ELGIN O'HARE - WEST BYPASS STUDY

TIER TWO FINAL ENVIRONMENTAL IMPACT STATEMENT

ELGIN O'HARE
WEST BYPASS
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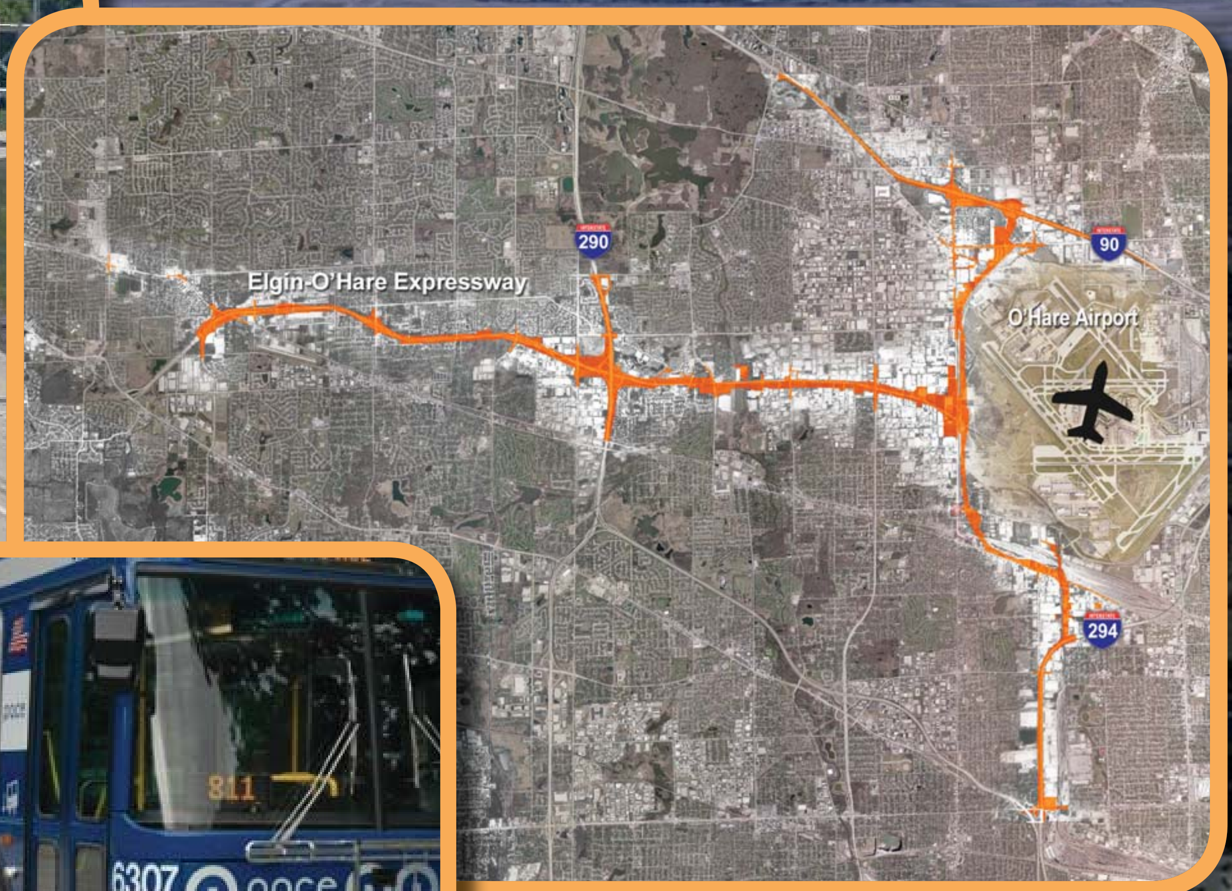

October 2012

Illinois Department of Transportation

U. S. Department of Transportation
Federal Highway Administration

Illinois Tollway

ELGIN O'HARE – WEST BYPASS STUDY
COOK AND DUPAGE COUNTIES, ILLINOIS

PROJECT NUMBER: P-91-443-06

TIER TWO FINAL ENVIRONMENTAL IMPACT STATEMENT

Submitted Pursuant to 42 USC 4332(2)(c)
and 49 USC 303 by

the U.S. Department of Transportation, Federal Highway Administration,
the U.S. Department of Transportation, Federal Aviation Administration,
the Illinois Department of Transportation, and the Illinois State Toll Highway Authority

Cooperating Agencies

Federal Transit Authority | U.S. Environmental Protection Agency

10/30/2012 Date of Approval	For Federal Highway Administration
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Abstract: The Federal Highway Administration, the Federal Aviation Administration, the Illinois Department of Transportation, and the Illinois State Toll Highway Authority (Illinois Tollway) have identified the Build Alternative described in the Tier Two Draft Environmental Impact Statement as the Preferred Alternative for the Elgin O'Hare –West Bypass project. The Preferred Alternative is a toll road with 25 miles of access-controlled highway, 16 miles of arterial improvements, space for transit accommodations, and bicycle/pedestrian facilities. An extensive public involvement program has been conducted with community and business stakeholders to reach consensus on the many design alternates. The Preferred Alternative's adverse impacts include a loss of up to 23.0 acres of wetlands, 58.1 acre-feet of floodplains, 2.45 acres of surface waters, seven residences, 39 commercial/industrial properties, and 46 businesses with 1,332 employees associated with the displaced businesses. Beneficial impacts include an increase in economic stimulus. The expenditure of construction dollars may create 2,000 to 3,000 jobs per year for the period of construction, and produce $730 million in federal, state, and local taxes. New development attracted to the area with the project would cause a fundamental shift in the quality and diversity of development with an impact on employment that would be 41,000 greater than the No-Build Alternative. Tax revenues from the new development may bring an added $16 million annually by the year 2040 to local jurisdictions. The travel benefits of the proposed project include an increase in the overall travel efficiency up to 17 percent; reduced congestion and delay savings on secondary roads up to 16 percent and 24 percent, respectively; and an increase in transit trips.

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Acronyms List

°C	degrees Celsius
µg/m³	micrograms per cubic meter
AASHTO	American Association of State and Highway Transportation Officials
AC	Advisory Circular
ADT	average daily traffic
ALP	Airport Layout Plan
ALSF-II	Approach Lighting with Sequenced Flashers II
AOA	Airfield Operations Area
AQI	Air Quality Index
ASDE	Airport Surface Detection Equipment
ASR	Airport Surveillance Radar
ASTM	American Society for Testing Materials
ATMS	Active Traffic Management System
AUID	Assessment Unit Identification
BDE	Bureau of Design and Environment
BOD	biochemical oxygen demand
BOL	Bureau of Land
BOW	Bureau of Water
BRT	bus rapid transit
BSC	Biological Stream Characterization
BSS	Biologically Significant Streams
C-value	coefficient of conservatism
C2000	Conservation 2000
CAAT	Corridor Aesthetics Advisory Team
CBOD	carbonaceous biochemical oxygen demand
CDA	City of Chicago Department of Aviation
CEQ	Council on Environmental Quality
CER	Cost Estimate Review

CERCLIS	Comprehensive Environmental Response Compensation and Liability Information System
CH_4	methane
CFI	continuous flow intersection
CMAP	Chicago Metropolitan Agency for Planning
CNE	common noise environments
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
COSIM	Carbon Monoxide Screen for Intersection Model
CP	Canadian Pacific
CPG	Corridor Planning Group
CSS	Context Sensitive Solutions
CTA	Chicago Transit Authority
CUP	Chicago Underflow Plan
CWA	Clean Water Act
CWS	Community Water Supply
dB(A)	A-weighted decibel
DBH	diameter at breast height
DCWI	DuPage County Wetland Inventory
DHHS	U.S. Department of Health and Human Services
DMU	diesel multiple unit
DO	dissolved oxygen
DRC	DuPage River Coalition
DRSCW	DuPage River Salt Creek Workgroup
DWG	Drainage Working Group
EcoCAT	Ecological Compliance and Assessment
EIS	Environmental Impact Statement
EO	Executive Order
EO-WB	Elgin O'Hare-West Bypass
EPT	Ephemeroptera, Plecoptera, and Trichoptera
ERNS	Emergency Response Notification System
EWG	Environmental Working Group

FAA	Federal Aviation Administration
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FIRM	Flood Insurance Rate Map
FPDCC	Forest Preserve District of Cook County
FPDDC	Forest Preserve District of DuPage County
FQA	Floristic Quality Assessment
FQI	Floristic Quality Index
FTA	Federal Transit Administration
FTE	full-time equivalent
GHG	Greenhouse gas
GIS	geographic information system
GWG	Geometrics Working Group
HMGP	Hazard Mitigation Grant Program
HRT	Heavy-rail Rapid Transit
HUC	Hydrologic Unit Code
IBI	Index of Biotic Integrity
ICA	Interagency Cooperative Agreement
ICC	Interstate Commerce Commission
ICP	Initial Construction Plan
IDNR	Illinois Department of Natural Resources
IDNR-OWR	Illinois Department of Natural Resources – Office of Water Resources
IDOA	Illinois Department of Agriculture
IDOT	Illinois Department of Transportation
IEMA	Illinois Emergency Management Agency
IEPA	Illinois Environmental Protection Agency
IFR	Instrument Flight Rules
IGA	Intergovernmental Agreement
IGPA	Illinois Groundwater Protection Act
IILCP	Illinois Interagency Landscape Classification Project
ILS	Instrument Landing Systems
IMPLAN	Impact Analysis for Planning

INAI	Illinois Natural Areas Inventory
INHS	Illinois Natural History Survey
ISGS	Illinois State Geological Survey
ISTHA	Illinois State Toll Highway Authority (now known as Illinois Tollway)
ISWS	Illinois State Water Survey
ITS	Intelligent Transportation System
IWPA	Interagency Wetland Policy Act
LDPEP	Lower Des Plaines Ecosystem Partnership
LEED	Leadership in Energy and Environmental Design
Leq	equivalent sound level
LID	low-impact development
LLWAS	low-level wind sheer alert system
LOS	level of service
LRT	Light Rapid Transit
LUST	leaking underground storage tank
MDSS	Maintenance Decision Support System
mg/L	milligrams per liter
$MMTCO_2e$	million metric tons carbon dioxide equivalent units
MOA	Memorandum of Agreement
MOT	Maintenance of Traffic
MOU	Memorandum of Understanding
MOVES	Motor Vehicle Emission Simulator
MPO	Metropolitan Planning Organization
MPSD	municipal point source discharge
MS4	municipal separate storm sewer system
MSAT	Mobile Source Air Toxics
MWRDGC	Metropolitan Water Reclamation District of Greater Chicago
N_2O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NAC	noise abatement criteria
NATA	National Air Toxics Assessment
NEPA	National Environmental Policy Act

NFIP	National Flood Insurance Program
NO_2	nitrogen dioxide
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
NRCS	Natural Resource Conservation Service
NWI	National Wetlands Inventory
O'Hare Airport	O'Hare International Airport
O_3	ground-level ozone
OEI-OIS	One Engine Inoperative obstacle identification surface
OMP	O'Hare Modernization Program
ORC	Office of Resource Conservation
OSHA	Occupational Safety and Health Administration
OWR	Office of Water Resources
PAH	polycyclic aromatic hydrocarbon
PEL	probable effects level
PESA	Preliminary Environmental Site Assessment
PIM	Public Involvement Meeting
PM	particulate matter
PMT	Project Management Team
PMxx	particulate matter (where xx indicates the micrometer size of the particulate)
POM	polycyclic organic matter
POTW	publicly owned treatment works
ppm	parts per million
PSG	Project Study Group
PSI	Preliminary Site Investigation
RCRA	Resource Conservation and Recovery Act
REC	recognized environmental condition
RF	Radio Frequency
RFID	Radio Frequency Identification
RMP	Risk Managed Project
ROD	Record of Decision

RPZ	Runway Protection Zone
RRA	Resource-Rich Area
RSA	Runway Safety Area
RTA	Regional Transportation Authority
RTR	remote transmit and receiver
RWIS	Road Weather Information System
s.u.	standard unit
SAFETEA-LU	Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users
SCWN	Salt Creek Watershed Network
SHPO	State Historic Preservation Officer
SIP	State Implementation Plan
SO_2	sulfur dioxide
SRP	Site Remediation Program
STIP	State Transportation Improvement Plan
SWCD	Soil and Water Conservation District
SWPPP	Storm Water Pollution Prevention Plan
TBD	To Be Determined
TDM	travel demand management
TDS	total dissolved solids
TERPS	Terminal Instrument Procedures
TIP	Transportation Improvement Program
TMA	Transportation Management Area
TMDL	total maximum daily load
TNM	Traffic Noise Model
TRI	Toxic Release Inventory
TSM	transportation system management
TSS	total suspended solids
TWG	Transit Working Group
UDPREP	Upper Des Plaines River Ecosystem Partnership
UP	Union Pacific
UP-NW	Union Pacific - Northwest
USACE	U.S. Army Corps of Engineers

USDA	U.S. Department of Agriculture
USDA-APHIS	U.S. Department of Agriculture – Animal and Plant Health Inspection Service
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
UST	underground storage tank
VMT	vehicle miles of travel
VSS	volatile suspended solids

Executive Summary

Introduction

The Illinois Department of Transportation (IDOT), in cooperation with the Federal Highway Administration (FHWA), the Federal Aviation Administration (FAA), and the Illinois State Toll Highway Authority (Illinois Tollway) have jointly served as lead agencies in the evaluation of the proposed Elgin O'Hare – West Bypass (EO-WB) project. The EO-WB project was advanced as a tiered Environmental Impact Statement (EIS) process. The use of the tiered process was tailored to the study needs because it allowed Tier One of the process to focus on the "big picture" questions, which included "where is it," and "what is it." Tier One concluded with a signed Record of Decision (ROD) in June 2010, and approved the selection of the preferred type of improvement (a set of roadway, transit, and bicycle/pedestrian improvements) and a preferred corridor (location). Tier Two expands on Tier One with detailed engineering and environmental studies that refine the project features in the selected corridor. During the Tier Two EIS process, Governor Pat Quinn's EO-WB Advisory Council completed a report, *Elgin O'Hare - West Bypass Advisory Council: Final Report to Governor Pat Quinn*, that recommended the Illinois Tollway as the implementing agency (see Appendix A).

The Tier Two Draft EIS for the EO-WB project was published on March 30, 2012 and made available for agency and public comment. A Public Hearing was held for this project on April 18, 2012, and the close of the comment period was May 14, 2012. This Tier Two Final EIS is an important milestone in a tiered EIS process that commenced in 2007. The objective of this Tier Two Final EIS is to provide the public and decisionmakers with the appropriate and relevant information to make an informed decision on the Preferred Alternative to select for implementation.

Upon review of the agency and public comments received on the Tier Two Draft EIS for the project, the lead agencies agreed that a traditional Final EIS will be prepared for the EO-WB project. Although, the comments received do not materially change the content, quality of the analyses, nor the scope of the project or its alternatives, the comments have resulted in refinements to design features of the project. The refinements have required minor changes to the project footprint and right-of-way requirements. This Tier Two Final EIS updates those sections of the Tier Two Draft EIS by responding to public and agency comments, and describing the project refinements (e.g., changes in factual data about impacts to wetlands, waters of the U.S., floodplains, displacements, etc.).

This Tier Two Final EIS consists of an executive summary that highlights project refinements, decisions, actions since the distribution of the Tier Two Draft EIS, and updates to the sections of the Tier Two Draft EIS. A detailed discussion of these updates is provided in the Alternatives/Preferred Alternative section (Section 2); the Environmental Resources, Impacts, and Mitigation section (Section 3); and the Agency Coordination and Public Involvement section (Section 4). All public and agency comments received during the Tier Two Draft EIS comment period have been included in the document along with responses.

In addition, this Tier Two Final EIS identifies the lead agencies' (FHWA, FAA, IDOT, and Illinois Tollway) Preferred Alternative. At the conclusion of the Tier Two Draft EIS, three decisions remained open including the Preferred Alternative (Build Alternative versus No-Build Alternative) and the preferred alternates at an intersection and interchange location.

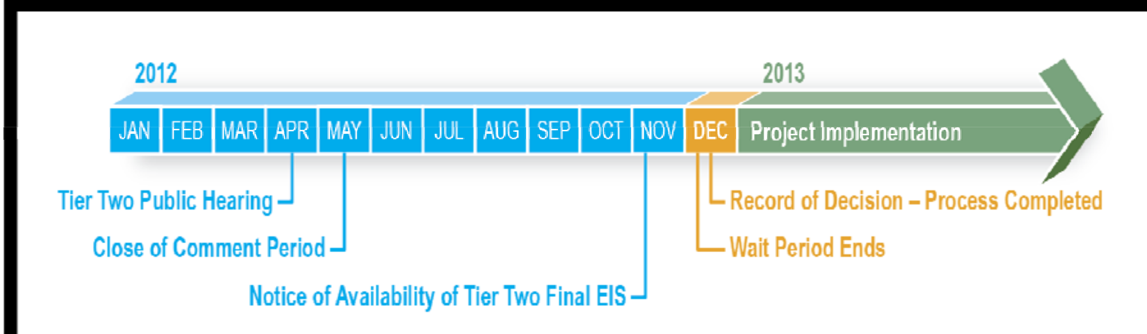
The document has been distributed to those listed in Section 7. Further, the document has been placed in public places for those not receiving a copy directly (see Section 7 for a list of those locations).

A request for an electronic copy of this Tier Two Final EIS may be submitted in writing to the mailing address or email address provided below:

Mr. Ron Krall
Illinois Department of Transportation
201 West Center Court
Schaumburg, Illinois 60196
Email: Ronald.Krall@illinois.gov

No sooner than 30 days from the date of publication of the Final EIS in the Federal Register, the Federal lead agencies (FHWA and FAA) will issue a ROD that finalizes its decision with respect to the Selected Alternative. With the release of the ROD, the planning process is complete, and if the Build Alternative is selected, the final design, right-of-way acquisition, and construction of the Selected Alternative may begin (see Figure ES-1). As the design and construction progresses, the implementing agency (Illinois Tollway) will continue to provide various avenues and opportunities for public involvement including a local advisory committee, individual stakeholder meetings, newsletters, and others.

FIGURE ES-1
TIER TWO SCHEDULE



The Proposed Project

Together, the IDOT, FHWA, FAA, and the Illinois Tollway have been evaluating transportation improvements in the vicinity of O'Hare International Airport (O'Hare Airport) in the Chicagoland area. The proposed action, known as the EO-WB project, is included and conformed in the Chicago Metropolitan Agency for Planning (CMAP) regional transportation plan, *GO TO 2040 Comprehensive Regional Plan* (CMAP, 2010), and the IDOT

State Transportation Improvement Program (STIP) (IDOT, 2011a). The proposed action is comprised of three elements that include roadway, transit, and bicycle/pedestrian improvements. Illinois Tollway would be the implementing agency for construction of the proposed roadway improvements. Transit improvements would be constructed along the roadway corridor by a local transit provider, and the implementation of these transit improvements would be dependent on future funding from the transit provider. Similarly, the roadway improvements have been planned so as not to preclude construction of bicycle and pedestrian facilities; however, local cost-sharing is anticipated for construction of new bicycle and pedestrian facilities and their long-term maintenance. Existing facilities impacted by construction would be replaced in-kind.

The roadway improvements would be developed as a toll road that is comprised of almost 25 miles of mainline improvements, including 14 miles on existing roadways and 11 miles on new alignment. The roadway improvements include four system interchanges, 16 service interchanges, and arterial improvements (totaling 16 miles) at service interchanges to accommodate traffic movement to and from the mainline.

Transit and bicycle/pedestrian improvements are planned in some sections of the roadway corridor. The roadway corridors reserve space for transit in the median of the Elgin O'Hare corridor, and along the north leg of the West Bypass corridor space is also reserved for bicycle and pedestrian facilities within, adjacent, or crossing selected sections of the roadway improvements.

The improvements respond to the needs of the area that are uniquely characterized as an important transportation node in the metropolitan area of Cook and DuPage counties, the center of many interstate highways, railroads, and a world class airport with 18 percent of all vehicular travel in the region. The area is further defined by extensive commercial and industrial development along with O'Hare Airport. The major development in the area is dependent upon reliable travel efficiency and access to maintain and improve the competitive position of the region. Based on the needs of the area, as defined by input of stakeholders and the findings of the travel performance study of existing conditions, the purpose of the proposed project includes:

- Improve regional and local travel.
- Improve overall travel efficiency.
- Improve western access to O'Hare Airport.
- Improve modal options and connectivity.

The purpose and need of the project is available for review in Section 1 of this Tier Two Final EIS. The purpose and need was concurred by the National Environmental Protection Act (NEPA)/404 merger group in Illinois on September 8, 2011.

In September 2011, the Illinois Tollway Board of Directors enacted a systemwide toll increase that would finance a 15-year capital improvement program, *Move Illinois: The Illinois Tollway Driving the Future*, which includes the EO-WB project (Illinois Tollway, 2011). Governor Quinn's EO-WB Advisory Council developed a strategy for the implementation of the project. Their findings recommended the Illinois Tollway as the implementing agency.

Tier Two Draft Environmental Impact Statement and Public Hearing Comments

The Tier Two Draft EIS was published in March 2012 and distributed to community leaders, stakeholders, regulatory resource agencies, and the general public. The Notice of Availability was published in the Federal Register, and the public comment period began on March 30, 2012. The comment period ended on May 14, 2012.

Comments were received from regulatory agencies, interest groups, special districts, municipalities, and the general public, as summarized below (see Section 4 for a description of comments received).

The regulatory agency (U.S. Army Corps of Engineers [USACE], U.S. Fish and Wildlife Service [USFWS], U.S. Environmental Protection Agency [USEPA], Illinois Environmental Protection Agency [IEPA], Illinois Department of Natural Resources [IDNR], Illinois Department of Agriculture [IDOA]) comments stressed the importance of implementing effective best management practices for reducing impacts to water quality and wetlands while honoring the FAA's requirements for reducing the wildlife attractants near airports. Other agency comments included consideration of fish and wildlife passage at greenways/stream crossings, and an interest in wetland and waters mitigation.

Interest groups/authorities (DuPage River Salt Creek Water Group, Metropolitan Water Reclamation District of Greater Chicago [MWRDGC], Maywood Sportsmen's Club, Active Transportation Alliance, Roselle Fire Department) commented on a variety of issues including: potential chloride pollution and practices to reduce chloride impact to receiving waters, bicycle and pedestrian compliance with IDOT's "Complete Street's Policy" (IDOT, 2011b), concerns about an exit ramp location on I-294 that would impact the Maywood Sportsmen's Club, preserving fire department access to hydrants, providing emergency vehicle turn-a-rounds, and impacts to the Touhy Flood Control Reservoirs and approval of a construction sequencing plan by the owning agency.

The general public comments were specific to private property impacts, noise barrier locations, design issues, and requests for information (e.g., maps).

The municipalities have been engaged in the project throughout the development process, and have contributed to a solution that is compatible with their individual needs and the needs of the project as a whole. Since the publication of the Tier Two Draft EIS, the communities were asked to review the proposed improvements for those portions of the project that affect their community. Most of the communities offered suggested design changes that would affect details of the project, but did not materially impact the scope of the Preferred Alternative. Among the comments received were shifting the location of an off-ramp along I-294, provision of a continuous frontage road between IL 83 and York Road, an improved circulation pattern in the Hamilton Lakes' Development, and further refinements of the intersection options at IL 72 and Elmhurst Road.

Each of the comments received during the comment period were reviewed. While some of the comments resulted in changes to the project design features, other comments warranted further explanation or clarification, or additional information in the form of maps, aerial mapping, and plan sheets for specific areas. Detailed responses have been written and sent to everyone that commented during the Tier Two Draft EIS comment period. Appendix B contains a copy of the comment letters, comment sheets, etc., and the responses that were prepared by IDOT. The scope of the comments has been helpful in providing further refinements to the proposed project that bring added value.

Project Refinements since the Tier Two Draft Environmental Impact Statement

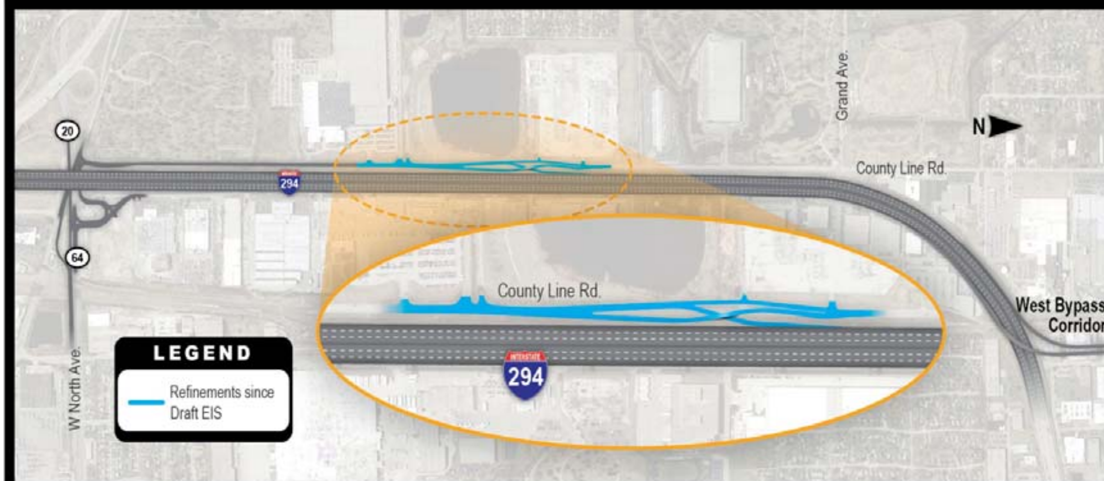
The comments received on the Tier Two Draft EIS have caused several design features to be revisited. In several cases, the comments were determined to warrant changes to the engineering plans (see Appendix B for additional details regarding comment letters and IDOT responses). Each of the design features that were re-evaluated is briefly discussed in the following subsections.

I-294 Off-Ramp Location to County Line Road

The Maywood Sportsmen's Club provided a comment letter to IDOT and suggested that the off-ramp from I-294 to County Line Road be relocated to avoid issues that include: conflicts between vehicles to and from their facility and ramp traffic, water quality concerns, displacement of club facilities, and lighting issues both from their facility and oncoming vehicle headlights. These concerns were resolved through a series of seven meetings with the Maywood Sportsmen's Club, City of Elmhurst, City of Northlake, Illinois Tollway, and others to find an acceptable solution. Five alternates were developed during the course of these discussions that would address the concerns of the Maywood Sportsmen's Club. The placement of the ramp had to be sensitive to maintaining acceptable travel performance on the mainline of I-294. Movement of the ramp exit too far north would result in a poor weaving section between the connection of the West Bypass corridor with I-294 near Grand Avenue, and the off-ramp from I-294 to County Line Road. A poor weaving section would generate traffic turbulence resulting in slower mainline speeds and congestion and operational issues. The objective in this analysis was to avoid proposing a new ramp location with unacceptable design conditions, maintain safe ingress and egress to the Maywood Sportsmen's Club, manage stormwater runoff to avoid lake contamination, and to provide access to the second largest employer (McMaster-Carr) in Elmhurst from the ramp.

In the review of the alternates by the stakeholders, it was agreed that Alternate B would best meet the objectives outlined above (see Figure ES-2). In order to shield ramp traffic from glare from the club activities, a sight screen or wall along the property line facing County Line Road was recommended. The preferred arrangement for the ramp has been relocated approximately 700 feet to the north to reduce the concerns of the Maywood Sportsmen's Club and includes the sight screen. The sight screen is approximately 1,100 feet in length, and will likely be a post and panel construction. Drainage located along the Maywood Sportsmen's Club property will be a closed system comprised of a piped system that would drain to open channels and conveyed to nearby streams. The closed drainage system (stormwater pipe system) would be extended beyond the south end of the sight screen to the entrance of the club. This feature would capture roadway runoff that would otherwise drain to the lake. With the planned drainage system, all roadway runoff would be directed away from the Maywood Sportsmen's Club lake. In a meeting on June 19, 2012, the stakeholders acknowledged agreement with the ramp arrangement shown in Figure ES-2. The final arrangement for the ramp would have no impact to wetlands, waters, threatened or endangered species, or cultural resources. Some additional land acquisition (0.65 acre) and tree displacements are required.

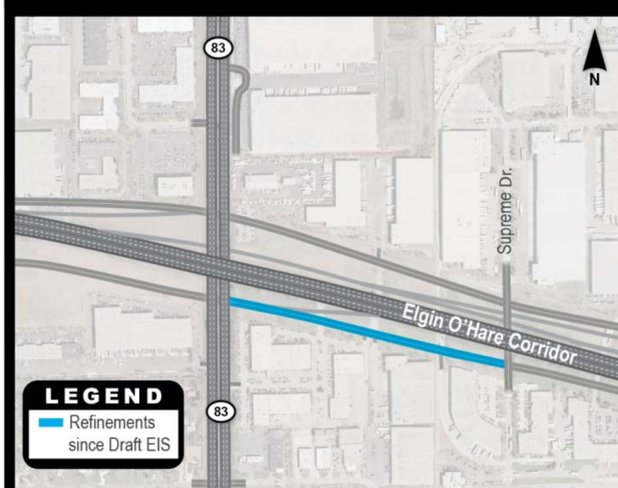
FIGURE ES-2
I-294 OFF-RAMP AND COUNTY LINE ROAD



Frontage Road Design between IL 83 and York Road

Both the Village of Bensenville and Elk Grove Village suggested that the frontage road system between IL 83 and York Road be revised (see Figure ES-3). They indicated that the proposed arrangement was circuitous, added to driver confusion, and impaired access to industrial and commercial development in the vicinity. The primary issue was the frontage road cross-over from the south side of the mainline to the north side at Supreme Drive. After further review of the arrangement, the frontage road was extended to IL 83 on the south side of the mainline. The extended frontage road from Supreme Drive to IL 83 would be one-way in the eastbound direction. The arrangement still requires the cross-over for

FIGURE ES-3
FRONTAGE ROAD BETWEEN IL 83 AND SUPREME DRIVE



westbound travel on the frontage road for connection with IL 83. However, the extension provides greatly improved access to properties between IL 83 and Supreme Drive on the south side of the mainline. The revised frontage road system remains in the original footprint of the project. Therefore, no additional right-of-way is needed, no environmental resources are impacted, and no additional displacements of residential or commercial properties are required.

Internal Circulation Road in Hamilton Lakes' Development

The Village of Itasca and Hamilton Lakes' Development have been involved in the proposed EO-WB project from its inception. They have commented frequently on design aspects and, in particular, access to and from the community and a major development (Hamilton Lakes' Development) near the I-290 and Elgin-O'Hare Expressway interchange. During the Tier Two process, many access refinements have been considered for properties near the I-290 and Elgin O'Hare corridor interchange. During the review of the 2040 roadway plans, the Village of Itasca and Hamilton Lakes' Development requested an additional design refinement that would improve traffic circulation and connectivity to the Elgin O'Hare corridor with the addition of a roadway section connecting Park Boulevard to Pierce Road (see Figure ES-4). This new roadway section would ensure that traffic will flow efficiently through the Park Boulevard interchange and preserve mainline operations, and would improve the existing traffic distribution into and through the development. The traffic movement at the intersection of Park Boulevard and Pierce Road along with the new extension would warrant a traffic signal. The added roadway would not impact any natural resources nor displace any residential or commercial structures.

FIGURE ES-4
INTERNAL CIRCULATION ROAD IN HAMILTON LAKES' DEVELOPMENT

Intersection Design at IL 72 and Elmhurst Road

The intersection at IL 72 (Higgins Road/Touhy Avenue) and Elmhurst Road would be impacted by EO-WB project phasing-related traffic and requires improvements. As shown in the Tier Two Draft EIS, four design alternates were considered to improve future conditions including:

- Intersection Widening Alternate
- Continuous Flow Intersection (CFI) Alternate
- Quadrant Bypass (Old Higgins Road) Alternate
- Quadrant Bypass (Greenleaf Avenue) Alternate

Although some preliminary conclusions were reached in the Tier Two Draft EIS, additional study has been advanced since the publication of the Draft EIS to refine the intersection design. These additional studies, prompted by community comments, caused two alternates to be dismissed, and further modification of the other two alternates. A modified intersection improvement concept was developed that combines design features of the Intersection Widening Alternate and the Quadrant Bypass (Old Higgins Road) Alternate. Also, the Quadrant Bypass (Greenleaf Avenue) Alternate was refined to address design and environmental issues identified by community input during the public comment period.

The Quadrant Bypass (Old Higgins Road) Alternate includes several new features (see Figure ES-5). First, the configuration of the existing IL 72 and Elmhurst Road intersection would be generally maintained; however, four travel lanes are provided for northbound travel, adding to the efficiency of this travel movement. Additionally, Old Higgins Road would be realigned at the connection with Elmhurst Road. These modifications would eliminate one turn phase at the existing IL 72 and Elmhurst Road intersection and provide more green time to critical movements. In addition, the realignment of Old Higgins Road provides added spacing between the intersections of IL 72 and Elmhurst Road and Old Higgins Road and Elmhurst Road with the objective to reduce northbound intersection queues from spilling through the Old Higgins Road and Elmhurst Road intersection.

FIGURE ES-5
QUADRANT BYPASS (OLD HIGGINS ROAD) ALTERNATE

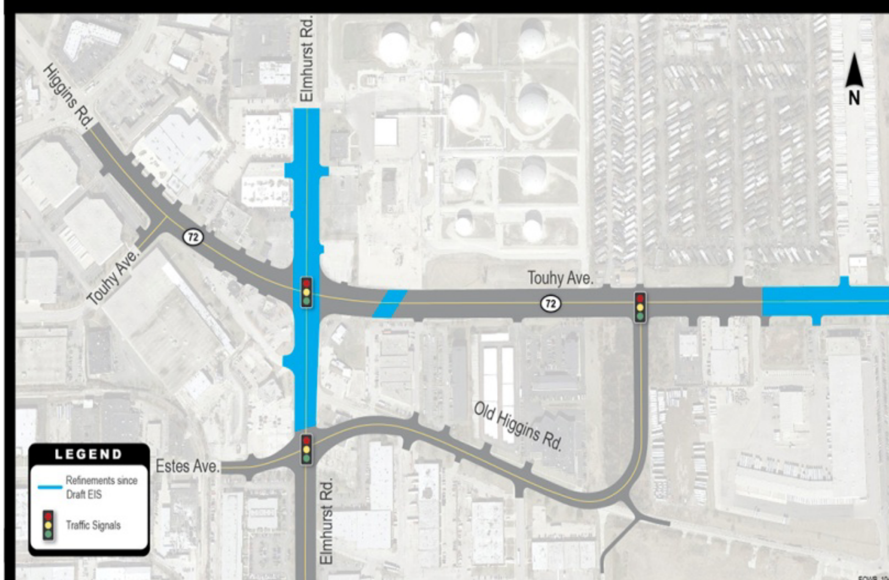
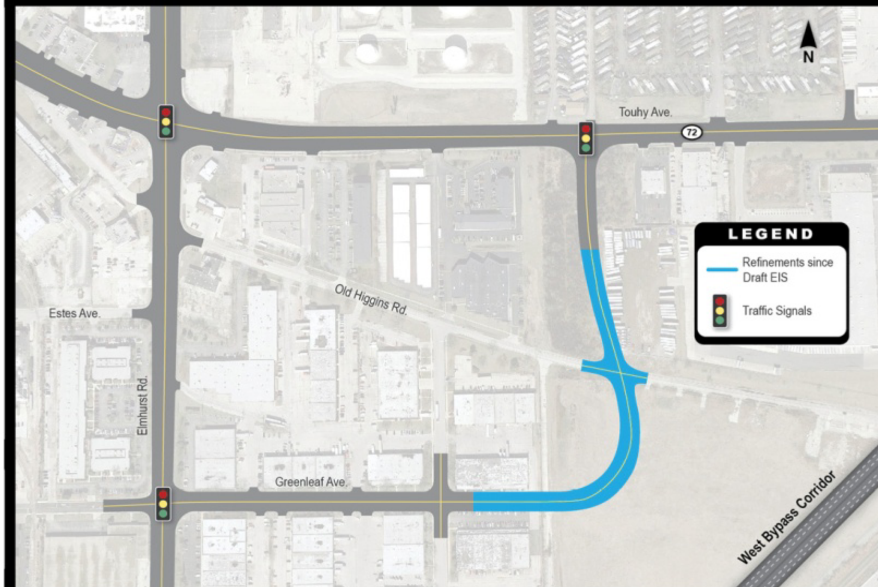


FIGURE ES-6
QUADRANT BYPASS (GREENLEAF AVENUE) ALTERNATE



The Quadrant Bypass (Greenleaf Avenue) Alternative intersection design has some important improvements including realignment of the bypass to avoid displacement of the Rogers property, and reduction of the width of Greenleaf Avenue near the connection with Elmhurst Road (see Figure ES-6). These modifications avoid the displacement of six businesses, and further reduce business impacts at the intersection of Greenleaf Avenue and Elmhurst Road. The narrowed right-of-way avoids impact to internal traffic circulation and parking of adjacent properties. Although, the displacement of the Rogers property is avoided, some of the tenant parking would be impacted. Adjacent undeveloped properties would be purchased for replacement parking. This concept would also require the closure of several driveways near the Greenleaf Avenue and Elmhurst Road intersection. Impacts to natural resources would consist of 0.25 acre of low quality wetland.

The evaluation of the two remaining intersection alternates concluded that the Quadrant Bypass (Old Higgins Road) Alternate is the recommended preferred alternate. This alternate provides an overall reduction in traffic delay at the IL 72 and Elmhurst Road intersection. This alternate would displace one unoccupied building, but, overall, has less environmental resource impacts, less right-of-way requirements, and less business impacts in terms of parking loss, and impaired access to adjacent business properties. Unlike the Quadrant Bypass (Greenleaf Avenue) Alternate, the preferred alternate avoids encroachment on the Runway 9L-29R runway protection zone (RPZ).

Presently, the interchange improvement at Elmhurst Road and I-90 is planned early in the phasing, and the north leg of the West Bypass corridor is planned late in the phasing. This sequence causes traffic impacts to occur at the intersection of IL 72 and Elmhurst Road that require improvements to be operational by 2022. The construction phasing for the overall project is continually being refined and should adjustments in phasing occur, further discussions regarding the scope of the intersection improvement may be initiated.

Updates to Environmental Impacts

The environmental and socioeconomic impacts of the proposed project have been updated since the preparation of the Tier Two Draft EIS to reflect the design modifications (described in Section 2 of this report), and numerous smaller adjustments in the project's footprint and other engineering refinements (e.g., drainage plans). Continuation of the highway development process has helped to further avoid or minimize impacts to resources. The impact updates are aligned with the major decisions described in the following subsection. An overall summary table shows the impact of the proposed project (see Table ES-1), and additional tables show the impacts for interchange design alternates at I-90 and Elmhurst Road and intersection alternates at IL 72 and Elmhurst Road (see Tables ES-2 and ES-3). Table ES-1 also shows, that in some cases, the amount of impact has been further reduced from those shown in the Tier Two Draft EIS. For example, wetland impacts have decreased from 24.4 acres to 22.8 acres of impact. Another example includes business displacements being reduced from 52 to 46.

TABLE ES-1
Summary of Environmental Consequences of the Build Alternative

Resource	Impact
Socioeconomics	
Residential displacements (#)	7
Businesses displaced (employees displaced) (#)	46 (1,332)
Other business impacts (#) [a]	13
Proposed right-of-way required (acre)	595
- Business (acre)	375
- Public (acre)	199
- Residential (acre)	21
- Religious Institutions (acre)	0.02
Tax revenue loss ($/%) [b]	$4.5 M/0.13%
Job creation per year during construction period (# employees)	2,000–3,000 [c]
Job creation (permanent number of employees in project area)	41,000
Total economic output during construction period ($)	$6 B
Total federal tax revenue accrued during construction period ($)	$517 M
Total state tax revenue accrued during construction period ($)	$213 M
Annual local tax revenue added (related to new development that would be induced by the project) ($)	$16 M
Potential redevelopment of land (acre)	4,700 [d]

TABLE ES-1
Summary of Environmental Consequences of the Build Alternative

Resource	Impact
Cultural Resources	
Cultural resources impacted (#)	0
Noise	
Common Noise Environments impacted (#)	24 [e]
Natural Resources	
Stream crossings (total #)	10 [f]
Surface waters impacts (acre)	2.45
Floodplain encroachments (normal to 10 years/10 years to 100 years) (acre-feet)	22.3/35.8
Floodway encroachments (normal to 10 years/10 years to 100 years) (acre-feet)	12.1/15.7
Floodplain encroachments (#transverse/#longitudinal)	12/4
Floodway encroachments (#transverse/#longitudinal)	8/2
Wetland impacts (acre)	23.0
Trees	25,570 [g]
Threatened and endangered species (#)	0
Section 4(f) Resource Involvement	
Section 4(f) resources involved/adversely affected (#) [h]	4/0

Note: NA= Not applicable
[a] Represents parking removal and access rerouting.
[b] The tax revenue loss is related to displaced properties removed from the tax base.
[c] Range represents the differing number of employees required in a given year during the construction period. There would be over 40,500 full-time job equivalents created by 2040. These numbers were determined using the IMPLAN model.
[d] The amount of potential redevelopment (4,700 acres) is attributed to the combined development of the EO-WB project, O'Hare Modernization Program (OMP), and I-90 reconstruction. The EO-WB project by itself would cause about the same amount of acreage to redevelop, however, at a different density in some locations.
[e] There is a total of 44 Common Noise Environments.
[f] The Build Alternative will cross the project corridor waterways at 13 general locations. Impacts are proposed at up to 10 of these locations.
[g] Estimated from transect/sub-sample methodology, and includes impacts to trees within closed woodland, scrub-shrub woodland, wooded fencerows, and landscape areas.
[h] Involvement with all four Section 4(f) resources qualifies as temporary occupancy under 23 CFR 774.13(d), and therefore, do not qualify as adverse effects on the resources.

TABLE ES-2
Comparison of Interchange Alternates at Elmhurst Road and I-90

	Alternate 3 (Traditional Diamond)	Alternate 4 (Diverging Diamond)
Wetland Impacts (acre)	0.0	0.01
Impact to Higgins Creek (acre)	0.03	0.11

TABLE ES-2
Comparison of Interchange Alternates at Elmhurst Road and I-90

	Alternate 3 (Traditional Diamond)	Alternate 4 (Diverging Diamond)
Impact to Higgins Creek Tributary A (acre)	0.07	0.07
100-year Floodplain Impacts (acre-feet)	13.5	14.2
Regulatory Floodway Impacts (acre-feet)	6.1	7.0
Tree Impacts (number)	124	124

TABLE ES-3
Comparison of Intersection Alternates at IL 72 and Elmhurst Road

	Quadrant Bypass (Old Higgins Road) Alternate	Quadrant Bypass (Greenleaf Avenue) Alternate
Business Displacements (number)	1 [a]	0
Residential Displacements (number)	0	0
Wetland Impacts (acres)	0.26	0.26
Tree Impacts (number)	112	120

[a] Building is vacant.

Major Decisions and Alternatives

The Tier Two Draft EIS comparatively evaluated the project alternatives carried forward in the process (NEPA/404 Merger Group concurrence reached in October 2011), and numerous design alternates for various aspects of the projects. Whereas, Tier One selected the type and location of the transportation improvement, Tier Two would focus on the design details that would be located in the selected corridor. During Tier Two, many design alternates for interchange types, drainage features, transit requirements, and others were examined. For example, at each interchange location, up to seven alternates were examined based on operational characteristics, environmental effects, cost, and constructability. At all locations but one where further evaluation was warranted, a preferred design alternate was identified with extensive input from the stakeholders and communities. The consideration of alternates was applied to each of the design features of the project, and led to a single build alternative that represented the optimum combination of design elements that provided the best performance, reduced environmental impact, and was cost effective.

The Tier Two Draft EIS concluded with three decisions to be finalized in this Tier Two Final EIS, which include:

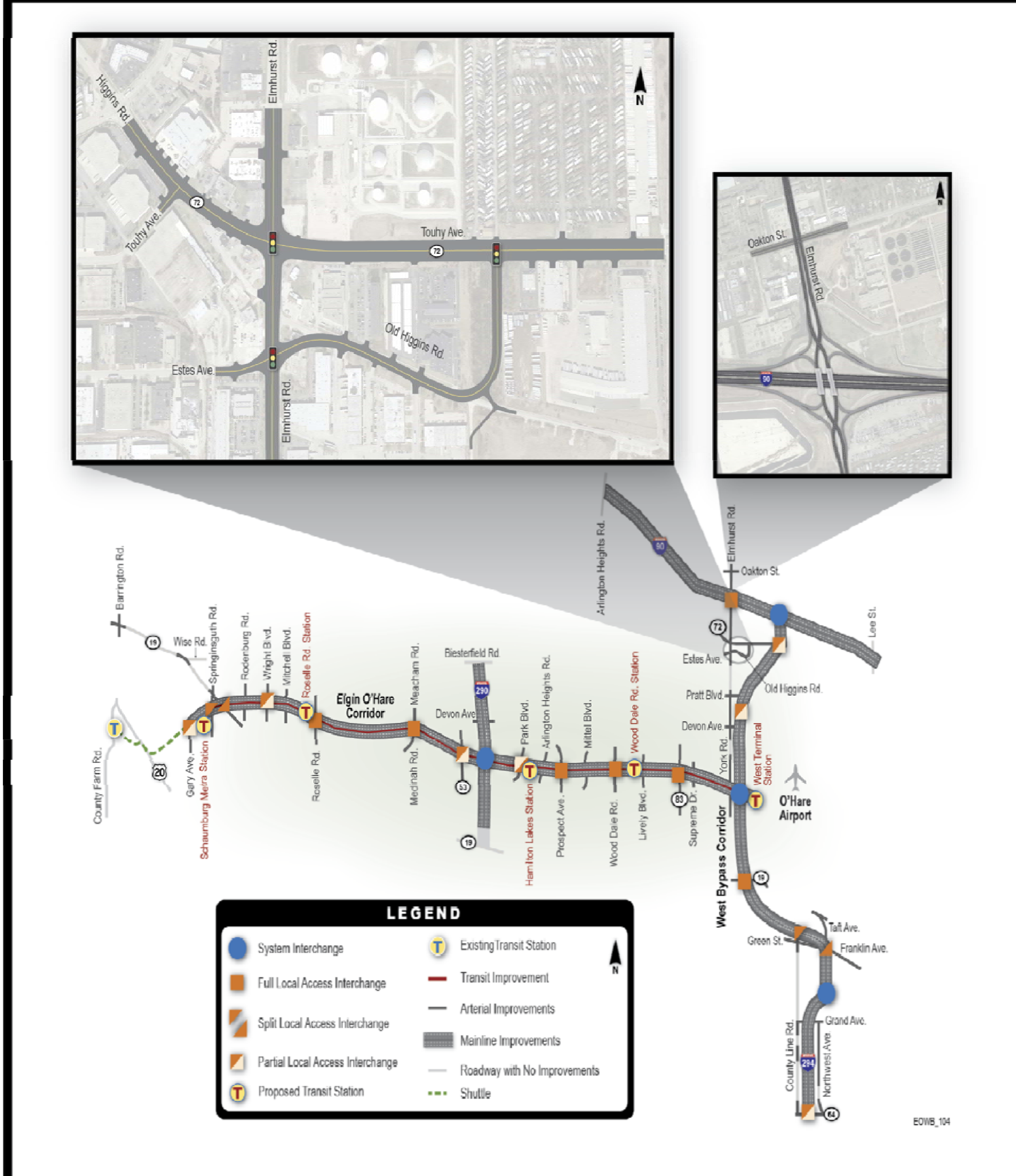
- Identification of the Preferred Alternative – Build versus No-Build Alternative.
- Identification of the preferred interchange design alternate at Elmhurst Road and I-90.
- Identification of the preferred intersection design alternate at IL 72 and Elmhurst Road.

This Tier Two Final EIS revisits each of the decisions that remain open and identifies the Preferred Alternative or alternate in each case. A summary of the Preferred Alternative and alternates, and a detailed analysis is included in Section 2.

The Build Alternative compared to the No-Build Alternative satisfies the project's Purpose and Need. The Build Alternative provides the needed efficiencies and improved operational characteristics that would maintain and enhance transportation in an area known as a regional transportation hub and its role as an economic center in the region. While enhancing mobility in the project area, the Build Alternative has been developed to be sensitive and compatible with the local community values and land use patterns of the surrounding communities. The final set of design features that comprise the Build Alternative were determined through a deliberate process of evaluating many design alternates against evaluation criteria that included environmental considerations, travel and operational performance, constructability, and cost considerations. Through this process, the Build Alternative achieves improved travel, while minimizing impacts to the important natural resources in the area. It has also been determined that the investment in the Build Alternative would provide extraordinary benefit to the local economy both during the period of construction, and in the long-term with the redevelopment opportunities that would be attracted to the area. The combined attributes of the Build Alternative make it the Preferred Alternative supported by the lead agencies (see Figure ES-7). This alternative received concurrence by the NEPA/404 Merger Group on September 6, 2012.

The lead agencies have concluded that the preferred alternates at Elmhurst Road and I-90, and IL 72 and Elmhurst Road are the diverging diamond (Alternate 4) and the Quadrant Bypass (Old Higgins Road) Alternate, respectively (see insets in Figure ES-7). These alternates received concurrence by the NEPA/404 Merger Group on September 6, 2012. Each provides the requisite operational performance required at these locations, and stakeholder involvement has been supportive of each decision. While performance has been achieved with both, the environmental impact of each has been reduced to fractional impacts, and impacts on adjacent businesses and residences are minor.

FIGURE ES-7
PREFERRED ALTERNATIVE



Environmental Commitments and Mitigation

Mitigation is required for impacts to natural and human resources that are unavoidable. The project does not impact cultural, historical, or threatened and endangered species; therefore, no mitigation is required for those resources. For resource impacts that require mitigation, the project will adhere to all applicable federal, state, and local laws and regulations. A brief description of the primary mitigation measures and commitments are presented here (see subsection 3.21 for an expanded discussion).

- Impacted waters of the U.S., including wetlands, will be mitigated by the Illinois Tollway at determined ratios at off-site locations (within the Des Plaines River drainage basin) that are agreeable to federal and state resource agencies.
- The wetland/waters mitigation sites under consideration have been selected based upon the site's potential to satisfy the project's mitigation requirements and provide for sustainable improvement to the Des Plaines River drainage basin. A final decision regarding wetland mitigation approach and site selection will be completed during the Section 404 permitting process and Interagency Wetland Policy Act (IWPA) review.
- Acquisition of wetland/waters mitigation sites will be accomplished by one of two methods: 1) an intergovernmental agreement (IGA) between the Illinois Tollway and land steward that specifies a partnership, wherein the build out of mitigation and acquisition of land is accomplished; and 2) the Illinois Tollway both acquires and develops the property and conveys to the long-term property steward.
- Stormwater management strategies that benefit both the roadway and community needs (e.g., Village of Franklin Park) will be considered. Roadway stormwater runoff will be managed to avoid/minimize local flooding, degradation of water quality in nearby water resources, and wildlife hazard safety issues for nearby airports. Stormwater volume will be managed by a system of conveyance, detention, and infiltration basins in accordance with Illinois Tollway and IDOT requirements and while incorporating county requirements to the greatest extent practicable. Best management practices will be implemented in conjunction with the project's drainage conveyance and detention system to minimize the transport of sediment, heavy metals, and other pollutants to surface waters. Additional stormwater best management practices (e.g., best management practice swales and infiltration basins/trenches) will be installed where necessary to protect wetlands and surface waters.
- A suite of chloride water quality best management practices will be implemented to reduce potential impacts to receiving waters. Strategies to reduce chloride loads include: weather-related data sharing, coordination with local municipalities, review of current de-icing practices, and operator training where necessary.
- The proposed improvements will comply with FAA Advisory Circular (AC) No. 150/5200-33B, *Hazardous Wildlife Attractants on or near Airports* (dated August 28, 2007). Specific requirements pertaining to stormwater management facilities, wetland mitigation, and landscaping are being coordinated with and confirmed by FAA and the U.S. Department of Agriculture – Animal and Plant Health Inspection Service (USDA-APHIS). The principal criteria include no new wildlife attractants (e.g., open water,

wetlands, or vegetation attractive to wildlife) within five miles of O'Hare Airport and 10,000 feet of Schaumburg Airport. Engineering plans will be submitted to the FAA/USDA-APHIS for review and approval of the new design features within the limits prescribed by the advisory circular.

- Tree and vegetation replacement will be guided by IDOT and Illinois Tollway manuals. Planting replacement trees will take into account FAA's concern for aircraft safety pertaining to birds and other wildlife.
- The bottom of new culverts greater than 48 inches in diameter or height associated with waters of the U.S. will be buried below streambed elevations to maintain a more natural condition, when feasible. Bottomless culverts will be considered in final design, when feasible, based on size of the span, geometry, skew, potential environmental impact associated with its installation, and cost. It is important to note that if a culvert is less than 48 inches in diameter, it is very difficult to place riverbed material within the entirety of the pipe.
- Compliance with soil erosion and sediment control requirements will consider the use of the Kane-DuPage and North Cook County Soil and Water Conservation Districts' personnel (SWCD) (via agreements) for soil erosion and sediment control plan review and site inspection during construction.
- Traffic and access management will be accomplished with a variety of measures. Traffic access will be enhanced by a frontage road system along the east-west corridor at locations noted in the preliminary plans to maintain local access. Maintenance of traffic plans will be developed to sustain traffic flow during construction. Plans will be developed to ensure safe travels and quick response for school system buses and emergency services.
- Special waste encountered during construction will be managed to avoid unintended migration of contaminants and protect against potential worker exposures. Impacted material will be screened and characterized on a case-by-case basis and remediation methods determined. To the extent possible, on-site management is proposed. If necessary, unsuitable materials will be disposed at a licensed facility.
- The control of air pollution during construction will be compliant with the Illinois Tollway's Supplemental Specifications (Sections 107.36 and 107.37).
- The determination of proposed noise barriers has been in compliance with FHWA and IDOT guidance on selecting feasible and reasonable locations for barriers. During the Tier Two Draft EIS comment period and after, the benefited receptors from proposed barriers were sent a postcard requesting their vote as to whether or not they want barriers implemented. For all barriers except one, there was unanimous agreement that barriers should be implemented. Noise barriers that will be implemented include B2, C1, C2, C3, C4, D1, D3, E1, E2, E3, and E6. Based on the voting by benefited receptors, barrier E4 has been dismissed from further consideration. The implementation of the noise barriers will be carried forward into future phases of the project. The final design aspects of the barriers, including length, height, types of materials, etc., will be determined in final design. Public involvement venues will be used to update the public on final design details for the noise barriers and the schedule of implementation.

- Relocation of businesses and residences will be performed in compliance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended, and IDOT's *Land Acquisition Policies and Procedures Manual* (IDOT, 2011c), and the Illinois Tollway's land acquisition policies, as applicable, to all residents and businesses displaced by the proposed improvements.
- The FAA has performed 7460 feasibility studies in both Tier One and Tier Two. The findings of this early work are guiding the preliminary design of the proposed roadway improvements to avoid airspace and navigational aid conflicts. The FAA's full 7460 (airspace compliance) analysis will be performed at the completion of the 60 percent engineering plans for roadway improvements that are located near or on airport property. A 7460 submittal will be prepared for FAA review and evaluation as final design is phased in the vicinity of the airport. Based on the recommendations from those reviews, aspects of the improvements will be adjusted to maintain compliance with airspace regulations.
- Glideslope antenna analyses will be used to determine any potential conflicts with signal transmission from the antenna to arriving aircraft. Based on the recommendation of the analysis, roadway design features may be adjusted to avoid signal conflicts.
- The EO-WB roadway improvements have been planned with due consideration for future transit improvements to be provided by others along the Elgin O'Hare corridor, north leg of the West Bypass corridor, and the I-90 corridor.
- Space is reserved for bicycle and pedestrian facilities within, adjacent, or crossing select sections of planned roadway improvements. In most cases, routes would be parallel to the frontage road system along the Elgin O'Hare corridor and would provide connections to north-south regional trails. Existing paths impacted by the construction of the proposed improvements would be replaced in-kind. Where existing bicycle and pedestrian trails and state highway routes cross the proposed roadway improvement, bicycle and pedestrian facilities would be incorporated into the design to provide restoration of the existing trails and in compliance with IDOT's "Complete Street's Policy" at state routes. Local cost-sharing is anticipated for construction of new bicycle and pedestrian facilities and their long-term maintenance.
- Sustainable practices and principles will be applied to the EO-WB project that align with the objectives of the Illinois Tollway.
- The aesthetic design guidelines developed by the Corridor Aesthetics Advisory Team (CAAT) will be used to guide further associated design efforts.

Implementation

In October 2010, Illinois's Governor Quinn formed the EO-WB Advisory Council to develop a strategy for the implementation of the EO-WB project. Their work spanned over eight months and concluded with a consensus opinion that a financially achievable project would be attained with the Illinois Tollway as the preferred implementing agency (see Appendix A). In September 2011, the Illinois Tollway Board enacted a system toll increase that would finance a 15-year capital improvement program, *Move Illinois: The Illinois Tollway Driving the Future*, which includes the EO-WB project (Illinois Tollway, 2011).

A phased approach is recommended for the implementation of the EO-WB project. The Build Alternative, as identified in this Tier Two Final EIS, is designed to accommodate long-term (year 2040) travel demand. While the overall Build Alternative addresses long-term travel needs in the area, it comes at a relatively high cost. Therefore, an Initial Construction Plan (ICP) was developed with the goal of being a more financially attainable first phase of the project. The ICP maintains the integrity of the full project and serves the area's sizable travel needs through an interim design period of 2030. The ICP would include improvements along all sections of the project but with fewer initial travel lanes, fewer interchanges, and in some cases, new interchanges that would accommodate fewer movements. The remaining added travel lanes and interchange improvements included in the Build Alternative would be considered as travel demand and future funding becomes available.

In accordance with the FHWA requirements for major projects such as the EO-WB project, an independent Cost Estimate Review (CER) for the ICP was conducted in May 2012 to verify the accuracy of and reasonableness of the total estimated cost. The total project costs are estimated to range from $3.1 billion to $3.6 billion, in year of expenditure dollars, escalated to the midpoint of construction. The Illinois Tollway has programmed 90 percent of the funding, and an additional $300 million to be contributed by others, or in-kind contributions.

The EO-WB project was proposed as a multimodal solution, and as such, the responsibility for the implementation will involve others. While, the Illinois Tollway will be mainly responsible for the implementation of the roadway improvements, transit providers will be responsible for implementing the transit infrastructure (i.e., pavement, track, stations, signage/signals, and station parking). Additionally, some arterial improvements would be provided by others. Bicycle and pedestrian facilities are planned in some sections of the roadway corridor, and local cost-sharing is anticipated for the construction of new bicycle and pedestrian facilities and their long-term maintenance.

The schedule of implementation for the ICP, as shown in the Illinois Tollway's capital improvement program, *Move Illinois: The Illinois Tollway Driving the Future*, would span approximately 12 years (2013-2025). The phased sections of the ICP include:

- West Section – Mainline widening (to the inside) and reconstruction from IL 19 to Meacham Road/Medinah Road; interchange improvements at IL 19 and Roselle Road.
- Central Section – Mainline widening and resurfacing from Meacham Road/Medinah Road to IL 53 and new mainline construction from IL 53 to Salt Creek; interchange improvements/construction at Meacham Road/Medinah Road, IL 53, I-290, Park Boulevard, and Arlington Heights Road/Prospect Avenue; improvements to connecting roadways.
- East Section – New mainline construction from Salt Creek to O'Hare Airport and portion of south leg of the West Bypass through IL 19; interchange construction at Wood Dale Road, IL 83, Elgin O'Hare/West Bypass, and IL 19; improvements to connecting roadways.

- South Section – New mainline construction from IL 19 to I-294 and mainline improvements along I-294; interchange construction at Franklin Avenue/Green Street and I-294; new interchange access at I-294/IL 64; improvements to connecting roadways and construction of Taft Avenue connector.
- North Section – New mainline construction from O'Hare Airport to I-90 and mainline improvements along I-90 approximately one mile west of Elmhurst Road to approximately a half mile east of the West Bypass/I-90 interchange; new interchange access at Elmhurst Road/I-90; improvements to connecting roadways (i.e., Elmhurst Road, Touhy Avenue, etc.).

The ICP meets the FHWA measures of operational independence. The ICP represents a functionally complete project that addresses diverse travel needs in the study area, and the ICP design provides a project with logical improvement limits (project termini). Further, the ICP includes design features that will provide acceptable traffic operations in the 2030 ICP design year, including required improvements to adjacent highways (freeways, toll roads, arterials, secondary roadways), thus, demonstrating its operational independence.

SECTION 1

Purpose of and Need for Improvements

Since the publication of the Tier Two Draft EIS on March 30, 2012, there has not been any public comments nor new information received that would alter the Purpose and Need. The Tier Two Purpose and Need received concurrence from the NEPA/404 Merger group in Illinois on September 8, 2011.

The study process for the Elgin O'Hare - West Bypass involved a thorough evaluation of the transportation system needs in an area just west of O'Hare Airport in the Chicagoland area by the joint lead agencies. The transportation system needs were determined through technical study and stakeholder involvement early in the process. The findings of those studies have been retained through the preparation of this Tier Two Final EIS. Evolving from the needs analysis, the project Purpose and Need statements have guided lead agencies and stakeholders to the Preferred Alternative.

The proposed project will require federal actions or approvals; therefore, full compliance with NEPA has been implemented as part of this process. Actions by the FHWA include the use of federal funding, and an interchange access approval at I-290. The proposed project also requires federal approvals from FAA, which may include the approval of concurrent use of land on O'Hare Airport for use as the West Bypass corridor, an airspace determination, an obstruction determination, and an unconditional approval of the revised Airport Layout Plan depicting the proposed location of the highway.

1.1 Background

The project area encompasses the northwest edge of Chicago, the entirety of O'Hare Airport, 26 suburban communities, and two counties (DuPage and Cook Counties) (see Exhibit 1-1). The project 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. In 2010, mobility was adversely affected by severe congestion on 86 percent of the interstate and primary roads in the study area. Because of severely impaired mobility for this important regional transportation hub, the EO-WB project was identified as a project of regional and national significance in Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA–LU) legislation, which requires a multimodal transportation solution to help address major congestion and mobility problems in the study area.

The project has been advanced in two parts or tiers; the second tier builds upon the first tier. The Tier One ROD, via unprecedented consensus, selected the type of improvement concepts (roadway, transit, bicycle/pedestrian), identified the project corridor (location), and provided the opportunity for early acquisition of needed right-of-way (FHWA, 2010). Tier Two expanded on Tier One with detailed engineering and environmental analysis that refine the project features, impacts, and right-of-way footprint within the preferred corridor.

The Tier Two Purpose and Need was updated from Tier One by extending the planning period from 2030 to the year 2040 to be consistent with the region's recently adopted *GO TO*

2040 Comprehensive Regional Plan (adopted in October 2010 and developed by the Metropolitan Planning Organization [MPO] for the area, CMAP). The update included development of the 2040 No-Build Alternative travel forecasts, an analysis of system travel performance using the 2040 No-Build forecasts, and a revision to the scope of the improvements in the No-Build Alternative to be representative of reasonably anticipated agency program investment levels. Based on the updated analysis, the Tier Two Purpose and Need continues to preserve the Purpose and Need statements presented in Tier One, and the re-analysis of travel performance supports the need for the proposed transportation improvements in the area.

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. The evaluation involved a detailed technical analysis and 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 have evolved as major themes from the technical analysis and stakeholder problem identification (see Table 1-1).

TABLE 1-1
Technical and Stakeholder Problem Statements

Project Needs	Technical Analysis Findings	Stakeholder Problem Statements
Improve local and regional travel	86 percent of the area's roadways will be congested in the peak periods by 2040. Congestion on major roads will spill over to secondary roads. Congestion on arterial and collector streets will grow from 86 percent in 2010 to 88 percent by 2040.	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 local access interchanges along interstate highways results in poor access and inadequate connections with major regional corridors. System interchanges operate inefficiently because of traffic volumes exceeding capacity, lack of all movements, and short weaving sections that reduce speed. Freight rail traffic impedes the movement of vehicle traffic in the study area, with 120 at-grade crossings, 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.

TABLE 1-1
Technical and Stakeholder Problem Statements

Project Needs	Technical Analysis Findings	Stakeholder Problem Statements
Improve access to O'Hare Airport from the west	The proposed West Terminal will rely on high-capacity transportation connections from the west (i.e., roadway, rail transit, bus, shuttle) to serve an estimated average daily traffic of 29,000 in 2040. 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.	Improve travel times to O'Hare Airport from the western and northwestern suburbs.
Improve modal opportunities and connections	A relatively small percentage (4 percent) of trips in the study area are made of transit, and future transit trips would increase only slightly (0.5 percent) without major improvements. 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 Tier Two EIS will focus on major system deficiencies and will also provide a foundation for planning by other transportation providers.

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.

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

1.2.1 Regional and Local Travel

A large volume of traffic enters, leaves, and travels within or passes through the study area (see Table 1-2). In all, about 3,450,000 vehicle trips occur daily (2010 data) in the area, or 18 percent of all trips in the six-county region. By 2040, daily vehicle trips in the study area will grow to around 3,950,000, or about 14 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). Employment in the project area is sizable at 472,550, a concentration of employment second only to that of downtown Chicago.

TABLE 1-2
Study Area Daily Trips by Trip Origin and Destination: 2010 and 2040

Trip Origin–Destination	2010		2040[a]	
	Trips	Percent	Trips	Percent
Internal-internal	1,057,000	31	1,208,000	30
Internal-external	808,000	23	903,000	23
External-internal	794,000	23	902,000	23
External-external	798,000	23	936,000	24
Total	**3,457,000**	**100**	**3,949,000**	**100**

[a] 2040 travel performance values presume improvements to the future transportation system that are identified in the Statewide Transportation Improvement Program (IDOT, 2011), and Illinois Tollway master plan for I-90 (Illinois Tollway, 2008), but without the Elgin O'Hare and West Bypass facilities. This level of improvement is referred to as the No-Build Alternative.

Between 2010 and 2040, the number of trips in the study area will increase by 14 percent. In the future, increases will occur across all categories of trip types (see Table 1-2). Trips within the study area (internal-internal) show the largest increase in actual trips compared to other types. These increases are attributed largely to the sizable increases in forecast population and employment by 2040, increasing by about 30,000 for population and more than 60,000 for employment with the No-Build Alternative. Trips traveling through the study area account for about 23 percent of all trips in 2010, and the percentage of trips passing through the study area, ranging in length from regional to interstate, will increase to 24 percent of all trips in the future. In addition, trips that either originate in the study area with destinations outside the study area, or originate outside the study area with destinations inside the study area are forecast to account for 1,805,000 trips or 46 percent of all trips in 2040, and have an average trip length of about 15 miles for work trips. Most trips from outside the study area are to the major traffic attractors named above, and the more than 472,000 jobs in the area (CMAP, 2010).

Freeways and primary arterials (I-90, I-290, Thorndale Avenue, York Road, etc.) represent only 47 percent of the total road system mileage, but carry 75 percent of all vehicle miles of travel (VMT) in the peak period. Congestion has overwhelmed the roadway system in the study area (see Exhibit 1-2). In 2010, 86 percent of freeways and 88 percent of primary arterials operated at level of service (LOS) D, E, or F, which are generally defined as moderate, severe, and extreme congestion, respectively (see Table 1-3). By 2040, congestion will worsen with an increase in travel by over nine percent in the P.M. peak period, and when LOS F will be typical for most all freeways and arterials (see Exhibit 1-3). By 2040, the total annual hours of delay would be equivalent to three million workdays, or six workdays for every employee (534,000 hours) in the study area. Extreme congestion on freeways and primary arterials will force traffic to use local collectors and secondary arterials, causing severe congestion on those facilities. By 2040, 91 percent of the secondary arterials and 78 percent of collectors in the study area are anticipated to be congested during the P.M. peak travel period.

TABLE 1-3
Traffic Congestion P.M. Peak Period: 2010 and 2040

Road Type	2010 Existing Condition			2040 No-Build Alternative[a]		
	Total (VMT)	Congested (VMT)[b]	Percent Congested[b]	Total (VMT)	Congested (VMT)[b]	Percent Congested[b]
Freeway	1,289,000	1,111,000	86	1,391,000	1,178,000	85
Primary arterial	430,000	377,000	88	471,000	413,000	88
Secondary arterial	397,000	356,000	90	442,000	403,000	91
Collector	176,000	132,000	75	199,000	156,000	78
Total	**2,292,000**	**1,976,000**	**86**	**2,503,000**	**2,150,000**	**86**

[a] 2040 travel performance values presume improvements to the future transportation system that are identified in the Statewide Transportation Improvement Program and Illinois Tollway master plan for I-90, but without the Elgin O'Hare and West Bypass facilities. This level of improvement is referred to as the No-Build Alternative.
[b] Congestion is a combination of LOS D, E, and F.

The study area is a key air, rail, and roadway transportation hub for the region, and increasing congestion and travel delay have consequences 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 at moving people and goods through and into the study area is degraded. Fundamentally, there is a need for transportation improvements that maintain longer distance travel on the appropriate type of facility and that assist in relieving travel congestion on the local road network to serve the travel needs of the region and the study area.

1.2.2 Travel Efficiency

Several factors other than congestion contribute to inefficient mobility within the study area including partial local access interchanges[1] 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 system interchanges[2] (see Exhibit 1-4).

Stakeholders ranked impaired accessibility to and from the interstate system among the top issues within the study area. An analysis has shown that the densest industrial development in the study area has the most impaired accessibility to the interstate system. Exhibit 1-5 shows 2040 travel times from the location of this dense industrial development on the west side of O’Hare Airport to locations inside and outside the study area. Travel times from the west side of O’Hare Airport to interstate locations along I-290, I-90, and I-294 approach 20 minutes. Further analysis examined travel times and speed from the west side of O’Hare Airport to five interstate locations and one U.S. highway location (see Table 1-4).

Travel times increase in the range of 26 to 47 percent by 2040 for shorter trips and by 34 to 50 percent for the longer trips (CMAP, 2010).

---

[1] Local access interchanges provide access from a fully accessed-controlled roadway to the local road system.
[2] System interchanges provide for the movement of traffic from one fully accessed-controlled roadway to the next.

Overall, poor travel efficiency in the study area was attributed to a lack of roadway capacity and too much traffic, which results in congestion. Where travel performance is already at an unacceptable LOS, the problem only worsens without major improvements. Notably, two longer distance trips (US 20/Elgin-O'Hare Expressway and Arlington Heights Road/I-90) to the west and the northwest areas show sizable increases in travel time between 2010 and 2040. These increases in travel time relate to forecasted increases in both population and employment for the area, and a lack of roadway capacity.

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/Elgin-O'Hare Expressway	
	2010	2040	2010	2040	2010	2040	2010	2040	2010	2040	2010	2040
Travel time (min)	16.3	22.6	16.2	24.3	11.2	14.8	8.5	12.5	12.1	15.2	28	37.5
Distance (mi)	4.5	4.5	6.4	6.4	2.8	2.8	4.6	4.6	5.0	5.0	11	11
Average travel speed (mph)	17	12	24	16	15	11	32	22	25	20	24	18

Note: 2040 travel performance values presume improvements to the future transportation system that are identified in the *GO TO 2040 Comprehensive Regional Plan*, but without the Elgin O'Hare and West Bypass facilities. This level of improvement is referred to as the No-Build Alternative.

Travel efficiency was also analyzed by examining the travel time required to reach interstate access from any location within the study area (see Exhibit 1-6). Considerable time is required to travel a short distance to the nearest interstate access during the P.M. peak period. This is clearly evident for locations near Elmhurst Road/I-90, Thorndale Avenue/I-290, Higgins Road/I-290, Arlington Heights Road/I-90, and Lake Street/I-355. At these locations, travel distances of two miles or less to interstate access experience average speeds of less than 15 miles per hour, and have travel times approaching or exceeding 10 minutes during peak periods. Over 40 percent of the study area has travel times greater than 10 minutes (averaging two to four miles in length) 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. 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 and positive relationship to the area's long-term economic vitality.

Adding to accessibility concerns is the number of local access 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 46 percent of all vehicle trips in the area either originate in the study area with destinations outside the study area or originate outside the study area with destinations inside 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 for system interchange locations), 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 are not provided in all directions.
- Loop style ramp capacity is exceeded for the volume of traffic.
- Interchange configurations have many short weaving sections through which vehicles enter or exit the interstate system.

All these issues contribute to inefficient movement through the 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, resulting in increased VMT.

1.2.3 Access to O’Hare Airport from the West

The O’Hare Airport is one of the busiest airports in the world and once held the rank of number one. The airport has only one major access road, I-190 on the east. Discussions have been ongoing with the City of Chicago/Department of Aviation about how improved access to O’Hare Airport 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, FAA published the Final EIS and issued the ROD for the OMP (FAA, 2005a; FAA 2005b). The approved plan includes 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 by 2015, three new runways, an extension of one runway, and numerous enabling projects will have been completed. In 2010, an agreement was made with airline partners and the City of Chicago that stated the construction of the proposed West Terminal complex would occur when demand demonstrates the need.

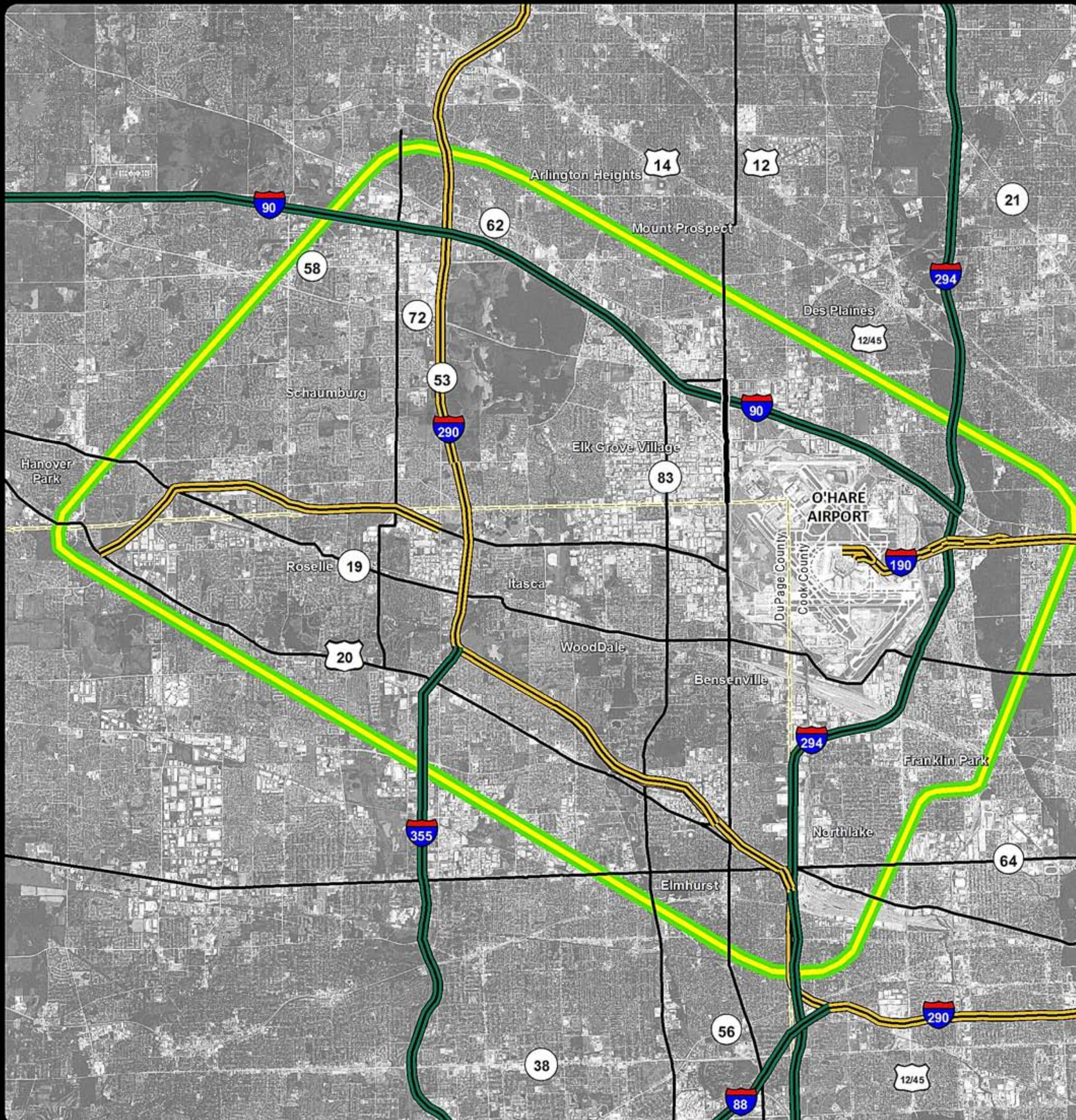
In 2040, the net increase in traffic with the addition of the proposed West Terminal would be an Average Daily Traffic (ADT) of 29,000. Examination of appropriate access to the west side of O’Hare Airport is a focus of the EO-WB project, as well as recent studies by others. It is evident worldwide that major airports rely on efficient regional access with the provision of major highway and transit facilities to serve terminal and cargo complexes. This is clearly the case on the east side of the airport with freeway, toll road, arterial, and transit access. Stakeholders rank improvement in access to O'Hare Airport from the west and northwest suburbs as a priority. Presently, travel to the west side of O'Hare Airport is provided by an arterial system that is severely congested during peak hours. Travel times from the planned west entrance to the airfield is over 20 minutes to an interstate connection on the west, northwest or southwest (see Exhibit 1-5). By 2040, those times will be more than 40 percent greater. The objective 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 place priority on improving the range of transportation mode choices as an alternative to the automobile. Regional and local transportation planning and operating agencies have been working to improve intermodal connections; adjust the systems to serve the needs of reverse and suburb-to-suburb commuters; create more direct and faster service; make "last mile" connections (linking rail stations to employment and activity centers with bus and shuttle service); and reduce transit travel times to trip lengths comparable to auto travel times. Even with these efforts, the current public transit ridership in the study area is presently about 4.0 percent, which is typical of suburbs in large metropolitan areas. By the year 2040, the projected transit ridership will increase to only 4.5 percent of all trips in the study area, even with the completion of several new proposed mostly transit projects. Transit ridership is not projected to substantially change from 2010 to 2040. However, given the magnitude of congestion on the roadway system, the need remains to improve the number and percentage of trips made by transit.

Because suburban employment and housing is dispersed, the transit system is challenged to effectively compete with the auto in connecting origins to destinations (i.e., linking home to work, shopping, recreation, and professional services). More than three million jobs in the Chicagoland area are in the suburbs, with almost 20 percent of them (472,550) within the study area. 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 an improved bus system. The mobility gap (the last mile) between commuter rail stations and employment centers is a major issue, and as of the year 2010, 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 has adversely affected ridership.

Easy access to transit is critical to maintaining and increasing ridership, and an important aspect of access is parking. In a few years, parking will be largely unavailable to new users unless supply is increased. Other accessibility issues are opportunities for non-motorized access to transit service (e.g., bicycle and pedestrian facilities). For example, IDOT classifies 45 percent of more than 550 miles of the roadways in the study area as "not recommended" for biking. There are also substantial gaps in the trail system where bicycle routes are either completely interrupted or unavailable within one-half mile of transit stations. 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 transit riders in the study area who walk to stations.



LEGEND

Study Area

County Boundary

Sources:
- Aerial photography: Airphoto USA, 2008
- County Boundary: U.S. Census Bureau, 2010

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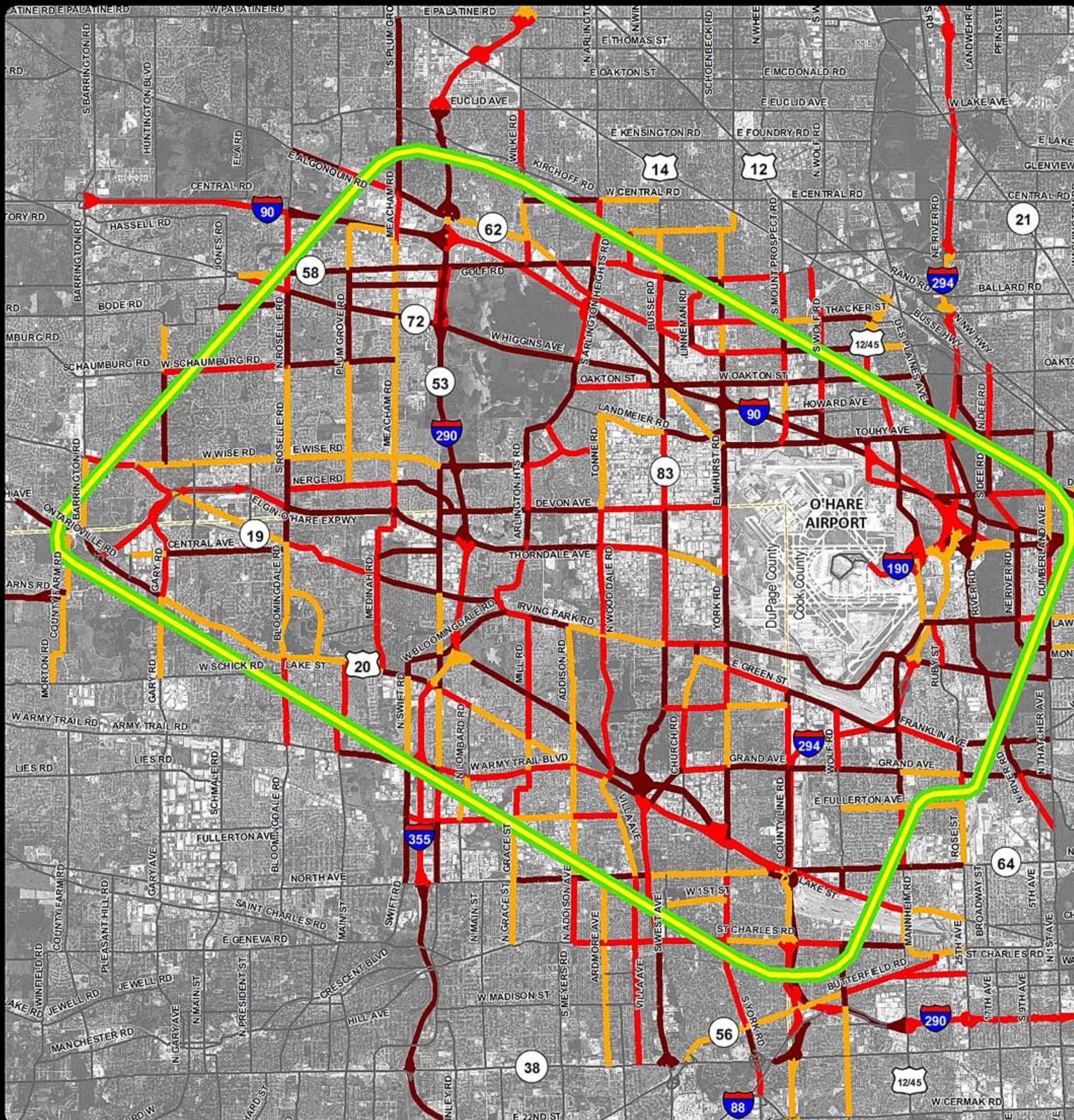
Miles

Exhibit 1-1

Study Area Map



LEGEND

2010 Congested Roadway Sections
(P.M. Peak Period: 4:00 P.M. - 6:00 P.M.)

Moderate Congestion (LOS D)

Severe Congestion (LOS E)

Extreme Congestion (LOS F)

Study Area

County Boundary

Sources:
- Aerial photography: Airphoto USA, 2008
- County Boundary: U.S. Census Bureau, 2010

Notes:
- Level of Service (LOS) estimates are based on HCM 2000 thresholds for volume/capacity ratio and average speed values
- LOS estimates are generated by 2010 Existing Travel Demand Model
- Travel Demand Model LOS estimates are adjusted for a few select sections to reflect existing conditions based on field observations

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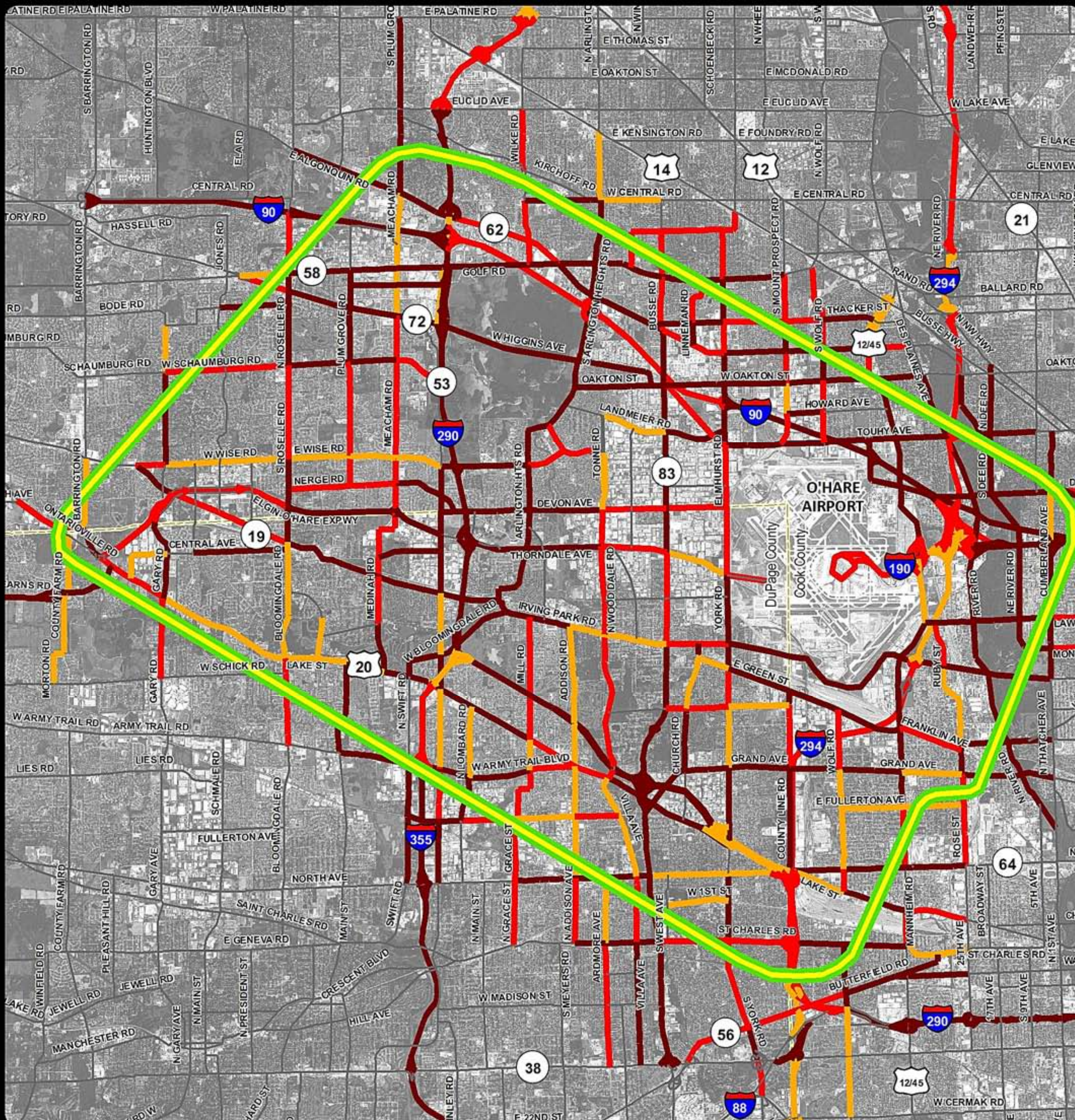
Exhibit 1-2
Study Area Congested Roadways
P.M. Peak Period (Year 2010)



LEGEND

No-Build Congested Roadway Sections

- Moderate Congestion (LOS D)
- Severe Congestion (LOS E)
- Extreme Congestion (LOS F)
- Study Area
- County Boundary

Sources:
-Aerial photography: Airphoto USA, 2008
-County Boundary: U.S. Census Bureau, 2010

Notes:
- Level of Service (LOS) estimates are based on HCM 2000 thresholds for volume/capacity ratio and average speed values
- LOS estimates are generated by 2040 No-Build Travel Demand Model

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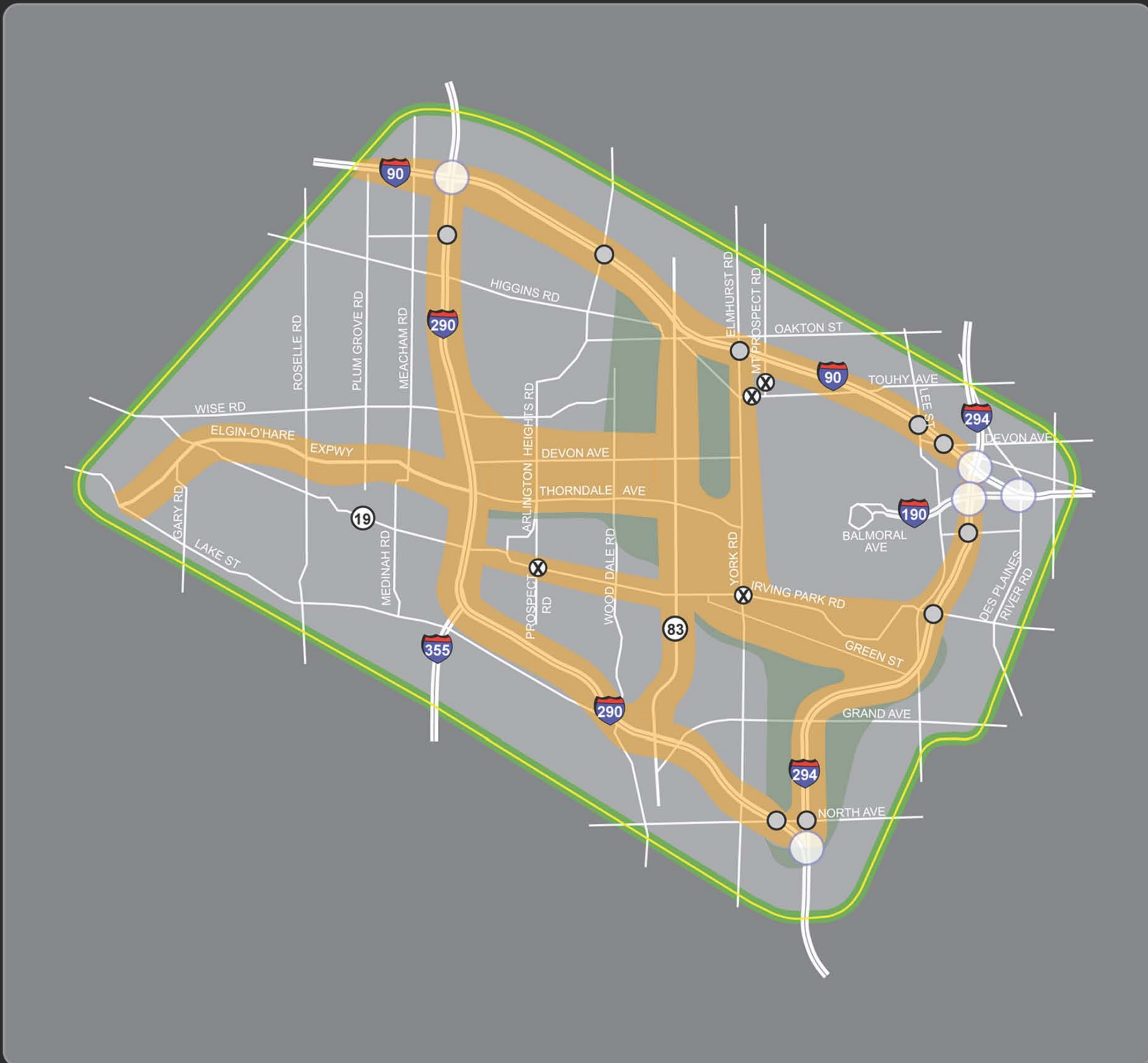
Exhibit 1-3
Study Area Congested Roadways
P.M. Peak Period (No-Build)



LEGEND

- Study Area
- Congestion Concern
- Inadequate Access to Industrial/Commercial Node
- Operational Issue at System Interchange
- Partial Local Interchange Access
- Major At-Grade Rail Crossing Issue

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NORTH
Not to Scale

Exhibit 1-4
Issues Identified by Stakeholders

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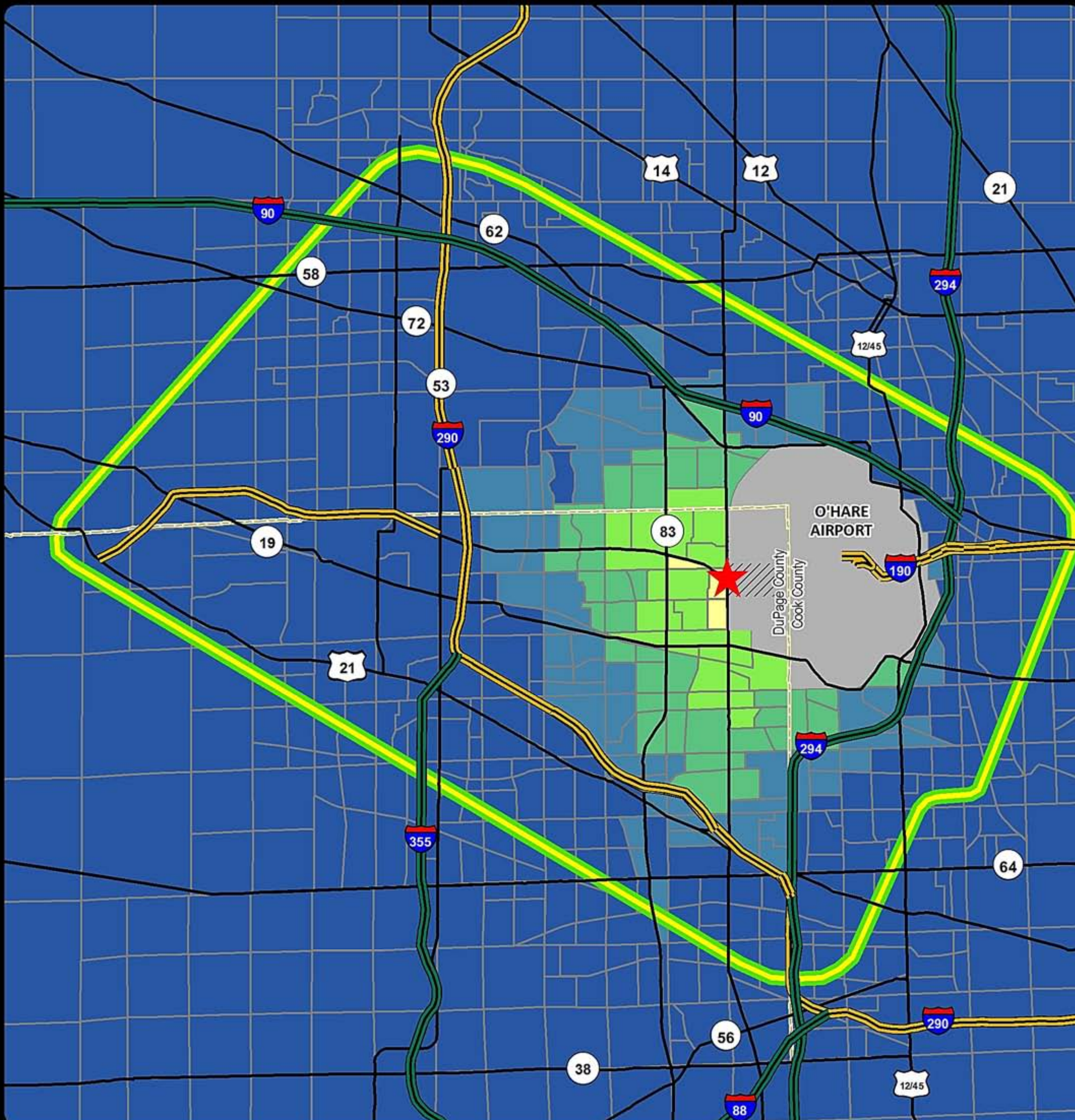

LEGEND

2040 No-Build
P.M. Peak Period Travel Times (Minutes)

- 0 - 5
- 5 - 10
- 10 - 15
- 15 - 20
- > 20
- Proposed O'Hare West Terminal
- Study Area
- County Boundary
- Trip Origin

Source:
- County Boundary: U.S. Census Bureau, 2010

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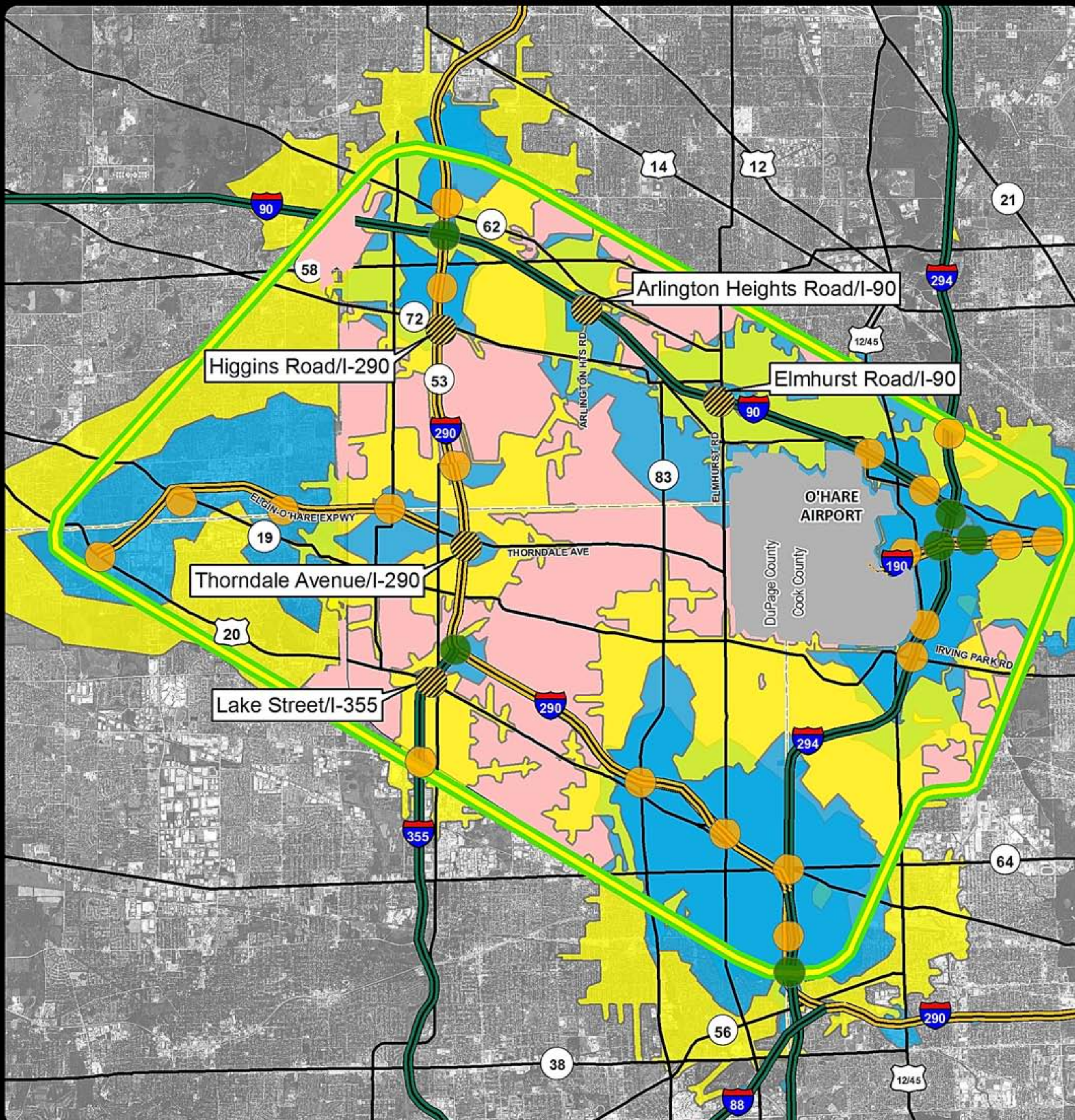
Exhibit 1-5
Travel Times from O'Hare West Terminal
2040 No-Build Scenario



LEGEND

Congested Travel Times
(Existing P.M. Peak Period)

- 5 Minutes
- 10 Minutes
- > 10 Minutes

- Local Access Interchange
- Service Interchange
- High-Access-Time Service Interchanges
- Study Area
- County Boundary

Sources:
- Aerial photography: Airphoto USA, 2008
- County Boundary: U.S. Census Bureau, 2010

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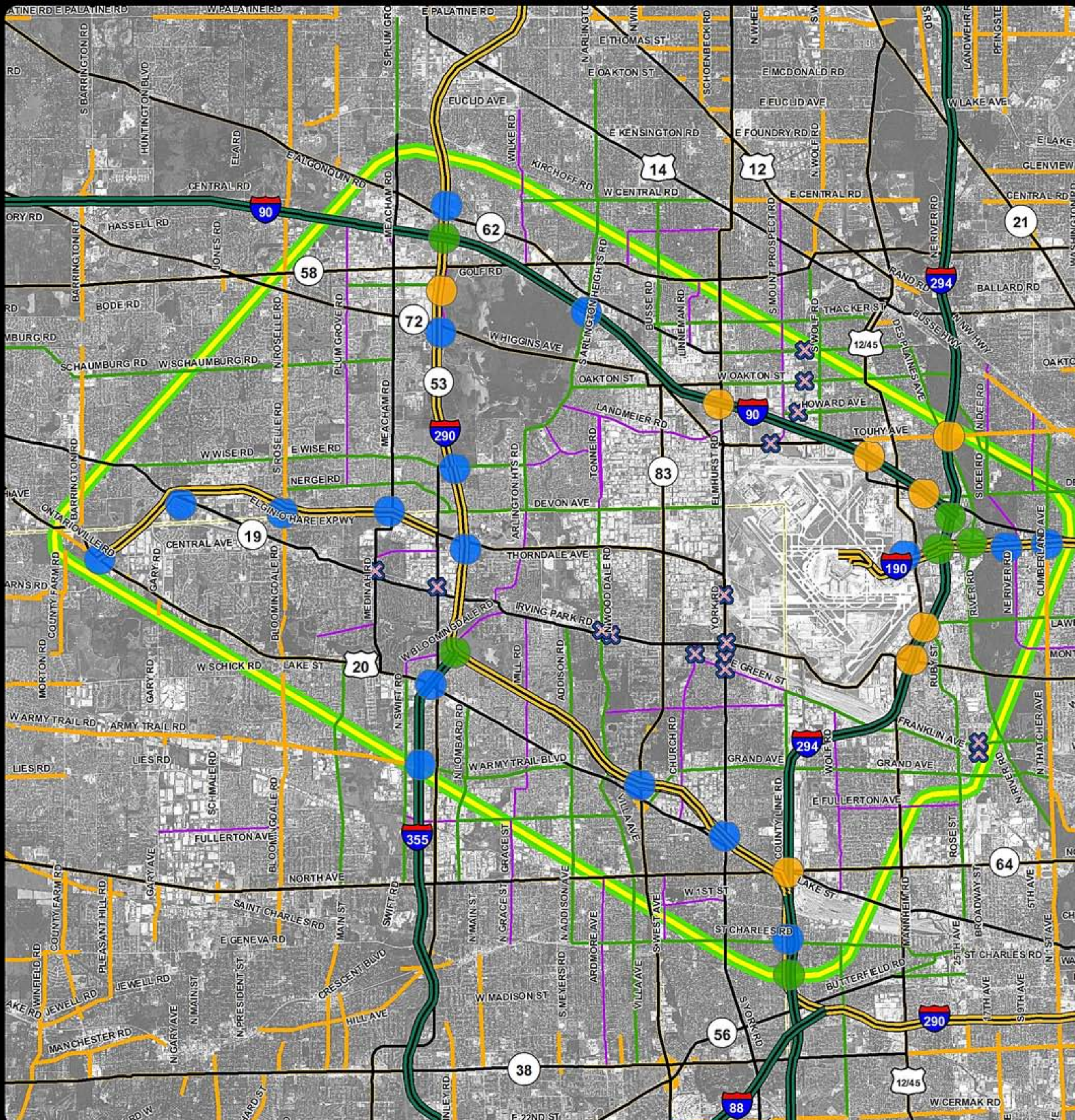
Exhibit 1-6
Accessibility to/from Interchange Locations within Study Area



LEGEND

Arterial Functional Class

- **Principal Arterial**
- **Minor Arterial**
- **Collector**
- **Major Railroad At-Grade Crossings**
- **Service Interchange (Partial Access)**
- **Service Interchange (Full Access)**
- **System Interchange**
- **Study Area**
- **County Boundary**

Sources:
-Aerial photography: Airphoto USA, 2008
-County Boundary: U.S. Census Bureau, 2010

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Exhibit 1-7
Interchange Locations and Major Railroad At-Grade Crossings

SECTION 2

Alternatives/Preferred Alternative

This section describes the alternative development process that led to the identification of the Preferred Alternative. The evaluation of alternatives in Tier Two has determined the Build Alternative to be preferred. This alternative received concurrence by the Illinois NEPA/404 Merger group on September 6, 2012.

