the project team refined the Preferred System Alternative to incorporate additional information pertaining to the alternatives' performance and to address stakeholder comments. The Preferred Alternative will be presented in the Tier One Final EIS and Record of Decision (ROD). If there were insufficient data to identify a single Preferred System Alternative, the remaining alternatives were to be advanced to Tier Two for further study.

2.3 CSS and Stakeholder Involvement

The EO–WB project is proceeding in compliance with IDOT's Context Sensitive Solutions (CSS) policies. This section describes CSS objectives, provides an overview of the *Stakeholder Involvement Plan* (SIP), and highlights opportunities for stakeholder involvement in the alternatives development and evaluation process.

2.3.1 IDOT's Context Sensitive Solution Policy Objectives

CSS is an interdisciplinary approach that seeks effective, multimodal transportation solutions by working with stakeholders to develop, build, and maintain cost-effective facilities that fit into and reflect the project's surroundings—its context. Through early, frequent, and meaningful communication with stakeholders, and a flexible and creative approach to design, the resulting projects should improve safety and mobility for the traveling public, while seeking to preserve and enhance the environmental, economic, historic, and natural qualities of the settings through which they pass. IDOT's CSS Policy and Procedural Memorandum 48-06 established project development guidance, stakeholder involvement processes, and design flexibility principles to be used in the project development process for major projects.

The CSS approach provides stakeholders with the tools and information they require to participate in the study process, including providing an understanding of the National Environmental Policy Act (NEPA) process, transportation planning guidelines, design guidelines, and the relationships between transportation issues (needs) and project alternatives. In other words, using the CSS process should provide all project stakeholders a mechanism to share comments or concerns about transportation objectives and project alternatives, as well as improve the ability of the project team to understand and address concerns raised. This integrated approach to problem solving and decision making will help to achieve community consensus and promote involvement through the study process.

As identified in IDOT's CSS policies, stakeholder involvement is critical to project success. The CSS process strives to achieve the following:

- Understand stakeholder's key issues and concerns.
- Involve stakeholders in the decision making process early and frequently.
- Establish an understanding of the stakeholder's project role.

- Address all modes of transportation.
- Apply flexibility in design to address stakeholder's concerns whenever possible.

2.3.2 Overview of the Stakeholder Involvement Plan

Adoption of the CSS policy for the EO–WB project represents a firm commitment to extensive stakeholder involvement. A stakeholder is anyone who could be affected by the project and has a stake in its outcome. This includes property owners, business owners, state and local officials, resource agencies, transportation agencies, special interest groups, and motorists who use the facility.

The SIP provides the framework for engaging all interested parties throughout the project development process. The process for stakeholder involvement operates at several levels, focused on communicating information to the public at-large and on engaging stakeholder groups in project development activities. Table 2-1 explains the major elements of the SIP.

2.4 Planning Framework

The project planning framework establishes the basic planning assumptions underlying the study and the guiding principles that will be used to develop and evaluate alternative transportation solutions. It addresses the following questions:

- What planned regional transportation improvements and land use assumptions should be considered in planning long-range transportation solutions for the study area?
- What are the transportation problems to be addressed by the EO–WB study?
- What principles will be used to develop solutions for addressing the identified problems?
- What approach and procedures will be used to evaluate alternative transportation solutions?

These four points are discussed below.

2.4.1 Regional Input and Assumptions

Developing a long-range transportation solution for the EO–WB study area required close coordination with long-range regional transportation plans, land use plans, and other major planned improvements. The *2030 Regional Transportation Plan* (RTP) prepared by Chicago Metropolitan Agency for Planning (CMAP) is the regionally adopted and endorsed plan for the Chicago metropolitan region. It represents both the regional long-range transportation plan and projected regional socioeconomic characteristics in 2030. The RTP identifies a fiscally constrained and air quality conformed set of major planned improvements to the regional transportation system, including the potential easterly extension of the Elgin O'Hare Expressway, the West Bypass, and improved western access to O'Hare Airport.