The content of this section is structured to provide a complete understanding of the alternative development process spanning both Tier One and Tier Two of the EO-WB study, and the process used to develop, evaluate, screen, refine, and ultimately select the Preferred Alternative.

Where, Tier One defined the project corridor (location) and project type (multimodal concept), Tier Two builds on the Tier One decision with a process that defines the project's design features that fit within that corridor. Tier Two design requirements have been based on an update of the planning horizon from 2030 to 2040 with the mainline facility operating as a toll road. The decisions in Tier Two that are required to advance the project include: decisions on the design features that best satisfy the needs of the project (i.e., mainline requirements, interchange type, tunnel versus bridge, transit requirements, drainage requirements, etc.); a decision on the facility type alternate that is most financially viable (i.e., freeway, toll road, or combination of freeway and toll road); and the sequence in which improvements are constructed including the development of an ICP.

As presented in the March 2012 Tier Two Draft EIS, the alternatives analysis concluded with two overall alternatives (Build Alternative and No-Build Alternative) and alternates at the interchange of Elmhurst Road and I-90 and the intersection at IL 72 and Elmhurst Road. The Tier Two Draft EIS was distributed for public comment on March 30, 2012 and comments were accepted until May 14, 2012. Based on the receipt of agency and public comments on the Tier Two Draft EIS, the general scope of the remaining project alternatives and alternates did not materially change. Public, agency, and community comments, however, did result in several suggested design refinements of the Build Alternative and the alternates considered at the intersection of IL 72 and Elmhurst Road. In all cases, the suggestions were considered and revisions were made (see subsection 2.2). Considering the input from the agencies, public, and the prior studies of transportation performance, cost, and environmental impacts, the Preferred Alternative and alternates at the interchange and intersection locations have been identified in this Tier Two Final EIS.

The process for the development of alternatives was guided by several principles that included:

- The Build Alternative will be the optimal arrangement of design features resulting from a thorough study of many design alternates.
- The No-Build Alternative will serve as the baseline 2040 transportation condition for comparing the travel performance of the Build Alternative.

- The base year for the existing roadway travel performance is 2010.
- The project design year is 2040, which is consistent with the CMAP's *GO TO 2040 Comprehensive Regional Plan* (CMAP, 2010). Thus, all travel forecasts conform to the 2040 time period, as do the facility design requirements.
- The development of alternatives was guided by the project's purpose and need to improve local and regional travel, improve travel efficiency, provide improved access to O'Hare Airport from the west, and improve modal opportunities and connections.
- The technical analyses would rely on detailed environmental studies; detailed engineering and roadway geometry; detailed analysis of facility and interchange types; engineering considerations of transit, drainage, and bicycle and pedestrian facilities; detailed travel modeling; and traffic operations analyses.

This section provides an overview of the process used to develop and evaluate alternatives in Tier Two. The section continues with a description of the alternatives carried forward in the Tier Two Draft EIS for additional study, a discussion of the design refinements since the distribution of the Tier Two Draft EIS, an analysis comparing the Build Alternative to the No-Build Alternative and a comparison of the alternates at the Elmhurst Road and I-90 interchange and the IL 72 and Elmhurst Road intersection. This section concludes with the identification of the Preferred Alternative and alternates and a strategy for implementation.

2.1 Alternatives Development Process

The alternatives development process for the EO-WB project has spanned both Tier One and Tier Two. The Tier One study process focused on "big picture" questions, including "what is the project" and "where is the project," while taking into account the full-range of environmental impacts. The *Elgin O'Hare – West Bypass Project Tier One ROD* approved the preferred type of improvement (a multimodal concept comprised of roadway, transit, and bicycle and pedestrian elements) and the preferred project corridor (location) (FHWA, 2010). With respect to the preferred project corridor, in Tier One, a conceptual plan of the project was developed with sufficient detail to define the project corridor with relative precision. The *Elgin O'Hare – West Bypass Project Tier One ROD* also enabled the early acquisition of needed right-of-way.

Tier Two expands on Tier One with detailed engineering and environmental studies that refine the project concept within the preferred project corridor. While the location of the project is fixed by the Tier One decision, the range of alternatives in Tier Two are in the form of design refinements that lead to design choices within the project corridor (i.e., interchange types; tunnel versus bridge; drainage requirements, and transit, bicycle, and pedestrian requirements), and facility type alternates (i.e., freeway, toll road, or combination of freeway and toll road). When assembled, the complete Build Alternative optimizes travel operations, is cost-effective, and minimizes or avoids natural and human resources to the greatest extent possible.

In order to give context to the alternative refinement process in Tier Two, a brief summary of Tier One is provided. Tier One included a robust evaluation of transportation strategies. In Tier One, there were 15 roadway system strategies developed and evaluated. Each of these strategies went through a rigorous evaluation process of travel performance, engineering, environmental, and cost considerations. The Tier One process concluded with a ROD that identified Alternative 203D (see Exhibit 2-1) as the selected alternative, which was unanimous amongst stakeholders. The selected alternative established both the location and the type of improvement for the EO-WB project, which included expressway-type roadway improvements and companion elements (transit, bicycle and pedestrian facilities) (see the EO-WB Tier One Final EIS for full details of the alternative analysis).

The selected alternative in Tier One was fully supported by the communities and exhibited the best travel performance characteristics, while having relatively low impacts to environmental and natural resources compared to other alternatives. One of the principal reasons for the support of Alternative 203D was the bypass's location on the western edge of O'Hare Airport, a location that occupies largely undeveloped properties between airfield infrastructure and dense industrial development just outside the airport boundary. A bypass at any other location would cause severe disruption to nearby communities (e.g., high displacement of residential and commercial properties, the loss of tax base and employment, highway development that would be out of scale with existing development, and the creation of a barrier that would have effectively divided communities). The City of Chicago Department of Aviation (CDA) also supported this location wherein the *O'Hare Airport Master Plan Update* (CDA, 2005) set aside a 300-foot corridor on the western edge of the airport. The vision for the corridor preservation on the western edge of the airport was fortuitous, for any other location, particularly to the west of the airport, would have resulted in an unworkable project.

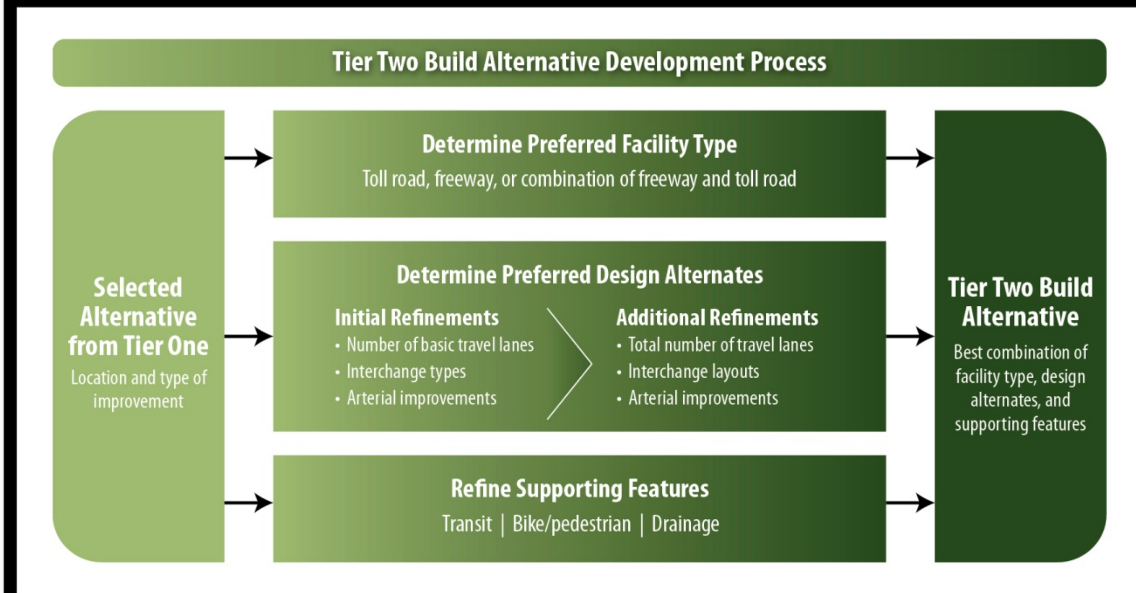
The selected corridor that emerged from Tier One was well-defined, and consists of an east-west component known as the Elgin O'Hare corridor and a north-south component known as the West Bypass corridor. The use of conceptual engineering for roadway and transit features provided corridor limits that closely approximate the right-of-way needs of the project. Although, this level of definition is not common for Tier One, the greater level of detail was warranted by the urban character of the area and, in particular, special land uses such as O'Hare Airport.

Tier Two of the EO-WB project process started with the project footprint from Tier One, and the process continued with greater engineering detail of the roadway, transit, bicycle and pedestrian facilities, and drainage requirements (see Figure 2-1). Tier Two finalizes the design details of the project (mainline lane requirements, interchange types, arterial improvements, drainage, etc.), and the means by which it would be operated (freeway or toll road). Tier Two outcomes include:

- Determine the most fiscally practicable facility type (i.e., freeway, toll road, or a combination of freeway and toll road).
- Determine the optimal arrangement of design features (i.e., mainline requirements, interchange alternates, arterial improvements, transit, bicycle/pedestrian requirements, and drainage facilities), while reducing environmental and socioeconomic impacts.
- Determine a construction sequencing plan.

The decisions that come from these analyses will be assembled to form a complete Build Alternative that represents the facility type (i.e., freeway, toll road, or combination of freeway and toll road); the design features (i.e., mainline requirements, interchange location and type, integration of transit, etc.) that optimize roadway geometry, travel and operational performance, environmental considerations, and cost; and a planned sequence of construction that adheres to the requirements for an operationally independent project with logical termini.

FIGURE 2-1
TIER TWO BUILD ALTERNATIVE DEVELOPMENT PROCESS



2.1.1 Facility Type Alternates

An early decision in the Tier Two alternative development process was a determination of the "facility type" (i.e., freeway, toll road, or a combination of freeway and toll road). The consideration of various freeway versus toll road scenarios was prompted by changing conditions in traditional federal and state funding. Declines in federal funds for new projects, particularly those like the EO-WB project that is projected to cost billions of dollars, have led to an increasing reliance on tolling to finance the construction and long-term maintenance of new projects.

In the examination of facility types, nine alternates were developed (ranging from all roadway elements being non-tolled to all roadway elements being tolled) and seven combinations with both freeway and toll road elements (see Exhibit 2-2). Evaluation of these facility type alternates was initially based on financial viability and travel performance. The evaluation of travel performance was similar for all alternates; therefore, it was not a discerning factor. Among the findings, alternates with tolled sections did not cause a substantial diversion of traffic from mainline facilities to arterials streets; thus, tolled facilities satisfies the project's purpose and need pertaining to reducing congestion and improving travel efficiency. The analysis showed the percentage of traffic diverting from tolled facilities (Alternates 2 to 9) was small, ranging from one to five percent. Thus, financial viability was the primary factor used for the initial screening of the alternates, and in ultimately selecting a facility type as a feature of the Build Alternative. The results of the facility type alternates are summarized below and are contained in Appendix C.

- Alternate 1 (all-freeway alternate): The availability of public funding to finance an all-freeway alternate at a cost of greater than $3 billion is unachievable. **This alternate was dismissed from further consideration.**
- Alternates 2, 3, 4, and 7 (alternates as a full toll road or combination of freeway and toll roads): These alternates were initially viewed as viable since the toll revenue generated from these configurations would support relatively higher bonding capacity, while reducing the required level of public funding. **These alternates were retained for further consideration.**
- Alternates 5, 6, 8, and 9 (alternates with a combination of freeway and toll roads): These alternates yielded a relatively low total revenue; therefore, each alternate showed a major shortfall in potential bonding capacity combined with a large public funding need that is likely unachievable. **These alternates were dismissed from further consideration.**

In further analysis of Alternates 2, 3, 4, and 7, the all-toll road alternate (Alternate 2) was considered the only alternate that would be financially and operationally viable. Three of the four remaining alternates include sections of freeways that attract short distance trips thereby impairing long distance travel continuity on the system. Other factors that affected the facility type decision included long-term maintenance of the facility. The maintenance of freeways is challenged by declining federal and state resources; therefore, funding to restore and rehabilitate a roadway is a large future cost that would be best addressed with a user-based system of finance. A re-examination of the project's purpose and need showed that Alternate 2 would maintain the integrity and intent of the four basic project purposes. The combination of improved travel continuity, the provision of regular long-term maintenance, and meeting the project's purpose and need resulted in the selection of Alternate 2 as the preferred overall facility type alternate.

In November 2010, Governor Quinn formed the EO-WB Advisory Council, which joined the ongoing study process. As directed by the Governor, the Council evaluated four topics including financing, sustainability, work force diversity, and economic impact. Based on an exhaustive evaluation of funding sources, the Council, in their final report (June 2011), recommended that the Elgin O'Hare and West Bypass corridors be operated as toll roads with the Illinois Tollway named as the implementing agency. In later actions (September 2011), the Illinois Tollway Board of Directors enacted a toll increase across the system to fund the Tollway's future capital improvement program, *Move Illinois: The Illinois Tollway Driving the Future,* which includes the EO-WB project (Illinois Tollway, 2011).

The EO-WB project has been proposed as a system of mainline and off-system (arterial) improvements. The proposed tolling concept for the project would consist of tolling the mainline facilities, while the off-system improvements (arterials) associated with the project would not be tolled.

The recommendation of the toll road has no material effect on the facility design other than the inclusion of electronic tolling facilities. For this facility, tolling would be a fully automated toll collection system where typical toll plazas and manual collection facilities would not be present. Although the design standards for federally-funded interstate routes vary slightly with toll road design standards in Illinois, the difference would cause no change to the outside dimension of the right-of-way; therefore, the environmental impacts would not change with the tolling alternate.

2.1.2 Design Alternates

Tier Two considered the optimal arrangement of design features within the project corridor that provide cost effective travel performance while reducing environmental and socioeconomic impacts. The process, leading to an overall design solution and the refinement of the project footprint, considered many aspects (see Figure 2-1) including the mainline lane requirements, interchange types, arterial improvements, drainage requirements, and other factors (i.e., transit facilities, bicycle and pedestrian facilities). Design alternates were evaluated using the following practices:

- Regular meetings with stakeholders were conducted to review design alternates.
- Application of sustainable practices were included that represents a transportation corridor of the 21st century.
- Application of measures that further avoid and minimize environmental and socioeconomic impacts (applied in every aspect of the engineering process) were included to reduce impacts on wetlands; floodplains; water resources; residential, commercial and industrial properties; and unique land use.

2.1.2.1 Mainline Roadway Requirements

The starting point of the process included establishing the mainline travel requirements. The key data required for this determination was future traffic forecasts. A Build Alternative travel forecast was developed for the year 2040 and assumed a tolled facility. Detailed forecasts (ADT and peak hour volumes) were developed for the project corridor. From this information, the number of basic lane requirements was determined for the roadways based on the *Highway Capacity Manual* (Transportation Research Board, 2010), and American Association of State Highway and Transportation Officials (AASHTO) standards. The mainline requirements include three basic lanes in each direction for the Elgin O'Hare corridor, and two basic lanes in each direction for the West Bypass corridor (see Exhibit 2-3).

The roadway cross-section is inclusive of other features including the addition of auxiliary travel lanes that would be dependent on the location and types of interchanges (see subsection 2.1.2.2). Another prominent feature includes a transit reservation in the Elgin O'Hare corridor for the future development of either bus rapid transit (BRT) or rail transit (including stations). Also, the Elgin O'Hare corridor includes frontage roads and bicycle/pedestrian facilities that further define the footprint of the project. The West Bypass corridor would be inclusive of basic and auxiliary travel lanes only. Transition lanes extending to and from the system interchanges would also be added to the mainline to manage merging and diverging traffic movements at these locations.

2.1.2.2 Interchange Types

Interchange types optimize the movement of traffic to and from the mainline. There are two types of interchanges associated with the project, system interchanges and local access interchanges. System interchanges provide for the movement of traffic from one fully access-controlled roadway to the next. Local access interchanges provide access from the fully access-controlled roadway to the local road system.

System interchanges are provided when two fully access-controlled facilities connect. For the EO-WB project, there are four locations where this occurs including:

- Elgin O'Hare corridor and I-290
- Elgin O'Hare and West Bypass corridors
- West Bypass corridor and I-90
- West Bypass corridor and I-294

The location of the local access interchanges was determined in Tier One. The locations were determined based on prevailing policy (i.e., crossing state routes are served by an interchange), traffic demands to and from an area, and stakeholder input. Other factors control the location of local access interchanges such as spacing between interchanges (the standard practice is a minimum one-mile spacing, which minimizes weaving conflicts on the mainline caused by on/off vehicle movement). There are 16 locations proposed for local service interchange improvements including:

- Improving existing interchanges along the Elgin-O'Hare Expressway (at Gary Avenue, Springinsguth Road/Irving Park Road [IL 19], Wright Boulevard, Roselle Road, and Meacham Road).

- Providing new interchanges along the proposed extension of the Elgin-O'Hare Expressway (at Rohlwing Road, Park Boulevard, Prospect Avenue/Arlington Heights Road, Wood Dale Road, and IL 83), and along the proposed West Bypass corridor (at Irving Park Road [IL 19], County Line Road/Franklin Avenue/Green Street, Pratt Boulevard/Devon Avenue, and Touhy Avenue).

- Adding ramps to existing partial interchanges at I-90 (at Elmhurst Road) and I-294 (at North Avenue).

The examination of the interchange alternates was grouped into nine geographic areas (see Exhibit 2-4A). In some areas, more than one interchange was grouped together at these locations; these interchanges are closely spaced where the operation of one affects the other. At each of the nine locations, different interchange alternates were examined, ranging from two or three to as many as seven.

The interchange alternates ranged from simple to more complex. The more complicated interchange types eliminated conflicting movements and better managed traffic. The evaluation and comparison of interchange alternates considered several different factors including geometric design (does it meet standards), LOS (does it provide an acceptable level of travel performance), impacts on environmental and social resources, cost, and constructability (can it be built).

The project's Geometric Working Group (GWG)[1] met regularly throughout the development process and provided guidance leading to the recommended alternates at each

[1] Geometric experts from the consulting industry, Illinois Tollway, IDOT, and FHWA (see Section 4).

location. Further, opportunities for community and stakeholder comment were provided throughout the process and offered valuable insights that helped shape the final interchange types.

Exhibits 2-4B to 2-4L depict the alternates considered for each geographic area, the preferred interchange alternate(s), and a comparison of key factors that assisted in the selection. The preferred alternates provided good traffic operations at a reasonable cost. In most cases, the environmental impacts were the same or similar, but in all cases where there was a difference, the alternate having the least environmental impacts was identified as the preferred. The footprints of the alternates vary only slightly from one to another in the nine locations. Design judgment was used in many instances to avoid resources or building impacts by slightly shifting the alignment, or using measures like retaining walls to minimize encroachment. Factors that were most influential in the evaluation of interchange types were traffic and operations performance.

In eight of the nine geographic areas, one alternate for each area has been recommended. For one geographic area, Area 8 (Elmhurst Road and I-90), two alternates remain under consideration. The alternates in Area 8 were presented in the Tier Two Draft EIS, and a preferred alternate has been identified in this document. For added details on the interchange type studies refer to the *Interchange Type Study Report,* dated December 2010 (IDOT, 2010a), and the *Interchange Type Study Report Addendum* dated December 2011 (IDOT, 2011a).

Once decisions about the interchange types were made, the mainline lane requirements could be finalized. The interchange types combined with the updated 2040 travel forecast were used to determine the added lane requirements such as auxiliary lanes between interchanges and transition lanes from interchanges extending onto the mainline section. Decisions were also made about the use of collector-distributor roads, where interchanges were too close and weaving movements needed to be better managed.

2.1.2.3 Drainage Facilities

Northeast Illinois has a long history of rigorous water resource and stormwater regulation. Adherence to drainage and water resource regulation requires land for implementation; thus, the right-of-way requirements for implementation of stormwater conveyance and detention, compensatory storage for displaced floodplains, and the use of best management practices have been accounted for in the refinement of the project footprint (see subsection 2.3.2.7).

2.1.2.4 Other Transportation Components

The engineering refinements in the project corridor have also required consideration of the other transportation and infrastructure needs that will be co-located in the project corridor. The space requirements for these facilities have been evaluated during the development of the Tier Two project footprint and have included crossing and connecting roads, transit facilities, bicycle and pedestrian facilities, and congestion management strategies. Each of the facility requirements are discussed in the following subsections.

Crossing and Connecting Roadway Improvements

A traffic analysis was conducted to study the effects of future traffic on the off-system routes in the vicinity of the proposed project. The travel forecasts for the project area showed that most of the arterial system would require no change in capacity improvements. Arterials in the immediate vicinity of the project, however, would require some capacity improvements to accommodate increased travel in close proximity to the interchanges, and along some sections of arterials. The extent of the improvements typically requires added travel lanes, turning lanes, and updated traffic signals. Added travel lanes commonly extend from the interchange areas for varying distances to accommodate the high traffic volumes at the interchange areas, which are then efficiently transitioned to the existing lane configuration. The added lane capacity was determined with the use of an ADT threshold criterion. The criteria are shown below for two conditions (see Appendix D):

- When existing arterial conditions are one lane in each direction, an ADT of greater than 9,500 would require added travel lanes.
- When existing arterial conditions are two lanes in each direction, an ADT of greater than 18,500 would require added travel lanes.

Table 2-1 lists the crossing and connecting road improvements, and the improvements are shown in Exhibit 2-5. Arterial improvements along Elmhurst Road and Touhy Avenue are more lengthy examples of capacity improvements that are warranted by the effects of the proposed project. Several intersection improvements are among the arterial improvements including IL 19/Barrington Road, IL 19/Wise Road, and IL 72/Elmhurst Road. The intersection improvements include additional left and right turning movements that enhance capacity (see subsection 2.3.2.3 for details). All of the arterial improvements have been included in the overall project footprint, accounted for in the project's right-of-way needs and costs, and evaluated for potential impacts to the environment discussed in Section 3.

TABLE 2-1
Local Cross Roads

Arterial	Existing Condition	Length of Improvements (feet)[a]	Improvement Description	Crossing Feature	Crossroad Over/ Under Highway
West Irving Park Road (IL 19)/ Barrington Road	4 through lanes with turn lanes	2,250 feet	Additional turn lanes at Barrington Road	NA	NA
West Irving Park Road (IL 19)/Wise Rd.	4 through lanes with turn lanes	1,350 feet	Additional turn lanes at Wise Road	NA	NA
Gary Avenue	1 lane eastbound and westbound ramps	1,360 feet	Lane added to both eastbound and westbound ramp	Elgin-O'Hare Expressway	Under
Springinsguth Road	4 through lanes interchange with turn lanes	1,800 feet	Grading and pavement improvements	Elgin-O'Hare Expressway	Under

TABLE 2-1
Local Cross Roads

Arterial	Existing Condition	Length of Improvements (feet)[a]	Improvement Description	Crossing Feature	Crossroad Over/ Under Highway
West Irving Park Road (IL 19)	4 through lanes with auxiliary and turn lanes	2,800 feet	Additional turn lanes at Springinsguth Road and frontage roads	Elgin-O'Hare Expressway	Under
Rodenburg Road	4 through lanes with turn lanes	1,400 feet	Grading and pavement improvements	Elgin-O'Hare Expressway	Under
Wright Boulevard	4 through lanes with turn lanes	900 feet	Grading and pavement improvements	Elgin-O'Hare Expressway	Under
Mitchell Boulevard	2 through lanes	600 feet	Grading and pavement improvements	Elgin-O'Hare Expressway	Under
Roselle Road	4 through lanes with auxiliary and turn lanes	1,300 feet	Reconfigured frontage road intersections and dual southbound left turn lanes at frontage road	Elgin-O'Hare Expressway	Over
Meacham Road/Medinah Road	4 through lanes with turn lanes	1,800 feet	Auxiliary lane added both northbound and southbound	Elgin-O'Hare Expressway	Under
IL 53 (Rohlwing Road)	4 through lanes with turn lanes; at-grade intersection	2,800 feet	New service interchange and frontage road intersections with auxiliary and turn lanes	Elgin-O'Hare Expressway	Over
Devon Avenue	4 through lanes	1,000 feet	Grading and pavement improvements	I-290	Over
Park Boulevard	2 lanes south and 4 lanes north of Thorndale Avenue; at-grade intersection with Thorndale Avenue	5,600 feet	Moved alignment and road extended to connect to Pierce Road; new turn lanes	Elgin-O'Hare Expressway	Under
Arlington Heights Road	2 through lanes with turn lanes; at-grade intersection	2,400 feet	Partial service interchange and frontage road intersections with turn lanes	Elgin-O'Hare Expressway	Under
Prospect Avenue	4 through lanes with turn lanes; at-grade intersection	2,400 feet	Partial service interchange and new frontage road intersections with auxiliary and turn lanes	Elgin-O'Hare Expressway	Under
Mittel Boulevard	2 through lanes with turn lanes; at-grade intersection	1,600 feet	Frontage road intersections with auxiliary lanes	Elgin-O'Hare Expressway	Under
Wood Dale Road	4 through lanes with turn lanes; at-grade intersection	2,300 feet	Full service interchange with auxiliary and turn lanes added	Elgin-O'Hare Expressway	Over
Lively Boulevard	2 lanes; offset at-grade intersection with Thorndale Avenue	700 feet	Extended under Elgin-O'Hare Expressway to eastbound frontage road	Elgin-O'Hare Expressway	Under

TABLE 2-1
Local Cross Roads

Arterial	Existing Condition	Length of Improvements (feet)[a]	Improvement Description	Crossing Feature	Crossroad Over/ Under Highway
IL 83 (Busse Road)	6 through lanes with turn lanes; at-grade intersection	3,100 feet	Full service interchange with auxiliary and turn lanes added	Elgin-O'Hare Expressway	Under
Supreme Drive	2 through lanes with turn lanes; at-grade intersection	900 feet	Frontage road intersections with turn lanes	Elgin-O'Hare Expressway	Under
York Road	4 through lanes with turn lanes	4,000 feet	Frontage road intersections and West Terminal access with turn lanes and median improvements	NA	NA
North Avenue	Existing Northwest Avenue intersection	2,100 feet	Reconfigured connector to Northwest Avenue and Lake Street	NA	NA
County Line Road (south of Grand Avenue)	2 through lanes; no access to/from I-294 between Grand Avenue and W Lake Street	3,500 feet	Moved alignment with southbound exit ramp from I-294	NA	NA
Northwest Avenue	2 through lanes	7,100 feet	Moved alignment	NA	NA
Grand Avenue	4 through lanes with turn lanes	1,200 feet	Grading and pavement improvements	I-294	Under
Franklin Avenue/Green Street	4 lanes west of County Line Road and 2 lanes to the east with turn lanes	6,900 feet	Split full service interchange with 4 lanes and additional turn lanes	NA	NA
Taft Avenue	2 through lanes; ends at Irving Park Road (IL 19) intersection (does not cross Bensenville Yard)	4,000 feet	New 4 lane Taft Avenue connector to Franklin Avenue	NA	NA
County Line Road (at Franklin Avenue)	2 through lanes with turn lanes; ends at Franklin Avenue intersection	700 feet	Intersection improvements with Franklin Avenue and new West Bypass corridor ramps	NA	NA
Irving Park Road (IL 19)	4 through lanes	2,100 feet	Full service interchange with additional turn lanes; roadway re-aligned with 6 through lanes	West Bypass	Under
Elmhurst Road (from Devon Avenue to Pratt Boulevard)	4 through lanes with turn lanes	3,400 feet	Partial service interchange with turn lanes	NA	NA
Touhy Avenue	6 through lanes	7,300 feet	Partial service interchange with turn lanes	West Bypass	Over

TABLE 2-1
Local Cross Roads

Arterial	Existing Condition	Length of Improvements (feet)[a]	Improvement Description	Crossing Feature	Crossroad Over/ Under Highway
Mount Prospect Road	4 through lanes with turn lanes; skewed intersection at Touhy Avenue	2,400 feet	Roadway re-aligned; improved Touhy Avenue intersection with turn lanes	NA	NA
Oakton Street	4 through lanes with turn lanes	1,400 feet	Additional auxiliary lane	NA	NA
Elmhurst Road (from Oakton Street to Touhy Avenue)	4 through lanes; partial cloverleaf interchange; 6 lanes through intersection at Elmhurst Road and Touhy Avenue	10, 950 feet	6 through lanes; diverging diamond interchange; intersection improvement at Elmhurst Road and Touhy Avenue	I-90	Over

Note: NA=Not Applicable

[a] Length of Improvement is total length of both sides of the mainline.

Transit Facilities

In Tier Two, transit improvements have focused on feasible service routes that would be co-located in the project corridor. Transit service has been considered along the Elgin O'Hare corridor, I-90 corridor, and the north leg of the West Bypass corridor that links I-90 service with the proposed West Terminal. The center piece of the transit plan is a new east-west dedicated transit corridor co-located in the Elgin O'Hare corridor right-of-way. The transit right-of-way would be sized to accommodate either BRT or rail. Transit stations are provided at regular intervals with station access and parking. The project footprint for the Elgin O'Hare corridor has been sized to include the transit reservation. Additionally, roadway features, such as crossing road bridges would also be sized to accommodate the future development of transit. The development of the transit service would be the responsibility of others (i.e., transit providers), and the timing of construction would be dependent on the availability of funds. The transit provider would be required to lay pavement or track depending upon the mode, build stations, build transit structures, pedestrian access and parking, signage, and signal controls for rail.

Several transit-related design decisions were evaluated in Tier Two. Among these include the location of transit along the Elgin O'Hare corridor, the I-90 corridor in the vicinity of the connection to the West Bypass corridor, the north leg of the West Bypass corridor, a re-examination of station locations, and extensions of transit service from the Elgin O'Hare corridor.

- **Location of Transit Service.** In the Elgin O'Hare corridor, three placement options for transit were considered: in the roadway median, to the side of the mainline, or along the frontage road system. The advantages and disadvantages of these locations are highlighted in Table 2-2.

TABLE 2-2
Transit Corridor Pros and Cons Analysis [a]

Evaluation Criteria	Transit Corridor Location Options		
	Frontage Roads	Median (from Tier One)	Along the Side
Level of Transit Service	Con - Transit operates in mixed traffic, therefore, increases travel time. Gaps in the frontage road system challenge the feasibility of this approach.	Pro - Transit operates efficiently in dedicated right-of-way and avoids conflicting traffic.	Pro - Transit operates efficiently in dedicated ROW and avoids conflicting traffic.
Right-of-way Costs	Pro - No right-of-way costs other than stations and transit parking.	Pro - Right-of-way provided within the roadway footprint except for transit parking.	Pro - Right-of-way provided within the roadway footprint except for transit parking.
Level of Pedestrian Access	Con - Non-pedestrian friendly access to stations or stops.	Pro - Pedestrian bridges would provide safe and comfortable access for pedestrians from points both north and south of the expressway.	Pro - Pedestrian bridges similar to those of the median alignment would be provided; however, longer walks would be required for pedestrians accessing platform from the opposite side of roadway.
Parking Availability	Neutral - The availability of space for parking is not affected by the alignment choice.		
Connections With Other Transit Services	Neutral - While there are small differences these differences are not important enough to allow for meaningful comparison between the alternatives.		
Modal Flexibility	Con - This alignment is not appropriate for any of the rail technologies, which require dedicated right-of-way.	Pro - This alternative would allow for any of the transit modes that are being considered (BRT, light rapid transit [LRT], Heavy-rail Rapid Transit [HRT], and Diesel Multiple Unit [DMU]).	Pro - This alternative would allow for any of the transit modes that are being considered (BRT, LRT, HRT, and DMU).

[a] *Source:* Vlecides-Schroeder Associates, Inc., 2010.

The analysis concluded with a determination that the median location would be best in the Elgin O'Hare corridor because it ensures the highest potential level of service with a fully dedicated transitway. Other factors that contributed to this conclusion included equity in access from both the north and south. The median location is also beneficial to the roadway design by maintaining roadway symmetry that minimizes alignment issues and avoids conflicts with crossing roads.

In Tier Two, the location of transit service along the north leg of the West Bypass corridor extending to the proposed West Terminal was re-examined. In further analysis, it was determined that transit service be moved from a median location to the east side of the roadway to reduce overall roadway costs. The roadway alignment and its cross-section were configured to provide sufficient space for a transit facility (either BRT or rail transit) directly east of the north leg of the West Bypass corridor alignment.

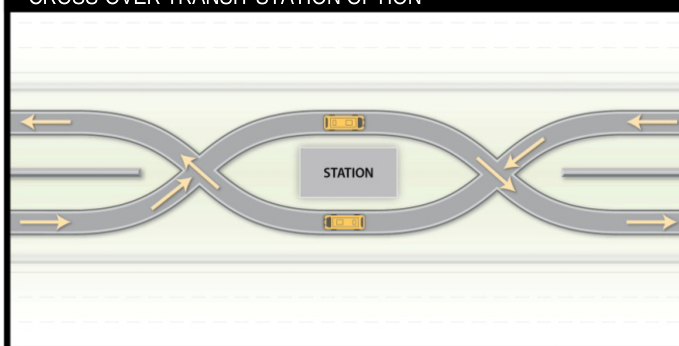
Consistent with the vision of the I-90 Transit Task Force and Corridor Planning Group, the EO-WB project considered the eventuality of a long-term transit facility in the I-90 corridor. Compliant with prior studies, transit is planned for a median location along I-90.

- **Right-of-Way Requirement for Transit Service.** Right-of-way requirements for transit have been based on prior studies in the project area sponsored and endorsed by Metra (regional commuter rail provider) (Metra, 2003). The findings of this work show that a minimum requirement of 35 feet (STAR Line criteria) would satisfy the requirements of transit needs (see Exhibit 2-6). At transit station locations, the right-of-way would be expanded to a minimum of 58 feet (see Exhibit 2-6). The Illinois Tollway will advance work for the rehabilitation of I-90 and the EO-WB project, with a requirement that right-of-way for transit will be provided consistent with the Star Line criteria (35 feet as a minimum). It is anticipated that some flexibility will be needed in the final dimension based on roadway geometric constraints, but as a minimum, all bus and rail options would be accommodated.
- **Transit Station Locations.** Transit stations were identified in Tier One at six locations: West Terminal, near Wood Dale Road, Hamilton Lakes' Development, IL 53, Roselle Road, and near Schaumburg Metra station. Transit station locations were reviewed and refined in Tier Two resulting in changes at three locations. Station relocations at the Wood Dale Road and Hamilton Lakes' Development locations involved a minor shift to the west, and the station location at IL 53 required consideration of additional design alternates. In the case of the Hamilton Lakes' Development station, the shift was more proximate to the center of activity, provided improved passenger access, and was closer to parking planned for the area. For the Wood Dale Road station, the shift to the west improved access to planned parking. In both cases, pedestrian access would be provided from both sides of the project corridor.

  The IL 53 station was originally sited to accommodate a service area to the south and the transfer of patrons coming from the west that desire to use the service routed north along IL 53 to Woodfield Mall. The original configuration included both a station and dedicated bus ramps from the median to access IL 53. The combined width of these facilities would measure over 150 feet. The sizable median dimension for station and ramps challenged cost-effective roadway design solutions in this area. The process of refining the roadway section in the vicinity found that a median width of about 100 feet would be preferable. The narrower median would accommodate either a station or the dedicated ramps to IL 53, but not both. Coordination with Regional Transportation Authority (RTA) followed to determine the best course of action. Four alternates were examined and presented to the RTA for consideration: Alternate 1 with no station and no ramps, Alternate 2 with station only, Alternate 3 with ramps only, and Alternate 4 with station and ramps (CH2M HILL, 2011). Both Alternates 2 and 3 could be provided within the 100-foot median. In both cases, the transfer from the west to the north would occur at the Hamilton Lakes' Development station causing minor out-of-direction travel. Under Alternate 2, buses would access IL 53 by leaving the median at Park Boulevard and utilize the mixed travel lanes to exit the mainline at IL 53. The return movement from the IL 53 service would be accomplished via the on-ramp at IL 53 and merging to the median. In discussions with the RTA, it was concluded that a median width of about 100 feet would provide a workable area for future transit infrastructure. Further, the agency preferred to defer the decision regarding either Alternate 2 (a station) or Alternate 3 (ramps) at IL 53, and revisit that decision at a later date when both a transit provider and funding for transit service are identified in the Elgin O'Hare corridor. Parking would be provided at stations and would range from 220 to 630 parking spaces (Vlecides-Schroeder Associates, Inc., 2010). The parking area requirements and locations have been included in the project footprint; therefore, the potential impacts to the environment have been considered as part of this analysis (see Exhibit 2-7).

At all station locations, the option to accommodate buses with doors on right-side only, doors on left-side only, or buses equipped with both left and right-side doors will be preserved. The conventional door arrangement for buses is right-side only; thus, for stations located in the median, a counterflow arrangement would be required at the stations for passenger entrance and exit. In this case, for buses with right-side doors only, buses would cross-over in advance of the station (see Figure 2-2). The median right-of-way would be sufficient to allow for this design solution. Buses equipped with left-side doors are unconventional, but would function in the Elgin O'Hare corridor without the need for the counterflow arrangement. However, buses equipped with left-side doors only would not function well when buses would exit the median to serve the north-south service along IL 53 to and from the Woodfield Mall area. Alternatively, buses equipped with both left- and right-side doors would function well on both the median route and the IL 53 route; however, two-sided door buses are costly and would reduce the overall capacity of the bus. As of October 2012, a decision on the actual bus configuration has been deferred to a future transit provider; therefore, the options discussed above will remain open.

FIGURE 2-2
CROSS-OVER TRANSIT STATION OPTION



- **Extended Transit Service.** Refinements in Tier Two also examined extending transit service from Schaumburg to Hanover Park, and express bus service from the proposed West Terminal complex to the Rosemont Chicago Transit Authority (CTA) station. Service to the west and east of the project limits was also considered.

  On the west, a study investigated the extension of BRT and rail service to the Hanover Park Metra station from the Schaumburg Metra station (a distance of two miles). Over 10 alternate routes were examined between Hanover Park and Schaumburg for both BRT and rail options. Two alternate routes were suited to both BRT and rail service, and the others would be exclusively BRT routes. The cost of the extended service was sizable, ranging from about $43 million to over $50 million, for the basic infrastructure (not including rolling stock). The travel time provided by the service would be approximately four minutes or represent about a four-minute savings over alternate modes (i.e., shuttle bus in mixed traffic) (Vlecides-Schroeder Associates, Inc., 2010).

In examining these routes, environmental issues were prominent along the more favored route (i.e., the transit corridor adjacent to Metra's existing Milwaukee District West railroad). Based on field work completed during the summer of 2011, there are several wetlands, prairie areas, and one river crossing (West Branch DuPage River) located within the transit alternative study corridor.

As described above, several factors have caused the service (BRT/rail) from Schaumburg to Hanover Park to be deferred from further consideration. Among the reasons include the high cost of transit service for a relatively small savings in travel time, and impacts to high quality wetlands, prairies, threatened/endangered species, and the West Branch DuPage River. This action does not preclude reconsideration of this service at a later date. In lieu of BRT or rail service, bus shuttle service would be used to connect the Schaumburg Metra station to the Hanover Park Metra station.

On the east, express bus service was studied from the proposed West Terminal to the Rosemont CTA Blue Line station. This service is viewed as interim until such time that transit is extended across the airfield to the proposed West Terminal. As an interim service, it would provide connectivity for commuter and work trips between the project area and downtown Chicago and airport-related businesses. Alternative routes were examined around both the north and south ends of the O'Hare Airport. Routes to the north were found to be slower and provided less reliable service due to numerous signals and more out-of-direction travel. The route to the south was favored because of shorter travel times and the reliability of travel speeds. This route would use the south leg of the West Bypass corridor to Irving Park Road (IL 19), travel east on Irving Park Road (IL 19) to Mannheim Road, north on Mannheim Road to Balmoral Avenue, and then to the Rosemont CTA Blue Line station. The service would operate as express bus service between the proposed West Terminal and the Rosemont CTA Blue Line station with travel frequencies of every 15 minutes during peak period. No special infrastructure requirements are anticipated for this service.

The bus service to both Hanover Park and to the Rosemont CTA Blue Line station are described further in subsection 2.3.2.8.

Bicycle and Pedestrian Facilities

Bicycle and pedestrian accommodations are an integral part of a multimodal project. The nonmotorized transportation needs and appropriate accommodations were analyzed as part of the Tier One and Tier Two process. The analysis of bicycle and pedestrian requirements are in conformance with IDOT's Complete Street's Policy, and were fully coordinated with community interests and bicycle organizations. The overall philosophy for this component of the project is to provide new east-west facilities to improve connectivity in that direction and with other existing north-south bicycle and pedestrian facilities in the area (see subsection 2.3.2.8). Because there is an abundance of north-south facilities, special care was given to maintaining the existing connectivity across the Elgin O'Hare corridor.

New bicycle and pedestrian facilities are planned along non-access-controlled facilities such as frontage and arterial roads. For the east-west corridor, a bicycle and pedestrian trail is proposed adjacent to the frontage road system, and would rely on local trail systems when it is absent. Existing north-south trails that cross the Elgin O'Hare corridor would be accommodated into the new crossing road facility design to maintain trail continuity. At locations where a state route crosses the Elgin O'Hare corridor, bicycle and pedestrian facilities would be provided at the crossing either over or under the mainline. These bicycle and pedestrian improvements would be developed in conjunction with the arterial improvements at these locations. The shared use path would have a 10-foot cross-section and would be located on one side of the crossing road. The connection from the crossing to the nearest local and community path would be the responsibility of local jurisdiction.

The EO-WB project has preserved the space for planned bicycle and pedestrian facilities. Details regarding cost, maintenance, and jurisdictional responsibilities for proposed pedestrian and bicycle facilities within the Tier Two Build Alternative will be determined during future final design and in coordination with local jurisdictions.

Congestion Management Process Strategies

The proposed project would include strategies designed to add efficiencies to travel and reduce single-occupancy vehicles. The strategies that aid travel efficiency can be added to the system without causing the need for additional right-of-way. Two types of strategies are proposed, transportation system management (TSM) and travel demand management (TDM) strategies. The TSM strategies are aimed at improving the operating efficiency of the system and include variable message signage, traffic incident management, signal pre-emption for emergency vehicle or buses, photo enforcement cameras, interconnected traffic signals on arterial streets, etc. The TDM strategies are aimed at changing driver behavior in order to reduce traffic and congestion, and to improve air quality. These strategies include toll pricing strategies, high occupancy vehicle lanes, more transit opportunities, better connectivity to all transit modes, and parking facilities that serve transit users as well as carpools and vanpools.

2.1.2.5 Summary

The evaluation of all of the design factors culminated in the Tier Two Draft EIS with the best arrangement of facility type (toll road) and design features that together form a complete Build Alternative.

At two locations, more than one design alternate remained at the Draft EIS stage of the NEPA process:

- Two interchange alternates remain at the Elmhurst Road and I-90 interchange.
- Four intersection alternates remain at the IL 72 and Elmhurst Road intersection.

The comments received on the Tier Two Draft EIS included suggestions for several design refinements. In consideration of those suggestions, several revisions occurred and have now been included in the Build Alternative. The project footprint reflects these changes, and the environmental impacts detailed in this Tier Two Final EIS have been appropriately updated. The design refinements are described in the following subsection, and a detailed description of the alternatives follow.

2.2 Design Refinements since Tier Two Draft Environmental Impact Statement

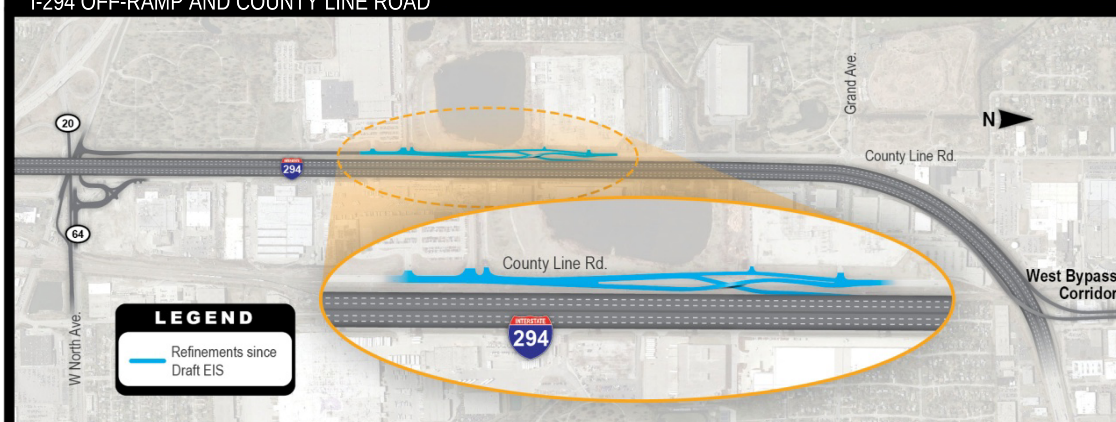
The comments received on the Tier Two Draft EIS prompted several design features to be revisited. In several cases, the comments were determined to warrant changes to the engineering plans (see Appendix B for additional details regarding comment letters and IDOT responses). Changes included revisions to roadway features and property access. Each of the major features that were re-evaluated is briefly discussed in the following subsections.

2.2.1 I-294 Off-Ramp Location to County Line Road

The Maywood Sportsmen's Club provided a comment letter to IDOT and suggested that the off-ramp from I-294 to County Line Road be relocated to avoid safety issues that include: turning vehicles to and from their facility, water quality concerns, displacement of club facilities, and lighting issues both from their facility and oncoming vehicle headlights. These concerns required a series of seven meetings with the Maywood Sportsmen's Club, City of Elmhurst, Village of Northlake, Illinois Tollway, and others to find an acceptable solution. Five alternates were developed during the course of these discussions that would address the concerns of the Maywood Sportsmen's Club. The placement of the ramp had to be sensitive to the maintenance of travel performance on the mainline of I-294. Movement of the ramp exit too far north would result in a poor weaving section between the connection of the West Bypass corridor with I-294 near Grand Avenue, and the off-ramp from I-294 to County Line Road. A poor weaving section would generate traffic turbulence resulting in slower mainline speeds and congestion and operational issues. The objective in this analysis was to avoid proposing a new ramp location with unacceptable design conditions, maintain safe ingress and egress to the Maywood Sportsmen's Club, manage stormwater runoff to avoid lake contamination, and to provide access to the second largest employer (McMaster-Carr) in Elmhurst from the ramp.

In the review of the alternates by the stakeholders, it was agreed that Alternate B would best meet the objectives outlined above (see Figure 2-3).

FIGURE 2-3
I-294 OFF-RAMP AND COUNTY LINE ROAD



In further evaluation of the preferred location, the Maywood Sportsmen's Club requested a screen or wall along their property line facing County Line Road to reduce headlight glare into their facility. The preferred arrangement for the ramp has been relocated to reduce the concerns of the Maywood Sportsmen's Club and includes the sight screen. The sight screen is approximately 1,100 feet in length, and will likely be a post and concrete panel construction. Drainage located along the Maywood Sportsmen's Club property will be a closed system comprised of a piped system that would be conveyed to open channel drainage located in the in-field areas of the roadway and conveyed to nearby stream channels. The closed drainage system (stormwater pipe system) would be extended beyond the south end of the sight screen for about 200 feet to the entrance of the club. This feature would capture roadway runoff that would otherwise drain to the lake. With the planned drainage system, all roadway runoff would be directed away from the Maywood Sportsmen's Club lake. In a meeting on June 19, 2012, the stakeholders acknowledged agreement with the ramp arrangement shown in Figure 2-3. The final arrangement for the ramp would have no impact to wetlands, waters, threatened or endangered species, or cultural resources. Some additional land acquisition (0.65 acre) and tree displacements are required.

2.2.2 Frontage Road Design between IL 83 and York Road

Both the Village of Bensenville and Elk Grove Village suggested that the frontage road system between IL 83 and York Road be revised (see Figure 2-4). They indicated that the proposed arrangement was circuitous, added to driver confusion, and impaired access to industrial and commercial development in the vicinity. The primary issue was the frontage road cross-over from the south side of the mainline to the north side at Supreme Drive. In further review of the arrangement, the frontage road was extended approximately 1,500 feet to IL 83 on the south side of the mainline. The extended frontage road from Supreme Drive to IL 83 would be one-way in the eastbound direction. The arrangement still requires the cross-over for west bound travel on the frontage road for connection with IL 83. However, the extension provides greatly improved access to properties between IL 83 and Supreme Drive on the south side of the mainline. The revised frontage road system remains in the original footprint of the project; therefore, no additional right-of-way is needed, no environmental resources are impacted, and there are no displacements of residential or commercial properties required. The at-grade railroad

FIGURE 2-4
FRONTAGE ROAD BETWEEN IL 83 AND SUPREME DRIVE

crossing by the frontage roads will require review and approval from the Interstate Commerce Commission (ICC).

2.2.3 Internal Circulation Road in Hamilton Lakes' Development

The Village of Itasca and Hamilton Lakes' Development have been involved in the proposed EO-WB project from its inception. They have commented frequently on design aspects and, in particular, access to and from the community and a major development (Hamilton Lakes' Development) near the I-290 and Elgin O'Hare corridor interchange. During the Tier Two process, many access refinements have been considered for properties near the I-290 and Elgin O'Hare corridor interchange. During the review of the 2040 roadway plans, the Village of Itasca and Hamilton Lakes' Development requested an additional design refinement that would improve traffic circulation at the interchange area, and within the Hamilton Lakes' Development with the addition of an approximately 1,000-foot roadway section connecting Park Boulevard to Pierce Road (see Figure 2-5). This new roadway section would improve the existing traffic distribution into and through the development, and would also provide improved traffic flow to future development planned within the site. The traffic movement at the intersection of Park Boulevard and Pierce Road along with the new extension would warrant a signal. The added roadway would not impact any natural resources nor displace any residential or commercial structures.

FIGURE 2-5
INTERNAL CIRCULATION ROAD IN HAMILTON LAKES' DEVELOPMENT

2.2.4 Intersection Design at IL 72 and Elmhurst Road

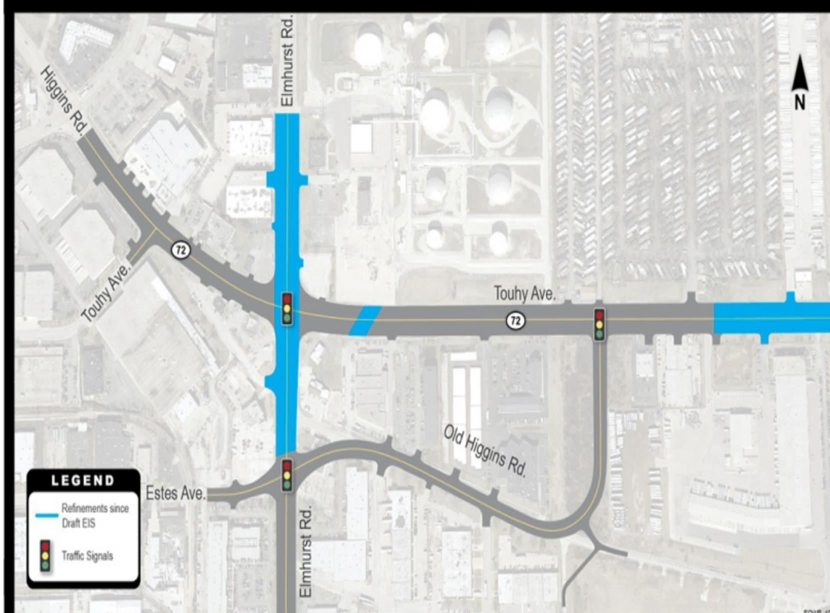
The intersection at IL 72 (Higgins Road/Touhy Avenue) and Elmhurst Road would be impacted by EO-WB related traffic and requires improvements to accommodate future traffic. As shown in the Tier Two Draft EIS, four design alternates were considered to improve future conditions including:

- Intersection Widening Alternate

- Continuous Flow Intersection (CFI) Alternate
- Quadrant Bypass (Old Higgins Road) Alternate
- Quadrant Bypass (Greenleaf Avenue) Alternate

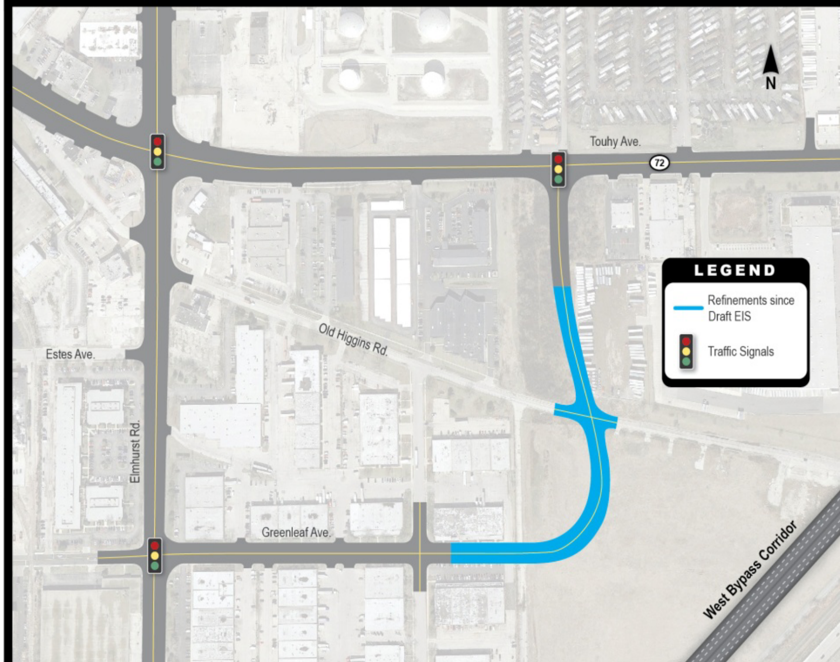
With the close of the public comment period on May 14, 2012, stakeholders requested additional study regarding the potential solutions at this location. Two alternates were re-evaluated including the Quadrant Bypass (Old Higgins Road) and the Quadrant Bypass (Greenleaf Avenue). The refinements included design measures to improve overall traffic performance and adjustments that would reduce environmental issues identified during earlier studies.

FIGURE 2-6
QUADRANT BYPASS (OLD HIGGINS ROAD) ALTERNATE



The Quadrant Bypass (Old Higgins Road) Alternate includes several new features (see Figure 2-6). First, the configuration of the existing IL 72 and Elmhurst Road intersection would be generally maintained; however, four travel lanes are provided for northbound travel, adding to the efficiency of this travel movement. Additionally, Old Higgins Road would be realigned at the connection with Elmhurst Road. These modifications would eliminate one turn phase at the existing IL 72 and Elmhurst Road intersection and provide more green time to critical movements. In addition, the realignment of Old Higgins Road provides added spacing between the intersections of IL 72 and Elmhurst Road and Old Higgins Road and Elmhurst Road with the objective to reduce northbound intersection queues from spilling through the Old Higgins Road and Elmhurst Road intersection. This alternate would only impact one business property (displacing a vacant building), and would impose minor constraints to business access in the southeast quadrant of the IL 72 and Elmhurst Road intersection (i.e., right-in/right-out). Although, access would be slightly impaired for several businesses from IL 72, each of these properties has full access from Old Higgins Road.

FIGURE 2-7
QUADRANT BYPASS (GREENLEAF AVENUE) ALTERNATE



The Quadrant Bypass (Greenleaf Avenue) Alternate includes a realignment of the bypass to avoid displacement of the Rogers property, and reduction of the width of Greenleaf Avenue near the connection with Elmhurst Road (see Figure 2-7). These modifications avoid the displacement of six businesses, and further reduce business impacts at the intersection of Greenleaf Avenue and Elmhurst Road. The narrowed right-of-way reduces impact to business parking and traffic circulation within adjacent business properties. Although, the displacement of the Rogers property is avoided, some of the tenant parking would be impacted. Adjacent undeveloped properties would be purchased for replacement parking. This concept would also require the closure of several driveways near the Greenleaf Avenue and Elmhurst Road intersection. Impacts to natural resources would consist of 0.25 acre of low quality wetland.

The evaluation of the two remaining intersection alternates concluded that the Quadrant Bypass (Old Higgins Road) Alternate is the preferred alternate. This alternate provides an acceptable level of traffic performance for all critical movements, and exhibits comparatively fewer impacts including: less right-of-way requirements, fewer displaced business parking spaces, less disruption to business property ingress and egress, and fewer natural resource impacts. Additionally, this alternate, unlike the Quadrant Bypass (Greenleaf Avenue) Alternate, would not involve O'Hare Airport's Runway 9L-27R RPZ. The Quadrant Bypass (Greenleaf Avenue) Alternate would require properties in the RPZ for replacement of business parking, which would require FAA approval for the release of the property for non-aviation uses. For the reasons stated above, the Quadrant Bypass (Old Higgins Road) Alternate is preferred.

Presently, the interchange improvement at the Elmhurst Road and I-90 interchange is planned early in the phasing, and the north leg of the West Bypass corridor is planned late in the phasing. This sequence causes traffic impacts to occur at the intersection of IL 72 and Elmhurst Road that require improvements to be operational by 2022. The construction phasing for the overall project is continually being refined and should adjustments in phasing occur, then further discussions regarding the scope of the intersection improvement may be initiated.

2.3 Description of the Alternatives

2.3.1 No-Build Alternative

The No-Build Alternative assumes improvements that are representative of current program funding levels, and as such, consist of transportation improvements that include roadway capacity improvements, intersection improvements, roadway safety improvements, and transit improvements. The No-Build Alternative, however, does not include the major transportation improvements considered in this study and is not consistent with the purpose and need for this project.

The development of the No-Build Alternative was fully coordinated with CMAP, the regional metropolitan planning organization, and other transportation providers. The transportation improvements in the No-Build Alternative include those projects within the project area that are identified and conformed in CMAP's *GO TO 2040 Comprehensive Regional Plan* (except the EO-WB project) (CMAP, 2010) and IDOT's *Fiscal Year 2012-2017 Statewide Transportation Improvement Program* (IDOT, 2011c). Through coordination with CMAP, it was agreed that improvements identified in the *GO TO 2040 Comprehensive Regional Plan* that are outside of the project area would be included in the development of the 2040 travel forecasts for the No-Build Alternative. The No-Build Alternative also recognizes the federally-approved OMP improvements, including the West Terminal complex, to be completed within the planning horizon.

Consistent with NEPA and FHWA guidance, an alternative-specific 2040 travel forecast was developed for the No-Build Alternative. An extensive analysis of the future population and employment was conducted as a key input to the No-Build travel forecast. This process included a detailed analysis that estimated future land use development and the associated population and employment for the No-Build Alternative. With the limited transportation improvements in the project area under the No-Build Alternative, the competitive position of the area is affected, and the corresponding 2040 employment and population estimates are 41,000 and 5,000 less than the Build Alternative, respectively.

The transportation improvements for the No-Build Alternative represent approximately 67 lane miles of additional capacity and eight miles of rehabilitation improvements to roadways, four intersection improvements, and five bus and rail transit improvements. Some of the key improvements include capacity improvements on I-90, Meacham Road, IL 53 (Rohlwing Road), and Mannheim Road; intersections improvements at York Road and Irving Park Road (IL 19), Wood Dale Road and Irving Park Road (IL 19); and transit improvements on the Union Pacific - Northwest (UP-NW) railroad (see Exhibit 2-8). The No-Build Alternative will be carried forward throughout the NEPA process to serve as the baseline for comparing the performance of the Build Alternative.

2.3.2 Build Alternative

The Build Alternative will be developed as a toll road that consists of 16 miles of new toll road, about nine miles of improvements to existing toll roads (i.e., I-294 and I-90) and freeway (i.e., I-290), and 16 miles of supporting arterial improvements (see Exhibit 2-9). Companion to the mainline improvements are four system interchanges, 16 local access interchanges, and intersection improvements on nearby arterials. Provisions for transit are incorporated into the median for a portion of the project, and bicycle and pedestrian facilities have also been integrated. In addition to important traffic benefits like increased mobility and accessibility, the project would enhance the competitive position of an extensive commercial and industrial area. The project is fully consistent with the purpose and need and includes many mitigation measures that avoid and minimize impacts, replaces wetland loss, compensates floodplain loss, improves stormwater quality with best management practices, and other measures to protect the environment.

2.3.2.1 Fully Access-Controlled Highway

The project would be developed as a fully access-controlled highway that would be tolled. The purpose of controlling access on any roadway is to maintain or enhance safety and travel efficiency. The mainline improvements under the EO-WB project are planned as fully access-controlled, where access to the toll road corridor is provided solely through interchanges. Prevailing IDOT and Illinois Tollway access-control standards were applied along new toll road corridors, and current access limits were maintained along the existing Elgin O'Hare corridor. Stakeholder input was considered when making decisions to modify or close existing access, the objective being to provide reasonable access-control while minimizing impacts to existing land uses. Access-control plans will be further refined in advanced steps of intersection and interchange design studies. The fully access-controlled portion of the project has two main components, the east-west component known at the Elgin O'Hare corridor, and the north-south component known as the West Bypass corridor.

The Elgin O'Hare corridor is about 10 miles in length, extending from Gary Avenue on the west to the western edge of O'Hare Airport on the east. The West Bypass corridor would extend from I-90 near the Elmhurst Road interchange on the north to I-294 on the south, a distance of about 6.2 miles. Lane additions would be required on I-90, I-290, and I-294 extending from the system interchange for purpose of transitioning merging and diverging traffic. The Elgin O'Hare corridor would have three basic lanes in each direction with added auxiliary lanes, and the West Bypass corridor would have two basic lanes in each direction with added auxiliary lanes in high traffic areas.

A portion of the Elgin O'Hare corridor (the Elgin-O'Hare Expressway from Gary Avenue to I-290, about five miles) is an existing expressway consisting of two-lanes in each direction. Approximately 80 percent of the cost of the expressway was constructed with federal funding. The conversion of the freeway for use as a toll road and conveyance of property will be accomplished with the use of a Memorandum of Understanding (MOU) between FHWA, IDOT, and Illinois Tollway. The MOU will be executed after the ROD is signed.

There would be 73 new bridges required in numerous locations to accommodate stream crossings, railroad crossings, and crossing roadways. Also, depressed roadway sections are required at two locations including a location under the Bensenville Yard, and one location under the Canadian Pacific (CP)/Union Pacific (UP) railroad tracks along the western edge of O'Hare Airport. The West Bypass corridor crosses the west end of the Bensenville Yard and would be placed below grade to avoid airspace violations in connection with proposed Runway 10R-28L. The roadway would be depressed while the yard tracks would be bridged over the mainline. A detailed construction staging plan is being prepared in cooperation with the CP railroad that would provide uninterrupted railroad operations during construction. The mainline crossing under the CP/UP railroad tracks is optional depending on the timing of the decommissioning of Runway 14R (see subsection 2.3.2.6).

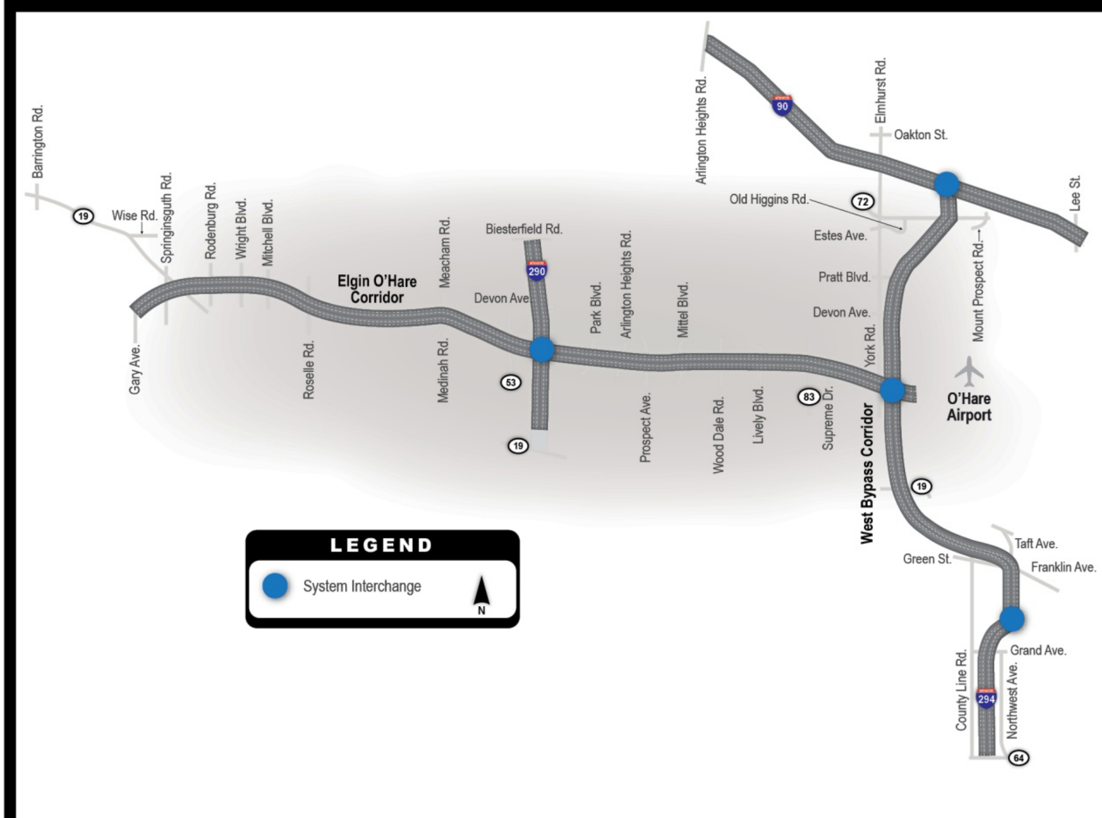
2.3.2.2 System Interchanges

System interchanges carry traffic between connecting high-speed roadways. These types of interchanges are characterized by higher speed ramps that allow efficient travel between access-controlled roadways.

In the project area, system interchanges would be required at the following four locations (see Figure 2-8):

- Elgin O'Hare corridor and I-290
- Elgin O'Hare and West Bypass corridors
- West Bypass corridor and I-90
- West Bypass corridor and I-294

FIGURE 2-8
SYSTEM INTERCHANGE LOCATIONS



The solutions at each location considered a range of alternates, and each were evaluated based on a number of factors including traffic operations, roadway geometry, environmental impacts, and cost. The evaluation of the interchange alternates led to the retention of one interchange type at each of the four locations (see Figures 2-9 to 2-12).

Elgin O'Hare Corridor and I-290

The Elgin O'Hare corridor and I-290 interchange complex would extend from Meacham Road on the west, through the I-290 interchange, to Prospect Avenue on the east. This is a complex interchange system, with both system and local connections provided. Numerous design alternates were developed and evaluated at this location based on the complex access requirements, changing roadway geometric conditions, and input from community interests. Initially, six design alternates were developed ranging from less complex to more complex (IDOT, 2010a) (see subsection 2.1.2). An important factor in their evaluation has been travel demand forecasts, and recently the 2040 travel forecasts were updated with a toll road condition. The consideration of tolling effectively lowers traffic on the proposed improvements; thus, each of the alternates was re-evaluated using these latest traffic data. The results showed that Alternates 1, 3, 4, 5, and 6 and their complex features were not necessary to satisfy the updated travel demand. This conclusion led to a re-evaluation of Alternate 2, which represented an efficient, cost-effective solution for the area. The re-evaluation spawned many new variants that ultimately lead to a single recommended interchange type at this location – Alternate 7.

As planned (Alternate 7), the interchange would provide for movements in all directions, with flyover ramps in two directions and loop ramps in two directions. Movements to and from the mainline system via local roads are described as follows:

- Direct movements from I-290 to IL 53 would not be provided, rather, the traffic would be required to use a Texas U-turn[2] at Meacham Road to return to IL 53 via a frontage road.
- Frontage roads would be provided on both sides of the mainline between Meacham Road and IL 53 to accommodate access to local development as well as local traffic movements in this area.
- Access to Park Boulevard, a current access point along existing Thorndale Avenue, is provided from the mainline system from the north, south, and west. Park Boulevard provides important access to the community of Itasca's residential and commercial areas. Access from the east would be provided at the Prospect Avenue interchange. Access from the Hamilton Lakes' Development to the mainline system would be provided in all directions from the Prospect Avenue interchange. Direct access from the development to the west and the south would also be provided from a slip ramp from Park Boulevard's circulation road.
- Access to and from the residential development in the southeast quadrant would be maintained. Direct access to the residential development from the I-290 interchange would be provided from the north, south, and west at Park Boulevard. Travel from the west would exit at Prospect Avenue. Access from the development to the mainline system would be provided to the south and west from Park Boulevard, to the west via a frontage road to the Prospect Avenue interchange, and to the north via an on-ramp at Arlington Heights Road.

[2] Texas U-turns are commonly used in conjunction with one-way frontage road pairs. At Meacham Road, the Texas U-turn would allow for return movements and avoid the need to travel through a signalized intersection.

Simulated traffic analyses have been conducted for Alternate 7, and an acceptable level of service is achieved with some added auxiliary lanes to manage weaving movements that extend from the interchange along I-290 to Biesterfield Road on the north and to the CP railroad on the south to Biesterfield Road, a combined distance of 2.1 miles.

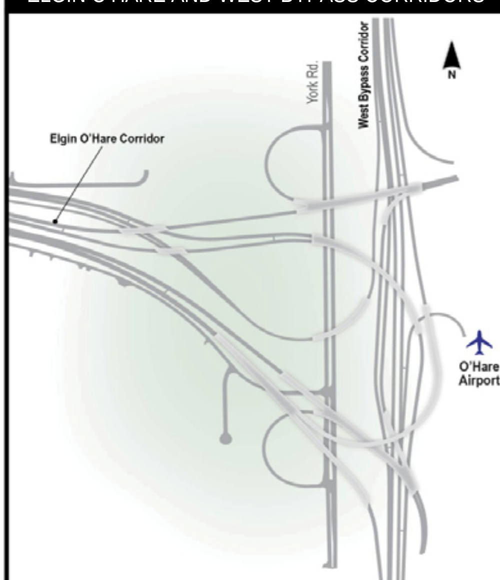
The development of Alternate 7 has been the product of many discussions and refinements. Alternate 7 would achieve a recommended solution that captures all the objectives of acceptable traffic operations; improve access to and through the area; produce cost savings with the use of a loop ramp rather than a flyover in one direction; and would be designed with the mainline to traverse under IL 53 rather than over.

FIGURE 2-9
ELGIN O'HARE CORRIDOR AND I-290

Elgin O'Hare and West Bypass Corridors

The Elgin O'Hare and West Bypass system interchange provided a unique design challenge due to the horizontal and vertical airspace constraints when building near O'Hare Airport. The selected interchange form would consist of a compact, three-level system interchange between the Elgin O'Hare and West Bypass corridors. The design features of the interchange were carefully selected to minimize encroachment on critical runway approach and departure areas and the planned footprint of the proposed West Terminal. The system interchange arrangement would emphasize the eastbound movement to the proposed West Terminal, with a single diverge point for the eastbound Elgin-O'Hare Expressway to West Bypass movements (northbound and southbound), approximately 2,000 feet west

FIGURE 2-10
ELGIN O'HARE AND WEST BYPASS CORRIDORS



of York Road. Refinements from earlier concepts have been introduced to reduce cost including the use of a flyover ramp instead of a tunnel for the north to west movement through the interchange. In addition, loop ramps on the west side of York Road would provide a direct connection between York Road and the proposed West Terminal area.

West Bypass Corridor and I-90

In the north, the system interchange between the West Bypass corridor and I-90 would be located just north of MWRDGC basins and directly east of the local access interchange improvement at I-90 and Elmhurst Road. The design layout would primarily occupy the space currently utilized for a toll road oasis. Four alternate concepts were evaluated at this location, three Y- type interchange forms and one Trumpet interchange form. Each of the alternates provides movement in three directions (east, west, and south). In the examination of the alternates, the 2040 travel forecasts allowed a more cost effective design while still maintaining accepted levels of service. The recommended alternate (Alternate 4) would achieve a cost-effective solution with the use of a loop ramp in one direction rather than a flyover ramp.

FIGURE 2-11
WEST BYPASS CORRIDOR AND I-90

A feature of the interchange design includes construction of a roadway embankment through a portion of the MWRDGC flood control reservoirs near Touhy Avenue. The MWRDGC has reviewed the concept and agrees with its implementation provided the functionality of the reservoir is maintained during and after construction. The Illinois Tollway and IDOT provided a construction phasing plan related to the impact on MWRDGC facilities demonstrating that the storage capacity of the facilities would be equal to or greater than the existing storage capacity during and after the construction period. A further benefit of the Trumpet design would be a reduction in impact to Majewski Athletic Complex on the north side of I-90. Lane additions are required along I-90 to the west and east in order to manage weaving movements to and from the interchange area. These improvements would extend to Arlington Heights Road on the west and to Lee Street on the east, a combined distance of 5.4 miles.

West Bypass Corridor and I-294

Both Y-type and Trumpet interchange forms were examined for this location. The Y-type interchange was preferred to the Trumpet interchange at this location because of less impact to surrounding development. In subsequent refinement of the Y-type interchange, retention of the ramps to and from the north were re-evaluated. The analysis showed that northbound movement to I-294 can be accomplished by other relatively convenient routes (i.e., north on proposed Taft Avenue to Irving Park Road [IL 19] and the Irving Park Road [IL 19] interchange at I-294). Thus, the ramps to and from the north were removed from the design, leaving the interchange with ramps to and from the south only. This refinement would reduce industrial business displacements. The combination of weaving movements to and from the new system interchange on I-294, and improved access at North Avenue to and from I-294 requires added travel lanes along 2.2 miles of I-294.

FIGURE 2-12
WEST BYPASS CORRIDOR AND I-294

2.3.2.3 Local Access Interchanges

Local access interchanges would be provided at 16 locations including existing and new interchanges, and would provide connections to local roads from the mainline facility (see Figure 2-13). Each of the interchanges would be located at major arterials or would serve to maintain access to the major arterial corridors in the project area. The ADT on these crossing roads ranges from 14,000 to 60,000 vehicles. The location of the service interchanges would be compatible with the Illinois Tollway and IDOT policies and represents stakeholder input, where improved access to community centers, and commercial and industrial development were ranked as a priority.

FIGURE 2-13
LOCAL ACCESS INTERCHANGE LOCATIONS AND INTERSECTION IMPROVEMENTS

Similar to the system interchange analysis, many interchange types were evaluated at each location and were compared based on their impacts to the environment, effects on nearby development, operational efficiencies and safety, and cost. The service interchange locations and the interchange forms that have been retained for analysis are shown in Exhibits 2-4A to 2-4L.

When the Tier Two Draft EIS was issued in March 2012, a single interchange type had been recommended at 15 of the 16 locations. Since the Tier Two Draft EIS, a preferred interchange alternate has been identified at the last remaining location – the I-90 and Elmhurst Road interchange. The preferred alternate is the diverging diamond (Alternate 4) because of its enhanced operational characteristics, added flexibility in construction sequencing, and maintenance of traffic during construction (see Figure 2-14).

FIGURE 2-14
ALTERNATE 4 ELMHURST ROAD AND I-90

2.3.2.4 Arterial Improvements

A detailed traffic analysis using 2040 forecasts showed that arterials in the immediate vicinity of the project would require some capacity improvements to accommodate increased travel in close proximity to the interchanges and along some sections of arterials. There are 31 arterial improvements associated with the project (see Table 2-1 and Exhibit 2-5 referenced in subsection 2.1.2.4). The extent of the improvements typically requires added travel lanes, turning lanes, and updated traffic signals. Added travel lanes commonly extend from either side of the interchange areas for varying distances, which allows the high traffic volumes at the interchange areas to efficiently transition to the existing lane configuration (see Table 2-1).

Traffic analysis (using 2040 forecasts) of the arterial system beyond the immediate vicinity of the project showed that proposed project would not create capacity improvements for most of the adjacent arterial system (see Appendix D). In several cases, arterials are impacted and capacity improvements have been planned as part of the overall project improvements. Among these capacity improvements include Taft Avenue, Touhy Avenue, Elmhurst Road, York Road, Franklin Avenue/Green Street, Irving Park Road (IL 19), and several others (see Table 2-1). Other arterial improvements include intersection upgrades at IL 19 and Barrington Road in Hanover Park, IL 19 and Wise Road in Hanover Park, and IL 72 and Elmhurst Road in Elk Grove Village.

The intersection at IL 19 and Barrington Road would be upgraded with capacity improvements that would benefit movements in all directions. These capacity improvements would be achieved without any displacements of businesses or parking. At IL 19 and Wise Road, a dual left-turn would be provided for eastbound IL 19 traffic to Wise Road. Other improvements include right-turn lanes. The combination of these two intersection improvements would assist with through traffic movement and would result in a substantial reduction in the P.M. traffic from Wise Road to Barrington Road on IL 19 (a reduction from 4,800 feet to less than 1,000 feet). Exhibit 2-10 shows the improvements at each location.

The Tier Two Draft EIS included consideration of four intersection alternates at IL 72 and Elmhurst Road (see Exhibit 2-11). Since the issuance of the Tier Two Draft EIS in March 2012, the intersection types at this location have been re-examined with further technical analysis and coordination with affected stakeholders. The preferred alternate is the Quadrant Bypass (Old Higgins Road) Alternate. This alternate provides acceptable traffic operations for future traffic conditions, and minimizes business impacts in the vicinity (see subsection 2.2.4).

2.3.2.5 Frontage Roads

Frontage roads are planned along the Elgin O'Hare corridor. The planned improvements include continued use of existing frontage roads along the west end of the Elgin O'Hare corridor and new frontage roads along the mainline section from Meacham Road to York Road for areas of high access demand (see Figure 2-15). The frontage roads would not be continuous, but are provided in locations to maintain access to developed and developable lands along the mainline. On the west end of the Elgin O'Hare corridor, the existing frontage roads between Gary Avenue and Wright Boulevard would be retained. New frontage roads would be provided in areas where access is required between Meacham Road and York Road.

FIGURE 2-15
PLANNED FRONTAGE ROADS

In total, there would be seven miles of new frontage roads configured mostly as two-lane one-way roads (see Table 2-3). The potential environmental consequences and any corresponding mitigation measures associated with these facilities are described in Section 3. Examples of these proposed facilities include new sections of frontage roads on each side of the mainline between Meacham Road and IL 53. In this location, the frontage roads would be one-way two-lane facilities providing access to adjacent development and facilitating local traffic movement. Frontage roads would also be provided on each side of the mainline between Park Boulevard and Prospect Avenue, providing access to extensive commercial development on the north side of the mainline and residential development on the south. Another example includes the frontage roads between Wood Dale Avenue and IL 83. These frontage roads provide convenient access for industrial and commercial development to and from the toll road. The Tier Two Draft EIS includes a frontage road system east of IL 83 that extends along the north side of the mainline to Supreme Drive as a three-lane roadway with two-lanes westbound and one-lane eastbound. At Supreme Drive, the frontage road would be routed under the mainline to the south side and would extend to York Road as a two-lane two-way road. The two-way configuration would be necessary to avoid impaired access to businesses in this locale. Stemming from community comments, the frontage road system in this locale was further modified after the publication of the Tier Two Draft EIS and the Public Hearing to extend the frontage road system on the south side of the mainline from Supreme Drive to IL 83. This arrangement would improve continuity and access to properties along that section of roadway. As planned, that section of frontage road would be one-way in the eastbound direction.

The frontage road system along the Elgin O'Hare corridor provides access to all crossing streets with one exception: a cul-de-sac at the south leg of AEC Drive. Several road closures[3] would be required along the Elgin O'Hare and West Bypass corridors. Among these include a cul-de-sac at AEC Drive. Access to AEC Drive would be provided from Mittel Drive[4] and Wood Dale Road. Along the West Bypass corridor, Acorn Lane will be closed at Franklin Avenue. The road's proximity to the interchange ramps would interfere with operations at the intersection; therefore, a road closure is recommended. Alternative access would be provided from Runge Street and Addison Avenue. Lastly, the configuration of the system interchange connecting the Elgin O'Hare and West Bypass corridors requires closure of Sivert Court. Continued access to an industrial property affected by the closure would be provided by relocating Sivert Court to a connection with the frontage road on the south side of the mainline.

Prevailing access control standards for the frontage roads would affect access to some properties near interchange ramp terminals merging with the frontage road system. In these cases, alternative access would be provided.

TABLE 2-3
New Frontage Roads

Location	Length of Improvements (feet)	Number of Lanes
Westbound Elgin O'Hare Corridor		
Supreme Drive to IL 83 (Busse Road)	1,800 feet [a]	Two-way: 2 lanes westbound, 1 lane eastbound
IL 83 (Busse Road) to Lively Boulevard	3,000 feet	2 lanes [a]
Lively Boulevard to Wood Dale Road	2,600 feet	2 lanes [a]
Wood Dale Road to Mittel Boulevard	1,800 feet	1 lane [a]
Mittel Boulevard to Salt Creek Golf Course	1,800 feet	Two-way: 1 lane westbound, 1 lane eastbound
Prospect Avenue to Arlington Heights Road	1,400 feet	2 lanes [a]
IL 53 (Rohlwing Road) to Meacham Road	4,300 feet	2 lanes [a]

[3] A Road Closure Hearing was conducted together with the Tier Two Draft EIS Public Hearing on April 18, 2012.

[4] Mittel Boulevard is known as Mittel Drive, south of Thorndale Avenue.

TABLE 2-3
New Frontage Roads

Location	Length of Improvements (feet)	Number of Lanes
Eastbound Elgin O'Hare Corridor		
Meacham Road to IL 53 (Rohlwing Road)	4,400 feet	2 lanes [a]
Park Boulevard to Arlington Heights Road	2,200 feet	1 lane [a]
Arlington Heights Road to Prospect Avenue	1,700 feet	1 lane [a]
Mittel Boulevard to Wood Dale Road	1,800 feet	1 lane [a]
Wood Dale Road to Lively Boulevard	2,600 feet	2 lanes [a]
Lively Boulevard to IL 83 (Busse Road)	3,000 feet	2 lanes [a]
IL 83 (Busse Road) to Supreme Drive	1,600 feet	1 lane [b]
Supreme Drive to York Road	4,200 feet [a]	Two-way: 1 lane westbound; 1 lane eastbound

[a] One-way traffic pattern.
[b] Crosses under the Elgin-O'Hare Expressway and intersects West Bypass corridor frontage road.

2.3.2.6 Grade Separation

Roadway grade separations are another consideration in the development of road design. Design decisions pertaining to grade separation were made for the mainline being over or under crossing roads, as well as interchange ramps being over or under crossing roads. There are several key factors that influence the over-crossing road versus under-crossing road decision including:

- Drainage – Good drainage is an objective of every road design. The design of the road's vertical profile needs to consider the potential consequences to existing drainage patterns and avoid disruption to natural drainage flow when possible.
- Access Control – Without careful consideration of profile changes, access to adjacent properties can be obstructed by raising or lowering the roadway.
- Cost – In a cost constrained environment, the ability to construct a project that provides comparable service at lower cost is a benefit. The comparative costs of the over-crossing roads versus under-crossing roads decisions are important.
- Maintenance of Traffic (MOT) – Since the EO-WB project will be constructed under traffic, another key consideration will be the ability to build the improvements and maintain existing traffic flow. Often times, changes in profiles complicate MOT; thus, managing the profile changes, in the interest of achieving a workable MOT plan that reduces community impacts, has been an objective with each of these decisions.
- Community impacts – Consideration of profiles that avoid visual impairment and reduce noise impacts.

Figure 2-16 shows the results of the "over" crossing roads versus "under" crossing roads decisions. In more than 80 percent of the cases, the mainline or ramps would be over the crossing roads.

FIGURE 2-16
GRADE SEPARATION

The decision to go over or under the CP/UP railroad near the intersection of Devon Avenue and Elmhurst Road is dependent on the operational status of Runway 14R. Based on cost considerations, the preference would be to go over the railroad with a bridge. The OMP shows that Runway 14R will be decommissioned as the program advances; however, the runway is currently active and will remain so for an indefinite period. Airspace analyses shows that the roadway alignment is located in the RPZ for Runway 14R and a tunnel would be required under the railroad to avoid airspace violations if the road construction were in advance of the decommissioning of the runway. If the runway was decommissioned prior to road construction, then a bridge over the railroad would be acceptable.

At the west end of the Bensenville Yard, the mainline would cross in a depressed roadway section with railroad tracks bridged over. Coordination with the CP railroad has spanned over several years as it relates to the involvement of the Bensenville Yard. A MOU is being developed that carefully outlines every coordination point related to the yard. Among the many coordination points will be the sequencing of bridge construction and temporary track location during the roadway construction. For this work and other involvements of railroad property, the Illinois Tollway will carefully plan each element of work to avoid any impact on the yard operations (see subsection 3.4.2).

2.3.2.7 Drainage

Stormwater detention facilities, compensatory floodplain storage, and other best management practices will be constructed to compensate for the increased impervious surface, loss of floodplain, and enhance the water quality of roadway runoff.

The project corridor is located in a well-developed urban area and includes several creek crossings, regulatory floodplains, and a small number of reported flood prone areas in adjacent communities. The creeks that pass through the project corridor are degraded as a result of prior disturbance and urban runoff. As such, the conveyance, storage, and treatment of stormwater runoff associated with the proposed improvements are an interest to the resource agencies and various stakeholders.

Drainage facilities have been provided in terms of extent, type, and size to satisfy the requirements of the planned roadway facilities. The proposed stormwater conveyance system would maintain existing drainage patterns, where practicable, and would consist of storm sewers and vegetated ditches. In line detention will be provided at up to 60 locations. Losses in floodplain will be replaced with compensatory storage facilities at 12 locations throughout the project corridor to meet roadway needs and to minimize flooding (see Exhibit 2-12). The stormwater management facilities will follow the Illinois Tollway and IDOT drainage requirements for highway systems (IDOT, 2004; ISTHA, 2008). The FAA wildlife hazard safety requirements that constrain open water and vegetative types within five miles of O'Hare Airport and 10,000 feet from the Schaumburg Airport will be followed by both IDOT and the Illinois Tollway. Right-of-way requirements to accommodate these drainage facilities have been accounted for in the development of the footprint for the Build Alternative.

In addition to stormwater detention facilities, other best management practices would be used along the corridor to improve the quality of waters discharging to receiving waters or nearby wetlands. Since the Tier Two Draft EIS, a concept plan for best management practices has been prepared and is included as part of this document (see Appendix E). The concept plan defines the location of best management practices, describes the type of facility proposed, and assesses the overall effectiveness by watershed. This plan has been reviewed in coordination with the USACE, USFWS, USEPA, FAA, and IEPA. The agencies concurred with the concept plan in July 2012.

2.3.2.8 Other Transportation Components of the Build Alternative

Transit Facilities

The inclusion of transit opportunities as part of the Build Alternative was a priority for stakeholders. The Tier Two process focused on transit facilities that would be co-located in the roadway improvement corridors or logical extension from the corridors. The main transit feature is the preservation of space in the median of the east-west corridor (Elgin O'Hare corridor) from the western edge of O'Hare Airport to Schaumburg. The transit dedicated service in the median has considered and will accommodate either BRT or rail options. Both would have a dedicated right-of-way for their sole use, with the frequency of service appropriate to a dedicated BRT or rail transit operation. Five stations are planned in the median along the route including the proposed West Terminal at O'Hare Airport, near Wood Dale Road, Hamilton Lakes' Development, Roselle Road, and near the Schaumburg Metra station (see Exhibit 2-7). At each of the transit stations, accommodations for parking and bicycle and pedestrian access would be provided (see Table 2-4). The parking requirements at the proposed West Terminal would be developed when more advanced site development information is known. A sixth station is possible at IL 53. The median width at IL 53 gives the option for future transit providers to locate either a station or dedicate bus ramps at IL 53, but not both. The ramps would provide bus connectivity to and from the planned route, north to Woodfield Mall. Alternatively, a station at IL 53 would require buses to leave the median in the vicinity of Park Boulevard (to the east) and maneuver via travel lanes to the mainline exit at IL 53. A similar maneuver would be required from the on-ramp at IL 53 to return to the median. The median preserves the option of either a station or the ramps at IL 53; however, the preferred option will be deferred to a future transit provider.

Transit considerations have also included the eventuality of a transit service in the I-90 corridor, and extending from the I-90 corridor along the north leg of the West Bypass corridor to the proposed West Terminal. The north leg of the bypass, in this case, has been located to provide sufficient space for a transit facility to be placed along the east side of the roadway. Transit along I-90, in the long-term, is planned to be commuter rail service as envisioned by the I-90 Transit Task Force and Corridor Planning Group. Other aspects of the plan include a bus express service connecting the proposed West Terminal with the Rosemont CTA Blue Line station. This service would be routed around the southern edge of the airfield along Irving Park Road (IL 19) to Rosemont's CTA Blue Line station. The proposed operation would be initiated as an interim service, connecting the west and east airfield until such time that the transit facilities would be extended across the airfield (i.e., extension of the CTA Blue Line from the main terminal core and extension of the People Mover).

Another bus express service would be extended from the median in the Elgin O'Hare corridor at IL 53 to the Woodfield Mall on the north. As described in subsection 2.1.2.4, the connectivity to IL 53 from the median would be provided by either dedicated bus ramps from the median to IL 53, or by a maneuver from the median at Park Boulevard to the mainline off-ramp at IL 53. Potential parking facilities would be available in the southeast quadrant of IL 53 and the Elgin O'Hare corridor, and would provide over 300 potential parking spaces.

A bus shuttle service would be provided from the Schaumburg Metra station to Hanover Park Metra station. This service would be aligned to the arrival and departure times of the BRT/rail transit at Schaumburg. The shuttle service would travel in mixed traffic along the Elgin-O'Hare Expressway to Lake Street and to the Hanover Park Metra station via Lake Street or Lake Street to Ontarioville Road.

TABLE 2-4
Transit Parking and Access

Location	Description	Parking Capacity	Pedestrian Access	Kiss & Ride Facility	Intersecting Service Stops
Schaumburg Metra	Re-build part of existing lot with two-level deck structure	630	Yes	Yes	Yes

TABLE 2-4
Transit Parking and Access

Location	Description	Parking Capacity	Pedestrian Access	Kiss & Ride Facility	Intersecting Service Stops
Roselle Road	New surface lots as part of new retail development	222	Yes	Yes	Yes
IL 53 (Rohlwing Road)	New surface lot	337	Yes	Yes	Yes [a]
Hamilton Lakes' Development/Park Boulevard	Partial use of new multi-level parking structure built as part of adjacent commercial development	532	Yes	Yes	Yes
Wood Dale Road	Partial use of new multi-level parking structure built as part of adjacent commercial development	293	Yes	Yes	Yes
West Terminal	Parking requirements will be determined as proposed West Terminal complex develops further	NA [b]	Yes	Yes	Yes

Note: Initial build parking capacity assumed to be 70 percent of complete Build Alternative parking capacity.

[a] No intersecting services operate at Meacham Road and the Elgin-O'Hare Expressway. Local circular services are proposed. When stop is re-located to Rohlwing Road with the complete Build Alternative, intersecting services would have stops at this location.

[b] Parking will be developed when more advanced site development information is known.

Bicycle and Pedestrian Facilities

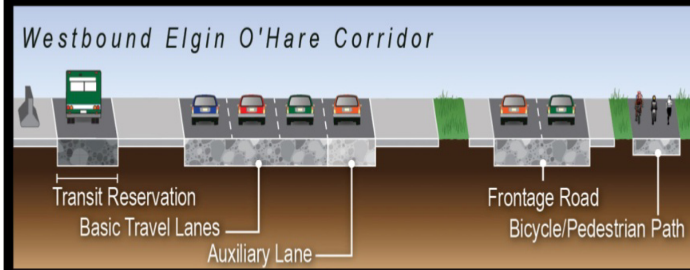
The planned bicycle and pedestrian facilities are shown in Exhibit 2-13. The elements of the plan are principally co-located in the project corridor; however, a few elements extend beyond the project limits to show system connectivity with other regional and local facilities. Bicycle and pedestrian facilities are planned within, adjacent, or crossing the planned roadway improvements (shown in pink in Exhibit 2-13). Other improvements (shown in purple in Exhibit 2-13) are the responsibility of others, and represent logical extensions of the project-related bicycle and pedestrian facilities that provide continuity in route or connection with other regional and local trails. The layout of these facilities has been fully coordinated with the Illinois Tollway, IDOT, community interests, and bicycle organizations (i.e., Active Transportation Alliance).

Features of the system concept plan include:

- 17.74 miles of side path within the Tier Two Build Alternative footprint.
- 3.61 miles of sidewalk within the Tier Two Build Alternative footprint.

The main feature of the planned bicycle and pedestrian facilities is a bidirectional side path (with a 10-foot cross-section set back at least five feet from the edge of the roadway) along the east-west corridor of the project extending from the west side of O'Hare Airport to Hanover Park (see Figure 2-17). The route is adjacent to the paralleling frontage road system, where provided.

FIGURE 2-17
BICYCLE AND PEDESTRIAN CROSS-SECTION



For the areas where a frontage road would not be provided (Wright Boulevard to Meacham Road/Medinah Road), alternate routes currently exist that connect to the planned east-west pedestrian and bicycle facilities to provide a continuous east-west route along the Elgin O'Hare corridor. The east-west bicycle and pedestrian path would provide connections to north-south regional and community trails in the area including the North DuPage Regional Trail, the Salt Creek Greenway Trail, and the Schaumburg community trail. This connectivity links places of interest such as the Ned Brown Forest Preserve, Metra stations, planned transit stations in the Elgin O'Hare corridor, employment centers, and community centers and facilities. Other aspects of the bicycle and pedestrian facilities include north-south connectivity that would be developed along York Road from Green Street to Touhy Avenue, and routed east to Mount Prospect Road connecting to a proposed regional trail at that point. Another leg of the north-south bicycle and pedestrian facilities will continue along Elmhurst Road from Touhy Avenue through the I-90 interchange to connect with Majewski Athletic Complex.

The other notable bicycle and pedestrian improvements include routes along Franklin Avenue/Green Street in Bensenville and Franklin Park, and the planned Taft Avenue improvement spanning the Bensenville Yard and connecting the south airfield of O'Hare Airport. These routes provide improved east-west access, improved access to the south side of the airport, and a new route crossing I-90.

There are 10 locations where the project corridor crosses major bicycle routes or state routes. In compliance with IDOT's "Complete Street's Policy" and to maintain existing regional paths, the planned roadway facilities would provide for bicycle/pedestrian improvements at the locations illustrated in Exhibit 2-13.

The EO-WB project has preserved the space for planned bicycle and pedestrian facilities. Details regarding cost and maintenance for proposed pedestrian and bicycle facilities within the Tier Two Build Alternative would be determined during future final design and in coordination with local jurisdictions.

Congestion Management Process Strategies

Congestion management process strategies have been applied to the EO-WB project, compliant with areas that are located in a Transportation Management Area (TMA). Within the TMA certification process, air quality management is a consideration. The combination of the project's improvements and strategies are compliant with the regional air quality conformity analysis, whereby it has been included and conformed to CMAP's *GO TO 2040 Comprehensive Regional Plan*. Further, a detailed air quality analysis contained in this document for the Build Alternative shows no violations for either carbon monoxide (CO) or particulate matter ($PM_{2.5}$) (where 2.5 indicates the micrometer size of the particulate) (see Section 3).

The EO-WB project has addressed congestion management through a cooperatively developed process that incorporates the use of TSM and TDM strategies to improve mobility and reduce congestion. One of the four principal purposes and needs of the project has been to reduce congestion in an area that currently exhibits congestion of 85 percent or greater during peak hour periods. The EO-WB project would measurably accommodate more traffic on mainline facilities, reduce the hours of delay on the mainline system, and would considerably reduce congestion on arterials and secondary roads that result in an overall reduction of congestion in the project area. The project has evolved as a multimodal solution, which incorporates transit and bicycle/pedestrian facilities. Transit either as a BRT or rail transit would effectively attract 30,000 riders per day. Bicycle and pedestrian facilities would improve connectivity to transit stations, employment centers, and activity centers in the project area.

In considering congestion management strategies, the EO-WB project has focused on opportunities for the implementation of TSM and TDM. TSM strategies focus on techniques designed to make transportation systems function more effectively, work more reliably, and operate more safely. The TSM strategies that can be implemented along the EO-WB project roadways include Intelligent Transportation System (ITS) and Active Traffic Management Systems (ATMS) applications such as variable message signage, closed-circuit TV cameras, electronic payment and pricing systems, ramp metering, and signal priority and signal preemption technologies.

On the other hand, TDM strategies are more broadly defined and focus on altering demand through changes to the characteristics that influence traffic patterns and travel decisions (e.g., travel mode, route, locations, and time of travel). The TDM strategies attempt to change travel behaviors by decreasing demand or distributing demand more evenly across all transportation facilities by raising awareness about travel options and encourage flexibility in travel decisions. The TDM strategies that can be implemented within the EO-WB project area include rideshare, carpool/vanpool, car sharing, bicycle travel services, and managed lanes. Within the managed lanes category, demand can be actively managed in response to changing conditions by varying pricing, vehicle eligibility, and access control. Employer-based strategies are another way to manage demand. Strategies such as variable work schedules, telecommuting, and employer shuttle services are currently deployed by many employers within the region, but these strategies can be expanded to other employment sites within the EO-WB project area.

The timeframe for implementing TSM and TDM would vary, some strategies may be more appropriate in the short-term because they are proven, whereas others may be deferred to the future given that they are still developing as established practices. The various strategies that are available are identified in Table 2-5. The Illinois Tollway and IDOT currently use many of the TSM technologies including variable message signs, automated license plate recognition, photo enforcement, ramp metering, signal preemption, etc. The techniques for TDM are less widespread by IDOT and the Illinois Tollway, but discussions have commenced on several practices including congestion pricing and managed lanes. These strategies support and foster motorized and non-motorized system of improvements. Separately and together, each TSM and TDM strategy would contribute to the effective management of the transportation system with increases in roadway efficiency and decreases in congestion and collisions. At this time, the approach to implementing TDM and

TSM practices is conceptual, and as the design details advance for transit, managed lanes, etc., the best mix of congestion management strategies will be better defined. In addition, the Illinois Tollway's new standard roadway cross-section provides flexibility for added capacity during peak hours without changes to the physical pavement width. Thus, the roadway cross-section avoids the premature pre-emption of future congestion management strategies and maintains the flexibility to accommodate most all congestion management strategies.

TABLE 2-5
TSM and TDM Strategies

Strategy	Description
TSM Strategy	
Variable Message Signage	An ITS application used to alert travelers of route conditions, alternate routes, construction activities, anticipated travel times and other information that will assist motorists in making travel decisions. Strategies can include real-time messaging, lane control signage, and variable speed displays.
Closed-Circuit TV Cameras/Detection Systems	An application used to detect and monitor traffic through cameras placed in key locations including automated license plate recognition technology.
Traffic Incident Management System	An ITS application that is a systematic, planned, and coordinated effort to detect, respond to, remove traffic incidents, and restore traffic capacity as safely and quickly as possible.
Photo Enforcement Cameras (Toll Violators)	An ITS application that uses photo images of vehicles moving through signalized intersections to capture and enforce traffic laws and reduce traffic incidents as a method of traffic management.
Ramp Metering	An ITS application that is the process of facilitating traffic flow by controlling the rate at which vehicles enter an access-controlled facility. Strategies include special-use ramp designations and metering at ramp junctions.
Interconnect Traffic Signals	An operational ITS technology that enables traffic signals to communicate with each other resulting in improved travel efficiency with minimum delay. Strategies include adaptive traffic signal control.
Signal Pre-Emption	An ITS technology that provides a travel time incentive through priority service opportunities within the coordinated operation of traffic signals.
Advanced Traveler Information Systems	An ITS application that communicates trip-related information and disseminates it to travelers, smart vehicles, various transportation operations including electronic payment and pricing systems for roadway use.

TABLE 2-5
TSM and TDM Strategies

Strategy	Description
TDM Strategy	
Managed Lanes	A technology, policy, and information-driven concept that offers operational flexibility through travel time incentive for a set of lanes that are proactively managed in response to changing conditions. Managed lanes are categorized into three main areas: pricing strategies, vehicle eligibility, and access management.

2.3.2.9 Sustainable Design

In the last decade, efforts have been made to embrace the practice of sustainable design solutions. The Brundtland Commission of the United Nations (1987) defines sustainability as "meeting the needs of the present generation without compromising the ability of future generations to meet their own needs."

The application of sustainable practices to our built environment has three intended purposes:

1. To reduce environmental impact,
2. to create social benefits for current and future generations, and
3. to realize short-term and long-term financial and operational benefits to the project.

In the Tier Two process, the application of sustainable practices started with the IDOT sustainable design manual, *I-LAST Illinois - Livable and Sustainable Transportation Rating System and Guide V 1.01* (IDOT, 2010b). Later in the process, the Governor's Advisory Council for the project developed another set of sustainable goals and recommendations that have been adopted. The Advisory Council's Sustainability Working Group strived to affect the incorporation of innovative ideas that went beyond traditional highway engineering and environmental considerations. Nine categories of sustainable practices were identified including: planning, design, environment, energy, water, materials and resources, construction, operations and maintenance, and users. For each category, broad and overarching goals were developed followed by recommendations that directed how those goals could be achieved. These recommendations, as well as the IDOT sustainable design manual, *I-LAST Illinois - Livable and Sustainable Transportation Rating System and Guide V 1.01*, are being used to advance the design of the proposed project. Examples of the recommendations include:

- Develop a philosophy of integrating sustainable practices throughout the process.
- Create a wetland mitigation plan that exceeds regulatory requirements.
- Incorporate at least two alternative energy strategies that exceed current practices.
- Obtain Leadership in Energy and Environmental Design (LEED) certification for any buildings that are constructed for the project.

- Use of bioswale/infiltration beds for improved water quality.
- Develop a pre, during, and post construction water quality monitoring program.
- Recycle reusable materials (i.e., asphalt, concrete, steel, etc.).
- Develop an incentive program for contractors to embrace sustainable measures.
- Develop new strategies for de-icing.
- Use of low sulfur fuels in construction equipment.
- Retain excess soils onsite to avoid the energy cost of hauling offsite.
- Use of drought tolerant plants for landscaping.
- Use of energy saving roadway lighting.

The implementation of sustainable design measures have been adopted into the culture of the Illinois Tollway and its business practices. These practices will be monitored by the Illinois Tollway and their "Corridor Manager" as the project advances through final design and construction, with the expectation that these practices are rigorously applied. Their incorporation will commence with final design for project elements. The design contractor will be required to identify potential sustainable opportunities, and as the design progresses (60 percent, 90 percent, and a 100 percent complete) reviews will be conducted to determine their success incorporating sustainable practices. As the project advances to construction, the same process will be applied to further the use of sustainable practices in the field. Research will be conducted on a regular basis to update the library of practices available to the Illinois Tollway.