Comprehensive transportation planning studies require consideration of both a No-Action Alternative and also Build Alternatives aimed at addressing identified transportation needs in the study area. The No-Action Alternative is the baseline 2030 transportation condition for the project that assumes implementation of various committed projects in the study area *excluding*

TABLE 2-1
Elements of the EO–WB Stakeholder Involvement Plan

Component	Description
Newsletters	Project newsletters will be prepared quarterly to coincide with key project milestones. The newsletters will provide current project information and include announcements for upcoming public meetings.
Web site	A project Web site will be maintained through the course of the project. It will contain information on project schedule, organization, and topic-specific issues. One feature of the site is a form-based comment page. Also, project documentation and materials will be posted to the Web site, as information is available, for public review.
Media Briefings	Media will receive current, relevant, and accurate information to share with the public. Participation will occur in media briefings, preparation of media kits, and preparation of press releases. Project staff will be available to support the IDOT media spokesperson in ongoing coordination with members of the media.
Public Information Meetings	Large-scale public meetings and a public hearing will be held during the Tier One process. The meetings will encourage public attendance and foster awareness of project developments and the alternatives being evaluated. They also will provide a forum for general public input, including concerns and comments regarding project alternatives. Public meetings will be held to coincide with major project milestones during the Tier One process.
Corridor Planning Group	A Corridor Planning Group (CPG) serves to provide local elected officials, regional transportation agencies, and regional planning agencies with input to the project development process. The project team will meet regularly with the CPG to elicit its input to technical analyses and project decisions.
Task Forces	Three technical task forces have been formed to provide an opportunity for representatives of diverse stakeholder groups to provide input for technical aspects of the project. The project team will meet with the task forces to elicit their input and guidance on technical issues. The *Transportation Task Force* focuses on identifying and evaluating transportation issues and potential transportation solutions. Members include representatives of area transportation agencies, as well as interested representatives of study area communities. The *Environmental Task Force* focuses on identifying and evaluating environmental issues and concerns. Members include representatives of federal and state regulatory/resource agencies, representatives of area communities, and various interest groups. The *Land Use Task Force* focuses on identifying and evaluating land use and economic issues and concerns. Members include representatives of regional planning agencies, interested representatives of area communities, and various interest groups.
Small group meetings	Small group meetings with various local agencies and organizations, members of the business community, various property owners or other interested groups will be ongoing throughout the project as desired. The meetings will address specific issues, encouraging discussions and input.
Speakers' bureau	A speakers' bureau will be assembled to present project-related information to interested local civic or service organizations, such as Rotary Clubs, Kiwanis, etc.
Stakeholder workshops	A series of stakeholder workshops will be conducted as a means to obtain stakeholder input regarding various project issues and potential system solutions. Invited participants will consist of CPG and Task Force members. Workshops will be structured with the objective of obtaining direct stakeholder input to the technical analyses and decision at-hand.

the major improvements that this study is considering, specifically the Elgin O'Hare Extension or a West Bypass. The No-Action Alternative establishes a baseline condition against which the Build Alternatives can be compared. For the EO–WB study, the No-Action Alternative consists of the existing transportation network plus the following:

- Roadway and transit improvements outside the study area, as identified in the 2030 RTP.

- Programmed roadway, transit, and aviation improvements within the study area, included in current multiyear programs.
- Roadway, transit, and aviation improvements expected to be funded with future multiyear programs in the study area (based on input from area transportation agencies), excluding major improvements being considered with the current study.

Exhibits 2-2 and 2-3 show the programmed and expected future improvements inside the original and revised study area that are part of the No-Action Alternative. No additional programmed or expected future improvements were added for the expanded study area.

Socioeconomic characteristics, such as future population and employment, that pertain to the build alternatives also pertain to the No-Action Alternative. Since transportation improvements are a factor in population and employment growth, it is appropriate to develop an alternative-specific future population and employment scenario uniquely aligned with taking no action. The population and employment forecast for the study area under the No-Action Alternative were developed with the assistance of CMAP and DuPage County planning staff. That forecast was used to estimate vehicle trips within the study area both for the No-Action Alternative and during the early steps of the alternatives development and evaluation process. Exhibits 2-4 and 2-5 depict population and employment forecasts for the original study area. Exhibits 2-6 and 2-7 depict forecasts in the revised study area.

2.4.2 Transportation Problems

Early steps in the project development process included identifying transportation problems within the EO–WB study area and establishing the project purpose and need. These steps are fundamental for the overall alternatives study process. Federal project development procedures (i.e., NEPA) require a purpose and need statement. It directs the nature of alternatives to be considered, and guides the evaluation and screening of alternatives.

A two-part approach was used with the EO–WB study to identify transportation problems. That approach included extensive stakeholder coordination activities coupled with a comprehensive technical analysis of transportation system performance, both today and in 2030, under the No-Action Alternative.

2.4.2.1 Stakeholder Input to Transportation Problems and Purpose and Need

An extensive stakeholder outreach and coordination effort was conducted to elicit input related to key transportation issues in the study area. This included a series of one-on-one meetings with core local communities potentially affected by the project, transportation agencies, and Project Working Groups (CPG and Technical Task Forces); a written transportation audit questionnaire; and a Public Information Meeting focused on inviting comments from the public regarding transportation problems. Table 2-2 summarizes stakeholder input related to the identification of transportation problems and development of project purpose and need.

TABLE 2-2
Summary of Stakeholder Input—Transportation Problems and Purpose and Need

Event	Date	Objectives	Summary of Input
CPG Meeting #1	10/3/2007	Identify transportation issues and initiate transportation context audit.	The project should provide a lasting solution that minimizes community impact and maximizes economic development potential. Concerns include congestion along Thorndale Avenue; travel delays along at-grade railroad crossings; i.e. Irving Park Road and York Road; inadequate westbound access on I-90; need for expanded public transportation. Concern with congestion on expressways (I-90, I-290, I-355), lack of convenient access from DuPage County and northwest Cook County, difficulty in moving truck freight traffic through the area. Poor connectivity from I-290 to I-294 with traffic concerns at the I-294/IL 64 interchange, overall congestion on all major routes, and traffic delays associated with at-grade railroad crossings. Improvements should include consideration of enhanced transit service, as well as provision of bicycle and pedestrian routes. Lack of local transportation options to and around the study area is a concern. Poor access to O'Hare Airport, particularly from the west is an issue, as well as connectivity between communities and to emergency services. Congestion I-290/IL 53 and I-90 interchange and poor access to and from I-90 from Elmhurst Road is stated as a concern.
PIM #1	11/14/2007	Identify transportation issues.	Location preferences for future improvements. Support for transit and non-motorized accommodations, and concerns about social and environmental impacts were also frequently mentioned. Importance of not making decisions based on the OMP.
Stakeholder Workshop #1	12/13/2007	Prioritize transportation issues.	Public transportation requires enhancement and expansion of services. Need a transportation solution that protects the quality and integrity of communities while maximizing the economic viability of the area. Poor access and connectivity in the study area. Lack of access to O'Hare Airport. Congestion on major routes in the study area. Travel delays caused by at-grade railroad crossings. Poor truck/freight mobility. Inadequate bicycle and pedestrian access to transit station. Need greater emphasis on travel management strategies. Need for “last mile” connections and enhanced transit opportunities.
CPG and Task Force Meeting #2	February 2008	Review and concur with transportation problem statements; review preliminary findings of transportation system performance analyses.	Review and consensus to stakeholder developed transportation problem statements developed on the basis of Stakeholder Workshop #1.

TABLE 2-2
Summary of Stakeholder Input—Transportation Problems and Purpose and Need

Event	Date	Objectives	Summary of Input
CPG and Task Force Meeting #3	April 08	Review draft purpose and need statement; overview of draft *Transportation System Performance Report* (TSPR)	Review comments related to the draft purpose and need statement, and draft TSPR
CPG and Task Force Meeting #4	May 08	Present and obtain stakeholder concurrence to revised draft purpose and need statement.	Stakeholder consensus

2.4.2.2 Transportation System Performance Analyses

Early in the project, IDOT initiated technical analyses to establish and confirm the nature of multimodal transportation problems within the study area. That effort concluded with the preparation of the *Final Transportation System Performance Report* (July 2009), which summarizes the transportation performance for the EO–WB study area both today and in 2030.