2.3.2.10 Project Aesthetics

Aesthetic design provides a sense of place, arrival, and image for a transportation corridor. The EO-WB project has been named a "Corridor of the Future," by Governor Quinn's Advisory Council and part of that future is serving as a gateway to the area and communities that it serves. Thus, a component of the Tier Two process has been the consideration of aesthetic design features for the EO-WB project. To address these requirements, the project created a CAAT made up of representatives of each of the communities immediately adjacent to the planned improvements, as well as groups and agencies with an interest in the overall aesthetics of the corridor.

A series of workshops were held with the CAAT. The first workshop focused on corridor character. The CAAT members identified several key words to describe the current conditions or future vision for each section of the corridor. Some words, like "gateway" and "multimodal" were common to all sections. However, for the most part, the descriptors in the west and central sections were more rustic, including "quaint" and "prairie," while the north-south sections were more urban/industrial in nature such as "efficient," "aviation," and "economic engine." During the second CAAT meeting, the group selected an overall theme for the project. The group preferred a signature gateway theme, "Gateways to the Future," and featured a simple continuous palette of landscape and hardscape throughout the corridor. There were customized elements such as landscape and signage that could be implemented to highlight each community. In addition to defining specific applications and areas of enhancement, some highlights of the project objectives include:

- Aesthetics should be scalable and appropriate for the multiple users in these corridors.
- Aesthetics should highlight and support new functions and improved efficiency of the corridors.
- Aesthetics should highlight improved areas of accessibility.
- Sustainable best management practices should be considered in selecting aesthetic treatments.

Once the overall theme and objectives were defined, the CAAT began focusing on potential design elements that could be incorporated into the corridor. These included bridge enhancements, roadway enhancements (retaining walls, noise walls, and signage upgrades), and landscape enhancements (see Figure 2-18). The process culminated a general design theme and design considerations. Further discussions with the local advisory committee, sponsored by the Illinois Tollway, will occur during the final design stage with the objective of developing aesthetic design guidance.

FIGURE 2-18
CORRIDOR AESTHETICS ADVISORY TEAM ENHANCEMENT OPTIONS

2.4 Comparison of Project Alternatives and Alternates

The Tier Two Draft EIS concluded with three decisions to be finalized in this Tier Two Final EIS, which include:

- Identification of the Preferred Alternative – Build versus No-Build Alternative.
- Identification of the preferred interchange design alternate at Elmhurst Road and I-90.
- Identification of the preferred intersection design alternate at IL 72 and Elmhurst Road.

This Tier Two Final EIS identifies the preferred alternative and design alternates and presents a comparative analysis of the alternatives and alternates.

2.4.1 Build versus No-Build Alternative

Two project alternatives were carried forward in the Tier Two Draft EIS for detailed analysis. Comments on the Tier Two Draft EIS did not expand on the number of alternatives considered; however, comments did cause some of the design features of the Build Alternative to change. As mentioned earlier, these refinements include: an adjusted exit ramp location along I-294, just north of North Avenue; a frontage road modification between IL 83 and York Road; refinements of the internal circulation road at the Hamilton Lakes' Development near the I-290 interchange; and refinements to the intersection design at IL 72 and Elmhurst Road.

The analysis of the No-Build and Build Alternatives showed that the project's purpose and need are best satisfied with the Build Alternative. For each of the four Purpose and Need statements, the Build Alternative satisfies the intent. The No-Build Alternative, on the other hand, does not satisfy any of the Purpose and Need objectives. The following discussion summarizes the findings and describes how the Build Alternative achieves improved regional and local travel, improved travel efficiency, improved connection to O'Hare Airport from the west, and improved intermodal connectivity. In each case, the Build Alternative has been developed with each of these purposes as a goal.

As determined in the overall analysis, the proposed Build Alternative also provides economic benefits compared to the No-Build Alternative. The economic benefits include: 2,000 to 3,000 construction jobs annually for the duration of construction period; over 4,700 acres of new development influenced by better access and transportation; over 40,000 permanent new jobs associated with the new development; over $700 million in federal and state tax revenue from construction dollar spending; and about $17 million annually in new property and business tax revenue directed to the local communities in the area.

In a comparison of improved travel efficiency, the Build Alternative would provide considerable travel benefits and enhance travel performance for the study area compared to the No-Build Alternative. As shown in Table 2-6, the proposed Build Alternative would produce the desired travel characteristics – more traffic on access-controlled facilities and less traffic on the secondary roads. The proposed improvements decrease travel (i.e., VMT) on primary and secondary roads by almost 18 percent and shift longer trips to access-controlled facilities – the right type of trip on the right type of facility. These traffic shifts reduce travel delays by 24 percent on the primary and secondary arterial roadway system, increasing the overall travel efficiency. Similar to secondary roads, collector roads would also experience a substantial reduction in vehicles hours of delay (-21.6 percent).

TABLE 2-6
Build Alternative Travel Performance Compared to No-Build Alternative

Roadway Type	Percent Change Vehicle Hours of Delay	Percent Change Vehicle Miles of Travel	Percent Change Congested Vehicle Miles of Travel
Access-controlled Highway	4.1%	29.5%	19.5%
Primary and Secondary Arterial	-24.1%	-17.9%	-16.0%
Collector	-21.6%	-0.9%	6.4%

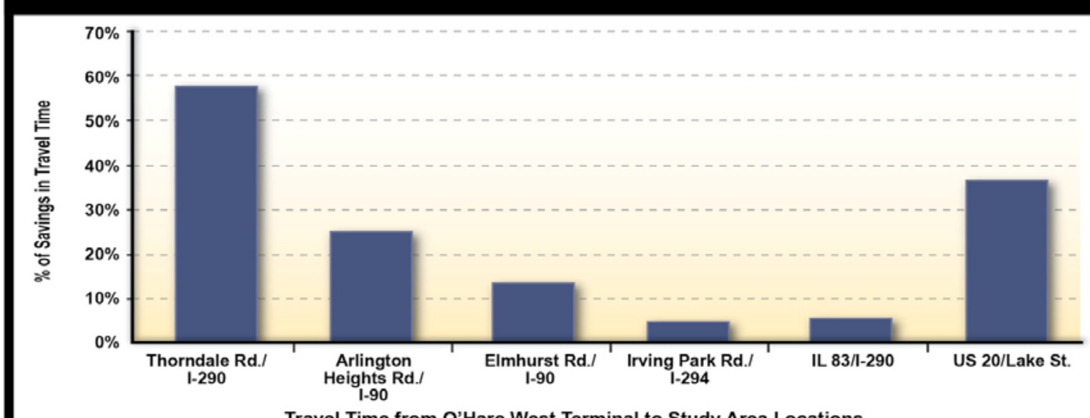
The increase in VMT on the access-controlled facility and the relative change in congested VMT can be better explained using the data in Table 2-7. As shown in Table 2-7, when the percent of congested VMT is examined for each alternative, the Build Alternative clearly shows that even with substantially more travel on access-controlled facilities, congested VMT is almost five percent less than the No-Build Alternative. Additionally, when the percent of congested VMT is compared to the Build and No-Build Alternatives across all the roadway types (i.e., access-controlled highway, primary, secondary, etc.), the results are similar showing the Build Alternative to be about three percent less. Overall, this demonstrates that for the Build Alternative, VMT can increase on access-controlled facilities, and still show a relative reduction in the percent of congested VMT when compared to the No-Build Alternative.

TABLE 2-7
Comparison of Percent of Daily Congested Vehicle Miles of Travel for No-Build and Build Alternatives

Roadway Type	2040 No-Build Alternative			2040 Build Alternative		
	Total VMT	Congested VMT	% Congested VMT	Total VMT	Congested VMT	% Congested VMT
Access-controlled Highway	10,929,925	6,848,343	62.7%	14,152,761	8,186,322	57.8%
Primary and Secondary Arterial	5,898,311	3,900,928	66.1%	4,844,766	3,278,133	67.7%
Collector	1,187,405	677,490	57.1%	1,176,151	721,141	61.3%
Total	18,015,641	11,426,761	63.4%	20,173,679	12,185,596	60.4%

With the reduction in travel delay, travel times to various destinations would improve markedly with the Build Alternative. In the examination of six trip pairs in the project area, the cumulative travel time savings totaled to about 28 percent (see Figure 2-19). A detailed analysis of the travel times shows that the largest time savings are trips from the west and northwest, which support improved access to O'Hare Airport from the west.

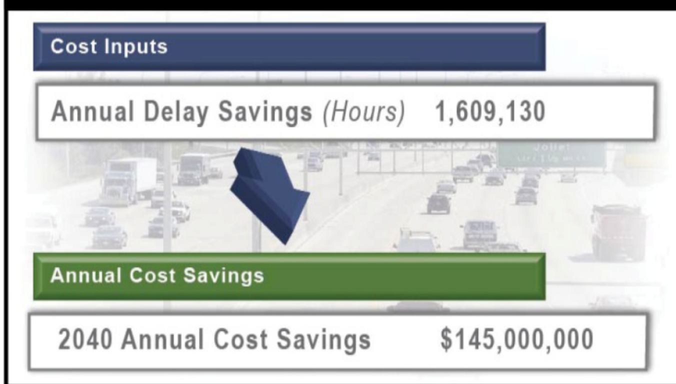
FIGURE 2-19
TRAVEL TIME SAVINGS



Transit is an important component of the Build Alternative. The reservation of space for transit is provided in the median of the Elgin O'Hare corridor and on the east side of the north leg of the West Bypass. The transit plan in the Elgin O'Hare corridor would include five stations with connectivity to north-south transit service. Additionally, express bus service would extend to Hanover Park, Rosemont, and Woodfield Mall. Connectivity to other transit would be provided via a transit center on the west side of O'Hare Airport connecting to a number of proposed transit options. Comparatively, the No-Build Alternative would have few alternative transportation options for people traveling within, into, or out of the project area.

The reduction in delay and travel time has an associated economic benefit that can be measured in dollars saved. It has been estimated that the construction of the EO-WB project would result in annual delay savings of over $145 million by the year 2040 (see Figure 2-20).

FIGURE 2-20
ANNUAL TRAVEL DELAY SAVINGS



As shown in the analysis described above, the No-Build Alternative does not provide the benefits that stakeholders carefully defined at the beginning of this process. As such, the No-Build Alternative is not consistent with the project's purpose and need.

2.4.2 Comparison of Design Alternates

The Build Alternative is defined as a set of design elements consisting of mainline pavement, frontage road, interchange, arterial, drainage, structural (bridges/retaining walls), transit, and bicycle and pedestrian improvements. An extensive process was applied to determine the design elements throughout the project corridor. In two locations, the final determination of the elements was not determined in the Tier Two Draft EIS. These include the interchange type at the Elmhurst Road and I-90 interchange and the intersection type at the IL 72 and Elmhurst Road intersection. In determining the preferred alternates at each location, impacts to environmental and socioeconomic resources are being considered along with travel performance, ability to implement mitigation measures (e.g., water quality best management practices), and stakeholder input. A comparison of these factors is provided in the following subsections.

2.4.2.1 Elmhurst Road and I-90 Interchange

Two interchange types remain under consideration at the Elmhurst Road and I-90 interchange location. Alternate 3 is a traditional diamond configuration (see Figure 2-9 in the Tier Two Draft EIS), and Alternate 4 is a diverging diamond configuration (see Figure 2-14). In comparing the two alternates, as shown in Table 2-8, Alternate 4 is preferred. Whereas, Alternate 3 is slightly less costly and has slightly fewer environmental resource impacts, Alternate 4 provides enhanced operational characteristics and easier construction sequencing, which would benefit maintenance of traffic during construction. In addition, both alternates provide opportunities for implementing best management practices.

TABLE 2-8
Comparison of Interchange Alternates at Elmhurst Road and I-90

	Alternate 3 (Traditional Diamond)	Alternate 4 (Diverging Diamond)
Driver Expectation	Good	Moderate
Traffic and Operations Evaluation Rating	Moderate	Good
Construction Sequencing and Maintenance of Traffic	Moderate	Good
Cost	Lower	Low
Wetland Impacts (acre)	0.0	0.01
Impact to Higgins Creek (acre)	0.03	0.11
Impact to Higgins Creek Tributary A (acre)	0.07	0.07
100-year Floodplain Impacts (acre-feet)	13.5	14.2
Regulatory Floodway Impacts (acre-feet)	6.1	7.0
Tree Impacts (number)	124	124
Opportunity for Implementing best management practices	Good	Good

Note: Green shading represents good performance or least impact, yellow shading represents moderate performance or average impact, and red shading represents poor performance or most impact.

During the evaluation of interchange types at the I-90 and Elmhurst Road interchange, numerous meetings have been held with Des Plaines, Elk Grove Village, and Mount Prospect. The non-traditional aspects of Alternative 4 (diverging diamond) were initially a concern to the surrounding communities. As more information was shared about this interchange type and its advantages, community leaders became more accepting of the concept. Specific input suggested that the design of an interchange and its bridges over I-90 preserve flexibility for future interchange modifications.

2.4.2.2 IL 72 and Elmhurst Road Intersection

The Tier Two Draft EIS considered four intersection types at the IL 72 and Elmhurst Road intersection. Since the close of the public comment period on May 14, 2012, the intersection type at this location has been the subject of further analysis and stakeholder input. In the re-evaluation process, two alternates were dismissed, while additional attention was given to the Quadrant Bypass (Old Higgins Road) and the Quadrant Bypass (Greenleaf Avenue) alternates. Each of the alternates was refined to include design measures to improve overall traffic performance and adjustments were made to reduce environmental issues identified during earlier studies.

The evaluation of the two remaining intersection alternates concluded that the Quadrant Bypass (Old Higgins Road) Alternate is the preferred alternate (see subsection 2.2.4 and Figure 2-6). This alternate provides an acceptable level of traffic performance for all critical movements, and comparatively exhibits fewer impacts including less right-of-way requirements, fewer displaced business parking spaces, less disruption to business property ingress and egress, and fewer natural resource impacts (see Table 2-9). Additionally, this alternate, unlike the Quadrant Bypass (Greenleaf Avenue) Alternate, would not involve O'Hare Airport's Runway 9L-27R RPZ. The Quadrant Bypass (Greenleaf Avenue) Alternate would require properties in the RPZ for replacement of business parking, which would require FAA approval for the release of the property for non-aviation uses. For the reasons stated above, the Quadrant Bypass (Old Higgins Road) Alternate is the best overall alternate.

TABLE 2-9
Comparison of Intersection Alternates at IL 72 and Elmhurst Road

	Quadrant Bypass (Old Higgins Road) Alternate	**Quadrant Bypass (Greenleaf Avenue) Alternate**
Business Displacements (number)	1 [a]	0
Residential Displacements (number)	0	0
Business Parking Displacements (number)	9	93
Driveway Closures/Restrictions	6	8
Wetland Impacts (acres)	0.26	0.26
Tree Impacts (number)	112	120

[a] Building is vacant.

2.5 Identification of Preferred Alternative and Alternates

The Build Alternative compared to the No-Build Alternative satisfies the project's purpose and need. The Build Alternative provides the needed efficiencies and improved operational characteristics that would maintain and enhance transportation in an area known as a regional transportation hub and its role as an economic center in the region. While enhancing mobility in the project area, the Build Alternative has been developed to be sensitive and compatible with the local community values and land use patterns of the surrounding communities. The final set of design features that comprise the Build Alternative was determined through a deliberate process of evaluating many design alternates against evaluation criteria that included environmental considerations, travel and operational performance, constructability, and cost considerations. Through this process, the Build Alternative achieves improved travel, while minimizing and avoiding impacts to the important natural resources in the area. It has also been determined that the investment in the Build Alternative would provide extraordinary benefit to the local economy, both during the period of construction and in the long-term, with redevelopment opportunities that would be attracted to the area. The combined attributes of the Build Alternative make it the Preferred Alternative supported by the lead agencies. This alternative received concurrence by the NEPA/404 Merger Group on September 6, 2012.

The lead agencies have concluded that the preferred alternates at the Elmhurst Road and I-90 interchange and the IL 72 and Elmhurst Road intersection are the diverging diamond (Alternate 4) and the Quadrant Bypass (Old Higgins Road) Alternate, respectively. These alternates received concurrence by local stakeholders (see Appendix B for concurrence letter from Elk Grove Village) and the NEPA/404 Merger Group on September 6, 2012. Each provides the requisite operational performance required at these locations, and stakeholder involvement has been supportive of each decision. While performance has been achieved with both, the environmental impact of each has been reduced to fractional impacts, and impacts on adjacent businesses and residences are minor.

2.6 Implementation

In October 2010, Illinois's Governor Quinn formed the EO-WB Advisory Council to develop a strategy for the implementation of the EO-WB project. Their work spanned over eight months and concluded with a consensus opinion that a financially achievable project would be attained with the Illinois Tollway as the preferred implementing agency. In September 2011, the Illinois Tollway Board enacted a system toll increase that would finance a 15-year capital improvement program, *Move Illinois: The Illinois Tollway Driving the Future*, which includes the EO-WB project.

A phased approach is recommended for the implementation of the EO-WB project. The Build Alternative, as identified in this Tier Two Final EIS, is designed to accommodate long-term (year 2040) travel demand. While the overall Build Alternative addresses long-term travel needs in the area, it comes at a relatively high cost. Therefore, an ICP was developed with the goal of being a more financially attainable first phase of the project. The ICP maintains the integrity of the full project and serves the area's sizable travel needs through an interim design period of 2030. The ICP would include improvements along all sections of the project, but with fewer initial travel lanes, fewer interchanges, and in some cases, new interchanges that would accommodate fewer movements. The remaining added travel lanes and interchange improvements included in the Build Alternative would be considered as travel demand warrants it and future funding becomes available.

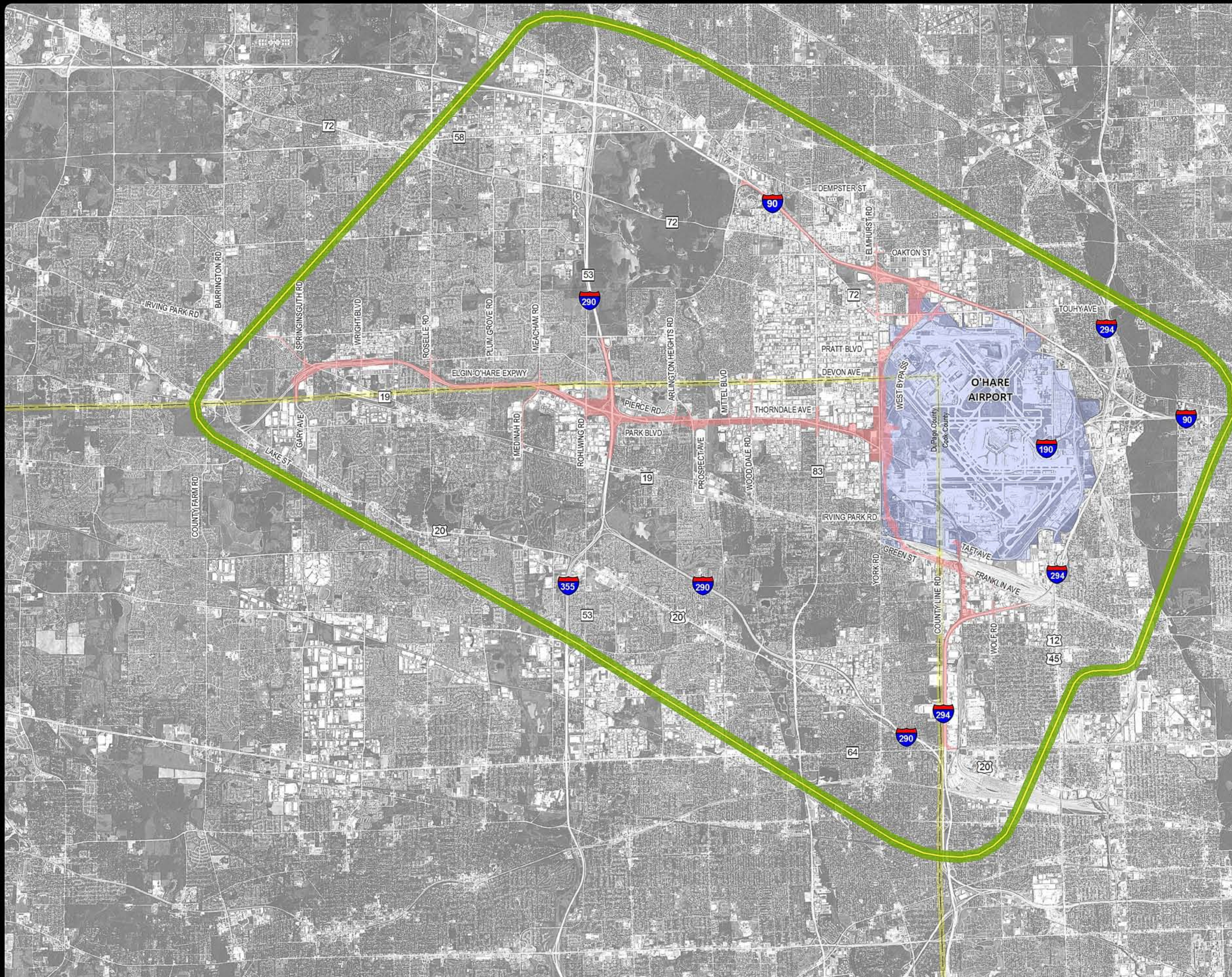
In accordance with the FHWA requirements for major projects such as the EO-WB project, an independent CER was conducted in May 2012 to verify the accuracy of and reasonableness of the total estimated cost. The project budget is estimated to range in cost from $3.1 billion to $3.6 billion, in year of expenditure dollars, escalated to the midpoint of construction, based on the CER conducted by the FHWA in May 2012. The Illinois Tollway has programmed 90 percent of the funding. An additional $300 million would need to be contributed by others or in-kind contributions.

The EO-WB project was proposed as a multimodal solution, and, as such the responsibility for the implementation will involve others. While, the Illinois Tollway will be mainly responsible for the implementation of the roadway improvements, transit providers will be responsible for implementing the transit infrastructure (i.e., pavement, track, stations, signage/signals, and station parking). Additionally, some arterial improvements would be provided by others. Bicycle and pedestrian facilities have been identified to be co-located within the EO-WB project right-of-way. The right-of-way, trail site-preparation, and crossroad treatment of existing trail crossings are included in the current project cost estimate. Some local cost-sharing is anticipated for construction as well as long-term maintenance.

The schedule of implementation for the ICP, as shown in the Illinois Tollway's capital improvement program, would span about 12 years (2013-2025). The phased sections of the ICP include:

- West Section – Mainline widening (to the inside) and resurfacing from IL 19 to Meacham Road/Medinah Road; interchange improvements at IL 19 and Roselle Road.
- Central Section – Mainline widening and reconstruction from Meacham Road/Medinah Road to IL 53 and new mainline construction from IL 53 to Salt Creek; interchange improvements/construction at Meacham Road/Medinah Road, IL 53, I-290, Park Boulevard, and Arlington Heights Road/Prospect Avenue; improvements to connecting roadways.
- East Section – New mainline construction from Salt Creek to O'Hare Airport and portion of south leg of the West Bypass through IL 19; interchange construction at Wood Dale Road, IL 83, Elgin O'Hare/West Bypass, and IL 19; improvements to connecting roadways.
- South Section – New mainline construction from IL 19 to I-294 and mainline improvements along I-294; interchange construction at Franklin Avenue/Green Street and I-294; new interchange access at I-294/IL 64; improvements to connecting roadways and construction of Taft Avenue connector.
- North Section – New mainline construction from O'Hare Airport to I-90 and mainline improvements along I-90 approximately one mile west of Elmhurst Road to approximately a half mile east of the West Bypass/I-90 interchange; new interchange access at Elmhurst Road/I-90; and improvements to connecting roadways (i.e., Elmhurst Road, Touhy Avenue, etc.).

The ICP meets the FHWA measures of operational independence (see Appendix A-13 of the *Draft Combined Design Report* [IDOT, 2012]). The ICP represents a functionally complete project that addresses diverse travel needs in the study area, and the ICP design provides a project with logical improvement limits (project termini). Further, the ICP includes design features that will provide acceptable traffic operations in the 2030 ICP design year, including required improvements to adjacent highways (freeways, toll roads, arterials, secondary roadways), thus, demonstrating its operational independence.



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LEGEND

- Footprint
- Study Area
- O'Hare Airport
- County Boundary

Sources:
-Aerial photography: Airpohoto USA, 2008; City of Chicago, 2009
-O'Hare Airport: City of Chicago, 2003
-County Boundary: U.S. Census Bureau, 2010

NORTH

0 0.5 1 2
Miles

Exhibit 2-1

Tier One Selected Alternative
Alternative 203D

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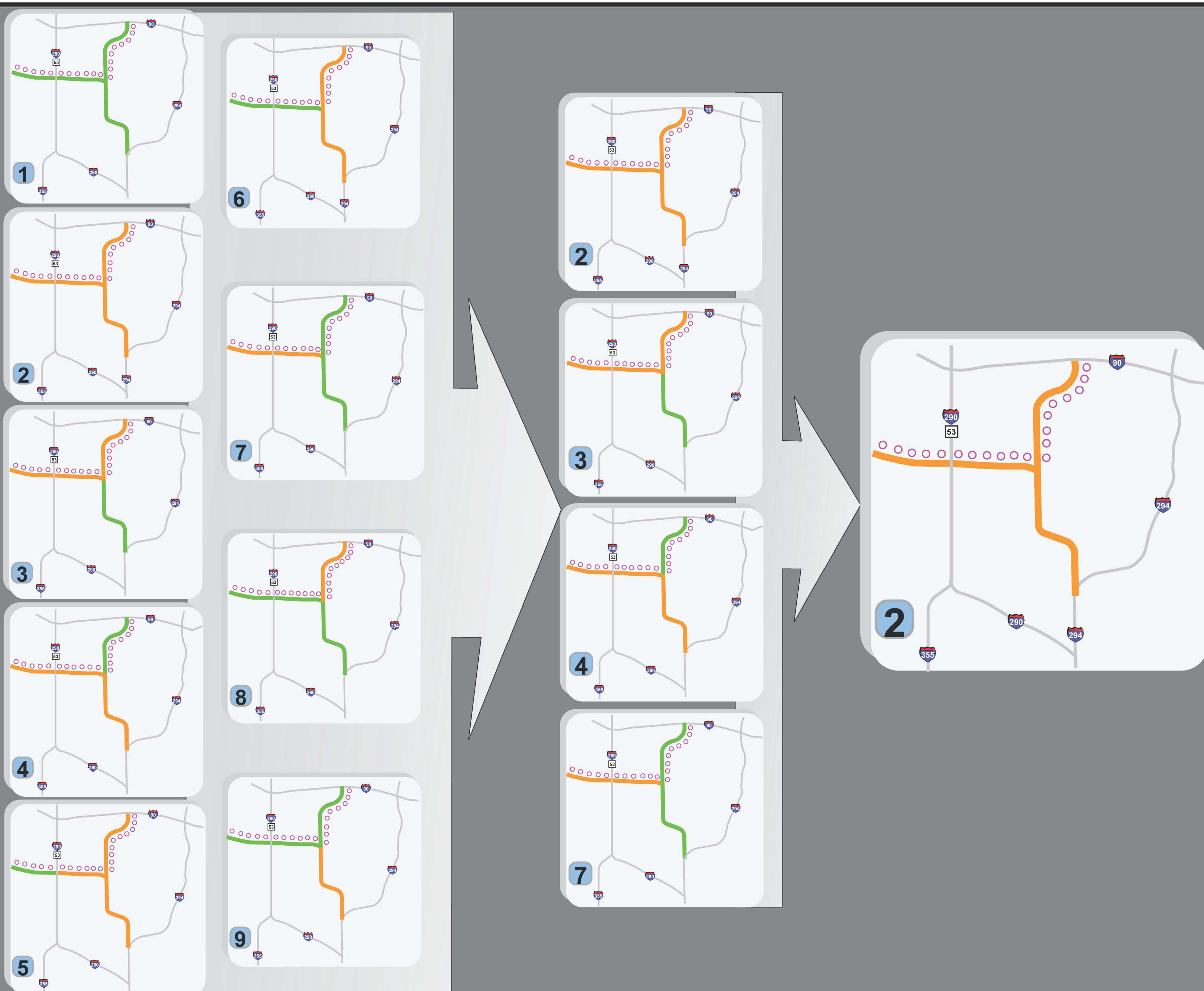

LEGEND

- Freeway
- Toll Road
- Dedicated Transitway
- X Alternate Number

NORTH
Not to Scale

Exhibit 2-2

Facility Type Alternates

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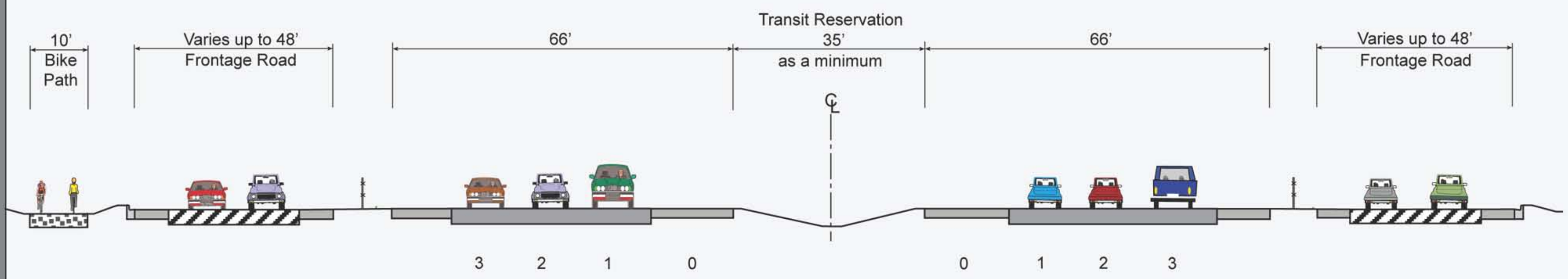
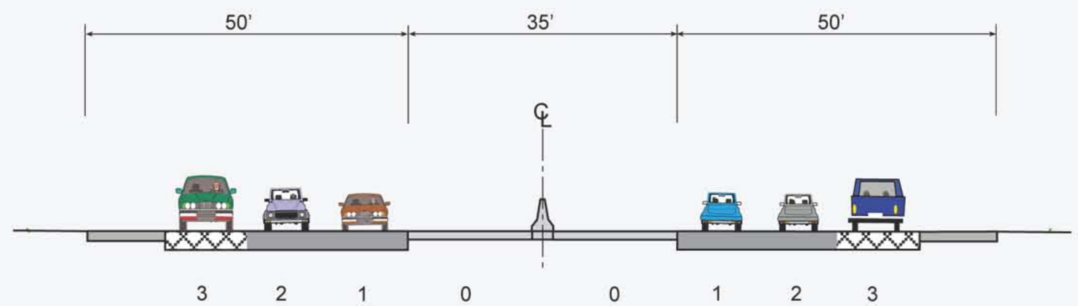


Elgin O'Hare Corridor Cross-section
(Elgin O'Hare Corridor West at Wood Dale Road)



West Bypass Corridor Cross-section

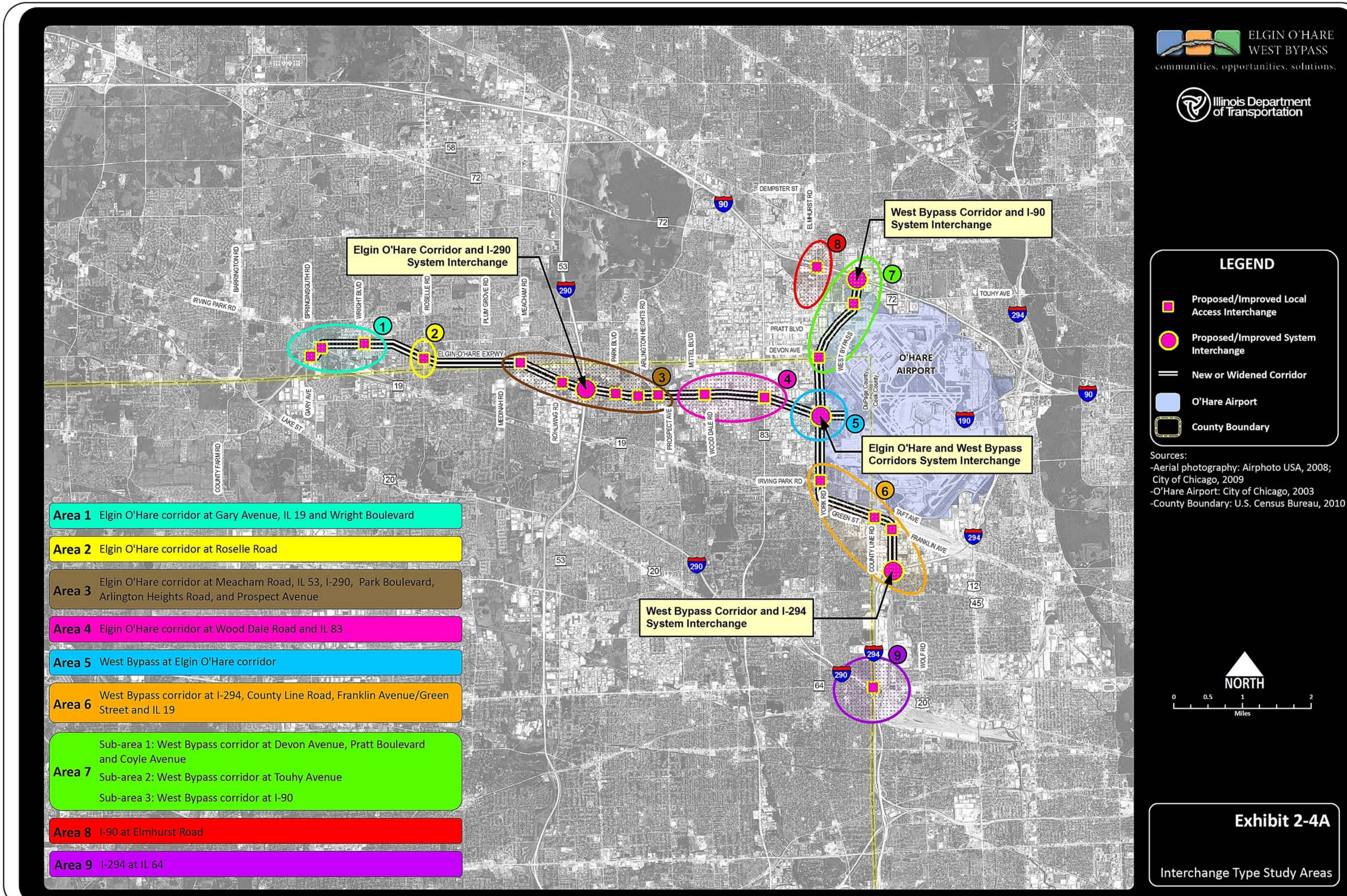
LEGEND

- Roadway
- Frontage Road
- Auxiliary Lane
- Bicycle/Pedestrian Path

Note:
℄ = Center Line

Exhibit 2-3

Typical Roadway Cross-section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Elgin O'Hare Corridor and I-290 System Interchange
West Bypass Corridor and I-90 System Interchange
Elgin O'Hare and West Bypass Corridors System Interchange
West Bypass Corridor and I-294 System Interchange
O'HARE AIRPORT
ELGIN-O'HARE EXPWY
WEST BYPASS
IRVING PARK RD
BARRINGTON RD
SPRINGINSGUTH RD
WRIGHT BLVD
ROSELLE RD
PLUM GROVE RD
MEACHAM RD
ARLINGTON HEIGHTS RD
PARK BLVD
MITTEL BLVD
ELMHURST RD
DEMPSTER ST
TOUHY AVE
PRATT BLVD
DEVON AVE
GARY AVE
LAKE ST
MEDINAH RD
ROHLWING RD
PROSPECT AVE
WOOD DALE RD
COUNTY FARM RD
YORK RD
GREEN ST
TAFT AVE
FRANKLIN AVE
COUNTY LINE RD
WOLF RD
DuPage County
Cook County
LEGEND
Proposed/Improved Local Access Interchange
Proposed/Improved System Interchange
New or Widened Corridor
O'Hare Airport
County Boundary
Sources:
-Aerial photography: Airphoto USA, 2008; City of Chicago, 2009
-O'Hare Airport: City of Chicago, 2003
-County Boundary: U.S. Census Bureau, 2010
NORTH
0 0.5 1 2
Miles
Area 1 Elgin O'Hare corridor at Gary Avenue, IL 19 and Wright Boulevard
Area 2 Elgin O'Hare corridor at Roselle Road
Area 3 Elgin O'Hare corridor at Meacham Road, IL 53, I-290, Park Boulevard, Arlington Heights Road, and Prospect Avenue
Area 4 Elgin O'Hare corridor at Wood Dale Road and IL 83
Area 5 West Bypass at Elgin O'Hare corridor
Area 6 West Bypass corridor at I-294, County Line Road, Franklin Avenue/Green Street and IL 19
Area 7 Sub-area 1: West Bypass corridor at Devon Avenue, Pratt Boulevard and Coyle Avenue
Sub-area 2: West Bypass corridor at Touhy Avenue
Sub-area 3: West Bypass corridor at I-90
Area 8 I-90 at Elmhurst Road
Area 9 I-294 at IL 64
Exhibit 2-4A
Interchange Type Study Areas

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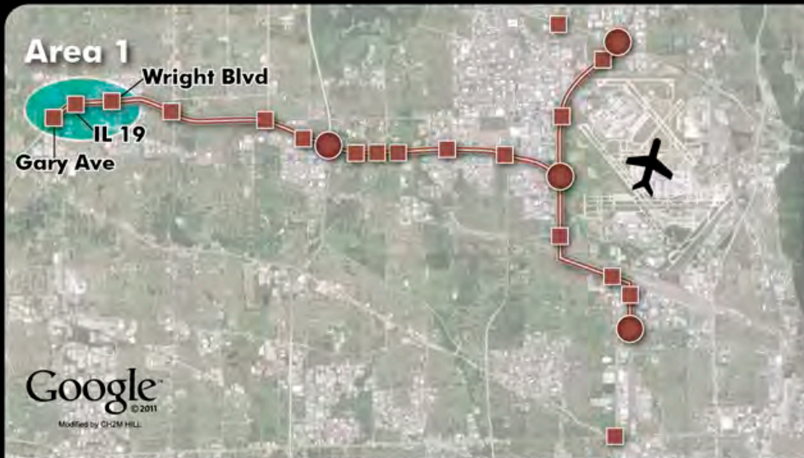
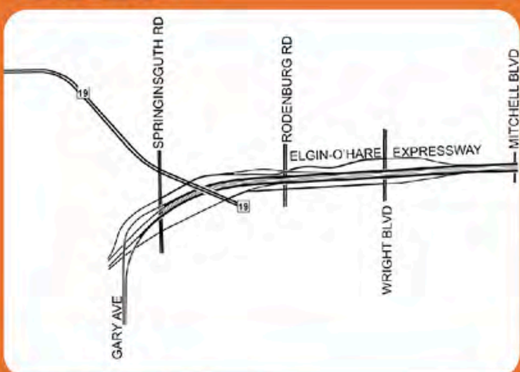
Area 1



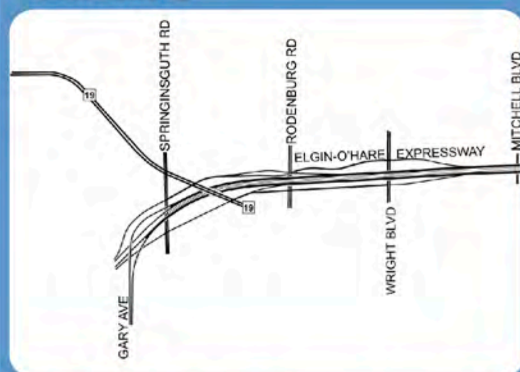
Alternates	Wetlands (ac)	Floodplains (ac)	Waters (ac)	Residential and Business Displacements (Number)	Cost	Traffic and Operations Evaluation Rating
1	1.4	0	0	0	Low	Good
2	1.4	0	0	0	Medium	Moderate
3	1.43	0	0	5	High	Poor

Alternate 1



Split diamond interchange

Alternate 2



Split diamond interchange with braided westbound Irving Park Road (IL 19) exit ramp

Alternate 3

Split diamond interchange with braided westbound Irving Park Road (IL 19) exit ramp and eastbound loop entrance ramp

Preferred Alternate

Alternate 1 maintains existing interchange configuration (Gary Avenue to Wright Boulevard). It provides acceptable traffic operations with lower cost and fewer displacements.

LEGEND

- Interchange Alternate Area
- Proposed/Improved System Interchange
- Proposed/Improved Local Access Interchange
- New or Widened Corridor
- Highest Cost, Highest Impacts, or Poor Travel Performance
- Average Cost, Average Impacts, or Average Travel Performance
- Low Cost, Low Impacts, or High Travel Performance
- Dismissed Alternate
- Preferred Alternate

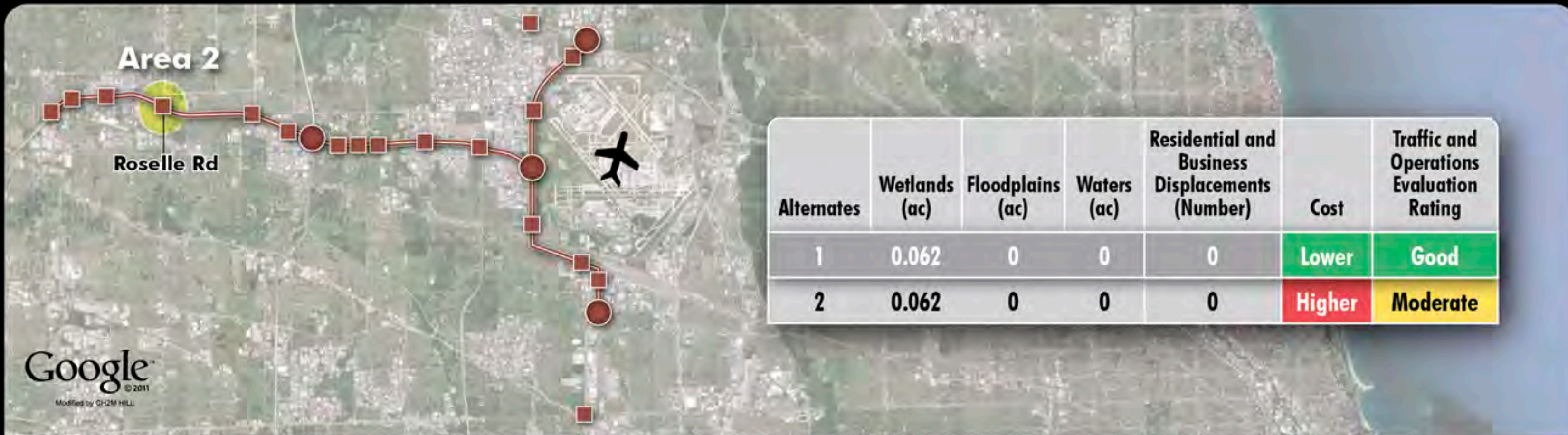
Note:
Quantities are based on area within project footprint for comparative purposes only. Impacts may vary following additional avoidance and minimization strategies.

Source:
Aerial photography: Google Earth Pro, 2011

NORTH
Not to Scale

Exhibit 2-4B

Interchange Type Study Alternate Evaluation – Area 1



Alternates	Wetlands (ac)	Floodplains (ac)	Waters (ac)	Residential and Business Displacements (Number)	Cost	Traffic and Operations Evaluation Rating
1	0.062	0	0	0	Lower	Good
2	0.062	0	0	0	Higher	Moderate

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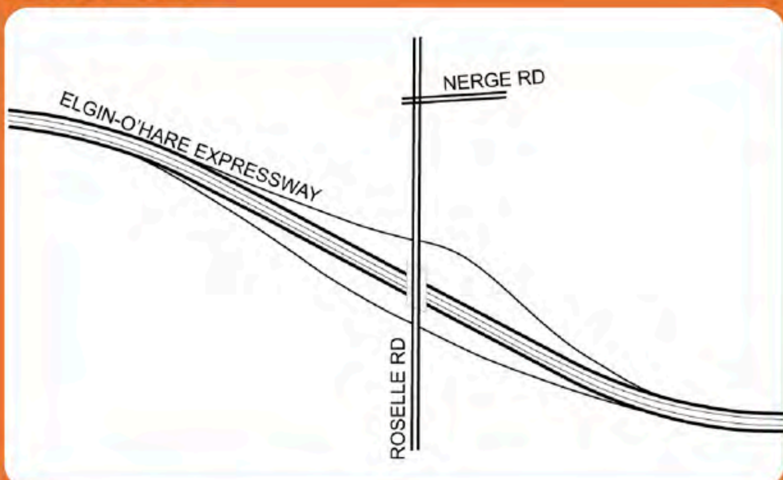
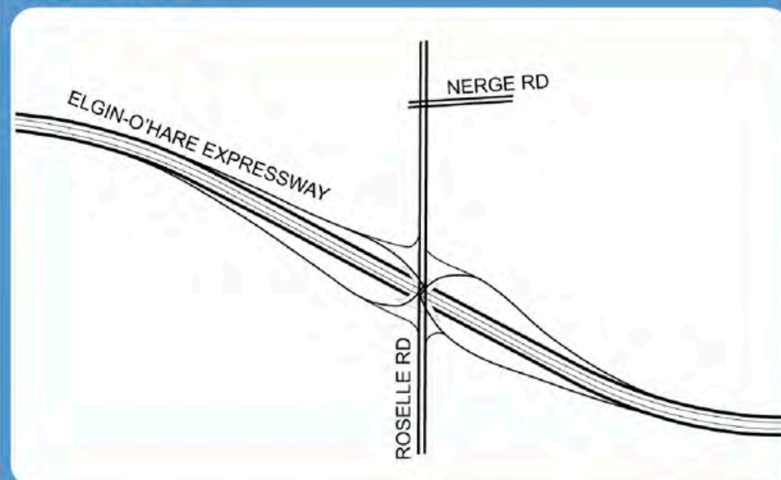
Alternate 1



Diamond interchange

Alternate 2



Single point urban interchange

LEGEND

- Interchange Alternate Area
- Proposed/Improved System Interchange
- Proposed/Improved Local Access Interchange
- New or Widened Corridor
- Highest Cost, Highest Impacts, or Poor Travel Performance
- Average Cost, Average Impacts, or Average Travel Performance
- Low Cost, Low Impacts, or High Travel Performance
- Dismissed Alternate
- Preferred Alternate

Note:
Quantities are based on area within project footprint for comparative purposes only. Impacts may vary following additional avoidance and minimization strategies.

Source:
Aerial photography: Google Earth Pro, 2011

NORTH
Not to Scale

Preferred Alternate

Alternate 1 maintains existing diamond interchange configuration at Roselle Road. It provides acceptable traffic operations, and simpler bridge design with less total cost.

Exhibit 2-4C

Interchange Type Study Alternate Evaluation – Area 2

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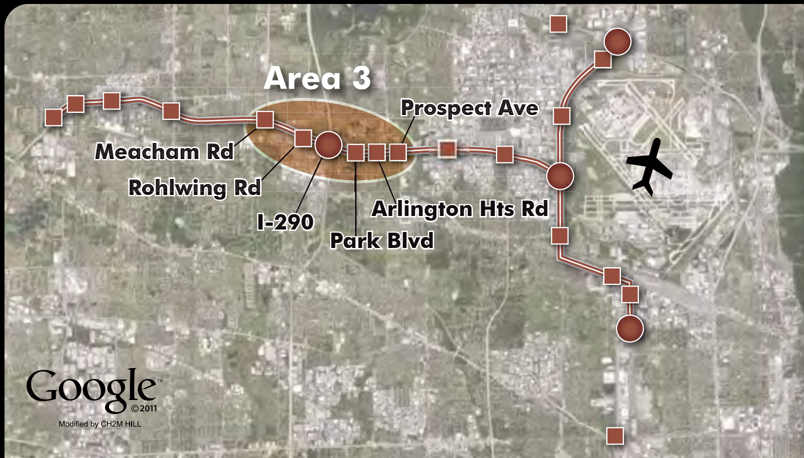

Alternates	Wetlands (ac)	Floodplains (ac)	Waters (ac)	Residential and Business Displacements (Number)	Cost	Traffic and Operations Evaluation Rating
1	12.83	10	0.4	11	Low	Moderate
2	12.88	10	0.4	11	Low	Poor
3	12.83	10	0.4	11	Medium	Good
4	12.83	10	0.4	11	Medium	Moderate
5	12.83	10	0.4	11	High	Poor
6	12.83	10	0.4	11	Highest	Poor
7	12.83	10	0.4	11	Lowest	Good

Alternate 1

Four-level system interchange with westbound to southbound loop ramp and direct access to Park Boulevard from north, south, and west

Alternate 2

Three-level system interchange with westbound to southbound and eastbound to northbound loop ramps and direct access to Park Boulevard from north, south, and west

Alternate 3

Four-level system interchange with westbound to southbound loop ramp and direct access to Park Boulevard from north, south, and west and from Park Boulevard to the west via frontage road

Alternate 4

Four-level system interchange with westbound to southbound loop ramp and direct access to Park Boulevard from north, south, and west and from Park Boulevard to the north, south, and west via frontage road

Alternate 5

Four-level system interchange with direct access to Park Boulevard from north, south, and west and from Park Boulevard to the west

Alternate 6

Four-level system interchange and direct access to Park Boulevard from north, south, and west and from Park Boulevard to the north, south (loop ramp), and west via frontage road

Alternate 7

Three-level system interchange with westbound to southbound and eastbound to northbound loop ramps and direct access to Park Boulevard from south and north and from Park Boulevard south and west

Preferred Alternate

Alternate 7 is a three-level system interchange with a two-loop interchange. It provides acceptable traffic operations at a lower cost.

LEGEND

- Interchange Alternate Area
- Proposed/Improved System Interchange
- Proposed/Improved Local Access Interchange
- New or Widened Corridor
- Highest Cost, Highest Impacts, or Poor Travel Performance
- Average Cost, Average Impacts, or Average Travel Performance
- Low Cost, Low Impacts, or High Travel Performance
- Dismissed Alternate
- Preferred Alternate

Note:
Quantities are based on area within project footprint for comparative purposes only. Impacts may vary following additional avoidance and minimization strategies.

Source:
Aerial photography: Google Earth Pro, 2011

NORTH
Not to Scale

Exhibit 2-4D

Interchange Type Study Alternate Evaluation – Area 3

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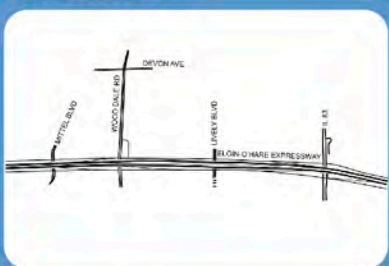
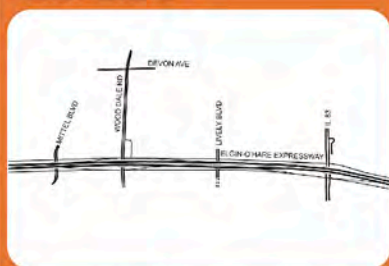
Alternates	Wetlands (ac)	Floodplains (ac)	Waters (ac)	Residential and Business Displacements (Number)	Cost	Traffic and Operations Evaluation Rating
1	4.19	0.6	0	0	Highest	Moderate
2	4.19	0.6	0	0	Lower	Good
3	4.19	0.6	0	0	Lowest	Poor
4	4.19	0.6	0	0	Higher	Moderate

Alternate 1



Split diamond interchanges with consecutive exits and entrances along with continuous one-way frontage roads

Alternate 2



Diamond interchanges at Wood Dale Road and IL 83 and continuous one-way frontage roads

Alternate 3

Diamond interchanges at Wood Dale Road and IL 83 and discontinuous frontage roads

Alternate 4

Split diamond access westbound and standard diamond access eastbound with continuous one-way frontage roads

Preferred Alternate

Alternate 2 includes conventional diamond interchanges with one-way frontage roads at Wood Dale Road and IL 83. It provides acceptable traffic operations while maintaining local travel patterns to support existing and planned development, which reduces traffic impacts on local roadways and access conflicts.

LEGEND

- Interchange Alternate Area
- Proposed/Improved System Interchange
- Proposed/Improved Local Access Interchange
- New or Widened Corridor
- Highest Cost, Highest Impacts, or Poor Travel Performance
- Average Cost, Average Impacts, or Average Travel Performance
- Low Cost, Low Impacts, or High Travel Performance
- Dismissed Alternate
- Preferred Alternate

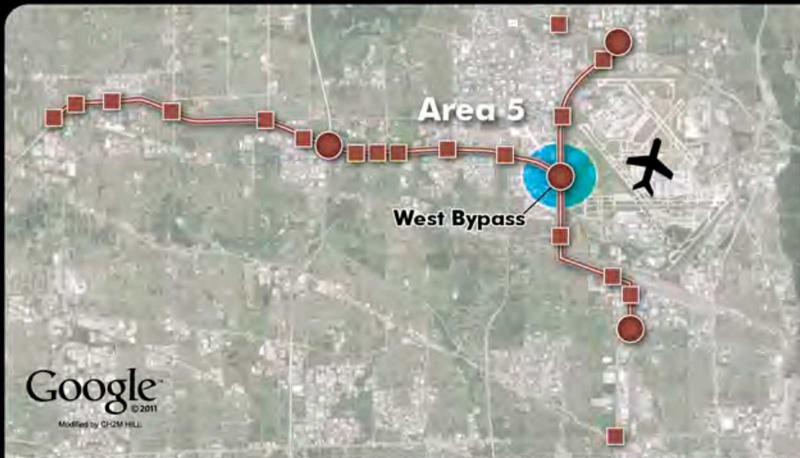
Note:
Quantities are based on area within project footprint for comparative purposes only. Impacts may vary following additional avoidance and minimization strategies.

Source:
Aerial photography: Google Earth Pro, 2011

NORTH
Not to Scale

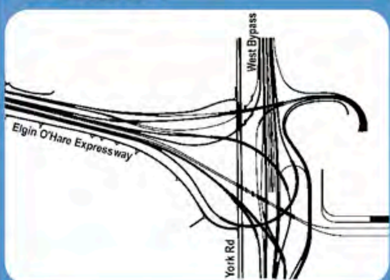
Exhibit 2-4E

Interchange Type Study Alternate Evaluation – Area 4



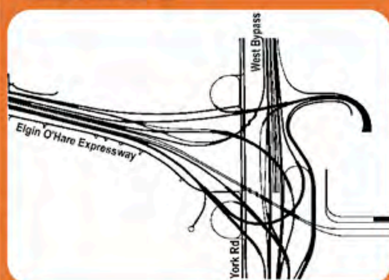
Alternates	Wetlands (ac)	Floodplains (ac)	Waters (ac)	Residential and Business Displacements (Number)	Cost	Traffic and Operations Evaluation Rating
1	6.1	1.2	0	6	Lowest	Moderate
2	6.1	1.2	0	6	Lower	Good
3	6.1	1.2	0	6	Higher	Moderate
4	6.1	1.2	0	6	Highest	Moderate

Alternate 1



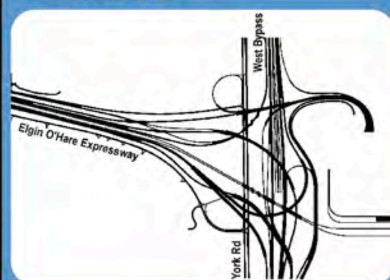
Four-level system interchange with multiple exit design eastbound and indirect access from West Terminal to York Road

Alternate 2



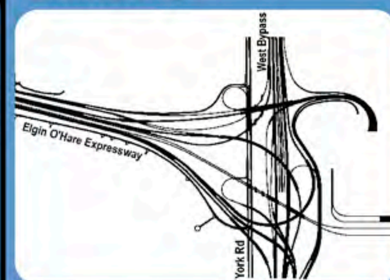
Four-level system interchange with single exit design eastbound (York Road left side) and direct access from West Terminal to York Road

Alternate 3



Four-level system interchange with single exit design eastbound (York Road right side) and direct access from West Terminal to York Road

Alternate 4



Four-level system interchange with multiple exit design eastbound and direct access from West Terminal to York Road

Preferred Alternate

Alternate 2 is a four-level system interchange with single exit design providing airport terminal access and local access at York Road. It provides better route continuity to O'Hare Airport and increased driver expectation for the system movements. This minimizes operational issues and weaving concerns in comparison to other alternates. It avoids circuitous travel for local traffic and supports local development objectives.

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LEGEND

- Interchange Alternate Area
- Proposed/Improved System Interchange
- Proposed/Improved Local Access Interchange
- New or Widened Corridor
- Highest Cost, Highest Impacts, or Poor Travel Performance
- Average Cost, Average Impacts, or Average Travel Performance
- Low Cost, Low Impacts, or High Travel Performance
- Dismissed Alternate
- Preferred Alternate

Note: Quantities are based on area within project footprint for comparative purposes only. Impacts may vary following additional avoidance and minimization strategies.

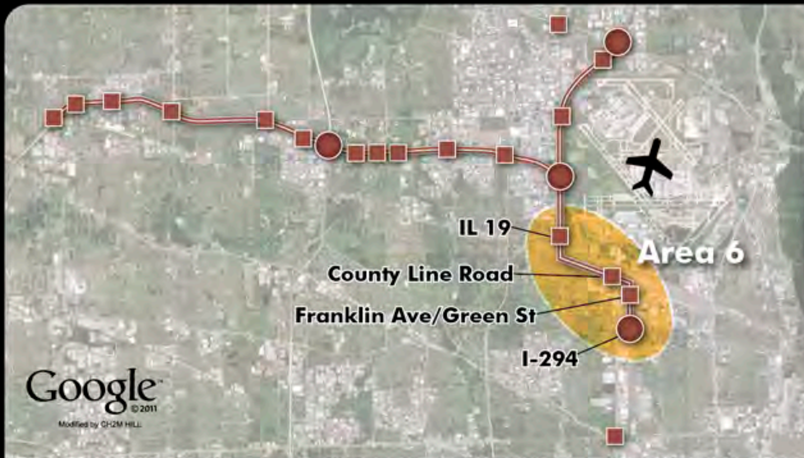
Source: Aerial photography: Google Earth Pro, 2011

NORTH

Not to Scale

Exhibit 2-4F

Interchange Type Study Alternate Evaluation – Area 5



Alternates	Wetlands (ac)	Floodplains (ac)	Waters (ac)	Residential and Business Displacements (Number)	Cost	Traffic and Operations Evaluation Rating
1	0	4.9	0.05	26	Medium	Good
2	0	4.9	0.05	26	Lowest	Moderate
3	0	4.9	0.07	26	Highest	Moderate

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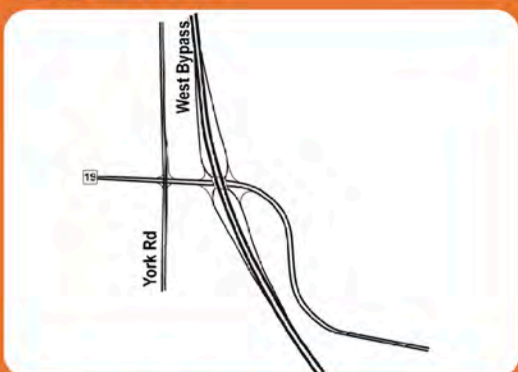
Alternate 1



Single point urban diamond interchange

Alternate 2

Tight diamond interchange

Alternate 3

Modified diamond interchange with single loop ramp

LEGEND

- Interchange Alternate Area
- Proposed/Improved System Interchange
- Proposed/Improved Local Access Interchange
- New or Widened Corridor
- Highest Cost, Highest Impacts, or Poor Travel Performance
- Average Cost, Average Impacts, or Average Travel Performance
- Low Cost, Low Impacts, or High Travel Performance
- Dismissed Alternate
- Preferred Alternate

Note:
Quantities are based on area within project footprint for comparative purposes only. Impacts may vary following additional avoidance and minimization strategies.

Source:
Aerial photography: Google Earth Pro, 2011

NORTH
Not to Scale

Preferred Alternate

Alternate 1 includes a single point diamond interchange at the West Bypass and Irving Park Road (IL 19), a directional "Y" system interchange at the West Bypass and I-294, and a split diamond interchange at the West Bypass and County Line Road and Franklin/Green Street. It provides good traffic operations while minimizing impact to O'Hare Airport in terms of right-of-way and cost, which results in slightly more initial bridge structure cost.

Exhibit 2-4G

Interchange Type Study Alternate Evaluation – Area 6

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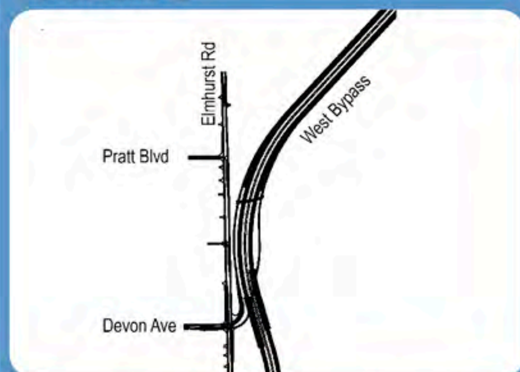
Alternates	Wetlands (ac)	Floodplains (ac)	Waters (ac)	Residential and Business Displacements (Number)	Cost	Traffic and Operations Evaluation Rating
1	0	0	0	3	Lowest	Good
2	0	0	0	1	Medium	Moderate
3	0	0	0	5	Highest	Poor

Alternate 1

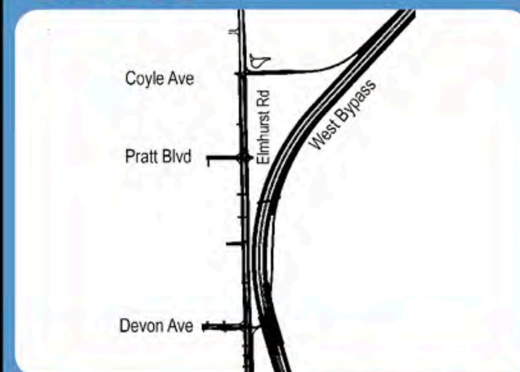
Half diamond interchange at Elmhurst Road with ramp connections at Pratt Boulevard and Devon Avenue

Alternate 2



Half diamond interchange at Elmhurst Road with ramp connection at Devon Avenue

Alternate 3



Half diamond interchange at Elmhurst Road with ramp connections at Coyle Avenue and Devon Avenue

Preferred Alternate

Alternate 1 includes a half diamond interchange with connections at Devon Avenue and Pratt Boulevard. It prevents major industrial development displacement, minimizes access impacts at Coyle Avenue, and provides efficient traffic operations with split intersections.

LEGEND

- Interchange Alternate Area
- Proposed/Improved System Interchange
- Proposed/Improved Local Access Interchange
- New or Widened Corridor
- Highest Cost, Highest Impacts, or Poor Travel Performance
- Average Cost, Average Impacts, or Average Travel Performance
- Low Cost, Low Impacts, or High Travel Performance
- Dismissed Alternate
- Preferred Alternate

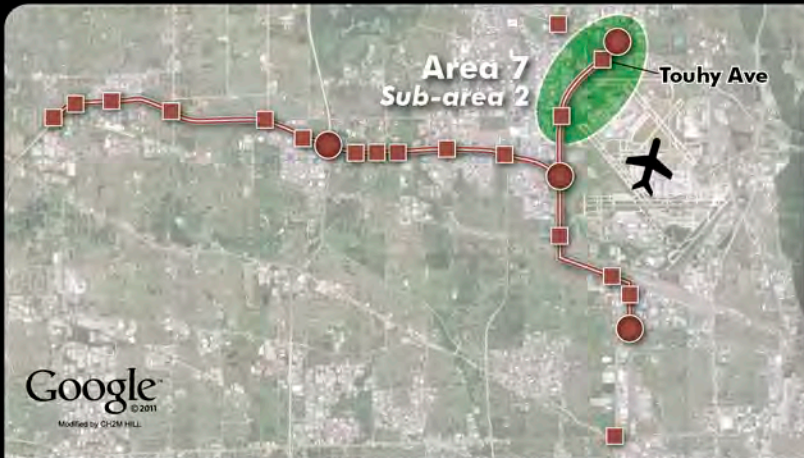
Note:
Quantities are based on area within project footprint for comparative purposes only. Impacts may vary following additional avoidance and minimization strategies.

Source:
Aerial photography: Google Earth Pro, 2011

NORTH
Not to Scale

Exhibit 2-4H

Interchange Type Study Alternate Evaluation – Area 7 *Sub-area 1*



Alternates	Wetlands (ac)	Floodplains (ac)	Waters (ac)	Residential and Business Displacements (Number)	Cost	Traffic and Operations Evaluation Rating
1	0	1.3	0.05	2	Lowest	Moderate
2	0	1.3	0.05	2	Medium	Good
3	0	1.3	0.05	2	Highest	Moderate

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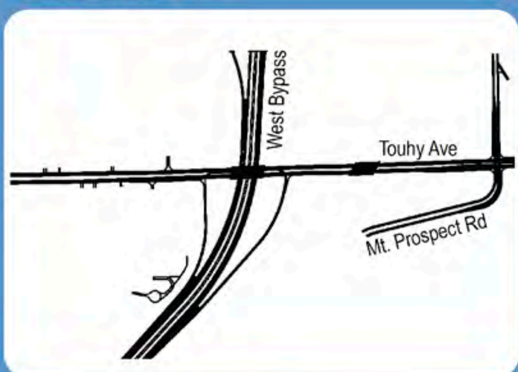
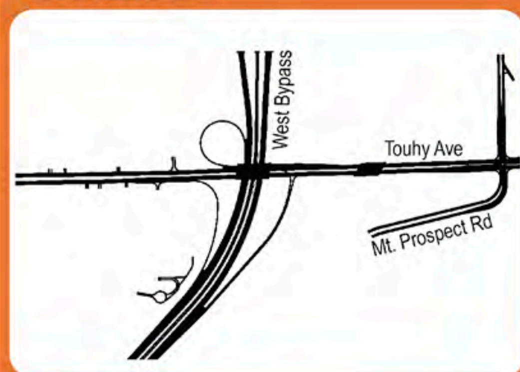
Alternate 1



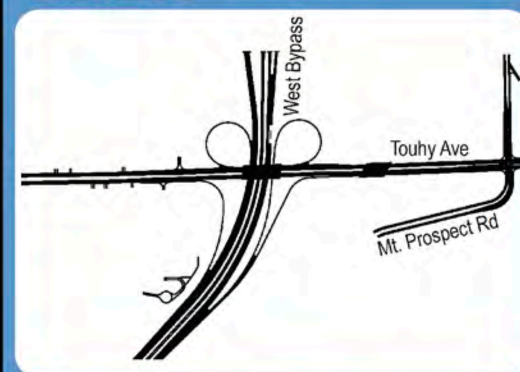
Half diamond interchange

Alternate 2



Half diamond interchange with single loop ramp (westbound to southbound)

Alternate 3



Half diamond interchange with two-loop ramps (westbound to southbound and northbound to westbound)

LEGEND

- Interchange Alternate Area
- Proposed/Improved System Interchange
- Proposed/Improved Local Access Interchange
- New or Widened Corridor
- Highest Cost, Highest Impacts, or Poor Travel Performance
- Average Cost, Average Impacts, or Average Travel Performance
- Low Cost, Low Impacts, or High Travel Performance
- Dismissed Alternate
- Preferred Alternate

Note:
Quantities are based on area within project footprint for comparative purposes only. Impacts may vary following additional avoidance and minimization strategies.

Source:
Aerial photography: Google Earth Pro, 2011

NORTH
Not to Scale

Preferred Alternate

Alternate 2 is a half diamond interchange with a single loop and connections at Touhy Avenue. It provides efficient traffic operations for the interchange without operational weaving concerns.

Exhibit 2-41

Interchange Type Study Alternate Evaluation – Area 7 *Sub-area 2*

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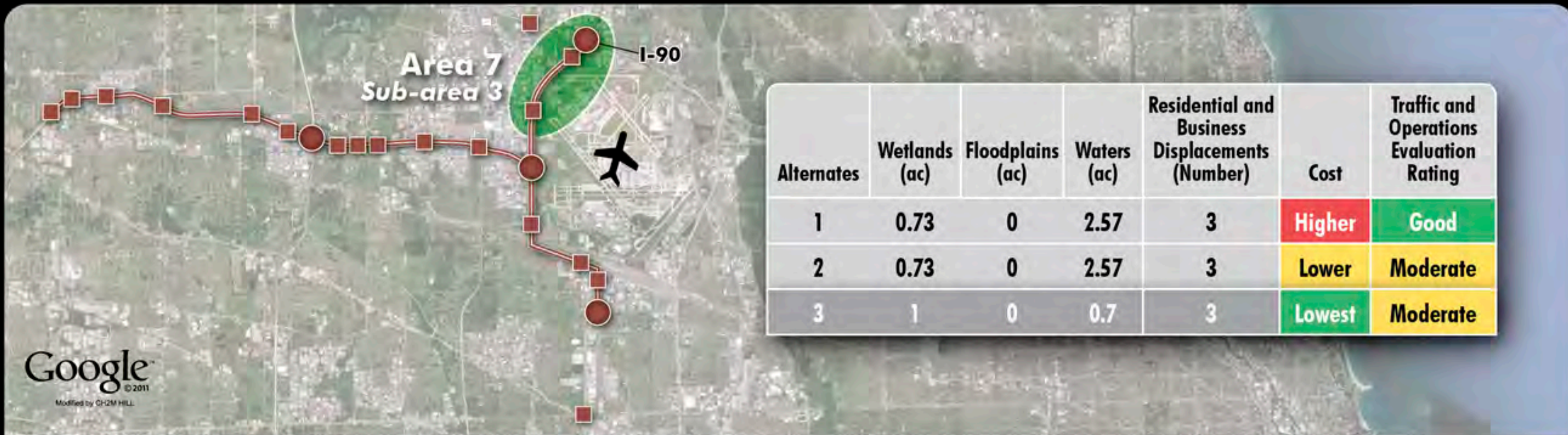
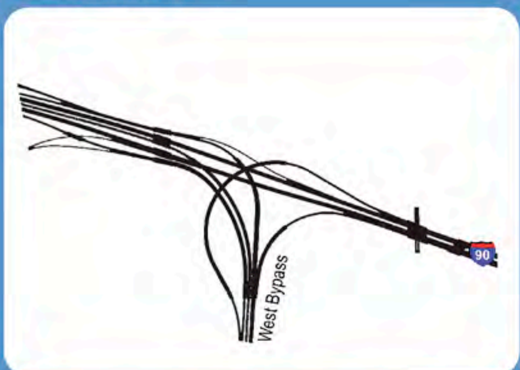


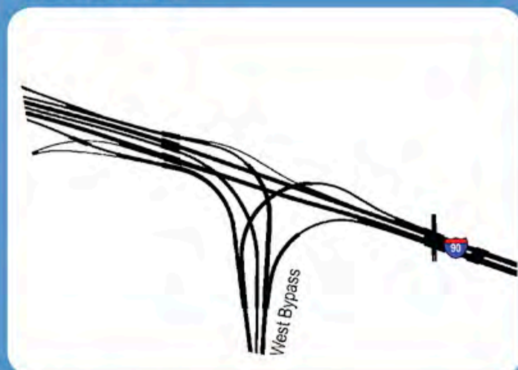
Alternates	Wetlands (ac)	Floodplains (ac)	Waters (ac)	Residential and Business Displacements (Number)	Cost	Traffic and Operations Evaluation Rating
1	0.73	0	2.57	3	Higher	Good
2	0.73	0	2.57	3	Lower	Moderate
3	1	0	0.7	3	Lowest	Moderate

Alternate 1



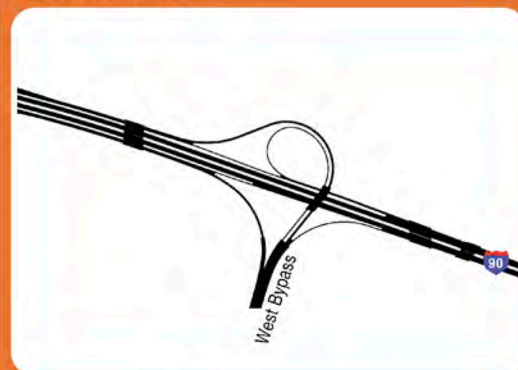
Y-type system interchange with braided southbound movements

Alternate 2



Y-type system interchange

Alternate 3



Trumpet interchange

Preferred Alternate

Alternate 3 is a trumpet interchange with a collector-distributer between the I-90 and West Bypass and I-90 and Elmhurst Road interchanges. It provides acceptable traffic operations at a lower cost. Cost is lower because the length, height, and number of bridge structures are reduced.

LEGEND

- Interchange Alternate Area
- Proposed/Improved System Interchange
- Proposed/Improved Local Access Interchange
- New or Widened Corridor
- Highest Cost, Highest Impacts, or Poor Travel Performance
- Average Cost, Average Impacts, or Average Travel Performance
- Low Cost, Low Impacts, or High Travel Performance
- Dismissed Alternate
- Preferred Alternate

Note:
Quantities are based on area within project footprint for comparative purposes only. Impacts may vary following additional avoidance and minimization strategies.

Source:
Aerial photography: Google Earth Pro, 2011

NORTH
Not to Scale

Exhibit 2-4J

Interchange Type Study Alternate Evaluation – Area 7 *Sub-area 3*

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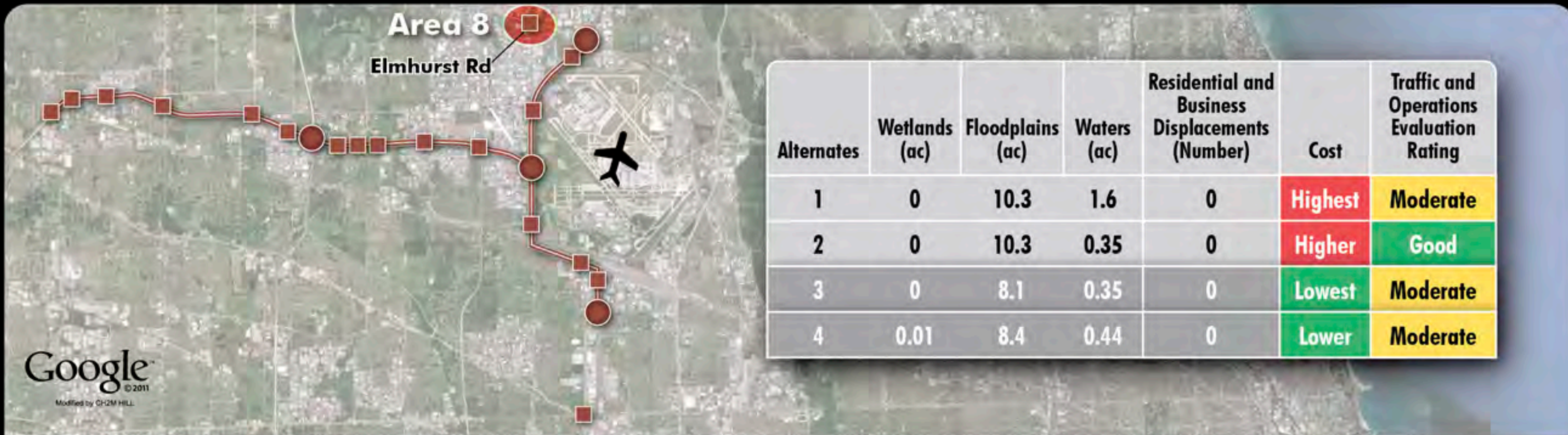

Alternates	Wetlands (ac)	Floodplains (ac)	Waters (ac)	Residential and Business Displacements (Number)	Cost	Traffic and Operations Evaluation Rating
1	0	10.3	1.6	0	Highest	Moderate
2	0	10.3	0.35	0	Higher	Good
3	0	8.1	0.35	0	Lowest	Moderate
4	0.01	8.4	0.44	0	Lower	Moderate

Alternate 1

Partial cloverleaf interchange with two-loop ramps (westbound to southbound and eastbound to northbound)

Alternate 2

Partial cloverleaf interchange with single loop ramp (eastbound to northbound)

Alternate 3

Diamond interchange

Alternate 4

Diverging diamond interchange

Preferred Alternate

Alternate 3 is a diamond interchange and Alternate 4 is a diverging diamond interchange. Both alternates provide comparable traffic operations and interchange capacity while limiting construction impacts to Higgins Creek.

LEGEND

- Interchange Alternate Area
- Proposed/Improved System Interchange
- Proposed/Improved Local Access Interchange
- New or Widened Corridor
- Highest Cost, Highest Impacts, or Poor Travel Performance
- Average Cost, Average Impacts, or Average Travel Performance
- Low Cost, Low Impacts, or High Travel Performance
- Dismissed Alternate
- Preferred Alternate

Note:
Quantities are based on area within project footprint for comparative purposes only. Impacts may vary following additional avoidance and minimization strategies.

Source:
Aerial photography: Google Earth Pro, 2011

NORTH
Not to Scale

Exhibit 2-4K

Interchange Type Study Alternate Evaluation – Area 8

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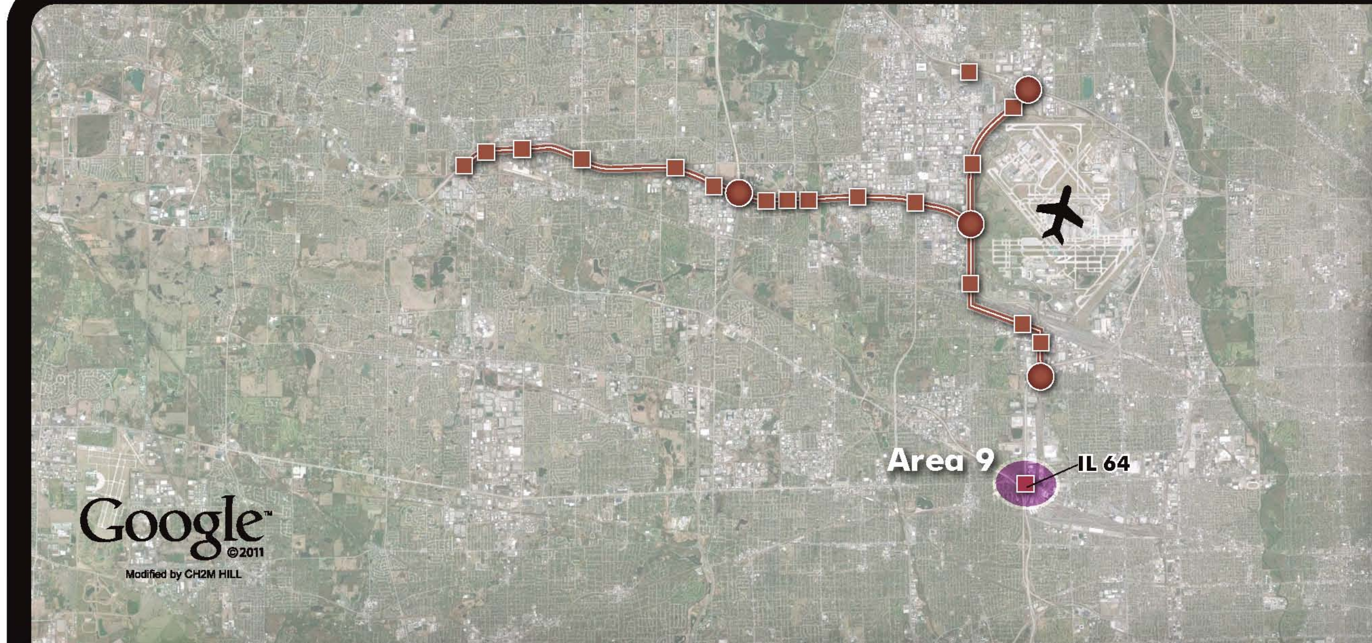
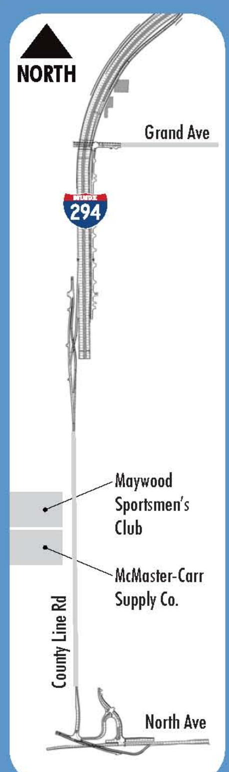


Alternates	Impacts to Southbound Weaving	Access to Major Development	Right-of-Way Impact to Adjacent Development	Cost	Impact to Elmhurst Detention Basin
1	Unacceptable for Tolling Operations	Good	Low	Low	None
2	Acceptable for Tolling Operations	Good	Medium	Low	None
3	Excellent for Tolling Operations	Poor	High	Medium	Low
4	Excellent for Tolling Operations	Poor	Medium	High	Medium
5	Excellent for Tolling Operations	Poor	Medium	High	High

LEGEND

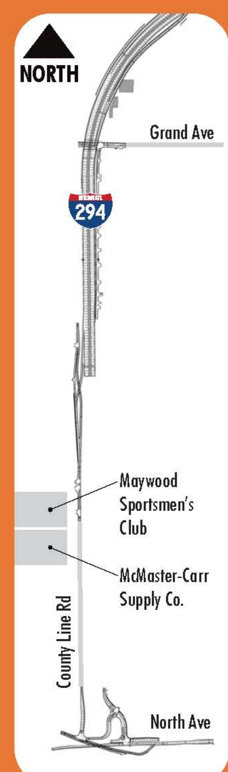
- Interchange Alternate Area
- Proposed/Improved System Interchange
- Proposed/Improved Local Access Interchange
- New or Widened Corridor
- Highest Cost, Highest Impacts, or Poor Travel Performance
- Average Cost, Average Impacts, or Average Travel Performance
- Low Cost, Low Impacts, or High Travel Performance
- Dismissed Alternate
- Preferred Alternate

Source:
Aerial photography: Google Earth Pro, 2011



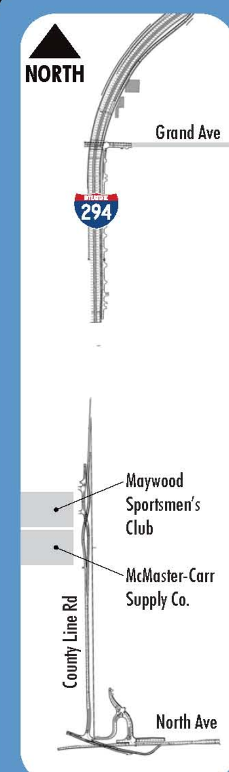
Alternate 1

- Exit ramp furthest north of all Alternates
- Creates worst weaving distance along I-294
- Provides direct access to major development



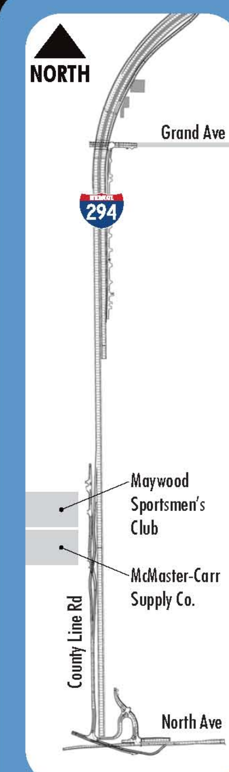
Alternate 2

- Exit ramp further south of Alternate 1
- Improves weaving distance along I-294 to acceptable levels
- Provides direct access to major development



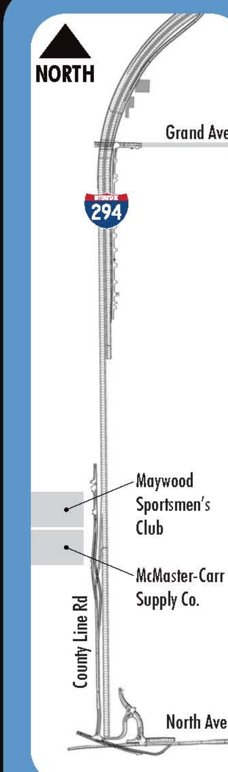
Alternate 3

- Exit ramp about 1,000 feet south of Alternate 2
- Excellent weaving distance along I-294
- Location prohibits direct access from ramp to major development



Alternate 4

- Exit ramp located slightly south of Alternate 3
- Excellent weaving distance along I-294
- Location prohibits direct access from ramp to major development



Alternate 5

- Exit ramp located furthest south of all Alternates
- Excellent weaving distance along I-294
- Greatest impact to Elmhurst Detention Basin
- Location prohibits direct access from ramp to major development

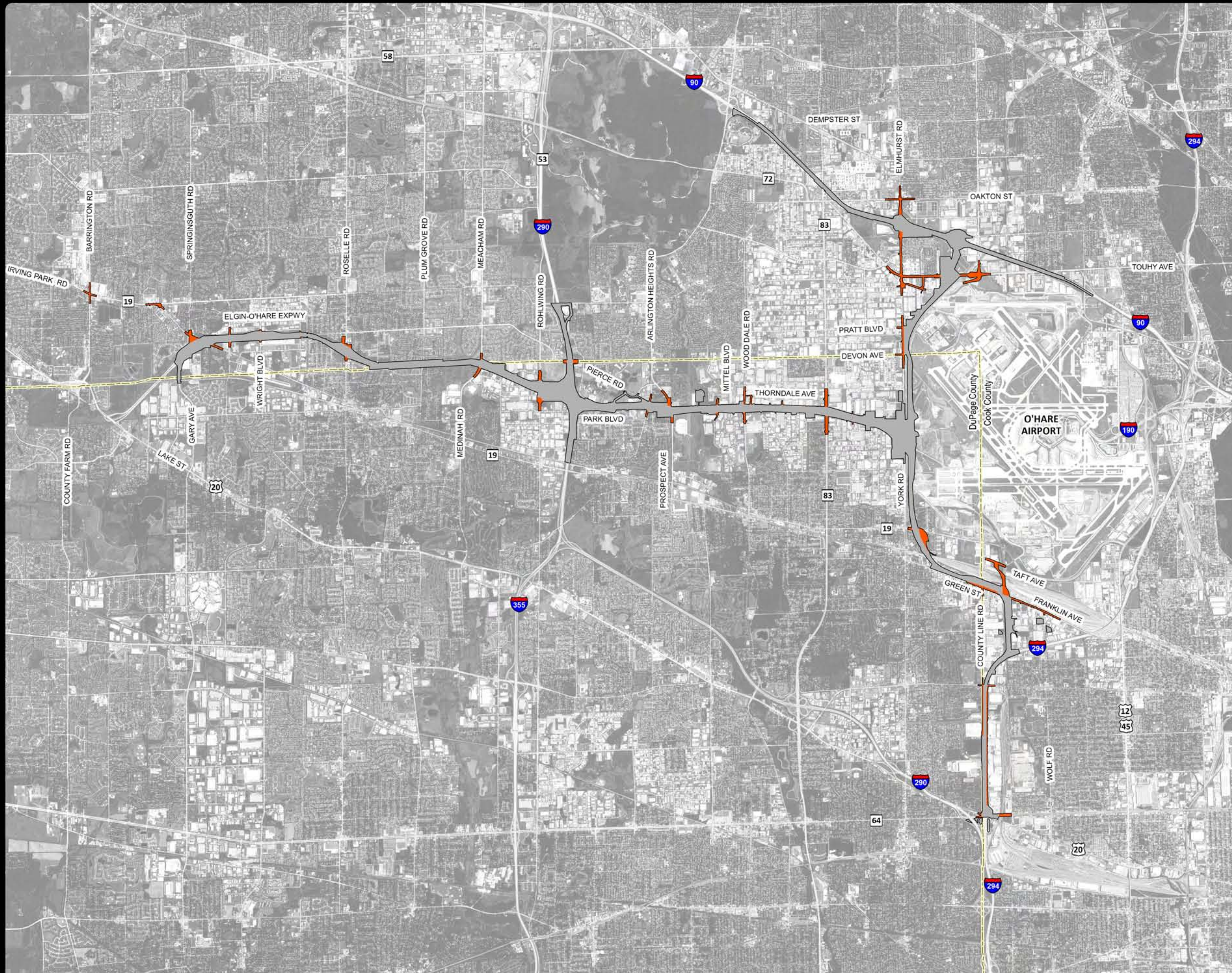
NORTH
Not to Scale

Preferred Alternate

Alternate 2 - Provides acceptable weaving distance on I-294 and direct access to major development on County Line Road.