Technical analyses included a detailed assessment of the roadway transportation system using a travel demand modeling tool, and a review of performance characteristics of the area transit, freight and nonmotorized transportation system components using available data from various planning studies. The *Travel Demand Modeling and Forecasting Report* in Appendix A details the existing and projected future travel demand on the roadway system that was analyzed with the objective of identifying travel performance deficiencies on the system and their underlying causes.

Existing and predicted future travel characteristics on the area public transportation system along with available information regarding system performance were reviewed, with a focus on identifying potential service gaps and improvement needs. Similarly, nonmotorized system features (bicycle and pedestrian facilities) were reviewed, with attention to connectivity gaps, and freight rail system performance was reviewed with particular focus on major freight/roadway crossing locations.

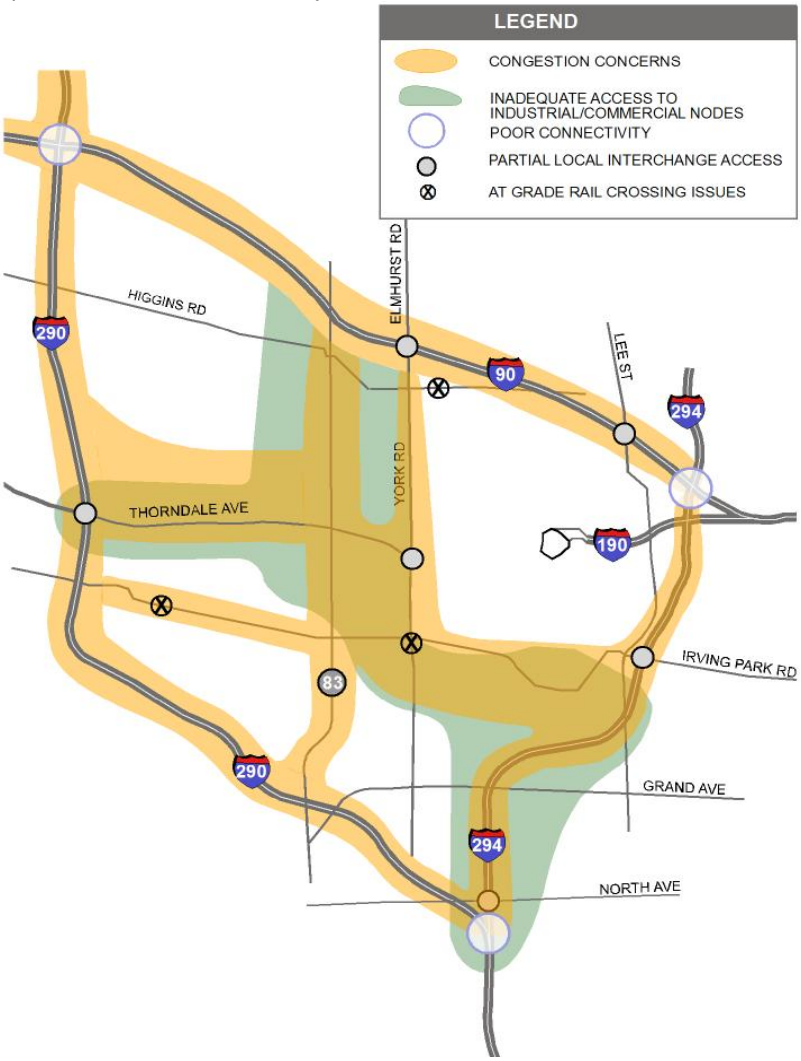
The findings of the technical analysis and stakeholder input were that the transportation system in the study area is clearly stressed and does not serve regional or local mobility needs. The levels of congestion and constrained mobility will be worse by 2030. Problems generally fall under four topics:

- Widespread congestion results in reduced mobility on major area roadways.
- Poor access and connectivity to major regional roadways result in travel inefficiencies.
- Connections to O'Hare Airport from the west are inadequate.
- Transit service falls short of being a feasible choice.

Detailed information regarding analysis procedures and system performance findings for the existing transportation system and under the 2030 No-Action Alternative are documented separately in the TSPR.

The transportation issues as enumerated by the detailed technical analysis and stakeholder outreach served as the basis for developing the purpose and need statement. See the TSPR and *Stakeholder Problem Definition* (April 2008) for details. The major transportation issues identified through technical analysis and stakeholder problem identification are illustrated in Exhibit 2-8 and described in Table 2-3.

EXHIBIT 2-8
Key Transportation Issues within the Study Area



The purpose of 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.

2.4.3 Guiding Principles for Alternatives Development

Guiding principles defined the ground rules that were followed through the alternatives development and evaluation process. They helped to ensure that appropriate planning and

TABLE 2-3
Technical and Stakeholder Problem Statements

Project Needs	Technical Analysis Findings	Stakeholder Problem Statement
Improve local and regional travel	Roughly 86% of the area's interstates and major arterials are congested, growing to 91% by 2030. Congestion on major roads will spill over to secondary roads with 81% congested on minor arterials by 2030, and travel delay increasing up to 46%	Congestion on major routes. Reduced truck/freight mobility.
Improve travel efficiency	40% 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 80 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 the 2030 average daily traffic of 29,000. O'Hare West terminal entrance would have longest travel times in 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 4% of the all existing trips in the study area are made by transit, increasing to 5% 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 other nodes.

design criteria were used to develop alternatives, the goal being to identify an acceptable transportation system alternative. The principles used for the alternatives development process are described below.

2.4.3.1 Project Planning Horizon

One of the basic assumptions related to alternatives development is that the project planning horizon will be established. The planning horizon for the project is as follows:

- The existing conditions analysis year for the EO–WB study is 2007.
- The design year is 2030, consistent with the regional planning horizon established with the 2030 RTP.

2.4.3.2 Planning and Design Criteria

Alternatives were developed in compliance with applicable planning and design criteria for various elements of the transportation system, including highway design standards (AASHTO and IDOT BDE Manual), and transit design standards. Improvements to the roadway and transit corridors were developed to comply with applicable regulatory requirements.

Current highway design standards were used to develop representative design concepts along corridors proposed for improvement. The design concepts were developed in conformance with standards for various facility types (e.g., freeway, expressway, arterial) that may be considered along a given corridor. Highways are grouped by functional classification (e.g., freeway, major arterial), which provides differing levels of access, mobility, and traffic movement. A more detailed description of the functional classification system is included in the TSPR. The two major controlling design standards for highways are design speed (the free-flow speed at which a roadway is designed to operate) and design level of service (LOS; a measure used to describe the operational quality of a given roadway). These two standards were used to develop a representative conceptual layout for roadway improvements, with the understanding that development of design alternatives and consideration of potential design exceptions will be addressed under the Tier Two studies.

Alternatives were developed with consideration of community land use patterns and community and environmental features. Where appropriate, principles of flexible highway design were used to ensure that design features minimize potential adverse impacts and that they benefit the socioeconomic vitality of the area.

2.4.4 Alternatives Development and Evaluation Guidelines

Two types of alternatives were developed and considered through the Tier One study effort: various build alternatives and the No-Action Alternative. The alternatives were developed at a conceptual level of detail. That level of development identifies the general location and characteristics of a system of multimodal transportation improvements and establishes a representative layout for the improvements to allow a comparative evaluation of the alternatives. Tier Two studies will include the development and evaluation of detailed design alternates for individual transportation improvements.

As noted, a four-step process was used to develop, test, and screen build alternatives through the Tier One process. Design guidelines used throughout the alternatives development process are discussed in subsection 2.4.4.1. The evaluation of alternatives was structured to measure the ability of alternatives to address purpose and need, and to compare their relative overall performance and potential environmental consequences. Subsection 2.4.4.2 describes the evaluation criteria, process, and tools used to evaluate alternatives at this conceptual level of study.

The No-Action Alternative represents the baseline condition of the transportation system in 2030 absent the major improvements being considered with the current project (EO–WB). In accordance with federal (NEPA) project development procedures, the No-Action Alternative must be carried through the entire alternatives development process. It serves as the basis for establishing the consequences of taking no action and is a benchmark for

evaluating the performance of the build alternatives. Subsection 2.4.1 describes the features of the No-Action Alternative.