Exhibit 2-4L

Interchange Type Study Alternate Evaluation – Area 9



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LEGEND

- Project Corridor
- Arterial
- Mainline
- County Boundary

Sources:
-Aerial photography: Airphoto USA, 2008; City of Chicago, 2009
-County Boundary: Tele Atlas North America, Inc., 2008

NORTH

0 0.5 1 2 Miles

Exhibit 2-5

Arterial Improvements

Path: N:\Idot\070404\GIS\Exhibits\Tier 2\Arterial Improvements\Exhibit\Arterial Improvements.mxd

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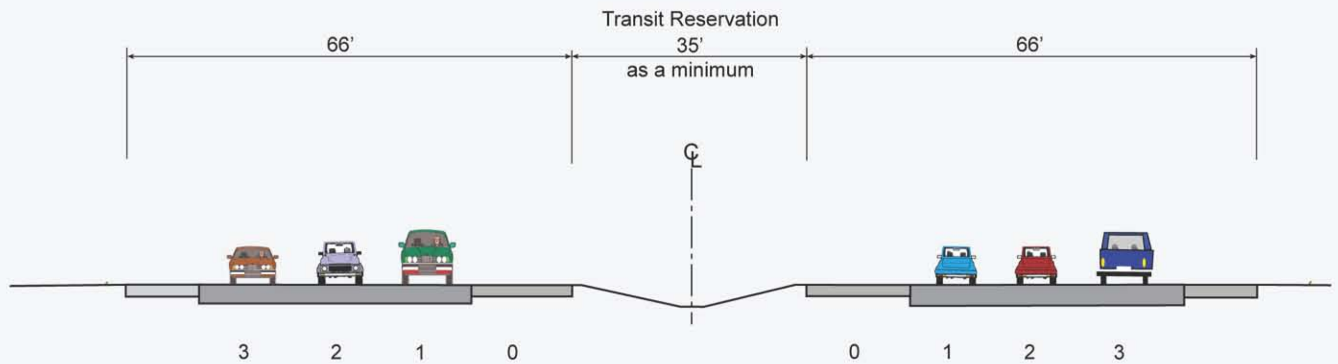
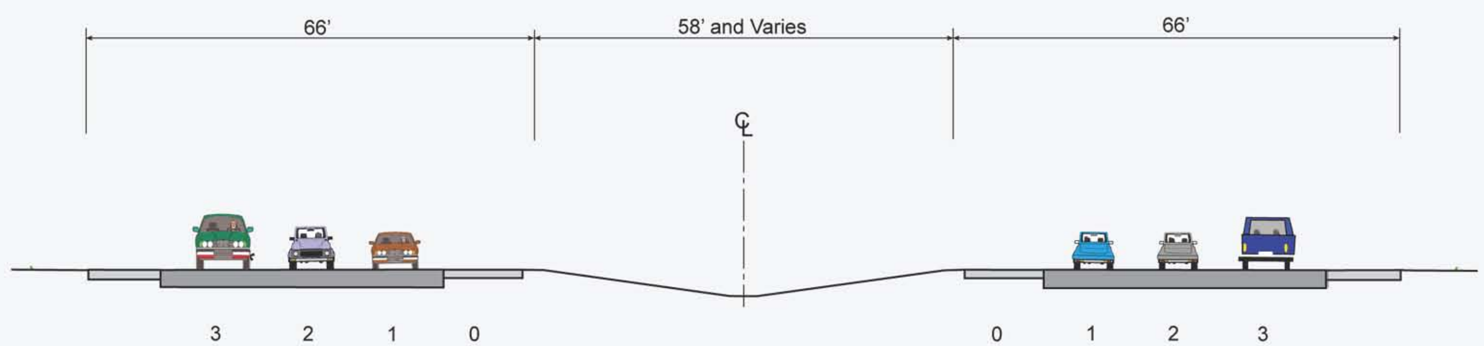


Roadway Cross-section without Transit Station



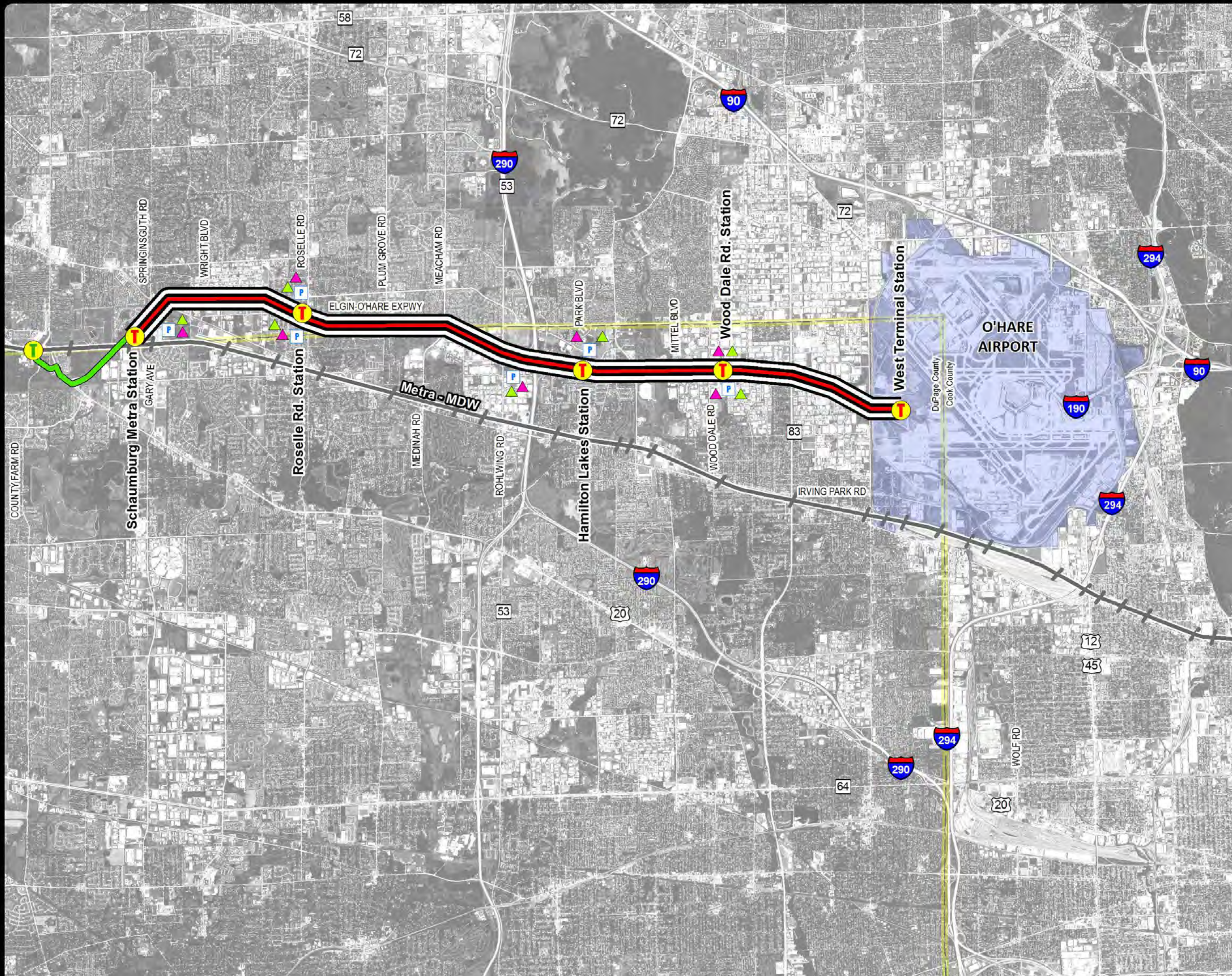
Transit Area with Station

LEGEND

Roadway

Note:
℄ = Center Line

Exhibit 2-6
Typical Roadway and
Transit Station Cross-section



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LEGEND

- Employee Shuttle
- Kiss-N-Ride
- Parking
- Existing Transit Station
- Transit Station
- Transit Improvement
- Express Bus Service to Hanover Park
- O'Hare Airport
- County Boundary

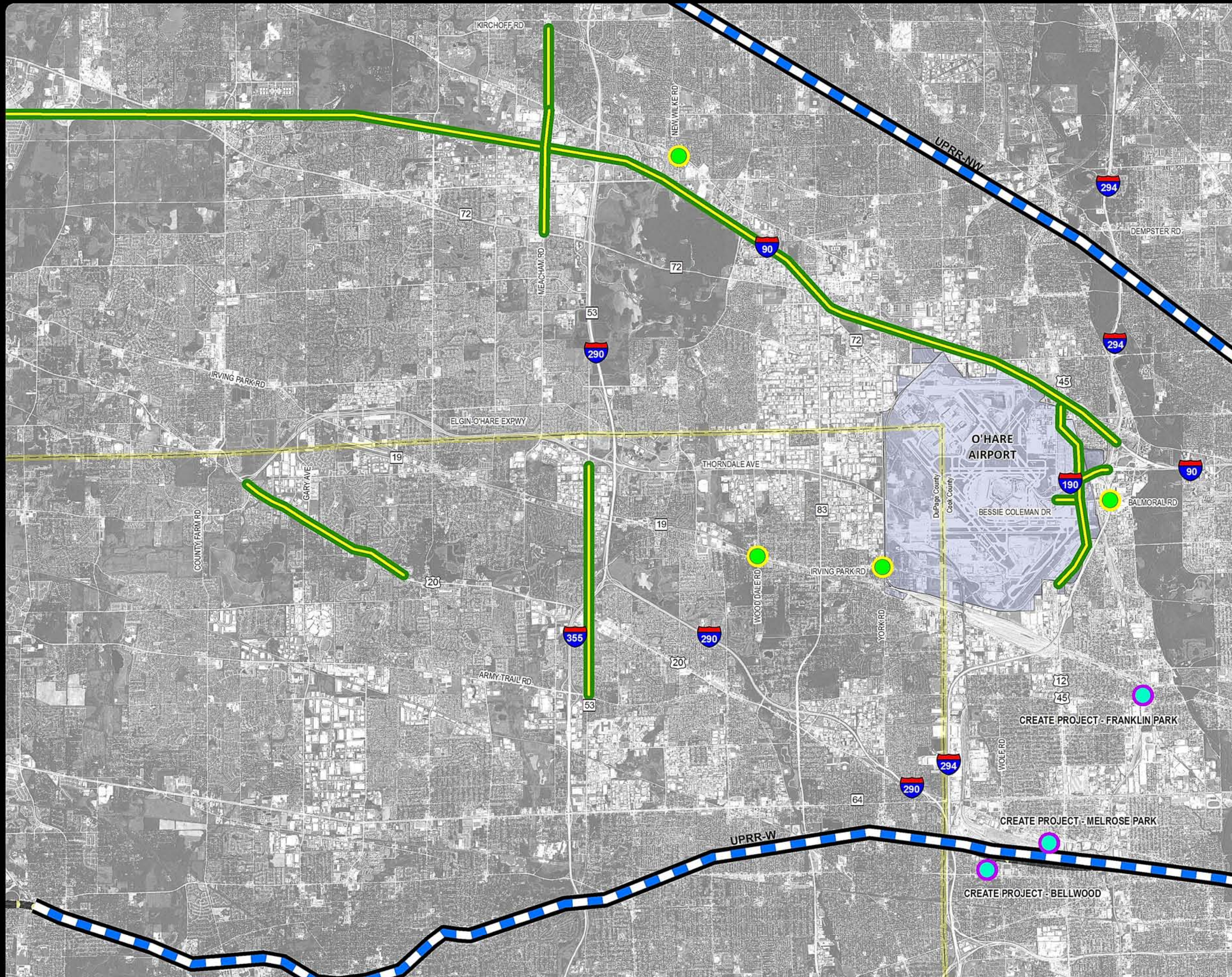
Sources:
-Aerial photography: Airphoto USA, 2008; City of Chicago, 2009
-O'Hare Airport: City of Chicago, 2003
-County Boundary: U.S. Census Bureau, 2010

NORTH

0 0.5 1 2 Miles

Exhibit 2-7

Proposed Transit Improvements



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LEGEND

No-Build Improvements

- Intersection Projects
- Roadway Projects
- CREATE Project
- Transit Projects
- O'Hare Airport
- County Boundary

Sources:
- Aerial photography: Airphoto USA, 2008; City of Chicago, 2009
- O'Hare Airport: City of Chicago, 2003
- County Boundary: U.S. Census Bureau, 2010
- No-Build Improvements: CMAP, 2010

NORTH

0 0.5 1 2 Miles

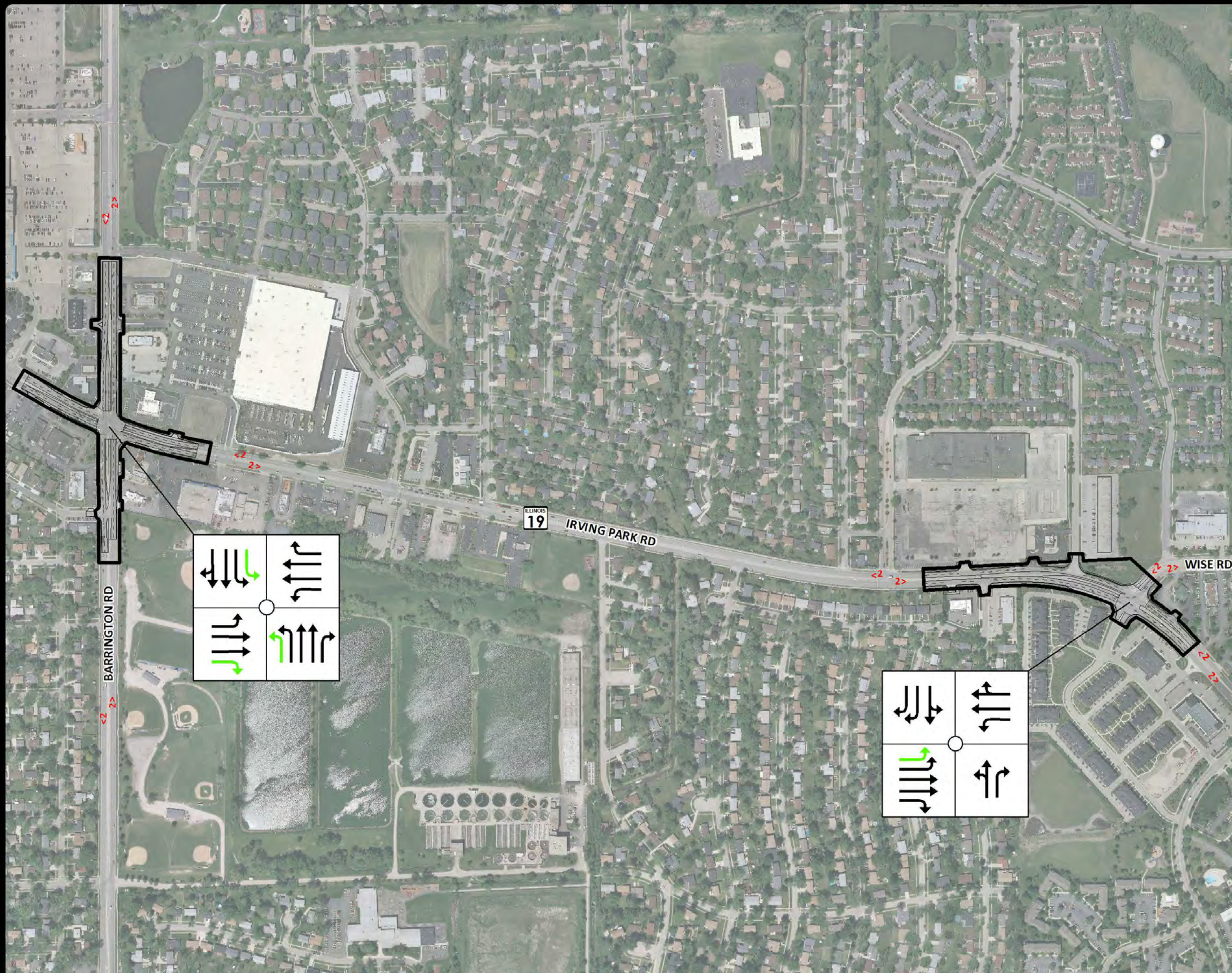
Exhibit 2-8

No-Build Alternative

Sources:
-Aerial photography: Airphoto USA, 2008; City of Chicago, 2009
-County Boundary: Tele Atlas North America, Inc., 2008

Exhibit 2-9
Preferred Alternative

Path: N:\Idot\070404\GIS\Exhibits\Tier 2\Project Location System Map\Exhibit\Build Alternative.mxd



Sources:
- Aerial photography: City of Chicago, 2009

Exhibit 2-10

IL 19 Intersection Improvements at Barrington Road and Wise Road

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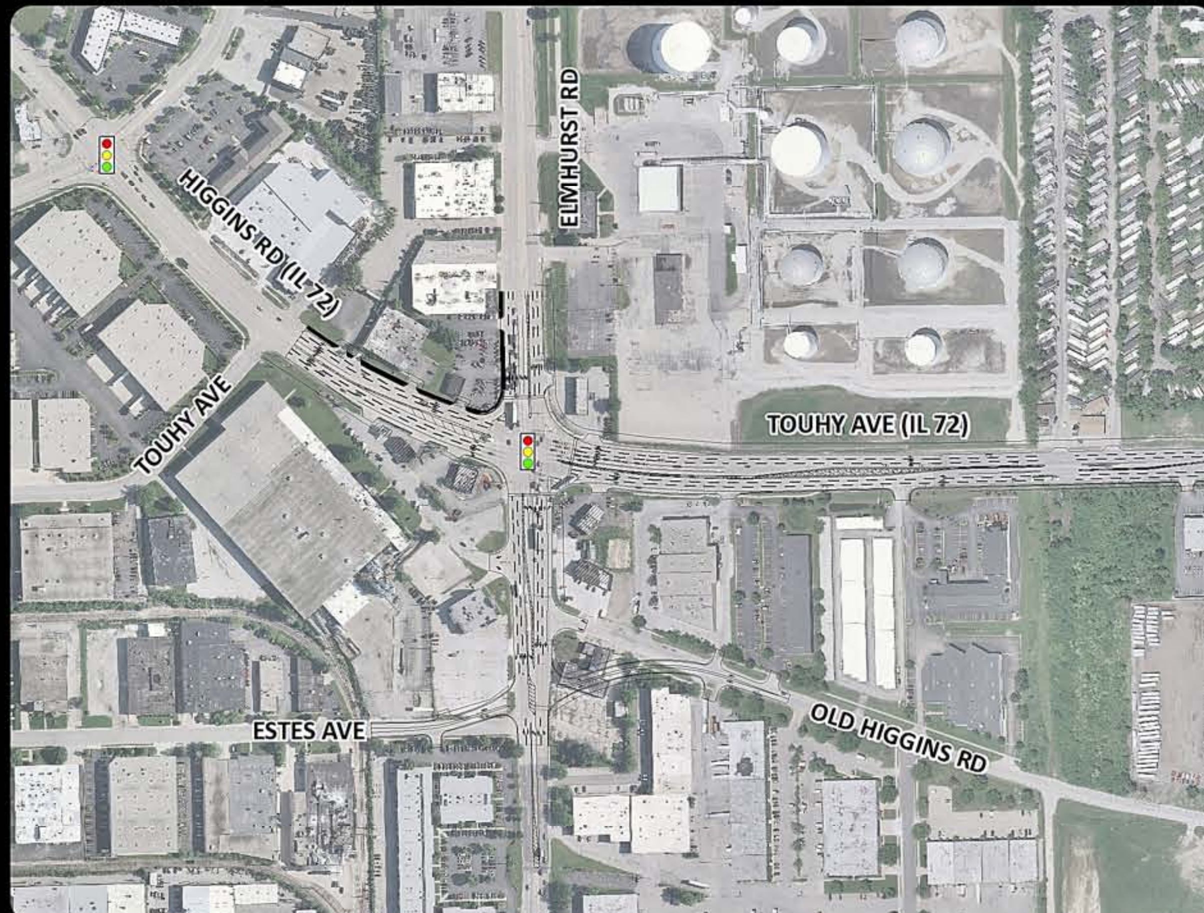
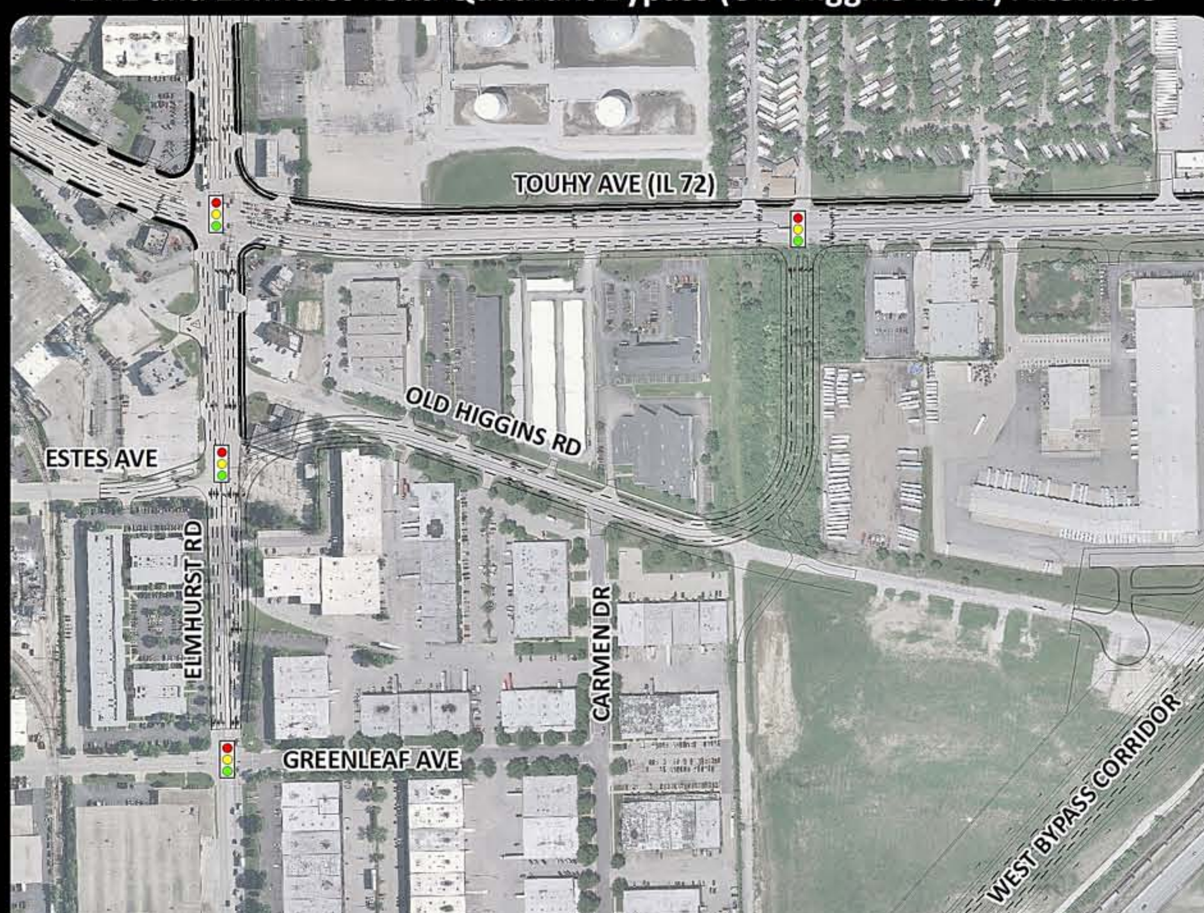
IL 72 and Elmhurst Road Intersection Widening Alternate

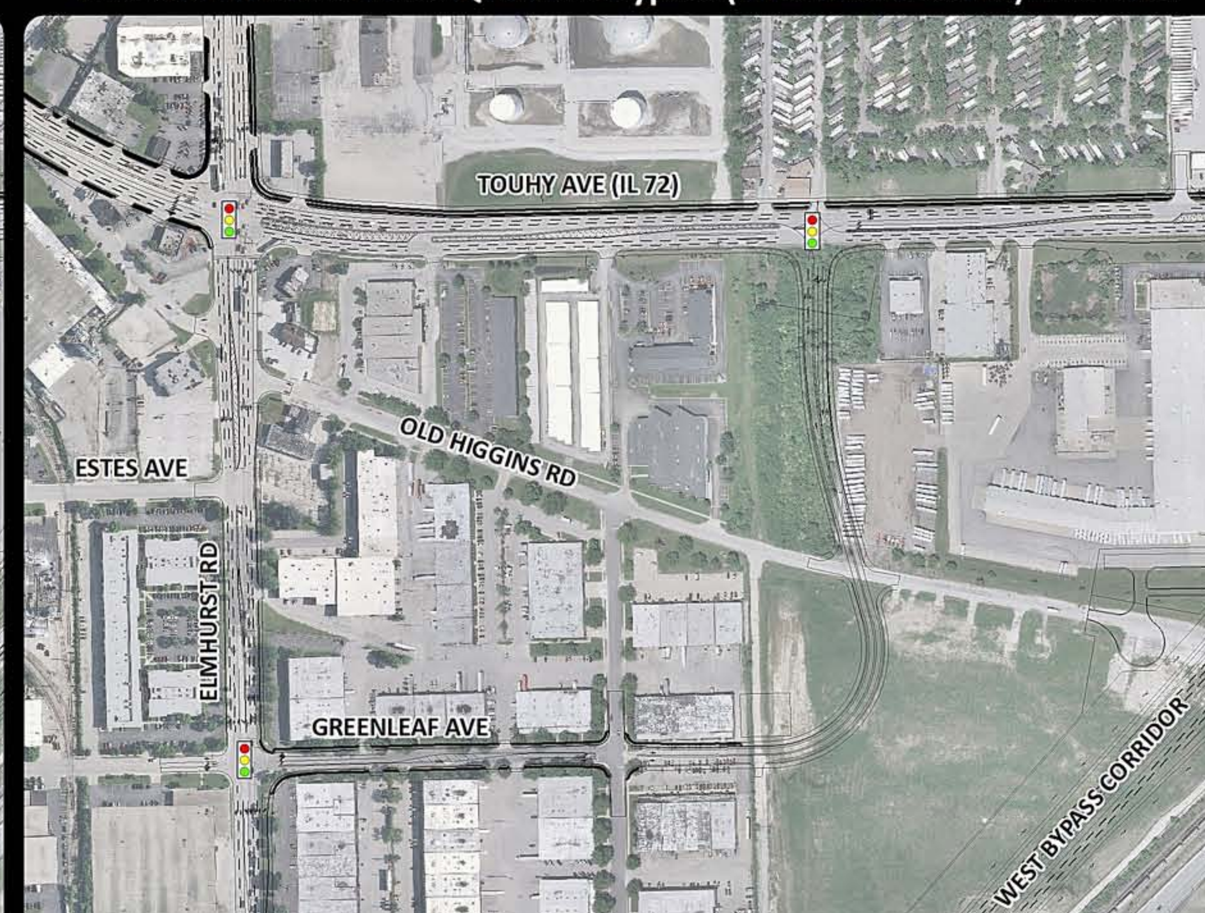


IL 72 and Elmhurst Road Continuous Flow Intersection Alternate

IL 72 and Elmhurst Road Quadrant Bypass (Old Higgins Road) Alternate



IL 72 and Elmhurst Road Quadrant Bypass (Greenleaf Avenue) Alternate



LEGEND

- Project Corridor
- Traffic Signals

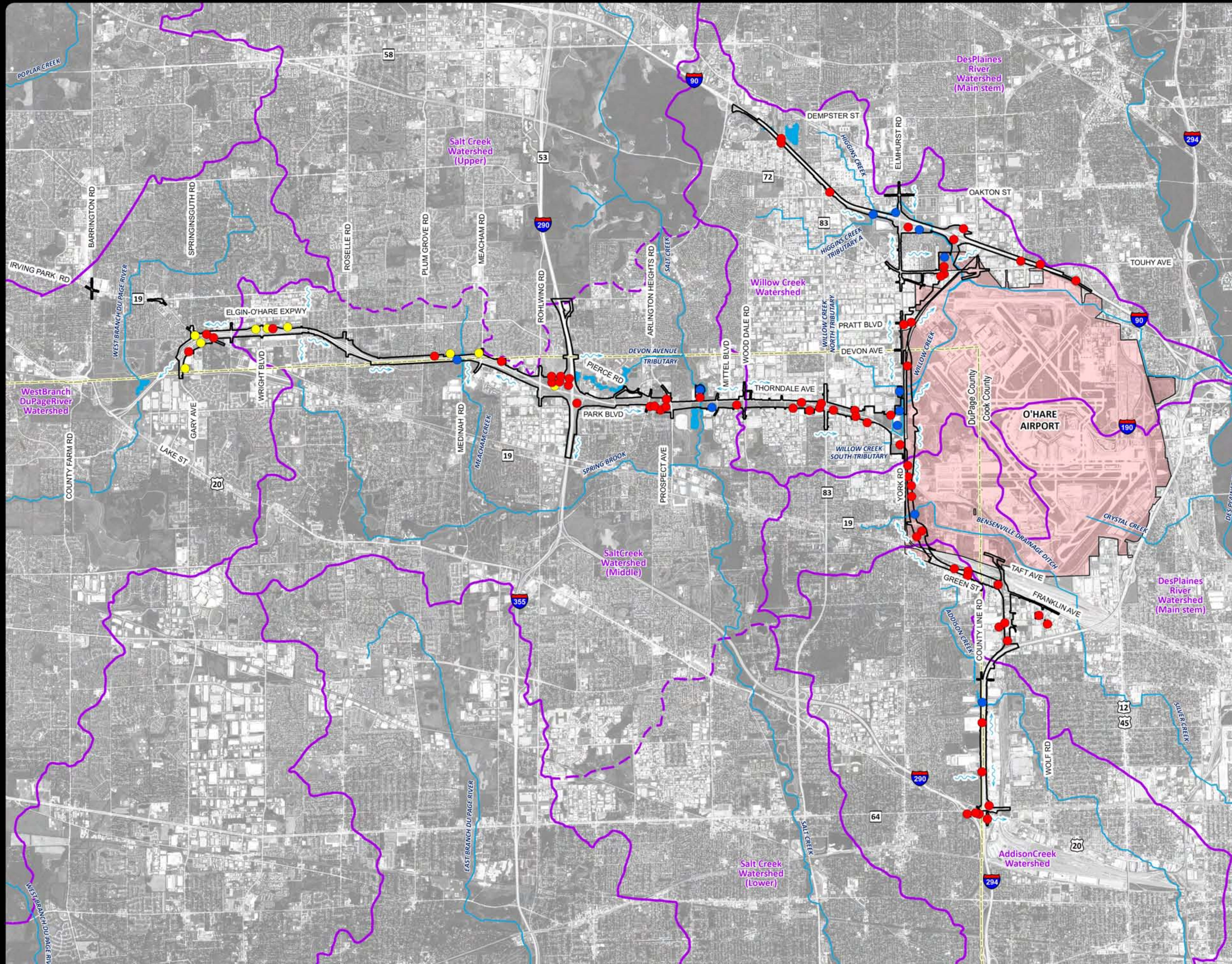
Sources:
- Aerial photography: City of Chicago, 2009
- Elk Grove Village Industrial/Commercial Revitalization Master Plan Update, 2011

NORTH

0 250 500 750 1,000
Feet

Exhibit 2-11

Intersection Alternates for IL 72 and Elmhurst Road



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LEGEND

- Existing Elgin O'Hare Expressway Detention Sites (at Project Corridor)
- Potential Detention Sites
- Potential Compensatory Storage Sites
- General Flow Direction
- Surface Waters
- Watershed Boundary
- O'Hare Airport
- County Boundary
- Project Corridor

Sources:
-Existing Elgin-O'Hare Expressway Detention Sites: Elgin-O'Hare Expressway General Layout Plan, undated
-Surface Waters: Cook County, 2006; DuPage County, 2009; IEPA, 2006; Matthews and Zercher, 2010; and Matthews, et al., 2011
-Watershed Boundary: IEPA, 2002
-Wastewater Treatment Plant Outfalls: IEPA, 2002
-O'Hare Airport: City of Chicago, 2003
-Aerial photography: Airphoto USA, 2008; City of Chicago, 2009
-County Boundary: Tele Atlas North America, Inc., 2008

NORTH

0 0.5 1 2
Miles

Exhibit 2-12

Potential Detention and Compensatory Storage Sites

Path: N:\idot\070404\GIS\Exhibits\Tier 2\CPG\Exhibits\Detention Sites Exhibit.mxd

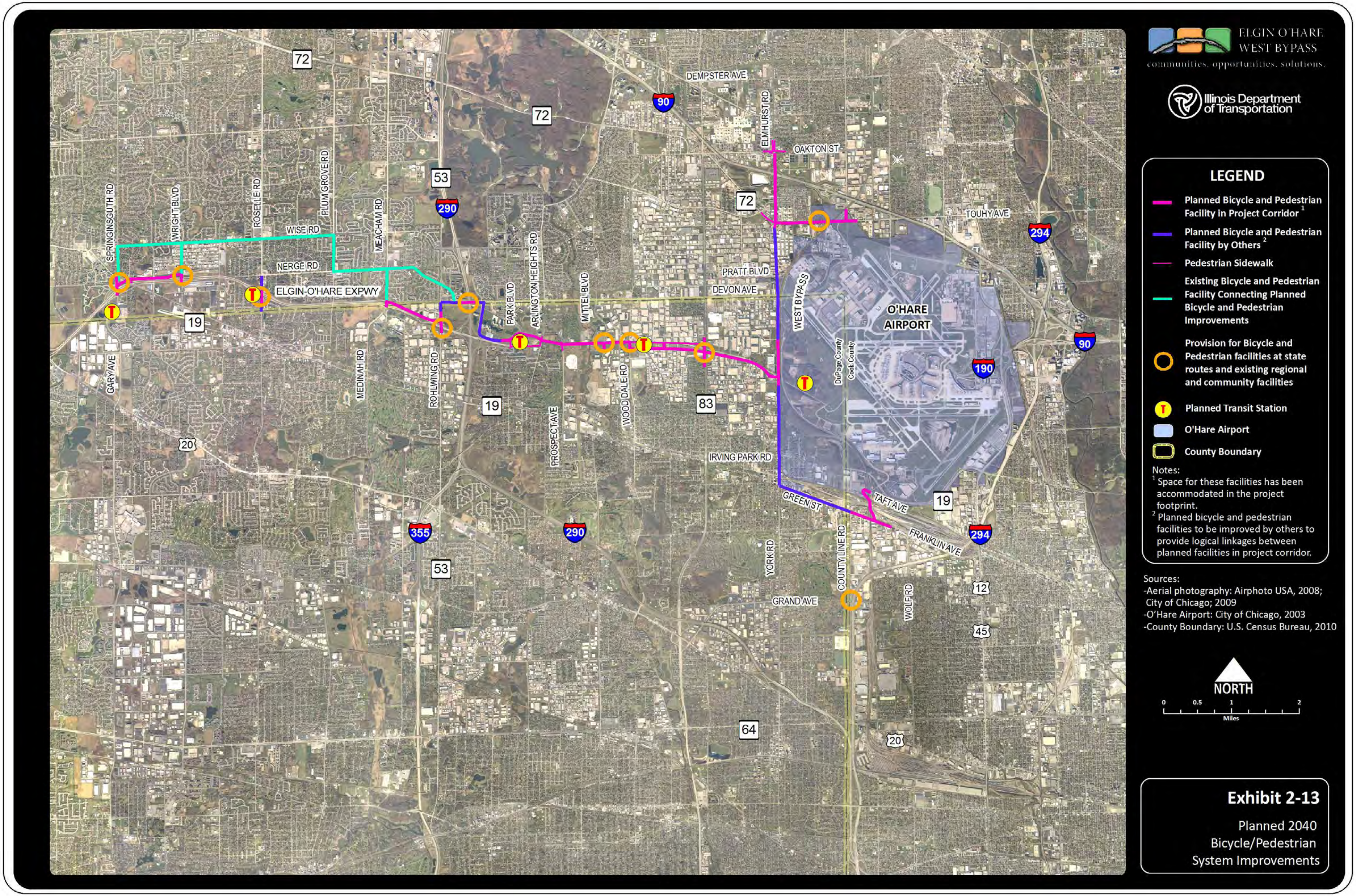


Exhibit 2-13

Planned 2040 Bicycle/Pedestrian System Improvements

SECTION 3

Environmental Resources, Impacts, and Mitigation

This section identifies the socioeconomic and natural resources in the Tier Two project corridor, and the potential impacts that the Build Alternative and its alternates may have on those resources. During Tier Two, detailed engineering work led to design decisions that refined the project footprint. The refined project footprint is inclusive of permanent right-of-way, and temporary and permanent easements. Throughout the process, there has been a concerted effort to avoid and minimize impacts with shifts or adjustments of project features, and when impacts could not be avoided, mitigation has been proposed to reduce the loss of resource.

In Tier Two, engineering details have been refined and resources have been defined with more precision through field surveys and detailed research. The refined engineering detail, combined with more accurate information, affords better estimates of the socioeconomic and environmental impacts of the Build Alternative and its alternates. Much of this information was compiled into a Geographic Information System (GIS) database. See Appendix F for the list of GIS data layer sources.

Surficial geology, bedrock geology, and mineral resources do not affect the consideration of the Build Alternative and its alternates; therefore, these resources are not discussed.

Generally, the impacts of the No-Build Alternative are included where they are relevant. In several instances, the discussion of impacts associated with the No-Build Alternative has value for comparative purposes, and this includes impacts to social characteristics, economic conditions, noise, and air quality. For each of these disciplines, the impacts of both the Build Alternative and the No-Build Alternative are presented.

Impacts in this section are described for several geographical extents. Sometimes, impacts are described specifically for the project corridor, and at other times, impacts may be described more broadly for the project area. The project corridor represents the footprint, or construction limits, of the proposed improvements. The project area is larger and coincides with the Tier One study area.

This Tier Two Final EIS has recommended the Build Alternative as the Preferred Alternative. The Build Alternative is an optimal arrangement of many design features including mainline, interchange types, facility type, and transit and bicycle/pedestrian accommodations. Many design alternates were evaluated in the process of defining the Build Alternative. In two locations, more than one design alternate was under consideration at the conclusion of the Tier Two Draft EIS. Since the close of the Tier Two Draft EIS comment period (May 14, 2012), the preferred alternate at the Elmhurst Road and I-90 interchange and the IL 72 and Elmhurst Road intersection have been identified and are presented in this document. The preferred alternates include the diverging diamond interchange type (Alternate 4) at the Elmhurst Road and I-90 interchange, and the Quadrant

Bypass (Old Higgins Road) Alternate at the IL 72 and Elmhurst Road intersection. In this section, the impacts have been updated. As described in Section 2, there have been refinements to various design features, which has resulted in slight changes to the project footprint of the Build Alternative and preferred alternates. Any impacts associated with these changes have been updated in this section.

Impacts are discussed in this section as direct, indirect, and cumulative. Direct impacts (those that have an immediate impact) are described for all resources. The analysis of indirect and cumulative impacts has been completed for those resources that have impacts far reaching in time and geography, including impacts to economic conditions, land use, wetlands, water quality, and biological resources. Indirect impacts "are caused by an action and are later in time or further removed in distance but are still reasonably foreseeable" (Title 40, *Code of Federal Regulations*, 1508.8). Indirect impacts occur after the initial construction of the project, or beyond the construction limits, but can be attributed to the project. Cumulative impacts "result from the incremental consequences of an action when added to other past and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions" (Title 40, *Code of Federal Regulations*, 1508.7). The analysis of cumulative impacts allows for a more comprehensive evaluation of impacts by projects that individually may have minimal impacts but, when considered in combination with other projects in the vicinity, may have greater impacts on sensitive resources. The projects that are considered cumulatively with this project include the modernization of O'Hare Airport, I-90 resurfacing, York Road and Irving Park Road intersection, and I-90 reconstruction. Uniquely, this analysis used a real estate based market study to determine the extent of secondary development that was pinpointed to specific properties. This provided the opportunity to more accurately determine the spatial resource impacts that result from the cumulative effects of the EO-WB project and other projects. In this section, when indirect impacts and cumulative impacts are described for a resource, their discussions follow the description of direct impacts.

A project of this magnitude has unavoidable impacts, and for resources that are impacted, appropriate mitigation has been developed to reduce harm. Since the circulation of the Tier Two Draft EIS, coordination with the resource agencies has occurred to finalize the scope of the mitigation strategies. These strategies have been concurred by the agencies and represent measures that will greatly benefit the environment. The Illinois Tollway and IDOT have embraced these measures as commitments and will steward the implementation (see subsection 3.21).

3.1 Social Characteristics

The social setting of the project corridor is representative of its population characteristics, the location of neighborhoods in relation to the proposed improvements, and income and demographic characteristics of residents. Impacts on the social characteristics are identified by determining the projected population changes with and without the proposed improvements, the results of displacing residents to enable construction of the project, and how the proposed improvements may affect low-income or minority populations.

3.1.1 Affected Environment

3.1.1.1 Population Changes

The project corridor is located within a densely populated suburban Chicago area. Communities in the project corridor have reached a mature development stage with most of the area developed into residential, industrial, commercial, or transportation uses and very little remaining as open space. As shown in Table 3-1, the population of Chicago and Cook County declined or stabilized between 1950 and 1980, while populations of suburban communities and DuPage County increased, some substantially. The populations of Chicago suburbs continued to increase from 1980 to its current population in 2010, albeit not as dramatically as from 1950 to 1980. As population growth slowed in Cook and DuPage Counties, population growth increased in surrounding counties. The continued shift in population growth farther from Chicago indicates that Cook and DuPage Counties have reached maturity in terms of population growth; notable population growth continues to shift to the counties farther from Chicago.

TABLE 3-1
Population Changes Over Time in the Affected Communities and Counties

Geographic Area	1950	1980	2010	% Change 1980 to 2010
Village of Hanover Park	305[a]	28,850	37,973	32%
Village of Schaumburg	130[b]	53,305	74,227	39%
Village of Roselle	1,038	16,948	22,763	34%
Elk Grove Village	116[c]	28,907	33,127	15%
Village of Itasca	1,274	7,129	8,649	21%
Village of Wood Dale	1,857	11,251	13,770	22%
Village of Bensenville	3,754	16,124	18,352	14%
City of Elmhurst	21,273	44,276	44,121	-0.4%
City of Northlake	4,361	12,166	12,323	1%
Village of Franklin Park	8,899	17,507	18,333	5%
City of Des Plaines	14,994	53,568	58,364	9%
Village of Mount Prospect	4,009	52,634	54,167	3%
City of Chicago	3,620,962	3,005,072	2,695,958	-10%
Cook County	4,508,792	5,253,655	5,194,675	-1%
DuPage County	154,599	658,835	916,924	39%

Sources: Elk Grove Village, 2010; Hanover Park, 2010; Schaumburg, 2010; U.S. Bureau of the Census, 1952; U.S. Bureau of the Census, 1982; CMAP, 2011.

[a] The population number is from 1958, the year Hanover Park was incorporated.
[b] The population number is from 1956, the year Schaumburg was incorporated.
[c] The population number is from 1956, the year Elk Grove Village was incorporated.

3.1.1.2 Neighborhoods

Residential areas can be found scattered along the project corridor. These neighborhoods are well established, well maintained, and a permanent part of the community fabric. These neighborhoods provide valued housing stock and a sense of community with the cultural attributes fully intact. Each of these neighborhoods is supported by a full complement of community services, including public and private schools, libraries, fire and police protection, hospitals, water and sewer services, and energy providers.

Current plans for each of the communities provide for the long-term preservation and protection of these neighborhoods. There are no known plans to relocate or rezone any parts of these neighborhoods. To the contrary, the community goals guard against their decline or conflicting uses that would threaten the quality of life.

Single- and multi-family residences can be found along much of the Elgin O'Hare corridor in Hanover Park, Schaumburg, Roselle, and Itasca (see Exhibit 1-1 for community locations and Figure 3-1 for a representation of residential areas along the Elgin O'Hare corridor). Access control policies along the existing Elgin-O'Hare Expressway do not permit direct access by any means other than local access interchanges, such as Springinsguth Road and Roselle Road. Along Thorndale Avenue, single- and multi-family residences are located on the south side of the roadway between I-290 and Prospect Avenue in Itasca. These residents have direct access to Thorndale Avenue. The residences on the north side of Thorndale Avenue between I-290 and Arlington Heights Road have direct access to Thorndale Avenue. Single- and multi-family residences can be found along I-90 in Mount Prospect and Des Plaines, including two mobile home communities. These residents access I-90 by local access interchanges at Arlington Heights Road, Elmhurst Road, or Lee Street. Single-family residences are located near the proposed south leg of the West Bypass corridor in Bensenville. The residents currently travel approximately 3.5 miles north on York Road to access I-90 and 2.75 miles south on York Road to access I-290 and I-294.

FIGURE 3-1
RESIDENTIAL NEIGHBORHOODS

3.1.1.3 Income and Demographic Characteristics

Income and demographic characteristics were gathered for the communities located along the project corridor (Hanover Park, Schaumburg, Roselle, Elk Grove Village, Itasca, Wood Dale, Bensenville, Elmhurst, Northlake, Franklin Park, Des Plaines, and Mount Prospect; see Exhibit 1-1), for Cook and DuPage Counties, and for the State of Illinois. Income and demographic characteristics presented for these core communities are also representative of the broader project area because the proposed improvements are mainly contained within the municipal limits of the communities.

Income characteristics in the project corridor are derived from the 2005-2009 American Community Survey (U.S. Bureau of the Census, 2010). The communities' median family income ranges between $44,129 (Elk Grove Village) and $104,392 (Elmhurst). The average family size is between three and four individuals. The 2011 U.S. Department of Health and Human Services (DHHS) poverty guidelines are $18,530 for a family of three and $22,350 for a family of four. The communities within the project corridor have incomes well above the poverty thresholds. The percentages of families in the core communities living below the poverty line range between 1.1 percent (Itasca) and 12.4 percent (Bensenville). In total, approximately 4.4 percent of families along the project corridor are living below the poverty line, compared to 11.8 percent of families in Cook County, 3.8 percent in DuPage County, and 9.1 percent in the State of Illinois (see Table 3-2).

TABLE 3-2
2005-2009 Income Characteristics of the Project Area

Community	Median Family Income [a]		Families Living Below Poverty Line
Hanover Park	$70,333	3.7	7.9%
Schaumburg	$85,944	3.1	3.7%
Roselle	$91,299	3.3	1.2%
Elk Grove Village	$44,129	3.2	2.8%
Itasca	$92,578	3.2	1.1%
Wood Dale	$66,944	3.3	6.2%
Bensenville	$55,616	3.3	12.4%
Elmhurst	$104,392	3.3	2.4%
Northlake	$65,250	3.8	1.9%
Franklin Park	$61,997	3.7	7.1%
Des Plaines	$75,178	3.3	4.5%
Mount Prospect	$81,836	3.2	3.8%
Cook County	$64,973	3.4	11.8%
DuPage County	$92,059	3.3	3.8%
Illinois	$67,660	3.3	9.1%

Source: U.S. Bureau of the Census, 2010.

[a] In 2009 inflation-adjusted dollars.

The 2010 Census data were used to determine demographic characteristics of the core communities in the project corridor. As a group, the core communities in the project area have a minority population of approximately 24.1 percent, which is lower than Cook County (44.6 percent) and Illinois (28.4 percent) but higher than DuPage County (22.1 percent). Hanover Park is the core community with the greatest percentage of minority residents at 41.5 percent. Elmhurst has the least percentage of minority residents at 10.5 percent, which is lower than both counties and the state. Hanover Park, Northlake, and Franklin Park have the highest percentages of Hispanic or Latino residents. The core communities with the lowest percentage of Hispanic and Latino residents are Schaumburg, Roselle, and Elmhurst (see Table 3-3).

3.1.2 Environmental Consequences

3.1.2.1 Population Forecasts

Population forecasts were developed for both the Build and No-Build Alternatives as part of the EO-WB project study. Population and employment forecasts for an area are subject to many variables, including the area's competitive position in the market place, the synergy of economic activities in the area, properties available for development or redevelopment, and accessibility to major transportation facilities. All of these variables were taken into consideration in the development of population and employment forecasts to the year 2040 for the Build and No-Build Alternatives. The analysis revealed notable differences in the population and employment between alternatives. The methodology used in the development of the forecasts was a fact-based economic analysis of the potential for development growth and its associated population and employment growth both with and without the project improvements. The method of analysis was fully coordinated with CMAP, the regional transportation agency responsible for the regional population and employment forecasts. These forecasts have had a variety of uses in the conduct of the study, including travel forecasts and traffic operations that directly influence the requirements of the project.

The growth in population would be a modest net increase of 34,000 people growing from 543,000 people in the year 2010 to 577,000 by the year 2040 under the Build Alternative. This nominal growth is characteristic of a mature area with limited opportunities for development that will see some infill of predominately multifamily housing development. The No-Build Alternative has a similar growth in population—growing to 572,000 people by 2040, or a net increase of 29,000. The small difference in population growth between the Build Alternative and No-Build Alternative (six percent versus five percent, respectively) is indicative of the fact that space is only available for close-in residential development despite improved transportation. However, additional population growth may occur under the Build Alternative if local communities accommodate residential infill to minimize housing/employment imbalances by encouraging residential development for housing new employees.

CMAP, underscoring the economic importance of the Chicagoland region and the potential for continuing imbalance between housing and employment in its *GO TO 2040 Comprehensive Regional Plan*, is encouraging communities to promote residential development to house employees working in the region. CMAP has projected that if communities follow CMAP's guidance and support residential growth, the population may increase under the Preferred Alternative by another 78,000 to 655,594 by the year 2040.

TABLE 3-3
Comparison of the Demographics of the Core Communities in the EO-WB Project Area to DuPage and Cook Counties and the State of Illinois

	Hanover Park	Schaumburg	Roselle	Elk Grove Village	Itasca	Wood Dale	Bensenville	Elmhurst	Northlake	Franklin Park	Des Plaines	Mount Prospect	Cook County	DuPage County	State of Illinois
White	22,207 (58.5%)	52,281 (70.4%)	19,161 (84.2%)	27,464 (82.9%)	7,271 (84.1%)	11,489 (83.4%)	12,345 (67.3%)	39,478 (89.5%)	8,250 (66.9%)	13,703 (74.7%)	45,133 (77.3%)	41,715 (77.0%)	2,877,212 (55.4%)	714,140 (77.9%)	9,177,877 (71.5%)
Black or African American	2,674 (7.0%)	3,123 (4.2%)	584 (2.6%)	472 (1.4%)	184 (2.1%)	168 (1.2%)	646 (3.5%)	841 (1.9%)	397 (3.2%)	233 (1.3%)	1,039 (1.8%)	1,282 (2.4%)	1,287,767 (24.8%)	42,346 (4.6%)	1,866,414 (14.5%)
American Indian and Alaska Native	397 (1.0%)	162 (0.2%)	34 (0.1%)	100 (0.3%)	17 (0.2%)	30 (0.2%)	179 (1.0%)	53 (0.1%)	57 (0.5%)	68 (0.4%)	369 (0.6%)	196 (0.4%)	21,559 (0.4%)	2,415 (0.3%)	43,963 (0.3%)
Asian	5,764 (15.2%)	14,731 (19.8%)	2,075 (9.1%)	3,348 (10.1%)	731 (8.5%)	721 (5.2%)	888 (4.8%)	2,272 (5.1%)	344 (2.8%)	565 (3.1%)	6,674 (11.4%)	6,339 (11.7%)	322,672 (6.2%)	92,304 (10.1%)	586,934 (4.6%)
Native Hawaiian and other Pacific Islander	9 (0.0%)	23 (0.0%)	7 (0.0%)	4 (0.0%)	1 (0.0%)	2 (0.0%)	3 (0.0%)	5 (0.0%)	4 (0.0%)	4 (0.0%)	9 (0.0%)	16 (0.0%)	1,724 (0.0%)	217 (0.0%)	4,050 (0.0%)
Other race	5,622 (14.8%)	2,100 (2.8%)	435 (1.9%)	1,110 (3.4%)	288 (3.3%)	1,067 (7.7%)	3,748 (20.4%)	773 (1.8%)	2,916 (23.7%)	3,295 (18.0%)	3,721 (6.4%)	3,533 (6.5%)	551,971 (10.6%)	45,106 (4.9%)	861,412 (6.7%)
Two or more races	1,300 (3.4%)	1,807 (2.4%)	467 (2.1%)	629 (1.9%)	157 (1.8%)	293 (2.1%)	543 (3.0%)	699 (1.6%)	355 (2.9%)	465 (2.5%)	1,419 (2.4%)	1,086 (2.0%)	131,770 (2.5%)	20,396 (2.2%)	289,982 (2.3%)
Total population	37,973	74,227	22,763	33,127	8,649	13,770	18,352	44,121	12,323	18,333	58,364	54,167	5,194,675	916,924	12,830,632
Percent minority	41.5%	29.6%	15.8%	17.1%	15.9%	16.6%	32.7%	10.5%	33.1%	25.3%	22.7%	23.0%	44.6%	22.1%	28.4%
Hispanic or Latino[a] population (any race)	14,532 (38.3%)	6,554 (8.8%)	1,867 (8.2%)	3,149 (9.5%)	919 (10.6%)	2,796 (20.3%)	8,781 (47.8%)	2,898 (6.6%)	6,520 (52.9%)	7,902 (43.1%)	10,053 (17.2%)	8,408 (15.5%)	1,244,762 (24.0%)	121,506 (13.3%)	2,027,578 (15.8%)

Source: U.S. Bureau of the Census, 2011.

[a] Individuals identifying themselves as Hispanic or Latino can be of any race. Therefore, this category is separate from the race categories above.

3.1.2.2 Residential Displacements

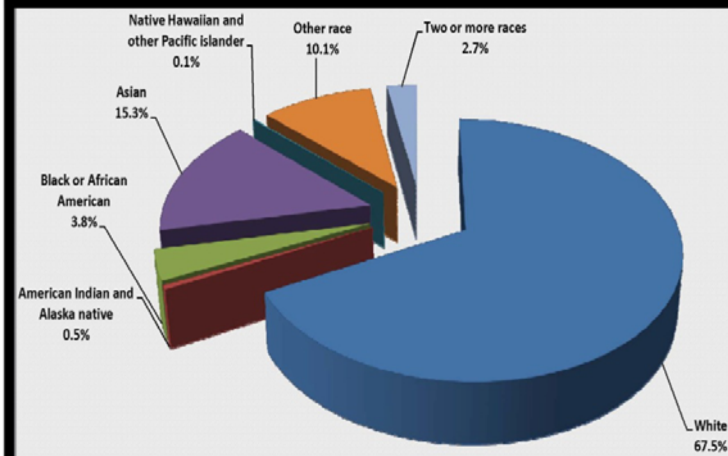
The proposed improvements would require the displacement of seven residences. Residential displacements are shown in Exhibit 3-1. All are located in unincorporated DuPage County on the north and south sides of Thorndale Avenue between Arlington Heights Road and Prospect Avenue. All are single-family residences; no multifamily residences would be displaced. Three residences are located within a Census block with a minority population higher than the county average and an Asian population higher than the state and county averages. One displacement is located in a Census block with an Asian population higher than the state average. Three residences are located within Census blocks with no minority, Hispanic or Asian population over the state and/or county averages. An environmental justice analysis was conducted to determine if the project is expected to have a disproportionate impact on minority and low-income populations. This evaluation is described in subsection 3.1.2.3. The displacements are located on the edges of the neighborhoods in which they are located. As such, they would not disrupt the cohesion, and therefore nature, of the neighborhoods. Ample replacement housing is located in the vicinity of the displaced residences. A review of Multiple Listing Service data indicated that as of February 10, 2012, 37 single-family homes in the vicinity of the displaced residences (between Devon Avenue and Irving Park Road, and Rohlwing Road and Busse Road) were on the market at a range of asking prices, between $159,900 and $949,000 (Multiple Listing Service, 2012). Losses in tax revenue resulting from the displacement of residences by the Build Alternative are described in subsection 3.2.2.4.

3.1.2.3 Environmental Justice

Executive Order (EO) 12898 on Environmental Justice signed February 11, 1994, requires federal agencies to consider the effects that actions have on low-income and minority populations. Federal agency actions, to the extent practicable and permitted by law, may not have disproportionately high or adverse impacts on such populations. Further, the EO requires federal agencies to allow low-income or minority populations that could be adversely affected by the project to have the opportunity to be included in the impact assessment and public involvement process. The analysis of effects on low-income or minority populations (described below) resulted in the finding that the proposed improvements would not disproportionately impact low-income or minority populations. The robust public involvement process undertaken for this project has been inclusive of all populations. No person, because of income, race, color, religion, national origin, sex, age, or handicap, has been excluded from participating in, denied benefits of, or was subject to discrimination during this project. The project's public involvement process included over 400 meetings with local communities and the public at-large during both Tier One and Tier Two. This provided early and frequent opportunities for community officials to notify the project team of any population within their communities that might require alternative outreach efforts to ensure project-related communications reach those community members. Notices to the public of upcoming public involvement activities provided members of the community the opportunity to request interpreters and other similar accommodations. A Spanish translator was available to attendees at both public information meetings. All public meetings were accessible to handicapped individuals.

Demographic characteristics, including race data and data on Hispanic populations, were gathered at the Census-block level (the smallest possible Census unit). As shown in Table 3-4 and Figure 3-2, non-white residents account for 32.5 percent of the population along the proposed improvements. Comparatively, this is higher than DuPage County and the State of Illinois but lower than Cook County. The highest non-white percentage (15.3 percent) includes the Asian population, which is higher than the State of Illinois and both counties. The Hispanic population percentage (24.8 percent) is higher than the State of Illinois and both counties.

FIGURE 3-2
DEMOGRAPHIC CHARACTERISTICS OF PROJECT CORRIDOR



Source: U.S. Bureau of the Census, 2011.

Census blocks with non-white percentages higher than the state or county are located along the Elgin O'Hare corridor, on either side of I-90, and on the south side of O'Hare Airport (see Exhibit 3-2A). Census blocks with Hispanic populations higher than the state or county are also located along the Elgin O'Hare corridor, both sides of I-90, and along I-294 at the south end of the proposed improvements (see Exhibit 3-2B). Census blocks with percentages of Asians higher than the state or counties are located on the north side of I-90, along the Elgin O'Hare corridor, and along I-294 at the south end of the proposed improvements (see Exhibit 3-2C).

TABLE 3-4
Demographic Characteristics of the Project Corridor

Race	Project Corridor	DuPage County	Cook County	State of Illinois
White	7,721 (67.5%)	714,140 (77.9%)	2,877,212 (55.4%)	9,177,877 (71.5%)
Black or African American	431 (3.8%)	42,346 (4.6%)	1,287,767 (24.8%)	1,866,414 (14.5%)
American Indian and Alaska native	60 (0.5%)	2,415 (0.3%)	21,559 (0.4%)	43,963 (0.3%)
Asian	1,747 (15.3%)	92,304 (10.1%)	322,672 (6.2%)	586,934 (4.6%)
Native Hawaiian and other Pacific islander	10 (0.1%)	217 (0.0%)	1,724 (0.0%)	4,050 (0.0%)
Other race	1,159 (10.1%)	45,106 (4.9%)	551,971 (10.6%)	861,412 (6.7%)
Two or more races	304 (2.7%)	20,396 (2.2%)	131,770 (2.5%)	289,982 (2.3%)

TABLE 3-4
Demographic Characteristics of the Project Corridor

Race	Project Corridor	DuPage County	Cook County	State of Illinois
Total population	**11,432**	**916,924**	**5,194,675**	**12,830,632**
Percent non-white	**32.5%**	**22.1%**	**44.6%**	**28.5%**
Hispanic population (any race)	24.8%	13.3%	24.0%	15.8%

Source: U.S. Bureau of the Census, 2011.

Note: In some cases, the percentages do not total exactly 100 percent due to rounding.

Residential displacements caused by the Build Alternative would occur in only three Census blocks, one with a higher non-white population than the county average and a higher Asian population than the state and county averages, one with a higher Asian population than the state average, and one without any minority population.

Business displacements caused by the Build Alternative occur in only one Census block with residents; this Census block has a higher non-white and Asian population than the state and county averages. All other business displacements occur in Census blocks with no residential population. Exhibits 3-2A, 3-2B, and 3-2C depict minority, Asian, and Hispanic populations along the project corridor.

Income characteristics were gathered at the Census block group level. Data collected during the 2005-2009 American Community Survey were used rather than decennial Census data because income characteristics were not collected for the 2010 Census. The average median family income (in 2009 inflation-adjusted dollars) in the project corridor is greater than Cook County and the State of Illinois, but less than DuPage County (see Table 3-5). It is, however, well above the 2012 DHHS poverty guideline for a family of three, $19,090. Further, there are no block groups with a median family income level below the 2012 poverty guideline.

TABLE 3-5
2005-2009 Income Characteristics of the Project Corridor

	Project Corridor	DuPage County	Cook County	State of Illinois
Median family income	$72,778	$92,059	$64,973	$67,660
Average family size	3	3	3	3
Families living below poverty line	6.9%	3.8%	11.8%	9.1%

Source: U.S. Bureau of the Census, 2010.

An analysis of the effects on toll users living in the vicinity of the corridor was undertaken (see subsection 3.2.2.5). As indicated on Exhibit 3-3, residents in the communities along the project corridor have a high participation rate of the prepaid toll collection system (I-PASS) program. Because the mainline along the entire corridor will be tolled, all residents along the corridor will be affected by the addition of tolling requirements.

Noise levels after implementation of the proposed improvements were predicted along the project corridor (see subsection 3.8). All applicable sensitive receptors (e.g., residences and parks) were analyzed to determine if the project would cause noise impacts and, where noise impacts were predicted to occur, if mitigation measures (i.e., noise barriers) would be feasible and reasonable. Sensitive receptors were located in Census blocks with comparatively higher and lower minority populations. Impacts were identified in Census blocks with comparatively higher and lower minority populations. Most of the residences adjacent to the proposed improvements would be impacted, regardless of racial or ethnic background. Noise barriers will be implemented along residential areas with comparatively higher and lower minority populations. Because noise impacts would occur in locations with and without comparatively higher minority populations, and noise barriers will be implemented in locations with and without comparatively higher minority populations, no minority population is expected to incur disproportionately high or adverse noise impacts.

Based on the evaluation of the demographic and income characteristics of the population along the project corridor, the Build Alternative would not exert high or disproportionate adverse impacts on minority or low-income populations. Furthermore, the Build Alternative would not have a disproportionate impact on Hispanic populations because no displacements occur in Census blocks with Hispanic populations above the state or county averages. In addition, non-white populations would not experience high or disproportionately adverse impacts. The proposed project is a large-scale project with white and non-white populations spread throughout the entire project corridor. Many of the improvements are proposed on existing transportation facilities, and none of the residential displacements would occur on new alignment. There are over 11,000 residents living along the project corridor, and only seven residential displacements would occur with all located within Census blocks with substantially higher white populations than Asian. Three of the residential displacements, or approximately half of the residential displacements, are located in all-white Census blocks. One residential displacement occurs within a Census block that is 94 percent white (15 residents) and 6 percent Asian (one resident). The three remaining residential displacements occur within a Census block that is 74 percent white (14 residents) and 26 percent Asian (five residents). Because the displacements occur in locations that have substantially higher white residents than non-white residents, there are no high or disproportionately adverse impacts to minority populations.

The project would not have a disproportionate impact on low-income populations because impacts are not borne by any smaller populations with income below the 2012 poverty guideline. No Census block along the project corridor has a median family income below the 2012 poverty guideline.

Further, because the number of residential displacements is small, there would be no impact on the demographic diversity of the area. Ample replacement housing is located in the vicinity of the displaced residences.

Tolling would be applied universally to all tollway users; therefore, there would be no disproportionate impact to low-income and minority populations with the addition of tolling. Local access would be maintained in nearly all residential areas by means of local service interchanges and frontage roads (e.g., along Thorndale Avenue). Thus, local trips would not require indirect or circuitous travel, and no populations would be adversely impacted by access changes.

Relocation assistance would be provided in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended, and the *Land Acquisition Procedures Manual* (IDOT, 2011), and the Illinois Tollway's land acquisition policies, as applicable, to all residents displaced by the proposed improvements. The policies provide for relocation assistance services to homeowners and renters. Participation under the state and federal policies is without discrimination. IDOT would pay property owners the fair market value for all private property purchased and for relocation assistance. Housing would be provided as a last resort, if needed.

3.2 Economic Conditions

3.2.1 Affected Environment

Communities in the project corridor are considered high employment centers. In 2010, Schaumburg hosted the largest concentration of employment of any city in the Chicago metropolitan region outside Chicago, followed closely by Elk Grove Village and O'Hare Airport (CMAP, 2011). Combined, this area is the second largest employment center in the metropolitan area.

Several major employers are among the hundreds of businesses located along the project corridor (see Exhibit 3-4). These businesses are located close to major roadways and benefit from regional and national transportation access. The businesses with the greatest number of employees in the project corridor; U.S. Foodservice, Inc. in Bensenville, U.S. Smokeless Tobacco Company, Nestle USA Inc., and A.M. Castle & Co. in Franklin Park, McMaster-Carr Supply Company in Elmhurst, and O'Hare Airport; have transportation-related operations. U.S. Foodservice, Inc. is a food distributor with a full distribution center. U.S. Smokeless Tobacco Company is a manufacturing facility for smokeless tobacco. Nestle USA Inc. manufactures confections and snacks. A.M. Castle & Co. supplies metal products nationwide and internationally. McMaster-Carr Supply Company maintains a large warehouse and distribution center and serves as the company's headquarters. An estimated 50,000 individuals work at O'Hare Airport for the numerous companies and agencies affiliated with airport-related functions and services.

Table 3-6 depicts employment by industry for the seven-county Chicagoland region. The industries with the highest percentage of workers are trade, transportation, and utilities. The project corridor, with its major roadways, railways, and O'Hare Airport, contributes to the transportation, professional and business services, and manufacturing categories in the region. The commercial businesses along the corridor consist of hotels, business complexes, restaurants, and other businesses that support airport employees and users. Industrial businesses in the area consist of warehouses, manufacturing facilities, and other businesses that rely on optimal access to regional and national roadways and railroads to ship and receive goods.

TABLE 3-6
Employment by Industry for the Seven-County Chicagoland Region

Industry	Employment
Trade, Transportation, and Utilities	740,161 (19.7%)
Professional and Business Services	623,619 (16.6%)

TABLE 3-6
Employment by Industry for the Seven-County Chicagoland Region

Industry	Employment
Education and Health Services	557,810 (14.9%)
State and Federal Government	495,918 (13.2%)
Leisure and Hospitality	364,565 (9.7%)
Manufacturing	356,630 (9.5%)
Financial Activities	266,495 (7.1%)
Other	138,206 (3.7%)
Construction	127,362 (3.4%)
Information	74,258 (2.0%)
Natural Resources and Mining	4,547 (0.1%)
Unclassified	3,970 (0.1%)
Total	**3,753,541**

Source: Illinois Department of Employment Security, 2010.

Surrounding communities are aggressively planning for changes in land use and economic bases to complement the future layout and access to O'Hare Airport. This includes identifying underutilized space for use in airport-specific industries. Communities are also identifying properties currently in operation that could be improved to be more attractive to industries that support airport-related activities, such as hotels, business complexes, and restaurants. Communities are also focusing on optimizing redevelopment options to complement the proposed EO-WB project improvements. Properties that can be used for transportation-related commerce or transit facilities are being actively primed for this use. Subsection 3.3.2.1 describes in more detail how this project is compatible with community comprehensive and economic plans.

Unemployment in the project corridor ranges between 6.2 percent (Itasca) and 10.0 percent (Hanover Park) (see Table 3-7). These rates are comparable to the national unemployment rate of 9.1 percent. Unemployment rates in project corridor communities have increased between 0.8 percent (Itasca) and 5.5 percent (Hanover Park). This is compared to the rate increase at the national level (+3.3 percent), state level (+3.5 percent), and the county levels (+2.9 percent in Cook County and +4.6 percent in DuPage County).

TABLE 3-7
Percent of Civilian Workforce Unemployed

Location	Percent of Civilian Workforce Unemployed (2000)	Percent of Civilian Workforce Unemployed	Change
United States	5.8	9.1 [a]	+3.3
Illinois	6.0	9.5 [a]	+3.5
Cook County	7.5	10.4 [a]	+2.9

TABLE 3-7
Percent of Civilian Workforce Unemployed

Location	Percent of Civilian Workforce Unemployed (2000)	Percent of Civilian Workforce Unemployed	Change
DuPage County	3.3	7.9 [a]	+4.6
Hanover Park	4.5	10.0 [a]	+5.5
Schaumburg	3.1	8.0 [a]	+4.9
Roselle	2.5	7.1 [b]	+4.6
Elk Grove Village	3.1	7.6 [a]	+4.5
Itasca	5.4	6.2 [c]	+0.8
Wood Dale	4.5	8.1 [c]	+3.6
Bensenville	4.1	7.4 [c]	+3.3
Elmhurst	2.8	6.8 [a]	+4.0
Northlake	6.2	6.9 [c]	+0.7
Franklin Park	6.9	8.9 [c]	+2.0
Des Plaines	3.9	9.0 [a]	+5.1
Mount Prospect	3.5	7.5 [a]	+4.0

Source: U.S. Bureau of the Census, 2000; U.S. Bureau of the Census, 2010; Illinois Department of Employment Security, 2011; U.S. Bureau of the Census, 2011.

[a] The Percent of Civilian Workforce Unemployed in September 2011 (Illinois Department of Employment Security, 2011).
[b] The Percent of Civilian Workforce Unemployed in 2008-2010 (U.S. Bureau of the Census (2011).
[c] The Percent of Civilian Workforce Unemployed in 2005-2009 (U.S. Bureau of the Census (2010).

3.2.2 Environmental Consequences

3.2.2.1 Business Displacements and Employment Loss

The proposed improvements under the Build Alternative would displace 39 commercial and industrial properties that are occupied by 46 businesses with a combined employment of 1,332 employees. Seven of the 39 displaced buildings are vacant. Most of the businesses displaced would be from the industrial sector. The others would be from the food and motorist service sectors. The business displacements would be spread throughout the project corridor and would be experienced by seven communities. The greatest number of business and employee displacements would occur in Des Plaines, Bensenville, and Franklin Park. Table 3-8 describes the businesses and number of employees displaced by the proposed improvements and their locations along the Build Alternative. These business displacements are shown in Exhibit 3-1.

Displaced businesses would be relocated in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended, IDOT's *Land Acquisition and Procedures Manual* (IDOT, 2011), and the Illinois Tollway's land acquisition policies, as applicable. Participation under the state and federal policies is without discrimination. The IDOT and Illinois Tollway, as applicable, would pay property owners the fair market value for all private property purchased and would provide relocation assistance.

Many of the businesses that would be displaced by the proposed improvements, the industrial companies in particular, are expected to relocate in the vicinity of the project corridor. A majority of the displaced companies rely on optimal access to regional and national transportation facilities; thus, the project will improve access to this transportation network. During the economic downturn, local cities and villages have been working to retain businesses in their community, and where opportunities exist, attract new business. Current economic conditions have caused the vacancy rate of commercial and industrial buildings in the area to increase substantially. Currently, the vacancy rate of industrial properties in the study area is 11 percent, and 17 percent of the industrial space in the study area is available for use (S.B. Friedman & Company, 2011). This suggests that displaced businesses that wish to relocate within the vicinity of their current location should have sufficient locations from which to choose. Local communities have recognized that these conditions represent opportunities to retain potentially displaced businesses by the project in the area. Each of the affected communities in the project corridor stands ready to aggressively retain potentially displaced businesses with action that would match their location and building requirements with available properties. When the proposed improvements result in the loss of parking spaces at area businesses, every effort would be made to relocate the displaced parking spaces to other areas within or adjacent to the property boundary.

TABLE 3-8
Business and Employee Displacements along the Build Alternative

Location along Build Alternative	Name of Business Displaced (Business Type)	Number of Employees Displaced	Location (Community)
Elgin-O’Hare Expressway/ I-290 Interchange	Extended Stay America (Hotel)	14	Itasca
	Wendy’s (Restaurant)	14	Itasca
Elgin-O’Hare Expressway	Midwest Tar Sealer Company (Construction Contractor)	48	Itasca
	Mobil Gas Station (Gas Station)	6	Wood Dale
Elgin-O’Hare Expressway/West Terminal Interchange	Crouch-Seranko Masonry (Masonry Contractor)	4	Bensenville
	JX Peterbilt (Truck Vendor and Servicer)	15	Bensenville
	Mainfreight (Logistics/Transportation)	22	Bensenville

TABLE 3-8
Business and Employee Displacements along the Build Alternative

Location along Build Alternative	Name of Business Displaced (Business Type)	Number of Employees Displaced	Location (Community)
North leg of West Bypass corridor	Palumbo Brothers (Construction Contractor)	50	Elk Grove Village
	Groot Recycling and Waste Services (Recycling and Waste Management)	2	Elk Grove Village
	MBS Group, Inc. (Distribution)	5	Elk Grove Village
	Helget Gas Products (Distribution)	5	Elk Grove Village
West Bypass/Touhy Avenue Interchange	Weiss-Rohlig USA (Transportation Logistics; Distribution)	40	Des Plaines
	Tax Airfreight (Transportation)	48	Des Plaines
	ATC Trucking (Transportation)	75	Des Plaines
	Midwest Express Distribution Center (Distribution)	25	Des Plaines
	Earth Incorporated Stone Yard (Storage)	0 [a]	Des Plaines
West Bypass/I-90 Interchange	Mobil Gas Station (Gas Station) [b]	30	Des Plaines
	Mobil Gas Station (Gas Station) [b]	30	Des Plaines
	Auntie Anne's (Restaurant) [b]	4	Des Plaines
	Baskin Robbins (Restaurant) [b]	4	Des Plaines
	McDonalds (Restaurant) [b]	40	Des Plaines
	Panda Express (Restaurant) [b]	12	Des Plaines
	Starbucks (Restaurant) [b]	10	Des Plaines
	Subway (Restaurant) [b]	8	Des Plaines
	Taco Bell/KFC Express (Restaurant) [b]	11	Des Plaines
	Illinois Tollway Customer Service Center (Service) [b]	2	Des Plaines
	Travel Mart (Retail) [b]	2	Des Plaines
	U.S. Equities Realty (Real Estate) [b]	4	Des Plaines
I-90/Elmhurst Road Interchange	8400 Partners Truck Parking (Truck Storage)	0 [a]	Des Plaines

TABLE 3-8
Business and Employee Displacements along the Build Alternative

Location along Build Alternative	Name of Business Displaced (Business Type)	Number of Employees Displaced	Location (Community)
West Bypass/Franklin Avenue/Green Street Interchange	Aaron Equipment Company (Equipment Wholesaler)	50	Bensenville
	Royal Die & Stamping Co. Inc. (Stamping and Parts Production)	125	Bensenville
	Waste Management Northwest Office (Recycling and Waste Management)	120	Bensenville
	The Flolo Corporation (Electrical Motor Products and Repair)	50	Bensenville
	StoneCraft USA (Retail)	40	Bensenville
	Phoenix Welding Co. (Contractor)	15	Bensenville
	Astroblast Inc. (Sandblasting and Painting)	18	Bensenville
	The Fastron Company (Manufacturing)	24	Bensenville
	Interplex Daystar Inc. (Manufacturing)	75	Franklin Park
	Elite Airline Linen of Chicago (Airline and Hotel Service)	100	Franklin Park
	Pat McNally Construction (Sewer Contractor)	9	Franklin Park
	Foodliner Inc. (Food Distribution and Truck Tank Wash)	90	Franklin Park
	Bustouts Excavating (Construction)	15	Franklin Park
	Fantis Imports Inc. (Imports)	6	Franklin Park
	General Polymers (Ashland Chemicals) (Flooring)	20	Franklin Park
	Viking Materials (Metals Supplier)	25	Franklin Park
West Bypass/I-294 Interchange	Sharon Piping Equipment (Sharpe Valves) (Warehouse)	50	Northlake

[a] This business does not have a business structure on site; therefore, no employees are at the site to displace.
[b] This business is located in the Des Plaines Oasis that will be displaced by the proposed improvements.

3.2.2.2 Other Business Impacts

The proposed improvements would result in other impacts to businesses, such as removal of parking spaces and changes in access (see Table 3-9). These impacts are primarily located along arterial road improvements throughout the project corridor.

In some cases, the impact on parking ranges from 10 percent to over 35 percent. In one case, 100 percent of the parking is lost. The estimated levels of parking loss, in some instances, may impact the functionality of the business and result in a displacement. Further coordination, as part of the land acquisition process, would be conducted with these businesses to determine the effects of the parking loss on their business and examine alternatives to reduce or mitigate such effects.

3.2.2.3 Land Use Changes

Approximately 595 acres of new right-of-way will be required to implement the proposed improvements (see Table 3-10). A large portion (375 acres or 63 percent) is property from private businesses, which include commercial and industrial properties as well as railroad and private utilities. Public properties account for 199 acres (33 percent) of all new right-of-way needed. Most of the public lands include O'Hare Airport and MWRDGC property. Residential property accounts for four percent of the right-of-way to be acquired. As shown in Table 3-10, the land use required to accommodate the proposed improvements is property reminiscent of an urban landscape.

Further discussion regarding residences is located in subsection 3.1. Public lands and religious institutions are discussed in subsection 3.5.

3.2.2.4 Tax Impacts

A short-term tax revenue loss in the region would result from converting taxable land into a nontaxable transportation use. To evaluate the tax losses, information was obtained from Cook and DuPage Counties. Tax losses were determined for all taxing jurisdictions, including schools, fire protection, park districts, and individual communities. A total of 45 taxing entities are impacted in Cook County and 26 taxing entities are impacted in DuPage County. The results of this analysis are summarized in Appendix G. The tax loss analysis shows that the total annual property tax losses are estimated to be $4.2 million along the project corridor. This potential loss represents 0.13 percent of the total annual taxes collected by the affected taxing entities in the two counties. Each individual taxing entity would lose between 0.01 and 9.61 of the total annual taxes collected.

TABLE 3-9
Other Business Impacts

Business Name	Address	Impact	Reason for Impact
MSC Industrial Supply Company	1020 N. Wood Dale Rd., Wood Dale	Parking removal (approximately 25 out of 100 spaces)	Widening of Wood Dale Road
T. Wood Bar and Grill	1051 N. Wood Dale Rd., Wood Dale	Parking removal (approximately 60 out of 135 spaces) and access rerouted	New access road being constructed through property
Ryder Truck Rental and Leasing	902 Route 83, Elk Grove Village	Parking removal (approximately 60 out of 220 spaces) and access rerouted	Southern portion of property removed due to westbound frontage road for Elgin-O'Hare Expressway
Lake View Appliance Distributing and O'Hare Paint Ball Park	1065 and 1071 Thorndale Ave., Bensenville	Access rerouted	Access changed from Thorndale Avenue to eastbound frontage road for Elgin-O'Hare Expressway
Sara Lee Coffee and Tea	950 and 990 Supreme Dr., Bensenville	Parking removal (approximately 20 out of 85 spaces) and access rerouted	Westbound frontage road for Elgin-O'Hare Expressway construction through site
Elkay Plastic Co. and Goodyear, Inc.	150-250 Thorndale Ave., Bensenville	Parking removal (approximately 20 out of 125 spaces)	Eastbound Elgin-O'Hare Expressway exit ramp constructed through site
Con-Way Central Express	401 W. Touhy Ave., Elk Grove Village	Temporary parking removal during construction (approximately 30 out of 150 spaces) and access rerouted	Southbound Touhy Avenue to West Bypass entrance ramp constructed across current access on Old Higgins Road; Old Higgins Road access shifted west
Xtra Lease LLC	320 W. Touhy Ave., Des Plaines	Parking removal (approximately 16 out of 16 spaces)	Construction of sidewalk on north side of Touhy Avenue
MacLean Power Systems	11411 Addison Ave., Franklin Park	Parking removal (approximately 140 out of 400 spaces)	Relocation of Powell Street and railroad spur
The Korner House	2736 Old Higgins Rd. , Elk Grove Village	One of two access points removed	Realignment of Old Higgins Road
Multi-business Building (with six businesses: Fastenal, Subway, CSC Complete Auto/Truck/Bus Repair, Target Auto Parts, Prestige Renovation, and FISA North America)	2801 Touhy Avenue, Elk Grove Village	One of three access points removed	Realignment of Old Higgins Road
Sysia LLC	2950 Higgins Rd., Elk Grove Village	One of two access points removed	Construction of the Old Higgins Road Bypass
Skyway Transportation	1250 Garnet Dr., Northlake	Partial building acquisition [a]	Ramp being constructed through property from I-294 to West Bypass

[a] This structure may be able to only be partially acquired. Investigations into whether or not this can be accomplished while retaining its structural integrity will be investigated during future stages of the project.

TABLE 3-10
Land Use within Proposed Right-of-Way

Land Use Type	Area (acres)	Percent of Total [b]
Business	375	63
Public	199	33
Residential	21	4
Religious Institutions	0.02	0

3.2.2.5 Impacts of Tolling

The roadway system in the project area includes both tolled and non-tolled facilities. The tolled facilities in the project area, operated by Illinois Tollway, are I-90, I-294, and I-355 to the south. All other roads in the vicinity of the project are non-tolled public roads. Participation in the Illinois Tollway I-PASS program is high in the communities surrounding the project corridor (see Exhibit 3-3). As shown in Exhibit 3-3, toll road usage is a regular occurrence; thus, added toll facilities would not be a new concept for area residents.

Current usage on the almost 300-mile Illinois Tollway system is largely dictated by the directness of travel and time savings; therefore, drivers are expected to approach the usage of the proposed project with the same objectives. Tolls were increased systemwide by 85 percent, equating to an average annual increase of $150 to $200 spent on tolls per user. A review of the median family income in communities along the project corridor revealed that none are close to the 2011 DHHS poverty guidelines, but rather well above (see Table 3-2). Therefore, it is reasonable to assume that tolling, including the 2012 systemwide increase in toll rate, would not have a negative economic effect on I-PASS participants in the surrounding communities. Motorists would have the option for using arterials located close to and paralleling the Elgin O'Hare and West Bypass corridors if they did not want to pay tolls. Arterials that motorists could use include Devon Avenue, Irving Park Road, and York Road. Motorists may, however, experience longer and more indirect travel times by using arterials rather than the Elgin O'Hare and West Bypass corridors. Alternatively, the proposed project provides for other transportation modes including transit and bicycle and pedestrian facilities, which represents travel options for area residents.

Likewise, tolling the roadway is not expected to adversely impact transit and bicycle/pedestrian opportunities in the project corridor, transportation modes that are favorable for low-income populations. The proposed improvements have been designed to accommodate the future incorporation of transit along the mainline as well as planned bicycle and pedestrian facilities. Finally, the project's robust public involvement process has included informing all residents of potential tolling options, including low-income and minority residents. No activities exclude any individuals because of income, race, color, religion, national origin, sex, age, or handicap. All public meetings were accessible to handicap individuals and a Spanish translator was available to attendees at both public information meetings.

3.2.2.6 Economic Benefits

The dollars invested for transportation improvements would lead to job creation (including direct, indirect, and induced jobs) and would increase federal and state tax revenue (including business profit, indirect business, personal income, and social insurance taxes), value added (the difference between total revenue and the purchase of materials and services from other entities) and economic output (total sales before subtracting the value of intermediate goods). The spending and re-spending of construction dollars in the project area is expected to lead to increased income and, hence, increased consumer spending.

The economic effects of this infrastructure investment were estimated using the economic model "IMPLAN PRO."[1] The model estimates economic impacts from construction activities on the economy[2] by tracing spending and consumption among various economic sectors, including businesses, households, government, and "foreign" economies in the form of exports and imports. Impact Analysis for Planning (IMPLAN) estimates economic impacts in terms of four components related to the expenditure of construction dollars—value added, employment, increased tax revenues, and economic output.

The economic benefits of the proposed project have been evaluated in Tier One and again in Tier Two. Economic analyses are sensitive to the duration of the construction period or the timeframe of the expenditure. In Tier One, the construction period for the roadway and transit improvements were assumed to be three years (not necessarily occurring at the same time) based on the best available information. In Tier Two, the Illinois Tollway capital improvement program, *Move Illinois: The Illinois Tollway Driving the Future*, showed a schedule for the proposed project spanning 12 years for the ICP from the year 2013 to 2025 (Illinois Tollway, 2011). It was assumed that travel demand would require the ultimate build-out of the project from the year 2035 to 2040. The following discussion describes the Tier One and Tier Two analyses.

The assumptions used in Tier One and Tier Two are shown below:

- Tier One
  - A cost of $3.05 billion for construction and $550 million for right-of-way[3] were used for the roadway element, and $325 million for the transit element of the project.
  - It was assumed for the purpose of this analysis that the construction costs would be evenly spread over a three-year period for both the roadway and transit elements.
- Tier Two
  - A cost of $3.05 billion for construction and $550 million for right-of-way were used for the roadway element, and $325 million for the transit element of the project.

[1] Impact Analysis for Planning (IMPLAN) is an economic impact software model that predicts the way a dollar injected into one sector is spent and re-spent in other sectors of the economy, generating waves of economic activity, or so-called "economic multiplier" effects. The model uses national industry data and county-level economic data to generate a series of multipliers, which in turn estimate the total economic implications of economic activity.

[2] For this analysis, the region of influence is that area that was assumed to experience most of the economic impacts from the proposed project and included Cook, DuPage, Kane, Lake, McHenry, and Will Counties, Illinois; and Kenosha County, Wisconsin.

[3] Right-of-way costs typically are treated as transfer payments, and therefore, do not contribute to an increase in economic activity in terms of jobs and value added.

– The construction of the roadway element would be constructed in two phases, an initial phase, and the ultimate build-out phase. For the ICP, a construction cost of $1.98 billion (total cost with right-of-way is $2.465 billion [2011 dollars]) was spread in accordance with the expenditure schedule shown in the Illinois Tollway's capital improvement program. The construction cost ($1.06 billion [2011 dollars]) for the remainder of the project (the ultimate build-out) between 2035 and 2040 was evenly spread over the term.

The IMPLAN model generates annual outputs. For this analysis, these annual outputs were summed for the construction period. Jobs are presented both annually and totaled for the term of construction.

Tier One Analysis

Table 3-11 details the results of the economic analysis for construction of both the roadway and the transit elements from the Tier One analysis. This analysis has been retained in the Tier Two Draft EIS as a reference to this earlier analysis, and the assumptions used. The Tier Two economic analysis in the next subsection is an update based on refined project details, information, and assumptions. The Tier One analysis showed that construction of the proposed roadway elements would result in creation of a total of 13,450 jobs per year or over 40,000 cumulative full-time equivalents (FTEs) over a three-year construction period. Of these, 7,430 jobs per year would be direct jobs in the highway industry (those created as part of roadway construction) and 6,020 jobs per year would be indirect and induced jobs (indirect jobs are those created by employees working for producers of material, equipment, and services used on the construction project, while induced jobs are those created by wages spent on consumer goods and services).

TABLE 3-11
Tier One Analysis of Economic Impacts during Construction Period [a, b]

	Roadway	Transit
Construction costs	$3 B	$325 M
Total jobs created per year/FTEs	13,450/40,350	1,355/4,065
Total value added	$3.3 B	$330 M
Added federal tax revenue [c]	$517 M	$54 M
Added state tax revenue [d]	$213 M	$22.5 M
Economic output	$6 B	$600 M

[a] Construction period in Tier One assumed to be three years.
[b] Economic benefits are for the area including Cook, DuPage, Kane, Lake, McHenry, and Will Counties, Illinois; and Kenosha County, Wisconsin.
[c] Federal taxes accrued from construction dollars are related to corporate profit, personal income, and social insurance.
[d] State tax revenue accrued from business taxes, personal income, and sales taxes.

Value added, which is the additional value of commodities produced by the industries in the region over and above the cost of commodities used from the previous stage of production, would be an estimated $3.3 billion over the three-year construction period ($1.1 billion per year).

Construction of the Build Alternative would generate an estimated $517 million over the three-year construction period in federal income taxes ($172 million per year), and an estimated $213 million in state and local taxes ($71 million per year).

Economic output[4] (total value of sales in the region before subtracting the value of intermediate goods) would be $6 billion over the three-year construction period (or $2 billion per year).

Construction associated with the transit elements (preservation of right-of-way in the median of the east-west corridor and along the east side of I-90, provision for stations along the route and associated parking and bicycle/pedestrian access, and connection between the proposed West Terminal with the Rosemont CTA Blue Line station) would result in creation of 1,355 jobs per year or 4,065 job years during the three-year construction period. Value added would be an estimated $330 million over the three-year construction period (approximately $110 million per year). The transit component would also generate an estimated $54 million over the three-year construction period in federal income taxes ($18 million per year), and an estimated $22.5 million in state and local taxes ($7.5 million per year). Finally, economic output would be $600 million over the three-year construction period (or $200 million per year).

Tier Two Analysis

The Illinois Tollway capital improvement program, M*ove Illinois: The Illinois Tollway Driving the Future*, spreads the term of construction for its major projects over a long period of time (12 years). This allowed the Illinois Tollway to finance a larger number of projects throughout its system in the same timeframe. As shown in Table 3-12, the more lengthy construction period produces less annual economic impact, which is the result of less project expenditures annually. However, the total economic impact over the term of construction is very similar to the shorter timeframe used for Tier One.

The analysis showed that construction of the proposed project would create a peak of 2,500 jobs annually during the initial phase of project construction and about 3,000 jobs annually during the ultimate build-out of the project. The total job years created for the term of the entire project is about 40,500 jobs, which is very similar to the results in the Tier One analysis.

The value added and total output are substantial numbers with values of $3.3 billion and $6.02 billion respectively.

Construction of the Build Alternative would generate an estimated $336 million over the initial phase of construction, and $181 million during the ultimate build-out in federal income taxes, or a total of $517 million in federal taxes. State and local taxes would tally to $138 million during the initial phase of construction and $74 million during the latter, or a total of $213 million. The results of the Tier Two analysis are very similar to the Tier One values.

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[4] Economic output is subject to double counting because it does not net out the intermediate sales of goods and services. Nevertheless, economic output provides a measure of economic activity in terms of sales in the region.

The economic analysis conducted for the transit element of the project remains the same. The total expenditure and the term of construction were unchanged. The timing of construction is unknown, but is not material to the analysis that is presented in 2010 dollars.

TABLE 3-12
Economic Impacts (2010 dollars)

Construction Period	Cost (millions)	Value Added (millions)	Output (millions)	Direct Jobs	Total Jobs	Federal Taxes (millions)	State and Local Taxes (millions)
2013	58	63	115	411	775	10	4
2014	186	202	368	1,315	2,479	32	13
2015	186	202	368	1,315	2,479	32	13
2016	186	202	368	1,315	2,479	32	13
2017	186	202	368	1,315	2,479	32	13
2018	141	154	279	999	1,883	24	10
2019	141	154	279	999	1,883	24	10
2020	141	154	279	999	1,883	24	10
2021	141	154	279	999	1,883	24	10
2022	141	154	279	999	1,883	24	10
2023	157	171	310	1109	2,091	27	11
2024	157	171	310	1,109	2,091	27	11
2025	157	171	310	1,109	2,091	27	11
Subtotal (2013 through 2025)	*1,978*	*2,154*	*3,912*	*13,993*	*26,379*	*336*	*138*
2035	213	232	421	1,505	2,837	36	15
2036	213	232	421	1,505	2,837	36	15
2037	213	232	421	1,505	2,837	36	15
2038	212	231	420	1,501	2,829	36	15
2039	212	231	420	1,501	2,829	36	15
Subtotal (2035 through 2039)	*1,063*	*1,158*	*2,103*	*7,517*	*14,169*	*181*	*74*
Total	**3,041**	**3,312**	**6,015**	**21,510**	**40,548**	**517**	**213**

Note: In some cases, due to rounding, numbers may not add up to the total listed.

3.2.3 Indirect and Cumulative Economic Impacts

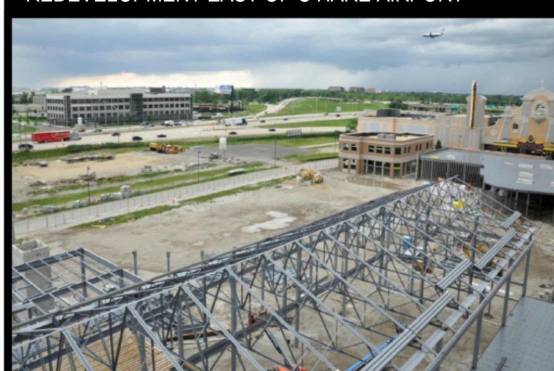
The EO-WB project possesses a unique and special set of physical and economic relationships that together offer tremendous economic benefit to the area west of O'Hare Airport, to the Chicago region, and to the State of Illinois. This project, along with the proposed West Terminal at O'Hare Airport, would provide Illinois with a greater potential for economic growth than any other planned infrastructure initiative. The combination of a world-class airport, crossing interstate highways, and intermodal freight facilities have already created one of the world's largest industrial developments and the second largest employment center in Illinois.

Nevertheless, the attributes that were attractive to new development in the past are changing today with declining travel conditions, aging infrastructure, and outdated and obsolete building configurations. Since 2007, employment in the area has declined by 70,000 jobs, or almost 14 percent for the area as a whole. This is well above national and regional averages (nine percent and seven percent, respectively). Further analysis as part of this study found that employment in the area might not return to 2007 levels within the period of the study (2040) and, in fact, might never return without this project.

Study of the economic interrelationships in this area has concluded that a comprehensive solution of sizable scope and scale is needed to affect a new future for the area. Thus, a "Transportation-Economic Development Program" is needed; whereby, transportation improvements bring an updated and diverse economic base. The improved transportation facilities and western access to one of the world's busiest airports resulting from the EO-WB project would provide the needed access and visibility to stimulate the redevelopment of the aging and vacant infrastructure that exists today (see Figure 3-3). The economic synergies of these projects would markedly change the future of the area west of O'Hare Airport and potentially impact the entire region. This is occurring on the east side of O'Hare Airport where the airport and good access to ground transportation infrastructure has fostered the redevelopment of aging infrastructure and provided the catalyst for economic renewal (see Figure 3-4).

FIGURE 3-3
AGING INFRASTRUCTURE WEST OF O'HARE AIRPORT

FIGURE 3-4
REDEVELOPMENT EAST OF O'HARE AIRPORT



This subsection examines both the short- and long-term economic effects of the project. The expenditure of billions of dollars to construct the project would have short-term economic effects in the project area and the region in terms of job creation, tax revenue, and additional economic factors. The analysis of long-term economic impacts realized after the project is completed includes the potential for new development and redevelopment within the project area, along with the resulting effect on long-term job growth and future tax revenue. The analysis also evaluates how the project would provide more efficient travel and time savings, as well as considerable annual cost savings.

3.2.3.1 Economic Benefits During Construction

The potential for induced economic effects from construction of the proposed Build Alternative is substantial for the region and is even more prominent when considering the combined or cumulative effects of the other reasonably foreseeable actions in the area. Cumulative economic impacts were estimated using IMPLAN modeling that was applied to all major projects in the project area that would occur in the same timeframe as the ICP of the EO-WB project (2013 to 2025). These projects and programs include:

- Proposed EO-WB project, to be constructed between 2013 and 2025.
- Transit improvements along the Elgin-O'Hare Expressway (express bus service routed in mixed traffic, using strengthened shoulders where needed), planned for 2018.
- I-90 resurfacing improvements between Elgin Plaza and IL 53, slated for 2015.
- York Road/Irving Park Road grade-separated intersection improvement, to be constructed between 2012 and 2014.
- I-90 reconstruction and add-lane project, between IL 53 and I-294, to occur between 2016 and 2018.
- The remainder of the OMP, which includes the completion of Runway 10C and constructing Runway 10R and other enabling projects (construction began in 2011 and would continue through 2015).

Table 3-13 details the results of the analysis. Cumulative economic impacts from construction of the EO-WB project, combined with the other improvements, would result in $10.6 billion in construction expenditures over the 13-year period from 2013 to 2025. Annual construction costs would range from $180 million to over $1.4 billion during the construction period.

The cumulative direct jobs created range from a low of 1,300 in 2025 to a high of almost 10,000 in 2015. Total job creation (which includes direct, indirect, and induced) follows a similar pattern, ranging from a low of 2,400 in 2025 to a high of 18,500 jobs created in 2015. Between 2013 and 2025 more than 140,000 cumulative FTEs would be created. The cumulative effect of these projects would contribute to sustaining employment in the region.

Total value added would be an estimated $11.592 billion, and estimated total sales volume, as measured by total output, would be $21 billion over the 13-year period.

The expenditure for the construction of the projects would contribute a sizable sum to federal and state/local taxes (income taxes, business taxes, etc). Federal taxes, as shown in

Table 3-13, would total over $1.8 billion for the time period, and state/local taxes would be over $740 million.

TABLE 3-13
Cumulative Economic Impacts (2010 dollars)

Construction Period	Cumulative Cost (millions)	Value Added (millions)	Output (millions)	Direct Jobs	Total Jobs	Federal Taxes (millions)	State and Local Taxes (millions)
2013	899	980	1,780	6,365	11,996	153	63
2014	1,027	1,119	2,033	7,269	13,700	175	72
2015	1,387	1,512	2,746	9,818	18,503	236	97
2016	1,127	1,228	2,231	7,977	15,034	192	79
2017	650	708	1,287	4,600	8,669	110	45
2018	605	660	1,198	4,284	8,074	103	42
2019	605	660	1,198	4,284	8,074	103	42
2020	911	993	1,804	6,450	12,157	155	64
2021	951	1,037	1,883	6,734	12,690	162	67
2022	951	1,037	1,883	6,734	12,690	162	67
2023	671	731	1,328	4,748	8,949	114	47
2024	671	731	1,328	4,748	8,949	114	47
2025	181	197	358	1,279	2,411	31	13
Total	10,636	11,592	21,057	75,290	141,896	1,810	745

Note: In some cases, due to rounding, numbers may not add up to the total listed.

3.2.3.2 Economic Benefits after Construction

Dependable transportation is important in helping to retain existing industries and attract new economic activities. The long-term evaluation of economic impacts realized after the project is constructed analyzed the potential for new development and redevelopment within the project area, and the resulting effect on long-term job growth and future tax revenue. To estimate long-term permanent workforce effects, a market feasibility analysis was conducted to approximate future development and employment growth that would occur under the Build Alternative and No-Build Alternative. Business development potential was estimated, both in terms of where it would occur and the type of future uses that could be expected. From that, employment was then calculated. The job impact summaries for the Build Alternative and No-Build Alternative were quantified relative to CMAP's baseline 2010 estimate of 472,000 jobs for the project area.

Fundamentally, a very different economic future is forecast for the area west of the airport under the Build Alternative compared to the No-Build Alternative. Table 3-14 shows the aggregate long-term economic growth for each scenario and the difference between the two scenarios, which represents the net economic impact for the project area. The projections assume little new housing to result from the proposed improvements to accommodate the increased number of employees expected to result from the project. However, community planning for new housing development through infill could minimize housing/employment imbalances.

The economic growth for each scenario and net impacts are presented in terms of:

- Net new development potential.
- Net new jobs added.
- Annual taxes resulting from net new development in 2040.

The Build Alternative improvements would enhance access to the west side of O'Hare Airport, as well as improve access and shorten travel times to areas within the project area, which is considered a competitive advantage to industrial and commercial properties in the area. This, in turn, would enhance redevelopment potential of underutilized properties, stimulate land use change, and create potential development and redevelopment opportunities throughout the project area. This would lead to a change in businesses and, in turn, a change in permanent workforce employment in the area.

As shown in Table 3-14, the Build Alternative, in combination with other economic stimuli in the area and the proposed West Terminal, is forecast to generate substantial new development potential and roughly 104,000 jobs by the end of the 30-year analysis period. Comparatively, the No-Build Alternative would add 63,000 jobs by 2040, or a net difference of 41,000 jobs. The job forecasts for both the Build and No-Build Alternatives include the build-out of the OMP with the proposed West Terminal, and the reconstruction of I-90; therefore, the effects of these projects are reflected in the total growth of permanent jobs in the area. The data shown in Table 3-14 and Table 3-15 is the net difference between the Build and No-Build Alternatives, and is attributable to the development of the EO-WB project only. In an analysis requested by the Governor's Advisory Council, it was demonstrated that a No-Build Alternative without the EO-WB project and without the proposed West Terminal would effectively reduce job creation by 65,000 jobs in the project area. Thus, the absence of the proposed West Terminal would result in about 24,000 jobs lost.

When comparing the Build Alternative to the No-Build Alternative, it is estimated that almost nine million square feet of new office, retail, and industrial space, and approximately 1,400 additional hotel rooms would be developed as a result of the improvements (see Table 3-14). This increase in new development would correspond to 41,000 more jobs by the year 2040. Other project area benefits associated with the new development under the Build Alternative would be approximately $16 million annually by 2040 in new tax revenues.

TABLE 3-14
Long-Term Economic Impacts for the Project Area

	Build Alternative	No-Build Alternative	Net Long-Term Economic Impact
Net New Development (2010-2040)			
Office	12,845,500 ft^2	5,872,100 ft^2	6,973,400 ft^2
Retail	2,694,200 ft^2	2,345,600 ft^2	348,600 ft^2
Industrial/business park	3,309,300 ft^2	2,078,700 ft^2	1,230,600 ft^2

TABLE 3-14
Long-Term Economic Impacts for the Project Area

	Build Alternative	No-Build Alternative	Net Long-Term Economic Impact
Hotel rooms	10,640	9,270	1,370
Residential units	17,630	17,090	540
Job growth (2010-2040)	104,000	63,000	41,000
Annual municipal tax revenues in 2040 from net new development (2010 $)[a]	$94,800,000	$78,900,000	$15,900,000

Note: This analysis does not include the school district portion of property taxes.

[a] Annual municipal tax revenues include hotel taxes, sales taxes, and property taxes for all property types (commercial, industrial, residential, etc). For property taxes, a combined tax rate has been created for each community that includes overlapping parks, library, and fire protection districts. Since some communities include these services in their base rate and others do not, this allows for better comparison of overall community impacts. Projections are in 2010 dollars.

This tremendous growth potential is driven by the synergy between the EO-WB project and the surrounding development and infrastructure. The EO-WB project would be an important addition to the transportation hub that would create further connectivity to multiple highways (I-290, I-94, I-294) and other modes of transportation, and provide access to numerous local roads in the project area, making the project area one of the most accessible parts of the region. The EO-WB project would also function as a new western gateway to one of the world's busiest airports. These factors, combined, would have the following effects:

- **Stimulate New Development**. The EO-WB project, combined with other projects in the area (namely, the proposed West Terminal and the reconstruction of I-90), is projected to fundamentally change the competitive position of the area and to attract corporate offices, hotels, modern industrial/business parks, and retail uses. Exhibit 3-5 shows potential future land use for key areas within the project area that are forecast to redevelop over the next 30 years if the EO-WB project and the proposed West Terminal are developed. The new development pattern is a shift away from the current predominance of industrial development to a more modern and diverse commercial center that, on average, has higher job density and a higher tax base. Corporate office developers and a major industrial developer in the region confirm that this would be the likely outcome. The emergence of a new mixed-use employment center in the Chicago region that includes office, hotel, retail, and industrial uses west of O'Hare Airport is a unique opportunity being facilitated by the convergence of major transportation investments.

- **Improve the Performance of Existing Development**. Existing development within the project area is experiencing relatively high levels of vacancy related to the nationwide recession. The proposed transportation investments would make existing industrial and commercial real estate more attractive for businesses, and vacancy levels are projected to return to pre-recession lows as new businesses seek space in the project area.

Approximately 4,700 acres (560 potential sites representing approximately 3,200 land parcels) are estimated as being likely to be redeveloped over the 30-year-period as a result of the proposed roadway improvements, OMP, and I-90 reconstruction. Exhibit 3-5 displays locations where redevelopment is predicted to occur. The communities west of the airport (along what is now Thorndale Avenue, York Road, Elmhurst Road, and the existing Elgin-O'Hare Expressway) would be transformed into a modern employment and business center that includes corporate offices, hotel, business parks, and retail uses. These uses would replace a portion of the current industrial uses (an estimated 2,200 buildings would be replaced). The transformation under the Build Alternative and other project development occurring during the same timeframe (i.e., OMP, I-90 reconstruction, etc.) results in a more diverse, higher quality, and a higher value economic base that is in alignment with long-term economic trends and the potentials associated with proximity to a major airport.

The communities showing the greatest gain in development potential and corresponding employment are the communities directly fronting the Elgin O'Hare and West Bypass corridors. Specifically, the communities of Wood Dale, Itasca, and Bensenville show the greatest potential economic benefits, ranging from 1.6 to 2.2 million square feet of net new commercial and industrial development potential, and 4,000 to 9,000 net new jobs as a result of the Build Alternative (see Table 3-15). Other communities, including Elk Grove Village, Roselle, Schaumburg, Mount Prospect, and Addison would each gain 1,000 to 3,000 net new jobs; and the remaining communities within the project area would gain less than 1,000 net new jobs as a result of the Build Alternative. Overall, the Build Alternative would add 104,000 jobs to the project area, and the No-Build Alternative would add 63,000 jobs by 2040, which is a net difference of 41,000 jobs.

Under the No-Build Alternative, the lack of transportation investments would limit the growth potential of the project area as a whole, including the following:

- **Dampen Development Potential.** The projections indicate that there would be a major dampening of growth and development potential within the project area without proposed roadway improvements, and congestion would be exacerbated as the area grows, leading to a stifling of growth potential of the project area as a whole.
- **Limit the Recovery from the Recession.** Without the new transportation facility, which would serve as a catalyst for change, the current business mix would prevail, and the vacancy levels likely would not recover to pre-recession levels, particularly as older or obsolete industrial properties in the project area continue to age.

Under the No-Build Alternative, the project area would experience new development or redevelopment that would correspond to 64,000 additional jobs (approximately 41,000 fewer jobs than the Build Alternative) over the next 30 years. The limited amount of new development would be largely concentrated along I-90 and east of O'Hare Airport, as well as within proximity to the new terminal, since developers would seek to concentrate new hotels close to the new terminal and in areas adjacent or close to interstate access. The lack of new highway frontage roads would limit the potential for corporate office, hotel, and retail development west of O'Hare Airport, and communities in this area would lose the opportunity to become major employment centers in the region.

TABLE 3-15
Net Long-Term Economic Impacts by Community (2040) [a]
Build Alternative versus No-Build Alternative

Community	Net New Development Potential					Net Job Impact
	Retail (sq ft) [b]	Office (sq ft) [b]	Industrial (sq ft) [b]	Hotel Rooms	Residential Units	
Addison	0	0	4,300	0	0	1,100
Arlington Heights	5,000	1,000	6,000	0	0	800
Bensenville	-118,000	1,205,400	989,500	-970	0	4,000
Berkeley	0	0	0	0	0	500
Bloomingdale	0	0	0	0	0	300
Chicago	0	1,000	0	0	0	400
Des Plaines	0	1,100	115,800	0	0	1,400
Elk Grove Village	0	30,000	0	0	0	2,900
Elmhurst	0	0	0	0	0	1,300
Franklin Park	0	-80,000	14,600	0	0	400
Hanover Park	109,000	111,800	84,000	0	-310	400
Itasca	90,000	2,080,000	0	830	410	8,500
Melrose Park	0	0	0	0	0	400
Mount Prospect	7,300	207,000	349,000	0	0	1,100
Northlake	0	0	79,000	0	0	400
Park Ridge	0	0	0	0	0	200
Rolling Meadows	500	463,000	0	0	0	1,900
Roselle	-1,000	617,000	158,000	380	-410	2,900
Rosemont	0	0	0	0	0	300
Schaumburg	7,000	2,000	354,000	0	0	1,900
Schiller Park	-800	34,100	11,900	0	0	400
Wood Dale	249,600	2,300,000	-935,500	1,130	850	9,000
Unincorporated	0	0	0	0	0	500
Total	**348,600**	**6,973,400**	**1,230,600**	**1,370**	**540**	**41,000**

Source: S.B. Friedman & Company, 2011b.

[a] The content of the table shows the net difference in land development and jobs between the Build and No-Build Alternatives.
[b] Square feet of floor area only.

The project area would realize increased property values as a result of new development, which would translate to increased tax revenues under both the Build Alternative and No-Build Alternative. Table 3-16 compares the Build Alternative and No-Build Alternative and the estimated annual potential tax revenue impact for the communities in the project area. The annual revenue shown in Table 3-16 will grow gradually as new development occurs. The estimates shown in Table 3-16 are presented in 2010 dollars and reflect the estimated additional annual tax income that would accrue annually to municipalities by 2040.

Construction of the Build Alternative, combined with the proposed West Terminal, would result in nearly $16 million in net tax revenues in the project area more than the No-Build Alternative (approximately $95 million versus $79 million). Communities that would realize the greatest net increase in total tax revenues under the Build Alternative would be Wood Dale, Itasca, Rosemont, and Franklin Park. Under the No-Build Alternative, the communities of Rosemont, Bensenville, Des Plaines, and Schaumburg would realize more property tax increase benefits, due to their proximity to existing interstates. However, the overall property tax benefit to the entire project area would be less, due to the lost development opportunity of the EO-WB project not being developed.

TABLE 3-16
Tax Revenue Impacts by Community

Municipality	Build Alternative Net Revenues by Source [a, b, c]	No-Build Alternative Net Revenues by Source [a, b, c]	Difference in Net Revenues between Build and No-Build
Addison	$2,009,000	$1,978,000	$31,000
Arlington Heights	$3,707,000	$3,583,000	$123,000
Bensenville [d]	$9,496,000	$9,808,000	$(312,000)
Berkeley	$321,000	$311,000	$10,000
Bloomingdale	$694,000	$677,000	$18,000
Chicago	$3,659,000	$3,601,000	$58,000
Des Plaines	$7,217,000	$6,720,000	$497,000
Elk Grove Village	$5,262,000	$5,005,000	$258,000
Elmhurst	$1,480,000	$1,449,000	$30,000
Franklin Park [d]	$4,922,000	$3,800,000	$1,123,000
Hanover Park	$4,007,000	$3,631,000	$376,000
Itasca [d]	$9,494,000	$5,871,000	$3,624,000
Mount Prospect	$4,787,000	$3,829,000	$0
Northlake	$1,017,000	$866,000	$959,000
Park Ridge	$327,000	$316,000	$152,000
Rolling Meadows	$5,513,000	$4,519,000	$11,000
Roselle [d]	$4,069,000	$2,887,000	$994,000
Rosemont	$12,142,000	$11,858,000	$1,182,000

TABLE 3-16
Tax Revenue Impacts by Community

Municipality	Build Alternative Net Revenues by Source [a, b, c]	No-Build Alternative Net Revenues by Source [a, b, c]	Difference in Net Revenues between Build and No-Build
Schaumburg	$6,655,000	$6,274,000	$284,000
Schiller Park	$789,000	$652,000	$381,000
Wood Dale [d]	$7,234,000	$1,238,000	$137,000
Total	**$94,801,000**	**$78,873,000**	**$15,933,000**

Source: S.B. Friedman & Company, 2011b.

Note: This analysis does not include the school district portion of property taxes.

[a] Projections are in 2010 dollars.
[b] Revenue is estimated on an annual basis.
[c] A combined tax rate has been created for each community that includes overlapping Parks, Library, and Fire districts. Since some communities include these services in their base rates, this allows for a better comparison of community impacts.
[d] Non home rule community. Under current statute, non home rule communities may only use Hotel tax revenues to promote tourism and related events. This means that, unless the statute is changed or these communities successfully undertake the process of converting to home rule, the uses of additional hotel revenues will be restricted.

3.2.3.3 Travel Delay Savings

TABLE 3-17
Annual Vehicle Operation Savings, Build Alternative

Benefit	Savings
Annual time savings per motorist	4.5 hours
Annual cost savings per motorist	$405
Annual cost savings for all motorists	$144,821,700

The proposed project would provide marked improvement in travel performance throughout the roadway system in the project area. The reduction in delay resulting from the transportation improvements would yield a large annual cost savings for travelers (see Table 3-17). The annual cost savings in 2040 was estimated by applying an hourly value for time and vehicle operating cost of $90 per hour (the future hourly rate was derived from a present day cost of $43 per hour escalated at 2.5 percent per year to 2040; and the hourly cost is comprised of fuel, vehicle maintenance, depreciation, and vehicle operator costs) to the reduced hours of delay with the project. The project's travel model generated the total annual hours of delay savings by comparing the Build Alternative to the No-Build Alternative. Based on that analysis, the EO-WB project would produce a 1.6 million hour delay savings with an annual cost savings of over $400 per motorist in the project area or $145 million annually by 2040.

3.2.4 Measures to Minimize Harm and Mitigation

3.2.4.1 Access During Construction

A traffic management plan would be developed by the Illinois Tollway with guidance from the community for use during the construction phase of the project. Goals of the plan would be to move traffic efficiently while minimizing disruption, especially during peak travel times; preserving access to area businesses, residences, and community facilities to the extent possible; and minimizing lane and road closures, as well as detours to the extent feasible and practical.

Construction sequencing would be designed to provide the best traffic flow and minimize disruptions to traffic movements. Construction would be coordinated to minimize the geographic area of the disruption and provide the opportunity for the best traffic flow through the construction area. When capacity is added to existing facilities, it is likely that lanes would be added on the outside of the mainline; then improvements would be made inward to the centerline. Similarly, when improvements are made over existing facilities, the improvements aboveground would be proposed for implementation before any changes being made on or underground. This causes the least disruption to the existing flow of traffic. On the interstates and Thorndale Avenue, frontage roads could be constructed before lanes are added to the mainline for use by traffic needing to be detoured off the mainline during construction. In the cases where an alignment would be shifted, the new alignment would likely be proposed for construction before the old one is deconstructed so that one route is always available for motorists. In most cases, complete construction at a location would be proposed to occur rather than proceeding in phases, which would minimize the need to cause multiple disruptions at the same location.

Despite attempts made to minimize disruption to motorists during construction, inconveniences may be necessary for safety, efficiency, or logistical reasons. Lane and road closures are possible during construction. During construction on interstates, the goal would be to reduce the number of lanes by only one lane in each direction. Where possible, at least one lane of traffic would remain open on the major cross streets. Other inconveniences include reduction of lane width during winter, temporary closures of exit and entrance ramps, and detours. When the vertical profile of streets is being changed, detours would be necessary. Detours could consist of rerouting motorists onto adjacent roadways or onto temporary roadways constructed onsite. Local access would be provided, to the extent feasible. If detours are required, proper signage would be posted to alert motorists of any changes in expected travel routes.

Most construction would occur during daylight hours. In certain circumstances, construction may need to occur at night time to minimize the duration of construction or to retain access to certain properties. Light and noise issues would need to be considered when deciding whether or not construction should occur during nighttime hours.

The public would be informed in advance of and during construction of the construction-related activities. Motorists would be advised of road closures, detours, and any other modifications to the expected travel routes. In order to alert motorists of future construction activities, as well as congestion and recommended alternative routes, ITS signage may be implemented. The Illinois Tollway and IDOT would coordinate construction activities, sequence, and traffic management plans with fire, police, and emergency rescue services to minimize delays and response times during the construction period.

3.2.4.2 Land Use Planning and Ordinances

Local communities are enabled by law to plan the future of their communities with comprehensive land use planning and zoning laws. Individually and collectively, the communities in the project area have the ability through their local planning powers to address new development induced by better transportation with thoughtful planning solutions. As the development proposal is advanced to each of the communities, they have the tools to shape solutions that are compatible with their community values and goals. Many of the communities have established goals and objectives concerning economic development, and these guiding principals will serve to manage their future. These may include accommodating the projected economic growth by promoting residential development to accommodate the increased workforce expected to result from the proposed improvements. New development pressures may cause some communities to revisit their land use plans, goals, and ordinances to determine if they are adequate to guide and manage an influx of new development that is consistent with their vision. Further, communities and the counties may choose to collaborate on a collective action that would produce a unified approach to managing induced growth throughout the area.

3.2.4.3 Permanent Access Changes

There are occasions where the business would not be displaced, but access to the business would be impacted. In these instances, access modifications may be required in order to maintain access to the establishment. Access modification may include relocation of business driveways or the consolidation of driveways that would not adversely affect business activities.

3.3 Land Use

3.3.1 Affected Environment

The project area is highly urbanized with a mix of residential, commercial, industrial, transportation, and recreational land uses. The project corridor is well represented by all the land use types, with some being more dominant than others. Residential areas are most prevalent along the western portion of the Elgin-O'Hare Expressway. Around O'Hare Airport, the land use is primarily industrial. The eastern portion of the Elgin-O'Hare Expressway is largely industrial and commercial. I-90 is a mix of residential, commercial, and industrial land uses. Recreational properties can be found in various locations along the project corridor.

The project corridor is uniquely located near one of the busiest airports in the world (O'Hare Airport) and is within a multimodal transportation network that provides national and regional access to and from a transportation-dependent economic hub. Therefore, its location has substantial economic advantages to the neighboring commercial and industrial facilities. As mentioned in subsection 3.2.1, trade, transportation, and utilities are the industries with the greatest number of employees in the Chicagoland region. Further, 18 percent of all vehicle trips in the Chicago region start, stop, or pass through the project area. The CP railroad's largest yard in the Chicagoland area, the Bensenville Yard, is located within the EO-WB project corridor and serves as a major loading and unloading station.

The EO-WB project corridor also contains large properties with unique uses that require special attention and extensive coordination with the land owners to ensure that impacts to those properties are minimal and that the project is in compliance with policies governing those land uses. These properties include O'Hare Airport, the Bensenville Yard, the

MWRDGC flood storage reservoirs, and radio towers for WBBM and CBS. These special land uses are described in subsection 3.4 and displayed in Exhibit 3-6.

3.3.2 Environmental Consequences

From a land use and community perspective, the Build Alternative would fit well within the community context. The Elgin O'Hare corridor improvements are proposed along an existing transportation corridor in the midst of interstates and arterials; therefore, the context of the area is well suited for transportation facilities with higher travel speed and limited access (e.g., highways, major arterials). The area is rich with commercial and industrial development that is dependent on reliable transportation access and service. The proposed improvements would be well suited to the business community's objective of better transportation that would sustain the competitive position of the area. Similarly, the location of the West Bypass corridor on O'Hare Airport property would be advantageous and result in no disruption to local communities (see subsection 3.4.1.2 for a discussion of the compatibility of the EO-WB project with O'Hare Airport). An analysis of the compatibility of the proposed improvements with existing land use and community plans and policies are described in the following subsections.

3.3.2.1 Compatibility with Land Use Plans

Land use planning is at various stages in the region and communities along the project corridor. The *GO TO 2040 Comprehensive Regional Plan,* a comprehensive regional plan developed by the region's metropolitan planning organization, CMAP, highlights the EO-WB project as a high-priority transportation improvement that will benefit mobility and economic development in the region. Several communities have recently updated their comprehensive land use plans to assume completion of the EO-WB project in the future. In other cases, communities have prepared plan updates for properties close to the proposed EO-WB project corridor, and in some cases, subarea plans are being initiated for properties near the corridor. Below is a description of the land use planning being conducted by local communities and the compatibility of the proposed improvements with the land use plans.

Village of Schaumburg

The Village of Schaumburg, as illustrated in its 1996 Comprehensive Plan, considered access to transportation facilities a critical benefit to the community. While it did not make direct reference to the current EO-WB project, the proposed improvements would not be in conflict with Village plans in the vicinity of the project corridor. Transportation access to and from the industrial facilities along the Elgin-O'Hare Expressway via the roadway was cited as an important component to the success of the industrial area. Existing access locations in this area are being maintained, and capacity is being added to accommodate future traffic growth. Very little new right-of-way would be required at this location, thereby maintaining Schaumburg's expectation that the existing land uses would be retained.