2.4.4.1 Alternatives Development Guidelines

Build alternatives considered a broad range of solutions within the EO–WB study area based on technical analysis, stakeholder input, and environmental constraints. Given the nature of transportation issues in the study area, no single improvement or travel mode can address the diverse transportation needs in this area. Rather, a comprehensive system of improvements to area highway and transit networks, coupled with effective operating and travel demand management strategies, are needed to optimize the movement of persons and goods.

Build alternatives comprise multimodal system improvement strategies that include improvements to existing facilities, construction of new facilities, and appropriate transportation operational technologies and strategies. The system alternatives were developed to address purpose and need. While numerous transportation performance issues have been identified throughout the study area, build alternatives focused on addressing the key regional and local transportation needs defined in the purpose and need statement. Build alternatives were developed at a conceptual level of detail during Tier One studies. The level of detail is sufficient to support the decision at hand—in other words, the design concept for the recommended system alternative.

Although the current and projected travel demands within the study area are significant, design concepts for potential improvements must reflect reasonable build-out conditions for improvement corridors based on community and environmental constraints, design practicality, and financial considerations. Alternatives were not be developed merely to maximize traffic throughput along a particular corridor; rather, they were developed to optimize travel distribution and flow throughout the transportation system. Social, environmental, and economic considerations were applied throughout the alternatives development process to help establish practical, feasible improvements along designated corridors.

Build alternatives were developed through an iterative process that integrated stakeholder input, technical considerations, and CSS design principles. See Section 2.2 for a description of the process.

2.4.4.2 Alternatives Evaluation Guidelines

Four categories of evaluation criteria were used to compare alternatives performance throughout the study process: travel performance, environment, socioeconomic/land use, and financial criteria. Evaluation measures were identified and refined during each step of the alternatives development process. The measures were developed to help compare the ability of each alternative to address purpose and need and to compare its overall performance and consequences. The evaluation measures were structured to differentiate performance of alternatives based on the level of design definition at each step of the alternatives development process, and also to support the screening process at hand. Evaluation measures were developed with stakeholder input to ensure that findings provide relevant information to address stakeholder issues and concerns.

The alternatives evaluation process supported alternatives screening and ultimately identification of the recommended system alternative. The screening and identification process was based upon technical analysis findings (defining in quantitative and qualitative terms the comparative performance of alternatives), stakeholder input, and regulatory/ resource agency comments.

A broad range of alternative solutions was considered within a large geographic area during the Tier One study. Sophisticated analytical tools were used to allow the project team to efficiently and objectively evaluate the performance of alternatives at a systemwide level. Two basic analytical tools were used throughout the Tier One study effort to perform comparative performance evaluations—a travel demand model and a geographic information system (GIS) database.

The travel characteristics used in evaluating the relative performance of system alternatives were developed using a travel demand model. The model was used to forecast travel demand for various system alternatives, and to compare systemwide travel performance characteristics for the No-Action and build alternatives. The travel demand model developed for the EO–WB study is based on the travel model for the northeastern Illinois region used by CMAP, and is designed to take maximum advantage of the CMAP model resources. Significant additional detail was added to the CMAP regional highway network and the CMAP region analysis zone structure was considerably refined within the EO–WB study area. CMAP provided specific trip tables for the 2007 base, 2030 No-Action, and 2030 recommended system alternative analysis stages. This forecasting approach ensures that the modeling process is highly consistent with the established regional planning processes. A detailed description of the travel demand modeling process and procedures is contained in the *Travel Demand Modeling and Forecasting Report* (see Appendix A).

The GIS database is an important analytical tool that was used at this stage of the project development process. The database was developed as a decision support tool for the development and evaluation of alternatives. It readily stores environmental, land use, transportation inventory data, and other relevant information in an electronic format that is easily retrievable, and is very useful as an analytical tool. The database was used to assist in the alternatives development process, helping the project team identify locations with sensitive environmental resources or community resources—locations where impacts should be avoided or minimized. Once the conceptual design and estimated right-of-way footprint of system alternatives were identified, the database was used as an analytical tool to calculate impacts to the environment and other resources associated with any specific alternative. With this information, comparative judgments were made as to how well a particular alternative would avoid or minimize impacts to natural or socioeconomic resources. The GIS database was the primary means by which the environmental and socioeconomic impacts of the alternatives were measured through the Tier One EIS study process.