Similarly, access to other nearby transportation facilities is considered by Village planners to be critical. The importance of access to the Schaumburg Regional Airport and Schaumburg Metra station was emphasized in the Village's Comprehensive Plan. Overall, the proposed improvements would maintain and improve access to community business centers and other transportation facilities.

The Village of Schaumburg Comprehensive Plan also highlighted the Schaumburg Bikeway Plan, a system of interconnected bicycle paths and trails throughout the community, with the intent of offering access to recreational amenities and alternatives to motorized transportation. Since the Plan was adopted, components of the Bikeway Plan have been completed, including bicycle paths across the Elgin-O'Hare Expressway along Springinsguth Road and Wright Boulevard in the project corridor. At these locations, the Village's existing bicycle facilities would be incorporated into the new roadway improvements.

In general, the Village of Schaumburg is satisfied with the land use pattern in the vicinity of the project corridor; therefore, the Village would retain the formal land use designations noted in its comprehensive plan and zoning ordinance.

Village of Roselle

The Village of Roselle's 1995 Comprehensive Plan designates residential, commercial, industrial, and open space land uses near the Elgin O'Hare corridor. The proposed improvements do not conflict with the Village's existing or planned land uses. Discussions with Village officials revealed that they view the area surrounding the Roselle Road interchange as a development opportunity. Thus, initial plans for commercial development are being considered that are both automobile oriented and transit oriented.

Elk Grove Village

Elk Grove Village does not have a current comprehensive plan. Village representatives, however, have been actively involved in both Tier One and Tier Two of the EO-WB project development process. During Tier One, Village officials were opposed to the location of alternatives that were disruptive and divided their community (e.g., alternatives that provided north-south travel with IL 83). Extensive community support and documentation was provided supporting their position and preference for the location that was ultimately selected (i.e., Alternative 203D). In their opinion, this alternative provided improved access and travel efficiency while avoiding any serious disruption to their industrial development. The Village is satisfied that the proposed project would be fully compatible with its community values.

Village of Itasca

The Village of Itasca's Comprehensive Plan was last published in 1994. The Plan assumed the eastern extension of the Elgin-O'Hare Expressway as a completed future project. Existing and future land uses included a mix of residential, commercial, and industrial. In Itasca, high quality commercial development exists along the existing Elgin-O'Hare Expressway and Thorndale Avenue. The Village has routinely shown support for the overall concept of better transportation in the area, but has been vocal about maintaining direct access from the access-controlled highway to valued development. Numerous one-on-one meetings have been conducted with the Village discussing local access in the vicinity of the I-290 interchange. The Village has been steadfast in their support for access that approximates existing conditions. Thus, the community's view of the project's compatibility with local land use will be determined by good access provided to valued properties.

City of Wood Dale

Although Wood Dale does not have a communitywide comprehensive plan, it completed a Master Plan for the Thorndale Avenue corridor in 2009. The Plan highlighted the importance of this corridor as a gateway to the proposed West Terminal of O'Hare Airport and as an important access point to the proposed transit facility associated with the EO-WB project. The City expects that the extension of the Elgin-O'Hare Expressway along Thorndale Avenue at this location and the addition of the proposed West Terminal at O'Hare Airport would provide the opportunity for land use changes and economic improvements of the adjacent area. Once the EO-WB project is completed, Wood Dale envisions that improved transportation provided by the proposed project would spawn a mixed-use development with multi-unit residences, restaurants, business facilities, and recreational amenities onsite or nearby. Historically, the area west of O'Hare Airport has been the location of manufacturing and transportation services for the airport. The combination of the EO-WB project with the proposed West Terminal would cause a shift in the future development in the area with opportunities for diverse, high-quality development.

The EO-WB project would be fully expected to support the goal and objective of the Thorndale Corridor Master Plan. The proposed improvements would be expected to provide the conditions for communities to experience an economic resurgence. Redevelopment of underutilized properties into multi-use development, such as the type discussed in the Thorndale Corridor Master Plan, could maximize the community's ability to attract such economic interest.

An issue raised in the Thorndale Corridor Master Plan is the lack of aesthetic quality along Thorndale Avenue. A set of design guidelines to provide aesthetic enhancements throughout the entire project corridor has been developed. These are described in subsection 3.17.3.

Village of Bensenville

The extension of the Elgin-O'Hare Expressway was included in the Village's 2004 plan as a potential future development. With the extension, the plan encouraged new development to provide office, research, and light-industrial uses along the Thorndale Avenue corridor. The proposed improvements would not conflict with the desired future land uses and, in fact, would be expected to facilitate redevelopment where local communities make the investments necessary to do so. In 2009, the Village developed the *Alternative Redevelopment Strategies Final Report*, in which short-term development strategies were presented for implementation independent of the airport expansion or Elgin O'Hare and West Bypass corridor improvements. The report also suggested that future land uses would be reevaluated if the Elgin O'Hare corridor is approved as a planned transportation facility.

City of Elmhurst

Elmhurst's 2009 Comprehensive Plan contained a reference to the proposed EO-WB project, but it did not identify specific goals to complement the construction of the facility. However, the City included goals to attract mixed land-use opportunities, commercial diversity to facilitate a sustainable economy, and facade improvements to increase marketability. The proposed improvements would be expected to create the opportunity for communities to attract and retain multi-use developers that would provide a diverse economic base. Redevelopment, where possible, would provide an economic advantage to communities that improve the visual quality of employment centers.

City of Northlake

The City of Northlake does not have a comprehensive plan, but it does have land use zoning. The properties adjacent to the proposed improvements are zoned for industrial land uses. The proposed improvements would not be expected to cause any changes in current zoning designations.

Village of Franklin Park

The Village of Franklin Park published its Comprehensive Plan in 1995. There was no mention of the proposed EO-WB project in it, but the proposed improvements would not be in conflict with the planning guidelines contained in the document. The Village of Franklin Park, throughout the EO-WB project development process, has been a staunch supporter for the project. In Tier One, the Village of Franklin Park supported the location of the south leg of the West Bypass in its community. The facility was viewed as an asset to its plans for future development and redevelopment; therefore, the Village representatives were fully supportive of the selected location through a portion of Franklin Park.

The EO-WB project would also be consistent with the Village's goal of improving the aesthetic qualities of transportation systems in the community. The corridor aesthetic design guidelines developed for this proposed project were developed to improve the aesthetic quality of the project features where possible. The focus of the aesthetic improvements is to provide motorists with a sense of the communities they are entering or passing through. The design guidelines are described in subsection 3.17.3.

City of Des Plaines

The City of Des Plaines, in its 2007 Comprehensive Plan, identified the expansion at O'Hare Airport, including access to the proposed West Terminal, as a critical consideration in planning for the southern portion of the City. Des Plaines officials foresee that revitalization of its industrial area on the south side of the City can be influenced by its proximity to O'Hare Airport and by the increased accessibility it would experience when the proposed West Terminal is constructed. This proposed project would assist in that goal by creating direct access via the West Bypass corridor and interchange at the proposed West Terminal. Similarly, Des Plaines is interested in expanding its commercial base by adding services for O'Hare Airport patrons, including hotels, restaurants, and entertainment establishments on the south side of the City. This proposed project, especially in conjunction with the development of the proposed West Terminal, would be expected to provide the conditions for redevelopment in the communities along the project corridor, specifically in industries serving surface transportation and airport-related activities.

Village of Mount Prospect

The Village of Mount Prospect expressed an interest in maximizing the Village's economic vibrancy in its 2007 Comprehensive Plan. The Village is interested in attracting business that provides the greatest employment opportunity and is diversified so that the economic improvements are sustainable. Opportunities for redeveloping and otherwise improving the appearance of aging commercial structures are other ways in which the Village is pursuing economic advancement. The EO-WB project would be expected to spur redevelopment and diversification of existing commercial properties because of its ability to provide access to O'Hare Airport for travelers and improved surface transportation. Therefore, businesses related to surface transportation and the airport service industries would be expected to locate in the area to the west of O'Hare Airport. Also, the improved transportation access that the proposed project would provide would make the area more attractive to residents and other businesses not in the transportation or airport service industries.

Mount Prospect developed the South Mount Prospect Sub-Area Plan in 2009 to enhance commercial and non-motorized transportation in south Mount Prospect. The EO-WB project was not discussed in this document, but the Village identified goals of attracting and retaining a diverse employment base, as well as upgrading the visual quality of the business properties, consistent with the expected economic vibrancy the proposed improvements would be expected to generate.

DuPage County

DuPage County's 2005 Comprehensive Plan included the Elgin O'Hare and West Bypass corridors as potential future projects. The Plan proposed future uses for the land surrounding the project corridor that would be compatible with the proposed improvements. The County also has prepared the *West O'Hare Economic Development Study*, which is a feasibility-level study that examined improved western access to O'Hare Airport and associated economic development.

The 2010 DuPage County West O'Hare Study was the predecessor of the EO-WB project study, providing some of the initial momentum for advancing the project. As such, objectives are largely compatible with the proposed improvements under the EO-WB project. In the West O'Hare Study, it was stressed that western access to O'Hare Airport would provide widespread travel benefits to the area. The West O'Hare Study's second action item was for the County, communities, and other stakeholders to maintain an active presence while the Elgin O'Hare corridor, West Bypass corridor, proposed West Terminal, and transit facilities are being designed. The EO-WB project has an extensive public involvement process during which DuPage County and communities within the county have been engaged through one-on-one meetings with individual entities, public information meetings, and Corridor Planning Group (CPG) and Task Force meetings. Throughout this process, County and community interests have been well represented in the alternatives selection process and detailed design of the Build Alternative.

Other DuPage County action items included support for the inclusion of transit services in the EO-WB project, and diversification of the economic base. Both transit services and a diverse economic base will be realized by the project.

DuPage County identified another action item to accommodate the ability of community industries to branch out from being primarily industrial businesses and include more service and retail businesses. The EO-WB project would provide communities on the west side of O'Hare Airport with improved transportation access to O'Hare Airport, which may encourage retail, hotel, and restaurant businesses to locate in western communities near the proposed improvements.

The County's final action item was developing gateway concepts that improve the aesthetics of community entrances. The CAAT assembled from EO-WB project team members and representatives from local communities have identified a set of guidelines to apply to the entire corridor to improve the aesthetic quality of the improvements. The guidelines are described in subsection 3.17.3.

3.3.2.2 Community Cohesion

The potential for the proposed improvements to affect community cohesion and create the undesirable effect of a community barrier was evaluated. Community cohesion throughout the project corridor is expected to remain intact. The locations of the Elgin O'Hare and West Bypass corridors are along existing barriers and land use divisions; communities currently do not traverse the locations of the corridors. Elgin-O'Hare Expressway and Thorndale Avenue, as higher-type roadway facilities with several lanes and high traffic levels, already compartmentalize communities to the north and to the south of the roadways. Because the east-west improvements are proposed along these facilities, the project is not expected to cause any new barriers to community cohesion at this location. The location of the West Bypass was chosen in large part because land uses are divided into O'Hare Airport to the east and north and business or residential to the west and south. The portion of the West Bypass between O'Hare Airport and I-294 follows the CP railroad line, an existing barrier to east-west travel in that industrial area of Franklin Park. No barriers to community cohesion will be introduced along the West Bypass either.

Local access along and across the project corridor will be provided by interchanges at major arterials, frontage roads, and grade-separated crossings. Interchanges would be provided at I-290, Park Boulevard, Arlington Heights Road, Prospect Avenue, Wood Dale Road, IL 83, and the West Bypass corridor. Other arterials would cross over or under the mainline at Mittel Boulevard, Lively Boulevard, and Superior Drive. A one-way frontage road paralleling the eastbound Elgin O'Hare corridor would be provided from Park Boulevard to Prospect Avenue and Mittel Boulevard to York Road. This would be used by area residents and business users on the south side of the Elgin O'Hare corridor for eastbound travel. A one-way frontage road paralleling the westbound Elgin O'Hare corridor would be provided from Supreme Drive to Mittel Road and Prospect Avenue to Arlington Heights Road. This would be used by area residents and business users on the north side of the facility for westbound travel. Residents and business users traveling in the opposite direction would be provided access via the interchanges and crossroads.

The location of the West Bypass corridor on the western edge of O'Hare Airport property would avoid conflict with the proposed OMP improvements and minimize displacement of valued industrial and commercial properties in Elk Grove Village, Des Plaines, Bensenville, and Franklin Park. While some circuitous travel may be introduced by the establishment of a new access-controlled facility where access currently exists, the location of the bypass would minimize alterations to community travel patterns that impair emergency response, school bus routes, or community travel to town and activity centers.

Specific benefits of the West Bypass corridor include:

- On the north leg where a portion of it is immediately west of O'Hare Airport, its location would preserve community cohesion by avoiding bisecting Elk Grove Village's primary industrial area. Similarly, on the south leg of the West Bypass corridor where the facility would be immediately to the south of O'Hare Airport, the facility would provide a barrier between the airport and Bensenville. By locating the facility south of the airport along the east side of the CP railroad, the roadway would maintain the railroad's existing division between industrial facilities on both sides of the railroad rather than adding a new one in a different location.

- On the south leg, community connections would be improved substantially with local roadway enhancements in the vicinity of the Bensenville Yard and intermodal facility. These proposed improvements would include the Taft Avenue Connector and the connection of Franklin Avenue/Green Street to Irving Park Road over the Bensenville Yard. This improvement would create a new connection and travel access between the industrial areas north and south of the rail yard.

3.3.3 Indirect and Cumulative Land Use Impacts

The cumulative effects of the proposed improvements would be expected to bring about land use changes in the project area. Generally, fully access-controlled roadways can lead to modernized land uses. The proposed tollway would dramatically increase traffic volumes passing by adjacent properties that would improve the visibility of these lands. These changing conditions would spur investment in private development. As detailed in subsection 3.2, approximately 5,000 acres (560 potential sites representing approximately 3,200 land parcels) are estimated to be redeveloped over the 30-year period as a result of the proposed roadway improvements. Exhibit 3-5 displays locations where this is forecasted to occur. The communities west of O'Hare Airport (along what are now Thorndale Avenue and the existing Elgin-O'Hare Expressway) could be transformed into a modern employment and business center that includes corporate offices, hotels, business parks, and retail uses. These uses would replace a portion of the current industrial uses that presently exist. The transformation under the Build Alternative would result in a more diverse, higher-quality, and higher-value economic base that is in alignment with long-term economic trends and the potentials associated with proximity to a major airport. Comparing the Build Alternative to the No-Build Alternative, it is estimated that almost nine million square feet of new office, retail, and industrial space, and almost 1,400 additional hotel rooms would be developed as a result of the improvements. This increase in new development would correspond to 41,000 more jobs by the 2040 (see subsection 3.2.3.2).

3.3.4 Measures to Minimize Harm and Mitigation

3.3.4.1 Land Use Planning/Ordinances

Thoughtful land use planning and ordinance implementation encourage organized and meaningful development. The proposed improvements, especially when considered with other notable projects in the area (such as the OMP), are expected to attract businesses and residents. The proposed improvements combined with the other attributes of the area are a prescription for facilitating new and diverse economic development. Community action, either individually or collectively, which includes the use of cutting edge land use planning tools and ordinances, would provide private investors with the confidence that their investment would be part of development that is organized and of quality.

3.4 Special Land Uses

Special land uses are those that have unique characteristics that required particular attention during the design of the proposed improvements. They include public and private lands.

3.4.1 O'Hare Airport

As proposed, approximately 3.6 linear miles of the West Bypass corridor would be located on the western edge of O'Hare Airport's property. The location would be on the extreme western edge of the airfield (see Exhibit 3-7), but outside the Airfield Operations Area (AOA) and would be located to avoid existing and planned runways, taxiways, perimeter roads, and be compatible with navigational aids. Under the OMP, an extensive multi-billion dollar modernization of the airfield has been under construction since 2005. When the OMP is complete, O'Hare Airport will have a total of eight runways (six east-west parallel runways and two crosswind runways). Additionally, the Airport Layout Plan (ALP) proposes a new passenger terminal on the west side of the airport. Six runway ends would be along the western edge of the airfield, and one existing diagonal runway (14R-32L) extends to the western edge. In anticipation of the need for a major transportation facility on the west side of O'Hare Airport property, the CDA designated a 300-foot corridor on the west side of the airport as a transportation corridor in its *O'Hare Airport Master Plan Update* (CDA, 2005). Additionally, there are proposed roadway improvements within the approaches of Runway 14L on the north side of the airport and Runway 4R on the south side of the airport. A primary objective of the Tier Two EIS is to evaluate in detail the impact of the West Bypass corridor against airport operations and ensure its compatibility with the airport. Results of these analyses are expected to further refine the design of the West Bypass corridor to mitigate any conflicts found. As discussed in the following subsections, the process is to understand the existing and future airport land uses, the special restrictions that apply to the airport environment, justify and request the use of airport property to FAA, determine whether conflicts exist for the West Bypass corridor, and if conflicts do exist, define appropriate mitigation measures.

3.4.1.1 Affected Environment

Land uses along the western side of the airport are a mix of runways, taxiways, navigational equipment, roadways, waterways, earth berms, and other facilities. Beginning at the north end of the airfield, Runway 9L-27R was commissioned in 2008 and is the newest runway. This runway required a substantial amount of land acquisition for the construction of the west end. Site preparation required the movement and placement of millions of cubic yards of material across the runway and within the RPZ, an area located beyond the ends of a runway intended to protect aircraft operations. The RPZ at the west end of the runway is occupied by the existing CP and UP railroads. In the future, the West Bypass corridor would be located in the RPZ, immediately west of the railroad alignment. The roadway in this location would be outside the AOA. Common to all the RPZs along the west side of the airfield are Approach Lighting with Sequenced Flashers II (ALSF-II) systems extending from the runway threshold across the existing railroads and to the western limit of the RPZ. The ALSF-II light plane is in an area that must remain clear of objects at and above the ALSF lights. Because the proposed West Bypass corridor would cross the ALSF light plane, adjustments to the light plane would be required in terms of heights and spacing that are compliant with FAA requirements and fully inspected and flight checked by the FAA. Additionally, any alterations to accessing the ALSF light bars would require a plan to have continuous access for long-term maintenance.

Other land use features along the west side of the North Airfield include Guard Post One, the airfield fuel farm, airline hangars, and navigation equipment. Guard Post One is the north entrance to the airfield, serving employees and vendors. It is newly constructed under the OMP, and the access road to the guard post would require relocation under the proposed plans for the West Bypass corridor. The fuel tank farm is the central fuel storage facility for the airlines. From this location, jet fuel is distributed throughout the airfield. The

West Bypass corridor would be located west of this facility, and the project-related construction would require modifications to the supply lines bringing fuel to the tank farm. The airline maintenance hangars are also in this vicinity, but are far enough to the east of the West Bypass corridor to avoid any conflict.

Progressing south along the west side of the airfield from Runway 9L-27R, the West Bypass would intersect six other runway RPZs (three existing and three proposed). In each case, the ALSF-II systems would be crossed by the roadway, and modifications to the ALSF light plane would be required. As the new runway facilities are advanced under the OMP, existing Runway 14R-32L would be decommissioned as one of the last phases of the program. There is a likelihood that the West Bypass corridor would be constructed prior to the decommissioning; therefore, airspace restrictions may dictate certain design requirements in this area. Thus, close coordination with the OMP is necessary. The area south of the fuel farm to Runway 14R is under construction with a new taxiway, guard post and perimeter road, and relocation of Willow Creek. Most of the area on the western edge of the airfield between Runway 14R and Runway 10L is open land. Other than the occasional navigational aid, the only other land use features are remnants of airport construction (e.g., excess soil stored in this area). The proposed West Terminal is planned in this area between Runway 9R-27L and Runway 10L-28R, and close coordination between IDOT, Illinois Tollway, and the OMP has been extensive to provide for the eventual access needed from the West Bypass corridor improvements into the west side of the airfield.

Moving south from the proposed West Terminal complex, the West Bypass corridor would intersect the RPZs for Runway 10L-28R (existing), Runway 10C-28C (under construction), and Runway 10R-28L (enabling projects under construction). The area along the western edge, between 10C and 10R, was recently acquired under the OMP, and demolition of homes and businesses was completed in 2010. Numerous construction projects related to the OMP are occurring in this area, including the relocation of the UP railroad tracks, Irving Park Road, and the Bensenville Ditch (all completed in 2012). Other projects include the grade separation of the CP railroad tracks at York Road and Irving Park Road, and by the year 2013, the construction of Runway 10R-28R would commence, with a scheduled completion in the fall of 2015.

While the proposed West Bypass corridor would cross the extended runway centerline of Runway 14L-32R and Runway 4R-22L and work would be within the extended approach areas of Runways 14L and 4R, the improvements are outside the RPZ.

Other existing features along the western edge of the airfield include numerous aircraft navigational aids, such as low-level wind sheer alert system (LLWAS), remote transmit and receivers (RTRs), Airport Surveillance Radar (ASR-9), Airport Surface Detection Equipment (ASDE-X RU) and Instrument Landing Systems (ILS) consisting of localizers, glideslopes, and ALSF-IIs. Additionally, airfield maintenance roads and major waterways (i.e., Willow Creek, Higgins Creek, and Bensenville Ditch) are present. The *O'Hare Airport Master Plan Update* (CDA, 2005) recognized the potential for the West Bypass corridor and reserved a corridor on the western side of the airport for its eventual implementation. Other planned uses, in addition to the proposed West Terminal complex, include future surface parking and future aviation development that would support airfield operations. As part of the West Bypass corridor implementation, a relocated security fence would need to be constructed along the edge of the AOA to separate the airport from the proposed roadway corridor on the western side of the airport.

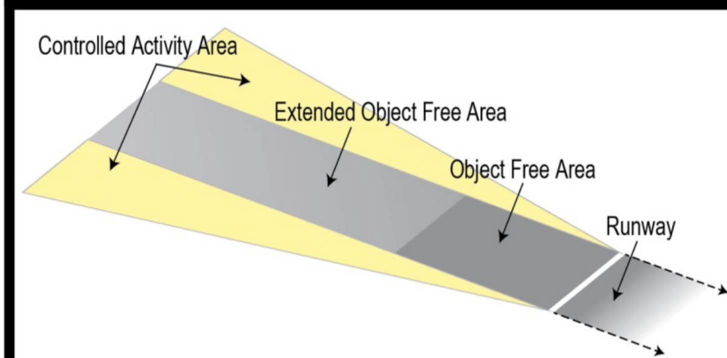
3.4.1.2 Requirements in an Airport Environment

Airport Land Use Restrictions

In addition to working within the framework of the existing and future airport land uses, runway imaginary airspace surfaces, RPZs, Object-Free Areas, related navigational aids, and other airfield facilities introduce a number of considerations in the engineering design of the West Bypass corridor. In this regard, ongoing coordination has been underway for several years between IDOT, FAA, CDA, and OMP. A priority issue is compliance within the RPZs because the West Bypass corridor would pass through six RPZs on the west side of the airport. Land uses within an RPZ are severely constrained and are defined in FAA's Airport Design Advisory Circular (AC) (AC 150/5300-13, current revision is Change 16, dated January 3, 2011).

The RPZ is a trapezoidal shape extending from the end of each runway at O'Hare Airport at a distance of 2,500 feet, beginning 200 feet after the end of the runway. Within the trapezoid are several layers of restricted areas (see Exhibit 3-7). First, an Object-Free Area, extending 1,000 feet from the end of the runway, prohibits the presence of any objects. Second, the center portion of the RPZ, extending from the beginning to the end of the RPZ, is fully controlled. Lastly, the area to the sides of the center portion, but beyond the Object-Free Area, is activity controlled (see Figure 3-5). In this latter area, some uses are permitted that would neither attract wildlife nor violate height restrictions within the RPZ, including such areas as storage facilities and covered stormwater detention basins. Uses that are not permitted include residences, fuel storage facilities, and places of public assembly, such as churches, schools, office buildings, and shopping centers. For the purpose of controlling land use, it is preferable that the land area encompassed by the RPZ be owned and controlled by the airport. However, at O'Hare Airport, some portions of the RPZ are not owned by the City of Chicago and, in some of these instances, commercial and industrial uses exist. As necessary, applicable navigational easements have been put in place to control land use, and these buildings do not violate relevant air space regulations as defined in 14 CFR Part 77.

FIGURE 3-5
RUNWAY PROTECTION ZONE



In addition to the RPZ requirements, FAA enacts regulation and policy pertaining to the protection of the public investment in the national airport system. In their administration of these regulations and policies, the FAA studies existing and proposed objects and activities, both on and off public-use airports with respect to their impacts upon the safe and efficient use of the airports and safety of persons and property on the ground, as defined in 14 CFR

Part 77. Based on these analyses of airspace issues, the FAA may issue an advisory recommendation in opposition to the presence of any off-airport object or activity in the vicinity of a public-use airport that is in conflict with an airport planning, design standard or recommendation. Within the airport environs, the FAA has full control in managing facilities and activities to ensure avoidance of air space conflicts. This would include the presence of the West Bypass corridor along the western edge of the airfield. In Tier One, a preliminary air space analysis was done to determine if the presence of the roadway in air space critical areas would cause conflicts. Based on that analysis, the location of the roadway did not impose any violations other than the height of signage and lighting. A second review by FAA was conducted during Tier Two using refined horizontal and vertical data for the roadway section. This review is described in subsection 3.4.1.3.

Right to Develop a Non-Aviation Use on Airport Property

Utilization of airport property for the West Bypass corridor is subject to FAA's land use release policy. In coordination with the FAA for this project, the FAA would agree for the City of Chicago to request a land use release of airport properties for non-aeronautical uses (e.g., roadway uses) only if it can be demonstrated that such use is not imperative to the core function of the airfield, and would serve a defined benefit. In general, the analysis has to demonstrate that approving the land for non-aviation uses would result in equal or greater benefit to the airport. In consideration of this decision, this document addresses a number of informational needs that are required to assist in FAA's decision of a land use approval. Among this documentation is a justification for the use of the property as a roadway, and consideration of other alternatives to the use of this land including the comparative benefit to the airport from the lease for a non-aviation use.

Justification of the Use of Airport Property

The proposal to develop the extension of the Elgin O'Hare and West Bypass corridors has been considered for decades. In the context of the EO-WB project, stakeholders placed a high priority on improving the access to O'Hare Airport from the west. This priority was prompted by the expectation that a West Terminal complex was planned as part of the Master Plan and ALP update in 2005 (CDA, 2005). Economic analyses have been conducted as part of Tier Two, which have shown that development of the EO-WB project and the proposed West Terminal offer a very different future to the communities on the west side of the airport in terms of new development that would be of high quality and diverse, and that would create many new employment opportunities. Improved transportation facilities and access are the keys to these important changes.

In consideration of how to best satisfy the transportation problems in the area, much attention was devoted to analyzing many alternatives. Thus, the selected location of the West Bypass corridor that was determined in Tier One is the product of considerable analysis and evaluation of alternative locations. In Tier One, 15 transportation strategies were developed and evaluated. Nine of those strategies include the West Bypass corridor as an element in the vicinity of the western edge of O'Hare Airport. The others either included a portion of the bypass, or accomplished the north-south movement in the project area in some other way that did not involve the airport property. Through a series of technical analyses, the alternatives were reduced to two alternatives that were comparatively evaluated in the Tier One Draft EIS. One alternative had the full West Bypass corridor (Alternative 203D) and the other had only the south leg of the bypass (Alternative 402D).

Based on detailed technical analyses, cost, travel performance analyses, environmental impact studies, and stakeholder input, Alternative 203D was identified in the Tier One Final EIS as the preferred alternative. Among the reasons that resonated amongst stakeholders was the lack of community disruption presented by Alternative 203D. This alternative would not displace large numbers of commercial and industrial businesses that represented the economic base of neighboring communities, nor would it divide communities by creating a travel, social, or physical barrier. Maintaining the integrity of their economic base and their community cohesion were among the most important community objectives when considering better transportation for the area. Thus, the airport location for the West Bypass corridor provided the best solution to satisfy these objectives.

Based on the discussion above, the West Bypass corridor is located in the only open space available for such a sizable facility that is neither out of scale nor completely incompatible with surrounding uses. The proposed location provides the needed travel efficiency and access to important activity centers, has the potential to propel substantial development and redevelopment, and serves as a logical border between O'Hare Airport and nearby communities.

Federal Aviation Administration Concurrent Land Use Approval

Based on the justification above, the City of Chicago is involved in discussions with the Illinois Tollway and IDOT concerning conveyance or use of approximately 195 acres of O'Hare Airport property as a permanent easement by the Illinois Tollway for the construction and operation of the West Bypass corridor and proposed West Terminal interchange (see Exhibit 3-8). The extent of these discussions, which included the FAA, have determined that the underlying ownership of the required properties will remain in the ownership of the City of Chicago. Further, the type of land transfer to the Illinois Tollway has been discussed, and the Illinois Tollway has stated that a permanent easement would be necessary. Further deliberations will continue on the type of land transfer.

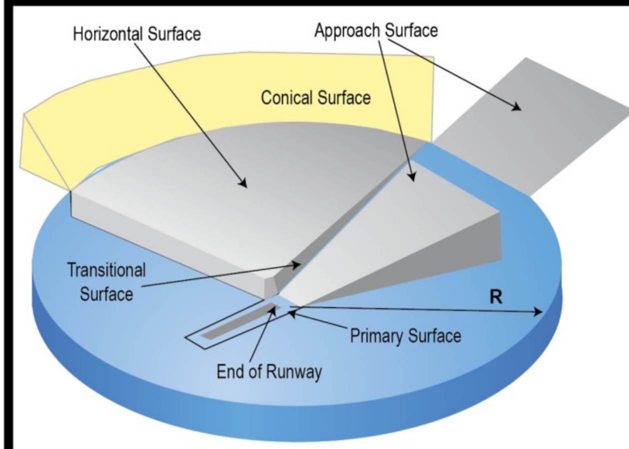
It is the responsibility of the City of Chicago to prepare and submit a concurrent land or land use release request. If the City of Chicago and the Illinois Tollway are successful in their negotiations regarding the lease and/or conveyance of a permanent easement for the construction and operations of the West Bypass corridor and the City receives approval from the Chicago City Council to convey such interests in the property, then the City plans to submit a land or land use release request to FAA following the Tier Two ROD (scheduled for December 2012).

Compatibility with the Airport

Most importantly, the development of the West Bypass corridor must be compatible with the adjacent airport operation. Through coordination by IDOT, the Illinois Tollway, and the CDA, numerous locational adjustments, roadway geometric revisions, profile adjustments, access requirements, and decisions whether to use bridges or tunnels have been made. In further definition of the facility design, the FAA has established guidelines to protect aviation safety through various land use restrictions. Among these restrictions are the following:

- Imaginary Airspace Surfaces. The FAA has established standards and requirements for objects affecting navigable airspace in 14 CFR Part 77 imaginary surfaces (Part 77), Terminal Instrument Procedures (TERPS), and to a lesser degree, the One Engine

FIGURE 3-6
PART 77 IMAGINARY SURFACES



Inoperative obstacle identification surface (OEI-OIS) used by air carriers to set maximum departure weights. These regulations are designed to protect an airport from objects that penetrate the defined imaginary airspace surfaces and vary depending on the use of the runways. The Part 77 imaginary surfaces are shown in Figure 3-6 and include the primary, transitional, horizontal, conical, and approach surfaces. The Part 77 inner approach surface (50:1 slope beginning 200 feet from the runway end) is the most restrictive surface that would affect the development of the West Bypass corridor. Specifically, a minimum of 17 feet of vertical clearance must be maintained between the high (crown) point of the roadway and the approach surface. Although the OEI-OIS is technically more restrictive at 62.5:1 slope beginning from the runway end, it is not often practical to plan for it since many other factors also determine maximum takeoff weight. The FAA currently requires reporting any OEI surface impacts, not protecting the airport environment against them. The most critical impacts for airport operations at O'Hare Airport that would be reported by the FAA would be an Instrument Flight Rules (IFR) impact, which is a violation of the TERPS surfaces. Exhibit 3-9 shows an example of the runway surfaces (i.e., Part 77, TERPS, and one-engine inoperative) in greater detail in relation to the proposed West Bypass corridor. The preliminary roadway profiles, considered to date, confirm that the obstacle heights associated with the West Bypass corridor (17-foot permanent clearance for the highest vehicle, per 14 CFR Part 77 standards) would be below the imaginary airspace surfaces associated with the end of the runways. Additional exhibits can be found in the *Feasibility Study for Elgin O'Hare - West Bypass (EOWB) Tier Two Preliminary Engineering Phase Study* (CH2M HILL, 2011) that was submitted to and reviewed by FAA. The FAA provided a response and determination on December 14, 2011 (see Appendix B).

- Runway Safety Zones. As with the imaginary airspace surfaces, the FAA has established standards concerning specified safety zones immediately following the departure path at the end of a runway. The key safety areas that the FAA uses are the Runway Safety Area (RSA) and the RPZ. These standards are published in AC 150/5300-13.

  The FAA describes the RSA as a "defined surface surrounding a runway prepared or suitable for reducing the risk of damage to airplanes in the event of an undershoot, overshoot, or other excursion from the runway." The RSA is a very restrictive area and is almost always on airport property. The West Bypass corridor would not impact any of the existing or future RSAs.

As discussed, the West Bypass corridor would be located within the RPZs, but is a permitted use provided it does not interfere with navigational aids and fits within the height restrictions set by the imaginary airspace surfaces above.

- **Aircraft Navigational Aids and Line of Sight.** It is imperative that the development of the West Bypass corridor not interfere with the navigational aids required to safely land aircraft. As previously discussed, the ALSF-II light plane is in an area that must remain clear of objects at and above the ALSF lights. The Tier Two EIS will analyze the impact of the West Bypass corridor on each component of the six runways' ILS, including the glideslope and localizer for signal interference and the ALSF-II for sighting considerations. Preliminary results are discussed in subsection 3.4.1.3.
- **Additional Compatible Land Use Guidelines.** Although the following guidelines are not regulatory, they provide recommendations in the interest of safety at O'Hare Airport and should be evaluated as part of the land release process.
  - *Lights, Glare.* Objects that project light upward or create glares, such as bodies of water or reflective surfaces, can be potentially hazardous because they can distract a pilot or create blinding glares. For the West Bypass corridor, roadway lighting near the final arrival approach may be misinterpreted as runway lights because they are arranged in a linear pattern and, therefore, should be designed to be downcast only with appropriate shielding. Open water surfaces (e.g., storm detention or retention facilities) and use of reflective building materials should not be used as part of the development of this site.
  - *Wildlife Attractants.* According to the FAA, wildlife/aircraft strikes have resulted in the loss of life and billions of dollars worth of aircraft damage worldwide during the past century. FAA AC 150/5200-33B, *Hazardous Wildlife Attractants on or near Airports*, provides guidance on identifying incompatible land uses and minimizing or eliminating hazardous wildlife attractants in the vicinity of airports. Hazardous wildlife attractants could include solid waste landfills, open water stormwater management facilities, wetlands, woodlands, and landscaped areas. This AC applies to both O'Hare Airport and the Schaumburg Regional Airport in the project area. For O'Hare Airport, the effect of the regulation extends five miles from the airport boundary, and in the case of the Schaumburg Regional Airport, it extends 10,000 feet. As required by FAA, the proposed EO-WB project improvements will implement the AC. Extensive coordination is expected with the FAA and U.S. Department of Agriculture (USDA) to achieve compliance with the hazardous wildlife attractant AC. It has been agreed through agency consultation that engineering plan at 60 percent completion will be submitted to regulatory agencies for review and approval including the USDA.

3.4.1.3 Measures to Minimize Harm and Mitigation

The FAA regulates airspace and obstacle clearance requirements near airport operations. Obstacle clearance requirements control the height of structures or objects in aircraft operating areas. As such, the FAA encourages early review of any proposed actions near airport operations and their possible conflicts with controlled air space. Early review is voluntary and is conducted with the objective of assisting in the development of design parameters such as the EO-WB's roadway profile, lighting and sign heights, construction means and methods, etc. Because of the project's proximity to the airport, early coordination during Tier One was initiated to determine if there were airspace concerns. Although the FAA typically conducts airspace reviews (using Form 7460 and required information) for projects much further into design, it was agreed that a preliminary 7460 review would be beneficial to facilitate airspace related design constraints. The FAA conducted two airspace reviews, one during Tier One and the other during Tier Two. The Tier One review was based on a conceptual level of detail, and Tier Two was based on more advanced engineering information. The reviews are both summarized below (see Appendix B for the FAA responses that include Tier One review [March 6, 2009] and Tier Two review [December 14, 2011]).

Tier One Airspace Review

The FAA's Tier One review cited no major concerns resulting from the location of the Elgin O'Hare and West Bypass corridors on or near airport property (see Appendix B). Most airspace conflicts cited by the FAA relate to future highway signage and lighting, which will be adjusted during the detailed design. In one case, a potential airspace violation would result in major roadway design decision (i.e., tunnel versus bridge). The highlights of the Tier One review are briefly described below:

- Four locations were identified as having IFR impacts, which concern departing aircraft initial climb surfaces. Two locations of concern (points 9R-PT5 and 9R-PT6) are near the proposed Runway 9R, where the Elgin O'Hare corridor connects with the West Bypass corridor (also the location of the proposed West Terminal). The FAA noted that a reduction in the height penetration at these locations by two to seven feet would avoid IFR impacts. The height violations at these locations would result in a reduction of aircraft departure weights allowed by the carriers. The third location (point 4R"G"-PT3) was associated with a south West Bypass corridor alignment option that is no longer under consideration, and therefore, warrants no further discussion. The fourth location (point 14R-PT3) is located near Runway 14R, which is planned to be decommissioned with the future construction of Runway 9R-27L and Runway 9C-27C. The timeframe for decommissioning will dictate if the roadway design at this location is a bridge over the CP railroad or a tunnel under the railroad. The decommissioning of Runway 14R is pending further discussion by the airlines and CDA regarding the construction of new Runway 9C, and the extension of Runway 9R. Until the schedule for the decommissioning of Runway 14R-32L is known, the design solution at this location will remain open.
- The FAA also provided a table of critical points for Part 77 height restrictions. The points show where potential penetrations to Part 77 imaginary surfaces could occur. See FAA memorandum, dated March 6, 2009, in Appendix B.
- The FAA noted that highway light poles must be obstruction lighted (shielded) for aircraft safety.
- The FAA specified that as the project proceeds to design, a formal 7460 review would be required before actual construction may commence.

Tier Two Airspace Review

As engineering detail advanced in Tier Two, the FAA agreed to update the 7460 review when details became available. By mid-2011, reliable horizontal and vertical roadway profile information was available to use in an updated 7460 air space submittal to FAA (July 2011). The FAA conducted the second review of the EO-WB project and issued a determination that is dated December 14, 2011. There are three main types of airspace results reported that include impacts to IFR, impacts to Part 77, and penetrations to both IFR and Part 77.

The highlights of the Tier Two airspace analysis are summarized below:

- Three locations were identified as having permanent IFR impacts caused by the roadway and associated vehicle traffic on the roadway. Table 1, in the technical memorandum, "Summary of FAA 7460 Review – Tier Two," (CH2M HILL, 2012) identifies the evaluation points (EOWB- PT 137, EOWB- PT 138 and EOWB- PT 139) that show IFR impacts. Although the points are located near Runway 14R, which would be decommissioned in the future as part of the OMP, uncertainty regarding the construction schedule for the OMP improvements has altered some prior assumptions. As such, the decommissioning schedule of Runway 14R may occur after the West Bypass corridor development. In this case, the bridge that is currently planned to cross the CP/UP railroad tracks would penetrate the Part 77 approach surface (including the 14R TERPS arrival surface), light plane for 14R approach lighting system, and the 32L TERPS departure surface (including the OEI-OIS). If Runway 14R-32L is decommissioned after the development of the West Bypass corridor, alternative design methods, such as tunneling the roadway under the CP/UP railroad tracks (as opposed to bridging over the tracks), may need to be explored to remain compatible with the runway operation.

- Fifteen locations were identified as having potential permanent IFR impacts caused by the signage and light poles associated with the roadway. At two locations, points Q1 PT 2 and Q1 PT 3, near the proposed Runway 9R extension where the Elgin O'Hare corridor would connect with the West Bypass corridor, alternate locations for signage and lighting would avoid permanent airspace impacts. At the other thirteen locations, the evaluation used conservative elevation inputs to the FAA analysis. The FAA chose to use existing ground elevation as opposed to final roadway grade, which represented a conservative evaluation approach. Thus, at these locations, there would actually be no IFR impact realized once the proposed grading changes are made to cut existing ground.

- The FAA evaluated the airspace concerns related to Part 77 height restrictions. With respect to Part 77, the goal is to have no penetrations, if possible. Table 2, in the technical memorandum, "Summary of FAA 7460 Review – Tier Two," (CH2M HILL, 2012) identifies where potential Part 77 impacts in the permanent condition could occur. Again, the FAA used the conservative ground evaluation inputs (i.e., existing ground elevation rather that the final roadway elevation), thus, there would be few actual impacts as noted in Table 2.

- The FAA offered the following additional comments in its response, to be considered as the design/planning process proceeds:
  - There is preliminary evidence that electronic I-PASS devices used by Illinois Tollway users may cause interference with some portions of the ILS, particularly the localizer or glideslope signals. Further research is required to ensure no disruption to the localizer and glideslope operations.

- Commercial signage (i.e., rotating/moving billboards) that may be installed along the proposed West Bypass corridor must exclude the new LED lighting. The lighting has been reported to provide distractions to pilots on final approach. Additionally, it was recommended that no moving signs, no flashing signs, no significant color change, no pulsing intensity, etc., be allowed. Signs that include steady state lighting and are positioned exactly parallel to the runway centerline are preferred.
- Glideslope facilities may be affected by the proposed West Bypass corridor (Runway 9L, 10, 9C, 9R, 10C, and 10R). These facilities must be studied and modeled on an individual basis. CAT III Flight Inspection Tolerances must be modeled. These modeling efforts are already underway, as discussed in the next subsection. A request was made that topographical information for the proposed contour out to 3,000 feet from the approach end of each potentially affected runway be provided for additional review.
- The agency requested that future project evaluations would analyze the potential effects of the project on existing and planned navigational facilities for the airport (e.g., ASDE-X RU, ALSF-II, and ASR-9 facilities).
- In response to the request above, a preliminary review of the existing navigational aid conflicts was conducted in the summer of 2012 and is summarized below:
    - Project improvements at the proposed north leg of the West Bypass and Touhy Avenue are in close proximity to LLWAS #20 and ASDE Remote Unit #14. Roadway improvements would require consideration of potential modifications to avoid conflict with these navigational aids.
    - Project improvements at the end of 14R (assuming the runway is active at the time of roadway construction) would require consideration of potential design options to maintain service of the Far Field Monitor associated with Runway 14R-32L and the ALSF light plane.
    - The proposed roadway alignment, immediately south to the airport's fuel farm, would be in conflict with the ASDE-X remote Unit #13, and would require the relocation of the unit. Further coordination with the FAA will be required to reposition the unit.
    - The proposed interchange improvements near the proposed West Terminal site would displace LLWAS #17 and ASDE Remote Unit #12. Further coordination with the FAA will be required to reposition the unit.
    - The proposed roadway alignment crosses through the RPZ of 10L and 10C, impacting the ALSF light plane and ALSF maintenances bridges, and crossing the UP railroad. Modifications of the ALSF light planes and maintenance bridges will be coordinated with the FAA and CDA as necessary.
- As the project proceeds to design, a formal 7460 review would be required before actual construction may commence.

Overall, the FAA cited no major concern resulting from the location of the proposed roadway on or near airport property except for its potential conflict with Runway 14R-32L. The other airspace conflicts described above relate to future highway signage and lighting, which can be adjusted during the final design.

Glideslope/Localizer Analysis

Ohio University was tasked with modeling the effects of the various structures and terrain surrounding the EO-WB project on the ILS of existing and proposed east-west configuration runways (i.e., the impacts on existing Runway 9L-27R, existing Runway 10L-28R, future existing Runway 10C-28C, proposed Runway 10R-28L, proposed Runway 9C-27C, and the proposed extension of Runway 9R-27L).

An ILS is made up of two main components including a glideslope antenna, which provides vertical guidance and a localizer antenna array that provide horizontal guidance to the runway for arriving aircraft. An ILS system requires the area surrounding the equipment to be relatively smooth and free of objects that might reflect signals and produce errant guidance to approaching aircraft.

The glideslope analysis is broken into two main components, an object model and a terrain model. The localizer analysis consists solely of an object model. The Ohio University ILS models used in this analysis are the Ohio University Navigation and Landing Performance Prediction Model and the Ohio University Glide Slope Model (Windows Version). The scattering algorithm in the computer codes is based on the Physical Optics theory and the Uniform Theory of Diffraction, respectively. These two techniques are used to estimate the amount of signal degradations caused by multipath from structures and undulations caused by terrain variations.

Preliminary results, to date, indicate that the glideslopes for four of the six runways will not incur any negative impacts from the EO-WB project. The localizer analysis also indicates that the performance of four of the six runways will be well within tolerance limits. Systems that are appreciably impacted by the West Bypass corridor are currently being analyzed further.

Approach Lighting System

As detailed analysis continues during Tier Two, preliminary analyses show that the West Bypass corridor crosses the approach lighting system of all seven (existing and proposed) runways. The ALSF-II light bars are spaced approximately every 100 feet extending 2,400 feet from the end of the runway. For the most part, the West Bypass corridor is proposed to pass the runway ends approximately 1,600 feet to the west at a width of 200 to 300 feet. This typically disrupts the placement of two to three light bars, depending on the roadway configuration. The preliminary analyses confirm that the ALSF-II light plane can be maintained above the obstacle heights associated with the West Bypass corridor (17-foot permanent clearance for the highest vehicle, per 14 CFR Part 77 standards) using the two percent maximum slope allowed from the end of the runways. Conceptual modifications to the Approach Lighting System were provided in Exhibits 1 to 6 in the *Feasibility Study for Elgin O'Hare - West Bypass (EOWB) Tier Two Preliminary Engineering Phase Study* (CH2M HILL, 2011) that was submitted to and reviewed by the FAA. These exhibits depict the overall environment in the vicinity of the runway threshold end point for both approach and departure considerations. The exhibits include the approach light plane that is coincident with the elevation of the approach lighting system. The exhibits also include the Part 77, TERPS departure and one-engine inoperative Imaginary Airspace Surfaces discussed above. The FAA provided a response and determination on December 14, 2011 (see Appendix B).

Tower structures supporting the light bars over the West Bypass corridor and UP railroad tracks would be required. Where typical low impact-resistant tower structures cannot be directly fixed to ground-based foundations, it is expected that a cantilever or bridge structure for the light bars would be required to span the West Bypass corridor improvements. Tower heights are planned to be 40 feet or less. Further details would be developed for the operation of the ALSF lighting system during both construction and operation of the facility in later stages of design.

Conformance with the FAA Wildlife AC will be monitored by the USDA through an IGA between the Illinois Tollway, City of Chicago, and the USDA. The USDA and the Illinois Tollway will develop an overall strategy for the use of practices that would minimize the attraction of birds and wildlife to roadway features specifically detention/retention basins and compensatory storage areas, roadway landscaping within five miles of O'Hare Airport, and 10,000 feet of Schaumburg Airport. The USDA will receive 60 percent complete design plans and will review new open water features of the project and landscape features for compliance. The USDA will advise the Illinois Tollway of any design refinements related to minimizing bird and wildlife attraction.

3.4.2 Bensenville Yard

3.4.2.1 Affected Environment

The CP railroad's Bensenville Yard is a Railroad Freight Classification Yard south of O'Hare Airport and is bound by Metra's Milwaukee West line on the north, Franklin Avenue/Green Street on the south, York Road on the west, and Mannheim Road on the east. A Classification Yard is a set of tracks where rail cars are sorted, segregated, or grouped according to type, contents, or destination.

The Bensenville Yard is the CP railroad's largest rail yard in the Chicagoland area and the third largest behind the Belt Railway of Chicago's Clearing Yard and UP railroad's Proviso Yard. The Bensenville Yard is 3.8 miles long and has an area of 376 acres. It processes approximately 60 million gross tons of freight per year (1,476 cars per day). The east part of the rail yard contains 34 classification tracks, an arrivals yard, a departures yard, storage tracks north of the departure yard, an intermodal facility located at the southeast corner with five loading and unloading tracks, and a machine shop for car repair. The western part of the yard contains a local rail yard, a locomotive turntable, and an area leased to the hostler of the yard.

The trains arrive at the arrival tracks from the east, west, and north. The trains are broken down using the "hump" located in the middle of the yard and sent to one of the 34 classification tracks. Trains are built-up on the classification tracks and sent to the storage tracks or the departures tracks, where they are then dispatched from the yard.

The CP railroad anticipates substantial traffic increases from the west to the yard due to its acquisition of the Dakota, Minnesota, and Eastern Railroad.

3.4.2.2 Environmental Consequences

The proposed project would require approximately 30 acres of the Bensenville Yard for location of the roadway. The location of the road was coordinated with CP railroad to avoid long-term operational consequences and to optimize future opportunities. Displacement of two major facilities occurs with the project, including the locomotive turntable and a machine shop. The relocation of these two facilities would allow for a more optimal placement that would add greater efficiency over existing conditions.

In addition, the proposed project would improve expressway access to the yard that currently requires circuitous routes to an interstate connection. The CP railroad anticipates a growing operation at this location because of recent acquisitions, as well as the prospect of improved access to the yard. With the prospect of growing the Bensenville Yard operations, the CP is mindful of its present configurations and the ability to expand in the future.

Coordination with CP railroad has identified numerous concerns and conditions that would require careful planning and implementation. Among the most critical is maintaining full operation of the yard with only minimal disruption or impacts to train operations and speed during the construction of the proposed roadway. These issues are most applicable to the roadway construction that would cross under the west end of the yard in the vicinity of the lead tracks. A preliminary staging plan has been developed to demonstrate that the yard operations would be maintained during all phases of construction.

3.4.2.3 Measures to Minimize Harm and Mitigation

Coordination with the CP railroad has been ongoing for over two years with the primary focus on the development of a construction staging concept for the west end of the Bensenville Yard. The concept shows the sequencing of roadway construction across the yard with the goal of uninterrupted operations of freight movement. Four stages of construction define the concept showing a well-orchestrated series of temporary track alignments and permanent railroad structures that would maintain full operation of the yard during construction and full flexibility for future track arrangements after construction by CP.

Coordination with CP has included the displacement and relocation of the Bensenville Yard turntable and machine shop. Both facilities would be required to be replaced and operational prior to the demolition of the existing facilities.

In addition to minimizing disruptions to railroad operations, specific safety procedures and regulations are required during construction near active railroads. Contractors are responsible for compliance with federal regulations (e.g., Railroad Workplace Safety [49 CFR 214] administered by the Federal Railroad Administration), Occupational Safety and Health Administration (OSHA) standards, as well as requirements specified by the applicable railroad. Prior to construction work on railroad property, right-of-way agreements and authorization must be obtained. Work must be coordinated with the appropriate railroad authority, and arrangements for flagmen may be necessary. Flagmen are employees designated by the railroad to direct or restrict the movement of trains, workers, or other on-track equipment for safety purposes.

Contractor employees would be required to be current on all railroad-related safety training and orientation courses. Contractors would be required to wear personal protective equipment, which includes hard hats, safety glasses, hearing protection, appropriate footwear (e.g., safety-toe boots), and high-visibility vests. Workers should not foul[5] a track, except when necessary to perform their duties. All construction equipment must be in safe

[5] Fouling a track occurs when an individual or equipment is located within four feet of a track, or could be hit by a moving train or on-track equipment.

operating condition and contractors must be properly trained in equipment use. Jobsites must be kept free from health and safety hazards. "Good housekeeping" must be practiced (e.g., material storage and proper disposal of litter, waste, and other debris), and tools, materials, equipment, or other objects should not be placed near the tracks (to avoid incidental contact with trains).

There would be situations when contractors would need to work on bridges over railroads or below grade under rail lines (e.g., at the southwest corner of the OMP, near the intersection of Green Street and York Road) for EO-WB project construction. Contractors must follow the applicable railroad, OSHA, and Federal Railroad Administration requirements for working on bridges and elevated structures, in confined spaces, or in below grade situations. Best practices may include fall protection when on bridges, respirators when in confined spaces or tunnels, and other measures to protect personnel and track structures during excavations. As appropriate, underground utilities shall be located prior to excavating. Hazardous materials, if encountered during construction excavation within railroad right-of-way, should be handled in accordance with applicable rules and regulations pertaining to Special Waste (see subsection 3.16).

3.4.3 Metropolitan Water Reclamation District of Greater Chicago Flood Storage Reservoirs

3.4.3.1 Affected Environment

Touhy Avenue Reservoir is an MWRDGC flood storage reservoir located south of I-90 and west of Mount Prospect Road. The reservoir consists of two deep "cells," working in tandem to help control flood flows along Higgins Creek through the use of spillways, and a pump station that pumps detained water from the cells back to Higgins Creek, after floodwaters have receded. The two cells are hydraulically connected via two relatively large concrete pipes (diameters of 42 inches and 70 inches). The primary cell, which is the initial collector of stormwater at this basin, is located northwest of the secondary cell, which collects overflow from the primary reservoir. The Touhy Avenue runoff is released from the reservoir at a monitored rate toward O'Hare Airport. The MWRDGC coordinates with O'Hare Airport to determine a pumping rate after each flood event; therefore, there are no automatic pump set points at the Touhy Avenue Reservoir.

3.4.3.2 Environmental Consequences

The proposed West Bypass interchange with I-90 would cross the Touhy Avenue Reservoir. Specifically, the proposed improvements would cross the western edge of the secondary cell, displacing 171 acre-feet of capacity.

3.4.3.3 Measures to Minimize Harm and Mitigation

Coordination with MWRDGC has been undertaken to develop a construction phasing plan pertaining to impacts of the reservoir. The phasing plan will include the sequence of construction and the provision of replacement storage capacity that is equal to or greater than the existing capacity at all times during the construction period and after the proposed improvements are implemented. In general, the staging plan includes:

1. Constructing a third cell to provide the replacement capacity lost by constructing the proposed improvements and hydraulically connecting it to the other two cells,

2. Extending the pipe connecting the primary and secondary cell into the portion of the secondary cell that will remain after construction to ensure the secondary cell remains functional during and after construction,

3. Sectioning off the western edge of the secondary cell to be filled so that it does not receive stormwater during construction, and

4. Constructing the proposed improvements in the secondary cell.

The final configuration of the reservoir will consist of three cells, working in tandem to provide capacity equal to or greater than that which existed prior to implementation of the proposed improvements.

3.4.4 WBBM/CBS AM Radio Towers

3.4.4.1 Affected Environment

WBBM/CBS have two AM radio transmission towers located in the northwest quadrant of the Elgin-O'Hare Expressway/I-290 interchange. The main tower is 650 feet tall and is guyed for support. The other auxiliary tower is self supporting at 253 feet tall. WBBM AM (780 kilohertz) transmits from an omni-directional tower that broadcasts on a Class A clear-channel frequency (offering the greatest protection against interference from other radio stations). Radiating out from the center of the tower (every two degrees) are 650-foot-long, 10-gauge copper wires buried approximately two feet underground. The purpose of the wires is to reduce ground losses and improve overall efficiency of the vertical antenna. The wires are fragile, so the area in proximity to the tower is fenced off and is not used.

3.4.4.2 Environmental Consequences

Radio frequency (RF) energy emitted by transmitting antennas is used for telecommunication services (i.e., radio broadcasting). The amount of RF energy exposure depends on several factors, such as the type of station, power transmitted to the antenna, antenna design, antenna height, and distance from the antenna. Energy potentially absorbed by the human body can vary by frequency and intensity of the transmitted signal. Public access to the broadcasting antennas is restricted to minimize exposure to high-level energy fields. Workers are occasionally required to climb antenna structures for maintenance. Both USEPA and OSHA have reported possible exposure to high levels of RF energy if work is performed on an active tower or in areas immediately surrounding a radiating antenna. Therefore, precautions must be taken to minimize exposure to potentially dangerous RF fields. Blocking or shielding from RF electromagnetic radiation is referred to as RF shielding. The amount of reduction depends on the material used, its thickness, and the size of the shield.

These towers have high-voltage (50-kilowatt), electromagnetic fields that could injure workers if encroached during construction, maintenance, or operation of the proposed EO-WB project. The interchange at I-290 and the Elgin-O'Hare Expressway was designed so that it would not encroach into the area around the towers where there are safety concerns. The proposed improvements do require the southeast corner of the property for the southbound I-290 to westbound Elgin-O'Hare Expressway ramp and the westbound Elgin-O'Hare Expressway to southbound I-290 ramp; however, this is outside the area of concern. Nevertheless, certain considerations would need to be made, and specific requirements would need to be followed during and after construction. Safety precautions would be developed with WBBM/CBS to be followed during construction. See subsection 3.4.4.3 for more detailed descriptions of safety precautions required during construction.

If the Illinois Tollway obtains roadway ownership in the vicinity of the antennas and vehicle-mounted transponders are used to collect tolls, there could be interference with the AM radio transmission. The transponders use Radio Frequency Identification (RFID) technology (RFID tagging). Interference could occur if the RFID tag frequency is the same as the AM radio broadcasting frequency.

Interference with the AM RF could also occur with RFID technology associated with social media through mobile devices, such as smart phones. Commercial and consumer products and marketers are evaluating the potential use of RFID technology to reach their market segment via cell phones. It is not clear at this time if this would interfere with the AM radio broadcast as mobile phones in vehicles pass by the AM antenna.

3.4.4.3 Measures to Minimize Harm and Mitigation

Construction personnel for this project are not anticipated to enter the perimeter of the transmitting antennas, which produce the high-energy RF fields. Coordination with WBBM/CBS would take place prior to construction in the vicinity of the antennas, as necessary, to confirm requirements. Potential safety considerations during the construction phase of the project are described below. All requirements may be assembled into a safety manual for use at the construction site.

- When working near the antennas, construction workers must be cognizant of land disturbance and vibration generated by heavy equipment. Because the buried 10-gauge copper wire is fragile, vibration monitoring may be required.
- Dust generated during construction and equipment noise should be minimized by implementing best management practices to reduce potential impacts.
- Safety measures, such as shielding construction equipment from the electromagnetic signals, would be used as necessary during construction to minimize potential for injury. Grounding and shielding requirements may include grounding metal, such as a chain-link fence installed at the roadway right-of-way with a separate electrode. However, because the fence would likely be located outside the radio transmission site, this may not be required.
- During construction, contractor radios may interfere with radio transmission, if the contractor RF is the same as the AM radio broadcasting frequency.
- If microwaves are transmitted from the tower, obstructions to the signal should be avoided. Microwaves work on a line-of-sight technology; therefore, signals would not penetrate through objects.

3.5 Public Facilities and Services

3.5.1 Affected Environment

The project corridor consists of well established communities with a full range of community facilities, including libraries, schools, and medical services. Following is a description of community facilities either located along or servicing the project corridor (see Exhibit 3-10).

3.5.1.1 Medical and Public Safety Services

Sherman Hospital in Elgin (not shown on Exhibit 3-10 because it is outside of the view), Alexian Brothers Medical Center in Elk Grove Village, and Kindred Hospital of Northlake are the hospitals located nearest the project corridor. No medical facility is located within the project corridor.

A number of the communities have mutual aid agreements with nearby communities to provide reciprocal emergency services when necessary. Mutual aid agreements exist between Elk Grove Village and Itasca for I-290; between Elk Grove Village and Roselle and between Elk Grove Village and Itasca for the Elgin-O'Hare Expressway; and between Bensenville, Franklin Park, and Leyden Township for the Bensenville Yard.

Hanover Park, Schaumburg, Roselle, Elk Grove Village, Franklin Park, Elmhurst, Des Plaines, and Mount Prospect have municipal fire departments to respond to emergencies within municipal limits. The Itasca Fire Protection District is a separate governmental entity that provides emergency services to portions of Itasca and Wood Dale. The Wood Dale, Bensenville, and Northlake Fire Protection Districts are also separate governmental bodies serving residents in their respective municipalities. Fire departments along the project corridor consider population, density, land uses, and traffic flow in locating their fire stations. Some fire departments have multiple stations and service areas. Routing emergency vehicles across railroad tracks is avoided where possible, and having alternative routes available when primary routes are temporarily out of service is preferred. Because time is critical in the delivery of medical attention for patient survival, fire departments strive to meet the National Fire Protection Association's 1710 Standard that recommends six minutes or less response time to an incident.

All core communities have municipal police departments that provide public safety for their respective communities. Police response along freeways and tollways is provided by the Illinois State Police. On occasion, the State Police may request additional freeway/tollway response from various local agencies. Police protection services strive for a response time of three minutes.

3.5.1.2 Schools

The project area is served by 10 public school districts. Table 3-18 lists the communities within the project corridor that are served by these school districts and what types of schools serve project corridor residents. Two colleges (DeVry University and Robert Morris University) are located along the project corridor. A public intermediate school (Elmer J. Franzen Intermediate School), a parochial school (St. John Evangelical Lutheran Preschool), one private school (Metro Prep/Laureate Day School), and a private daycare/preschool (Kindercare) are located nearby.

TABLE 3-18
School Districts Serving the Project Corridor

Name of School District	School Type Included	Project Corridor Communities Served
School District 54	Elementary and Junior High Schools	Elk Grove Village, Roselle, Schaumburg, Hanover Park
Township High School District 211	High Schools	Elk Grove Village, Roselle, Schaumburg, Hanover Park
Lake Park High School District 108	High School	Hanover Park, Roselle, Itasca
Wood Dale District 7	Elementary and Junior High Schools	Itasca, Wood Dale, Elk Grove Village, Bensenville
Itasca School District 10	Primary, Intermediate and Middle Schools	Itasca, Wood Dale
School District 100	High School	Itasca, Elk Grove Village, Wood Dale, Bensenville
Township High School District 214	High Schools	Mount Prospect, Des Plaines, Elk Grove Village
Community Consolidated School District 59	Elementary and Junior High Schools; Family Center for Learning	Mount Prospect, Des Plaines, Elk Grove Village
Elmhurst Community Unit School District 205	Elementary, Middle, and High Schools	Elmhurst, Bensenville
Bensenville School District 2	Elementary and Middle Schools	Bensenville

3.5.1.3 Religious Institutions

Two religious institutions are located within the project corridor—Masjid-al-huda and the Christian Meditation Center in Schaumburg. Three religious institutions are located nearby—St. John Evangelical Lutheran Church and Kingdom Hall in Schaumburg, and the Bethel Protestant Reformed Church in Roselle.

3.5.1.4 Cemeteries

Two cemeteries are located along the project corridor. They include Mount Emblem Cemetery and Arlington Cemetery in Elmhurst. Two cemeteries are located nearby—St. John Evangelical Lutheran Church Cemetery in Schaumburg and Elm Lawn Cemetery in Elmhurst.

3.5.1.5 Utilities

The project corridor is in a maturely developed area and, therefore, has a dense utility network. Utilities within the project area include electricity, natural gas, oil and petroleum, water, wastewater and stormwater collection, and telecommunications. Information obtained from utility providers is discussed and includes location, utility owner/operator, size, and type of material for large transmission mains. Field surveys to collect more accurate locational information were conducted in key locations throughout the corridor where structures are proposed and subsurface activity during construction is likely. A more detailed investigation would likely be conducted during geometric plan development and during the final design phase. Utility companies would also have the opportunity to do their own investigations to locate utilities that are along the project corridor before and during construction. Specific utility conflicts are described in subsection 3.5.2.3.

3.5.1.6 Other Public Facilities

Three other public facilities are located within the project area. A City of Chicago canine training facility is located in Des Plaines, the Elk Grove Detention Pond is located in Elk Grove Village, and the Majewski Athletic Complex is located in Mount Prospect.

3.5.2 Environmental Consequences

The proposed improvements would not displace any medical or public safety facilities, schools, religious institutions or encroach on any cemeteries. Two religious institutions, the canine training facility, Majewski Athletic Complex, and Elk Grove Detention Pond would be affected (see subsection 3.5.2.4). School bus routes are developed annually in advance of the school year and, therefore, would take into consideration any permanent roadway modifications resulting from the proposed improvements. Emergency response services would benefit from the implementation of the improvements. Utility conflicts would be present during construction. Coordination would occur to ensure the least impact to emergency response and utility services during and after construction.

3.5.2.1 Emergency Response Services

Both the Elgin O'Hare and West Bypass corridors introduce new challenges for emergency response. Access to and from, as well as across, the improved Elgin O'Hare corridor is limited. Cross roads are provided, but access to them is through a discontinuous system of frontage roads, which in itself presents additional access challenges. The West Bypass corridor is also a limited-access facility with limited access across the corridor. Although one-way frontage roads are not present along the West Bypass corridor, the existing geography is riddled with railroad mainline tracks, rail spur lines, and one-way streets. Access in, out, and through the area is further limited by O'Hare Airport, I-294, and the Bensenville Yard, which limits access to these areas.

3.5.2.2 Religious Institutions

A sliver of undeveloped property adjacent to the roadway would be required from two religious institutions, the Masjid-al-huda and the Christian Meditation Center, to accommodate the lengthening of the right turn lane along Irving Park Road. Approximately 627 square feet would be required from the Masjid-al-huda, and approximately 351 square feet would be required from the Christian Mediation Center.

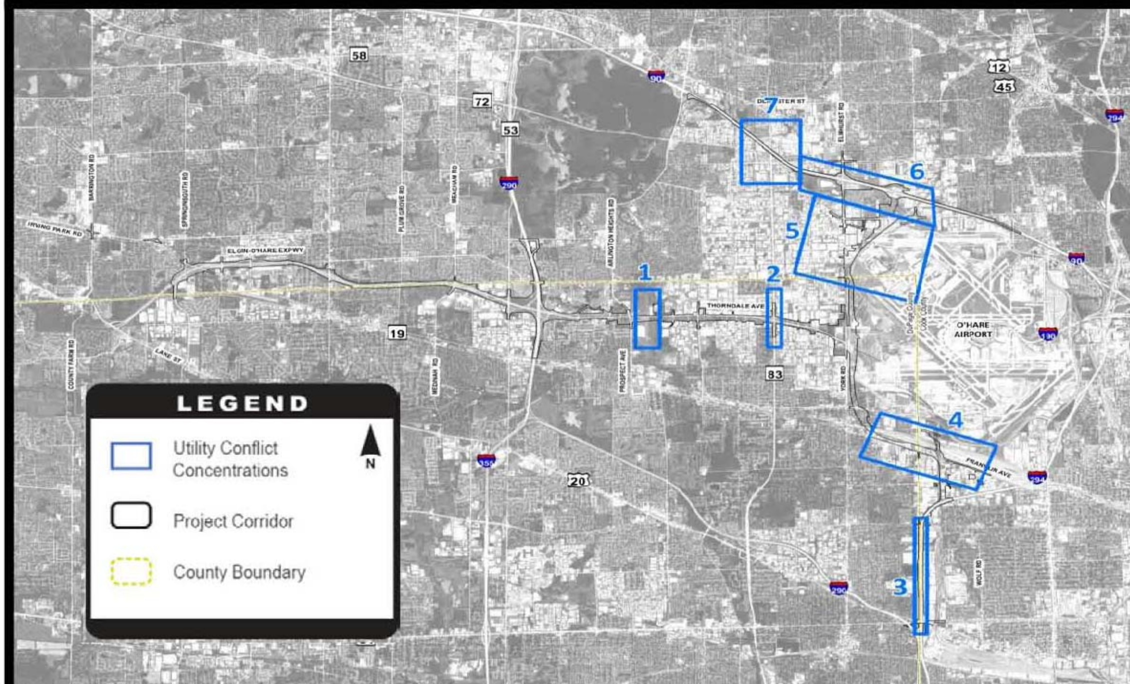
3.5.2.3 Utility Conflicts

Construction will require relocation or adjustment of utility lines or facilities. Because relocations of many utilities are required within the project corridor, a long lead time for coordinating and negotiating the relocation would be necessary to avoid compromising the project construction schedule.

Individual utility providers were contacted early to identify specific utility locations and would be contacted and would have an opportunity to conduct their own investigation to identify horizontal and vertical conflicts and to identify any disruptions of service or operational equipment that the proposed EO-WB improvements may have on their facilities before, during, and after construction. Coordination will occur with utility providers during the engineering and site relocation of displaced utilities.

There are seven potential conflict areas. These are discussed in the following subsections and depicted in Figure 3-7.

FIGURE 3-7
POTENTIAL UTILITY CONFLICT AREAS



Source: Aerial Photography from AirPhoto USA, 2008.

Section 1 – Located near Salt Creek at the Elgin O'Hare Corridor

This area has a number of utilities oriented in a north-south direction along a utility corridor that is immediately west of Salt Creek and spans Thorndale Avenue. Utilities located in this section include the Commonwealth Edison Itasca substation located between Prospect Avenue and Mittel Drive, south of the Elgin O'Hare corridor, with a number of electric transmission power lines tied to the substation, which then span Thorndale Avenue. Nicor has a subsurface 36-inch natural gas transmission main in this section.

Section 2 – Located near IL 83 at the Elgin O'Hare Corridor

This area has a number of utilities located parallel to IL 83 on both the east and west sides of the roadway. This corridor is unique in that a number of large transmission mains belong to pipeline companies that serve O'Hare Airport. Two pipelines, owned by West Shore Oil, are located to the east of IL 83. In addition, two pipelines (one pipeline owned by West Shore Oil and the other is a transmission main [Manhattan North-O'Hare main] owned by British Petroleum) are both located to the west of IL 83.

Section 3 – Located between Grand Avenue and IL 64 near I-294

This area has a number of utilities located parallel to I-294. Preliminary review indicates that electric, water, gas, telephone, oil, and fiber optic utilities are located in this section. There are two electrical substations, one located approximately 0.5 mile south of Grand Avenue near County Line Road and one near Northwest Avenue, with electric transmission lines spanning County Line Road, I-294, and Northwest Avenue in a southwest to northeast orientation.

A water main, oriented north-south along Northwest Avenue and parallel to I-294, connects to Northlake's 500,000-gallon elevated water tower. The EO-WB project design would not require relocation of the water tower.

Section 4 – Located near the Franklin Avenue and West Bypass Corridor

This is another area with many closely situated utilities near EO-WB project areas. Nicor has a gas transmission main on York Road that angles onto Franklin Avenue and then angles to Wolf Road where it T's into a main that runs along IL 64. Ties to Nicor's distribution system are located on Franklin Avenue near County Line Road and Taft Avenue. Additionally, the Magellan Oil pipeline runs along Franklin Avenue to a tank farm located east of I-294 in Franklin Park, and a number of electrical lines that supply power to O'Hare Airport are parallel to the UP railroad over the Bensenville Yard.

Section 5 – Located near IL 72, Elmhurst Road, and the West Bypass Corridor

The utilities located in this section are densely packed with many fiber optic cables and natural gas pipelines located near IL 72. Because the EO-WB project has proposed grade-separations at IL 72/West Bypass and Higgins Creek/UP railroad, coordination and relocations of a number of utilities would be required. In addition, a British Petroleum tank farm is located at the corner of Elmhurst Road and IL 72. These tanks provide O'Hare Airport with jet fuel from British Petroleum's Manhattan North–O'Hare transmission main. The main also extends south to the tank farm located on O'Hare Airport property east of Carmen Drive and immediately south of Coyle Avenue. This transmission main then extends west along Devon Avenue to IL 83 and south to the Village of Manhattan.

Also in this section, flood control along Higgins Creek is provided by the MWRDGC Touhy Avenue Reservoir located between I-90 and IL 72 just west of Mount Prospect Road. The reservoir consists of two deep cells, working in tandem to hold floodwater and runoff from Higgins Creek. Following an event, spillways and pump stations pump water from the cells back to Higgins Creek. Cell 1 and Cell 2 are hydraulically connected to the Touhy Avenue Reservoir by two concrete pipelines (one 42 inches in diameter and one 72 inches in diameter).

Section 6 – Located between Elmhurst Road and Lee Street near the West Bypass Corridor and I-90 System Interchange

This section is located between Elmhurst Road and Lee Street along I-90. There are four Joint Action Water Agency transmission mains (54 inches to 90 inches in diameter) located near I-90. The Mount Prospect Transmission Main extends from the Village on Elmhurst Road to Touhy Avenue, where it connects to the Elk Grove Transmission Main and extends west along Touhy Avenue to Barrington Road in Hanover Park. The O'Hare Transmission Main begins at the ground storage reservoir and the main pumping station on the east side of O'Hare Airport. The pipeline extends along the south side of I-90 to the Northwest

Transmission Main, which continues west along I-90 past IL 59. Delivery points to the local system are located at Elmhurst Road and Oakton Street, at Touhy Avenue and Busse Road, and at I-90 and Arlington Heights Road.

Both the Mount Prospect Transmission Main and a 72-inch water main cross I-90 near Elmhurst Road and near Wolf Road. A number of fiber optic cables are along I-90, serving the Illinois Tollway ITS system. A 36-inch Natural Gas Pipeline Company's transmission main connects to Nicor's distribution system south of the MWRDGC O'Hare Chicago Underflow Plan (CUP) reservoir and west of Elmhurst Road near Nicor's regulating station on Elmhurst Road. Kinder Morgan has a 30-inch pipeline that runs along this same corridor south of the MWRDGC O'Hare CUP reservoir. Buckeye Partners pipeline crosses I-90 just west of Elmhurst Road and connects to the tank farm north of I-90 just east of Busse Road; the pipeline continues to O'Hare Airport's tank farm. There is also a 20-foot-deep MWRDGC tunnel sewer (Upper Des Plaines) that extends from Mount Prospect to the MWRDGC O'Hare CUP reservoir along Elmhurst Road, and it connects to the Kirie Water Reclamation Plant at Oakton Street off Elmhurst Road.

Section 7 – Located near Busse Road and I-90

This section has a number of utilities oriented in a north-south direction along a utility corridor just west of Busse Road, and the corridor crosses I-90. Preliminary review indicates that there are electric transmission lines and Nicor's 36-inch transmission main (which continues to the utility corridor near Salt Creek and Thorndale Avenue), as well as Nicor's Transmission Station 129. The MWRDGC Upper Des Plaines deep tunnel sewer extends west from Elmhurst Road on Oakton Street and crosses I-90 just east of IL 83. The MWRDGC's 18-inch O'Hare-Egan solids pipeline (sludge) is oriented east-west and located south of the MWRDGC CUP reservoir. The Joint Action Water Agency transmission mains located in Section 6, above, are also located in this section.

3.5.2.4 Other Public Facilities

City of Chicago Canine Training Facility

The City of Chicago canine training facility would be displaced by the north leg of the West Bypass corridor. Communication has occurred with City of Chicago representatives, and relocation options for the canine training facility are available within close proximity to the project corridor.

Majewski Athletic Complex

A strip, approximately 1.8 acres in area, would be required from the south edge of the Majewski Athletic Complex. Due to severe constraints at this location, other options are not practical without seriously compromising the LOS along this section of road. The land required from the complex is grassland; thus, no amenities would be affected. Access to the Majewski Athletic Complex would not change at the main entrance at Mount Prospect Road, but access from Elmhurst Road would be restricted to right-in and right-out only.

Elk Grove Detention Pond

The proposed improvements would displace approximately 4 acre-feet (approximately half) of the Elk Grove Detention Pond. The pond is located along the north leg of the proposed West Bypass. Placement of the proposed alignment is limited by horizontal and vertical restrictions. The proposed location minimizes impacts to the industrial area on the west side of Elmhurst Road and avoids impacts to the CP/UP railroad tracks and O'Hare Airport's tank farm on the east side of the alignment. If the alignment were shifted to the west, additional structures (office buildings and industrial properties) would likely be displaced, and access to some remaining structures would be compromised or eliminated. Placement of the alignment to the east is impractical due to the active railroad tracks and the O'Hare Airport's tank farm. All detention lost by the removal of part of the facility will be mitigated by augmenting the remainder of the detention pond with additional detention capacity, as well as implementing new detention facilities in the vicinity of the pond.

3.5.3 Construction Impacts

Impacts to emergency response activities and routes from the addition of the proposed EO-WB project improvements are anticipated, with the greatest challenge centered on maintaining local access during and after construction. During construction, rerouting of emergency response vehicles is problematic in many areas due to the abundance of active railroad tracks, one-way streets, limited access to tollways and freeways, and an abundance of fragmented sections of arterial roadways that would impede cross-regional travel. Detour routes would be developed with local emergency response providers to minimize the impacts on response times and local access. Furthermore, because there is a potential for onsite accidents or incidents, emergency responders and police security would require access to construction sites and staging areas to patrol the areas, discouraging theft, vandalism, and trespassing or to provide emergency services onsite.

Similarly, school bus routes may be affected during construction; however, it would likely be minimal because there is not an abundance of residences along the proposed improvements. Communication with school districts to apprise them of construction-related activities and road closures is critical for operations to remain intact.

3.5.4 Measures to Minimize Harm and Mitigation

Minimization and mitigation measures for impacts to emergency response services were evaluated. Emergency response department representatives indicated that local access must be maintained before, during, and after construction, and the extension of response times must be minimized. There are four means to do this:

1. Emergency Response Plans
2. Mutual Aid Agreements
3. Construction Activities Sequencing
4. Emergency Access Routes

To mitigate impacts, an Emergency Response Plan would be developed by the Illinois Tollway and emergency providers; coordination would be undertaken with emergency providers to develop acceptable response times and routes. The plan would involve organizing Mutual Aid Agreements between all emergency responders in the project area. It would identify which resources are available and would have contingency plans in place to make up for any deficiencies. Whatever the situation, people, equipment, facilities, and materials needed for emergency response would be identified, and where they would come from must be determined in advance. Moreover, the people supplying these resources must be made aware of their role in the plan, a key to effective emergency response being a communications system that can relay accurate information quickly. As a result, reliable communication equipment must be used, procedures developed, personnel trained, and a backup system in place. Accordingly, the Emergency Response Plan would identify a list of site personnel with cellular phones, email addresses, and/or two-way radios.

Another means to mitigate impacts is to sequence construction activities such as road or ramp closures, so that local access is maintained at all times. However, in areas where sequencing of work cannot be instituted, temporary access routes for emergency routing during construction activities may be required. These locations would be identified with input from emergency responders in the area.

3.6 Agriculture

The project corridor does not have any property with agricultural use. Further, the project corridor is located within the Chicago, Illinois-Indiana urbanized area, as defined by the U.S. Bureau of the Census (U.S. Bureau of the Census, 2000[6]). Per the cooperative agreements between IDOT and the IDOA, coordination with IDOA and the Natural Resource Conservation Service (NRCS) is not required.

3.7 Cultural Resources

Cultural resources include archaeological sites and standing structures with architectural integrity that adequately represent American history and culture. The National Historic Preservation Act and its implementing regulations require that federal agencies consider the impact that their actions have on such resources and allow the Advisory Council on Historic Preservation an opportunity to comment on such undertakings. Section 4(f) of the Department of Transportation Act of 1966 also protects historic properties.

No cultural resources subject to the provisions of Section 106 of the National Historic Preservation Act of 1966, as amended, or of Section 4(f) of the Department of Transportation Act of 1966 were found in the project corridor. Where field surveys were conducted, the Illinois State Historic Preservation Officer (SHPO) has concurred in this finding (see Appendix B). Elsewhere, the professional IDOT cultural resources staff, under the provisions of an agreement between the Illinois SHPO, FHWA, and IDOT, made the determination without field surveys (see Appendix B).

Each of the eight Tribal governments (see subsection 5.1.3 of the Tier One Final EIS for the list) with an interest in Cook and DuPage Counties was invited to be a participating agency and Section 106 consulting party. The Peoria Tribe of Indians of Oklahoma was the only respondent (see Appendix B). The Peoria indicated they are unaware of any link between Indian Religious Sites and the proposed project and have no objection to construction of the proposed project. According to SAFETEA-LU Section 6002, Tribal agencies that did not respond are considered to have declined the invitation to be NEPA participating agencies. However, they will be contacted immediately if human remains are uncovered during construction.

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[6] Urbanized areas determined for the 2000 Census is the most recent available information. The urbanized areas have not yet been published for the 2010 Census.

3.8 Noise

3.8.1 Affected Environment

Traffic on the proposed alignment would affect noise levels in areas adjacent to the proposed alignment. This section describes existing noise levels in those areas and the likely future increase in noise levels. The noise analysis contrasted existing conditions, predicted design year (2040, Build and No-Build) noise levels, and the FHWA's Noise Abatement Criteria (NAC) to determine whether noise abatement measures should be considered. A noise abatement analysis was conducted at impacted receptors to determine if feasible and reasonable noise abatement measures could be developed.

3.8.1.1 Noise Abatement Criteria

The criteria used to evaluate noise impacts are contained in Title 23 CFR 772, *Procedures for Abatement of Highway Traffic Noise and Construction Noise*, and the IDOT *Bureau of Design and Environment Manual*, Chapter 26, "Noise Analysis" (IDOT, 2011). The Activity Category B and C NAC of 67 A-weighted sound level-decibels (dB[A]) in the *Procedures for Abatement of Highway Traffic Noise and Construction Noise*, apply to residences, churches, schools, recreation areas, and similar activities. Other developed land (e.g., hotels/motels or other business areas) is included in Activity Category E, with a NAC of 72 dB(A). Primary consideration is given to exterior areas where frequent human use occurs. Noise levels are determined under worst case traffic noise conditions.

Table 3-19 shows the FHWA NAC for specific land uses. The FHWA considers a traffic noise impact to occur if predicted traffic noise levels approach or exceed the NAC, or if predicted future traffic noise levels are substantially higher than existing levels. The IDOT defines "approach" as noise levels within 1 dB(A) of NAC. For Activity Categories B and C, this is equal to 66 dB(A). For Activity Category E, this is equal to 71 dB(A).

TABLE 3-19
Noise Abatement Criteria
Hourly A-Weighted Sound Level-decibels (dB[A])

Activity Category	L_{eq}(h) [a] NAC	Evaluation Location	Activity Description
A	57	Exterior	Lands on which serenity and quiet are of extraordinary significance and serve an important public need, and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B	67	Exterior	Residential.
C	67	Exterior	Active sport areas, amphitheaters, auditoriums, campgrounds, cemeteries, daycare centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreation areas, Section 4(f) sites, schools, television studios, trails, and trail crossings.
D	52	Interior	Auditoriums, daycare centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios.

TABLE 3-19
Noise Abatement Criteria
Hourly A-Weighted Sound Level-decibels (dB[A])

Activity Category	$L_{eq}(h)$ [a] NAC	Evaluation Location	Activity Description
E	72	Exterior	Hotels, motels, offices, restaurants/bars, and other developed lands, properties or activities not included in A-D or F.
F	---[b]	---[b]	Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical), and warehousing.
G	---[c]	---[c]	Undeveloped lands that are not permitted.

Note: The NAC are noise impact thresholds for considering abatement. (Abatement must be considered when predicted traffic noise levels for the design year approach [i.e., within 1 decibel] or exceed the NAC, or when the predicted traffic noise levels are substantially higher [i.e., more than 14 decibels greater] than the existing noise level.) The NAC are not attenuation design criteria or targets. The goal of noise abatement measures is to achieve the feasibility noise reduction criteria and the noise reduction design goal. The reductions may or may not result in design year noise levels at or below the NAC.

[a] L_{eq} = Equivalent sound level
[b] No noise analysis is required for these locations.
[c] There is no NAC for undeveloped lands.

The IDOT defines "substantially higher" as an increase of greater than 14 dB(A) over existing noise level conditions. Consequently, noise abatement must be considered if predicted design year noise levels result in an increase of greater than 14 dB(A) over existing noise levels. The NAC are noise impact thresholds for determining when consideration of noise abatement measures could be warranted. The NAC are not noise abatement design criteria or targets.

3.8.1.2 Field Measurements

Noise level measurements were conducted at 18 representative locations throughout the project corridor. The noise monitoring locations were selected based on their representativeness of Common Noise Environments (CNEs) within the project limits. CNEs are defined as a grouping of receptors of the same type and experience similar exposure to noise levels, topography, and traffic characteristics. The purpose of the noise level measurements was to validate the use of the Traffic Noise Model (TNM) in predicting traffic noise exposure within the study area.

Modeled noise levels for all but three receptors were within 3 dB(A) of those measured. Such agreement between measured and modeled noise levels indicates that the TNM may be used to accurately calculate noise exposure at these locations. Measured and modeled noise levels differ by more than 3-dB(A) at the three locations because of extensive aircraft activity at the O'Hare Airport during the measurement period. In each case, the monitored noise levels were higher than the modeled levels, indicating excessive background noise during the measurement period.

3.8.1.3 Existing Noise Environment

The study area is an urban highway and arterial corridor, surrounded by residential, commercial, and industrial land uses, with O'Hare Airport at the eastern end of the study area. The principal noise sources are vehicular traffic and frequent overhead commercial aircraft.

Using the year 2010 traffic data, existing condition noise levels were predicted at noise-sensitive locations within the project area. Forty-four CNEs, organized into six sections (A-F), were used to identify worst case noise levels at representative receptors in the project area. Table 3-20 lists the worst case noise level at each CNE.

Under existing traffic noise conditions, 21 of the 44 CNEs approach or exceed the NAC, with existing representative noise levels ranging from 50 to 77 dB(A). Existing traffic noise levels are the loudest along I-90 and near the Elgin-O'Hare Expressway/I-290 interchange. Existing noise barriers in the corridor along the Elgin-O'Hare Expressway suppress traffic noise levels for many residences in CNE Sections B and C. CNE Section D, with a similar noise environment as CNE Sections B and C, experiences notably louder traffic noise levels at residences because there is not an existing noise barrier constructed in this section.

The LOS C traffic volumes, which consist of the highest traffic volumes under free flow conditions and typically represent the worst-case noise hour, were used in the existing condition analysis, resulting in the worst-case noise condition for the existing facility. Peak-hour traffic under the 2040 No-Build Alternative would be severely congested, resulting in reduced speeds and lower noise levels. Therefore, noise levels under the existing condition are considered to represent the worst case noise environment for the No-Build Alternative as well.

Appendix H presents existing and predicted (Build and No-Build) condition noise levels. The CNEs and receptor locations are indicated on Exhibits 3-11A to 3-11O.

3.8.2 Environmental Consequences

Traffic noise impacts were evaluated for sensitive receptors such as residences and public park land as well as wildlife resources. This section focuses on traffic noise impacts to sensitive receptors. The discussion regarding traffic noise impacts to wildlife resources can be found in subsection 3.14.2.3. Peak-hour noise levels under the Build Alternative are predicted to approach or exceed the NAC at 24 CNEs, compared to 21 CNEs under the existing condition. Noise levels range from 50 to 77 dB(A) under the Build Alternative, with increases above existing conditions of up to 14 dB(A), as shown in Table 3-20. Impacted locations consist primarily of residences (single-family residences and multi-family residences), but locations also include public park land. Attenuation, provided by existing noise barriers, was included in the analysis.

CNE Section A remains relatively unchanged between existing and the Build Alternative, and low increases in traffic volumes result in minor increases in noise levels. The largest increase in traffic noise levels occurs in CNE Sections B and C. Predicted noise levels remain the highest along I-90 and at the Elgin-O'Hare Expressway/I-290 interchange in CNE Sections D and E.

The difference in noise levels between existing and the Build Alternative is a result of several factors such as shifts in the alignment from the existing to the proposed facility (i.e., a shift to one side or another of the bypass alignment), additional travel lanes, changes in traffic volumes between the existing and design year, and shifts in the roadway elevation.

TABLE 3-20
Common Noise Environments

CNE	Representative Receptor (Type)	NAC Approach Threshold (dB[A])	Existing (dB[A])	No-Build (db[A])	Build (dB[A])	Increase Above Existing	Impact
A1	ANC-04 (park)	66	61	61	64	+3	No
A2	ANB-07 (residence)	66	70	70	69	-1	Yes
A3	ASC-01 (park)	66	67	67	68	+1	Yes
A4	ASB-13 (residence)	66	63	63	61	-2	No
A5	ASB-01 (residence)	66	58	58	56	-2	No
A6	ANB-48 (residence)	66	69	69	68	-1	Yes
B1	BNB-08 (residence)	66	59	59	70	+11	Yes
B2	BSB-16 (residence)	66	67	67	70	+3	Yes
C1	CNE-01 (restaurant)	71	67[a]	67[a]	68	+1	No
C2	CNB-51 (residence)	66	59[a]	59[a]	73	+14	Yes
C3	CSE-01 (restaurant)	71	64[a]	64[a]	64	0	No
C4	CSB-08 (residence)	66	69[a]	69[a]	75	+6	Yes
C5	CNB-75 (residence)	66	61	61	69	+8	Yes
C6	CNE-02 (office)	71	66	66	69	+3	No
C7	CNB-98 (residence)	66	73	73	73	0	Yes
D1	DNB-07 (residence)	66	71	71	73	+2	Yes
D2	DNE-01 (office)	71	75	75	77	+2	Yes
D3	DSB-03 (residence)	66	75	75	75	+0	Yes
D4	DSE-01 (office)	71	68	68	66	-2	No
D5	DSB-56 (residence)	66	65	65	65	0	No
D6	DNE-10 (office)	71	68	68	68	0	No
D7	DSE-02 (office)	71	60	60	69	+9	No
D8	DNC-07 (recreation)	66	67	67	69	+2	Yes
E1	EE-04 (office)	71	65	65	67	+2	No
E2	EB-26 (residence)	66	77	77	77	+0	Yes
E3	EE-05 (office)	71	68	68	72	+4	Yes
E4	EE-10 (hotel)	71	66	66	67	+1	No
E5	EB-31 (residence)	66	69	69	69	0	Yes

TABLE 3-20
Common Noise Environments

CNE	Representative Receptor (Type)	NAC Approach Threshold (dB[A])	Existing (dB[A])	No-Build (db[A])	Build (dB[A])	Increase Above Existing	Impact
E6	EC-04 (recording studio)	66	67	67	67	0	Yes
E7	EE-13 (hotel)	71	73	73	74	+1	Yes
E8	EC-03 (park)	66	73	73	75	+2	Yes
E9	EB-46 (residence)	66	70	70	71	+1	Yes
E10	EB-59 (residence)	66	67	67	69	+2	Yes
E11	EB-67 (residence)	66	67	67	67	0	Yes
E12	EE-35 (restaurant)	71	68	68	68	0	No
E13	EE-32 (office)	71	67	67	66	-1	No
E14	EB-82 (residence)	66	69	69	68	-1	Yes
E15	EE-34 (restaurant)	71	67	67	65	-2	No
F1	FE-01 (office)	71	52	52	62	+10	No
F2	FB-06 (residence)	66	60	60	61	+1	No
F3	FB-14 (residence)	66	69	69	70	+1	Yes
F4	FC-01 (cemetery)	66	69	69	65	-4	No
F5	FB-27 (residence)	66	66	66	65	-1	No
F6	FC-04 (cemetery)	66	64	64	64	0	No

[a] Attenuation, provided by existing noise barriers, was included in the analysis.

3.8.3 Measures to Minimize Harm and Mitigation

3.8.3.1 Evaluation of Abatement Measures

The FHWA regulations indicate that noise abatement should be considered when design year future predicted traffic noise levels approach or exceed the NAC, or when design year predicted traffic noise levels substantially exceed the existing condition noise levels. None of the sites evaluated is expected to experience substantial increases in noise levels. However, 24 CNEs are expected to experience noise levels that approach or exceed the NAC. As a result, noise abatement measures were evaluated for those locations. As outlined in FHWA's guidelines, such measures may include noise barriers, TSM measures, alignment modifications, property acquisitions, and land use controls.

Of the noise abatement measures mentioned, the noise barrier is the most practical, reasonable, and effective abatement measure. As such, the noise barrier is the measure evaluated for this project.

3.8.3.2 Noise Barrier Analysis

Noise barriers reduce noise levels by blocking the sound path between a roadway and noise-sensitive site. To be effective in reducing traffic noise, a noise barrier must have certain characteristics. The barrier must be long (theoretically about four times the distance from the receptor to the noise wall), continuous (with no intermittent openings), and high enough to provide the necessary reduction in noise levels. According to IDOT's noise policy, for a barrier to be implemented, it must be considered feasible and reasonable and meet the following minimum criteria described below.

Feasibility

Feasibility is based on the minimum required noise reduction and constructability.

- It must provide a minimum insertion loss (noise reduction) of 5 dB(A) for at least one *impacted* receptor.
- The barrier must be compatible with safety, drainage, and utility considerations.

Reasonableness

The reasonableness evaluation is based on the noise reduction design goal, cost-effectiveness, and the viewpoints of the benefited receptors.

- The noise barrier must provide a minimum insertion loss of 8 dB(A) for at least one *benefited* receptor.
- The cost to construct the barrier should not exceed $37,000 per benefited receptor based on adjustment factors per IDOT policy. The IDOT noise policy unit cost of $25 per square feet was used to calculate barrier cost. For the purposes of this determination, benefited receptors are those that would experience a reduction of 5 dB(A) or more as a result of the noise barrier. The base cost for allowable noise abatement is $24,000 per benefited receptor, but may be adjusted based on three factors: the absolute noise level, the incremental increase between existing and build levels, and the date of development compared to when the highway was built (see Table 3-21). The base cost may be adjusted to a maximum allowable limit of $37,000 per benefited receptor.
- If the barrier is determined to meet the design goal and be cost-effective, the viewpoints of benefited receptors must be solicited to determine the desire for building the noise barrier.

TABLE 3-21
Cost per Benefited Receptor Adjustment Factors

Absolute Noise Level Consideration	
Predicted Build Noise Level Before Noise Abatement	**Dollars Added to Base Value Cost per Benefited Receptor**
Less than 70 dB(A)	$0
70 to 74 dB(A)	$1,000
75 to 79 dB(A)	$2,000
80 dB(A) or greater	$4,000

TABLE 3-21
Cost per Benefited Receptor Adjustment Factors

Increase in Noise Level Consideration	
Incremental Increase in Noise Level Between the Existing Noise Level and the Predicted Build Noise Level Before Noise Abatement	**Dollars Added to Base Value Cost per Benefited Receptor**
Less than 5 dB(A)	$0
5 to 9 dB(A)	$1,000
10 to 14 dB(A)	$2,000
15 dB(A) or greater	$4,000
New Alignment/Construction Date Consideration	
Project is on new alignment or the receptor existed prior to the original construction of the highway	**Dollars Added to Base Value Cost per Benefited Receptor**
No for both	$0
Yes for either	$5,000

Source: IDOT, 2011.

The TNM was used to determine the noise level reduction provided by various barrier heights along the proposed project. The program calculates barrier insertion loss by accounting for such variables as distance from source to barrier, distance from barrier to receptor, source and receptor elevations, and barrier height. Per standard assumptions, effective acoustical heights of automobiles, medium trucks and heavy trucks are at roadway surface, two and eight feet above the road, respectively. Receptor height is assumed to be about five feet above the ground.

Barriers were not evaluated at the following representative receptors: ANB-02 (CNE A2), EE-14 to 31 (CNE E7), and FB-11 to 18 (CNE F3). Noise barriers at these locations were determined to not be feasible due to design constraints (i.e., number of driveways that would require a break in the barrier for access and sight distance limitations).

Preliminary noise barrier locations were presented in the Tier Two Draft EIS for public review and input (see subsection 3.8.3.2 of the Tier Two Draft EIS). Some residents affected by noise barriers requested shifts in the location of proposed noise barriers for various aesthetic and personal reasons. Barrier shifts were also warranted with refinements in the roadway design and accommodation of drainage features. The noise barriers analysis below reflects the modifications to the locations based on public input and design advancements since the Tier Two Draft EIS.

The analysis found that barriers would be feasible and meet the reasonableness noise reduction design goal at all locations, with the exception of Barrier E5. Barrier E5 would not meet the reasonableness design goal, as an 8-dB(A) reduction could not be achieved by this barrier. The barrier would be located on the right-of-way line at this location. The residences in this area are located back from the roadway a substantial distance, limiting the ability of the barrier to effectively attenuate noise levels. The remaining 20 barriers were further evaluated for cost-effectiveness. Nine of the remaining 20 barriers were determined to also meet the reasonableness criteria on an individual cost-effectiveness basis.

Each barrier is summarized in Table 3-22 and shown on Exhibits 3-11A to 3-11O.

TABLE 3-22
Summary of Noise Mitigation: Barrier Descriptions

Barrier	Benefited Receptors	Height (feet)	Length (feet)	Construction Cost	Noise Reduction Potential (dB[A])	Estimated Build Cost Per Benefited Receptor	Allowable Cost Per Benefited Receptor	Likely to be Implemented if Desired by Benefited Receptor	If no, reason why?
A1 (residences, church)	2	19-25	1,824	$1,115,350	5-8	$557,675	$24,000	No	Exceeds allowable cost
A2 (ball field)	1	9	500	$242,300	8	$242,300	$24,000	No	Exceeds allowable cost
A3 (residence)	0	25	333	$8,325	< 5	---[b]	---[b]	No	Not Feasible
B1 (residence, church)	7	9-17	2,510	$904,725	5-8	$129,246	$27,000	No	Exceeds allowable cost
B2 (residences)	18	11-15	2,102	$623,175	5-8	$34,620	$25,000	No	Exceeds allowable cost
C1 (residences, park)	322	17-23	9,312	$4,540,700	5-15	$14,101	$27,000	Yes	NA
C2 (residences)	40	11-19	2,174	$906,440	5-10	$22,661	$24,000	Yes	NA
C3 (residences)	209	13-17	6,602	$2,641,750	5-13	$12,640	$27,000	Yes	NA
C4 (residences)	171	11-21	3,521	$1,309,075	5-12	$7,655	$25,000	Yes	NA
D1 (residences)	113	9-25	3491	$1,859,650	5-13	$16,457	$25,000	Yes	NA
D2 (offices)	1	13-15	298	$109,800	8	$109,800	$26,000	No	Exceeds allowable cost
D3 (residences, park)	184	15-25	8,096	$4,040,325	5-17	$21,958	$27,000	Yes	NA
D4 (recreation)	2	23	1,402	$806,400	5-8	$403,200	$24,000	No	Exceeds allowable cost
E1 (residences)	48	15	3,185	$1,194,450	6-13	$24,884	$26,000	Yes	NA
E2 (residences)	57	15-21	1,900	$982,375	6-9	$17,234	$24,000	Yes	NA

TABLE 3-22
Summary of Noise Mitigation: Barrier Descriptions

Barrier	Benefited Receptors	Height (feet)	Length (feet)	Construction Cost	Noise Reduction Potential (dB[A])	Estimated Build Cost Per Benefited Receptor	Allowable Cost Per Benefited Receptor	Likely to be Implemented if Desired by Benefited Receptor	If no, reason why?
E3 (residences)	27	9-13	2,400	$679,975	5-8	$25,184	$24,000	No	Exceeds allowable cost
E4 (residences)	15	9-17	1,083	$340,725	5-10	$22,715	$25,000	Yes	NA
E5 (residences)	NA	25	928	$580,000	7	---[a]	---[a]	No	Cannot meet design goal
E6 (residences)	4	13-15	448	$151,325	5-8	$37,831	$24,000	No	Exceeds allowable limit
E7 (recording studio)	1	25	2,000	$1,249,975	8	$1,249,975	$24,000	No	Exceeds allowable limit
E8 (park)	3	9-25	2096	$993,975	5-8	$331,325	$26,000	No	Exceeds allowable limit

Note: NA = Not Applicable

[a] Cost estimates were not conducted because the noise barrier analysis could not achieve an 8-dB(A) traffic noise level reduction to meet the design goal criteria.

[b] Noise barrier analysis could not achieve the 5 dB(A) noise level reduction to meet feasibility criteria.

Noise barriers were also evaluated for cost-effectiveness on a cumulative basis. For a barrier to be considered for cost averaging, the cost per benefited receptor cannot exceed twice the adjusted allowable limit. As shown in Table 3-23, the noise barriers were ranked in decreasing order of cost-effectiveness based on the ratio of build cost per benefited receptor to the adjusted allowable limit. Ratios less than 1.0 would be cost-effective on an individual basis. Barriers with a ratio greater than 2.0 were removed from the evaluation in accordance with FHWA regulations and IDOT policy, as the estimated build cost is more than double the adjusted allowable limit.

TABLE 3-23
Summary of Barrier Cost Reasonableness Analysis

Barrier	Benefited Receptors	Noise Wall Cost[a]	Cost per Benefited Receptor	Adjusted Allowable Cost per Benefited Receptor	Ratio of Est. Build/ Adjust. Allowable	Cumulative Estimated Build Cost/ Benefited	Cumulative Adjusted Allowable Cost/ Benefited	Determination
C4 (residences)	171	$1,309,075	$7,655	$25,000	0.31	$7,655	$25,000	Cost-Effective Stand-Alone
C3 (residences)	209	$2,641,750	$12,640	$27,000	0.47	$10,397	$26,100	Cost-Effective Stand-Alone
C1 (residences, park)	322	$4,540,700	$14,101	$27,000	0.52	$12,096	$26,513	Cost-Effective Stand-Alone

TABLE 3-23
Summary of Barrier Cost Reasonableness Analysis

Barrier	Benefited Receptors	Noise Wall Cost[a]	Cost per Benefited Receptor	Adjusted Allowable Cost per Benefited Receptor	Ratio of Est. Build/ Adjust. Allowable	Cumulative Estimated Build Cost/ Benefited	Cumulative Adjusted Allowable Cost/ Benefited	Determination
D1 (residences)	113	$1,859,650	$16,457	$25,000	0.66	$12,701	$26,303	Cost-Effective Stand-Alone
E2 (residences)	57	$982,375	$17,234	$24,000	0.72	$12,997	$26,153	Cost-Effective Stand-Alone
D3 (residences, park)	184	$4,040,325	$21,958	$27,000	0.81	$14,559	$26,300	Cost-Effective Stand-Alone
E4 (residences)	15	$340,725	$22,715	$25,000	0.91	$14,673	$26,282	Cost-Effective Stand-Alone
C2 (residences)	40	$906,440	$22,661	$24,000	0.94	$14,960	$26,200	Cost-Effective Stand-Alone
E1 (residences)	48	$1,194,450	$24,884	$26,000	0.96	$15,371	$26,192	Cost-Effective Stand-Alone
E3 (residences)	27	$679,975	$25,184	$24,000	1.05	$15,595	$26,142	Cost-Effective Cumulative
B2 (residences)	18	$623,175	$34,620	$25,000	1.38	$15,879	$26,125	Cost-Effective Cumulative
E6 (residences)	4	$151,325	$37,831	$24,000	1.58	$15,926	$26,114	Cost-Effective Cumulative
D2 (offices)	1	$109,800	$109,800	$26,000	4.22	Not part of evaluation as estimated cost is more than two times the adjusted allowable cost.		Not Cost-Effective
B1 (residence, church)	7	$904,725	$129,246	$27,000	4.79	Not part of evaluation as estimated cost is more than two times the adjusted allowable cost.		Not Cost-Effective
A2 (ball field)	1	$242,300	$242,300	$24,000	10.10	Not part of evaluation as estimated cost is more than two times the adjusted allowable cost.		Not Cost-Effective
E8 (park)	3	$993,975	$331,325	$26,000	12.74	Not part of evaluation as estimated cost is more than two times the adjusted allowable cost.		Not Cost-Effective
D4 (recreation)	2	$806,400	$403,200	$24,000	16.80	Not part of evaluation as estimated cost is more than two times the adjusted allowable cost.		Not Cost-Effective
A1 (residences, church)	2	$1,115,350	$557,675	$24,000	23.24	Not part of evaluation as estimated cost is more than two times the adjusted allowable cost.		Not Cost-Effective
E7 (recording studio)	1	$1,249,975	$1,249,975	$24,000	52.08	Not part of evaluation as estimated cost is more than two times the adjusted allowable cost.		Not Cost-Effective

[a] The current unit cost used by IDOT to determine the estimated build cost for noise barriers is $25 per square feet.

Nine barriers would be considered cost-effective when considered individually, as the adjusted allowable cost per benefited receptor is less than the estimated build cost per benefited receptor. Under the cost averaging approach, an additional three barriers would also be considered cost-effective. The remaining seven barriers would not be cost-effective when considered individually or under the cost averaging approach. As a result, the technical analysis supports a total of 12 barriers for inclusion in the project; however, the public viewpoint provided during the Tier Two Draft EIS public comment period also affects the outcome of the recommended noise barriers.

To assess reasonableness from a public viewpoint perspective, benefited receptors of the 12 noise barriers that were found to be feasible and reasonable from a noise reduction and cost standpoint were sent postcards requesting them to vote on their preference for implementation of the barrier. The goal was to receive responses from at least one third of the benefited receptors, of which a majority must be in favor of the barrier for it to be implemented. As shown in Table 3-24 below, at least one third of the benefited receptors responded in all cases except Barrier E2, where no responses were received during the first or second mailing. A third mailing was distributed on October 12, 2012 for Barrier E2, and a subsequent final determination of likelihood will be made following the results of that mailing. The remainder of the barriers received responses from at least one-third of the benefited receptors, and in only one case was a noise barrier rejected by the majority of those who responded; therefore, Barrier E4 along Elmhurst Road will not be built. All other noise barriers were supported by the majority of benefited receptors, as such, continue to be recommended for inclusion in the project. Table 3-24 describes the results of the viewpoint solicitation activity.

TABLE 3-24
Results of the Viewpoint Solicitation Activity

Barrier	Percent Responses Received	Percent Responses Favoring Barrier Implementation	Recommended for Inclusion in the Project
B2 (residences)	53	100	Yes
C1 (residences, park)	39	92	Yes
C2 (residences)	40	94	Yes
C3 (residences)	36	97	Yes
C4 (residences)	42	99	Yes
D1 (residences)	38	98	Yes
D3 (residences, park)	50	94	Yes
E1 (residences)	36	97	Yes
E2 (residences)	0	0	TBD
E3 (residences)	41	100	Yes
E4 (residences)	100	27	No
E6 (residences)	100	83	Yes

Note: TBD = To Be Determined

The following includes descriptions of each barrier.

Barrier A1: Irving Park Road (north side) from Springinsguth Road to the eastern end of Meadow Drive (Receptors ANB-05 to ANB-11, ANC-01, Barrier Exhibit 3-11A)

The placement of a 1,824-linear-foot barrier was evaluated along the northeast corner of Springinsguth Road, Irving Park Road, and Elgin-O'Hare Expressway Frontage Road along the right-of-way. This barrier would be located along the Elgin O'Hare corridor and included several breaks to allow for access to residences. Barrier heights between 19 to 25 feet would be required to achieve an 8-dB(A) reduction, satisfying the 5-dB(A) feasibility and 8-dB(A) reasonableness design goals. The total cost to construct the barrier would be nearly $1,115,350, or $557,675 per benefited receptor, which would exceed the allowable cost criterion for reasonableness of $24,000 per benefited receptor. In addition, this barrier was not included in the cost averaging analysis since the estimated build cost is more than double the adjusted allowable limit. Therefore, a barrier is not likely at this location.

Barrier A2: Elgin-O'Hare Expressway Frontage Road (south side) from Springinsguth Road to the Alexian Field driveway (Receptor ASC-01, Barrier Exhibit 3-11A)

The placement of a 500-linear-foot barrier was evaluated for the picnic area at the north end of the Alexian Baseball Field along the south side of the Elgin-O'Hare Expressway Frontage Road between Springinsguth Road and the Alexian Field driveway along the right-of-way. This barrier would be located along the Elgin O'Hare corridor. A barrier height of 9 feet would be required to achieve an 8-dB(A) reduction, satisfying the 5-dB(A) feasibility and 8-dB(A) reasonableness design goals. The total cost of the barrier would be nearly $242,300, or $242,300 per benefited receptor, and would exceed the allowable cost criterion for reasonableness of $24,000 per benefited receptor. In addition, this barrier was not included in the cost averaging analysis since the estimated build cost is more than double the adjusted allowable limit. Therefore, a barrier is not likely at this location.

Barrier A3: Irving Park Road (south side) from Keystone Place to Georgetown Drive (Receptors ANB-43 to ANB-53, Barrier Exhibit 3-11B)

The placement of a 333-linear-foot barrier was evaluated along the south side of Irving Park Road from Keystone Place to Georgetown Drive. This barrier would be located along the Elgin O'Hare corridor. Barrier heights of up to 25 feet were analyzed. No impacted receptors would experience a 5-dB(A) reduction with Barrier A4; thus, this barrier would not satisfy the 5 dB(A) feasibility criteria and was not analyzed further. Therefore, a barrier is not likely at this location.

Barrier B1: Elgin-O'Hare Expressway (north side) from approximately the railroad tracks to west of Roselle Road (Receptors BNB-02 to BNB-09, Barrier Exhibit 3-11C)

The placement of a 2,510-linear-foot barrier was evaluated for the residences on the north side of the Elgin-O'Hare Expressway between the railroad tracks and west of Roselle Road along the right-of-way. This barrier would be located along the Elgin O'Hare corridor. Barrier heights between 9 to 17 feet would be required to achieve an 8-dB(A) reduction, satisfying the 5-dB(A) feasibility and 8-dB(A) reasonableness design goals. Barrier B1 is represented by BNB-08, with a build noise level of 70 dB(A) (+ $1,000) and increase above existing levels of 11 dB(A) (+ $2,000), resulting in an adjusted allowable cost of $27,000. The total cost to construct the barrier would be nearly $904,725, or $129,246 per benefited receptor, which would exceed the adjusted allowable cost criterion for reasonableness of $27,000 per benefited receptor. In addition, this barrier was not included in the cost averaging analysis since the estimated build cost is more than double the adjusted allowable limit. Therefore, a barrier is not likely at this location.

Barrier B2: Elgin-O'Hare Expressway (south side) from approximately east of Mitchell Boulevard to Roselle Road off-ramp (Receptors BSB-01 to BSB-16, Barrier Exhibit 3-11C)

The placement of a 2,393-linear-foot barrier was evaluated for the residences on the south side of the Elgin-O'Hare Expressway from east of Mitchell Boulevard to the Roselle Road off-ramp along the right-of-way. This barrier would be located along the Elgin O'Hare corridor. Barrier heights between 11 to 15 feet would be required to achieve an 8-dB(A) reduction, satisfying the 5-dB(A) feasibility and 8-dB(A) reasonableness design goals. Barrier B2 is represented by BSB-16, with a build noise level of 70 dB(A) (+ $1,000) and increase above existing levels of 3 dB(A), resulting in an adjusted allowable cost of $25,000. The total cost to construct the barrier would be nearly $623,175, or $34,620 per benefited receptor, which would exceed the adjusted allowable cost criterion for reasonableness of $25,000 per benefited receptor. Extending the barrier east to BSB-22 was also evaluated, but the additional length was determined to not be cost effective. This barrier was included in the cost averaging analysis, and was determined to be cost-effective from a cumulative approach. Further, it received the requisite support from benefited receptors. Therefore, a barrier is likely at this location.

Barrier C1: Elgin-O'Hare Expressway (north side) from Roselle Road to west of Meacham Road (Receptors CNB-10 to CNB-63, Barrier Exhibits 3-11D and 3-11E)

The placement of an 8,765-linear-foot barrier was evaluated for the residences on the north side of the Elgin-O'Hare Expressway between Roselle Road and west of Meacham Road along the right-of-way. A short segment of the barrier immediately west of Meacham Road would be located along the mainline edge of shoulder. This barrier would be located along the Elgin O'Hare corridor. Barrier heights between 17 to 23 feet would be required to achieve an 8-dB(A) reduction, satisfying the 5-dB(A) feasibility and 8-dB(A) reasonableness design goals. Barrier C1 is represented by CNB-51, with a build noise level of 73 dB(A) (+ $1,000) and increase above existing levels of 14 dB(A) (+ $2,000), resulting in an adjusted allowable cost of $27,000. The total cost to construct the barrier would be nearly $4,540,700, or $14,101 per benefited receptor, below the adjusted allowable cost criterion for reasonableness of $27,000 per benefited receptor. As a result, this barrier would be cost-effective as a stand-alone barrier. Further, it received the requisite support from benefited receptors. Therefore, a barrier is likely at this location.

Barrier C2: Elgin-O'Hare Expressway (north side) from Meacham Road to east of Volkamer Trail (Receptors CNB-66 to CNB-81, Barrier Exhibit 3-11E)

The placement of a 2,174-linear-foot barrier was evaluated for the residences on the north side of the Elgin-O'Hare Expressway between Meacham Road and east of Volkamer Trail along the right-of-way. This barrier would be located along the Elgin O'Hare corridor. Barrier heights between 11 to 19 feet would be required to achieve an 8-dB(A) reduction, satisfying the 5-dB(A) feasibility and 8-dB(A) reasonableness design goals. The total cost to construct the barrier would be nearly $906,440, or $22,661 per benefited receptor, below the allowable $24,000 reasonableness cost criterion per benefited receptor. As a result, this barrier would be cost-effective as a stand-alone barrier. Further, it received the requisite support from benefited receptors. Therefore, a barrier is likely at this location.

Barrier C3: Elgin-O'Hare Expressway (south side) from Roselle Road to the eastern end of Poplar Avenue (Receptors CSB-01 to CSB-47, Barrier Exhibits 3-11D and 3-11E)

The placement of a 6,602-linear-foot barrier was evaluated for the residences along the south side of the Elgin-O'Hare Expressway from Roselle Road to the eastern end of Poplar Avenue along the right-of-way. This barrier would be located along the Elgin O'Hare corridor. A barrier height of 13 to 17 feet would be required to achieve an 8-dB(A) reduction, satisfying the 5-dB(A) feasibility and 8-dB(A) reasonableness design goals. Barrier C3 is represented by CSB-08, with a build noise level of 75 dB(A) (+ $2,000) and increase above existing levels of 6 dB(A) (+ $1,000), resulting in an adjusted allowable cost of $27,000. The total cost to construct the barrier would be nearly $2,641,750, or $12,640 per benefited receptor, below the adjusted allowable $27,000 reasonableness cost criterion per benefited receptor. As a result, this barrier would be cost-effective as a stand-alone barrier. Further, it received the requisite support from benefited receptors. Therefore, a barrier is likely at this location.

Barrier C4: I-290 (west side) south of Biesterfield Road to north of Devon Avenue (Receptors CNB-84 to CNB-118, Barrier Exhibit 3-11F)

The placement of a 3,521-linear-foot barrier was evaluated for the apartments on the west side of I-290, north of Devon Avenue and south of Biesterfield Road along the right-of-way. This barrier would be located along I-290. Barrier heights between 11 to 21 feet would be required to achieve an 8-dB(A) reduction, satisfying the 5-dB(A) feasibility and 8-dB(A) reasonableness design goals. Barrier C4 is represented by CNB-98, with a build noise level of 73 dB(A) (+ $1,000) with no increase above existing levels, resulting in an adjusted allowable cost of $25,000. The total cost to construct the barrier would be nearly $1,309,075, or $7,655 per benefited receptor, below the adjusted allowable $25,000 reasonableness cost criterion per benefited receptor. As a result, this barrier would be cost-effective as a stand-alone barrier. Further, it received the requisite support from benefited receptors. Therefore, a barrier is likely at this location.

Barrier D1: I-290 (east side) north of Devon Avenue and south of Biesterfield Road (Receptors DNB-07 to DNB-20, Barrier Exhibit 3-11F)

The placement of a 3,491-linear-foot barrier was evaluated for the residences on the east side of I-290 north of Devon Avenue and south of Biesterfield Road along the right-of-way. This barrier would be located along I-290. Barrier heights between 9 to 25 feet would be required to achieve an 8-dB(A) reduction, satisfying the 5-dB(A) feasibility and 8-dB(A) reasonableness design goals. Barrier D1 is represented by DNB-07, with a build noise level of 73 dB(A) (+ $1,000) and increase above existing levels of 2 dB(A), resulting in an adjusted allowable cost of $25,000. The total cost to construct the barrier would be nearly $1,859,650, or $16,457 per benefited receptor, below the adjusted allowable $25,000 reasonableness cost criterion per benefited receptor. As a result, this barrier would be cost-effective as a stand-alone barrier. Further, it received the requisite support from benefited receptors. Therefore, a barrier is likely at this location.

Barrier D2: I-290 (east side) south of Devon Avenue (Receptors DNE-01 to DNE-02, Barrier Exhibit 3-11F)

The placement of a 298-linear-foot barrier was evaluated for the office building on the east side of I-290 south of Devon Avenue along the right-of-way. This barrier would be located along I-290. The owner of the building was contacted to determine the number of businesses. Barrier heights between 13 to 15 feet would be required to achieve an 8-dB(A) reduction, satisfying the 5-dB(A) feasibility and 8-dB(A) reasonableness design goals. Barrier D2 is represented by DNE-01, with a build noise level of 77 dB(A) (+ $2,000) and no increase above existing levels, resulting in an adjusted allowable cost of $26,000. The cost to construct the barrier would be nearly $109,800, or $109,800 per benefited receptor, which would exceed the adjusted allowable cost criterion for reasonableness of $26,000 per benefited receptor. In addition, this barrier was not included in the cost averaging analysis since the estimated build cost is more than double the adjusted allowable limit. Therefore, a barrier is not likely at this location.

Barrier D3: I-290 (east side) from Milwaukee District West Railroad to Thorndale Avenue and Thorndale Avenue (south side) from I-290 to Nicol Way (Receptors DSB-01 to DSB-52, Barrier Exhibit 3-11G)

The placement of an 8,096-linear-foot barrier was evaluated for the residences on the east side of I-290 from the Milwaukee District West Railroad, north to Thorndale Avenue, and along Thorndale Avenue on the south side from I-290 to Nicol Way along the right-of-way. This barrier would be located along the Elgin O'Hare corridor and I-290. Barrier heights between 15 to 25 feet would be required to achieve an 8-dB(A) reduction, satisfying the 5-dB(A) feasibility and 8-dB(A) reasonableness design goals. Barrier D3 is represented by DSB-03, with a build noise level of 75 dB(A) (+ $2,000) and no increase above existing levels, resulting in an adjusted allowable cost of $27,000. The cost to construct the barrier would be nearly $4,040,325, or $21,958 per benefited receptor, below the adjusted allowable $27,000 reasonableness cost criterion per benefited receptor. As a result, this barrier would be cost-effective as a stand-alone barrier. Further, it received the requisite support from benefited receptors. Therefore, a barrier is likely at this location.

Barrier D4: Thorndale Avenue (north side) east of North Prospect Avenue (Receptor DNC-01-DNC-02, Barrier Exhibit 3-11H)

The placement of a 1,402-linear-foot barrier was evaluated for a Section 4(f) property on the north side of Thorndale Avenue just east of North Prospect Avenue along the proposed right-of-way. This barrier would be located along the Elgin O'Hare corridor. Barrier heights of 23 feet would be required to achieve an 8-dB(A) reduction, satisfying the 5-dB(A) feasibility and 8-dB(A) reasonableness design goals. The cost to construct the barrier would be nearly $806,400, or $403,200 per benefited receptor, which would exceed the allowable cost criterion for reasonableness of $24,000 per benefited receptor. In addition, this barrier was not included in the cost averaging analysis since the estimated build cost is more than double the adjusted allowable limit. Therefore, a barrier is not likely at this location.

Barrier E1: I-90 (north side) from South Cedar Glen Drive to Briarwood Drive East (Receptors EB-01 to EB-29, Barrier Exhibit 3-11I)

The placement of a 3,185-linear-foot barrier was evaluated for the residences on the north side of I-90 between South Cedar Glen Drive and Briarwood Drive East along the edge of pavement. This barrier would be located along I-90. A barrier height of 15 feet would be required to achieve an 8-dB(A) reduction, satisfying the 5-dB(A) feasibility and 8-dB(A) reasonableness design goals. Barrier E1 is represented by EB-26, with a build noise level of 77 dB(A) (+ $2,000) and no increase above existing levels, resulting in an adjusted allowable cost of $26,000. The cost to construct the barrier would be nearly $1,194,450, or $24,884 per benefited receptor, below the adjusted allowable $26,000 reasonableness cost criterion per benefited receptor. As a result, this barrier would be cost-effective as a stand-alone barrier. Further, it received the requisite support from benefited receptors. Therefore, a barrier is likely at this location.

Barrier E2: I-90 (north side) from Terminal Drive to southeast of Oakton Street (Receptors EB-30 to EB-35, Barrier Exhibit 3-11J)

The placement of a 1,900-linear-foot barrier was evaluated for the residences on the north side of I-90 between Terminal Drive and southeast of Oakton Street along the edge of pavement. This barrier would be located along I-90. Barrier heights between 15 to 21 feet would be required to achieve an 8-dB(A) reduction, satisfying the 5-dB(A) feasibility and 8-dB(A) reasonableness design goals. The total cost to construct the barrier would be nearly $982,375, or $17,234 per benefited receptor, below the allowable $24,000 reasonableness cost criterion per benefited receptor. As a result, this barrier would be cost-effective as a stand-alone barrier. While viewpoints were not received by at least one-third of the benefited receptors during the first or second mailing, the barrier does meet the feasibility and reasonableness criteria from a noise reduction and cost standpoint. A third mailing was distributed on October 12, 2012 for Barrier E2, and a subsequent final determination of likelihood will be made following the results of that mailing.

Barrier E3: I-90 (north side) from west of Wolf Road to east Webster Lane (Receptors EB-71 to EB-84, Barrier Exhibit 3-11L)

The placement of a 2,400-linear-foot barrier was evaluated for the residences on the north side of I-90 from west of Wolf Road to east of Webster Lane along the edge-of-shoulder. This barrier would be located along I-90. Barrier heights between 9 to 13 feet would be required to achieve an 8-dB(A) reduction, satisfying the 5-dB(A) feasibility and 8-dB(A) reasonableness design goals. The cost to construct the barrier would be nearly $679,975, or $25,184 per benefited receptor, which would exceed the allowable cost criterion for reasonableness of $24,000 per benefited receptor. This barrier was included in the cost averaging analysis, and was determined to be cost-effective from a cumulative approach. Further, it received the requisite support from benefited receptors. Therefore, a barrier is likely at this location.

Barrier E4: Elmhurst Road (east side) from Tyler Road to south of Taft Road (Receptors EB-44 to EB-53, Barrier Exhibit 3-11K)

The placement of a 1,083-linear-foot barrier was evaluated for the residences on the east side of Elmhurst Road from approximately Tyler Road to south of Taft Road along the right-of-way. This barrier would be located along Elmhurst Road, and consists of two barriers with a break in between to provide access to the mobile home park. Barrier heights between 9 to 17 feet would be required to achieve an 8-dB(A) reduction, satisfying the 5-dB(A) feasibility and 8-dB(A) reasonableness design goals. Barrier E4 is represented by EB-46, with a build noise level of 71 dB(A) (+ $1,000) and increase above existing levels of 1 dB(A), resulting in an adjusted allowable cost of $25,000. The cost to construct the barrier would be nearly $340,725, or $22,715 per benefited receptor, below the adjusted allowable $25,000 reasonableness cost criterion per benefited receptor. As a result, this barrier would be cost-effective as a stand-alone barrier. However, a majority of benefited receptors that responded to the voting solicitation opposed the implementation of this barrier. Therefore, a barrier is not likely at this location.

Barrier E5: Touhy Avenue (north side) east of Elmhurst Road (Receptors EB-61 to EB-67, Barrier Exhibit 3-11K)

The placement of a 928-linear-foot barrier was evaluated for the residences on the north side of Touhy Avenue and east of Elmhurst Road along the right-of-way. This barrier would be located along Touhy Avenue, and consists of two barriers with a break in between to provide access to the mobile home park. Barrier heights of up to 25 feet were analyzed. A 5-dB(A) reduction would be achieved to satisfy the 5-dB(A) feasibility criteria; however, the barrier would not satisfy the 8-dB(A) reasonableness noise reduction design goal and was not analyzed further. Therefore, a barrier is not likely at this location.

Barrier E6: I-90 (south side) (Receptors EB-58 to EB-60, Barrier Exhibit 3-11K)

The placement of a 448-linear-foot barrier was evaluated for the residences on the south of I-90 along the right-of-way. This barrier would be located along I-90. Barrier heights between 13 to 15 feet would be required to achieve an 8-dB(A) reduction, satisfying the 5-dB(A) feasibility and 8-dB(A) reasonableness design goals. The cost to construct the barrier would be nearly $151,325, or $37,831 per benefited receptor, which would exceed the allowable cost criterion for reasonableness of $24,000 per benefited receptor. This barrier was included in the cost averaging analysis, and was determined to be cost-effective from a cumulative approach. Further, it received the requisite support from benefited receptors. Therefore, a barrier is likely at this location.

Barrier E7: I-90 (south side) at Higgins Road and Commerce Drive (Receptor EC-04, Barrier Exhibit 3-11J)

The placement of a 2,000-linear-foot barrier was evaluated for a recording studio on the south side of I-90 at approximately Higgins Road and Commerce Drive along the edge of pavement. This barrier would be located along the toll road right-of-way. A barrier height of 25 feet would be required to achieve an 8-dB(A) reduction, satisfying the 5-dB(A) feasibility and 8-dB(A) reasonableness design goals. The total cost to construct the barrier would be nearly $1,249,975 or $1,249,975 per benefited receptor, which would exceed the allowable cost criterion for reasonableness of $24,000 per benefited receptor. In addition, this barrier was not included in the cost averaging analysis since the estimated build cost is more than double the adjusted allowable limit. Therefore, a barrier is not likely at this location.

Barrier E8: I-90 (north side) east of Elmhurst Road (Receptors EC-01 to EC-03, Barrier Exhibit 3-11K)

The placement of a 2,096-linear-foot barrier was evaluated for the park and baseball fields north of I-90 and east of Elmhurst Road along the right-of-way. This barrier would be located along the toll road right-of-way. Barrier heights of 9 to 25 feet would be required to achieve an 8-dB(A) reduction, satisfying the 5-dB(A) feasibility and 8-dB(A) reasonableness design goals. Barrier E8 is represented by EC-03, with a build noise level of 75 dB(A) (+ $2,000) and increase above existing levels of 2 dB(A), resulting in an adjusted allowable cost of $26,000. The total cost to construct the barrier would be nearly $993,975, or $331,325 per benefited receptor, which would exceed the adjusted allowable cost criterion for reasonableness of $26,000 per benefited receptor. In addition, this barrier was not included in the cost averaging analysis since the estimated build cost is more than double the adjusted allowable limit. Therefore, a barrier is not likely at this location.

Coordination with Local Officials for Undeveloped Lands

For the undeveloped lands along the project, the existing zoning and comprehensive plans of these lands were reviewed to determine the future goals of the lands.

For any undeveloped lands (lands that are not permitted), or agriculture land zoned for development, coordination occurred with local officials, informing them of the predicted noise levels as a result of the proposed project. Appendix B includes letters that were sent to the local officials having jurisdiction over the undeveloped lands, and an exhibit (as an attachment to the letter), depicting where the NAC is approached.

Statement of Likelihood

Based on the traffic noise analysis and noise abatement evaluation conducted, highway traffic noise abatement measures are likely to be implemented based on preliminary design. The noise barriers determined to meet the feasible and reasonable criteria are identified in Table 3-24. If constraints not foreseen in the preliminary design subsequently develop during final design or public input substantially changes reasonableness, the abatement measures may need to be modified or removed from the project plans. A final decision on the installation of abatement measure(s) would be made upon completion of project's final design and the public involvement process.

3.8.3.3 Construction Noise

Trucks and machinery used for construction produce noise that may affect some land uses and activities during the construction period. Residents along the alignment would at some time experience perceptible construction noise from implementation of the project. To minimize or eliminate the effect of construction noise on these receptors, mitigation measures have been incorporated into the IDOT's *Standard Specifications for Road and Bridge Construction* as Article 107.35 (IDOT, 2012).

3.9 Air Quality

3.9.1 Affected Environment

The National Ambient Air Quality Standards (NAAQS), established by USEPA, set maximum allowable concentration limits for six criteria air pollutants. Areas in which air pollution levels persistently exceed the NAAQS may be designated as "nonattainment." States where a nonattainment area is located must develop and implement a state implementation plan (SIP) containing policies and regulations that would bring about attainment of the NAAQS. Areas that had been designated as nonattainment, but have attained the NAAQS for the criteria pollutant(s) associated with the nonattainment designation, would be designated as maintenance areas.

In the greater Chicago area, Cook, DuPage, Kane, Lake, McHenry, and Will Counties, as well as Aux Sable and Goose Lake Townships in Grundy County and Oswego Township in Kendall County, have been designated as nonattainment areas for the 1997 8-hour ozone standard and the 1997 annual $PM_{2.5}$ standard. The Lake Calumet area and Lyons Township in Cook County have been designated as a maintenance area for the PM_{10} standard. The EO-WB project is located within DuPage County and Cook County. The project is not located in the areas of Cook County that are designated maintenance for PM_{10}.

The current NAAQS for the 8-hour ozone standard is 0.075 parts per million (ppm). Ozone attainment is based on the 1997 8-hour NAAQS of 0.08 ppm. On June 11, 2012, USEPA designated the Chicago nonattainment area for the 2008 ozone standard. See http://www.gpo.gov/fdsys/pkg/FR-2012-06-11/pdf/2012-14097.pdf. Conformity for this standard is not required until one year after the effective date of July 20, 2012. Two NAAQS are applied to $PM_{2.5}$, a primary 24-hour standard of 35 micrograms per cubic meter ($\mu g/m^3$) and a primary annual standard of 15 $\mu g/m^3$. IEPA publishes air quality information for the state in its *Annual Air Quality Report*. The latest year for which data are available is 2010. During that year, two air quality monitoring sites were relatively close to the project corridor. No exceedances of the 8-hour ozone NAAQS, the 24-hour primary standard for $PM_{2.5}$ or the primary annual standard for $PM_{2.5}$ were recorded at these locations.

The Air Quality Index (AQI) is the current national standard method for reporting air pollution levels to the general public. The AQI is based on the short-term federal NAAQS, the federal episode criteria, and the Federal Significant Harm levels for five of the "criteria pollutants," namely, ground-level ozone (O_3), sulfur dioxide (SO_2), CO, particulate matter (PM), and nitrogen dioxide (NO_2). The AQI levels have been divided into six categories: Good (0-50), Moderate (51-100), Unhealthy for Sensitive Groups (101-150), Unhealthy (151-200), Very Unhealthy (201-300), and Hazardous (301-500).

The AQI classification of "Unhealthy for Sensitive Groups" occurs on occasion in Illinois under the 8-hour ozone and $PM_{2.5}$ standards. The AQI classifications of Unhealthy are uncommon and classifications of Very Unhealthy are rare in the state. To date, no classifications of Hazardous air quality have occurred in Illinois.

3.9.2 Environmental Consequences

This subsection analyzes the air quality impacts related to the construction and vehicle operations associated with the Build Alternative and No-Build Alternative.

3.9.2.1 COSIM Screening

A pre-screen CO analysis was completed for the proposed project (see Exhibit 3-12 for analysis locations). The results from this proposed roadway improvement indicate that a detailed Carbon Monoxide Screen for Intersection Model (COSIM) air quality analysis is not required because the results for the worst-case receptor are below the 8-hour average NAAQS for CO of 9.0 ppm, which is necessary to protect the public health and welfare.

3.9.2.2 $PM_{2.5}$ Hot-Spot Analysis

Project-level conformity must be established for projects located in a $PM_{2.5}$ nonattainment area. A hot-spot analysis is required in $PM_{2.5}$ and PM_{10} nonattainment or maintenance areas for projects that are determined as project of air quality concern (40 CFR 93.123[b][1]). A $PM_{2.5}$ hot-spot analysis was performed using the latest emission factor model and procedures outlined in the memorandum, "Transportation Conformity Guidance for Quantitative Hot-spot Analyses in $PM_{2.5}$ and PM_{10} Nonattainment and Maintenance Areas" (USEPA, 2010a) to estimate annual $PM_{2.5}$ concentrations in the project area. A hot-spot analysis is only required for the pollutants and averaging periods for which the area is in nonattainment. In this case, only annual $PM_{2.5}$ was evaluated because the project is located in the DuPage County and Cook County annual $PM_{2.5}$ nonattainment areas.

The USEPA published the Quantitative PM Hot-spot Guidance and announced the approval of USEPA's Motor Vehicle Emission Simulator (MOVES) for hot-spot analyses in the Federal Register notice on December 20, 2010, which also started a two-year conformity grace period to implement the quantitative methodology using MOVES. Air quality analyses that start within the grace period are not required to perform a quantitative analysis, and a qualitative analysis is acceptable. This project was discussed during an interagency consultation meeting on September 10, 2010 (CMAP, 2010a), where it was determined by the group to be a project of air quality concern. In addition, it was determined that in anticipation of the release of final guidance that the $PM_{2.5}$ hot-spot analysis would be completed quantitatively.

Overview of the Analysis

The technical details of the PM hot-spot analysis, Mobile Source Air Toxic (MSAT) analysis, and greenhouse gas emissions estimates are included as Appendix I. The following sections summarize the methodology and results.

The dispersion modeling technique in the project area was USEPA's CAL3QHCR model and emission factors from USEPA's MOVES model. Model inputs were selected according to guidance (USEPA, 2010a). MOVES inputs incorporated local registration mix and fuel data provided by IEPA that are consistent with the regional emissions analyses for conformity determinations in the Transportation Improvement Program (TIP) and SIP. Other CAL3QHCR model inputs include local meteorological data and traffic data specific to each roadway section. Details regarding inputs are included in Appendix I.

The PM hot-spot analyses examine the air quality impacts for the relevant PM NAAQS in the areas substantially affected by the project. Hot-spot analyses typically include the entire project; however, since this project is so expansive, the PM hot-spot analysis focuses on the locations with the highest likelihood of new or worsened PM NAAQS violations. If conformity is demonstrated at these locations, then it will be extrapolated that conformity is met in the entire project area. This is consistent with Section 3.3.2 of the quantitative hot-spot modeling guidance (USEPA, 2010a).

Through consultation with the Illinois Interagency Workgroup on February 25, 2011, four locations were chosen to represent the locations expected to the have the highest air quality concentrations, as a result of high projected traffic volumes and sensitive receptor locations. Interchanges were chosen for analysis because they have the highest traffic volumes concentrated in a given area.

The four locations modeled for the $PM_{2.5}$ hot-spot analysis were:

- Elgin O'Hare and West Bypass corridors
- Elgin O'Hare corridor and I-290
- Elgin O'Hare corridor and Roselle Road
- West Bypass corridor and I-90

It was determined that the concentrations of $PM_{2.5}$ would be evaluated at all four locations for both the Build Alternative and the No-Build Alternative. Section 2.8 of the quantitative hot-spot modeling guidance indicates that if a project is being developed in two stages and the entire two-stage project is being approved, two analysis years should be modeled: one to examine the impacts of the first stage of the project and another to examine the impacts of the completed project (USEPA, 2010a). Because this project is being constructed in two phases, analyses were conducted for 2030 (i.e., after the ICP would be completed), and 2040 (i.e., after construction of the entire project would be completed). The ICP would include improvements for the entire project corridor, but with fewer travel lanes and reduced interchanges. The 2030 interim year represents the year of peak capacity after the ICP would be complete, and it was modeled because it was likely to produce the peak emissions associated with that phase. The PM hot-spot analyses included only directly emitted $PM_{2.5}$ emissions. $PM_{2.5}$ precursors are not considered in PM hot-spot analyses, since precursors take time at the regional level to form into secondary PM. Exhaust, brake wear, and tire wear emissions from on-road vehicles are always included in a project's $PM_{2.5}$. For this analysis, only running exhaust was considered because start exhaust is unlikely to occur on the roadways included in the model domain.

Re-entrained road dust was not included because the SIP does not identify that such emissions are a significant contributor to the $PM_{2.5}$ air quality in the nonattainment area. Emissions from construction-related activities were not included because they are considered temporary, as defined in 40 CFR 93.123(c)(5) (i.e., emissions that occur only during the construction phase and last five years or less at any individual site).

Model output was used to determine a design value, which is a statistic that describes a future air quality concentration in the project that can be compared to a particular NAAQS. The design value was determined by combining modeled $PM_{2.5}$ concentrations from the project and a representative monitored background $PM_{2.5}$ concentration provided by IEPA. Refer to Appendix I for details on how the model results were used to determine the appropriate value to use in the design value.

Background concentrations representing the cumulative $PM_{2.5}$ emissions of other sources in the area were added into the predicted local concentrations for $PM_{2.5}$ emissions at locations where the general public could have extended access. Because of this inclusive analysis methodology, the forecast impacts represent cumulative air quality impacts.

This total concentration was compared to the annual $PM_{2.5}$ NAAQS of 15 $\mu g/m^3$.

Results

The 1997 annual $PM_{2.5}$ design value is currently defined as the average of three consecutive years' annual averages, each estimated using equally-weighted quarterly averages. This NAAQS is met when the three-year average concentration is less than or equal to the 1997 annual $PM_{2.5}$ NAAQS (15.0 $\mu g/m^3$).

The receptor with maximum annual average $PM_{2.5}$ concentration was identified for each model run for each year of meteorological data, and the associated design value was determined for comparison to the NAAQS. The annual $PM_{2.5}$ design value for the receptor with the maximum concentration for each scenario is presented in Table 3-25. $PM_{2.5}$ concentrations ranged from 13.2 $\mu g/m^3$ to 13.8 $\mu g/m^3$ for the 2040 No-Build Alternative and 13.4 $\mu g/m^3$ to 14.0 $\mu g/m^3$ for the 2040 Build Alternative. The annual concentrations of $PM_{2.5}$ for the 2030 interim year ranged from 13.4 $\mu g/m^3$ to 13.8 $\mu g/m^3$.

TABLE 3-25
Annual $PM_{2.5}$ Design Value Concentrations in µg/m^3

Location	2040 Build Alternative	2040 No-Build Alternative	2030 Interim Year
Elgin O'Hare and West Bypass corridors	14.0	13.2	13.8
Elgin O'Hare corridor and I-290	13.5	13.8	13.6
Elgin O'Hare corridor and Roselle Road	13.4	13.4	13.4
West Bypass corridor and I-90	13.6	13.8	13.8

Notes: All concentrations include background concentration of 13 µg/m^3; Annual $PM_{2.5}$ NAAQS is 15 µg/m^3; µg/m^3 = micrograms per cubic meter. Concentrations are for the receptor with highest concentration for each scenario.

The results of the analysis show that the modeled localized $PM_{2.5}$ concentrations do not exceed the annual $PM_{2.5}$ NAAQS for the Build Alternative, No-Build Alternative, or 2030 interim year of the Build Alternative.

The local hot-spot analysis demonstrates that the project would not:

- Cause or contribute to a new violation of any air quality standards in any area.
- Increase the severity or frequency of an existing violation of any standard in any area.
- Delay timely attainment of any standard, required interim emission reductions, or milestones in any area.

On March 13, 2012, the Illinois Interagency Workgroup agreed on the $PM_{2.5}$ Hot-Spot Analysis conducted for this project (CMAP, 2012).

3.9.2.3 Mobile Source Air Toxics Analysis

In addition to the criteria air pollutants for which there are NAAQS, USEPA also regulates air toxics. Most air toxics originate from human-made sources, including on-road mobile sources, non-road mobile sources (e.g., airplanes), area sources (e.g., dry cleaners), and stationary sources (e.g., factories or refineries).

MSATs are a subset of the 188 air toxics defined by the Clean Air Act. The MSATs are compounds emitted from highway vehicles and non-road equipment. Some toxic compounds are present in fuel and are emitted to the air when the fuel evaporates or passes through the engine unburned. Other toxics are emitted from the incomplete combustion of fuels or as secondary combustion products. Metal air toxics also result from engine wear or from impurities in oil or gasoline.

The USEPA is the lead federal agency for administering the Clean Air Act and has certain responsibilities regarding the health effects of MSATs. Controlling air toxic emissions became a national priority with the passage of the Clean Air Act Amendments of 1990. With these amendments, Congress mandated that USEPA regulate 188 air toxics, also known as hazardous air pollutants.

The USEPA has assessed this expansive list in its *Control of Hazardous Air Pollutants from Mobile Sources; Final Rule* (USEPA, 2007) and identified a group of 93 compounds emitted from mobile sources that are listed in its Integrated Risk Information System database (USEPA, 2010b).

In addition, USEPA identified seven compounds with significant contributions from mobile sources that are among the national and regional-scale cancer risk drivers from its 1999 National Air Toxics Assessment (NATA) (USEPA, 1999). These compounds are:

- Acrolein
- Benzene
- 1,3-butadiene
- Diesel particulate matter plus diesel exhaust organic gases (diesel PM)
- Formaldehyde
- Naphthalene
- Polycyclic organic matter (POM)

Although FHWA considers these the priority MSATs, the list is subject to change and may be adjusted in consideration of future USEPA rules.

Impact Analysis

The FHWA, *Interim Guidance Update on Mobile Source Air Toxic Analysis in NEPA* suggests a three-tiered approach to analyzing the effects of a transportation project in terms of public exposure to MSAT emissions (FHWA, 2009).

The level of analysis is related to the expected size and effect of the project, as follows:

- No analysis for projects with no potential for meaningful MSAT effects.
- Qualitative analysis for projects with low potential MSAT effects.
- Quantitative analysis to differentiate alternatives for projects with higher potential MSAT effects.

The EO-WB project exceeds the annual ADT volume to warrant a quantitative MSAT analysis; therefore, total project emissions were estimated for the 2010 existing timeframe and Build Alternative and the No-Build Alternative.

Daily emissions were estimated for each priority MSAT using the MOVES emission factor model. The estimates used ADT volumes and average speeds for access-controlled facility, primary arterials, and minor arterials in the project area.

With the Build Alternative and No-Build Alternative, there are localized areas where VMT would increase, and other areas where VMT would decrease. Therefore, it is possible that localized increases and decreases in MSAT emissions may occur. The MSAT emissions for the project area are presented in Table 3-26. Emissions increase as a result of the project as compared to the No-Build Alternative by about 14 percent for each pollutant. However, this is a reduction of approximately 80 percent as compared to the existing MSAT emissions. This is consistent with USEPA's projections that national control programs will reduce annual MSAT emissions by 72 percent between 1999 and 2050.

TABLE 3-26
Daily Project Area MSAT Emissions in Pounds per Day

Pollutant	2010 Existing Condition	2040 Build Alternative	2040 No-Build Alternative
Benzene	50.9	13.4	11.8
Acrolein	3.7	0.6	0.5
1,3-Butadiene	12.2	2.8	2.4
Diesel PM [a]	685.9	31.9	27.8
Formaldehyde	75.8	9.6	8.4
Naphthalene	23.2	19.4	16.8
POM [b]	NA	NA	NA

Notes: NA=Not Applicable

[a] PM_{10} emissions from diesel running exhaust and crankcase exhaust.
[b] POM emissions are not calculated by MOVES, but the trend would be similar to that for naphthalene.

3.9.2.4 Greenhouse Gas Emissions

Vehicles are a major source of Greenhouse Gas (GHG) emissions and contribute to global warming primarily through the burning of gasoline and diesel fuels. National estimates show that the transportation sector (including on-road vehicles, construction activities, airplanes, and boats) accounts for almost 30 percent of total domestic carbon dioxide (CO_2) emissions.

Climate change is an important national and global concern. While the earth has gone through many natural changes in climate in its history, there is general agreement that the earth's climate is currently changing at an accelerated rate and will continue to do so in the foreseeable future. Anthropogenic (human-caused) GHG emissions contribute to this rapid change. CO_2 makes up the largest component of these GHG emissions. Other prominent transportation GHGs include methane (CH_4) and nitrous oxide (N_2O).

Many GHGs occur naturally. Water vapor is the most abundant GHG and makes up approximately two-thirds of the natural greenhouse effect. However, the burning of fossil fuels and other human activities are adding to the concentration of GHGs in the atmosphere. Many GHGs remain in the atmosphere for time periods ranging from decades to centuries. GHGs trap heat in the earth's atmosphere. Because the atmospheric concentration of GHGs continues to climb, our planet will continue to experience climate-related phenomena. For example, warmer global temperatures can cause changes in precipitation and sea levels.

To date, no national standards have been established regarding GHGs, nor has USEPA established criteria or thresholds for ambient GHG emissions pursuant to its authority to establish motor vehicle emission standards for CO_2 under the Clean Air Act. However, there is a considerable body of scientific literature addressing the sources of GHG emissions and their adverse effects on climate, including reports from the Intergovernmental Panel on Climate Change, the U.S. National Academy of Sciences, and USEPA and other Federal agencies. GHGs are different from other air pollutants evaluated in Federal environmental reviews because their impacts are not localized or regional due to their rapid dispersion into the global atmosphere, which is characteristic of these gases. The affected environment for CO_2 and other GHG emissions is the entire planet. In addition, from a quantitative perspective, global climate change is the cumulative result of numerous and varied emissions sources (in terms of both absolute numbers and types), each of which makes a relatively small addition to global atmospheric GHG concentrations. In contrast to broad scale actions such as actions involving an entire industry sector or very large geographic areas, it is difficult to isolate and understand the GHG emissions impacts for a particular transportation project. Furthermore, there is presently no scientific methodology for attributing specific climatological changes to a particular transportation project's emissions.

Under NEPA, detailed environmental analysis should be focused on issues that are significant and meaningful to decisionmaking.[7] Based on the nature of GHG emissions and the exceedingly small potential GHG impacts of the proposed action, as discussed below and shown in Table 3-27, the GHG emissions from the proposed action will not result in "reasonably foreseeable significant adverse impacts on the human environment" (40 CFR 1502.22[b]).

The context in which the emissions from the proposed project will occur, together with the expected GHG emissions contribution from the project, illustrate why the project's GHG emissions will not be significant and will not be a substantial factor in the decisionmaking. The transportation sector is the second largest source of total GHG emissions in the United States, behind electricity generation. The transportation sector was responsible for approximately 27 percent of all anthropogenic (human-caused) GHG emissions in the United States in 2009.[8] The majority of transportation GHG emissions are the result of fossil fuel combustion. CO_2 makes up the largest component of these GHG emissions. United States CO_2 emissions from the consumption of energy accounted for about 18 percent of worldwide energy consumption CO_2 emissions in 2009.[9] United States transportation CO_2 emissions accounted for about six percent of worldwide CO_2 emissions.[10]

While the contribution of GHGs from transportation in the United States, as a whole, is a large component of United States' GHG emissions, as the scale of analysis is reduced the GHG contributions become quite small. Table 3-27 presents the relationship between current and projected Illinois highway GHG emissions and total global GHG emissions, as well as information on the scale of the project relative to statewide travel activity. The emissions in Table 3-27 are presented as carbon dioxide equivalent (CO_2e) emissions, which take into account the global warming potential of chemical emissions from a source. The combustion of fossil fuels emits small amounts of N_2O and CH_4. The global warming potential of N_2O and CH_4 are 310 and 21 times that of CO_2, respectively.

The potential CO_2e emissions due to the project were estimated using the MOVES emission factor model. The estimates used ADT volumes and average speeds for access-controlled

7 See 40 CFR 1500.1(b), 1500.2(b), 1500.4(g), and 1501.7

8 Calculated from data in U.S. Environmental Protection Agency, Inventory of Greenhouse Gas Emissions and Sinks, 1990-2009.

9 Calculated from data in U.S. Energy Information Administration International Energy Statistics, Total Carbon Dioxide Emissions from the Consumption of Energy, http://www.eia.gov/cfapps/ipdbproject/IEDIndex3.cfm?tid=90&pid=44&aid=8, accessed 9/12/11.

10 Calculated from data in EIA figure 104: http://205.254.135.24/oiaf/ieo/graphic_data_emissions.html and USEPA table ES-3: http://epa.gov/climatechange/emissions/downloads11/US-GHG-Inventory-2011-Executive-Summary.pdf.

highways, primary arterials, and secondary arterials in the project area. The results were multiplied by 365 to present the GHG emissions in terms of million metric tons of CO_2e ($MMTCO_2$e) per year (see Table 3-27). The annual CO_2e emissions due to the project were compared to projected global emissions and projected emissions from the entire State of Illinois.

TABLE 3-27
Annual Project GHG Emissions in Million Metric Tons CO_2 Equivalent per Year

Pollutant	Global CO_2e[a]	Illinois CO_2e[b]	Illinois % of Global Total	Project CO_2e[c]
Existing Conditions (2010)	31,305	60.8	0.19%	0.92
Future Projections (2040)	46,103	84.0	0.18%	0.96

[a] Global emissions from EIA's International Energy Outlook 2011. The 2040 emissions were estimated by applying 1.3 percent growth rate to 2035 emissions.
[b] Illinois emissions from MOVES using Illinois defaults.
[c] Project emissions from MOVES using project volume and speed data.

Based on emissions estimates from MOVES, and global CO_2e estimates and projections from the Energy Information Administration, CO_2e emissions from motor vehicles in the entire state of Illinois contributed less than one percent of global emissions in 2010 (0.19 percent), and are projected to contribute an even smaller fraction (0.18 percent) in 2040. Illinois emissions represent a smaller share of global emissions in 2040 because global emissions increase at a faster rate. Based on modeled project CO_2e emissions, the proposed project could result in a potential increase in global CO_2 emissions in 2040 (0.0021 percent), and a corresponding increase in Illinois's share of global emissions in 2040 (1.14 percent). This very small change in global emissions is well within the range of uncertainty associated with future emissions estimates.[11, 12]

3.9.2.5 Construction-Related Particulate Matter Emissions

Demolition and construction activities can result in short-term increases in fugitive dust and equipment-related particulate emissions in and around the project area. (Equipment-related particulate emissions can be minimized if the equipment is well-maintained.) The potential air quality impacts would be short-term, occurring only while demolition and construction work is in progress and local weather conditions are appropriate. According to 40 CFR 93.123(c)(5), construction emissions were not required to be included in the PM hot-spot analysis because they would not last more than five years at any one site.

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[11] For example, Figure 114 of the Energy Information Administration's *International Energy Outlook 2010* shows that future emissions projections can vary by almost 20 percent, depending on which scenario for future economic growth proves to be most accurate.

[12] When an agency is evaluating reasonably foreseeable significant adverse effects on the human environment in an Environmental Impact Statement, and there is incomplete or unavailable information, the agency is required make clear that such information is lacking (40 CFR 1502.22). The methodologies for forecasting GHG emissions from transportation projects continue to evolve, and the data provided should be considered in light of the constraints affecting the currently available methodologies. As previously stated, tools such as USEPA's MOVES model can be used to estimate vehicle exhaust emissions of CO_2 and other GHGs. However, only rudimentary information is available regarding the GHG emissions impacts of highway construction and maintenance. Estimation of GHG emissions from vehicle exhaust is subject to the same types of uncertainty affecting other types of air quality analysis, including imprecise information about current and future estimates of vehicle miles traveled, vehicle travel speeds, and the effectiveness of vehicle emissions control technology. Finally, there is presently no scientific methodology that can identify causal connections between individual source emissions and specific climate impacts at a particular location.

The potential for fugitive dust emissions typically is associated with building demolition, ground clearing, site preparation, grading, stockpiling of materials, onsite movement of equipment, and transportation of materials. The potential is greatest during dry periods, periods of intense construction activity, and during high-wind conditions.

3.9.2.6 Conformity Analysis/Statement

The EO-WB project is located within DuPage County and Cook County, both of which are nonattainment for the 1997 8-hour ozone and 1997 annual $PM_{2.5}$ standards. The project is not located in the areas of Cook County that are designated maintenance for PM_{10}. Since this project is located in nonattainment areas for transportation-related criteria pollutants, the transportation conformity requirements of the Clean Air Act apply.

In 2010, the entire EO-WB project was included in the fiscally-constrained and conformed part of the *GO TO 2040 Comprehensive Regional Plan* (CMAP, 2010b).

Some aspects of the EO-WB project are included in the *Federal Fiscal Year 2010-2015 Transportation Improvement Program (TIP)* (CMAP, 2010c) endorsed by the MPO Policy Committee of the CMAP for the region in which the proposed project is located (the TIP number for this project is 03-96-0021). The specific elements of the project that are contained in the current TIP include Phase I and Phase II engineering and right-of-way acquisition for improvements to extend the Elgin-O'Hare Expressway east from Rohlwing Road to the new O'Hare West Bypass (see page 28 of the *Federal Fiscal Year 2010-2015 Transportation Improvement Program [TIP]* [CMAP, 2010c]). Further, the *FY 2010-2015 Proposed Highway Improvement Program* (IDOT, 2010) has several entries referencing the EO-WB project including:

- Phase I and Phase II engineering for improvements to the Elgin-O'Hare Expressway extending from IL 53 to the new O'Hare West Bypass, and the new West Bypass from I-90 to I-294.
- Land acquisition for improvements to the Elgin-O'Hare Expressway extending from IL 53 to the new O'Hare West Bypass.
- New construction of portions of the Elgin-O'Hare Expressway extending from IL 53 to the West Bypass, and the new West Bypass from I-90 to I-294.

Whereas, the project area is defined as nonattainment, the FHWA must make certain that the project is conformed as part of *GO TO 2040 Comprehensive Regional Plan*, contained within the fiscally-constrained portion of the long-range plan, and referenced in the TIP as appropriate for 2010-2015 prior to the signing of the ROD.

On March 8, 2012, the FHWA and the Federal Transit Administration (FTA) determined that the *GO TO 2040 Comprehensive Regional Plan* and the TIP conform to the SIP and the transportation-related requirements of the 1990 Clean Air Act Amendments. These findings were in accordance with 40 CFR Part 93, "Determining Conformity of Federal Actions to State or Federal Implementation Plans."

A quantitative $PM_{2.5}$ hot-spot analysis was performed for this project, and it was determined that the project would not cause, contribute to, or delay timely attainment of the annual $PM_{2.5}$ NAAQS.

The EO-WB project's design concept and scope are consistent with the project information used for the regional conformity analysis. Therefore, this project conforms to the transportation-related requirements of the 1990 Clean Air Act Amendments for the 1997 8-hour ozone standard and 1997 $PM_{2.5}$ standard.

3.9.3 Measures to Minimize Harm and Mitigation

IDOT's *Standard Specifications for Road and Bridge Construction* (IDOT, 2012) and the Illinois Tollway Supplemental Specification include provisions on dust control. Under these provisions, dust and airborne dirt generated by IDOT construction-related activities would be controlled through dust control procedures or a specific dust control plan, when warranted. The contractor would meet with the Illinois Tollway/IDOT to review the nature and extent of dust-generating activities and would cooperatively develop specific types of control techniques appropriate to the specific situation (Dust Control Plan). Techniques that may warrant consideration include measures such as minimizing track-out of soil onto nearby publicly-traveled roads, reducing speed on unpaved roads, covering haul vehicles, and applying chemical dust suppressants or water to exposed surfaces, particularly those on which construction vehicles travel. With the application of appropriate measures to limit dust emissions during construction, the EO-WB project would not cause any major, short-term PM air quality impacts.

Both IDOT and the Illinois Tollway have Special Provisions to reduce diesel exhaust air pollution from construction activities. These Special Provisions include: Ultra Low Sulfur Diesel Fuel, idling restrictions, and the use of diesel retrofits on older diesel construction equipment. These provisions will be applied during construction as referenced in subsection 3.21.3.

The Illinois Tollway specifies that construction equipment shall reduce air emissions with the use of retrofit emission control devices, and/or the use of cleaner burning diesel fuels for equipment greater than 50 horsepower. The retrofit device shall be technology included on USEPA's verified retrofit technology list, or certified by the manufacturer. Air emissions are also reduced with idling restrictions. Diesel powered equipment will not be allowed to idle except for short periods (five minutes) when loading or unloading, when forced to remain motionless in traffic, when necessary to use auxiliary equipment, and when equipment is being repaired.

The contractor will designate a point person to coordinate with the Illinois Tollway on matters of air quality. If adverse air quality conditions arise an appropriate course of action will be determined by the Illinois Tollway and the contractor.

The Chicago Climate Action Plan was developed by a multi-stakeholder task force to evaluate local sources of GHG emissions and set goals to reduce those emissions. Improved transportation options include enhancing transit developments; promoting other alternative forms of commuting such as walking, biking, and ride sharing; and developing communities around public transportation hubs. The Chicago Climate Action Plan estimates a potential reduction of 3.61 $MMTCO_2e$ from improved transportation options.

3.10 Water Resources and Aquatic Habitats

3.10.1 Affected Environment

This subsection describes the physical, biological, and chemical characteristics of surface waters in the project corridor, including their associated aquatic habitats. An evaluation of these characteristics can provide an indication of water quality and a baseline from which potential water quality impacts can be assessed. Wetlands are discussed in subsection 3.13.

The project corridor is within the Des Plaines River drainage basin, Hydrologic Unit Code (HUC) 07120004, as catalogued by the U.S. Geological Survey (USGS). The Des Plaines River drainage basin has been divided into several smaller sub-watersheds near the project corridor, including Addison Creek, Des Plaines River (main stem), Salt Creek, West Branch DuPage River, and Willow Creek. The watershed limits are based on those obtained from the IEPA.[13]

Residential land use makes up roughly half of the area within the previously mentioned watersheds (see Table 3-28), except for the Willow Creek Watershed, which consists largely of O'Hare Airport and the adjacent industrial and transportation corridor. Additional information regarding land use is provided in subsection 3.3. Studies have shown that the biological quality of streams may be impacted if the percentage of urban land use within a watershed exceeds between 10 and 30 percent (Midwest Biodiversity Institute, 2008). All of the project corridor watersheds have urban land use that exceeds 30 percent. In an effort to restore or protect watersheds and to maintain or improve water quality, watershed plans have been prepared for many of the project corridor watersheds (CBBEL, 2011a; MWH, 2009; DuPage River Coalition, 2007; CBBEL-West, 2006; CBBEL, 2004; Lower Des Plaines River Ecosystem Partnership, 2004). The DuPage River Salt Creek Workgroup (DRSCW) has also conducted studies and developed initiatives for improvement of water quality in these watersheds. The intent of the EO-WB project would be to maintain/improve the quality and quantity of aquatic resources identified in these plans, as applicable.

TABLE 3-28
Watershed Land Use Summary

Land Use	Watershed [a]									
	Addison Creek		Des Plaines River (main stem)		Salt Creek		West Branch DuPage River		Willow Creek	
	acres	%	acres	%	acres	%	acres	%	acres	%
Agricultural	0.6	0.0	46.4	0.1	295.9	0.6	940.6	4.4	69.6	0.5
Commercial	1,128.8	7.3	4,619.4	8.2	5,814.5	11.5	1,135.0	5.3	922.9	7.0
Industrial	2,466.4	16.0	4,371.1	7.8	2,448.6	4.9	296.6	1.4	5,071.1	38.3
Institutional	1,628.1	10.5	5,087.6	9.1	2,342.9	4.6	676.7	3.2	88.1	0.7

[13] Derived from 12-digit HUC (sub-watersheds). The Des Plaines River (main stem) represents one of the watersheds in the project corridor (see Exhibit 3-13). It includes areas that are tributary to the Des Plaines River, but are not included in the other watersheds. For the purposes of this document, the upper and middle Salt Creek sub-watersheds are discussed collectively as the Salt Creek Watershed. The project corridor is not located within the lower Salt Creek sub-watershed, and it is not discussed further.

TABLE 3-28
Watershed Land Use Summary

Land Use	Watershed [a]									
	Addison Creek		Des Plaines River (main stem)		Salt Creek		West Branch DuPage River		Willow Creek	
	acres	%	acres	%	acres	%	acres	%	acres	%
Open Space	1,021.7	6.6	7,170.4	12.8	9,237.2	18.3	4,670.3	22.0	652.7	4.9
Residential	7,233.4	46.8	28,879.8	51.4	24,464.7	48.5	11,047.9	51.9	1,525.8	11.5
Transportation	1,686.1	10.9	4,331.3	7.7	1,987.5	3.9	501.6	2.4	4,302.2	32.5
Vacant/ Wetlands/ Construction	237.3	1.5	1,050.7	1.9	2,636.9	5.2	1,521.5	7.2	559.4	4.2
Water	70.3	0.5	653.9	1.2	1,257.3	2.5	497.9	2.3	48.1	0.4
Total	15,472.7	100.1	56,210.6	100.2	50,485.5	100.0	21,288.1	100.1	13,239.9	100.0

Source: CMAP, 2005.

Note: Land use acreages are from CMAP and may vary from data provided by other sources found in other tables within this document. Numbers in table have been rounded. Percentages may exceed 100.

[a] Includes the 12-digit HUC sub-watersheds where the project corridor is located. For the purposes of this document, the upper and middle Salt Creek sub-watersheds are discussed collectively as the Salt Creek Watershed. The project corridor is not located within the lower Salt Creek sub-watershed and it is not discussed further.

The DRSCW is an active watershed group consisting of local communities, publicly owned treatment works (POTW), and environmental organizations that work together to identify stressors to the aquatic environment (through stream monitoring) and develop/implement recommendations and actions to improve water quality and stream health. The DRSCW has also identified projects with a high potential to restore beneficial uses to stream segments in the DuPage River-Salt Creek Watersheds. Projects include dam removal, habitat restoration, stormwater management, chloride reduction, and a study of the impact of deicers (Midwest Biodiversity Institute, 2010). For additional information refer to: http://drscw.org/.

In addition to the DRSCW, several other watershed groups have formed, including the Upper Des Plaines River Ecosystem Partnership (UDPREP), Lower Des Plaines Ecosystem Partnership (LDPEP), the DuPage River Coalition (DRC), and the Salt Creek Watershed Network (SCWN). The UDPREP, LDPEP, and DRC are Ecosystem Partnerships associated with the IDNR Conservation 2000 (C2000) Program.[14] The UDPREP and LDPEP are dedicated to watershed protection, preservation, and enhancement. Both of these partnerships provide watershed resources, assist stakeholders with developing strong grant proposals for watershed improvements, and provide input on the C2000 grant selection process. Additional information can be found on the Internet at:

[14] The C2000 Program (renamed Partners for Conservation in 2008) is a comprehensive, long-term approach to natural resource protection and management in Illinois. The Partners for Conservation program provides funding and technical assistance for habitat restoration, land acquisition, planning, research, and outreach. Partners for Conservation is joint funded by the IDNR, IDOA, and IEPA.

http://lowerdesplaines.org/index.html and http://www.upperdesplainesriver.org/index.htm.

The DRC is a sister organization to the DRSCW. The main role of the DRC is to work with individuals in the watershed at the local level through outreach and education with the goal of improving the water quality of the DuPage River. The DRC also coordinates the DuPage River Watershed Plan. Similar to UDPREP and LDPEP, the DRC provides input on the C2000 grant selection process. Additional information can be found on the Internet at: http://www.dupagerivers.org/.

The SCWN is an organization that promotes awareness of issues affecting Salt Creek and investigates opportunities to restore the creek to be an enjoyable public resource. The SCWN conducts public education and outreach throughout the watershed and promotes the use of best management practices to improve water quality and recreation. Additional information can be found on the Internet at: http://www.saltcreekwatershed.org/.

3.10.1.1 Water Resources

Water resources in the project corridor include riverine and lacustrine cover types. During the summer and fall of 2009, 2010, and 2011, the Illinois Natural History Survey (INHS) conducted field surveys and assessments of streams, lakes, and non-wetland ponds near the project corridor (Matthews et al., 2009; Matthews et al., 2010; Matthews and Zercher, 2010; Wetzel et al., 2010a; Wetzel et al., 2010b; Matthews et al., 2011).

Ten creeks and their tributaries, two lakes, and 40 non-wetland ponds were identified in the vicinity of the project corridor (see Table 3-29 and Exhibit 3-13). The non-wetland ponds are predominantly stormwater management facilities that INHS did not consider to be jurisdictional waters of the U.S.[15] These non-jurisdictional stormwater management ponds are not discussed further in this subsection.

TABLE 3-29
Project Corridor Water Body Summary

Watershed	Surface Water [a]	Acreage in Project Corridor [b]
Addison Creek	Addison Creek	0.07
Des Plaines River – main stem	Bensenville Drainage Ditch [c]	0.05
	Silver Creek	0
Salt Creek	Devon Avenue Tributary (including on-line ponds)	0.002
	Meacham Creek	0.04
	Salt Creek	0.44
	Spring Brook	0
	Wood Dale – Itasca Reservoir	0
West Branch DuPage River	West Branch DuPage River	0

15 Section 404 (Clean Water Act) waters are defined at and determined in accordance with 33 CFR §§328-329 and 40 CFR §230.3. Final jurisdictional determination is completed by the USACE.

TABLE 3-29
Project Corridor Water Body Summary

Watershed	Surface Water [a]	Acreage in Project Corridor [b]
Willow Creek	Briarwood Lake	0
	Higgins Creek	1.50
	Willow Creek	1.25
Total		**3.35**

Source: Matthews and Zercher, 2010; Matthews et al., 2011.

[a] Two lakes and three streams were identified by INHS near, but outside, the project corridor. These water bodies have an acreage of "0" in this table.
[b] Acreage for streams includes main stem and tributaries (where applicable). Totals may vary from other data in this document due to rounding.
[c] Downstream of O'Hare Airport, Bensenville Drainage Ditch is known as Silver Creek.

The two lakes identified by INHS are located outside the project corridor, but are adjacent to it. One of these lakes is actually a compensatory wetland mitigation site for a project previously authorized under Section 404 of the Clean Water Act (CWA). This mitigation site is located adjacent to Salt Creek, south of Thorndale Avenue at the Wood Dale – Itasca Reservoir, and includes primarily open water. The other lake is known as Briarwood Lake. This lake is located within a residential subdivision north of I-90 and west of Busse Road. Briarwood Lake outlets to Higgins Creek.

The West Bypass corridor is located along the west side of O'Hare Airport. Two of the project corridor creeks, Willow Creek and Bensenville Drainage Ditch, pass through this corridor. Portions of these creeks have been or will be realigned as part of the OMP improvements to meet airport needs, FAA requirements (AC 150-5300-13), and in compliance with IDNR – OWR regulations (see Exhibit 3-13 and Figure 3-8). Construction of remaining OMP creek realignment(s) is anticipated to continue through 2014.

FIGURE 3-8
REALIGNED WILLOW CREEK WEST BYPASS CORRIDOR AT O'HARE AIRPORT

Source: CBBEL, 2010.

None of the project corridor streams have special designations with respect to function, value, or high quality.[16] The streams are not listed as navigable waters of the U.S. under Section 10 of the River and Harbors Act of 1899 (USACE, 2010) or as Wild and Scenic Rivers. The waters are also not included on the Nationwide Rivers Inventory for "outstandingly remarkable" natural or cultural values of more than local or regional significance. No Biologically Significant

[16] Based on the DuPage County Wetland Inventory, two of the identified creeks (i.e., Meacham Creek and West Branch DuPage River) pass through/are adjacent to mapped higher quality wetland near the project corridor. As described in this section, these streams are degraded/low quality.

Streams (BSS) are within the project corridor. Based on information provided by the IDNR and Illinois Natural Heritage Database (March 21, 2011), none of the identified streams include mapped Illinois Natural Areas or state-listed threatened or endangered species within the project corridor.

The location of the surface bodies of water and watersheds are depicted in Exhibit 3-13. The physical, biological, and chemical characteristics of the project corridor surface bodies of water are described in the following subsections.

3.10.1.2 Physical and Biological Description of Surface Water Bodies

A stream's physical characteristics (such as substrate and flow rate) may interact to affect the aquatic biota. In rivers, habitat is usually closely linked to biological diversity. This subsection describes the physical and biological characteristics of streams in the project corridor (see Table 3-30 and Table 3-31). The information summarized is primarily based on fieldwork completed during 2009 and 2010 (Matthews and Zercher, 2010; Wetzel et al., 2010a; Wetzel et al., 2010b). Stream sampling locations are depicted in Exhibit 3-13. Key physical characteristics of the streams listed in Table 3-30 are defined in the following subsections.

Flow Characteristics

All of the water bodies in Table 3-30 are lotic systems, or streams with flow. Streams may have an ephemeral, intermittent, or perennial flow regime. In general, a perennial stream usually maintains constant flow throughout the year and is capable of supporting fish and mussels. An intermittent stream flows when the water table is seasonally high or during periods of precipitation that generate surface flow. Intermittent streams may support a limited assemblage of fish species. Ephemeral streams flow only during or after storms or snow melt or during short periods of elevated water tables. Stream flow within the evaluated creeks was determined by field observation, unless otherwise noted in Table 3-30. Seven of the nine streams listed in Table 3-30 (i.e., Addison Creek, Higgins Creek, Meacham Creek, Salt Creek, Spring Brook, West Branch DuPage River, and Willow Creek) appear to have perennial flow, and two (i.e., Bensenville Drainage Ditch and Silver Creek) appear to have intermittent flow (near the project corridor).

TABLE 3-30
Summary of the Physical Parameters of Project Corridor Creeks

Stream [a]	Upstream Drainage Area (sq mi) [b]	Flow Characteristics	Substrate Type	Stream Width (ft) [c]	Water Depth (ft) [c]	Riparian Vegetation	Mean Habitat Score [d]	Watershed Characteristics [e]
Addison Creek	6.0	lotic, perennial	silt, clay	15-24.5	0.5-4	trees, herbaceous vegetation	50.5 (poor)	industrial, residential, forest, STP
Bensenville Drainage Ditch	1.9	lotic, intermittent [f]	silt	7	2	herbaceous vegetation, mowed grass, concrete [g]	not scored	O'Hare Airport, residential, mowed grass [g]
Higgins Creek	7.0	lotic, perennial	concrete	16.5-33	1-5	concrete, mowed grass	not scored	mowed grass, interstate, STP
Meacham Creek	2.9	lotic, perennial	silt, clay, sand	19.5-36	1-5	emergents, herbaceous vegetation, shrubs	44.0 (poor)	mowed grass, parking lot, industrial
Salt Creek	71.0	lotic, perennial	silt, clay, sand	46-59	1-7	grasses, trees	67.0 (poor)	field/pasture, forest, parking lot, industrial, STP
Silver Creek	6.4 [h]	lotic, intermittent [f]	sand, gravel, silt [g]	15	≤1 [g]	herbaceous vegetation, trees [g]	not scored	transportation, industrial, residential [g]
Spring Brook	12.0 [h]	lotic, perennial	silt, sand, clay	23	1.5	trees, herbaceous vegetation	52.0 (poor)	industrial, forest, STP
West Branch DuPage River	10.1 [h]	lotic, perennial	clay, silt, gravel, cobble	26-39.5	2.5-5	trees, grass, herbaceous vegetation	54.0 (poor)	industrial, field
Willow Creek	6.0	lotic, perennial	silt, gravel, cobble	15-18.5	1-4	trees, herbaceous vegetation	40.5 (poor)	industrial, field/pasture

Source: Matthews and Zercher, 2010; Wetzel et al., 2010a; Wetzel et al., 2010b; USGS Elmhurst Quadrangle Map, 1997; CBBEL field reconnaissance, 2008; CMAP, 2005.

[a] Devon Avenue Tributary was not sampled. Near the project corridor, it consists of a series of interconnected online ponds, which eventually drain to Salt Creek.
[b] Drainage area provided near downstream crossing of project corridor, unless otherwise noted.
[c] Estimated during INHS field visits
[d] A score less than 80 = poor; 80-109.9 = fair; 110-129.9 = good; greater than 130 = excellent
[e] Watershed characteristics are based on surrounding land use as described in INHS Technical Reports, unless otherwise noted. STP = immediately downstream of sewage treatment plant/water with strong odor of treated sewage.
[f] Periodicity of flow based on USGS Quadrangle Map.
[g] Information based on CBBEL field reconnaissance (August 2008) and/or review of mapped land use (CMAP, 2005).
[h] The project corridor drains to Silver Creek, Spring Brook, and the West Branch DuPage River, but it does not cross these streams. Drainage areas are from the Flood Insurance Study for Cook and DuPage County (FEMA and DuPage County, 2007; FEMA, 2008) near Silver Creek/Franklin Avenue, Spring Brook/IL 53, and West Branch DuPage River/Lake Street.

TABLE 3-31
Summary of the Biological Characteristics of Project Corridor Creeks

Stream [a]	No. Fish Species Present [b]	Dominant Fish Species (%)	Index of Biotic Integrity [c]	Aquatic Habitat Quality [d]	Cumulative EPT Richness [e]	Mean Taxa Richness [f]	Oligochaete Specimens (%)	Chironomid Specimens (%)	Diversity [g] (Score)	Integrity [g] (Score)
Addison Creek	5	fathead minnow (87%)	8	7.14 (poor)	0	10.00	52%	19%	not scored [h]	not scored [h]
Bensenville Drainage Ditch [i]	1	mosquitofish (100%)	not scored	not scored	1	10.00 [j]	0%	0%	not scored	not scored
Higgins Creek [k]	NA	NA	NA	NA	NA	NA	NA	NA	not scored	not scored
Meacham Creek	5	fathead minnow (70%)	13	6.86 (poor)	0	17.17	33%	15%	not scored	not scored
Salt Creek	10 (plus 1 hybrid)	green sunfish (29%)	17	5.97 (fairly poor)	0	10.83	34%	20%	C (0.714)	C (0.500)
Silver Creek [k]	NA	NA	NA	NA	NA	NA	NA	NA	not scored	not scored
Spring Brook	14	largemouth bass (29%)	22	7.00 (poor)	1	8.00	77%	5%	not scored	not scored
West Branch DuPage River	7	sand shiner (32%)	17	7.00 (poor)	0	7.67	58%	13%	not scored	not scored
Willow Creek	2	green sunfish (72%)	4	6.76 (poor)	1	12.33	32%	9%	not scored [h]	not scored

Source: All data from Wetzel et al. (2010a) and Wetzel et al. (2010b), unless otherwise noted. Diversity and Integrity Scores from IDNR-Office of Resource Conservation (ORC) (2008); Data for Bensenville Drainage Ditch from Headrick (2002).

Note: A mussel survey was not completed for this project.

[a] Devon Avenue Tributary was not sampled. Near the project corridor, it consists of a series of interconnected online ponds, which eventually drain to Salt Creek.
[b] No intolerant fish species were collected by INHS or Headrick during field sampling.
[c] Calculated using INHS fish sampling data. Scores range from 0-60. Scores ≤ 30 represent streams where the biotic integrity is much lower than that expected in Illinois streams that are least impacted by human activities.
[d] Based on Hilsenhoff's (1988) *Family-Level Biotic Index*. Mean scores are provided. Scores range from 0-10 (cutoff points associated with this table include: 5.76-6.50 = fairly poor/substantial pollution likely; 6.51-7.25 = poor/very substantial pollution likely)
[e] The total number of different kinds of aquatic organisms in a collection belonging to the insect orders: Ephemeroptera (E), Plecoptera (P), and Trichoptera (T)
[f] An indicator of macroinvertebrate diversity; a greater number represents a more diverse community
[g] From IDNR-ORC (2008). Streams without available data or that did not fit the assessment tools (e.g., Index of Biotic Integrity [IBI]) were "not scored."
[h] Within the project corridor, Addison Creek and Willow Creek were not scored. Approximately 8,500 feet downstream of the project corridor, Addison Creek has an E rating for diversity and integrity. Approximately 1,750 feet downstream of the project corridor, Willow Creek has a D rating for diversity.
[i] Data for Bensenville Drainage Ditch is from Headrick (2002). Macroinvertebrate communities typical of low quality aquatic habitats were collected during sampling. Only one species of fish was collected during sampling. Therefore, an IBI was not scored.
[j] Represents Total Taxa Richness based on data collected by Headrick (2002).
[k] Higgins Creek was not sampled by INHS due to absence of natural habitat (i.e., concrete-lined channel). Silver Creek was not sampled. NA = data not available.

Stream Substrate

Substrate may provide habitat, shelter, or refuge from the current or predators, a surface for organisms to cling to or burrow under, or material to build cases or tubes (e.g., caddisflies). The streambed may be composed of sand, gravel, cobble, detritus, silt, clay, or bedrock. Substrate type(s) may vary at different locations within a stream and may change over time. Excessive sand and silt in the substrate can diminish habitat quality for fish and aquatic macroinvertebrates by filling interstitial spaces and by contributing to turbidity (when in suspension). Other substrate types, such as gravel, cobble, and detritus can contribute to a diverse fish and aquatic macroinvertebrate assemblage. The majority of the project corridor streams have substrates of silt, clay, or sand.

Stream Width and Depth

Stream width and depth, in combination with other factors (e.g., flow velocity, discharge, etc.), can influence channel stability and habitat diversity. A wide stream generally will have more variation in substrate type than a narrow stream, and may support more diverse assemblages of aquatic biota. However, flow regime is a more important determinant of aquatic species richness.

The volume of water in the stream channel also plays an important role in determining the number and variety of aquatic organisms. Slow current velocities and shallow water limit large fish with respect to feeding, reproduction, and predator avoidance.

The project corridor streams range in width from approximately seven to 59 feet and water depth ranges from less than one foot deep to approximately seven feet. In general, Bensenville Drainage Ditch and Silver Creek are the smallest of the assessed project corridor streams and Salt Creek is the largest.

Riparian Vegetation

Riparian environments include the vegetated portion of the floodplain adjacent to rivers, streams, and creeks (see Figure 3-9). Riparian environment functions may include erosion control, streambank stabilization, water quality benefits, treatment of contaminated stormwater runoff, habitat for plants and animals, a source of organic and nutrient input, moderation of stream temperatures (keep streams cool), and recreational or aesthetic value.

FIGURE 3-9
SALT CREEK SOUTH OF THORNDALE AVENUE LOOKING DOWNSTREAM (SOUTH)

Source: INHS, 2009.

The majority of the project corridor streams have trees or shrubs located within a relatively narrow riparian corridor. The wooded areas are generally not extensive and are fragmented by existing roads or other development. For the most part, beneficial buffer functions of the riparian environment in the project corridor are limited. See subsection 3.14 for additional discussion regarding wooded riparian habitat.

Mean Habitat Score

Mean habitat assessment scores are based on a modified standard USEPA method that looks at several physical stream characteristics to rate the habitat structure of a stream segment. Assessment scores represent an average of scores determined by two researchers. A score greater than 130 indicates excellent habitat characteristics. A score below 80 indicates poor habitat characteristics. The project corridor streams ranked "poor," ranging from 40.5 (Willow Creek) to 67 (Salt Creek). These scores indicate the presence of degraded habitat or the presence of pollutants.

A habitat assessment was not completed for Higgins Creek. This stream is contained within a concrete-lined channel and had limited natural habitat at the INHS sampling point (see Figure 3-10). Higgins Creek was eliminated from further study regarding biota (i.e., fish and macroinvertebrates); however, water quality sampling was completed for Higgins Creek.

FIGURE 3-10
HIGGINS CREEK NORTH OF I-90 LOOKING UPSTREAM (WEST)

Source: INHS, 2009.

Upstream Drainage Area and Watershed Characteristics

Assessing the upstream drainage area and characteristics of a watershed can provide information relative to stream health and potential causes of impairment. The upstream drainage areas range from 1.9 square miles (Bensenville Drainage Ditch) to 71.0 square miles (Salt Creek). The majority of the land use in the project corridor watersheds includes developed land that appears to have contributed to stream degradation (see subsection 3.10.1.3).

Highly Erodible Soils

Highly erodible soils have been identified to have slopes of four percent or greater. These soils are usually associated with changes in topography and can occur along streams. When cleared of vegetation, these soils can become a source of sediment for adjacent waters. Based on Cook County and DuPage County soils maps, approximately 88.1 acres of highly erodible soils were identified in the project corridor (see Exhibit 3-14), primarily near the creeks, open space, and/or residential areas. Even though soil types have been mapped by the NRCS, most of the project corridor soils have been extensively altered by past grading activity associated with the existing roadway network and adjoining development; therefore, the mapped characteristics actually may not be present.

Biological Stream Ratings

In 2008, the IDNR released biological stream ratings for Illinois streams (IDNR-Office of Resource Conservation [ORC], 2008).[17] These ratings can be used to identify aquatic

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[17] Based on information from IDNR, the new stream ratings replace the Biological Stream Characterization (BSC) and BSS developed in 1984 and 1992, respectively.

resource quality, including biologically diverse streams and those with a high degree of biological integrity. The diversity and integrity scores fall within one of five ratings ranging from A to E, with A representing the highest biological integrity or diversity of evaluated stream segments. Within the project corridor, only one creek was rated by IDNR. Salt Creek received a C rating for both biological diversity and integrity (see Table 3-31).[18]

Fish

Seventeen species of fish and one hybrid sunfish, representing seven families, were identified within the project corridor streams during sampling (Wetzel et al., 2010a; Wetzel et al., 2010b; Headrick, 2002). No pollution intolerant fish species, threatened or endangered species, or "Species in Greatest Need of Conservation for Illinois"[19] were collected or observed. All fish species collected were common inhabitants of northern Illinois. The low level of fish diversity and absence of intolerant species is likely a result of poor habitat and/or water quality. High levels of siltation and urban debris were observed at most sites during the sampling, and riparian vegetation was minimal.

Dominant fish species are those species that make up 20 percent or more of the total catch at a sampling site. Five fish species dominated these streams, including fathead minnow (*Pimephales promelas*), green sunfish (*Lepomis cyanellus*), largemouth bass (*Micropterus salmoides*), mosquitofish (*Gambusia affinis*), and sand shiner (*Notropis stramineus*) (see Table 3-31). Fathead minnow and green sunfish are among the most tolerant fish species in Illinois, and are frequently found in disturbed habitats. Largemouth bass and sand shiners are widespread in Illinois and found in habitats of all types and quality. Mosquitofish are very adaptable and relatively tolerant of pollution. Mosquitofish have been widely introduced to control mosquitoes, although its expansion is limited locally by cold winters.

Of the streams in which fish assemblages were assessed, Spring Brook had the highest species diversity (14 species; Index of Biotic Integrity [IBI] = 22).[20] However, habitat diversity in Spring Brook was low because the stream was predominantly a run with moderate flow and substrate of mostly firm mud and gravel. Salt Creek had 10 species of fish (plus one hybrid sunfish) (IBI = 17). Both pools and runs were observed at the Salt Creek sampling location. The larger size of Salt Creek appears to be responsible for the greater diversity of fish. The West Branch DuPage River had seven fish species (IBI = 17). Fish diversity was low for a stream of this size. Addison Creek (IBI = 8) and Meacham Creek (IBI = 13) each had five fish species. Low habitat quality likely explains the low diversity of fish. Low-quality habitat likely explains the extremely low diversity at Willow Creek, too, where only two tolerant fish species were collected (IBI = 4). Industrial development surrounds this sampling site, and a large amount of concrete and industrial debris was in the stream at the time of the INHS assessment. One species, the mosquitofish, was collected from Bensenville Drainage Ditch during sampling. Fish sampling was limited by dense stands of common waterweed (*Elodea canadensis*) and thick bank vegetation. The potential of

[18] All integrity and diversity ratings for the project corridor were rated with macroinvertebrates; no fish, mussel, or crayfish data were available for the streams.

[19] Based on Appendix I of Illinois Wildlife Action Plan (IDNR, 2005).

[20] IBI was calculated using INHS fish sampling data. IBI scores range from 0 to 60. Scores equal to or less than 30 represent streams where the biotic integrity is much lower than that expected in Illinois streams least impacted by human activities (i.e., degraded conditions).

this stream to maintain a viable fish population is limited by the water quality conditions and other habitat factors (Headrick, 2002).

The project corridor creeks may be used for recreational fishing, but the creeks do not support commercial fisheries. Game fish, such as largemouth bass, bluegill (*Lepomis macrochirus*), sunfish (*Lepomis* spp.), bullhead (*Ameiurus* spp.), and black crappie (*Pomoxis nigromaculatus*) were identified during the sampling. Besides Bensenville Drainage Ditch, all of the sampled creeks contained at least one species of game fish, with the greatest representation being found in Salt Creek and Spring Brook, which is tributary to Salt Creek. Many of these game fish species are stocked for recreational purposes in water bodies (e.g., Busse Lake) at parks and/or forest preserves located near the project corridor. Busse Lake drains to Salt Creek upstream of the project corridor. The larger project corridor creeks (e.g., Salt Creek and the West Branch DuPage River) may be used for other water-related activities, such as canoeing. However, the recreational use of the project corridor creeks is limited by their degraded nature and water quality impairments (see Table 3-32).

TABLE 3-32
Use Support and Impairment Summary for Project Corridor Water Bodies

Water Body [a]	Designated Use [b]	Causes of Impairment	Sources of Impairment	Impaired Waters [c]
Addison Creek Watershed				
Addison Creek (AUID: GLA 04)	Not supporting: AL Not assessed: AQ, FC, PC, SC	alpha.-BHC, alteration in stream-side or littoral vegetative covers, copper, hexachlorobenzene, oil and grease, other flow regime alterations, DO, polychlorinated biphenyls (PCBs), sedimentation/siltation, total suspended solids (TSS), phosphorous (total), bottom deposits, aquatic algae, visible oil	Contaminated sediments, channelization, loss of riparian habitat, streambank modifications/ destabilization, upstream impoundments, municipal point source discharges (MPSD), impacts from hydrostructure flow regulation/modification, urban runoff/storm sewers, dam or impoundment	Yes
Des Plaines River (main stem) Watershed				
Bensenville Drainage Ditch	Not identified [d]	Not identified [d]	Not identified [d]	Not assessed
Silver Creek [e] (AUID: GM 01)	Not assessed: AL, AQ, FC, PC, SC	Not assessed	Not assessed	Not assessed
Salt Creek Watershed				
Devon Avenue Tributary	Not identified [d]	Not identified [d]	Not identified [d]	Not assessed
Meacham Creek (AUID: GLBA)	Not supporting: AL Not assessed: AQ, FC, PC, SC	Other flow regime alterations, DO	Impacts from hydrostructure flow regulation/modification, urban runoff/storm sewers	Yes [f]

TABLE 3-32
Use Support and Impairment Summary for Project Corridor Water Bodies

Water Body [a]	Designated Use [b]	Causes of Impairment	Sources of Impairment	Impaired Waters [c]
Salt Creek (AUID: GL 10)	Not supporting: AL, FC, PC Not assessed: AQ, SC	Alteration in stream-side or littoral vegetative covers, arsenic, chloride, hexachlorobenzene, methoxychlor, nickel, other flow regime alterations, pH, DO, aquatic plants, aquatic algae, mercury, PCBs, fecal coliform	Channelization, streambank modifications/destabilization, contaminated sediments, MPSD, urban runoff/storm sewers, impacts from hydrostructure flow regulation/modification, upstream impoundments, dam or impoundment, source unknown, atmospheric deposition - toxics	Yes
Spring Brook [e] (AUID: GLB 01)	Not supporting: AL Not assessed: AQ, FC, PC, SC	Alteration in stream-side or littoral vegetative covers, dichloro-diphenyl-trichloroethane (DDT), endrin, hexachlorobenzene, other flow regime alterations, DO, sedimentation/siltation, TSS, phosphorus (total), aquatic algae	Channelization, contaminated sediments, impacts from hydrostructure flow regulation/modification, MPSD, upstream impoundments, urban runoff/storm sewers	Yes
West Branch DuPage River Watershed				
West Branch DuPage River [e] (AUID: GBK 14,09)	Not supporting: AL, PC Not assessed: AQ, FC, SC	Chloride, sedimentation/siltation, pH, phosphorus (total), fecal coliform, alteration in stream-side or littoral vegetative covers, DO, changes in stream depth and velocity patterns	MPSD, urban runoff/storm sewers, site clearance, channelization, municipal (urbanized high density area)	Yes
Willow Creek Watershed				
Briarwood Lake (AUID: SGI)	Insufficient information: AL, AQ Not assessed: FC, PC, SC	TSS, phosphorus (total)	Unknown	Insufficient information/ Not assessed
Higgins Creek (AUID: GOA 02,01)	Not supporting: AL, PC Not assessed: AQ, FC, SC	Chloride, phosphorus (total), fecal coliform, cause unknown	MPSD, urban runoff/storm sewers	Yes
Willow Creek (AUID: GO 01)	Not supporting: AL Not assessed: AQ, FC, PC, SC	Alteration in stream-side or littoral vegetative covers, phosphorus (total), loss of in-stream cover	Channelization, loss of riparian habitat, municipal (urbanized high density area), MPSD	Yes

Source: IEPA/BOW, 2012.

[a] Information is provided for water body segment Assessment Unit Identifications (AUID) associated with the project corridor. Designated uses and impairments may vary per AUID. The Wood Dale – Itasca Reservoir was not assessed by IEPA and is not included in this table.
[b] Abbreviations: AL: Aquatic Life; AQ: Aesthetic Quality; FC: Fish Consumption; PC: Primary Contact; SC: Secondary Contact. No specific assessment guidelines have been developed to assess SC use for Illinois streams and inland lakes.
[c] Impairment status is based on the IEPA *Illinois Integrated Water Quality Report and Section 303(d) List* (IEPA/BOW, 2012)
[d] "Not identified" means that the water body was not listed in the IEPA *Illinois Integrated Water Quality Report and Section 303(d) List* (IEPA/BOW, 2012)
[e] AUID is not crossed by the project corridor.
[f] Meacham Creek is impaired for AL, but it is not on the IEPA 303(d) list. A TMDL for the pollutant causing the impairment has been approved by USEPA.

Aquatic Macroinvertebrates

Aquatic macroinvertebrates can be used as indicators of water quality conditions. Aquatic macroinvertebrates were sampled in seven of the project corridor streams (Wetzel et al., 2010a; Wetzel et al., 2010b; Headrick, 2002).[21] No unique or rare aquatic macroinvertebrates were observed during the sampling. The project corridor streams support aquatic macroinvertebrate communities that are typical of polluted, urban streams. Based on the sampling, none of the aquatic macroinvertebrates collected from the streams are listed as threatened or endangered species, nor are any of the listed species known or thought likely to occur within the project corridor (Wetzel et al., 2010a; Wetzel et al., 2010b).

Relationships between four metrics were assessed during analysis of the project corridor streams, including Cumulative EPT[22] Richness, Mean Taxa Richness, Mean Habitat Score, and Mean Family-Level Biotic Index. The EPT taxa are generally considered good indicators of water quality. Only a small number of mayflies (Ephemeroptera)[23] were collected during the sampling at Willow Creek, Spring Brook, and Bensenville Drainage Ditch (a mayfly was also collected at Meacham Creek during supplemental sampling). No stoneflies (Plecoptera) or caddisflies (Trichoptera) were collected (see Table 3-31).

Mean Taxa Richness can be used as an indicator of macroinvertebrate diversity; a greater number represents a more diverse community. Mean Taxa Richness ranged from 7.67 (West Branch DuPage River) to 17.17 (Meacham Creek) (see Table 3-31). Based on the macroinvertebrate samples collected by INHS, Meacham Creek had the greatest number of different taxa collected and the most diversity. Generally, the number of taxa decreases with increased degradation. Mean Habitat Score was previously discussed with physical characteristics of the project corridor streams. Salt Creek had the highest Mean Habitat Score, with the other sites having somewhat similar lower scores; all were indicative of poor habitat conditions (see Table 3-30).

In contrast to the EPT taxa, other macroinvertebrate taxa may be indicative of degraded or polluted streams. Degraded streams (e.g., streams with low amounts of dissolved oxygen [DO]) may include a higher percentage of oligochaete worms and midges (Chironomids). In general, the percentage of oligochaete worms in the macroinvertebrate samples ranged from 32 to 77 percent and the percentage of midges ranged from five to 20 percent (see Table 3-31). No oligochaete worms or midges were collected from Bensenville Drainage Ditch; flatworms (Turbellaria) were the dominant taxa at this site (Headrick, 2002). Flatworms may dominate in moderately polluted waters and prefer moderate nutrient levels.

Aquatic Habitat Quality was based on Hilsenhoff's (1988) *Family-Level Biotic Index*, which summarizes the macroinvertebrate community into a single pollution tolerance value. The biotic index is reported on a scale of 0 to 10. Low scores indicate good water quality with negligible organic pollution. High scores indicate poor water quality with serious organic pollution. Mean scores for the project corridor streams ranged from 5.97 (Salt Creek) to 7.14 (Addison Creek). Salt Creek was the only stream that received a mean score indicative of fairly poor aquatic habitat (likely substantial pollution). The other streams received mean

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[21] INHS did not assess Bensenville Drainage Ditch. Data from Headrick (2002) was used in this document.

[22] EPT refers to Ephemeroptera (mayflies), Plecoptera (stoneflies), and Trichoptera (caddisflies). EPT taxa richness will decrease with degrading water quality.

[23] Mayflies exhibit variation in pollution tolerance between species, but in general, are indicators of good water quality.

scores that indicate poor aquatic habitats that likely have very substantial pollution (see Table 3-31).

Based on the results of an unrelated study for the DRSCW, the Salt Creek main stem scored in the poor to fair quality range with respect to macroinvertebrate sampling. The West Branch DuPage River sites located in the vicinity of the project corridor had scores indicating relatively poor quality. Addison Creek, Spring Brook, and Meacham Creek had relatively tolerant macroinvertebrate communities, with scores suggesting toxic conditions (Midwest Biodiversity Institute, 2008). The Willow Creek and Des Plaines River (main stem) Watersheds were not sampled during the DRSCW study.

Mussels and Clams

Due to the degraded condition of the streams in the project corridor, a mussel survey was not completed for this project. Instead, available databases were searched for mussel and clam information. According to a review of the available data, seven species of mussels and four species of clams were collected from aquatic resources located in (or near) the project corridor.[24] Most of these mussel species are widespread or common and locally abundant species (INHS, 2005). The Forest Preserve District of DuPage County (FPDDC) information included one state-listed threatened slippershell mussel (*Alasmidonta viridis*); however, the specimen was a relic or weathered dead shell (Meister, 2010).

3.10.1.3 Water Quality

In addition to the information previously discussed in this subsection (e.g., Hilsenhoff's 1988 *Family-Level Biotic Index*), water quality was assessed based on the Illinois Integrated Water Quality Report and Section 303(d) List (IEPA/Bureau of Water [BOW], 2012) and based on chemical constituents of area streams from data collected by INHS during 2009 and 2010 (Wetzel et al., 2010a; Wetzel et al., 2010b) and DRSCW (various years, see discussion below).

Within Illinois, waters are protected and evaluated under the General Use Water Quality Standards (Title 35 Illinois Administrative Code, Subtitle C, Chapter I, Part 302, Subparts A and B). Designated uses under the General Use Water Quality Standards include aquatic life, fish consumption, primary contact, secondary contact, and aesthetic quality. States are required to classify waters with respect to impairments. Waters that do not fully support their designated uses are considered impaired and are cataloged in the 303(d) list, requiring total maximum daily loads (TMDLs). TMDLs establish pollution reduction goals to improve the quality of impaired waters.

TMDLs have been prepared for waters in the Salt Creek Watershed[25] and the West Branch DuPage River (CH2M HILL, 2004b). In addition, segments of three creeks that cross (or are proximate to) the project corridor (i.e., Salt Creek, West Branch DuPage River, and Higgins Creek) have TMDLs in progress to address additional impairments (IEPA/BOW, 2012; AECOM, 2009; AECOM, 2010; CDM, 2009).

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[24] Includes mussel and clam data from the county forest preserves, from the macroinvertebrate sampling completed for this project (Wetzel et al., 2010a; Wetzel et al., 2010b), and from a separate study for O'Hare Airport (Headrick, 2002).

[25] The Salt Creek TMDLs address segments of the following project corridor creeks: Salt Creek, Addison Creek, Spring Brook, and Meacham Creek (CH2M HILL, 2004a).

Table 3-32 provides IEPA water quality assessment designations for surface waters within the project corridor.

Most of these surface waters are impaired creeks that do not support aquatic life (i.e., have an aquatic life use impairment), have been channelized or modified, and are surrounded by development (with forest preserve areas generally being an exception). All of the assessed streams with impairments have municipal point source discharges (MPSD), urban runoff, and/or storm sewers listed as a source of their degradation. Other common sources of impairment for these streams include channelization, impacts from hydrostructure flow regulation/modification,[26] upstream impoundments, and contaminated sediments (IEPA/BOW, 2012).

Effluent from wastewater treatment plants (e.g., MPSD) can dominate the flow of creeks downstream, especially during the summer base flow period between July and October (Midwest Biodiversity Institute, 2008). Wastewater effluents entering streams may increase pollutant loads, particularly during low-flow conditions. These loads may affect water quality downstream of their outflows. Eight wastewater treatment plant outfalls are located near the project corridor; in general, six are located within two miles upstream of the project corridor and two are located within one mile downstream of the project corridor (see Exhibit 3-13).

Five of the seven INHS sampling sites (Addison Creek, Higgins Creek, Salt Creek, Spring Brook, and West Branch DuPage River) are located downstream of municipal wastewater treatment facilities. Several of these streams smelled strongly of treated wastewater effluent or had a heavy chlorinated water odor (most likely attributed to the upstream wastewater treatment facility) during the INHS field visits (Wetzel et al., 2010a; Wetzel et al., 2010b).

Similar to IEPA, other studies concur that the urban surroundings (and consequent stormwater runoff and other discharges) and channel/riparian modifications have contributed to the degradation of the project corridor streams. Based on the field assessments completed by INHS, the degraded condition of the project corridor streams is associated with urbanization, sedimentation, and chemical pollution resulting from urban/industrial development, channelization of streams, garbage and appliance dumping, and indiscriminate/haphazard bank "stabilization" with old concrete and asphalt pieces (Wetzel et al., 2010a; Wetzel et al., 2010b). In an unrelated study of the DuPage River and Salt Creek Watersheds, stormwater impacts and habitat degradation appeared to be the predominant stressors on the aquatic biological community. Sewer overflows and wastewater loadings were mentioned as secondary and indirect stressors, respectively (Midwest Biodiversity Institute, 2008).[27]

Urban streams, such as those crossed by the project corridor, often show signs of degradation. The water quality of streams in developed watersheds typically reflects the point and nonpoint source pollutant discharges from surrounding urban areas. Stormwater runoff from urban areas often includes pollutants (such as total suspended solids [TSS] and heavy metals) as summarized in Table 3-33.

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[26] Alteration of normal flow regimes (e.g., dams, channelization, impervious surfaces, water withdrawal) based upon actual observation and/or other existing data.

[27] With respect to the EO-WB project corridor, this study included Addison Creek, Meacham Creek, Salt Creek, Spring Brook, and West Branch DuPage River.

TABLE 3-33
Urban Stormwater Runoff Quality for TSS and Metals

Data Description	TSS (mg/L)	Copper, Total (mg/L)	Lead, Total (mg/L)	Zinc, Total (mg/L)
Average concentration	79	0.016	0.017	0.116
Maximum concentration	4,800	1.36	1.20	22.50
Average range based on comparison of several prior national studies	78 - 174	0.014 - 0.067	0.068 - 0.175	0.162 - 0.176

Note: mg/L = milligrams per liter. This summary table is based on *A Compilation and Analysis of NPDES Stormwater Monitoring Information from The National Stormwater Quality Database, Version 1.1* (Maestre, Pitt, and Center for Watershed Protection, 2005).

Table 3-34 compares water quality constituents for project corridor streams against Illinois General Use Water Quality Standards. The measured values in the table are generally the average of two or three sampling events conducted by INHS in the months of May through October during 2009 and 2010. The sampling data collected by INHS were within acceptable levels, except for the June 2009 DO concentration in Addison Creek and dissolved zinc in Higgins Creek and Salt Creek.[28] Dissolved metal concentrations did not exceed the acute toxicity concentration in any single sample measured.

TABLE 3-34
Measured Levels of Water Quality Constituents versus the Numeric Water Quality Standards within the Project Area

Parameter	Stream							General Use Water Quality Standard [b]
	Addison Creek	Higgins Creek	Meacham Creek	Salt Creek	Spring Brook [a]	West Branch DuPage River [a]	Willow Creek	
pH (s.u.)	7.87 - 8.19	7.21 - 7.92	7.53 - 8.04	7.50 - 7.86	6.52 - 7.16	6.98 - 7.59	7.68 - 8.12	6.5 - 9.0
Dissolved Oxygen (mg/L) [c]	4.90/ June [d]	8.90/ October	4.69/ August	7.63/ June	6.92/ June	7.43/ June	5.55/ June	5.0 mg/L minimum (March-July) 3.5 mg/L minimum (August-February)
Total Phosphorous (mg/L)	1.15	1.32	0.04	1.25	0.21	1.31	0.07	Not applicable [e]
Chloride (mg/L)	135 [f]	194 [f]	224 [f]	212 [f]	183 [f]	179 [f]	203 [f]	500 mg/L
Dissolved Copper (mg/L)	0.011	0.019	0.008	0.009	0.005	0.006	0.018	0.023 – 0.030 mg/L chronic 0.037 – 0.050 mg/L acute
Dissolved Lead (mg/L)	<0.041 [g]	<0.041 [g]	<0.041 [g]	<0.041 [g]	<0.041 [g]	<0.041 [g]	<0.041 [g]	0.039 – 0.054 mg/L chronic 0.184 – 0.258 mg/L acute
Dissolved Zinc (mg/L) [h]	0.062	0.140 [d]	0.043	0.073 [d]	0.013	0.030	0.063	0.063 – 0.083 mg/L chronic 0.241 – 0.317 mg/L acute

28 Water quality exceedances are listed for the zinc chronic criteria as reflected under the proposed Illinois Pollution Control Board change R2011-018.

TABLE 3-34
Measured Levels of Water Quality Constituents versus the Numeric Water Quality Standards within the Project Area

Parameter	Stream							General Use Water Quality Standard [b]
	Addison Creek	Higgins Creek	Meacham Creek	Salt Creek	Spring Brook [a]	West Branch DuPage River [a]	Willow Creek	
Dissolved Sulfate (mg/L)	77.1	78.4	90.7	70.6	102.7	51.0	35.8	1,462 – 1,788 mg/L
Total Dissolved Solids (mg/L)	568	621	673	623	656	574	501	No standard
Water Temperature (ºC) [i]	29.8	23.5	31.7	27.2	26.6	28.0	26.9	16ºC maximum (December – March) 32ºC maximum (April – November)
Hardness (mg/L)	290	278	308	248	316	229	230	No standard

Source: Wetzel et al., 2010a; Wetzel et al., 2010b.

Notes: mg/L = milligrams per liter, ºC = degrees Celsius, s.u. = standard unit.

Measured levels of parameters in this table are the average of three sampling events in June, August, and October of 2009, unless otherwise noted. pH value ranges are provided.

Silver Creek, Bensenville Drainage Ditch, tributaries to the streams listed in this table, lakes near the project corridor, and non-wetland ponds were not sampled by INHS and are not included in this table. USEPA STORET website (2010a) did not include monitoring data for the water bodies that were not sampled by INHS.

[a] Measured levels of parameters are the average of two sampling events in May and June of 2010, unless otherwise noted.
[b] General Use Water Quality Standards are provided (from Illinois Administrative Code, Title 35, Part 302), unless otherwise noted. The dissolved metal standard is calculated based on equations in Section 302, Water Quality Standards. Refer to the Illinois Administrative Code for additional information. A range is provided for the General Use Water Quality Standard. Specific standards (within each range) may vary per creek based on input values used in the calculations.
[c] Measurement represents the minimum DO concentration from all sampling events. The month the lowest measurement was taken is provided.
[d] **Bold** text indicates that the measurement does not meet water quality standards.
[e] Not applicable for the project corridor sampling sites. The water quality standard particularly applies to inland lakes and reservoirs, or in streams at the point of entry into these inland lakes and reservoirs.
[f] Chloride concentrations did not exceed the chloride water quality standard in any single sample.
[g] Sample is below mean detection limit of 0.041 mg/L.
[h] Water quality exceedances are listed for the chronic criteria as reflected under the proposed Illinois Pollution Control Board change R2011-018.
[i] Maximum water temperature from sampling events is provided. Sampling took place between June and October.

Streams in developed watersheds often have low DO concentrations. Combined sewer overflows, leaky or broken combined sewers and sanitary sewers, MPSD, nutrient enrichment, and high algal concentrations are potential causes of low DO in streams (CH2M HILL, 2004a). Low DO can also be caused by sediment oxygen demand and high biochemical oxygen demand (BOD). Elevated BOD can be influenced by stormwater runoff from developed areas and by organic decomposition. It can also result from the oxidation of ammonia in surface waters. One source of ammonia in surface waters is effluent from wastewater treatment plants. IEPA lists DO as an impairment cause for segments of Addison Creek, Meacham Creek, Salt Creek, Spring Brook, and West Branch DuPage River near the project corridor (IEPA/BOW, 2012).

Heavy metals, such as zinc, are common pollutants in highway stormwater runoff. Zinc may be deposited on roadway surfaces through normal vehicle operations and friction of moving parts. Some sources of zinc associated with the use of motor vehicles include tire wear, motor oil, and grease. Industrial facilities can also contribute zinc to receiving waters, as a result of their activities (e.g., plating or galvanizing operations) and runoff from impervious surfaces (e.g., parking areas). Sources of zinc from industrial areas could include waste, galvanized surfaces (e.g., roofs), batteries, paints, and pharmaceuticals. Other sources of zinc include municipal wastewater and combustion of fossil fuels. Zinc can negatively impact aquatic organisms even at low concentrations. In 2010, IEPA listed zinc as an impairment cause for segments of Higgins Creek and the West Branch DuPage River near the project corridor, but not for Salt Creek (IEPA/BOW, 2010). Based on the TMDL reports for Higgins Creek and the West Branch DuPage River, a point source is most likely causing the impairment. The point source would be required to comply with the water quality standard at the point of discharge. IEPA believes that compliance with the zinc water quality standard would be achieved after point source dischargers have installed appropriate best management practices (AECOM, 2009; AECOM, 2010). IEPA did not list zinc as an impairment cause for these creek segments in 2012 (IEPA/BOW, 2012).

In addition to the water quality sampling conducted by INHS, the DRSCW has chloride data for the Salt Creek and the West Branch DuPage River watersheds (see Table 3-35).[29] Based on chloride and conductivity data collected in 2007 and 2008, chloride concentrations in sampled segments of Salt Creek and West Branch DuPage River exceeded the 500 milligram per liter (mg/L) water quality standard for considerable periods of the winter (CDM, 2008). Subsequent to the winter 2007/2008 monitoring, DRSCW conducted additional sampling in the watersheds crossed by the project corridor. For sampling locations near or downstream of the project corridor, chloride concentrations for the winter season were found to exceed (on average) the 500 mg/L water quality standard, while annual and non-winter season averages were below the standard (McCracken, 2011b). This is consistent with the data collected by INHS for the non-winter season (see Table 3-34). IEPA lists chloride as an impairment cause for segments of Higgins Creek, Salt Creek, and the West Branch DuPage River near the project corridor (IEPA/BOW, 2012).

TABLE 3-35
Chloride Monitoring for Salt Creek and West Branch DuPage River

	Salt Creek at Busse Woods	Salt Creek at JFK Boulevard	Salt Creek at Wolf Road	West Branch DuPage River at Arlington Drive
2010 Annual Average	428.1 mg/L	345.5 mg/L	358.4 mg/L	NA
2010 Winter Average (January-March and November-December)	605.6 mg/L	503.4 mg/L	576.1 mg/L	428.3 mg/L [a]
2010 Non-Winter Season Average (April-October)	297.5 mg/L	269.9 mg/L	256.8 mg/L	NA

Note: mg/L = milligrams per liter, NA = Not available

[a] Data for the West Branch DuPage River is from January-February 2010.

29 DRSCW uses conductivity as a surrogate for measuring chlorides. Equations can be used to estimate chloride concentrations from conductivity measurements.

Another pollutant that can have negative effects on the aquatic environment includes polycyclic aromatic hydrocarbons (PAHs). PAHs are a group of organic compounds that may form as a result of natural or man-made sources. Materials with PAHs include fossil fuels, coal-tar-based pavement sealants, incomplete combustion of organic matter, and others (Mahler and Van Metre, 2011). Although Illinois does not have any water quality standards for PAHs, there are guidelines for threshold effects levels and probable effects levels (PELs) for various PAHs (MacDonald et al., 2000). Threshold effects levels represent the concentration below which adverse affects on aquatic organisms are rarely expected to occur. PELs represent the concentration above which adverse effects are frequently expected to occur. Although these are not regulated criteria recognized by USEPA or IEPA, they are recognized among the scientific community as consensus-based guidelines.

PAHs attach to small particles, particularly organic matter, and can be transported to surface waters via stormwater runoff after being deposited on the landscape. Runoff from pavements coated with coal-tar-based sealants was identified as a source of PAHs in stormwater runoff in studies conducted by USGS and the Minnesota Pollution Control Agency (Van Metre and Mahler, 2010; Crane et al., 2010). These studies found that coal-tar based sealants contributed approximately 50 percent of the PAHs found in nearby bodies of water.

DRSCW also commissioned a literature study to review potential sources of PAHs (Prabhukumar and Pagilla, 2010). Sediments in several of the watersheds that are crossed by the project corridor have been tested for PAHs. Studies in the Salt Creek and West Branch DuPage River watersheds found PAH concentrations in sediment that exceed PELs where toxicity is likely to be observed over a range of aquatic organisms, including amphipods (*Hyalella azteca*), mayflies (*Hexagenia limbata*), midges (*Chironomus tentans* or *C. riparius*), oligochaetes (*Lumbriculus variegates*), daphnids (*Ceriodaphnia dubia*), and bacteria (*Photobacterium phosphoreum*) (Midwest Biodiversity Institute, 2008).

3.10.2 Environmental Consequences

This subsection discusses potential impacts to surface water resources that would be associated with the construction, operation, and maintenance of the Build Alternative, including the pollutants that could be deposited into receiving waters, potential impacts to water quality, and direct impacts through construction and the placement of fill material. Pollutants, such as sediments, solids, heavy metals (e.g., copper, lead, and zinc), oil and grease, deicing material, fertilizers, and nutrients, may be released into the environment during construction or may accumulate on roadway surfaces and adjoining rights-of-way as a result of motor vehicle operations and maintenance. These pollutants can be transported to receiving waters via stormwater runoff.

Several of the project corridor streams have named tributaries (e.g., Willow Creek South Tributary, Willow Creek North Tributary, and Higgins Creek Tributary A) that were evaluated separately for the project drainage study and are discussed separately in this subsection.

3.10.2.1 Construction Impacts to Surface Waters

The Build Alternative crosses six streams and their tributaries at 13 general locations (see Appendix J [Exhibits J-1 through J-16] and Table 3-36). Nine of the proposed crossings are located in the Willow Creek Watershed. Direct impacts to surface waters would result from construction and the placement of fill to construct the proposed improvements. Construction associated with transportation projects include earthmoving practices (e.g., demolition, clearing and grubbing, grading, filling, excavation) that remove vegetative cover and expose soils. Such activities increase the potential for erosion and sedimentation by exposing disturbed soils to precipitation.

Increased impervious surface area due to construction and compaction of soils by heavy equipment may result in less stormwater infiltration and additional stormwater runoff. In-stream construction, placement of structures (e.g., abutments and piers), streambank disturbance, channel realignment, and temporary crossings could cause increases in turbidity and sedimentation and temporarily alter downstream hydraulics and substrate conditions. Downstream aquatic systems could be temporarily affected by the increases in turbidity and sedimentation. Increased sedimentation during construction has the potential to cover stream substrate, thereby affecting habitat for some species of fish and macroinvertebrates. The magnitude of impact varies based on several factors, such as proposed type of crossing, number of crossings, stream characteristics (substrate, depth, current velocity), soil type, construction method, and implementation of best management practices.[30]

Highly erodible soils are mapped as being present within the Build Alternative corridor with minimal surface area near the proposed stream crossings (see Exhibit 3-14). To reduce potential stream impacts, soil erosion and sediment control measures near streams would involve special consideration, such as minimization of soil disturbance, installation of applicable soil erosion and sediment controls prior to, during, and following construction. This may include installation of silt fence prior to construction activities, installation of temporary erosion control products if disturbed areas are to sit idle, and protection of side slopes with seed and rolled erosion control products (i.e., erosion control blanket) to assist with vegetation establishment (see subsection 3.10.3.1).

The placement of fill for stream crossings and additional lanes may also have an impact on surface waters. Improvements associated with the Build Alternative primarily take place adjacent to and within existing transportation corridors. As such, surface water impacts may be associated with the widening or lengthening of existing stream crossing structures or construction of new stream crossings. Temporary construction-related impacts could result even if a waterway is not directly impacted, depending on the proximity of the activity to the waterway and drainage patterns. Potential impacts would be minimized through best management practices implementation.

In-stream construction may be required to install bridge piers, extend culverts, or install new culverts (see Table 3-36). In-stream construction would follow standard practice (see IDOT *Standard Specification for Road and Bridge Construction* [IDOT, 2012] and the *Tollway Supplemental Specifications* [Illinois Tollway, 2011]), including isolating the work area, as necessary. All required permits and approvals (e.g., Section 404 CWA, Section 401 CWA water quality certification, and IDNR-OWR floodway construction permits) would be obtained prior to any in-stream construction. Additional details regarding construction

30 Best management practices are schedules of activities, prohibition of practices, maintenance procedures, and other management practices used to prevent or reduce negative impacts to water quality.

methodology would be provided during CWA and floodway construction permitting. Flow would be maintained during construction in perennial streams by using dam and pumping, fluming, culverts, or other techniques. Cofferdams, if necessary, would be constructed of nonerodible materials; earthen embankments or dikes would not be used as cofferdams. If dewatering is required to perform "work in the dry" in perennial streams, the dewatering would be temporary in nature. All materials used for temporary construction activities would be moved to upland areas following completion of the construction activity. Temporarily disturbed areas would be restored to preconstruction conditions, including grading to original contours and installation of erosion control as soon as practicable in accordance with National Pollutant Discharge Elimination System (NPDES) permit requirements. Erosion and sediment controls would be used to minimize downstream impacts.

TABLE 3-36
Streams Crossed by the Proposed Project in the Existing and Proposed Condition

Stream	Description of Existing Crossing	Description of Proposed Crossing [a]	Impact (acre) [a]	Linear Feet of Stream Enclosed in Culvert (Proposed Condition)
Addison Creek Watershed				
Addison Creek	Two-cell, 10-foot (span) x 9.5-foot (rise) concrete box culvert at I-294	Extend culvert in-kind approximately 20 feet to the east and 10 feet to the west	0.039	30
Des Plaines River (main stem) Watershed				
Bensenville Drainage Ditch	No crossing in project corridor	Extend railroad culvert (constructed as part of OMP) approximately 400 feet to the east	0.280 [b]	367 [b]
Salt Creek Watershed				
Meacham Creek	10-foot (span) x 8-foot (rise) concrete box culvert at Elgin-O'Hare Expressway	Extend existing drainage structure approximately 15 feet to the south	0.008	15
Salt Creek	Two-span, prestressed concrete beam bridge carrying Thorndale Avenue over creek. Center pier is pile supported with solid cast-in-place concrete wall around piles	Construct two new bridges to carry eastbound/westbound Elgin O'Hare corridor over creek. New bridges will span the creek and will not require piers to be placed in the creek	0	Not applicable
Willow Creek Watershed				
Higgins Creek (I-90 east of Elmhurst Road)	Two 2-span, prestressed concrete beam bridges with center pier in creek for eastbound/westbound I-90	Widen both existing I-90 bridges in-kind (with center pier in creek). Construct two new bridges over the creek, one to the north and one to the south of I-90 for ramps (these new bridges will span the creek and will not require piers to be placed in the creek)	0.006	Not applicable

TABLE 3-36
Streams Crossed by the Proposed Project in the Existing and Proposed Condition

Stream	Description of Existing Crossing	Description of Proposed Crossing [a]	Impact (acre) [a]	Linear Feet of Stream Enclosed in Culvert (Proposed Condition)
Higgins Creek (at Touhy Avenue)	Two-cell, 13.5-foot (span) x 8-foot (rise) concrete box culvert at railroad and Touhy Avenue	New bridge to span over the creek/existing culvert (culvert to remain for railroad)	0	Not applicable
Higgins Creek (Elmhurst Road)	Single 25-foot concrete slab bridge at Elmhurst Road	Widen existing structure in-kind	0.024	Not applicable
Higgins Creek (I-90 north embankment west of Elmhurst Road)	No crossing in project corridor	Longitudinal impact at the south bank of Higgins Creek for the proposed westbound I-90 ramp from southbound Elmhurst Road. Construct an outfall for a proposed compensatory storage site at the northwest quadrant of the I-90/Elmhurst Road interchange	0.101	Not applicable
Higgins Creek headwaters (I-90 approximately two miles west of Elmhurst Road)	Two-cell, 9-foot (span) x 4-foot (rise) concrete box culvert at I-90	Extend existing drainage structure approximately 15 feet to the southwest	0.012	15
Higgins Creek Tributary A	Two-cell, 9-foot (span) x 5.75-foot (rise) concrete box culvert at I-90	Extend existing drainage structure approximately 60 feet to the north and south	0.089	60
Willow Creek (downstream of York Road)	No crossing in project corridor	Install new culverts and/or extend three existing drainage structures from the railroad beneath the proposed West Bypass embankment	1.170 [b]	1,677 [b]
Willow Creek South Tributary	Three-cell, 10-foot (span) x 4-foot (rise) concrete box culvert at Thorndale Avenue	Existing Thorndale Avenue culvert would be removed, replaced, and realigned. Existing channel between Thorndale Avenue and York Road would be filled and slightly shifted	0.721	1,185 [c]
Willow Creek South/North Tributaries (upstream of York Road)	Three trapezoidal channels under a dry land bridge at York Road. The three different channels have varying dimensions in regard to top width, bottom width, and depth	Maintain condition at York Road	0	Not applicable
Build Alternative Total [b]			2.45	3,349

[a] Impact area includes the placement of fill material (e.g., culvert, pier footprint, retaining wall) in waters of the U.S. Total does not include potential temporary impacts.
[b] Bensenville Drainage Ditch and Willow Creek are being realigned as part of a separate project at O'Hare Airport. Impacts are based on the proposed realignment (as part of the O'Hare Modernization Program).
[c] In existing condition, Willow Creek South Tributary consists of approximately 3,905 linear feet open channel and 296 linear feet enclosed in culvert within the project corridor. In proposed condition, Willow Creek South Tributary will consist of approximately 1,743 linear feet of open channel and 1,185 linear feet enclosed in culvert.

To allow for wildlife connectivity and fish habitat, new culverts greater than 48 inches in diameter or height associated with waters of the U.S. are proposed to be enlarged and buried with stream bedding material approximately six to 12 inches. New culverts to be buried include I-90 over Higgins Creek Tributary A, Elmhurst Road over Higgins Creek (if a second culvert alternative is selected during a future design phase), culverts associated with the proposed Elgin-O'Hare Expressway and West Bypass interchange ramps over Willow Creek South Tributary, and culverts associated with the headwaters of Devon Avenue Tributary. The buried depth was determined based on standard culvert sizes. For example, the two-cell, 12-foot (span) x 9-foot (rise) concrete box culverts at I-90 over Higgins Creek Tributary A would be 12-foot (span) x 10-foot (rise) culverts, and buried one foot.

The proposed West Bypass crossings at Bensenville Drainage Ditch and Willow Creek are within the limits of OMP and would be on new roadway alignment (i.e., in a reserved transportation corridor). The Build Alternative would cross stream segments that will be (or recently have been) relocated as part of OMP.[31] The OMP has specific design criteria that apply to all OMP construction projects. These criteria would be provided to the designer for the West Bypass. The OMP would participate in review of 30 percent, 60 percent, 90 percent, and 100 percent plans to assure compliance with CDA and OMP design project requirements.

The segment of Willow Creek South Tributary between Thorndale Avenue and York Road would be slightly shifted as part of the Build Alternative. Within the project corridor, this tributary is channelized and located immediately adjacent and parallel to the north side of Thorndale Avenue and the west side of York Road (see Exhibit 3-13). It ranges from approximately seven to 20 feet wide and is relatively shallow in depth (up to approximately three feet deep). The substrate is variable, consisting of silt, riprap, and silt with gravel. The creek banks are stabilized with riprap and vegetation, dominated by sandbar willow (*Salix interior*), common reed (*Phragmites australis*), pinkweed (*Polygonum pensylvanicum*), and tall goldenrod (*Solidago altissima*) (see Figure 3-11).

FIGURE 3-11
WILLOW CREEK SOUTH TRIBUTARY AT THORNDALE AVENUE LOOKING DOWNSTREAM (EAST)

Source: CBBEL, 2011b.

Under proposed conditions, Willow Creek South Tributary would be shifted west, farther from York Road; this would improve drainage conditions near York Road and present-day Thorndale Avenue and would better accommodate proposed compensatory storage locations northwest of the proposed Elgin O'Hare and West Bypass interchange. The proposed channel would be constructed and stabilized prior to use by

31 The OMP obtained a Section 404 CWA permit from the USACE in December 2005 for airport improvements. That permit authorized the relocation of several waterways to accommodate airport improvements.

installing appropriate erosion control measures, which may include gabions, mechanically stabilized earth walls, vertical walls, cellular concrete mat, riprap, seed, or rolled erosion control products (e.g., turf reinforcement mats, blankets). Due to the proximity of the proposed interchange ramps to the adjacent runways at O'Hare Airport, the elevation of the ramp would be kept to a minimum. To accommodate the ramp design and FAA safety requirements, it is anticipated that approximately 1,000 feet of the south portion of Willow Creek South Tributary may be enclosed in a box culvert under the interchange ramps.[32] Any necessary construction in the existing waterway would be conducted in low- or zero-flow conditions. As necessary, flow would be maintained during construction, and erosion and sediment controls would be used to minimize downstream impacts.

All seven of the assessed streams that could be affected by the Build Alternative are impaired (see Table 3-32), based on the IEPA 303(d) list,[33] and parts have been channelized or modified. All of the assessed streams had relatively poor habitat quality and were dominated by pollution-tolerant to intermediate-tolerant fish and macroinvertebrates. None of the streams are listed as a natural area (Illinois Natural Areas Inventory [INAI] site) or rated as a higher-quality Class A or B stream (based on biological diversity or integrity; see subsection 3.10.1).[34] With the implementation of best management practices during construction, the in-stream work and construction activities adjacent to the streams would not be expected to adversely impact the overall habitat quality of the stream. Impacts to the aquatic community are anticipated to be minor and temporary in nature.

3.10.2.2 Operational Impacts to Surface Waters

Operation includes the use and maintenance of the transportation system. Potential impacts associated with the operation of the Build Alternative would result from pollutant accumulation on roadway surfaces, median areas, and adjacent rights-of-way. Pollutants accumulate through use and maintenance of the transportation system, natural processes, and as a result of airborne deposition. Pollutant concentrations are highly variable and are affected by numerous factors, such as traffic characteristics (volume and speed), weather (precipitation and wind), maintenance practices, and adjacent land uses. Roadway runoff can transport pollutants that have accumulated on impervious surfaces. Primary constituents of highway runoff associated with typical operations include TSS (from pavement wear, atmospheric deposition, dirt), lead (from tire wear), zinc (from tire wear, motor oil, grease), copper (from metal plating, moving engine parts, brake lining wear), and petroleum (from spills, leaks, gasoline, antifreeze, hydraulic fluids).

Additional travel lanes and other impervious surfaces would be constructed under the Build Alternative (see Table 3-37). When undeveloped land is converted to impervious surface, the volume of stormwater runoff increases and stormwater infiltration decreases. Use and maintenance of the additional impervious surfaces would generate more pollutants. The increased volume of stormwater runoff could increase in-stream erosion. However, this risk is minimized through the incorporation of stormwater best management practices and stormwater detention facilities. Stormwater detention facilities would be

[32] The length of the creek to be enclosed and the type of structure will be determined during final design and permitting. Final design may vary based on additional coordination with FAA and/or other agencies.

[33] Meacham Creek is impaired for aquatic life use, but it is not listed on IEPA's 2012 303(d) list.

[34] Mapped critical wetlands are located adjacent to two of the streams near the project corridor—Meacham Creek and the West Branch DuPage River (see Exhibit 3-17).

constructed to compensate for the increased impervious surface. The detention facilities will follow Illinois Tollway and IDOT drainage requirements for highway systems (including consideration of local stormwater management ordinances). For a more detailed description of stormwater detention and other proposed stormwater best management practices refer to subsection 3.10.3 and the Location Drainage Study.

TABLE 3-37
Impervious Area and Detention Summary

Watershed	County	Detention Required due to Increase in Impervious Area			Detention Required due to Proposed Hydrologic Disturbed Area (acre-feet)	Total Required Detention [a] (acre-feet)
		Existing Impervious Area (acres)	Proposed Impervious Area (acres)	Required Detention Storage (acre-feet)		
Addison Creek	Cook	44.06	56.84	6.65	--	13.36
	DuPage	3.37	4.70	0.76	5.58	
Bensenville Ditch	DuPage	--	--	--	25.60	25.60
Higgins Creek	Cook	112.66	160.87	25.07	18.18	44.76 [b]
Meacham Creek	Cook	34.55	50.67	8.38	--	15.48
	DuPage	15.61	28.06	7.10	--	
Spring Brook	Cook	19.16	23.73	2.38	--	2.38
Salt Creek	Cook	5.20	5.43	0.12	--	80.71 [c]
	DuPage	82.13	138.88	32.47	--	
Silver Creek	Cook	12.95	20.20	3.77	14.68	21.08
	DuPage	0.83	1.19	0.21	2.43	
West Branch DuPage River	Cook	31.56	37.58	3.13	--	3.15
	DuPage	0.26	0.29	0.02	--	
Willow Creek	Cook	--	--	--	11.98	86.76 [d]
	DuPage	55.73	101.42	26.04	37.80	
Total		418.7	629.86	116.10	116.25	293.28

Note: Hydrologic disturbed area was used to calculate detention required for new roadways, including the West Bypass based on IDOT and Illinois Tollway requirements. Increased impervious area was used to calculate detention for existing roadway expansion, including the Elgin-O'Hare Expressway, I-90, I-290, and I-294.

[a] See Appendix E for potential locations of detention facilities.
[b] Includes compensation for 1.51 ac-ft of existing detention fill.
[c] Includes compensation for 25.08 ac-ft of existing detention fill, 20.89 ac-ft of lost depressional storage area, and 2.27 ac-ft diverted from Willow Creek to Salt Creek.
[d] Includes compensation for 9.80 ac-ft of existing detention fill, 3.41 ac-ft of lost depressional storage area, and loss of 2.27 ac-ft diverted from Willow Creek to Salt Creek.

Highway runoff pollution may affect the quality of receiving waters not only through shock or acute loadings during storms but also through chronic effects from long-term accumulation in the receiving water. Water impacts are site-specific and depend heavily on the characteristics of the highway and the receiving waters. The degree of pollutant loading is linked directly to the amount of roadway traffic. Research indicates few substantial impacts for highways with less than 30,000 ADT (Young et al., 1996; Dupuis et al., 1985). Under these conditions, potential impacts are generally short-term, localized, acute loadings from temporary water quality degradation, with few (if any) long-term or chronic effects.

All projected year 2040 ADTs (bidirectional) along the proposed Elgin O'Hare and West Bypass corridors exceed 30,000. The projected bidirectional ADT for the Build Alternative in the year 2040 ranges from 57,700 to 132,300 vehicles per day along the Elgin O'Hare corridor from Lake Street to the proposed West Bypass corridor.

The low end of that range is between Lake Street and Gary Avenue, and the high end is projected between Gary Avenue and I-290. The greatest increase in bidirectional ADT from existing conditions (year 2010) to year 2040 traffic is anticipated east of I-290 to the proposed West Bypass corridor (i.e., an increase of approximately 202 to 211 percent). Salt Creek and Willow Creek South Tributary would be crossed by the Build Alternative along this stretch of the Elgin O'Hare corridor. West of I-290 the projected percent increase in bidirectional ADTs is much less (i.e., an increase of approximately 2.5 to 26 percent). Meacham Creek and West Branch DuPage River are located along this stretch of the Elgin O'Hare corridor.

The projected ADT (bidirectional) for the West Bypass corridor in the year 2040 ranges from 55,100 to 100,800 vehicles per day. The low end of that range is between IL 19 and I-294, and the high end is projected between I-90 and Devon Avenue. The West Bypass corridor would cross Bensenville Drainage Ditch, Willow Creek, and Higgins Creek. The West Bypass corridor would be constructed on new alignment, so there is no existing condition for comparison.

For streams receiving runoff along these corridors, the pollutant loading from traffic could be higher and the potential impact could be greater, depending upon the stream characteristics and the post-construction stormwater best management practices used. Potential water quality impacts to the project corridor streams as a result of the Build Alternative were evaluated using the FHWA methodology developed by Driscoll, Shelley, and Strecker (1990) for both existing and proposed conditions (including proposed structural best management practices). The analysis is specific to highway projects and predicts stormwater runoff concentrations of copper, lead, zinc, and TSS from highway right-of-way areas. The analysis also predicts the resultant stream concentrations (see Table 3-38). More information can be found in Appendix K.

TABLE 3-38
Pollutant Loading Analysis Summary

Condition	Pollutant (mg/L)	Addison Creek	Bensenville Drainage Ditch	Higgins Creek	Meacham Creek	Salt Creek	Silver Creek	Spring Brook	West Branch DuPage River	Willow Creek
Summary of Analysis Without Best Management Practices										
Existing Condition	TSS	257	274	361	360	171	307	352	284	355
	Copper	0.033	0.035	0.046	0.046	0.022	0.039	0.045	0.036	0.046
	Lead	0.005	0.005	0.007	0.007	0.003	0.006	0.007	0.006	0.007
	Zinc	0.151	0.161	0.211	0.211	0.100	0.180	0.206	0.166	0.208
2040 Build Condition	TSS	337	344	407	412	204	313	372	296	412
	Copper	0.043	0.044	0.052	0.053	0.026	0.040	0.048	0.038	0.053
	Lead	0.007	0.007	0.008	0.008	0.004	0.006	0.007	0.006	0.008
	Zinc	0.197	0.201	0.238	0.241	0.119	0.183	0.218	0.173	0.241
Percent Increase [a]	TSS	31%	25%	13%	14%	19%	2%	6%	4%	16%
	Copper	31%	25%	13%	14%	19%	2%	6%	4%	16%
	Lead	31%	25%	13%	14%	19%	2%	6%	4%	16%
	Zinc	31%	25%	13%	14%	19%	2%	6%	4%	16%
Summary of Analysis With Best Management Practices [b]										
Existing Condition	TSS	227	261	302	68	74	292	88	70	326
	Copper	0.030	0.034	0.041	0.017	0.013	0.038	0.019	0.015	0.043
	Lead	0.005	0.005	0.006	0.003	0.002	0.006	0.003	0.002	0.007
	Zinc	0.138	0.155	0.187	0.076	0.058	0.174	0.087	0.066	0.196
2040 Build Condition	TSS	144	152	246	54	63	171	60	47	155
	Copper	0.026	0.019	0.036	0.015	0.011	0.026	0.016	0.013	0.028
	Lead	0.004	0.003	0.006	0.002	0.002	0.004	0.002	0.002	0.004
	Zinc	0.116	0.089	0.166	0.070	0.052	0.116	0.071	0.059	0.125
Percent Increase [a]	TSS	-37%	-42%	-18%	-21%	-16%	-42%	-32%	-33%	-52%
	Copper	-16%	-43%	-11%	-8%	-10%	-33%	-19%	-12%	-36%
	Lead	-16%	-43%	-11%	-8%	-10%	-33%	-19%	-12%	-36%
	Zinc	-16%	-43%	-11%	-8%	-10%	-33%	-19%	-12%	-36%

[a] Percent increase values were rounded. Percentages were calculated prior to rounding and represent the increase or decrease between existing and build conditions.
[b] Best management practices were factored into the analysis for the existing and 2040 build conditions.

Based on the results of the pollutant loading analysis, the resultant concentrations for representative roadway pollutants (i.e., copper, lead, and zinc) were compared to Illinois General Use Water Quality Standards. The results from the analysis indicate that the project does not exceed General Use Water Quality Standards in the proposed condition with the implementation of best management practices. In fact, the heavy metal concentrations associated with the roadway are predicted to decrease in the 2040 build condition in all the streams (by eight to 43 percent) due to the incorporation of stormwater best management practices that would be implemented with the project. With proper best management practices implementation, the project is not expected to exceed water quality standards for heavy metals.

There is no numeric water quality standard in Illinois for TSS. Based on the results of the pollutant loading analysis, the estimated TSS concentration decreases in the creeks by 16 to 52 percent with the implementation of best management practices in the proposed condition (when compared to the existing condition). Under existing conditions, the best management practices that treat stormwater runoff from the roadways within the project corridor are limited east of IL 53. There are limited numbers of existing detention ponds along this portion of the corridor and the grassed swales that are present do not appear to have been designed specifically for water quality treatment. Under existing conditions, several best management practices are already in place along the project corridor west of IL 53, where Spring Brook, Meacham Creek, and West Branch DuPage River are located, so the anticipated change in stormwater quality is smaller for these streams.[35] With proper best management practice implementation, no adverse changes or effects to the project corridor streams are anticipated as a result of TSS concentrations and operation of the proposed EO-WB project.

As engineering details progress, additional stormwater best management practices (such as bioswales and infiltration basins/trenches) will be evaluated and installed where practicable and feasible (see subsection 3.10.3.2). The effectiveness of pollutant removal is anticipated to increase with the implementation of these additional best management practices. Areas along the project corridor to be evaluated for additional best management practices opportunities are shown in Appendix E.

In general, existing pollutant concentrations and habitat modifications have affected the water quality of the project corridor streams. Seven of the streams (Addison Creek, Higgins Creek, Meacham Creek, Salt Creek, Spring Brook, West Branch DuPage River, and Willow Creek) are impaired streams, as defined by the federal CWA and as identified by IEPA (IEPA/BOW, 2012).[36] Refer to Table 3-32 for causes and sources of impairments. Potential causes of impairment for these streams include chloride from maintenance practices, phosphorus, DO, and other signature highway runoff pollutants, such as heavy metals and TSS. The USEPA has approved TMDLs for the Salt Creek Watershed[37,38] to address chloride

[35] The existing best management practices located adjacent to the Elgin-O'Hare Expressway have been included in the pollutant loading analysis.

[36] Meacham Creek is impaired for aquatic life use, but it is not listed on IEPA's 2012 303(d) list.

[37] The Salt Creek TMDLs address segments of the following project corridor creeks: Salt Creek, Addison Creek, Spring Brook, and Meacham Creek (CH2M HILL, 2004a). Meacham Creek is impaired, but is not on IEPA's 2012 303(d) list.

[38] The Build Alternative crosses surface waters that are in TMDL development to address additional impairments (IEPA/BOW, 2012). Additional TMDLs and other NPDES requirements would be followed, as necessary. The Chicago District USACE has also added a General Condition for TMDLs to their re-issued Regional Permit Program that requires applicants to develop plans and best management practices that are consistent with the assumptions and requirements in approved TMDLs (USACE, 2012).

and DO[39] and for the West Branch DuPage River to address chloride (CH2M HILL, 2004b). Chloride used for road deicing is a primary pollutant associated with highway maintenance and is discussed in subsection 3.10.2.3.

If untreated, stormwater runoff and highway pollutants could cause further degradation of receiving waters, erosion, harm or stress to aquatic life, and decreased recreational use and aesthetics. However, best management practices would be incorporated into the Build Alternative to minimize adverse impacts to the downstream aquatic environment. Water quality would be managed through a combination of stormwater runoff and drainage collection facilities, and the implementation of other post-construction best management practices in accordance with state and federal water quality goals for managing the water quality of impaired or degraded streams. To the extent practicable, improvements would be designed so that stormwater runoff quality would be improved with capture infiltration, detention, or other stormwater treatment before discharge to surface waters. Stormwater controls that treat stressors of concern based on TMDLs or typical highway pollutants (e.g., suspended solids, sediment, heavy metals, inorganic salts, PAHs) and that control the volume of stormwater runoff are discussed in subsection 3.10.3.

Based on available data, most of the aquatic species found in the surface waters that cross the Build Alternative generally are locally common, widespread, and tolerant of urban conditions. Several waters are impaired for support of aquatic life (see Table 3-32). As a result, the dominant fish species are pollution tolerant, and potential impacts to fishing and other recreational surface water uses near the proposed improvements are anticipated to be minimal with implementation of best management practices.

3.10.2.3 Maintenance Impacts to Surface Waters

Maintenance impacts associated with the proposed project include implementation of deicing practices during winter months and herbicide spraying for invasive/noxious vegetative species within the right-of-way. Herbicide applications would follow the manufacturer's guidelines to minimize drift and runoff into surface waters. An NPDES permit for pesticide application point source discharges (including herbicide application) will be obtained, as necessary.

Seasonal deicing with salt (commonly sodium chloride), along with plowing and other alternative measures, are used to reduce snow and ice build-up on roads. Deicing assists with safe traffic movement by improving road conditions in winter, but application of road salt contributes chloride loads to surface waters. Road salt is highly soluble and moves through the environment in solution as runoff, splash, spray, and dust. The General Use Water Quality Standard for chloride in Illinois is 500 mg/L.[40] Sodium does not have a numeric water quality standard.

The primary methods of snow and ice removal in IDOT, District One, and on the Illinois Tollway are plowing and the application of road salt. During the last ten winter seasons (2000/2001 through 2010/2011), IDOT and the Illinois Tollway averaged 39.7 tons of salt per

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[39] The DO TMDL includes load allocations for carbonaceous biochemical oxygen demand (CBOD), volatile suspended solids (VSS), and ammonia-nitrogen. In general, the DO TMDL recommendations pertain to wastewater treatment plants and dam removal on Salt Creek. Stormwater control for municipal separate storm sewer systems would be accomplished through the NPDES Phase II General Permit No. ILR40.

[40] Title 35 Illinois Administrative Code, Subtitle C, Chapter 1, Part 302.

lane-mile (systemwide).[41] An abrasive sand-type material (e.g., crushed pea gravel or equivalent) is often used by the Illinois Tollway on the ramps. Whatever material is used, efforts are made to apply only the amount of material necessary to maintain motorist safety. The total quantity of road salt entering the environment varies based on the number of snow events per season and the number of times road salt is applied per storm.

Under proposed conditions, the majority of the Elgin O'Hare and West Bypass corridors will be a tolled facility maintained by the Illinois Tollway. The Build Alternative would increase the number of lane-miles and pavement in the project corridor, thereby increasing the total salt loading over existing levels. Potential water quality impacts to the project corridor streams due to chlorides were evaluated for the Build Alternative by using the USGS methodology developed by Frost, Pollock, and Wakelee (1981) for both existing and proposed conditions. The results of the pollutant loading analysis were compared to Illinois General Use Water Quality Standards (see Table 3-39).

TABLE 3-39
Chloride Loading Analysis Summary

Stream	Highway Lane-Miles			Annual Daily Average Chloride (mg/L)			Annual Daily Maximum Chloride (mg/L)		
	Existing	Build	Percent Increase	Existing	Build	Percent Increase	Existing	Build	Percent Increase
Addison Creek	47.52	74.39	57%	255	400	57%	467	716	53%
Bensenville Drainage Ditch	0.92	13.89	1410%	15	255	>100%	52	415	>100%
Higgins Creek	44.87	79	76%	208	367	76%	385	658	71%
Meacham Creek	27.14	43.77	61%	294	474	61%	532	842	58%
Salt Creek	23.46	67.04	186%	11	33	>100%	46	84	83%
Silver Creek	12.84	47.19	268%	64	235	>100%	136	431	>100%
Spring Brook	6.21	11.34	83%	157	286	82%	296	520	76%
West Branch DuPage River	6.89	10.62	54%	48	75	56%	110	156	42%
Willow Creek	No existing crossing	50.29	No existing crossing	No existing crossing	270	No existing crossing	No existing crossing	492	No existing crossing

41 Salt application rates are based on information from IDOT and the Illinois Tollway.

Based on the results of the analysis, the annual daily average chloride concentrations in the existing condition range from 11 mg/L to 294 mg/L, compared to 33 mg/L to 474 mg/L in the build condition. Under the existing and proposed conditions, the estimated annual daily average chloride concentrations are below 500 mg/L for all creeks in the project corridor.

The annual daily maximum chloride concentrations range from 46 mg/L to 532 mg/L in the existing condition, while the build condition ranges from 84 mg/L to 842 mg/L. Addison Creek, Higgins Creek, and Spring Brook meet the General Use Water Quality Standard in the existing condition, but exceed the standard in the proposed condition. Meacham Creek exceeds the General Use Water Quality Standard in both the existing and proposed conditions.

Watersheds exceed the chloride water quality standard (in the analysis) because of the amount of road salt applied and the amount of impervious highway lane-miles under existing and/or proposed conditions. The highway lane-miles in each of the watersheds exceeding chloride water quality standards increases by 50 percent or more. The salt application on the number of highway lane-miles in these watersheds combined with the relatively small watershed area (compared to other project corridor drainage areas, like Salt Creek) creates a chloride concentration that is estimated to exceed the water quality standard.

Even though chloride is dissolved in the stormwater runoff, the daily annual maximum chloride concentration may be able to be reduced by using structural best management practices. Best management practices, such as detention ponds, infiltration basins/trenches, and vegetated swales/bioswales with ditch checks, may be able to attenuate the peak concentration of stormwater flows by mixing chlorides with permanent pool volumes in existing wet ponds and/or by collecting the runoff and allowing it to mix with lower-concentration runoff. In addition, non-structural best management practices (such as pre-wetting and monitoring salt application rates) are already used and will continue to be used to balance public safety and environmental impacts (see subsections 3.10.3.2 and 3.10.3.3).

Reductions in peak chloride loading from best management practices have been documented by the USGS (Sherwood, 2001). A 2001 USGS study looked at the concentration of chloride (and other pollutants) at the inlet and outlet of a stormwater detention basin, which included a mixture of open water and vegetated areas. The study concluded that chloride concentrations can be reduced during large winter storm events (up to 30 percent reduction). However, during smaller storm events in other seasons, chloride concentrations were observed in the stormwater discharge from the basin. The USGS observations suggest mixing of chlorides was occurring in the stormwater basin and that this resulted in lower concentrations in the outflow than what was measured in the inflow during winter deicing. The stormwater best management practices associated with the EO-WB project would also be expected to provide mixing and subsequent lowering of peak chloride concentrations during the winter deicing season.

For the proposed improvements, a 20 percent reduction was used in the chloride analysis to represent a conservative estimate of the reduction in peak chloride loading. A 20 percent attenuation in peak chloride concentration from stormwater best management practices results in annual daily maximum chloride concentrations ranging from 67 mg/L to 674 mg/L under the Build Alternative. Under this analysis, Spring Brook no longer exceeds the chloride water quality standard. However, Addison Creek, Higgins Creek, and Meacham Creek still exceed the chloride water quality standard, although to a lesser extent. Details of the chloride analysis can be found in Appendix K.

In the winter, deicing salt moves primarily through the project corridor environment as surface runoff. Studies show that 60 to 80 percent of the salt is carried by runoff to surface waters, 15 to 35 percent occurs as splash, and up to three percent occurs as spray (Frost et al., 1981; Diment et al., 1973; Lipka and Aulenbach, 1976; Sucoff, 1975). Salt also percolates into the soil profile. The highest salt concentrations generally are found near the roadway shoulders because of plowing and splash. Salt deposition and concentrations adjacent to roadways decrease as the distance from a treated roadway increases (Kelsey and Hootman, 1992; Williams et al., 2000). Sodium chloride can decrease soil permeability and raise soil pH, which could adversely affect soil fertility and plant growth (Transportation Research Board, 1991).

High salinity levels may adversely affect sensitive floral communities, particularly wetland plants and conifer trees. Road salt runoff can stress wetland plant communities and may result in reduction of native plant diversity due to replacement by more salt-tolerant plant species, such as narrow-leaved cattail (*Typha angustifolia*) and common reed (*Phragmites australis*). Both cattail and common reed are wetland plant species that frequently can be observed in roadside ditches, stormwater management facilities, and wetlands within and adjacent to the Build Alternative.

The potential impact that stormwater containing chlorides may have on receiving waters is dependent on many factors, such as the concentration, size of the water body (water volume), precipitation, topography, soil type, and drainage patterns. In smaller bodies of water, fish and aquatic macroinvertebrates can be affected by elevated chloride levels. However, impact thresholds may vary.

Parts of the Build Alternative are within the Salt Creek, Addison Creek, and West Branch DuPage River watersheds, which have a chloride TMDL.[42] Also, a draft Stage 3 TMDL Report for chloride has been prepared for Higgins Creek.[43] The IEPA's General NPDES Permit No. ILR40 requires that small municipal separate storm sewer system (MS4) permittees, such as IDOT and the Illinois Tollway, implement TMDLs, as applicable.[44]

Of the creeks in the project corridor, a chloride TMDL is in effect for Addison Creek, Salt Creek, and West Branch DuPage River. However, the TMDL and best management practices to address chloride loads can be applied to protect other streams located downstream of the proposed project, as well. Elevated levels of chloride in receiving streams are seasonal and occur predominantly during the winter months as a result of salt application (CH2M HILL, 2004a). Although road deicing is necessary, the overall goal of the TMDL is to reduce chloride loading caused by winter road salting applications.

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[42] The Salt Creek TMDL includes Addison Creek. Based on the Salt Creek TMDL report (CH2M HILL, 2004a), Salt Creek and Addison Creek are listed for TDS/conductivity impairments. Chloride constitutes a significant part of TDS/conductivity and chloride management provides a means to control exceedances of the TDS/conductivity standard.

[43] Refer to the Des Plaines River/Higgins Creek Watershed TMDL Stage 3 Report (AECOM, 2010) for Higgins Creek. In addition to chloride, TMDLs for Higgins Creek are being prepared for dissolved oxygen and fecal coliform.

[44] Road deicing is necessary for public safety. Thus, the implementation of the chloride TMDL by MS4s should be based on prudent and practicable road salting best management practices to the extent that the safety of the public is not compromised (CH2M HILL, 2004a).

Organizations, such as the DRSCW, have presented seminars on deicing best practices to educate those involved in the maintenance of public roads. Evaluation of these practices would occur as necessary to meet NPDES permit requirements and TMDL goals.

The initial water quality modeling indicates that annual daily maximum chloride concentrations calculated without stormwater management structures in place are predicted to exceed water quality standards for several of the watersheds crossed by the project. However, the amount of salt entering the environment depends on the number of snow storms per season and salting events per storm. There will be additional effort applied to identify ways for the project to achieve lower chloride concentrations in receiving streams through the implementation of stormwater best management practices, promoting deicing material application best practices in the project corridor watersheds, reviewing the anticipated road-salt application rate for future operating conditions, and evaluating chloride reduction implementation plans for TMDLs developed within the watersheds affected by the project. IDOT and the Illinois Tollway recognize that water quality is an important issue and will strive to meet chloride standards based on prudent and practicable stormwater and road salting best management practices to the extent that public safety is not compromised (see subsection 3.10.3).

Surface Runoff

Surface runoff is the primary means of road salt transport following application. Runoff would generally be directed into roadside ditches and other stormwater management structures or facilities before discharge into receiving waters. The intent is to drain surface runoff from bridge decks and roadways to ditches or detention ponds via scuppers and storm sewers, prior to discharge to offsite drainageways. Peak chloride concentrations in waterways could be reduced by using detention basins.

As practical and feasible, stormwater runoff from the proposed bridge over Salt Creek will be routed to a stabilized outlet and through additional best management practices, where the runoff can receive treatment prior to discharge into the creek.[45] Although all of the streams crossed by the project corridor are degraded, Salt Creek appears to have the least disturbed aquatic habitat, comparatively speaking (based on Mean Habitat Score and Aquatic Habitat Quality score; see Tables 3-30 and 3-31).

Splash and Spray

Plants, soils, and to a limited extent aquatic biota, could be affected by salt brine splash and spray from the Build Alternative. The greatest effect from splash generally would be expected within 45 to 60 feet of the edge of the road in the splash deposition zone (Transportation Research Board, 1991; Public Sector Consultants, Inc., 1993; Williams and Stensland, 2006). Splash could increase soil erosion because of soil impact and subsequent flow concentration on embankments and other slopes. Spray consists of smaller-sized droplets than splash and may be deposited farther from the roadside. Roadside vegetation (trees, shrubs, ground cover, grasses) may suffer salt injury with drought-like symptoms, such as inhibited growth, leaf discoloration, and defoliation. Some plant species are more susceptible than others (e.g., grasses are generally more tolerant of salt than conifer trees). Vegetative damage generally increases with greater salt usage, traffic speed and volume,

[45] Based on a request by the USACE at meeting with USEPA, USFWS, IDOT, Illinois Tollway, and project consultants on October 12, 2011.

and steeper side slopes; vegetative damage generally diminishes as the distance from the road increases (Transportation Research Board, 1991; Public Sector Consultants, Inc., 1993; Shi et al., 2009).

3.10.3 Measures to Minimize Harm and Mitigation

3.10.3.1 Construction

Construction activities can affect surface waters. This project would be subject to the requirements of IEPA's NPDES permit for construction site stormwater discharges. NPDES permit coverage is required when a construction project disturbs one acre or more of land, or is part of a larger common plan of development that ultimately disturbs one or more acres of total land (see subsection 3.20.4).

As required by the NPDES permit, a Storm Water Pollution Prevention Plan (SWPPP) would be prepared during Phase II engineering (final design and permitting). The Illinois Tollway's *Erosion and Sediment Control, Landscape Design Criteria* manual (Illinois Tollway, 2012) would be referenced when preparing the SWPPP for the proposed tolled facility. The IDOT *Bureau of Design and Environment (BDE) Manual*, "Chapter 41, Construction Site Storm Water Pollution Control" (IDOT, 2011), would be referenced when preparing the SWPPP for free roads. IDOT and Illinois Tollway standard specifications (including supplemental specifications) would also be followed, as applicable. The SWPPP would identify soil erosion and sediment control practices to be used throughout the construction process to minimize soil loss and subsequent sedimentation.

Control practices would be implemented as outlined in the SWPPP to protect surface waters and the downstream aquatic environment. For example, perimeter sediment controls (e.g., silt fence) would be installed before land disturbance activities are initiated. Appropriate erosion and sediment controls would be implemented onsite and would be modified as necessary to reflect the current phase of construction. Controls would be inspected, maintained, and repaired/replaced, as necessary, to maintain NPDES compliance. IDOT has prepared the *Erosion and Sediment Control Field Guide for Construction Inspection* (IDOT, 2010), which provides guidance that can be used during construction of roadway projects. The Illinois Tollway's *Erosion and Sediment Control, Landscape Design Criteria* manual (Illinois Tollway, 2012) would also be referenced.

Contractors would be responsible for compliance with the NPDES permit and shall submit a signed certification statement to that effect. Contractors also would be responsible for non-stormwater controls, including material delivery, storage, and use; stockpile management; waste disposal; spill prevention and control; concrete residuals and washout; litter management; and vehicle equipment, fueling, and maintenance.

Soil erosion and sediment control measures would be installed in areas of active construction. Special attention would be given to particular areas such as wetlands, surface waters, highly erodible soils, and drainage ways. Disturbance of streamside vegetation and riparian vegetation would be kept to a minimum. Temporary fencing or alternative measures would be considered to protect existing vegetation to remain in critical erosion-prone areas. In-stream construction (e.g., for the placement of bridge piers) and soil-disturbing activities near streams would be conducted during low or no-flow periods, as required. Discharge points would be protected with rock (or an alternative measure) to minimize scour and erosion. Exposed soils adjacent to surface waters and any work on a streambank that is performed below the ordinary high water mark of a stream would be permanently stabilized in accordance with NPDES and Section 404 CWA permit requirements. Final stabilization would follow the applicable Landscaping and Erosion Control sections of the IDOT and the Illinois Tollway standard specifications (including supplemental specifications), Chapters 41 and 59 ("Landscape Design") of the *BDE Manual* (IDOT, 2011), and/or the Illinois Tollway's *Erosion and Sediment Control, Landscape Design Criteria* manual (Illinois Tollway, 2012). A Section 404 CWA permit and Section 401 CWA water quality certification would be obtained prior to in-stream work.

At a minimum, the following best management practices will be used for the project to reduce soil erosion, minimize sedimentation, and limit the amount of dust created in association with construction activities (specific best management practices, locations, and types would be developed during Phase II engineering):

- Mulch (straw, hydraulic, etc.)
- Seed (temporary or permanent) or sod
- Preservation of existing vegetation or vegetated buffer strip
- Limitation of the amount of area that is disturbed at any one time
- Polymers (for stabilization and/or flocculation)
- Rolled erosion control products (erosion control blankets or turf reinforcement mats)
- Stone aprons at flared end sections
- Concentrated flow controls (diversion dikes, drainage swales, lined ditches)
- Storm drain inlet protection
- Temporary ditch checks
- Stabilized construction entrance/exit
- Silt fence barrier
- Wattles
- Sediment traps and basins

Proper use of soil erosion and sediment control measures are a condition of Section 404 CWA permits, prescribed in design and construction guidance by IDOT and the Illinois Tollway, and would be coordinated with the local SWCD, if required by the USACE. Pursuant to an Interagency Cooperative Agreement (ICA) between SWCD and USACE, the SWCD conducts soil erosion and sediment control plan reviews and performs site inspections to determine compliance with those plans. These site visits would be in addition to those required under the NPDES Construction General Permit. Due to the size, scope, and anticipated duration of this project, a cost-reimbursable agreement with the SWCDs may be prepared. This agreement could include a modified fee schedule appropriate for the EO-WB project (as was completed for OMP).

Surface water impacts (including adverse impacts to fish and aquatic macroinvertebrates) as a result of construction of the proposed EO-WB project are anticipated to be minimal with routine and storm-event site inspections and the implementation of appropriate best management practices. Mitigation for permanent fill placed in jurisdictional waters of the U.S. would be accomplished in conjunction with wetland mitigation either through purchasing credits in a USACE-approved mitigation bank or at an offsite location. Opportunities for stream enhancements (e.g., streambank stabilization, installing rock riffles) within the project corridor watersheds will be investigated with the mitigation (see subsection 3.13.3). Depending on the potential mitigation sites, mitigation for unvegetated waters may include re-meandering channelized streams, removing/replacing existing drain tiles/culverts with stabilized stream channels, stabilizing eroded streambanks, constructing in-stream habitat, creating riparian buffer, etc. (or a combination of these methods).

3.10.3.2 Operation (Including Federal Aviation Administration Guidance)

Operation of the proposed EO-WB project could affect surface waters. Best management practices would be incorporated into project design to minimize that effect and improve the quality of stormwater discharging to receiving waters or nearby wetlands. Right-of-way requirements to accommodate these best management practices have been accounted for in the project corridor. Existing drainage patterns will be maintained as part of the project. However, the existing drainage system would be enhanced where practicable and feasible. Appendix E contains exhibits that show locations for the application of best management practices.

Among these practices would be grassed ditches, infiltration basins/trenches, bioswales, etc., in addition to detention basins and compensatory floodplain storage facilities. At this stage in project development, the implementing agencies are committed to the use of these practices, and the information presented in Appendix E demonstrates that there is sufficient area in the project corridor to accommodate these practices. As the overall details for the project's drainage plan evolve, so will the specificity for best management practices. A concept plan for best management practices was created that defines location, type, and effectiveness of best management practices. The plan demonstrates a general improvement in stormwater runoff quality throughout the project corridor.[46] The best management practice concept plan was reviewed and discussed with resource agencies (including the USACE, USEPA, USFWS, IDNR, FAA, and USDA–APHIS) at a meeting on July 23, 2012. At this meeting, the resource agencies agreed, in principle, that that the concept plan had sufficient detail for this Tier Two Final EIS and that specific details would be coordinated during the Section 404 CWA permitting process.

Based on coordination with the resource agencies, one area in particular that will receive special consideration regarding water quality best management practices is the proposed system interchange at I-290.[47] This interchange drains to the Devon Avenue tributary ponds at Hamilton Lakes' Development (in Itasca) and eventually to Salt Creek. As practicable and feasible, stormwater runoff will be treated by stormwater best management practices prior to leaving the proposed right-of-way outlet to the Devon Avenue tributary ponds. This proposed interchange is located in DuPage County. Therefore, any offsite, future development adjacent to this proposed interchange will be subject to the requirements of the DuPage County Countywide Stormwater and Flood Plain Ordinance. The ordinance requires that the developer incorporate best management practices into its site design to minimize increases in runoff rates, volumes, and pollutant loads. In accordance with this ordinance, impacts to the effectiveness of the proposed best management practices at this system interchange are not anticipated as a result of adjacent future development.

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[46] Based on results of the pollutant loading analysis with respect to TSS and heavy metals for year 2040 Full Build conditions.

[47] Based on meeting with the USACE, USEPA, USFWS, IDOT, Illinois Tollway, and project consultants on October 12, 2011.

Best management practice selection and drainage design for this project incorporate both water quantity and quality control, where practicable. Best management practices would be implemented that minimize the volume of stormwater runoff discharge and change to water quality, resulting in pollutant load reduction, increased infiltration and evapotranspiration, where possible. The previously mentioned best management practices that would be incorporated into project design could also reduce potential thermal impacts to receiving waters.

Selection of best management practices for this project would be influenced by the proximity of the project corridor to two airports (i.e., Schaumburg Regional Airport and O'Hare Airport). Oftentimes, stormwater quality/quantity best management practices include open water and/or vegetative components. Vegetative cover types (e.g., wetlands) and open water areas can attract wildlife. The Federal Aviation Act charges the FAA with providing a safe and efficient National Airspace System. As such, the FAA prepares ACs that include standards, practices, and suggestions for use by project developers, land use planners, the operators and sponsors of public airports, and others. Safe and efficient operations at an airport require that certain areas on and near the airport are clear of objects (e.g., wildlife attractants) or restricted to objects with a certain function, composition, and height.

FAA AC No. 150/5200-33B, *Hazardous Wildlife Attractants on or near Airports* (dated August 28, 2007), discusses certain land uses on and near public-use airports. The use of active airport land, including approach and departure airspace, by wildlife can pose a safety threat. Deer have the potential to pose the greatest relative hazard to aircraft. However, the most common type of aircraft/wildlife collision is caused by birds (specifically, gulls, waterfowl, and raptors, including vultures).[48] Man-made or natural areas (e.g., stormwater management facilities, wetlands, landscaping) attract and provide habitat for wildlife (including birds).

Several species of birds may use the wetlands and open water habitats in the vicinity of the project corridor on a seasonal or transient basis. The project corridor is located within a bird migration route, and various bird species likely use habitats along the project corridor for resting.

Having open water or wetlands on or near airport property can increase the likelihood of aircraft/wildlife collisions. In July 2003, a Memorandum of Agreement (MOA) between federal resource agencies[49] was signed to acknowledge their respective missions in protecting aviation from wildlife hazards. The FAA recommends that the following distances be established between the wildlife attractant and an airport's aircraft movement areas, loading ramps, or aircraft parking areas:

- 5,000 feet for propeller-serviced airports.
- 10,000 feet for jet-serviced airports.

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[48] *Memorandum of Agreement Between the Federal Aviation Administration, the U.S. Air Force, the U.S. Army, the U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service, and the USDA to Address Aircraft-Wildlife Strikes.* July 29, 2003.

[49] The resource agencies included FAA, U.S. Air Force, USACE, USEPA, USFWS, and the USDA – Wildlife Services.

- Five miles for approach and departure airspaces (if the wildlife attractant has the potential to cause hazardous wildlife movement into or across these areas similar to wetlands and stormwater management facilities).

The proposed West Bypass corridor is located on O'Hare Airport property at the east end of the project corridor, and the Schaumburg Regional Airport is located adjacent to Rodenburg Road near the west end of the project. Consequently, the majority of the project corridor is located within the wildlife hazard separation distances listed above (see Exhibit 3-15).

Stormwater runoff best management practices for the EO-WB project would be designed to minimize wildlife hazards near the airports, while at the same time provide stormwater quality and quantity control, to the extent practicable. Based on preliminary engineering, 66 potential stormwater detention sites and 11 potential compensatory storage sites have been identified along the project corridor to accommodate the roadway improvements (some sites may have multiple basins) (see Appendix E). Compensatory storage is discussed in more detail under subsection 3.12.3. The stormwater detention sites are designed to capture stormwater runoff from the project's disturbed surfaces and control the release rate. At least one stormwater detention site would be constructed in each of the sub-watersheds that receive runoff from this project (see Table 3-37).

To minimize attractiveness to wildlife within the separation distances noted above, the proposed stormwater management facilities would be designed following the guidance in FAA AC No. 150/5200-33B, to the extent practicable, which includes narrow, linear-shaped facilities with steep side slopes that are lined with rip-rap. The AC also recommends that stormwater detention ponds have a maximum 48-hour detention period after the design storm and have no open water between storms. Measures would be taken to minimize the number of basins with a drawdown time greater than 48 hours. However, this requirement cannot be met at all locations due to the necessity to meet storage volume and release rate requirements. Vegetation to be established in or around the detention facilities should not be wildlife attractants that provide food or cover for wildlife. Underground stormwater infiltration systems (such as vaults), French drains, or rock fields, would be considered where practicable to minimize surface water ponding.

To increase the pollutant removal effectiveness of "dry" detention facilities, design considerations may include (USEPA, 2006):

- Sediment forebays for pretreatment (to help settle larger sediment particles).
- High length-to-width ratios (at least 1.5:1) to maximize flow path and enhance pollutant removal.
- Micropools at the outlet to minimize resuspension of sediment and outlet clogging.
- Regular maintenance for functionality.

In addition to detention facilities, other practices such as vegetated buffers, infiltration basins/trenches, or bioswales, would be installed where practicable to minimize transport of sediment, heavy metals, and other pollutants to surface waters. Pollutant removal in stormwater basins would be accomplished through gravity settling, assimilation of nutrients, bacterial degradation, and filtration. Vegetated stormwater conveyance channels could be used alone or in conjunction with stormwater basins to remove pollutants by filtering particulates through the vegetation and infiltration into the subsoil, which would remove soluble pollutants. Permanent ditch checks may be added to allow for additional stormwater treatment and to minimize erosion. Low profile grass seed mixes would be evaluated for the bioswales and detention basins to minimize maintenance and attractiveness to wildlife. Plant species listed in the *OMP Master Specifications*, "Section 02905: Sustainable Airport Landscaping," would be considered when designing seed mixes to address FAA AC guidelines (CDA, 2011).[50]

Studies show that best management practices such as infiltration basins/trenches, detention basins, and vegetated swales generally have pollutant removal effectiveness of between 50 and 90 percent for TSS with more variable removal percentages for metals (generally averaging between 35 and 85 percent).[51] Sediment particles are a primary component of TSS. Other pollutants such as nutrients, trace metals, and hydrocarbons have been known to attach to sediments and can be transported in stormwater runoff. As discussed in the FHWA's *Stormwater Best Management Practices in an Ultra-Urban Setting: Selection and Monitoring*, studies suggest that by controlling TSS, other constituents (e.g., metals and nutrients), could also be controlled (Shoemaker et al., 2002). This document summarizes water quality best management practices and their pollutant removal effectiveness.

Best management practices to reduce PAHs from entering surface waters include installing stormwater best management practices that settle or filter out particles to which PAHs attach, and using source control practices to minimize the amount of high PAH-containing materials used in the watershed (Prabhukumar and Pagilla, 2010). The DRSCW intends to advocate for source control and stormwater best management practices that reduce the potential for additional PAHs to enter surface waters, including those crossed by the project corridor (McCracken, 2011a). The stormwater best management practices being considered with the Build Alternative would likely also be beneficial for PAH removal. A study by the USGS (2011) found that the principal source of PAHs was often coal-tar-based pavement sealcoat, followed by vehicle-related sources. Coal-tar-based sealants are not anticipated for the proposed roadway improvements. The EO-WB project would consider stormwater best management practices consistent with highway operational requirements that can reduce PAHs from stormwater runoff.

During final engineering, stormwater controls would be designed to meet local, state, and federal regulatory requirements to treat the "first flush" of a storm, as necessary. The first flush is often referred to as the first 0.5 to 1.25 inch of runoff per impervious area in a drainage basin and typically includes a higher concentration of pollutants compared to later during the storm (Shoemaker et al., 2002; CMAP, 2008; DuPage County, 2012).

In addition, a watershed approach was used where it was possible to evaluate opportunities to improve existing drainage conditions and provide water quality benefits to local municipalities near the project corridor. As such, seven additional detention facilities are proposed near the project corridor to minimize flooding. For example, Franklin Park has experienced chronic flooding problems in an industrial area along I-294. Therefore, as part

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[50] The three main criteria for sustainable landscaping at O'Hare Airport include minimizing wildlife hazards, increasing landscape sustainability, and maximizing safety and security.

[51] Dry detention ponds may be less efficient at pollutant removal compared to wet ponds and stormwater wetland basins.

of this project, a drainage investigation was coordinated with Franklin Park to propose solutions for this problem. Recommendations to improve the chronic flooding include three potential stormwater detention sites on vacant land within Franklin Park. Similarly, several potential stormwater detention sites are proposed near the I-290/I-294/North Avenue interchange to improve chronic flooding in the cities of Elmhurst and Northlake.

Stream crossings and structure sizing would be performed in accordance with state and federal guidelines regarding floodplain and floodway encroachment and hydraulic capacity. All new structures would comply with these guidelines. Waterway crossings would be bridged, enclosed in a culvert, or otherwise designed to accommodate anticipated high-water flows, to allow movement of aquatic biota, and not to impede low-water flows to minimize negative effects to the aquatic ecosystem. Per the Illinois Tollway drainage design criteria, culverts are designed for the 50-year peak flow and checked for the 100-year and 500-year peak flows to avoid overtopping.

Drainage systems, including ditches, would be maintained and restored so as not to impound water (unless designed to do so for a water quality benefit, such as using ditch checks). The final design of stormwater best management practices would be completed during Phase II engineering. Stormwater facilities and discharges would be monitored and managed during and following construction in accordance with the requirements of the General NPDES Permit No. ILR40.

3.10.3.3 Maintenance

Deicing (e.g., salt application) of highways is necessary during the winter months for safety reasons. As a result, chloride water quality standards may be exceeded in some of the project corridor watersheds. The Illinois Tollway will sponsor a chloride water quality initiative with the following objectives:

- The Illinois Tollway will implement chloride stormwater best management practices (in accordance with FAA wildlife hazard guidelines, to the extent practicable) to reduce peak chloride concentrations consistent with the findings of USGS (Sherwood, 2001) and to minimize potential water quality impacts from deicing associated with the proposed improvements.
- The Illinois Tollway will promote weather-related data sharing with local communities to enable more efficient chloride application and to minimize the over-application of road salt based upon available pavement temperature and weather forecasts.
- The Illinois Tollway will approach chloride reduction on a watershed basis by partnering with local municipalities. The outcome of these partnerships will assist in providing a holistic view and approach to chloride application and reduction on a watershed level.
- Additionally, over the next two and half years (by winter 2014/2015 – prior to winter maintenance of the new facility), the Illinois Tollway will review road salting practices, procedures, and materials. This review will include evaluation of chloride reduction implementation plan recommendations for chloride TMDLs within the watersheds affected by the project. Adjustments will be made where practicable and feasible. Additional operator training will be provided, as necessary, based on this review. The potential use of chloride reduction best management practices, including a water quality

monitoring program, will be explored with resource agencies and interested stakeholders.

Implementing these measures may help to mitigate the potential future impact from salt use and could provide guidance for future highway projects.

In addition, best management practices and recommendations for chloride reduction are provided in the chloride TMDLs and other studies including *Chloride Usage Education and Reduction Program Study* published by the DRSCW (CDM, 2007), *Evaluation of Alternative Anti-icing and Deicing Compounds Using Sodium Chloride and Magnesium Chloride as Baseline Deicers – Phase I* (Shi et al., 2009), and *Source Water Protection Practices Bulletin: Managing Highway Deicing to Prevent Contamination of Drinking Water* (USEPA, 2010). Nonstructural best management practices (such as management strategies) can be used in concert with structural best management practices to control dissolved chlorides. Best management practices to reduce chloride loads would also likely include:

- Public education and employee training.
- Proper storage and handling operations (e.g., perform on impervious surfaces, completely cover salt piles, control stormwater runoff).
- Use of digitally calibrated spreaders to minimize over-application.
- Routine calibration (at least twice a year).
- Timing of application.
- Consideration of alternative non-chloride products (e.g., acetate deicers or corn and beet derivatives).
- Implementation of pre-wetting and anti-icing programs throughout the watershed.
- Weather information and forecasting using Road Weather Information Systems (RWIS) and Maintenance Decision Support Systems (MDSS).
- Passive snow control with the use of snow fences.
- Plowing and snow removal.
- Street sweeping during or soon after spring snow melt.

Evaluation of these practices would occur as necessary to meet NPDES permit requirements. IDOT and Illinois Tollway currently implement some of these best management practices (e.g., having a written snow plan, utilizing digital spreaders, and/or reviewing data from an existing RWIS station) and would continue to do so, or would implement alternative practices. As a result of ice formation, IDOT and Illinois Tollway also apply anti-icing strategies (e.g., salt brine) on existing bridges where necessary. The use of alternative deicing agents could be considered in relation to cost, applicability, feasibility, and public safety. Costs for sodium chloride alternatives tend to be substantially higher, and those alternatives cannot be used in all conditions or locations. In addition, these deicing alternatives may present potential adverse water quality impacts, such as reduced DO, that must be taken into consideration.

3.10.4 Indirect and Cumulative Water Resource Impacts

The six core communities near the project corridor are predominantly urban and built-out with a high concentration of industrial and commercial uses. Exceptions include preserved open space associated with forest preserves and municipal parks. The built-up nature and use of the area have contributed to the degradation of its streams by various means, such as urban runoff, storm sewers, MPSDs, upstream impoundments, or channelization and streambank modification.

More development through infilling and selective redevelopment is expected to occur in the vicinity of the project corridor over the next 30 years. Additional impervious surfaces may be constructed as part of the anticipated development. Areas that are unprotected open, underdeveloped, or underused space may be developed to take advantage of better transportation and access. These effects would be most noticeable in proximity to the proposed Elgin O'Hare and West Bypass corridors.

In addition, increased traffic on other roads is anticipated as a result of the proposed project and from induced and cumulative development. The increased traffic and impervious surfaces could result in additional pollutants being deposited on the roadways. Pollutant concentrations are highly variable and can be affected by numerous factors, such as construction, operation, maintenance, weather, and adjacent land uses. Through normal operations, such as tire wear, vehicles contribute constituents to roadway surfaces. During storms, these constituents are transported to receiving waters and could cause an indirect impact on the aquatic ecosystem or designated uses of nearby creeks. Potential impacts from pollutants in stormwater runoff from roads and other developed areas include the following:

- Sediment contamination: Bottom substrates in the aquatic environment accumulate contaminated sediment that could interfere with the reproduction and feeding mechanisms of aquatic organisms, such as fish. Contaminated sediments may be toxic to some organisms because of elevated pollutant concentrations. Sediments can have a relatively high organic content that when "broken down," exert an oxygen demand.
- Deicing salts: Induced development could include additional paved surfaces (e.g., parking lots, widened roads), which could result in an increased use of deicing salts. The use of deicing agents may raise salt concentrations in receiving waters. High salinity levels may affect sensitive floral communities, particularly wetland plants and conifer trees. Road salt runoff may stress wetland plant communities and may result in a reduction of native plant diversity and replacement by more salt-tolerant plant species.
- Impaired aesthetics: Turbid water, trash, debris, and an oily sheen may reduce the visual appeal of waterways, affect recreational potential, and harm wildlife.
- Elevated water temperatures: Several factors can increase summertime water temperatures, such as the removal of overhanging vegetation, reduction of base flows, and runoff from impervious surfaces that have been heated by the sun. Higher temperatures can stress aquatic life and raise water quality issues.

- Impairment of water supplies: Pollutants have the potential to adversely affect surface and groundwater sources of water supply. See subsection 3.11 for a discussion on potential impacts to groundwater resources (USDA-NRCS and IEPA, 2002).

With the implementation of best management practices, negative impacts to the aquatic environment are anticipated to be minimal as a result of the EO-WB; however, if a development is not designed with appropriate best management practices, impacts may occur. Development has the potential to increase the rate and volume of stormwater runoff and reduce groundwater recharge. If not managed appropriately, cumulative urban development could result in increased flooding, higher and more frequent storm-related flows, and low flows of longer duration in streams. The increased runoff rates and high channel velocities from inappropriately managed sites could result in excessive bank erosion or channel downcutting. Stream substrates and bottom-dwelling or benthic organisms can be scoured away by frequent high flows and velocities. Pollutants may concentrate during periods of lower flow. Extended periods of low flow may also result in higher in-stream temperatures during the summer, which could affect fish or other aquatic wildlife (USDA-NRCS and IEPA, 2002). However, these potential impacts can be mitigated by regulation and implementation of modern stormwater best management practices.

Detention would be provided to compensate for the increased stormwater runoff from the additional impervious area for existing alignments and disturbed area for new alignments associated with the Build Alternative. Future development also would have to provide detention, as required by state and local regulations. To minimize cumulative impacts, best management practices that integrate both water quantity and quality control would be considered, as practicable.

Many changes have been implemented and much progress has been achieved over the last several decades to improve water quality nationally and in the region. The Salt Creek Watershed, for example, is located in both Cook and DuPage Counties near the center of the project corridor. Rapid urbanization of the Salt Creek Watershed started around the 1950s. In the years that followed, human activities (e.g., land development/construction, land use) placed an overwhelming strain on the watershed. Several factors, such as increased impervious area, floodplain encroachment, loss of natural storage area, channel modification, and pollutant discharges resulted in increased stormwater runoff, flooding, and stream degradation (DuPage County, 2008).

Since the 1970s, various environmental regulations (at the federal, state, and local levels), flood control projects, public awareness, and activism have played a role in improving water quality and reducing flooding. Regulations, such as the federal CWA and the DuPage County Countywide Stormwater and Flood Plain Ordinance, are reducing the adverse effects of development upon water resources.[52] For waterways located close to the project corridor, a TMDL has been prepared for the Salt Creek Watershed[53] for chloride and DO, and for the West Branch DuPage River for chloride (CH2M HILL, 2004b). Additional TMDLs are in progress for impaired segments of Salt Creek, Addison Creek, and the West Branch

[52] The MWRDGC is preparing a countywide watershed management ordinance for Cook County.

[53] The Salt Creek TMDLs address segments of the following project corridor creeks: Salt Creek, Addison Creek, Spring Brook, and Meacham Creek (CH2M HILL, 2004a).

DuPage River to address fecal coliform.[54] A TMDL is also in progress to address chloride, DO, and fecal coliform for Higgins Creek (AECOM, 2010). TMDLs by themselves will not lessen future degradation, but with regulatory oversight, stakeholder initiatives, and implementation of best management practices, water quality in the local watersheds and the larger Des Plaines River drainage basin should improve, even with more development. The pollutant loading analysis for this project shows that water quality for TSS and metals (i.e., copper, lead, and zinc) has the potential of being improved with best management practice implementation in the majority of the watersheds that are tributary to the proposed Elgin O'Hare and West Bypass corridors.

Stormwater quality control would be accomplished through the NPDES Phase II General Permit No. ILR40, including incorporation of TMDLs to address impairments in affected watersheds. Water quality would be managed through a combination of stormwater runoff and drainage collection facilities and the implementation of other post-construction best management practices in accordance with state and federal water quality goals of restoring water quality of impaired or degraded streams.

In response to the TMDLs for Salt Creek and East and West Branches of the DuPage River, the DRSCW was formed. The DRSCW has set short-term and long-term goals to improve water quality. The DRSCW members work together and use data collection to help set priorities, make decisions, and provide recommendations to help achieve these goals. Through education and outreach the DRSCW has promoted water quality awareness throughout the Salt Creek and DuPage River watersheds. Implementation of practices and activities recommended by workgroups, such as the DRSCW, could help minimize indirect and cumulative impacts of this project and other projects in the Des Plaines River drainage basin.

Other workgroups are also active in the project corridor watersheds and have had a positive influence on the environment and protecting surface waters. With the assistance of Ecosystem Partnerships (i.e., UDPREP, LDPEP, and DRC), more than 700 acres of land and 10.8 miles of stream have been restored; more than 4,000 students have been educated; more than 6,000 volunteers have been enlisted; and more than 160 sites have been monitored. More than $2.5 million dollars in C2000 grants have been awarded. Local matching funds have leveraged approximately $4.9 million more. In total, this equals roughly $7.4 million dollars primarily for restoration and education projects in the respective watersheds of the Des Plaines River drainage basin (IDNR, 2011). The continued efforts of these organizations to meet their watershed goals, participate in the grant review process for restoration projects and/or land acquisition, and educate the community and other stakeholders can help to minimize the indirect and cumulative impacts that the proposed project could have on surface waters.

Of the major transportation projects proposed in the next 30 years in the vicinity of the project corridor, the EO-WB project is expected to break ground first. As such, it could be viewed as a model to develop practices that could be applied to other infrastructure projects in the larger Des Plaines River drainage basin or northeastern Illinois. As part of the EO-WB

[54] In addition to fecal coliform, TMDLs are being prepared for the following impairments associated with stream segments near the project corridor: pH (Salt Creek); DO, pH, manganese, and silver (West Branch DuPage River) (AECOM, 2009).

project, a Sustainability Working Group[55] was established. The working group prepared sustainability goals and recommendations to guide the planning, design, construction, and operation of the proposed EO-WB project. Sustainable practices potentially can reduce the environmental impact of a project and, at the same time, create financial and operational benefits, as well as social benefits for the community at large. Sustainable projects attempt to meet existing needs without jeopardizing the ability of others to meet future needs.

The sustainability goals and recommendations for this project include nine categories—planning, design, environment, energy reduction, water quality, materials and resources, construction practices, operations, and maintenance. The goals and recommendations can be used to supplement existing federal, state, or local regulatory requirements with additional best management practice environmental strategies and considerations.

Through the use of sustainable practices, the indirect and cumulative impact of this project can be minimized. To protect surface waters (by minimizing water pollution and practicing water conservation), the following recommendations (by the Sustainability Working Group) would be considered for this project and could be used for other projects, depending on project constraints, support, feasibility and available budget.

Construction practices that would be considered for this project include:

- Establish, implement, and maintain a Construction Waste Management Plan.
- Practice water efficiencies (e.g., use nonpotable water when possible and track its use).
- Provide preconstruction training for construction managers and contractors.
- Install signage highlighting environmentally sensitive areas (e.g., wetlands and stream corridors) to provide field reminders of sustainability objectives.
- Develop an incentive program, such as credit for future work for avoidance of environmental violations.

Water quality practices that would be considered for this project include:

- Determine the life-cycle costs and savings associated with low-impact development (LID)[56] stormwater best management practices.
- Specify drought-tolerant plant species.
- Consider opportunities for rainwater harvesting.
- Incorporate green roofs on associated roadway facilities.
- Incorporate grey-water flushing in toilet facilities (grey water refers to water from roof or road drainage).

[55] Illinois Governor Pat Quinn issued Executive Order10-13 on October 5, 2010, establishing the EO-WB Advisory Council. The Sustainability Working Group was established by the Advisory Council.

[56] LID describes engineered controls, stormwater management facilities, and other best management practices that attempt to mimic pre-development hydrologic conditions, by emphasizing infiltration, evapotranspiration, or stormwater reuse for long-term flow control and runoff treatment.

- Work with the DRSCW to design a water quality monitoring program (designed for before, during, and after construction).
- Use the latest technology to track and quantify deicing material application rates, spreading techniques, weather data, pavement conditions, and all necessary items to make informed decisions to best manage a storm and minimize deicing material.
- Install vegetative swales and bioswales.
- Include permeable and porous pavement in mostly non- or low-traffic areas, such as parking areas, roadway shoulders, and maintenance roads.

More detail on the EO-WB project's sustainability goals and recommendations can be found in Appendix A. As practical, these sustainable practices would be applied to the future design and construction phases of the EO-WB project and could serve as a prototype for other transportation projects to minimize indirect and cumulative water quality impacts in the immediate area and to the downstream environment.

The surface waters crossed by the project corridor are largely impaired or degraded, but their water quality is anticipated to improve because of watershed studies, restoration projects, and regulatory action. Notably, the implementation of regulatory controls and the increasing consideration of sustainable policies have shown benefits to water quality. Overall, the potential indirect and cumulative water quality impacts of the proposed improvement and other major projects in the area can be minimized through agency oversight (at the local, state, and federal levels) and the implementation of best management practices.

3.11 Groundwater

3.11.1 Affected Environment

3.11.1.1 Aquifers

The project corridor contains groundwater resources and aquifers, within the surficial glacial deposits and bedrock; however, the main source of potable water in the vicinity of the project corridor is Lake Michigan water. In the surficial deposits, the accessible shallow aquifers can be found in the isolated lenses of sands and gravels of glacial till located within generally clayey soils. These aquifers are connected hydrologically and are recharged directly by surface water infiltration.

Within the bedrock, shallow Silurian dolomite produces water in varying quantities depending on the presence of water-bearing sands in the overlying drift. The shallow dolomite aquifer is separated from deeper aquifers by the shale of the Maquoketa Group. Below the shale is the Cambrian-Ordovician aquifer. The Cambrian-Ordovician aquifer is the most developed deep aquifer within the Chicago region and consists primarily of St. Peter Sandstone. Shallow aquifer wells supply low water-demand needs (e.g., single-family homes). Deep aquifer wells typically are used for large water-demand needs (e.g., community supply).

There are no sole-source aquifers, as designated under Section 1424(e) of the Safe Drinking Water Act, within the project corridor. The Illinois State Geological Survey (ISGS) published a map titled *Potential for Aquifer Recharge in Illinois* (Keefer and Berg, 1990). The map indicates that the project corridor has a relatively low potential for aquifer recharge into either aquifer. Consequently, there is a low potential for groundwater contamination except in the Salt Creek and West Branch DuPage River corridors, where larger resources of sand and gravel are present.

The project corridor contains no Class III special resource groundwaters, which are found by the Illinois Pollution Control Board to be demonstrably unique or irreplaceable sources of groundwater and are suitable for application of a water quality standard more stringent than Class I groundwater. Class III groundwaters are considered vital contributors for particularly sensitive ecological systems and/or dedicated nature preserves. There are no dedicated nature preserves in the project corridor.

3.11.1.2 Water Supply Wells

The Illinois Groundwater Protection Act (IGPA) established a program for protection of groundwater. The minimum setback zone established by the IGPA prohibits locating new potential primary or secondary sources and potential routes of groundwater pollution (e.g., abandoned or improperly plugged wells) within 200 or 400 feet of a wellhead. The second level of protection is the maximum setback zone. The maximum zone prohibits locating new potential primary sources of groundwater pollution within 1,000 feet of the wellhead. This project does not pose a potential primary or secondary source, or a potential route, for pollution as defined in the Illinois Environmental Protection Act, and the project corridor does not contain any wellhead protection areas. The nearest wellhead protection area is located in west-central Illinois.

Within the project corridor, nearly all potable water supply needs are met using Lake Michigan water. Nonetheless, 83 water supply wells are within 200 feet of the project corridor, according to the ISGS Water and Related Wells Database and the IEPA Source Water Assessment Program. According to the IEPA Source Water Assessment Program, six of those wells are classified as Community Water Supply (CWS) wells, and 77 wells are classified as non-CWS wells (IEPA, 2008). Six CWS wells are within 400 feet of the project corridor, and 20 CWS wells are within 1,000 feet of the project corridor.

The wells vary in depth from less than 100 feet to more than 2,200 feet. Of the 83 water supply wells within 200 feet of the project corridor, 72 wells are in the shallow aquifer (less than 500 feet deep), averaging about 200 feet deep, and 11 wells are in the deep aquifer (500 to 2,200 feet deep). Of the six CWS wells within 200 and 400 feet of the project corridor, three are shallow aquifer and three are deep aquifer wells. Of the 20 CWS wells within 1,000 feet of the project corridor, 12 are shallow aquifer wells, and eight are deep aquifer wells.

Every incorporated community within the project corridor receives its main water supply from Lake Michigan, supplied by either the City of Chicago or the City of Evanston. Municipal wells provide water for irrigation and serve as backup for Lake Michigan supplies. In DuPage County, unincorporated areas without public water supply typically rely on shallow wells to supply their water needs. The Oasis, Des Plaines, and Touhy mobile home parks are located within 200 feet of the project corridor, and use CWS wells to meet their needs.

3.11.1.3 Groundwater Quality

The IEPA monitors groundwater quality from CWS wells in the state. This information is summarized in IEPA's *Integrated Water Quality Report and Section 303(d) List* (IEPA/BOW, 2012). This report assesses water quality throughout the state and categorizes it into three levels. The groundwater use assessments are based primarily upon CWS chemical monitoring analyses of the Class I potable resource groundwater standards. A fixed-station probabilistic network of CWS wells is used to predict the likelihood of attaining full use support in the major aquifers in Illinois. The attainment of use support is described as Full Support and Nonsupport. CWS wells were identified to have Full Support (good) water quality on the northwest side of O'Hare Airport in the vicinity of the project corridor. CWS wells were identified as having Nonsupport (fair and poor) water quality from west of O'Hare Airport to the western terminus of the project corridor.

In northeastern Illinois, including parts of Cook and DuPage Counties, the primary groundwater quality issues concerning deep bedrock aquifers include high levels of naturally occurring barium, radium, and total dissolved solids (TDS). Public water systems treat these groundwater contaminants as necessary (e.g., by ion-exchange softening, lime softening, etc.) to make groundwater potable. In general, the groundwater quality of deep bedrock aquifers is less susceptible to chemical contamination by vertical migration from the land surface than shallow aquifers, although groundwater in deep bedrock aquifers tends to have higher mineral concentrations than groundwater in shallow aquifers (this varies by location).

Shallow aquifers can be affected by surface contamination. Road runoff, underground storage tanks (USTs), landfills, septic fields, industrial discharges, wastewater treatment plants, and atmospheric deposition are common sources of pollutants. Potential contaminants include chloride, TDS, heavy metals, and petroleum compounds. During the last 20 years in northeastern Illinois, contaminants, such as TDS and chloride, have been increasing in many shallow wells. Chloride can be used as an indicator of surface aquifer contamination. Chloride concentrations have been increasing in shallow aquifers throughout the Chicago metropolitan area, especially in the outer counties (DuPage, Kane, McHenry, Will). The smallest change in chloride concentrations have been recorded in Cook and Lake Counties, where 80 percent of samples were greater than 10 mg/L, almost 50 percent were greater than 40 mg/L, and only 16 percent were greater than 100 mg/L. None of the sampled values were greater than the maximum level of acceptability of 250 mg/L. The increase in chloride concentrations in shallow aquifers may be attributed primarily to road salt runoff and septic field discharge (Illinois Department of Public Health, 2011; Illinois State Water Survey [ISWS], 2008a; ISWS, 2008b; Kelly and Wilson, 2008).

3.11.1.4 Karst Topography

Karst topography is a landscape characterized by sinkholes, depressions, caves, and underground drainage, generally underlain by soluble rocks (e.g., limestone, dolomite). Most karst topography in Illinois is restricted to the northwestern counties (Carroll and Jo Daviess Counties), western counties (Adams, Calhoun, and Pike Counties), and southwestern counties (Madison, Monroe, Randolph, and St. Clair Counties). Karst topographic regions are highly vulnerable to groundwater contamination. The project corridor is not located within an area identified to have karst topography. Consequently, there is no potential for an impact to this resource.

3.11.1.5 Seeps

In this region, seeps are generally associated with steep valley walls and usually are associated with wetland areas. No seeps have been identified as part of the wetland assessments completed for this project, and no impacts to seeps are anticipated.

3.11.2 Environmental Consequences

This analysis focuses on potential impacts of the Build Alternative on community and private water supplies. All of the communities located near the Build Alternative receive their drinking water supply from Lake Michigan; therefore, impacts to their drinking water supply are not anticipated. However, wells mapped within the project corridor are being considered. This evaluation is based on available well location data provided by IEPA and ISGS.

Every community near the Build Alternative has municipal wells. The active wells are used for irrigation and for water supply at parks or other facilities that do not have a Lake Michigan water supply. Most of the wells are remnants from pre–Lake Michigan water supply and are kept operational in case the Lake Michigan water supply is compromised. Similarly, private wells are used for various purposes. Not every owner is supplied by Lake Michigan water; therefore, wells may be used to provide potable water.

Although roadways and other supporting transportation improvements are not considered a source for groundwater contamination because the project corridor has a low potential for groundwater recharge, the following information is provided as documentation of consideration of the setback requirements. The IGPA (Chapter 415 ILCS Section 55) establishes setback zones for the location of potential sources of pollution, such as USTs, dry wells, borrow pits, and facilities for storage of deicing salt. The minimum setback zone around a private well is 200 feet for protection of groundwater. For a CWS well the minimum setback zone is 400 feet. Up to a 1,000-foot setback for CWS wells is required if technical data support a wider zone. The Build Alternative is not located within a regulated recharge area established by the Illinois Pollution Control Board. The nearest regulated recharge area is west of Peru, Illinois.

Non-CWS wells, private water wells, and CWS wells near the project corridor have a potential risk for contamination from roadway runoff, especially if the wells are shallow or improperly cased. Potential sources of contamination associated with roadway construction include sedimentation, siltation, and hydrocarbon runoff. During operation and maintenance of the project roadway, potential sources of contamination include road oils, chlorides, pesticides and fertilizers. Operations and maintenance activities involving chlorides, pesticides, or fertilizer-handling should be implemented carefully to avoid potential impacts.

The potential for contaminating groundwater supply wells depends on well construction, proximity to pollutant sources, and geological conditions. It is anticipated that potential well impacts near the Build Alternative would be minimal because of the generally clayey soils with low permeability above the aquifers, controlled roadway drainage patterns (e.g., stormwater conveyed and captured by curb and gutter, storm sewer, and open ditches), and the dilution of runoff associated with proposed stormwater management facilities.

There are 77 private water supply wells within 200 feet of the project corridor and six community water supply wells within 400 feet of the project corridor. Additionally, 24 wells are identified to be within the project corridor that are likely remnant records of wells that no longer exist because they are mapped as being within existing pavement areas of the Elgin-O'Hare Expressway or other past improvements. Wells that are identified as being functional within the construction limits of the Build Alternative would be abandoned in accordance with state regulations.

The project would not create any new potential "routes" for groundwater pollution or any new potential "sources" of groundwater pollution as defined in the Illinois Environmental Protection Act (415 ILCS 5/3, et seq.). Accordingly, the project is not subject to compliance with the minimum setback requirements for CWS wells or other potable water supply wells as set forth in 415 ILCS 5/14, et seq. This project does not pose a potential primary or secondary source, or a potential route, for pollution as defined in the Illinois Environmental Protection Act.

No measurable change in available groundwater supply is expected due to the Build Alternative. The additional impervious area associated with the project would represent a small reduction in potential recharge area that would be offset by construction of the stormwater management facilities and other stormwater best management practices.

3.11.3 Measures to Minimize Harm and Mitigation

To minimize potential changes in groundwater quality, a comprehensive soil erosion and sediment control plan will be implemented by IDOT and/or the Illinois Tollway during construction, which would minimize degradation of surface waters. Additionally, post-construction best management practices, such as bioswales, infiltration basins, native vegetation, filter strips, and stormwater management facilities, would be installed where practical and feasible to collect, detain, and filter stormwater runoff to minimize potential surface and groundwater degradation (see subsection 3.10). The post-construction best management practices would be installed with all stormwater management facilities and surface drainageways. The best management practices would focus on capturing and retaining potential contaminants to prevent them from exiting the project corridor as surface or groundwater flow. In particular, at the three locations where shallow aquifer wells are used for potable water, the types of best management practices to be implemented will be carefully considered to minimize infiltration while maximizing the filtering of runoff (see Appendix E). The potential for groundwater infiltration is limited due to the clayey soils; therefore, it is expected that the potential for groundwater migration of contaminants will be minimal.

3.12 Floodplains

3.12.1 Affected Environment

Floodplains within the project corridor typically consist of open areas but may also contain roadways or developments. Floodplains are extensions of waterways where water rises and expands into additional storage areas. Within vegetated areas, floodplains provide an opportunity for infiltration and water quality treatment through filtering of nutrients, sediment, and impurities.

Based on Illinois Administrative Code, Title 17 (Conservation), floodplain and floodway are defined as follows:

- *Floodplain or Regulatory Floodplain* is defined as that land adjacent to a body of water with ground surface elevation at and below the 100-year frequency flood elevation.
- *Floodway* or *Regulatory Floodway* is defined as the channel and that portion of the floodplain adjacent to a stream or watercourse that is needed to store and convey the anticipated future 100-year frequency flood discharge with no more than a 0.1-foot increase in flood stage, and no more than a 0.1 percent increase in velocities due to the loss of flood conveyance and storage.

3.12.1.1 Floodplains and Floodways

According to the National Flood Insurance Program (NFIP) Flood Insurance Rate Maps (FIRMs) produced by the Federal Emergency Management Agency (FEMA), the proposed project corridor includes eight base floodplains and six regulatory floodways (see Exhibit 3-16 and Table 3-40). The project corridor spans DuPage County and Cook County and lies in the governing drainage districts of DuPage County Stormwater Management and the MWRDGC.

Some flood-prone areas also exist in the Franklin Park/I-294 industrial area, the southwest quadrant of the intersection of Roselle Road and existing Elgin-O'Hare Expressway, IL 64 (North Avenue) at I-290 and I-294, east of Plum Grove Road south of the existing Elgin-O'Hare Expressway, Thorndale Avenue over the Devon Avenue Tributary in Itasca, IL 83 (Busse Road) and Bryn Mawr Avenue south of Thorndale Avenue, and Irving Park Road west of Seymour Avenue on the south side of O'Hare Airport. As part of the Location Drainage Study, IDOT has engaged in separate drainage investigations of these areas to identify and propose possible solutions to chronic flooding issues.

FIGURE 3-12
YORK ROAD OVER WILLOW CREEK, CENTER CHANNEL

Source: CBBEL, 2010.

In the vicinity of the proposed Elgin-O'Hare Expressway and West Bypass system interchange, York Road is supported by a bridge over the Willow Creek and Willow Creek South Tributary floodplains (see Figure 3-12). The bridge extends 1,200 feet northward from a location 2,400 feet north of the intersection of York Road and Thorndale Avenue.

The following three irregular trapezoidal structures are under this bridge:

- 30 feet (top width) by 6 feet (height) by 6 feet (bottom width)
- 40 feet (top width) by 8.4 feet (height) by 6 feet (bottom width)
- 31 feet (top width) by 5.2 feet (height) by 10 feet (bottom width)

The effective waterway opening of the bridge trapezoidal structures would not be impacted by the proposed EO-WB project improvements.

Within the project corridor along Higgins Creek at the northwest corner of OMP, the MWRDGC maintains the Touhy Avenue Reservoir. This reservoir consists of two deep ponds (or "cells") working in tandem to help control flood flows along Higgins Creek through the use of spillways and a pump station that pumps water detained in the cells back to Higgins Creek after flood waters recede. This reservoir releases runoff at a monitored rate toward O'Hare Airport. The storage capacity of this reservoir would not be impacted as a result of the EO-WB project improvements.

TABLE 3-40
Designated 100-Year Floodplains within the Project Corridor

Water Resource [a]	County	Floodplain Area in Project Corridor (acres) [b]	Floodway Identified
Addison Creek	Cook	2.25	Yes
Bensenville Drainage Ditch	DuPage	4.03	Yes
Higgins Creek	Cook	13.41	Yes
Higgins Creek Tributary A	Cook	5.87	Yes
Meacham Creek	DuPage	9.12	No
Salt Creek	DuPage	23.35	Yes
Willow Creek	DuPage	1.98	No
Willow Creek South/North Tributaries	DuPage	16.30	Yes

[a] All streams and associated 100-year floodplains lie within the Des Plaines River drainage basin (HUC 07120004). This table lists FEMA-named streams and tributaries with mapped floodplain in the project corridor.
[b] Area is based on GIS calculation of digitized published FEMA floodplain data.

The floodway consists of the stream channel and adjacent areas that carry flood flows. Six regulatory floodways (involving multiple waterway crossings) are included within the project corridor (see Table 3-40)—Addison Creek, Bensenville Drainage Ditch, Higgins Creek, Higgins Creek Tributary A, Salt Creek, and Willow Creek South Tributary. The extent of floodway limits were identified from FIRM maps published by FEMA. New bridges or culverts to be constructed in a designated floodway would not result in an increase of upstream flood stages more than 0.1 foot over the existing conditions for all flood events up to and including the 100-year frequency event.

3.12.1.2 Natural and Beneficial Floodplain Values

Beneficial values of floodplains include, but are not limited to, the moderation of floods, water quality, groundwater recharge, fish and wildlife habitat, open space, and recreational value. All of the floodplains for this project are located in urban areas. Although some floodplain areas are confined within the banks of the creeks, other floodplain areas (that is, Willow Creek South Tributary and Bensenville Drainage Ditch) contain homes or other structures that experience repeated flood damage.

3.12.1.3 Flood Buyout Properties

Although there are areas of chronic flooding within and surrounding the project corridor, there are currently no properties, communities, local agencies, or counties participating in a FEMA Hazard Mitigation Grant Program (HMGP) or flood-prone property buyout program.

3.12.2 Environmental Consequences

The floodplain encroachment evaluation was conducted in accordance with EO 11988 “Floodplain Management,” the “Assessment and Documentation of Flood Plain Encroachment” as contained in the *BDE Manual* (IDOT, 2011), “Floodplain Encroachments” in the *Illinois Drainage Manual* (IDOT, 2004), Illinois Administrative Code 3708 “Floodway Construction in Northeastern Illinois,” and Illinois Administrative Code 3700 “Construction in Floodways of Rivers, Lakes, and Streams.” Guidance from the DuPage County Stormwater Management Division, MWRDGC, and the various local municipalities was applied in determining floodplain impacts and compensatory storage requirements because the local or county ordinances are more restrictive than IDOT and Illinois Tollway requirements.

3.12.2.1 Floodplains and Floodways

Potential floodplain encroachments were first identified by overlaying proposed roadway locations onto FIRMs published by FEMA. Normal, 10-year, and 100-year water surface elevations, which were developed in Existing Conditions Hydraulic Reports, were used in further analysis to calculate the amount of roadway fill in the floodplain. The floodplain fill volumes were then separated by county, Cook or DuPage, to quantify compensatory storage volumes required by each respective local stormwater ordinance. Within Cook County, the Addison Creek crossing is located in the City of Northlake, and the Higgins Creek crossings are located in the City of Des Plaines. The City of Northlake, City of Des Plaines, and DuPage County require a compensatory storage volume ratio of 1.5:1. Therefore, all floodplain fill volumes within the project corridor must be compensated for at a ratio of 1.5:1 or greater, if feasible. Floodplain encroachments and mitigation measures are discussed below. Table 3-41 briefly describes and quantifies the proposed fill within the FEMA-mapped floodplains in the project corridor. Consequently, Table 3-41 also defines the required storage volume necessary to compensate for fill placed in the floodplain (also see subsection 3.12.3). Potential floodplain compensatory storage sites are depicted in Appendix E.

TABLE 3-41
Proposed 100-Year Floodplain Impact Summary

Waterway	Location and Description	Normal to 10 Years		10 Years to 100 Years	
		Fill Volume (acre-feet)	Required Storage (acre-feet)	Fill Volume (acre-feet)	Required Storage (acre-feet)
Addison Creek	At I-294 and Northwest Avenue. Two-cell 10-foot (span) x 9.5-foot (rise) concrete box culvert at I-294 to be extended.	0.60	0.90	0.66	0.99

TABLE 3-41
Proposed 100-Year Floodplain Impact Summary

Waterway	Location and Description	Normal to 10 Years		10 Years to 100 Years	
		Fill Volume (acre-feet)	Required Storage (acre-feet)	Fill Volume (acre-feet)	Required Storage (acre-feet)
Bensenville Drainage Ditch	At West Bypass corridor. Install a new culvert or extend existing railroad culvert to the east. [a]	0.00	0.00	0.37	0.56
Higgins Creek	At West Bypass corridor over Touhy Avenue Reservoir. [b]	No impact	No impact	No impact	No impact
Higgins Creek	At Touhy Avenue. Two-cell, 13.5-foot (span) x 8-foot (rise) concrete box culvert to remain.	No impact	No impact	No impact	No impact
Higgins Creek	At I-90. Two 2-span, concrete beam bridges with center pier to be widened in-kind; construct two new bridges over the creek to the north and south of I-90 for ramps (similar construction to existing I-90 bridges).	0.59	0.89	2.13	3.20
Higgins Creek	At Elmhurst Road. Single 25-foot concrete slab bridge to be widened in-kind; Proposed westbound I-90 ramp at Elmhurst Road.	0.42	0.63	1.78	2.67
Higgins Creek Tributary A	At I-90. Two-cell, 9-foot (span) x 5.75-foot (rise) concrete box culvert to be modified as necessary.	2.24	3.36	5.66	8.49
Meacham Creek	At Elgin O'Hare corridor. 10-foot (span) x 8-foot (rise) concrete box culvert to be modified as necessary.	0.05	0.08	0.16	0.24
Salt Creek	At Elgin O'Hare corridor. Existing two-span, prestressed concrete beam bridge with center pier in creek to remain for frontage road. Construct two new bridges for mainline (proposed mainline bridges will not have piers in creek).	6.33	9.50	11.65	17.48
Willow Creek	At West Bypass corridor. Install new culverts and/or extend existing drainage structures (3) from the railroad to beneath proposed West Bypass embankment.	3.30	4.95	4.70	7.05
Willow Creek South/North Tributaries	At York Road. Three trapezoidal channels under a bridge at York Road to remain.	No impact	No impact	No impact	No impact

TABLE 3-41
Proposed 100-Year Floodplain Impact Summary

Waterway	Location and Description	Normal to 10 Years		10 Years to 100 Years	
		Fill Volume (acre-feet)	Required Storage (acre-feet)	Fill Volume (acre-feet)	Required Storage (acre-feet)
Willow Creek South Tributary	At Thorndale Avenue. Two-cell, 10-foot (span) x 4-foot (rise) concrete box culvert to be removed, replaced and realigned. Existing channel between Thorndale Avenue and York Road would be realigned.	8.80	13.20	8.70	13.05

[a] Work proposed below the 10-year floodplain elevation would not result in floodplain fill.
[b] In addition, an embankment for the West Bypass/ I-90 interchange will partially fill Cell 2 of the Touhy Avenue Reservoir. This would require 171 acre-feet of floodplain fill in the reservoir, which would be compensated by construction of a new cell just south of Cell 1.

Table 3-42 summarizes floodplain encroachment type (e.g., longitudinal or transverse) and the assessment category of each floodplain crossing. There are no significant floodplain encroachments proposed under the Build Alternative (i.e., Category 6 significant floodplain encroachments are defined in the IDOT Drainage Manual).

Transverse encroachments occur when the roadway is roughly perpendicular to the floodplain (similar to the proposed bridge crossing of the Elgin O'Hare corridor over Salt Creek). The proposed improvements would result in 12 transverse floodplain encroachments and eight transverse floodway encroachments. The potential transverse encroachments are generally associated with proposed pavement widening that increases embankment fill in the floodplain and causes culvert extension and bridge widening. Some potential transverse encroachments are due to the proposed construction of new roadway. For instance, the proposed West Bypass corridor would involve a transverse encroachment over the Bensenville Drainage Ditch and Willow Creek where there is no encroachment in the existing condition.

TABLE 3-42
Proposed 100-Year Floodplain and Regulatory Floodway Encroachment Summary

Waterway	Crossing Location	Floodplain Encroachment	Floodway Encroachment	Assessment Category [a]
Addison Creek	At I-294 and Northwest Avenue	Transverse	Transverse	3
Bensenville Drainage Ditch	At West Bypass corridor	Transverse	Transverse	3,4,5
Higgins Creek	At Touhy Avenue	Transverse	Transverse	2,3
Higgins Creek	At Touhy Avenue Reservoir	Transverse/ Longitudinal	No encroachment	2,3
Higgins Creek	At I-90	Transverse/ Longitudinal	Transverse	3,5

TABLE 3-42
Proposed 100-Year Floodplain and Regulatory Floodway Encroachment Summary

Waterway	Crossing Location	Floodplain Encroachment	Floodway Encroachment	Assessment Category [a]
Higgins Creek	At Elmhurst Road	Transverse/ Longitudinal	Transverse/ Longitudinal	3
Higgins Creek Tributary A	At I-90	Transverse/ Longitudinal	Transverse/ Longitudinal	3
Meacham Creek	At Elgin O'Hare corridor	Transverse	No encroachment	3
Salt Creek	At Elgin O'Hare corridor	Transverse	Transverse	3,5
Willow Creek	At West Bypass corridor	Transverse	No encroachment	3,4,5
Willow Creek South/ North Tributaries	At York Road	Transverse	No encroachment	2
Willow Creek South Tributary	At Elgin O'Hare corridor	Transverse	Transverse	5

[a] Assessment categories are from IDOT's *BDE Manual (*2011): Chapter 26, Section 26-7, Floodplain Encroachments; and IDOT's *Illinois Drainage Manual* (2004): Chapter 3 Floodplain Encroachments, Section 3-005 Categories.

Assessment categories range from 1 to 6. Categories relevant to the proposed EO-WB project improvements are described below:

- Category 2 represents projects that would not replace or modify any drainage structures.
- Category 3 represents projects involving modification to existing drainage structures.
- Category 4 represents projects involving replacement of existing drainage structures on existing alignment.
- Category 5 represents projects on new alignment.

Longitudinal encroachments occur where the roadway runs parallel to the floodplain. The proposed improvements would result in four longitudinal floodplain and two longitudinal floodway encroachments. One longitudinal encroachment is located at I-90 at Higgins Creek Tributary A; it would be the result of both roadway widening and the creation of a ramp to provide access from eastbound I-90 to southbound Elmhurst Road. Upstream of the crossing (south side of I-90), Higgins Creek Tributary A runs parallel to I-90. The addition of pavement and embankment slope causes a longitudinal encroachment on the Higgins Creek Tributary A floodplain and floodway.

Downstream of the confluence of Higgins Creek Tributary A and Higgins Creek, and immediately west of Elmhurst Road, is another longitudinal floodplain and floodway encroachment. A diverging diamond-style interchange is proposed at this location. The proposed ramp directing traffic from southbound Elmhurst Road to westbound I-90 would encroach longitudinally on the Higgins Creek floodplain and floodway. It is estimated that the improvement at this location may introduce 2.66 acre-feet of fill between the normal flow elevation and 10-year flood elevation, and 7.44 acre-feet of fill between the 10- and 100-year flood elevations.

A third longitudinal encroachment of the Higgins Creek floodplain is located immediately upstream of its crossing under I-90 (north side of I-90), east of Elmhurst Road. Ramps connecting the West Bypass to I-90 increase the roadway width and impact the Higgins Creek floodplain at this location. Only transverse encroachments impact the Higgins Creek floodway at this location.

The fourth longitudinal encroachment of the Higgins Creek floodplain is located at the Touhy Avenue Reservoir. West Bypass ramps over the reservoir will require an embankment within a portion of Cell 2 (see subsection 3.12.3). A floodway is not associated with the reservoir cell.

All structures crossing floodplain areas will be sized to allow a minimum of three feet between the roadway edge of pavement and the 50-year headwater elevation. Bridges would be sized to have a minimum of two feet of clearance between the low-beam elevation and 50-year natural water elevation. Additionally, the 500-year flood stage will not overtop the roadway edge of pavement.

Regulatory floodway encroachments are anticipated at eight waterway crossings in the project corridor (some waterways have more than one crossing) (see Table 3-42). Proposed structures would comply with the 17 Illinois Administrative Code - Part 3708 rules for Bridge and Culvert Reconstruction or Modification, which may involve determining the feasibility of reducing the created head to 0.1 foot over the natural elevation for floods up to and including the 100-year event, if the existing structure is a source of flood damage. If the structure is not a source of flood damage, the proposed structures would not increase the flood profile by more than 0.1 foot above existing conditions up to and including the 100-year storm event. A permit for floodway construction in Northeastern Illinois would be secured from IDNR-OWR prior to any work within the floodway or locations with one square mile or greater of tributary area without a defined floodway; Table 3-43 summarizes the floodway impacts.

TABLE 3-43
Proposed 100-Year Floodway Impact Summary

Waterway	Location and Description	Normal to 10 Years		10 Years to 100 Years	
		Fill Volume (acre-feet)	Required Storage (acre-feet)	Fill Volume (acre-feet)	Required Storage (acre-feet)
Addison Creek	At I-294 and Northwest Avenue. Two-cell 10-foot (span) x 9.5-foot (rise) concrete box culvert at I-294 to be modified as necessary.	0.11	0.11	0.07	0.07
Bensenville Drainage Ditch	At West Bypass corridor. Install a new culvert or extend existing railroad culvert to the east.	0.00	0.00	0.37	0.37
Higgins Creek	At Touhy Avenue. Two-cell, 13.5-foot (span) x 8-foot (rise) concrete box culvert to remain.	No impact	No impact	No impact	No impact

TABLE 3-43
Proposed 100-Year Floodway Impact Summary

Waterway	Location and Description	Normal to 10 Years		10 Years to 100 Years	
		Fill Volume (acre-feet)	Required Storage (acre-feet)	Fill Volume (acre-feet)	Required Storage (acre-feet)
Higgins Creek	At I-90. Two 2-span, concrete beam bridges with center pier to be widened in-kind; construct two new bridges over the creek to the north and south of I-90 for ramps (similar construction to existing I-90 bridges).	0.01	0.01	0.01	0.01
Higgins Creek	At Elmhurst Road. Single 25-foot concrete slab bridge to be widened in-kind; Proposed westbound I-90 ramp at Elmhurst Road.	0.30	0.30	0.50	0.50
Higgins Creek Tributary A	At I-90. Two-cell, 9-foot (span) x 5.75-foot (rise) concrete box culvert to be replaced with a two-cell, 12-foot (span) x 9-foot (rise) concrete box culvert.	0.98	0.98	5.23	5.23
Salt Creek	At Elgin O'Hare corridor. Two-span, prestressed concrete beam bridge with center pier in creek to remain for frontage road. Construct two new bridges for mainline (proposed mainline bridges will not have piers in creek).	1.94	1.94	0.80	0.80
Willow Creek South Tributary	At Thorndale Avenue. Three-cell, 10-foot (span) x 4-foot (rise) concrete box culvert to be removed, replaced and realigned. Existing channel between Thorndale Avenue and York Road would be realigned.	8.80	8.80	8.70	8.70

Note: The Build Alternative would result in eight transverse and two longitudinal floodway encroachments (see Table 3-42).

Willow Creek South Tributary would be slightly shifted as part of the Build Alternative. The existing creek and its associated floodway and floodplain would be shifted west of the existing location along York Road. The new creek alignment would better accommodate proposed detention and compensatory storage locations northwest of the proposed interchange of the Elgin O'Hare and West Bypass corridors. Due to the proximity of the proposed interchange ramps to the adjacent runways at O'Hare Airport, the elevation of the ramps would be kept to a minimum. To accommodate the ramp designs, a portion of the realigned creek would be enclosed in a box culvert under the interchange ramps. As necessary, flow would be maintained during construction and realignment; erosion and sediment controls would be used to minimize downstream impacts.

3.12.2.2 Coordination

Throughout Tier Two, the Drainage Working Group (DWG), made up of consultant team members, IDOT Hydraulics staff members, and Illinois Tollway representatives, will continue to complete extensive coordination with local municipalities, the FAA, DuPage County Stormwater Management, and MWRDGC. This coordination occurs as an effort to gain more knowledge of specific drainage issues occurring within the local communities to refine the proposed drainage designs.

Specifically, in the Village of Franklin Park, a drainage investigation was commissioned to propose solutions to a chronic flooding problem in the roughly 430-acre Franklin Park I-294 Industrial Area. A lack of detention storage, the poor condition of existing storm sewers, and a high tailwater condition at the outlet to Silver Creek contribute to the recurring flooding of this area. Recommendations for proposed solutions to alleviate these drainage deficiencies are included in the draft drainage investigation report, which is under review by IDOT and the Illinois Tollway. Upon concurrence by IDOT and the Illinois Tollway, the drainage investigation report will be provided to the Village of Franklin Park.

Similarly, drainage investigations were commissioned in the City of Northlake and City of Elmhurst to propose solutions to a chronic flooding problem at the North Avenue underpasses at I-294 and I-290. A lack of detention storage and limited-capacity storm sewers contribute to recurring flooding of the North Avenue low spots and surrounding area. Recommendations for proposed solutions to alleviate some of these deficiencies are provided in a hydraulic report, “*North Avenue at I-290/I-294 Drainage Investigation*” (CBBEL, 2011).

3.12.3 Measures to Minimize Harm and Mitigation

It is expected that all encroachment assessment categories (see Table 3-42) will be avoided or mitigated. In subsequent phases of design, notices published in the news media would indicate that such floodplain encroachments are being considered. All potential floodplain encroachments will also be identified during the presentation hearings or meetings.

The proposed system interchange where the Elgin-O’Hare Expressway meets the West Bypass impacts a portion of the Willow Creek South Tributary floodplain. Currently, the Willow Creek South Tributary flows alongside and parallel to York Road. The existing channel would be relocated to the west to accommodate York Road widening. The creek relocation would tie back into the existing channel approximately 500 feet south of Supreme Drive, and the three trapezoidal crossings under York Road would be maintained.

At Higgins Creek in the northwest quadrant of the intersection of Elmhurst Road and I-90, a potential exists for longitudinal floodplain encroachment from a proposed ramp. Floodplain impacts will be minimized in this area with the use of retaining walls. Additionally, along Higgins Creek, the proposed West Bypass North Connection interchange to I-90 would impact the Touhy Avenue Reservoir. Ramps serving I-90 and the West Bypass (Ramps X1, X2, X5, and X8) are proposed to sit on an embankment that would be constructed in Cell 2 of the reservoir, reducing the overall watershed flood storage volume and impacting the function of the reservoir during the construction phase. Through coordination, MWRDGC has requested that any flood storage that is lost due to the embankment be compensated at a 1:1 ratio, and a plan of action to accommodate flood storage during the construction phase must be crafted. MWRDGC has advised that full capacity of both cells is required during the entire construction phase. It is anticipated that a new 171 acre-feet compensatory storage cell will be constructed prior to the construction of the Touhy Avenue Reservoir embankment to maintain function of the reservoir. Alternative techniques for construction or structural support will be explored to effectively maintain upstream and downstream flood stages. Hydraulic modeling is required to factor in cofferdam installation, dewatering, and compensatory storage volume for each stage of the reservoir construction, and to demonstrate that upstream and downstream properties have no adverse impacts. Compensatory storage would be provided for all regulatory floodplain impacts, as necessary. In DuPage County, fill in the floodplain is compensated for incrementally at a ratio of 1.5:1. In Cook County, fill in the floodplain is compensated for at a ratio of 1:1, except for unincorporated areas and communities with stricter ordinances, which are compensated for at 1.5:1. Local ordinances, such as those for the City of Des Plaines and City of Northlake, govern because they are stricter than county requirements (see Table 3-41). Potential compensatory storage locations are depicted in Appendix E.

3.12.3.1 O'Hare Airport and FAA Guidelines

Where waterways (Higgins Creek, Willow Creek, and Bensenville Drainage Ditch) exit the project limits and discharge onto O'Hare Airport, it is the intent of the project not to increase flow rates or flood stage elevations. Incremental compensatory storage would be provided adjacent to the project corridor streams to accommodate flood-stage storage lost to roadway fill that would be placed in the floodplain. Combined with proposed detention sites, the creeks would be able to flow onto O'Hare Airport without increasing the flow rates or elevation of the water surface.

To establish a baseline for the creeks that flow onto O'Hare Airport, the hydraulic analysis was built from HEC-RAS hydraulic models representing the future condition of the OMP, which is currently under construction. Approved hydraulic models for the OMP were used as a starting point. The realignment and relocation of runways, the enclosure of Willow Creek in long box culverts, and the realignment of the Bensenville Drainage Ditch occurring during the construction of the OMP have been considered in the development of the existing conditions.

The EO-WB project is located within defined wildlife hazard separation distances of O'Hare Airport and Schaumburg Regional Airport (see Exhibit 3-15). Therefore, proposed detention and compensatory storage sites would be designed, when practical and feasible, to minimize potential wildlife attractants within the project corridor near the airports. Having open water or wetlands on or near airport property can substantially increase the likelihood of aircraft/wildlife collisions. In July 2003, a MOA between federal resource agencies[57] was signed to acknowledge their respective missions in protecting aviation from wildlife hazards. Using guidance provided by the FAA AC No. 150/5200-33B, *Hazardous Wildlife Attractants on or near Airports*, stormwater management facilities that do not draw down within 48 hours after the design storm event would use physical barriers, such as wire grids, pillows, or netting, to prevent access of hazardous wildlife to open-water areas, as necessary (see subsection 3.10.3.2 for additional information).

Proposed compensatory storage and detention sites to aid in flood control and to offset floodplain storage loss for Willow Creek and Bensenville Drainage Ditch lie within future

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[57] The resource agencies included FAA, U.S. Air Force, USACE, USEPA, USFWS, and the USDA–Wildlife Services.

airport RPZs. Based on discussions with FAA and USDA–APHIS, there are no special structural cover requirements for stormwater management facilities located in an RPZ, beyond the wildlife deterrent practices discussed above.[58] Preliminary engineering plans will be submitted to FAA and/or USDA-APHIS, as necessary, to review of wildlife hazard safety requirements.

3.13 Wetlands

Wetlands are "areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions."[59] The *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region (Version 2.0* identifies three essential characteristics of a jurisdictional wetland—hydrophytic vegetation, hydric soils, and wetland hydrology (USACE, 2010).[60] Wetlands generally are associated with lakes, streams, or localized depressional areas. Wetlands can be waters of the U.S. Other waters of the U.S. (e.g., streams, ponds, lakes) are described in subsection 3.10.

3.13.1 Affected Environment

In the vicinity of the project corridor, the relief is gently rolling to nearly flat. Most of the project corridor and adjacent areas are urbanized and have been affected by development.

Published data, including National Wetlands Inventory (NWI)[61] maps, were used to conduct a preliminary evaluation of the extent and type of wetlands within Cook and DuPage Counties, as well as the watersheds that encompass the project corridor. Wetland resources per NWI mapping are summarized in *Wetland Resources of Illinois, An Analysis and Atlas* (Suloway and Hubbell, 1994). Statewide, 3.3 percent of Illinois land surface is mapped as palustrine wetland. Of the two counties where the project corridor is located, DuPage County has a larger percentage (5.1 percent) of mapped palustrine wetlands than the statewide average. Cook County (3.0 percent) is slightly less than the statewide average (see Table 3-44). NWI mapping provides an estimate of wetland extent based on a remote sensing effort. The NWI serves only as a large-scale guide, and field-delineated wetland locations and types often vary from those that are mapped.

TABLE 3-44
Mapped Palustrine Wetlands

Geographic Area	Total Area (acres)	Palustrine Wetland Area (acres)	Percent of Total Area
Illinois	35,573,491	1,168,964	3.3%
Des Plaines River Basin	835,516	37,629	4.5%

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58 Based on a July 23, 2012, meeting between FAA, USDA-APHIS, USACE, USEPA, USFWS, IDNR, IDOT, Illinois Tollway, and project consultants.

59 40 CFR 230.3(t)

60 The *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region (Version 2.0)* (USACE, 2010) provides additional guidance regarding completion of wetland delineations in most of Illinois and supplements the *1987 Corps of Engineers Wetland Delineation Manual* (Environmental Laboratory, 1987).

61 The NWI is a series of topical maps developed by the USFWS to show wetlands and deep water habitats.

TABLE 3-44
Mapped Palustrine Wetlands

Geographic Area	Total Area (acres)	Palustrine Wetland Area (acres)	Percent of Total Area
Cook County	607,261	18,383	3.0%
DuPage County	213,476	10,899	5.1%

Source: Suloway and Hubbell, 1994.

As mentioned in subsection 3.10.1, the project corridor is located within the Des Plaines River drainage basin (HUC 07120004), which has a total area of 835,516 acres. Based on NWI mapping, the basin contains 37,629 acres of palustrine wetland, or 4.5 percent of the basin area (higher than the statewide average). Table 3-45 summarizes wetland types that are mapped in the basin. More than half (52.4 percent) of the mapped palustrine wetlands in the basin consists of emergent wetland, followed by forested wetland (24.2 percent), open water wetland (19.1 percent), and scrub-shrub (4.4 percent).

TABLE 3-45
Acreage of Mapped Palustrine Wetland Types within the Des Plaines River Basin (HUC 07120004)

Palustrine Cover Type	Wetland Area (acres)	Percent of Wetland Area	Percent of Watershed Area
Forested	9,089	24.2%	1.1%
Emergent	19,714	52.4%	2.4%
Open Water	7,183	19.1%	0.9%
Scrub-Shrub	1,643	4.4%	0.2%
Total	37,629	100.1% [a]	4.6% [a]

Source: Suloway and Hubbell, 1994.
[a] Totals may vary from other tables in this document due to rounding.

The Des Plaines River drainage basin includes portions of two states and eight counties. It has been divided into several smaller sub-watersheds (see subsection 3.10.1), the remainder of the watershed discussion in this subsection focuses on these smaller sub-basins, unless otherwise noted.

During the summers of 2009, 2010, and 2011, the INHS completed routine onsite wetland delineations for the proposed EO-WB project improvements. Based on the field delineations, 118 wetland sites were identified in the vicinity of the project corridor (see Appendix J). The *U.S. Army Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory, 1987); *Field Indicators of Hydric Soils of the United States* (USDA-NRCS, 2006); and *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region* (USACE, 2008; USACE, 2010)[62] were referenced for the field delineations, which included an evaluation of vegetation, soils, and hydrology.

Following completion of the 2009/2010 wetland fieldwork, the project corridor was refined.[63] The remainder of this subsection concentrates on the project corridor. Approximately 28.5 acres of wetland at 66 sites are within the project corridor (see Appendix J and Exhibit 3-17). The size of individual wetland sites ranged from less than 0.01 acre to more than 31 acres.[64] Almost 84 percent of the project corridor wetland area is within DuPage County. The majority of the wetland area is located within the Salt Creek Watershed (approximately 54 percent) and the Willow Creek Watershed (approximately 39 percent), followed by the Des Plaines River (main stem) Watershed (approximately 5 percent), the West Branch DuPage River Watershed (almost 2 percent), and the Addison Creek Watershed (less than one percent) (see Table 3-46 and Exhibit 3-17).

Most of the West Bypass corridor is located on the west side of O'Hare Airport (see Exhibit 3-17). INHS did not evaluate wetland areas on airport property; however, wetland data from the OMP was used for these overlapping project areas. The West Bypass corridor includes approximately 0.3 acre of wetland area (as of early June 2010) within OMP limits. The OMP obtained a Section 404 CWA permit from the USACE in December 2005 for airport improvements. It is anticipated that the wetlands at O'Hare Airport will be filled as part of OMP in accordance with the City of Chicago Section 404 CWA permit prior to December 15, 2015. That permit authorized all onsite wetlands to be filled to make way for airport improvements. The wetlands within OMP limits are not discussed further in this subsection.

TABLE 3-46
Summary of Wetland Types/Plant Communities within Project Corridor by Acreage and Watershed

Wetland Plant Community	Addison Creek Watershed (acre)	Des Plaines River (Main Stem) Watershed (acre)	Salt Creek Watershed (acre)	West Branch DuPage River Watershed (acre)	Willow Creek Watershed (acre)	Total [a,b] (acre)
Cook County						
Forested Depression	0	0.50	0.50	0	0	1.00
Marsh	0	0.34	0.68	0.38	0.75	2.15
Marsh/Pond	0	0	0.07	0	0.65	0.72
Pond	0	0	0.43	0	0	0.43
Wet Meadow	0	0	0	0.08	0	0.08
Wet Shrubland	0	0	0	0	0.20	0.20

[62] The Final Report – *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region (Version 2.0)* was released in August 2010 near the end of the 2010 fieldwork.

[63] The original wetland field study included wetlands located up to 400 feet or more beyond the current project corridor.

[64] Wetlands may extend beyond the project corridor. The average size of each field identified wetland site was approximately 1 acre in total size (based on 64 of the 66 project corridor wetland sites). This average size does not include two relatively large wetland sites that extend beyond the project corridor for which a total acreage was not determined. Several wetland sites were comprised of more than one wetland polygon located in close proximity. INHS commonly referred to these proximate wetland polygons as one site.

TABLE 3-46
Summary of Wetland Types/Plant Communities within Project Corridor by Acreage and Watershed

Wetland Plant Community	Addison Creek Watershed (acre)	Des Plaines River (Main Stem) Watershed (acre)	Salt Creek Watershed (acre)	West Branch DuPage River Watershed (acre)	Willow Creek Watershed (acre)	Total [a,b] (acre)
Subtotal	0	0.84	1.68	0.46	1.60	4.58
DuPage County						
Forested Depression	0	0	0.74	0	2.39	3.13
Marsh	0.20	0.63	11.14	0	3.22	15.19
Marsh/Pond	0	0	0.12	0	0	0.12
Marsh/Wet Meadow	0	0	0.01	0	0	0.01
Pond	0	0	0.03	0	0.21	0.24
Wet Meadow	0	0	1.56	0	0.47	2.03
Wet Shrubland	0	0	0	0	0.95	0.95
Wet Shrubland/ Marsh	0	0	0	0	2.20	2.20
Subtotal	0.20	0.63	13.60	0	9.44	23.87
Total acreage [b]	0.20	1.47	15.28	0.46	11.04	28.45
Total percent of project corridor wetland	0.70	5.17	53.71	1.62	38.80	100.00

Source: Matthews et al., 2009; Matthews et al., 2010; Matthews, et al., 2011.

[a] Acreages less than 0.005 have been rounded to 0.
[b] Totals may vary from other tables in this document due to rounding.

3.13.1.1 Wetland Plant Communities

Past human disturbances and runoff from the urban environment appear to have adversely affected the majority of the wetlands located within the project corridor. In general, most of the identified wetlands are characterized by low diversity and low richness of native plant species. Based on floristic inventories conducted for the wetlands within the project corridor, the average Floristic Quality Index (FQI) was 8.6 and the average mean coefficient of conservatism (C-value) was 2.2, which are indicative of plant communities that have been disturbed or are in an early successional stage (discussed below in more detail in subsection 3.13.1.2). The palustrine cover type is dominated by invasive plant species.

Floristic quality was measured using the Floristic Quality Assessment (FQA) methodology of *Floristic Quality Assessment for Vegetation in Illinois: A Method for Assessing Vegetation Integrity* (Taft et al., 1997). The FQA method was applied to wetland plant communities identified in the EO-WB project corridor. The FQA method is based on a numerical rating

(FQI) of plant communities. The numerical rating describes the natural quality of plant communities. A low FQI often indicates disturbance and low natural quality; whereas, a high FQI indicates low disturbance and high natural quality. The basis for the numerical rating is the assignment of coefficients of conservatism (or C-value, numbered 0 to 10) to each plant species known to occur in Illinois. Higher C-values generally are assigned to native species that are found in specialized habitats, and lower C-values are assigned to species that are non-native, common, and habitat generalists.

Once a comprehensive plant species list has been compiled for an area, its FQI is calculated. An FQI below 10 suggests a site of low natural quality, while a score of below 5 may denote a highly disturbed site. An FQI above 20 suggests that a site has evidence of native character and may be an environmental asset. The implementing rules of the Illinois Interagency Wetland Policy Act (IWPA) require a 5.5- to 1.0-acre mitigation ratio for impacts to wetland sites having an FQI of 20 or greater or a mean C-value greater than 4.0.[65]

Approximately 71 percent of the wetland acreage within the project corridor is accounted for by marsh wetlands or a wetland community that includes a marsh component. The remaining wetland plant communities consist of pond wetlands, forested depressions, wet shrubland, wet meadow, or a combination of these wetland types. Appendix J summarizes characteristics of individual wetland sites in the vicinity of the project corridor.

The five primary wetland cover types (plant communities) within the project corridor are described below in order of decreasing predominance. Wetlands may include more than one cover type (see Table 3-47 and Figure 3-13).

FIGURE 3-13
PERCENT OF TOTAL WETLAND AREA IN PROJECT CORRIDOR

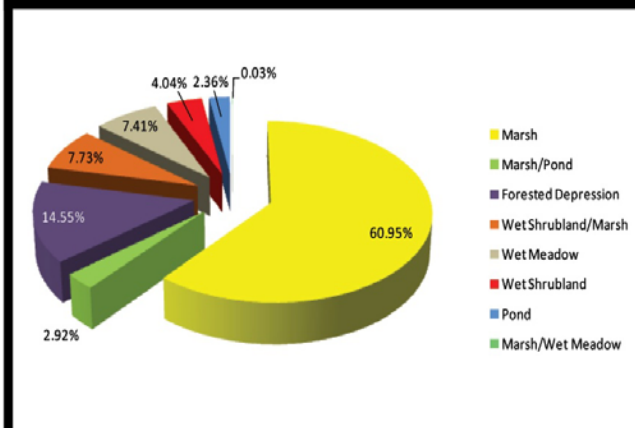


TABLE 3-47
Extent of Wetland Types/Plant Communities within Project Corridor

Wetland Plant Community	Total Wetland Area from Field Delineation (acre)			Percentage of Total Wetland Area in Project Corridor	Percentage of Project Corridor Acreage [a]
	Cook County	DuPage County	Combined in Cook and DuPage Counties		
Marsh	2.15	15.19	17.34	60.95	0.93
Forested Depression	1.01	3.13	4.14	14.55	0.22
Wet Shrubland/Marsh	0	2.20	2.20	7.73	0.12

65 Based on guidance in the USACE Regional Permit Program (2012), high-quality aquatic resources may be described as having an FQI of 20 or greater or a mean C-value of 3.5 or greater (Swink and Wilhelm, 1994).

TABLE 3-47
Extent of Wetland Types/Plant Communities within Project Corridor

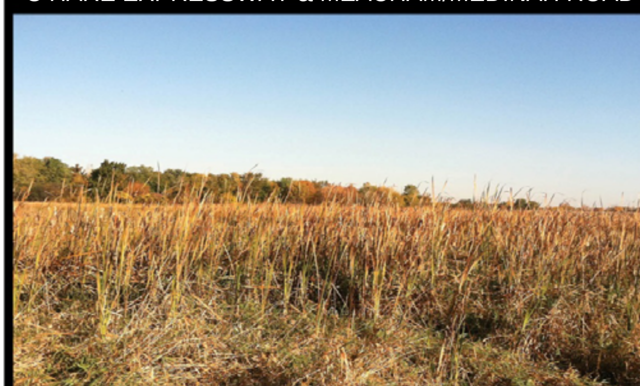
Wetland Plant Community	Total Wetland Area from Field Delineation (acre)			Percentage of Total Wetland Area in Project Corridor	Percentage of Project Corridor Acreage [a]
	Cook County	DuPage County	Combined in Cook and DuPage Counties		
Wet Meadow	0.08	2.03	2.11	7.41	0.11
Wet Shrubland	0.20	0.95	1.15	4.04	0.06
Marsh/Pond	0.71	0.12	0.83	2.92	0.04
Pond	0.43	0.24	0.67	2.36	0.04
Marsh/Wet Meadow	0	0.01	0.01	0.04	0.00
Total [b]	4.58	23.87	28.45	100.00	1.52

Source: Matthews et al., 2009; Matthews et al., 2010; Matthews et al., 2011.
[a] Based on a total project corridor area equal to 1,863.8 acres.
[b] Totals may vary from other tables in this document due to rounding.

Marsh Wetlands

Marsh wetlands generally are characterized by the presence of standing water throughout the growing season and contain vegetation that is tolerant of standing water for prolonged periods, such as cattails (*Typha* spp). Typically, less than 30 percent of the areal cover consists of woody vegetation (IDNR, 2000). Marsh wetlands are the most prevalent wetland type in the project corridor and account for roughly 61 percent of the wetland acreage. An additional 11 percent of the wetland acreage has a marsh component, primarily wet shrubland/marsh complexes (approximately eight percent). Based on floristic inventories, the majority of the marsh/marsh component wetlands are lower quality (average FQI of 8.1).[66] Three of the wetlands are known mitigation sites or overlap with mapped higher quality wetlands (discussed in more detail in subsection 3.13.1.2). The most common dominant plant species in the marsh/marsh component wetlands were narrow-leaved cattail (*Typha angustifolia*) and common reed (*Phragmites australis*) (see Figure 3-14); both of these species are considered invasive.

FIGURE 3-14
EMERGENT WETLAND - SOUTHWEST OF ELGIN-O'HARE EXPRESSWAY & MEACHAM/MEDINAH ROAD



Source: CBBEL. 2011.

[66] Based on the guidance provided in the IWPA and description of high quality aquatic resources in the USACE Regional Permit Program (2012). One marsh wetland with high floristic quality (i.e., Site 158) was identified outside, but near the project corridor, northeast of I-290 and Devon Avenue (see Appendix J).

Regarding the marsh and wet shrubland/marsh wetlands (the two most dominant marsh cover types), approximately 19.5 acres of marsh wetlands are scattered throughout the project corridor, generally along the existing Elgin-O'Hare Expressway and Thorndale Avenue, and to a lesser extent, along York Road.

Forested Depression Wetlands

Generally speaking, forested depression wetlands include wooded areas that are located in a topographically low landscape position, that have a high water table, or that retain stormwater runoff or precipitation on a seasonal or temporary basis. Forested depression wetlands usually do not have continuous standing water.

Based on floristic inventories, the forested depression wetlands in the project corridor are low quality to fair quality (FQI ranged from 6.3 to 14.3). Common dominant woody species include eastern cottonwood (*Populus deltoides*), box elder (*Acer negundo*), silver maple (*Acer saccharinum*), green ash (*Fraxinus pennsylvanica*), and common buckthorn (*Rhamnus cathartica*) (see Figure 3-15). In the understory, reed canary grass (*Phalaris arundinacea*) is a dominant species. Forested depression wetlands account for almost 15 percent (approximately 4.1 acres) of the wetland area within the project corridor. The forested depression wetlands are located primarily along Thorndale Avenue, east of I-290. Roughly half of the forested depression wetland acreage is concentrated on the south side of Thorndale Avenue between Central Avenue and Lively Boulevard.

FIGURE 3-15
FORESTED DEPRESSION WETLAND ADJACENT TO THORNDALE AVENUE

Source: CBBEL, 2010.

Wet Meadow Wetlands

Wet meadow wetlands generally are characterized by moist to saturated soils with standing water for only brief to moderate periods during the growing season. Wet meadow wetlands comprise more than seven percent (approximately 2.1 acres) of the wetland acreage within the project corridor. The wet meadow wetlands are located primarily along Thorndale Avenue, east of Arlington Heights Road. Based on floristic inventories, the identified wet meadow wetlands are mainly low quality (average FQI of 7.7) and commonly are dominated by reed canary grass.

Wet Shrubland

Wetlands dominated by saplings and shrubs are identified as wet shrubland. In this community type, woody plants less than 20 feet tall account for 30 percent or more of the vegetation present (IDNR, 2000). Wet shrubland (including wet shrubland/marsh communities) accounts for almost 12 percent (approximately 3.4 acres) of the project corridor wetland acreage. The wet shrubland and wet shrubland/marsh wetlands in the project corridor are concentrated west of York Road near the intersection with Thorndale

Avenue. Based on floristic inventories, these wetland areas are low to fair quality (FQI ranged from 6.1 to 15.8), and the dominant vegetation includes sandbar willow (*Salix interior*), narrow-leaved cattail, and reed canary grass.

Pond Wetlands

Pond wetlands are typically characterized by a nearly permanent open water area roughly 0.5 acre to 20 acres in size. Floating vascular plants and algae may make up the dominant vegetation during the growing season. However, during the winter months, vegetation may not be visible. Rooted vegetation is generally located near the perimeter of the pond or restricted to shallow water areas (IDNR, 2000).

Within the project corridor, most of the pond wetlands and wetlands with a relatively large open water component (e.g., marsh/ponds) appear to be man-made (or man-induced). The ponds comprise approximately 0.7 acre or just over two percent of the project corridor wetlands. An additional three percent of the wetlands are marsh/pond wetlands. Ponds and marsh/pond wetlands are primarily located along the existing Elgin-O'Hare Expressway, Thorndale Avenue, and north of the Des Plaines Oasis at I-90. These ponds and marsh/ponds include Elgin-O'Hare Expressway wetland mitigation sites (see subsection 3.13.1.2) and stormwater detention areas. Based on floristic inventories, the ponds and marsh/ponds are low to fair quality (FQI ranged from 5.3 to 13.9). Dominant plant species in the pond wetlands include narrow-leaved cattail (in the shallow areas and at the pond perimeter).

3.13.1.2 Wetland Functions

During the wetland field delineations, wetland functions were assessed qualitatively for all sites. Field assessments were based on several factors, including visual observation, plant community composition and structure, landscape position, adjacent land uses, hydrologic inputs and outflows, and soils. Specific functions identified by INHS during its wetland fieldwork included surface water and flood storage, wildlife habitat, and stabilization of streambanks and shorelines. In addition, heritage characteristics/recreational values, mitigation sites, and other functional characteristics are discussed in this subsection. Heritage characteristics include high floristic quality value, presence of threatened or endangered species, or inclusion of designated lands (e.g., forest preserves).

Groundwater recharge was not listed as a wetland function by INHS for the project corridor wetlands. The wetlands likely provide groundwater recharge, but it is not a primary function. Wetlands within the project corridor are depressional features surrounded by upland areas or associated with stream channels or overbank floodplain areas. These wetlands do not appear to be sustained by groundwater. Generally, the project corridor wetlands have a high content of clay soil, which along with depressional characteristics of wetlands, tends to trap surface water. Rainfall and stormwater runoff is collected within these depressional areas and slowly infiltrates or evaporates.

Brief descriptions of the suite of considered wetland functions are in the following subsections.

Surface Water and Flood Storage

Wetlands are capable of holding stormwater runoff and may provide water quality benefits by filtering stormwater pollutants and assimilating nutrients. Wetlands may also reduce flood flow rates, velocities, and volumes. Wetlands may reduce peak flood damage by providing flood storage and by gradually releasing floodwater as the flood recedes.

The stormwater storage function and water quality benefit of several of the project corridor wetlands may be limited because of their relatively small size and apparent shallow depth and storage capacity. Although providing limited functional value on an individual basis, when combined, the wetlands contribute to the overall stormwater storage, conveyance, and water quality benefits.

Wildlife Habitat

Wetlands can provide wildlife with food, water, and shelter. Due to urban disturbance and the relatively degraded nature of the project corridor, wetlands provide habitat primarily for common and adaptable wildlife. Based on the INHS field observations, roughly half of the wetlands in the project corridor provide wildlife habitat. These wetlands range in size from 0.20 acre to over 31 acres in total size. Although wildlife habitat was not listed as a function for all project corridor wetlands, it is likely that all of the wetlands are used by wildlife on at least a limited basis, whether it is for resting, foraging, or some other use. The wetlands that INHS did not identify as providing wildlife habitat are relatively small (on average) and provide surface water storage.

Larger wetlands with a high interspersion of vegetative cover have the potential to provide habitat for more diverse wetland fauna. Wetland complexes may provide a variety of strata (e.g., tree, shrub, and herbaceous) that different wildlife guilds can occupy. Factors important for wildlife include abundant cover for protection from predators, resting, and movement. The wetlands identified by INHS with the highest quality wildlife habitat (Sites 84 and 125) included relatively large marshes. These wetlands are 7.4 acres in size, or larger, and extend beyond the limits of the project corridor. Site 84 is located near the existing Elgin-O'Hare Expressway and Gary Avenue, in the vicinity of several other wetlands and open water areas. Site 125 is partially located within the Medinah Wetlands Forest Preserve at the southwest corner of the existing Elgin-O'Hare Expressway and Meacham/Medinah Road. Meacham Creek flows through this wetland.

Stabilization of Streambanks and Shorelines

Wetland vegetation and associated root mass located along streambanks and at pond perimeters may reduce the velocity of runoff from adjacent upland areas, hold soil in place, and minimize erosion. Sediments that are suspended in the runoff may settle and deposit when water velocity is reduced. Based on the INHS delineations, two wetlands within the project corridor (Sites 178 and 2C) provide streambank stabilization. Both are wet meadow wetlands located at Salt Creek and Thorndale Avenue.

Heritage Characteristics and Recreational Value

Heritage characteristics refer to wetlands that provide habitat for state- or federal-listed species, have high floristic quality value, or are located in designated lands, such as Illinois Nature Preserves, natural areas, forest preserves, parks, and wildlife refuges. Wetlands within the project corridor and having recreational value are generally in public ownership and are maintained for recreation.

A state-endangered bird, the black-crowned night-heron (*Nycticorax nycticorax*), was observed at a wet shrubland/marsh (i.e., Site 49) during the 2009 wetland delineations.

However, INHS stated that this wetland site did not appear to be good foraging habitat or a likely nesting spot; this wetland was not considered to have heritage characteristics (see subsection 3.14.1.3).

There are no Illinois Nature Preserves, natural areas, or wildlife refuges within the project corridor (IDNR and the Illinois Natural Heritage Database, 2011). Six wetlands (Sites 2C, 124, 125, 177, 178, and 181) are located within (or extend into) forest preserve property or public parks. These wetlands may provide passive recreational opportunities, including aesthetics or wildlife observation.

- **High Floristic Quality.** Appendix J summarizes the FQI, mean C-value, and percent adventive of each delineated wetland within the project corridor. Based on data collected during the field delineations, none of the wetlands identified within the project corridor have high floristic quality. However, one wetland (Site 158), located approximately 20 feet outside the project corridor on the east side of I-290 and north of Devon Avenue, has high floristic quality. Site 158 is a 1.47-acre marsh with an FQI of 22.8 (mean C-value = 3.1; percent adventive = 20.9). Some of the plant species occurring in this wetland appear to have been intentionally planted.

- **DuPage County Wetland Inventory – Critical Wetlands.** In DuPage County, the DuPage County Wetland Inventory (DCWI) identifies potential high quality wetlands. The DCWI mapping identifies two categories of wetlands—critical and regulatory.[67] Critical wetlands are high quality wetlands possessing one or more characteristics (e.g., high floristic quality, quality wildlife habitat/frequent use, habitat for threatened or endangered species, etc.) that result in a uniquely valuable environment (DuPage County, 2012). All wetlands in DuPage County that are not designated as critical are considered regulatory. The NWI does not distinguish between critical and regulatory wetlands for the purposes of quality evaluation; therefore, this method of quality determination could not be used in Cook County.

  Based on the DCWI, two mapped critical wetlands are along the existing Elgin-O'Hare Expressway and proposed project corridor. One critical wetland area is mapped southwest of the intersection with Meacham Road/Medinah Road and the other location is adjacent to the West Branch DuPage River. The mapped DCWI critical wetland polygons overlap with wetland Site 125 and an existing open-water Elgin-O'Hare Expressway mitigation site (see Exhibit 3-17).

- **Mitigation Wetlands.** Compensatory wetland mitigation sites for projects previously authorized under Section 404 of the CWA are located within the project corridor. Sites 90 and 124 include known mitigation sites.[68] These two wetland sites include previously constructed mitigation areas located adjacent to the existing Elgin-O'Hare Expressway (USACE Permit No. 009359110). The wetlands consist of marsh and marsh/pond plant communities of varying size and fair quality, and include man-made stormwater detention areas. The Elgin-O'Hare Expressway wetland mitigation areas were deemed

[67] Several criteria are used to determine if a wetland is regulatory or critical. Mapped critical status should be confirmed based on additional evaluation. If additional evaluation does not confirm critical status, the wetland shall be considered regulatory (DuPage County, 2012).

[68] Due to the extent of development that has occurred in the vicinity of the project corridor, it is possible that additional mitigation sites could be located within or near the proposed improvements.

unsuccessful by the USACE, and a payment was made as compensation. A letter from the USACE documents "Final Sign-off" with respect to the mitigation areas (Wozniak, 2001). The letter states that no further action by IDOT is required to fulfill obligations pertaining to USACE Permit No. 009359110. The USACE confirmed that impacts to these unsuccessful mitigation areas would not require higher mitigation ratios under the CWA simply because they were constructed as compensatory wetland mitigation. The Elgin-O'Hare Expressway mitigation areas would be reviewed by the USACE in the same manner as other wetlands identified in the project corridor (Chernich, 2010). As such, they are not differentiated from other wetlands for the remainder of this document.

An additional mitigation site (USACE Permit No. 007869012) is located adjacent to the south side of the project corridor adjacent to Salt Creek at the Wood Dale—Itasca Reservoir. The mitigation site is primarily open water with a low-quality marsh wetland along the east shoreline (Site 180: C-value = 2.2; FQI = 4.9).

3.13.2 Environmental Consequences

This subsection describes wetland resources potentially impacted by the proposed improvements. Impacts to unvegetated waters of the U.S. are discussed in subsection 3.10.2. Wetland impacts associated with the transportation improvements include vegetation removal, discharge of clean fill material, and changes to hydrology. Impacts could be either direct or indirect. Direct wetland impacts would result from construction and the placement of fill material to construct the roadways and rail lines, ramps, and grading for drainage and stormwater management facilities. Indirect impacts could result from changes in hydrologic regime, quality of stormwater runoff, increased salt spray, or habitat continuity.[69]

3.13.2.1 Acreage Impacts

Of the 118 field-delineated wetlands in the vicinity of the project corridor (66 of which are within the project corridor), the proposed project would impact up to 51 wetland sites (totaling approximately 23.0 acres) under the Build Alternative (see Table 3-48 and Appendix J).[70]

Close to 90 percent of the potential wetland impacts associated with the proposed improvements would take place in DuPage County, with slightly over ten percent in Cook County. The majority of the overall wetland loss would be located in the Salt Creek Watershed (19 impact sites totaling 12.2 acres). Willow Creek would have slightly more impact sites (23), but less wetland loss (8.7 acres). Approximately 2.2 acres of wetlands at nine sites would be impacted in the remaining three watersheds (see Table 3-48 and Appendix J).

The wetland assessment for the Build Alternative is based on preliminary engineering and right-of-way estimate. Besides the loss of wetland area, wetland functions and values would be impacted by the proposed project. The potential impact of the proposed project on wetlands is discussed in the following subsections.

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[69] Salt spray and the potential impacts of chlorides on the environment are discussed in subsection 3.10.2.3.

[70] A total of 2.45 acres of impact to unvegetated waters of the U.S. would be in addition to the 23.0 acres of wetland impact. Impacts to unvegetated waters of the U.S. are discussed in Section 3.10.2.

TABLE 3-48
Summary of Potential Wetland Impacts by Watershed

County	Addison Creek Watershed (acre)	Des Plaines River (Main Stem) Watershed (acre)	Salt Creek Watershed (acre)	West Branch DuPage River Watershed (acre)	Willow Creek Watershed (acre)	Total [a] (acre)	Percent of Total Acreage
Cook	0.0 (0 sites)	0.83 (2 sites)	0.13 (3 sites)	0.47 (4 sites)	1.32 (5 sites) [a]	2.75 (14 sites)	11.96
DuPage	0.22 (2 sites)	0.63 (1 site)	12.05 (16 sites)	0 (0 sites)	7.35 (18 sites)	20.25 (37 sites)	88.04
Total Acreage [a]	0.22 (2 sites)	1.46 (3 sites)	12.18 (19 sites)	0.47 (4 sites)	8.67 (23 sites)	23.00 (51 sites)	100.00
Percent of Total Acreage	0.96	6.35	52.96	2.04	37.70	100.00	

Note: See Table 3-49 and Appendix J for additional wetland impact information.
[a] Totals may vary from other tables in this document due to rounding.

3.13.2.2 Functional Impacts

Past human disturbances and runoff from the urban environment appear to have adversely affected most of the wetland sites near the proposed improvements. In general, most of the project corridor wetland sites are dominated by invasive plant species and exhibit low diversity and low richness of native plant species.

The proposed project impacts up to 51 wetland sites, the majority of which are marsh wetlands or have a marsh component. The functions qualitatively analyzed for the impacted wetlands, defined under the Affected Environment (see subsection 3.13.1.2), include surface water and flood storage, wildlife habitat, stabilization of streambanks and shorelines, and heritage characteristics and recreational value. These wetland functions and the affected wetlands that exhibit them are summarized below.

Surface Water and Flood Storage

The principal function performed by the identified wetland sites is stormwater and flood storage, including conveyance and water quality benefits. All of the identified wetlands serve this function to some extent. In general, wetlands that would be impacted by the proposed improvements provide limited functional value on an individual basis, but when combined, the wetlands provide overall water quality benefits.

Overall, wetland functions (e.g., stormwater storage and water quality benefit) that are affected as a result of the proposed project are expected to be minimal. Functions lost as a result of wetland fill could be offset by proposed compensatory wetland mitigation, stormwater management facilities, and other best management practices. Wetland mitigation credit will not be generated within stormwater management facilities; however, these structures and other best management practices will provide some of the lost functions of stormwater storage and water quality benefit. Wetland mitigation will be coordinated with the appropriate regulatory agencies so that wetland impacts are adequately compensated in accordance with applicable federal and state regulations.

In addition to wetland mitigation, to minimize potential environmental impacts at (and downstream from) the project, stormwater detention and compensatory storage facilities will be provided to compensate for increased impervious area and floodplain fill associated with the Build Alternative (see subsection 3.12.3). To provide water quality benefits, improvements would be designed, as practical, to infiltrate, detain, or treat stormwater runoff before it is discharged to surface waters. Best management practices that control the volume and treat stormwater runoff will be considered during final design to reduce pollutant loads to wetlands and other receiving waters, while maintaining the hydrology of the watershed to the extent possible (see subsection 3.10.3).

Wildlife Habitat

Roughly half of the wetlands in the project corridor were noted by INHS as providing wildlife habitat. The urban nature of the project corridor and surrounding areas tend to limit habitation by sensitive wildlife species that may be found in protected lands located outside and beyond the scope of the proposed improvements. Wildlife species in urban and suburban areas tend to be tolerant of disturbance and human activities and generally are common, adaptable species. Wetlands that would be impacted as a result of the proposed improvements are located primarily in developed areas adjacent to existing transportation infrastructure that provides limited wildlife use potential. Most wetland impacts would affect relatively small percentages of larger wetland complexes (mainly impacts to the perimeter of wetlands located adjacent to existing roadways) or comparatively smaller wetlands located in previously fragmented habitats and do not dramatically alter wildlife habitat by bisecting large wetlands. Thus, wildlife habitat impacts associated with the affected wetlands would be minimal (see subsection 3.14).

Two wetlands with high-quality wildlife habitat were identified by INHS within the project corridor at Sites 84 and 125. These wetland sites are relatively large marshes, and the impacts would be located at the perimeter of the wetland. The majority of the wetland areas will remain following construction of the proposed improvements. To the extent practicable, best management practices and a wetland buffer will be incorporated into the plan near wetland Sites 84 and 125. Native plant species that meet FAA wildlife hazard safety requirements will be considered when designing seed mixes for the wetland buffers. Thus, the impacts to the wildlife habitat functions of these wetlands are anticipated to be minimal. Site 125 is discussed in additional detail below in the subsection "Heritage Characteristics and Recreational Value."

Wetlands generally attract wildlife (including birds), which could result in aircraft/wildlife strikes near airports. Approximately 60 percent of the project corridor wetland sites are within 10,000 feet of O'Hare Airport or the Schaumburg Regional Airport. A reduction in wildlife habitat (i.e., filling low-quality wetlands) near the airport would be in accordance with FAA guidelines and is consistent with the O'Hare Airport *Wildlife Hazard Management Plan* (USDA, 2010), see subsection 3.10.3.2. As discussed in the *Wildlife Hazard Management Plan*, wildlife control efforts (including working cooperatively with adjacent property owners) would be concentrated primarily within a 10,000-foot radius of the runway centerline (i.e., critical area), where arriving and departing aircraft are typically operating at or below 500 feet above ground level (USDA, 2010). Approximately 75 percent of all civilian bird/aircraft strikes occur within this 10,000-foot critical area.

Stabilization of Streambanks and Shorelines

Two wetlands within the project corridor (i.e., Sites 178 and 2C) provide streambank stabilization. These wetlands are located north and south of Thorndale Avenue along the east and west sides of Salt Creek. Soil erosion and sediment control measures will be installed in areas of active construction near Salt Creek and its adjacent wetland areas. Disturbance of streamside vegetation will be kept to a minimum. As necessary, to minimize disturbance, low ground pressure equipment or other protective measures (e.g., timber mats) will be used if temporary construction activities are required at Site 178 or 2C and Salt Creek. To minimize soil loss and subsequent sedimentation, an erosion and sediment control plan will be prepared as part of the contract documents (see subsection 3.10.3).

Streambank stabilization functions of the impacted wetlands will be compensated by vegetative and/or structural methods. Plant species listed in the *O'Hare Modernization Program Master Specifications*, "Section 02905: Sustainable Airport Landscaping," will be considered when designing seed mixes to address FAA wildlife hazard safety requirements. This plant list includes several native species and was previously provided to the USACE, USEPA, USFWS, and IDNR for review. Proposed grading and erosion controls (including stream protection) will be reviewed as part of the Section 404 CWA permit process. Disturbed areas, including the streambank, will be stabilized as soon as practical in accordance with NPDES requirements. Final stabilization will follow the Illinois Tollway's *Erosion and Sediment Control, Landscape Design Criteria* manual (Illinois Tollway, 2012) for construction projects associated with the proposed tolled facility. Chapters 41 (Construction Site Storm Water Pollution Control) and 59 (Landscape Design) of IDOT's *BDE Manual* (IDOT, 2011) will be followed for construction associated with free roads. The IDOT and Illinois Tollway standard specifications (including supplemental specifications) will also be followed, as applicable. When the disturbed streambank has reached final grade (or if the area will sit idle), the streambank will be seeded and slopes will be protected with erosion control blanket, as necessary, to minimize erosion.

Heritage Characteristics and Recreational Value

There are no proposed impacts to wetlands with a recorded presence[71] of state- or federal-listed threatened or endangered species, or their critical habitat. In addition, there are no proposed impacts to designated lands (e.g., INAI sites) or high-quality floristic communities (e.g., FQI of 20 or higher and/or native mean C-value of 3.5 or more). Six wetlands in the project corridor (Sites 2C, 124, 125, 177, 178, and 181) are located within (or extend into) forest preserve property or public parks. An additional wetland (Site 180) is located approximately 180 feet south of the project corridor within forest preserve property adjacent to Salt Creek at the Wood Dale–Itasca Reservoir. Site 180 is also a previously constructed mitigation site. However, the mitigation site is degraded and primarily consists of open water. Wetland impacts near the forest preserves and parks have been minimized, and no wetland fill is proposed within the limits of these public lands. Therefore, impacts to the recreational value of these wetlands are not anticipated.

[71] As defined in the IWPA, "presence" includes listed plants or mussels with individuals or populations that occur within the area that is to be adversely impacted by a proposed action. For mobile species, "presence" is based on the existence of confirmed nesting or breeding sites in the area to be adversely impacted by the proposed action.

Based on the DCWI, two mapped critical wetlands are located adjacent to the existing Elgin-O'Hare Expressway. The mapped critical wetlands overlap with wetland Site 125 and an existing open-water Elgin-O'Hare Expressway mitigation site at the West Branch DuPage River (see Exhibit 3-17). Impacts are not anticipated at the existing open-water site.

Site 125 is a large marsh (estimated at approximately 61.8 acres)[72] dominated by reed canary grass, common reed, and narrow-leaved cattail. The entire field-identified wetland is not mapped as critical. Based on the floristic inventory data collected for this project, the wetland is fair quality (mean C-value equals 2.3; FQI equals 15.1; percent adventive equals 23.6). The wetland provides high-quality wildlife habitat and a large amount of surface water storage. It is most likely mapped as critical due to its habitat function (e.g., large wetland complex, interspersion of vegetative cover). The wetland has a direct hydrologic connection to Meacham Creek, which flows through the marsh. Approximately 0.2 acre (or less than 0.5 percent) of the wetland will be directly impacted by the Build Alternative. Wetland impacts will be minimized by installing a retaining wall at the construction limits. Impacts are expected to be associated with lower-quality habitat at the perimeter of the wetland adjacent to the existing Elgin-O'Hare Expressway, and no impacts are proposed within potentially higher-quality interior wetland habitat. No fragmentation of the critical wetland habitat would occur. Recreational or educational amenities would not be affected as a result of the Build Alternative.

3.13.3 Measures to Minimize Harm and Mitigation

In accordance with state and federal policies and regulations for wetland preservation, including the Section 404(b)(1) *Guidelines for Specification of Disposal Sites for Dredged or Fill Material* (40 CFR, Part 230), the following discussion summarizes the wetland avoidance, minimization, and mitigation strategies for the proposed project.

3.13.3.1 Wetland Avoidance and Minimization of Impacts

Based on the field delineations completed for Tier Two, 118 wetland sites were identified in the vicinity of the project corridor. Of these wetland sites, the proposed project will impact fewer than half of the wetland sites (up to 51 sites) totaling approximately 23.0 acres. The Build Alternative does not impact any wetlands with a recorded presence of state- or federal-listed threatened or endangered species or their critical habitat. In addition, there are no proposed impacts to INAI sites or high-quality floristic communities (e.g., FQI equal to 20 or more and/or native mean C-value equal to 3.5 or more).

One wetland in the vicinity of the project corridor has high floristic quality: Site 158 (mean C-value of 3.1; FQI of 22.8). This wetland will be avoided by the proposed improvements. In addition, a known mitigation site at the Wood Dale-Itasca Reservoir (Site 180 and adjacent open water), located along the south side of Thorndale Avenue at Salt Creek, will be avoided by the project.

It is not possible to construct this project and completely avoid wetland impacts. Existing wetlands are located within and adjacent to the project corridor associated with existing right-of-way, expressways, other roads, and rail lines. Any road widening or additional rail lines would impact wetlands in these locations. The project corridor is located in a

[72] Based on the INHS wetland delineation in the vicinity of the project corridor and a review of aerial photography for areas beyond the scope of the fieldwork.

constrained, developed area with many adjacent urban land uses. Minimization of residential, commercial, and industrial displacements or other potential socioeconomic or environmental impacts make it difficult or impractical to shift the proposed alignment to avoid additional wetland impacts.

As part of the preferred corridor (established in Tier One), the majority of the West Bypass is located on the west side of O'Hare Airport. Wetlands within the West Bypass corridor have been filled as part of the OMP, and the land has been cleared for future development, thus minimizing wetland impacts associated with the West Bypass.

In a future design phase, IDOT and the Illinois Tollway will investigate additional measures to minimize wetland impacts, such as:

- Minor refinements in roadway alignment.
- Narrower roadway cross-sections with the use of:
  - Narrower center medians.
  - Narrower shoulders.
  - Retaining walls.
  - Steeper roadway embankments.
  - Enclosed drainage systems.
- Refined bridge and culvert specifications.
- Use of equalizer pipes to maintain wetland hydrology.
- Implementation of proper soil erosion and sediment control measures to minimize sediment deposition at adjacent wetlands (see subsection 3.10.3.1).

Final avoidance and minimization factors will be reviewed during the permitting process. Wetland impacts will be reviewed in accordance with state and federal regulatory procedures to ensure that wetlands are avoided, or impacts are minimized or compensated for appropriately. Upland buffers (of appropriate vegetation, as approved by the appropriate state and federal review agencies) will be established and maintained within the right-of-way adjacent to remaining wetlands. Appropriate wetland compensatory mitigation will be provided, and water quality and quantity best management practices will be implemented as necessary to comply with regulatory requirements and to protect the downstream aquatic environment from potential construction, operation, and maintenance impacts associated with the proposed improvements. Therefore, the wetland displacement associated with the Build Alternative is not expected to have a net negative effect on the larger Des Plaines River drainage basin or the region. Wetland compensation is discussed below in subsection 3.13.3.2.

3.13.3.2 Wetland Compensation

State and federal regulations require compensatory mitigation when there are no practicable alternatives to filling wetlands. State-sponsored or funded projects that impact wetlands are regulated by the IDNR under the IWPA. Federal jurisdiction under Section 404 of the CWA also will be assumed for all of the project corridor wetlands. [73,74]

At a meeting on December 17, 2010, the USACE stated a preference for wetland mitigation to take place in the vicinity of the proposed wetland impacts. To accommodate this request, a meeting was held with various stakeholders on January 25, 2011. As part of this meeting, a workshop was conducted to identify potential mitigation sites in the vicinity of the project corridor. Stakeholders were consulted on preferable criteria and site exclusion criteria. Suggested sites were reviewed for wetland mitigation potential.

The Build Alternative is located in a densely developed area adjacent to two airports. Wetland mitigation sites have the potential to attract wildlife. Therefore, mitigation site selection must consider the potential to attract wildlife (e.g., waterfowl and other bird species) that could pose a threat to aircraft, as required in the July 2003 MOA signed by the FAA, USACE, USEPA, and USFWS. The FAA AC No. 150/5200-33B, *Hazardous Wildlife Attractants on or near Airports*, recommends that wetland mitigation projects (that may attract wildlife hazardous to airport operations) be located outside defined wildlife hazard separation distances (see FAA guidance in subsection 3.10.3.2).

At a meeting on April 21, 2011, FAA stated that "new" wetland mitigation sites shall not be located within five miles of O'Hare Airport or 10,000 feet from the Schaumburg Regional Airport. This requirement excludes the vast majority of the project corridor from consideration. There are also several other airports in the surrounding area where this restriction would apply (see Exhibit 3-15). These requirements limit the area and, consequently, the number of sites near the project corridor that could be used as onsite mitigation (or within one mile) for this project.

Wetland impacts associated with the proposed EO-WB improvements are located within one hydrologic basin, the Des Plaines River drainage basin (HUC 07120004), and involve several wetland types. The project qualifies as a Standard Review Action under the IDOT Wetlands Action Plan as approved by IDNR. The IWPA has established compensatory wetland mitigation ratios for all state-sponsored or funded projects. It is anticipated that mitigation will take place within the Des Plaines River drainage basin, but more than one mile from the Build Alternative due to the airport-wildlife hazard separation distance requirements. The wetland compensation requirements that are likely to be implemented for the proposed project are shown in Table 3-49. As a Standard Review Action with the wetland mitigation occurring offsite and within the basin, three ratios would potentially apply to the project. These ratios are 2:1 for impacts less than or equal to 0.5 acre, 4:1 for impacts more than 0.5 acre, and 5.5:1 for wetland impacts in the following cases: [75]

- Alteration of wetlands that contain state- or federal-listed threatened or endangered species.

[73] In addition to federal and state regulations, DuPage County also regulates wetland impacts through the DuPage County Countywide Stormwater and Flood Plain Ordinance (revisions effective April 25, 2012). Any component of the alternatives that may be local non-IDOT/Illinois Tollway roads may be subject to the DuPage County Countywide Stormwater and Flood Plain Ordinance or the pending Cook County Watershed Management Ordinance.

[74] The USACE acknowledged this approach at the NEPA/404 merger meeting on February 15, 2011.

[75] The compensation ratios represent the current compensation guidelines required for wetland impacts in Illinois by the IWPA; however, DuPage County and the USACE have identified certain wetland resources (e.g., critical wetlands in DuPage County; High Quality Aquatic Resources) requiring elevated compensatory wetland mitigation.

- Wetlands that contain essential habitat for state- or federal-listed species.
- Presence of an INAI site.
- A mean C-value of 4.0 or more (Swink and Wilhelm, 1994).
- Individual wetlands with an FQI of 20 or more (Swink and Wilhelm, 1994).

Based on a review of data collected for this project, the 5.5:1 mitigation ratio (under the IWPA) does not apply for the anticipated wetland impacts.

Based on preliminary engineering, it is anticipated that 23.0 acres of wetland would be impacted by the proposed project and up to 77.2 acres of wetland compensation would be required. IDOT and the Illinois Tollway have separate agreements with IDNR, which determine the mitigation ratios for each impact. The Illinois Tollway will be responsible for coordinating final ratios with IDNR prior to the permitting process. IDNR prefers that wetland mitigation for this project consider the use of existing wetland mitigation banks and/or the use of land that is either an unprotected natural area or open space not currently protected by a resource agency.[76] The goal of the state is that state-supported activities do not result in an overall net loss of the state's existing wetland acres or functional values. The wetlands to be impacted by the proposed project do not appear to provide irreplaceable functions.

For this project, wetland mitigation preferences (in descending preferential order) include:

1. Wetland mitigation banking within a USACE-approved bank (i.e., purchasing wetland mitigation credits).[77]
2. Onsite—within the same hydrologic unit and less than one mile from the project site.[78]
3. Offsite, within basin—the same hydrologic unit, but more than one mile from the project site.
4. Waters of the U.S., including wetlands, within the Salt Creek Watershed in cooperation with the DRSCW.[79]
5. Offsite, out of basin—compensation not provided within the watershed of the impacted wetlands.

[76] Based on a May 13, 2011, conference call between IDNR, IDOT, and project consultants.

[77] The option most preferred is mitigation bank credits. See the *Compensatory Mitigation for Losses of Aquatic Resources; Final Rule* (USACE, 2008).

[78] Locating wetland/waters of the U.S. mitigation near the project corridor is preferred, more specifically in the affected watersheds. As practical and feasible, wetland/waters of the U.S. mitigation will be driven by an assessment of watershed needs. However, due to the previously mentioned constraints and the extent of developed land/relative scarcity of large, available, privately owned parcels within one mile of the proposed project, this may not be possible.

[79] Depending on available sites, mitigation for unvegetated waters of the U.S. could include re-meandering channelized streams, removing/replacing existing drain tiles/culverts with stabilized stream channels, stabilizing eroded streambanks, constructing in-stream habitat, creating riparian buffer, etc.

The following compensatory wetland mitigation strategies were considered with the above preferences:

- One overall mitigation site because larger sites provide economies of scale and facilitate long-term management for a composite of desired wetland functions, values, and biodiversity.
- Sites located outside FAA-defined wildlife hazard separation distances.
- Sites with no impediments to immediate design, permitting, and construction.
- Sites that provide a high plant ground cover and diversity, contain minimal invasive species, provide wetland functions, and improve the quality of the resource.
- Sites that provide, to the extent practicable, in-kind replacement of impacted wetlands and streambank ecosystems.
- Sites that may support a diverse ecosystem with hydrologic/ecologic connections to other ecosystems and associated riparian areas.
- Sites that have a high likelihood of success.
- Acquisition and land protection.

In the examination of the various mitigation strategies, the approach for the EO-WB project will likely involve a combination of strategies. In accordance with the federal Compensatory Mitigation Rule mitigation hierarchy, purchasing credits in a USACE-approved wetland mitigation bank should be considered first for this, or any, project. There are currently ten USACE-approved wetland mitigation bank sites with available credits in the Des Plaines River drainage basin (as of July 2012). Available wetland mitigation credits vary over time, as available credits are purchased and as new credits become available. Due to the extent of potential wetland impacts associated with the EO-WB project and the magnitude of the compensatory wetland mitigation credits that the regulatory agencies are anticipated to require, it is unlikely that purchasing credits in a mitigation bank would be the primary method used to accomplish the wetland mitigation. Alternate mitigation methods have been discussed with federal and state resource agencies on several occasions (see Section 4).

Wetland mitigation within or immediately adjacent to the project corridor is not possible when considering FAA wildlife hazard guidance and IDNR's preference to not use existing public lands. Under the IWPA, mitigation sites located farther from the wetland impact site require higher mitigation ratios. The USACE recognized these constraints, and requested that additional coordination with FAA, IDNR, and local resource agencies take place with regards to site location. The USACE also indicated a preference for the wetland/waters of U.S. mitigation to be accomplished at a small number of large site(s).[80]

One or two large mitigation sites are preferred to accomplish the wetland/waters of U.S. mitigation. Larger compensatory mitigation projects (generally greater than 25 acres) often have less risk and uncertainty than smaller wetland mitigation areas. Larger wetland mitigation sites are also more manageable than numerous smaller, isolated sites and

[80] Based on a September 22, 2011 meeting between USACE, USFWS, FAA, FHWA, and project consultants and a January 30, 2012 meeting between USACE, USEPA, USFWS, and project consultants.

typically provide substantial economies of scale and higher likelihood of success. The mitigation site(s) will be developed and reviewed in coordination with resource agencies that include the IDNR, IEPA, USACE, USEPA, USFWS, and FAA.

Based on further coordination with USACE, USEPA, USFWS, IDNR, FAA, USDA-APHIS, IDOT, and the Illinois Tollway, the most likely mitigation scenario for the EO-WB project would involve working with a local land steward to acquire sites where wetland mitigation could be completed. Coordination with local forest preserve districts and the DRSCW has occurred to assess local sites within the Salt Creek Watershed to potentially provide compensation for DuPage County wetland impacts within DuPage County[81] and/or the specific affected watersheds.

Wetland/waters mitigation would be implemented offsite, but within the Des Plaines River drainage basin. More than 20 potential mitigation sites have been presented to the appropriate federal and state regulatory agencies for review. All sites under review by the federal and state agencies are private properties and represent new acquisition. All of the sites contain existing wetland that will be incorporated into the restoration and enhanced as part of the overall project. One or more of the sites under consideration will be necessary to satisfy the wetland impact mitigation ratios. A final decision regarding wetland mitigation approach and site selection will be completed during the Section 404 permitting process and IWPA review. The mitigation sites will be conveyed (if necessary) to a steward, such as a forest preserve district, for long term maintenance.

Acquisition of wetland/waters mitigation sites will most likely be accomplished by one of two methods: 1) an IGA between the Illinois Tollway and land steward that specifies a partnership wherein the steward acquires the needed property and the Illinois Tollway develops the build-out of the mitigation; 2) the Illinois Tollway both acquires and develops the property and then conveys it to the long term property steward.

The location of the compensatory wetland mitigation will be finalized following agreement on the wetland replacement ratio and other mitigation objectives. Table 3-49 shows the wetland impact and likely compensation summary.

TABLE 3-49
Wetland Impact and Compensation Summary

Site No.	Exhibit Sheet No. [a]	Wetland Type	FQI	Mean C-Value	Total Wetland Size (acre) [b]	Impact Area (acre)	Mitigation Ratio [c]	Wetland Mitigation Credits Required	Function
6	J-10	marsh	11.6	2.3	2.97	0.004	2:1	0.01	surface water storage, fair quality wildlife habitat
21	J-9	marsh	4.0	1.8	0.03	0.03	2:1	0.06	surface water storage

[81] Wetland mitigation for local non-IDOT/Illinois Tollway road projects subject to the DuPage County Countywide Stormwater and Flood Plain Ordinance will be provided in DuPage County, as required.

TABLE 3-49
Wetland Impact and Compensation Summary

Site No.	Exhibit Sheet No. [a]	Wetland Type	FQI	Mean C-Value	Total Wetland Size (acre) [b]	Impact Area (acre)	Mitigation Ratio [c]	Wetland Mitigation Credits Required	Function
27	J-9	marsh	8.0	2.1	0.74	0.74	4:1	2.96	surface water storage
28	J-9	marsh/pond	10.1	2.4	1.85	0.29	2:1	0.58	surface water storage
42	J-8	wet shrubland	10.4	2.1	0.26	0.26	2:1	0.52	surface water storage
49	J-7	wet shrubland/ marsh	10.6	2.0	1.94	1.94	4:1	7.76	surface water storage, wildlife habitat
50	J-7	wet shrubland/ marsh	10.3	2.4	0.97	0.56	4:1	2.24	surface water storage, wildlife habitat
52	J-7	wet shrubland	9.7	2.4	0.25	0.25	2:1	0.50	surface water storage, wildlife habitat
53	J-7	marsh	8.7	2.1	0.43	0.43	2:1	0.86	surface water storage, wildlife habitat
54	J-7	forested depression	8.9	2.6	0.25	0.25	2:1	0.50	surface water storage, wildlife habitat
55	J-7	wet meadow	9.4	2.6	0.41	0.41	2:1	0.82	surface water storage, wildlife habitat
59	J-7	wet shrubland/ marsh	6.1	1.6	0.30	0.15	2:1	0.30	surface water storage
61	J-7	marsh	3.7	1.2	0.98	0.17	2:1	0.34	surface water storage
62	J-7	wet shrubland	12.4	2.5	0.70	0.05	2:1	0.10	surface water storage, wildlife habitat
64	J-12	marsh	13.3	2.6	0.63	0.63	4:1	2.52	surface water storage, wildlife habitat
71	J-13	forested depression	10.3	2.3	0.51	0.51	4:1	2.04	surface water storage, wildlife habitat
78	J-14	marsh	4.0	2.3	0.20	0.20	2:1	0.40	surface water storage

TABLE 3-49
Wetland Impact and Compensation Summary

Site No.	Exhibit Sheet No. [a]	Wetland Type	FQI	Mean C-Value	Total Wetland Size (acre) [b]	Impact Area (acre)	Mitigation Ratio [c]	Wetland Mitigation Credits Required	Function
84	J-1	marsh	10.9	2.4	7.35	0.16	2:1	0.32	high quality wildlife habitat, large amount of surface water storage
89	J-1	wet meadow	8.5	3.0	0.08	0.08	2:1	0.16	surface water storage
90	J-1	marsh	11.8	2.6	1.19	0.13	2:1	0.26	wildlife habitat, surface water storage
91	J-1	marsh	1.3	0.6	0.10	0.10	2:1	0.20	surface water storage
113	J-2	forested depression	14.3	2.9	0.20	0.07	2:1	0.14	wildlife habitat, surface water storage
114	J-2	marsh	13.8	2.2	2.39	0.01	2:1	0.02	wildlife habitat, surface water storage
124	J-3	marsh/pond	13.3	2.4	13.34	0.05	2:1	0.10	wildlife habitat, surface water storage, heritage/ recreation
125	J-3	marsh	15.1	2.3	31.43	0.21	2:1 [d]	0.42	high quality wildlife habitat, large amount of surface water storage, heritage/ recreation
134	J-3	marsh	11.7	2.5	0.52	0.52	4:1	2.08	wildlife habitat, surface water storage
137	J-5	marsh/pond	7.9	3.0	1.93	0.12	2:1	0.24	wildlife habitat, surface water storage
138	J-5	marsh	7.2	2.1	2.93	0.50	2:1	1.00	surface water storage
139	J-5	marsh	9.0	2.7	0.34	0.34	2:1	0.68	surface water storage
140	J-5	marsh	10.2	2.0	3.21	3.21	4:1	12.84	surface water storage
141	J-5	marsh	6.1	1.5	0.49	0.49	2:1	0.98	surface water storage

TABLE 3-49
Wetland Impact and Compensation Summary

Site No.	Exhibit Sheet No. [a]	Wetland Type	FQI	Mean C-Value	Total Wetland Size (acre) [b]	Impact Area (acre)	Mitigation Ratio [c]	Wetland Mitigation Credits Required	Function
142	J-5	marsh	9.6	2.0	0.89	0.89	4:1	3.56	surface water storage
151	J-5	marsh	4.5	2.0	0.16	0.16	2:1	0.32	surface water storage
152	J-5	marsh	13.3	2.7	0.99	0.99	4:1	3.96	surface water storage
164	J-5	forested depression	11.5	2.1	5.18	0.72	4:1	2.88	wildlife habitat, surface water storage
172	J-5	wet meadow	6.7	1.5	0.32	0.32	2:1	0.64	surface water storage
178	J-6	wet meadow	7.2	2.0	2.48	0.72	4:1	2.88	flood water storage, streambank stabilization, wildlife habitat, heritage/ recreation
181	J-6	marsh	7.8	1.9	2.30	2.30	4:1	9.20	wildlife habitat, surface water storage, heritage/ recreation
184	J-6	marsh	3.9	1.2	0.20	0.20	2:1	0.40	surface water storage
187	J-6	forested depression	10.0	2.2	0.81	0.81	4:1	3.24	wildlife habitat, surface water storage
188	J-6	pond	8.0	2.1	0.21	0.21	2:1	0.42	surface water storage
189	J-6	forested depression	7.3	1.8	1.03	1.03	4:1	4.12	wildlife habitat, surface water storage
190	J-6	forested depression	6.3	1.9	0.34	0.34	2:1	0.68	wildlife habitat, surface water storage
191	J-6	marsh	5.7	1.9	0.14	0.14	2:1	0.28	surface water storage
192	J-6	wet meadow	9.9	2.3	0.06	0.06	2:1	0.12	surface water storage
194	J-6	marsh	6.3	2.1	0.14	0.14	2:1	0.28	surface water storage

TABLE 3-49
Wetland Impact and Compensation Summary

Site No.	Exhibit Sheet No. [a]	Wetland Type	FQI	Mean C-Value	Total Wetland Size (acre) [b]	Impact Area (acre)	Mitigation Ratio [c]	Wetland Mitigation Credits Required	Function
195	J-7	marsh	6.1	2.5	0.20	0.20	2:1	0.40	surface water storage
2C	J-6	wet meadow	8.5	2.2	0.88	0.38	2:1	0.76	flood water storage, streambank stabilization, wildlife habitat, heritage/ recreation
3A	J-14	marsh	4.1	1.7	0.02	0.02	2:1	0.04	surface water storage
5C	J-5	wet meadow	1.7	1.0	0.19	0.19	2:1	0.38	surface water storage
11C	J-13	marsh	3.0	1.5	0.32	0.32	2:1	0.64	surface water storage
Total					**95.78**	**23.00**		**77.15**	

Note: Impacts to unvegetated waters of the U.S. are discussed in subsection 3.10.2 and are not included in this table.

[a] See Appendix J for exhibits.
[b] Some wetlands may extend beyond the study limit. Acreage is based on delineated area.
[c] Compensation is based on the mitigation ratios in the IWPA (Standard Review Action and mitigation located offsite within basin). The IWPA ratios generally are more stringent than those established by the USACE.
[d] Wetland overlaps mapped DuPage County critical wetland. Under the local DuPage County Countywide Stormwater and Flood Plain Ordinance, critical wetland impacts require compensatory wetland mitigation at a 3:1 mitigation ratio. This ratio could be applicable for any local, non-IDOT/Illinois Tollway component of the project.

3.13.3.3 Only Practicable Alternative Finding - Wetlands

Executive Order (EO) 11990, *Protection of Wetlands*, requires federal agencies to avoid (to the extent practicable) long- and short-term adverse impacts associated with the destruction or modification of wetlands. More specifically, EO 11990 directs federal agencies to avoid new construction in wetlands, if a practicable avoidance alternative exists. Where wetlands cannot be avoided, the proposed action must include all practicable measures to minimize harm to wetlands (see subsection 3.13.3.1).

The alternatives development process for the EO-WB project spanned the Tier One and Tier Two evaluations. The *EO-WB Tier One ROD* approved the preferred improvement and project corridor (location). The corridor that emerged from Tier One was well-defined, and its location was fixed by the *EO-WB Tier One ROD*. The project corridor was fully supported by local communities and exhibited the best travel performance characteristics, while having relatively low impacts compared to other alternative strategies. Avoidance and minimization of wetland impacts (along with other environmental and socioeconomic issues) were important factors in the development of the project corridor and screening of alternatives. In general, alternatives with notable wetland impacts, such as those that overlapped with mapped threatened and endangered species sites or that were located in special lands (e.g., forest preserves) were dismissed in Tier One. Alternatives that involved potentially higher-quality wetland areas were also eliminated from consideration, or potential impacts were minimized.

Tier Two considered the optimal arrangement of design features within the project corridor that provide cost effective travel performance while reducing environmental and socioeconomic impacts. The design features included mainline lane requirements, interchange types, arterial improvements, drainage requirements, and other factors (i.e., transit facilities, bicycle and pedestrian facilities, etc.).

Based on the above considerations (including subsection 3.13.3.1), it is determined that there is no practicable alternative to the proposed construction in wetlands, and that the proposed action includes all practicable measures to minimize harm to wetlands that may result from such use.

Prior to construction, all necessary wetland permits and approvals (e.g., Section 404 CWA) will be obtained. Wetland impacts are summarized in Table 3-49. Because this project occurs on new alignment, it is being processed as a Standard Review Action, in accordance with the IDOT Wetlands Action Plan, and coordinated with IDNR. Wetland Impact Evaluation forms were submitted to IDNR for review. On August 8, 2012, IDNR concurred with the impacts to wetlands (see Appendix B).

3.13.4 Indirect and Cumulative Wetland Impacts

More than 90 percent of Illinois' original eight million acres of wetlands have been destroyed by human modification (Suloway and Hubbell, 1994). Wetlands reportedly once covered more than 23 percent of Illinois. Wetland degradation in Illinois and in the vicinity of the project corridor historically was associated with agriculture, but recent degradation is attributed to urban development.

The majority of the wetlands that are impacted by the proposed improvements include wetlands that are located adjacent to existing roadways or rail lines. Wetlands in the project corridor and the immediate vicinity include predominantly low- to fair-quality, disturbed vegetative communities that are dominated by invasive plant species and have relatively low diversity or richness of native plant species. The proposed project may further impact these wetlands through direct fill, changes in hydrology, or stormwater runoff. These potential indirect wetland impacts have been included with the direct wetland impacts in Table 3-49. Indirect wetland impacts could cause further degradation as a result of point source and nonpoint source pollution resulting in an increase in the presence of adventive (non-native) plant species. Potential indirect impacts as a result of construction, operation, or maintenance of the facility would be minimized through the use of water quality and quantity best management practices (see subsection 3.10.3). Indirect wetland impacts are anticipated to be minimal.

The majority of the project corridor and surrounding land is developed. Based on a review of available wetland mapping (i.e., NWI and DCWI), the majority of the wetlands in the watersheds that receive runoff from the project corridor are located in undeveloped protected areas, such as special lands (e.g., forest preserves) or 100-year floodplain corridors. Special lands, floodplains, and wetlands are protected by federal, state, and/or local (e.g., DuPage County) regulations.

In the project corridor watersheds, it is anticipated that future wetland loss generally would be attributed to urban development at vacant lots and redevelopment of properties. Wetlands that are filled for development purposes would be mitigated as required under Section 404 of the CWA and/or other state and local regulations. Therefore, future development near the project corridor is not expected to greatly affect the total number of wetlands in the Des Plaines River drainage basin. Future projects, including those prompted by the proposed EO-WB improvements, are expected to avoid or minimize wetland impacts to meet regulatory requirements and to minimize the expense associated with compensatory wetland mitigation. Future development would also tend to avoid wetlands located in the protected areas mentioned.

From a broader perspective, it is expected that the cumulative loss of wetland acreage to development in Cook and DuPage Counties would slow in the future. Past wetland loss due to urban and agricultural development has led to a reduction in the overall acreage of remaining wetland areas. Remaining wetland areas are subject to strict wetland regulations at the federal, state, county, and municipal levels. These regulations promote the continued preservation of wetland areas and a reduction in future wetland losses. In addition, these wetland regulations require higher mitigation ratios. Under the protection granted to wetlands (Section 404 of the CWA), mitigation guidelines require that wetland losses of more than 0.10 acre be replaced at a ratio of 1.5:1 or greater (depending on the type and quality of wetland affected, the mitigation ratios may be higher). In many cases, more wetlands are being created than destroyed by individual projects. In-kind replacement has been elevated as an objective, lessening the potential for changing wetland composition in the area. These mitigation requirements are applicable to both public and private projects.

The IWPA (applicable to state/state pass-through-funded projects) also provides protection to wetlands and requires mitigation for all wetland impacts regardless of size. Overall, this legislation has been effective for mitigating the loss of wetlands from public projects that receive state/state pass-through funding. This has helped to slow total wetland loss across the state. DuPage County has developed a wetland protection ordinance to fill potential gaps in state and federal regulations, and Cook County is preparing a watershed management ordinance that includes wetland protection.

Land management is another mechanism that can minimize the potential conversion of special resources, such as wetlands. Examples are park districts, forest preserves, state parks, and natural areas that provide long-term protection to special resources within their boundaries.

These practices minimize wetland losses due to urban development, slow or stop the rate of wetland loss near the project corridor and, thus, the overall cumulative impact. The percent of existing wetland loss that would result from the Build Alternative represents a small fraction of the total wetland acreage found in the local region. Based on NWI and DCWI mapping, there are approximately 10,235 acres of mapped wetlands within the six watersheds that are near the project.[82] Based on information provided by S.B. Friedman & Company (2011), an evaluation of the indirect and cumulative impacts that potential development near the project could have on wetland resources was completed. It is estimated that over the next 30 years, roughly two percent of the mapped wetlands in the six watersheds near the project could be impacted. Ultimately, there would be a net increase in total wetlands as a result of the mitigation for these projects.[83] Thus, the net indirect and cumulative impacts of the proposed project on wetlands are anticipated to be minimal.

3.14 Natural Resources

3.14.1 Affected Environment

This subsection describes plants and wildlife, including invasive species and threatened and endangered species, located proximate to the project corridor. Information contained in this section is primarily based on existing information. Unless otherwise noted, field surveys were not conducted for the project corridor.

3.14.1.1 Upland Plant Communities

The project corridor lies within the Northeastern Morainal Natural Division in Illinois (Schwegman, 1973). Urban land is the predominant cover type. Similar to most of Illinois, the natural land cover has been extensively altered. Within this natural division, urban development continues to be a major environmental stressor.

Northeastern Illinois has not only a larger population than the rest of Illinois but also the most acreage of protected natural areas (IDNR, 2005). The Northeastern Morainal Natural Division includes several designated resource-rich areas (RRAs), or areas that are rich in biological resources (Suloway et al., 1996).[84] The project corridor does not lie in one of these designated RRAs, and no high-quality natural plant communities were observed during field visits (Handel, 2009; Handel, 2010).

Land Cover

Table 3-50 summarizes the land cover within the project corridor, which is the result of the Illinois Interagency Landscape Classification Project (IILCP).[85]

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[82] The NWI and DCWI serve only as large-scale guides and field-delineated wetland locations often vary from those that are mapped. The mapped wetland total includes more than 600 acres of O'Hare Airport, which has been permitted for fill under Section 404 of the CWA. The six watersheds near the project include Addison Creek, Des Plaines River (main stem), East Branch DuPage River, Salt Creek (upper, middle, and lower), West Branch DuPage River, and Willow Creek.

[83] Due to FAA guidelines regarding wildlife hazard separation distances, there could be a slight loss in cumulative wetland acreage near the project corridor as a result of potential development. However, there would be an overall net gain in wetland acreage in the larger Des Plaines River drainage basin as a result of compensatory wetland mitigation.

[84] The RRA is an IDNR program that identifies large areas containing concentrated natural resources (forests, wetlands, natural areas/nature preserves, and biologically important streams) so that cooperative public-private partnerships can be formed to merge natural resource stewardship with compatible economic and recreational development.

[85] IILCP includes the following agencies: USDA National Agricultural Statistics Service, IDOA, and IDNR.

TABLE 3-50
Land Cover Mapped in the Project Corridor

Cover Type	Acres [a]	Percent of Total Land Cover within Project Corridor
Forested Land		
Upland forest	60.8	3.3
Partial canopy/savannah upland forest	30.9	1.7
Floodplain forest	6.7	0.4
Total	98.4 [b]	5.4
Urban and Built-up Land		
High density	665.9	35.8
Low/medium density	679.4	36.5
Urban open space	399.0	21.4
Total	1,744.3	93.7
Other [c]	19.5 [d]	1.1 [d]

Source: USDA National Agriculture Statistics Service, et al., 2002.

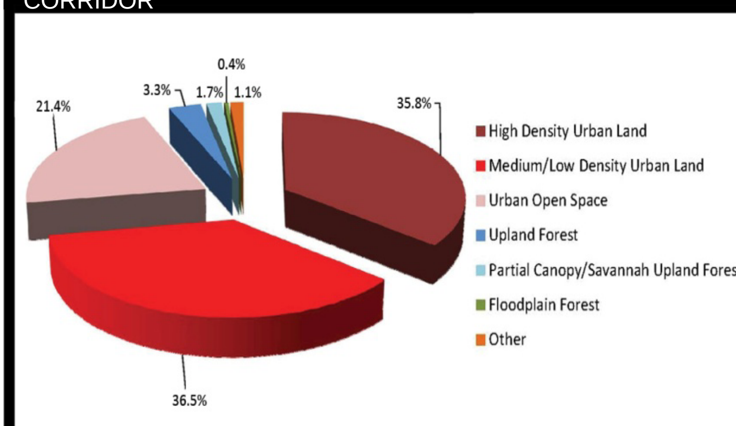
[a] Land cover acreages for this table were calculated for the project corridor based on data from the *Land Cover of Illinois 1999–2000* (USDA, 2010).

[b] Approximately 49 percent of this total (48.1 acres) is mapped within OMP limits (discussed in more detail below).

[c] "Other" represents mapped agricultural land, wetland, and waters. The project corridor does not have any property in agricultural use (see subsection 3.6). See subsection 3.10 for surface waters and subsection 3.13 for wetlands.

[d] The percentages/acreages provided in this table may vary from totals provided by different sources found in other tables in this document.

FIGURE 3-16
PERCENT OF TOTAL LAND COVER WITHIN PROJECT CORRIDOR



The project corridor is located in a densely developed portion of northeastern Illinois with a mixture of residential, commercial, industrial, and transportation land uses. Due to the urban environment, the land cover has been substantially modified. Over 90 percent of the total cover within the project corridor is mapped urban and built-up land, including low-, medium-, and high-density development, as well as urban open space (see Figure 3-16, Table 3-50, and

Exhibit 3-18). In high-density areas, nearly all the land surface is covered with structures and facilities. In areas of low and medium density, up to half of the land surface is covered with man-made structures. The remaining surface area is intermixed with urban landscaping, open space, or forested cover. Urban open space represents parks, golf courses, and other grass-covered surfaces within developed areas.

Close to 400 acres of mapped urban open space is scattered throughout the project corridor. Field reconnaissance of the project corridor found that most of the open space habitat consists of turf grass and old successional fields, and to a lesser extent degraded or low-quality woodlands, a prairie remnant, surface waters, and wetlands (see subsection 3.10 for surface waters and subsection 3.13 for wetlands). The old successional fields are entirely herbaceous or are scattered with trees and shrubs that are beginning to colonize idle, open space. Non-native or quickly colonizing plant species dominate these areas.

FIGURE 3-17
OLD SUCCESSIONAL FIELD LOCATED NEAR THORNDALE AVENUE AND CENTRAL AVENUE

Source: CBBEL, 2010b.

Dominant herbaceous species generally include Queen Anne's lace (*Daucus carota*), cut-leaved teasel (*Dipsacus laciniatus*), fescue (*Festuca* spp.), and tall goldenrod (*Solidago altissima*). Trees and shrubs, such as box elder, common buckthorn, and Siberian elm (*Ulmus pumila*) are beginning to colonize the old successional fields that have been undisturbed for an extended time (see Figure 3-17).

No high-quality natural communities or endangered and threatened plant species were found by the INHS during its field studies (Handel, 2009; Handel, 2010). Except for a few instances noted elsewhere in this document, higher-quality natural resources are not located within the project corridor. Most vegetative cover types in the project corridor have been altered by urbanization and are dominated by non-native or invasive species. The biological resources within the project corridor consist primarily of common or adaptable plant and wildlife species that are relatively tolerant of disturbance and human activities.

The project corridor is located adjacent to (but does not include) one Cook County forest preserve (i.e., Ned Brown Forest Preserve) and three DuPage County forest preserves (i.e., Medinah Wetlands, Salt Creek Marsh, and Silver Creek). The forest preserve holdings may contain higher-quality natural communities and more conservative plant and wildlife species when compared to the remainder of the project corridor.

Prairie Remnants

Prairie cover types are scarce in the project corridor. During botanical field surveys, INHS identified two disturbed prairie remnants along the I-290 embankment south of Thorndale

Avenue (see Exhibit 3-19) (Handel, 2009; Handel, 2010).[86] One of these remnant prairie areas is located within the project corridor, and the other is located just beyond the project corridor between the Metra Milwaukee District/West rail line and Irving Park Road. Due to the severity and ongoing disturbance of the prairie remnants, natural area recovery may not be possible. The prairie remnant characteristics are described in Table 3-51.

Forested and Wooded Land

Based on the tree study (using transect/sub-sample methodology) completed for this project, approximately 182.8 acres of wooded land are in the project corridor with the exception of OMP (see discussion below).[87] Much of this acreage consists of relatively small, scattered wooded land. There are no dense, unfragmented woodland sites that exceed 20 acres in the project corridor. In general, the creeks that pass through the project corridor are lined with a relatively narrow band of trees or shrubs, and the wooded riparian environment is fragmented by existing roads or other development. Identified woodland types include scrub-shrub woodland, closed woodland, wooded fencerow, and landscape trees (see Exhibit 3-19).

Scrub-shrub woodlands are the predominant woodland type in the project corridor (see Table 3-52). The scrub-shrub woodlands are scattered sporadically throughout the project corridor and range in size from approximately 0.01 acre to 13.8 acres. Scrub-shrub woodlands consist of a mixture of trees, shrubs, and old field herbaceous plants. In general, these areas appear to be disturbed and dominated by lower-quality mid-canopy and canopy species (see Table 3-52). They are typically old field successional areas that are slowly transitioning to closed wooded habitat. The scrub-shrub woodlands include primarily smaller stems of trees ranging from four to nine inches in diameter at breast height (DBH), although larger trees may be present. No specimen trees[88] were observed in scrub-shrub woodlands within the sample plots. The scrub-shrub woodlands also contain numerous smaller shrubs, including common buckthorn and gray dogwood (*Cornus racemosa*). The understory is dominated by tall goldenrod, cut-leaved teasel, and early colonizing species. Within the project corridor, the largest scrub-shrub concentrations are located at York Road and Sivert Court, (13.8 acres), and on the south side of Thorndale Avenue between Mittel Boulevard and Wood Dale Road (9.0 acres) (see Exhibit 3-19).

Closed woodland areas were the next most common woodland type in the project corridor. In general, closed woodlands consist of narrow wooded areas that border residential homes, commercial and industrial development, arterial roadways, and open fields. The closed woodlands are generally fragmented, degraded, and of low to moderate quality. These areas are dominated by small to moderately sized stems, generally ranging in size from 4 to 16 inches DBH. Two trees with 21 inches DBH were identified within closed woodland sample plots during the tree study. No specimen trees were observed in closed woodlands within the sample plots.

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86 The primary objective of the 2009 and 2010 surveys focused on the eastern prairie fringed orchid (*Platanthera leucophaea*), but a standard survey was also conducted for high-quality natural communities and endangered or threatened plant species.

87 Due to the large size and urban nature of the project corridor, a transect/sub-sample methodology was used to approximate tree quantities (CBBEL, 2011).

88 A specimen tree is a notable and valued tree, based on consideration of species, size, condition, age, longevity, visual quality, and genetic attributes. Also see IDOT's *D&E-18, Preservation and Replacement of Trees* (IDOT, 2002) and the Tollway's "Criteria for Removal and Replacement of Trees" section of the *Erosion and Sediment Control, Landscape Design Criteria* manual (Illinois Tollway, 2012).

TABLE 3-51
Project Corridor Prairie Remnant Characteristics

Site No.	Size (acre)	Community Type	Prairie Grasses [a]		Prairie Forbs [a]		Percent Adventive [b]	FQI
			Common Name	Scientific Name	Common Name	Scientific Name		
1	0.8	dry-mesic prairie, mesic prairie, wet meadow	fowl manna grass drop seed	*Glyceria striata* *Sporobolus asper*	common milkweed whorled milkweed heath aster smooth aster [c] New England aster pale purple coneflower [c] daisy fleabane rattlesnake master [c] sawtooth sunflower spotted St. John's wort button snakeroot winged loosestrife drooping coneflower black-eyed Susan compass plant prairie dock rigid goldenrod common spiderwort	*Asclepias syriaca* *Asclepias verticillata* *Aster ericoides* *Aster laevis* [c] *Aster novae-angliae* *Echinacea pallida* [c] *Erigeron strigosus* *Eryngium yuccifolium* [c] *Helianthus grosseserratus* *Hypericum punctatum* *Liatris pycnostachya* *Lythrum alatum* *Ratibida pinnata* *Rudbeckia hirta* *Silphium laciniatum* *Silphium terebinthinaceum* *Solidago rigida* *Tradescantia ohiensis*	12.9	17.5
2	3.5	dry-mesic prairie	drop seed	*Sporobolus asper*	whorled milkweed heath aster smooth aster [c] New England aster pale purple coneflower [c] daisy fleabane button snakeroot pasture rose black-eyed Susan compass plant prairie dock Canada goldenrod dyersweed goldenrod rigid goldenrod common spiderwort	*Asclepias verticillata* *Aster ericoides* *Aster laevis* [c] *Aster novae-angliae* *Echinacea pallida* [c] *Erigeron strigosus* *Liatris pycnostachya* *Rosa carolina* *Rudbeckia hirta* *Silphium laciniatum* *Silphium terebinthinaceum* *Solidago canadensis* *Solidago nemoralis* *Solidago rigida* *Tradescantia ohiensis*	13.0	14.5

Source: Handel, 2009.

[a] Dominant species were not listed in the studies.
[b] Adventive plant species are not native to Illinois. A high percentage of adventive plants indicates a high level of ecological disturbance, whereas a low percentage indicates a low level of disturbance.
[c] Species with C-value equal to 7 or more (see subsection 3.13.1.1).

TABLE 3-52
Project Corridor Woodland Summary

Woodland Type	Total Acreage in Project Corridor	Density (trees/acre) [a]	Total Basal Area (ft^2/acre)	Number of Tree Species	Dominant Tree Species	
					Common Name	Scientific Name
Scrub-Shrub Woodland	66.7	89	24.2	12	box elder black willow eastern cottonwood	*Acer negundo* *Salix nigra* *Populus deltoides*
Closed Woodland	64.8	314	127.1	13	box elder eastern cottonwood Siberian elm	*Acer negundo* *Populus deltoides* *Ulmus pumila*
Wooded Fencerow	11.0	193	87.2	12	box elder honey locust Siberian elm	*Acer negundo* *Gleditsia triacanthos* *Ulmus pumila*
Landscape Trees (scattered)	35.7	122	89.5	15	Austrian pine green ash Iowa crabapple	*Pinus nigra* *Fraxinus pennsylvanica* *Malus ioensis*
Landscape Trees (linear rows)	4.6	122	151.4	7	Austrian pine downy hawthorne honey locust silver maple	*Pinus nigra* *Crataegus mollis* *Gleditsia triacanthos* *Acer saccharinum*

Source: CBBEL, 2011.

Note: Values are approximate based on the tree study. Some individual trees were not associated with a woodland type and are not included in the tree study; these individual trees were found to be in wetlands, old field successional areas, or isolated landscape trees.

[a] Density (trees/acre) is based on stems that are 4 inches DBH and greater for all woodland types per *BDE Manual* (IDOT, 2011). Landscape trees also include stems less than 4 inches DBH.

Closed woodland areas are dispersed throughout the project corridor and range in size from approximately 0.02 acre to 11.8 acres within the project corridor (most of the closed woodland areas extend beyond the proposed project corridor). The largest concentrations in the proposed project corridor are located northwest of the intersection of York Road and Thorndale Avenue (approximately 11.8 acres) (see Figure 3-18), on the south side of Thorndale Avenue between Central Avenue and Sivert Drive (approximately 5.8 acres), and on the north side of the existing Elgin-O'Hare Expressway between Rohlwing Road and I-290 (approximately 3.5 acres) (see Exhibit 3-19).

FIGURE 3-18
CLOSED WOODLAND AT NORTHWEST CORNER OF YORK ROAD AND THORNDALE AVENUE

Source: CBBEL, 2010a.

In the project corridor, wooded fencerows are found primarily along the existing Elgin O'Hare corridor, interstate roadways, and railroads. In general, these areas consist of narrow treelines containing one row of trees mixed with shrubs and herbaceous vegetation. The distance between trees and the tree density vary considerably. Based on the tree study, the fencerows are generally degraded, highly fragmented, and lower-quality areas (see Table 3-52). Tree stems range in size from four to 23 inches DBH, with the majority of trees approximately four to nine inches DBH. No specimen trees were observed in the wooded fencerow sample plots.

Landscape trees consist of intentionally planted or maintained trees within or adjacent to rights-of-way, commercial, industrial, or residential areas, and parks or preserves. These trees are situated throughout the proposed project corridor and may have been planted in rows (e.g., parkway trees) or planted in clusters throughout a property (see Exhibit 3-19). In general, the understory consists of turf grass, mulch, and/or landscape plantings amongst the trees. The landscaped areas contain typical nursery tree species commonly planted by municipalities, public, and private agencies (see Table 3-52). The landscape trees consist of newly planted and established trees ranging from one inch to 30 inches DBH, with most trees ranging from five inches to 19 inches DBH. The majority of the landscape trees appeared in good to fair health. Four specimen trees were noted in the landscape tree sample plots—two 26-inch-DBH silver maples, one 27-inch-DBH honey locust, and one 30-inch-DBH silver maple. The landscape specimen trees were identified in sample plots at two general locations: (1) in the vicinity of the southeast quadrant of the intersection of IL 72 and Elmhurst Road; and (2) adjacent to residences on the north side of Thorndale Avenue, west of Prospect Avenue.

Wooded Riparian Areas

The project corridor also includes riparian areas associated with mapped floodplain along the creeks. These riparian areas contain a mixture of wetland, closed woodland, narrow woodland along the creek banks, and upland herbaceous plant communities extending away from the waterways. In the vicinity of the project corridor, a large portion of the Salt Creek and Meacham Creek riparian environment is wetland. Wetland areas are discussed in subsection 3.13. Wooded riparian corridors are summarized below.

Portions of Salt Creek are lined with a narrow band of trees. However, the riparian environment also includes closed woodland (approximately 3.2 acres) that extends west from the creek and adjacent wetland located south of Thorndale Avenue. The Salt Creek wooded riparian environment is generally dominated by an overstory of moderately sized trees, a mid-canopy of invasive shrubs, and an understory of herbaceous vegetation. Floristic quality is relatively low, and species composition is dominated by box elder, silver maple, green ash, and eastern cottonwood. The mid-canopy and herbaceous layers are dominated by non-native invasive common buckthorn and reed canary grass. The Meacham Creek riparian corridor is dominated by herbaceous wetland vegetation containing primarily cattail and common reed with low-density, scattered trees and shrubs.

Riparian corridors associated with Addison Creek, Higgins Creek, and Willow Creek primarily consist of narrow widths of adjacent upland trees and shrubs with herbaceous vegetation and/or mowed grass. These areas contain lower-quality riparian habitat with woodland species dominated by box elder, common buckthorn, green ash, black cherry (*Prunus serotina*), honeysuckle (*Lonicera* spp.), eastern cottonwood, and gray dogwood.

Land Cover at O'Hare Airport

OMP construction commenced in fall 2005 and included site preparation for the portions of the West Bypass corridor west of the airport (see Figure 3-19). Trees, shrubs, and other vegetation within and adjacent to this corridor have been cleared for future development, including OMP projects.

FIGURE 3-19
AERIAL VIEW OF O'HARE AIRPORT

Source: City of Chicago, 2009.

According to FAA policy, potential wildlife attractants (e.g., woodlands, shrubs, open water, and wetlands) should be minimized on or near airports to promote safety by reducing the number of aircraft/wildlife conflicts.

Consistent with the intent of the O'Hare Airport *Wildlife Hazard Management Plan* and FAA policy, potential wildlife habitat within OMP limits (including the West Bypass corridor) has been minimized by removing shrubs and woody vegetation, mowing vegetation, and planting grasses that are unattractive to hazardous wildlife (see Figure 3-20) (FAA, 2007; USDA, 2010). Building a roadway at the west end of O'Hare Airport is consistent with FAA policy and would not impact high-quality natural communities.

FIGURE 3-20
WEST BYPASS CORRIDOR WITHIN OMP LIMITS

Source: City of Chicago, 2009.

3.14.1.2 Invasive Species

Invasive species are those whose introduction may cause harm to the associated habitat, environment, economy, or human health. Under EO 13112 (*Invasive Species*), federal agencies are required to identify, control, and minimize or prevent actions that may cause or promote the introduction or spread of invasive species. Invasive species shall be considered during all phases of the environmental process to comply with NEPA requirements.

The USDA-NRCS *Noxious Weeds List for Illinois* includes invasive plant species that have been recorded within Cook and DuPage Counties, such as Canada thistle (*Cirsium arvense*), Johnson grass (*Sorghum halepense*), musk thistle (*Carduus nutans*), and perennial sow thistle (*Sonchus arvensis*). Additional invasive plant species dominate many of the upland and wetland habitats in the project corridor, such as common buckthorn, garlic mustard (*Alliaria petiolata*), purple loosestrife *(Lythrum salicaria)*, reed canary grass, Siberian elm, Tartarian honeysuckle (*Lonicera tatarica*), and teasel (*Dipsacus* spp.).

The project is situated within the USDA/IDOA quarantine area for the emerald ash borer (*Agrilus planipennis*), which is an invasive insect that kills ash trees.

Invasive species also include several aquatic nuisance species[89] and injurious wildlife species[90] that can potentially harm an ecosystem. Examples of aquatic nuisance species and injurious wildlife that have been recorded in the vicinity of the project corridor include the Asian clam (*Corbicula fluminea*), common carp (*Cyprinus carpio*), grass carp (*Ctenopharyngodon idella*), and rusty crayfish (*Orconectes rusticus*).

3.14.1.3 Wildlife Resources

The project corridor contains an existing transportation network in a predominantly built-out area and consequently has limited areas of prime wildlife habitat. The least productive cover types for providing wildlife habitat in the project corridor are high- and medium-density developments. Wildlife may use such areas for foraging, but there is little opportunity for nesting or cover for most species. No wildlife studies were conducted as part of this project.

Of the land cover types listed in Table 3-50, the most important for wildlife are forested lands and urban open space. Roughly five percent of the project corridor is mapped as having a wooded cover type, and another 21 percent is mapped as urban open space. Surface waters and wetlands are also important to wildlife. Approximately two percent of the project corridor consists of wetlands or surface waters. This combination of cover types may provide habitat for many species of plants and wildlife. Subsections 3.10 and 3.13 discuss the general distribution of aquatic and wetland habitats. Near the project corridor, development has limited the distribution of sensitive wildlife species to protected lands, such as forest preserves.

Old fields are the most common wildlife habitat type within the project corridor and are important to woodland edge and grassland bird and mammal species, when the old fields are large and un-fragmented. Near the proposed project improvements, most of the old field areas are highly fragmented and have less-stable wildlife populations. The smaller open areas and linear rights-of-way tend to be most valuable for common suburban bird species (see discussion below) and small mammals (e.g., voles and mice).

The developed parts of the proposed project corridor provide minimal wildlife habitat. Wildlife species in urban/suburban areas tend to be tolerant of disturbance and human activities. Some species would use urban and suburban habitats, but species diversity generally is lower than in forest preserves and rural habitats. Urban-tolerant wildlife species

[89] An aquatic nuisance species is defined in the *Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990* (16 USC 4701 *et seq.*) as a nonindigenous species that threatens the diversity or abundance of native species or the ecological stability of infested waters, commercial, agricultural, aquacultural or recreational activities dependent on such waters.

[90] Injurious wildlife are mammals, birds, amphibians, reptiles, fish, crustaceans, mollusks and their offspring or gametes that are injurious to the interests of human beings, agriculture, horticulture, forestry, wildlife, or wildlife resources of the United States. Refer to 18 USC 42 and 50 CFR Part 16. The list of Illinois "injurious species" can be found at 17 Ill. Adm. Code §805.20.

are generally common, adaptable species and include limited numbers of mammals, birds, reptiles, and amphibians. Aquatic species, such as fish and macroinvertebrates, are discussed with aquatic habitat in subsection 3.10.1.2. A wildlife survey was not conducted as part of the study; instead, national, state, and county databases were reviewed for wildlife information (see Appendix L).[91]

Birds

Based on the North American Breeding Bird Survey and information from the Forest Preserve District of Cook County (FPDCC) and FPDDC, 141 bird species have been documented in the vicinity of the project corridor, including seasonal spring-fall migrants, breeding residents, and overwintering species. Of those, 95 species have been recorded as nesting within the forest preserves proximate to the project corridor, and 32 of the bird species are listed as "Species in Greatest Need of Conservation for Illinois."[92] In general, most of the birds are passerine species (or perching birds), with a complement of birds of prey, waterfowl, woodpeckers, and shorebirds (see Appendix L). The most common birds expected to be found in the project corridor include typical suburban species, such as: the American crow (*Corvus brachyrhynchos*), American goldfinch (*Carduelis tristis*), American robin (*Turdus migratorius*), blue jay (*Cyanocitta cristata*), brown-headed cowbird (*Molothrus ater*), Canada goose (*Branta canadensis*), common grackle (*Quiscalus quiscula*), European starling (*Sturnus vulgaris*), house sparrow (*Passer domesticus*), mallard (*Anas platyrhynchos*), mourning dove (*Zenaida macroura*), northern cardinal (*Cardinalis cardinalis*), and song sparrow (*Melospiza melodia*).

The project corridor is within the eastern half of the Mississippi flyway, which is used by migratory birds. Many birds that migrate through the project corridor also nest within or adjacent to the corridor, including neotropical migrants. Neotropical migrants, including all or part of their population, fly through or breed in the United States and Canada but spend winters in the tropical habitats of Latin America or the Caribbean. Seventy-three neotropical migrants[93] are known to breed within the forest preserves close to the proposed project corridor. Neotropical migrants may use the habitats found in (and adjacent to) the project corridor (e.g., wetlands, woodlands, and shrublands) for breeding. Some species rely on large stands of mature forests for breeding. Large wooded stands are found outside the project corridor (e.g., Ned Brown Forest Preserve); however, no large (more than 20 acres) unfragmented wooded stands are located within the proposed project corridor.

In general, based on habitat types, neotropical migrants that might be observed in the project corridor include the house wren (*Troglodytes aedon*) in urban areas, eastern kingbird (*Tyrannus tyrannus*) in undeveloped areas, common yellowthroat (*Geothlypis trichas*) in wetlands and shrublands, and red-eyed vireo (*Vireo olivaceus*) in woodlands. Additional neotropical migrants that commonly might be observed in the project corridor include the barn swallow (*Hirundo rustica*), chimney swift (*Chaetura pelagica*), and gray catbird (*Dumetella carolinensis*).

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[91] FPDDC provided a wildlife species list for all preserves located proximate to the project corridor, including Silver Creek, Salt Creek Marsh, and Medinah Wetlands (FPDDC, 2010a – d). FPDCC provided wildlife lists for the Ned Brown Forest Preserve (FPDCC, 2010). The wildlife lists included birds, mammals, reptiles, and amphibians.

[92] Based on Appendix I of *The Illinois Comprehensive Wildlife Conservation Plan & Strategy* (Illinois Wildlife Action Plan) (IDNR, 2005).

[93] Based on a list of neotropical migrants provided by the American Bird Conservancy and USFWS – Division of Bird Habitat Conservation, last updated November 2009. The migratory bird lists include both nearctic and neotropical migrants; no distinction is made between the two types.

Mammals

Based on data compiled from the FPDCC and the FPDDC, 38 mammal species have been recorded at the forest preserves located proximate to the project corridor. Six of these mammal species are listed as "Species in Greatest Need of Conservation for Illinois" (see Appendix L).[94] However, inclusion on the list does not necessarily mean that a species is rare. For example, the muskrat (*Ondatra zibethicus*), which is abundant in northern Illinois, can be found in aquatic habitats (including stormwater management basins) in every county in the state (University of Illinois Extension, 2010).

Several of the mammal species recorded proximate to the project corridor are relatively tolerant of development but require greenways or nearby natural areas for habitat. Common species relatively tolerant of urban areas include the eastern cottontail (*Sylvilagus floridanus*), gray and fox squirrels (*Sciurus* spp.), Virginia opossum (*Didelphis virginiana*), raccoon (*Procyon lotor*), striped skunk (*Mephitis mephitis*), coyote (*Canis latrans*), and white-tailed deer (*Odocoileus virginianus*).

Reptiles and Amphibians

Based on data compiled by the FPDCC and the FPDDC, 16 reptile species and 12 species of amphibians have been recorded at the forest preserves located close to the proposed project corridor. Two of the reptiles and two of the amphibians are listed as "Species in Greatest Need of Conservation for Illinois" (see Appendix L).[95] One of the reptiles, the Blanding's turtle (*Emydoidea blandingii*), is state endangered and was included in the FPDCC wildlife list for Ned Brown Forest Preserve (see subsection 3.14.1.4). Other than the Blanding's turtle, most of the reptiles and amphibians recorded at the forest preserves adjacent to the project corridor are considered locally common. Common species relatively tolerant of urban areas include the American toad (*Bufo americanus*) and the plains garter snake (*Thamnophis radix*).

Terrestrial Wildlife Movement Corridors

The large percentage of urban development, habitat fragmentation, and existing transportation infrastructure throughout (and adjacent to) the project corridor limits wildlife movement. Wildlife use linear corridors and greenways, such as those found within rights-of-way (e.g., transportation, utility), fencerows, and riparian environments for movement, dispersal, and access to habitat divided by roads, rail, or other types of development (see Exhibit 3-20).

The largest open-space habitat types within or close to the proposed project corridor can be found at the 3,700-acre Ned Brown Forest Preserve in Cook County, a handful of smaller DuPage County forest preserves, other special lands, and existing undeveloped stretches of right-of-way. Based on correspondence with the FPDDC, greenways that could be used for wildlife movement in the vicinity of the project corridor include the Salt Creek and West Branch DuPage River corridors, along with the forest preserves that are interconnected (including golf courses) and greenways under Commonwealth Edison lines (Meister, 2010). FPDCC did not disclose any specific wildlife movement corridors near the project (proximate to Ned Brown Forest Preserve) (Anchor, 2010). The preserved open space and undeveloped corridors and greenways provide connectivity and may allow animal movement between habitats.

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[94] Based on Appendix I of Illinois Wildlife Action Plan (IDNR, 2005).

[95] Based on Appendix I of Illinois Wildlife Action Plan (IDNR, 2005).

To identify potential areas of animal movement across the project corridor, five years of vehicle/animal crash data for state-owned/maintained routes were reviewed (IDOT, 2010). There were approximately 28 vehicle/animal crashes recorded within the proposed project corridor during this same period, most of which involved deer. No human fatalities or injuries were reported. Generally speaking, the relatively small number of reported vehicle/animal crashes were scattered throughout the proposed project corridor. The greatest concentration of crashes (five accidents over a five-year period) occurred at I-90, just east of Elmhurst Road near Higgins Creek. From 2004 through 2008, a greater concentration of vehicle/animal crashes was reported outside the project corridor along roads close to the Ned Brown Forest Preserve and along I-290 near special lands (see Exhibit 3-20).

A substantial portion of the proposed EO-WB project improvements lies within DuPage County on County routes, such as Thorndale Avenue. Based on DuPage County data, there were approximately nine vehicle/animal crashes on these roads between 2004 and 2008 (DuPage County Transportation Data Management System, 2010). Seven of these crashes were scattered along Thorndale Avenue. Five of the Thorndale Avenue crashes were reported between Lively Boulevard and Prospect Avenue/Arlington Heights Road, near Salt Creek and reserved right-of-way or open space (see Exhibit 3-20).

3.14.1.4 Threatened and Endangered Species

Threatened and endangered species assessments were accomplished through coordination and consultation with state and federal resource agencies, review of published and file information, and field surveys. As part of project planning, the IDNR Natural Heritage Database (dated March 21, 2011) was also reviewed. No federally designated critical habitat or state-listed plant or animal species were mapped within the project corridor.

Surveys and reviews concerning federal- and state-listed species that could be affected by the proposed improvements were completed during 2009 and 2010. Survey results and database reviews are summarized in the following subsections. Based on the results of agency coordination, field surveys, and database reviews, impacts to threatened and endangered species are not anticipated as a result of this project (see Biological Resources Reviews in Appendix M).

Federal-Listed Species

In this Tier Two Final EIS, Appendix M contains project correspondence with the USFWS. Appendix M also includes a review of federal-listed species and critical habitat in Cook and DuPage Counties. The federal-listed species discussed below are also state-listed. Adverse effects to federal-listed species as a result of the project are unlikely.

- **Eastern Prairie Fringed Orchid (*Platanthera leucophaea*) (Status: Federal-Threatened and State-Endangered).** Based on coordination with the USFWS, there are no known eastern prairie fringed orchid locations within the project corridor. Possible habitat for this protected species includes mesic prairie, sedge meadows, marsh edges, and bogs. Any moderate- to high-quality wetland habitat within the project corridor could support the species (Rogner, 2008; Rogner, 2009).

  During the summer of 2009 and spring/summer of 2010, field visits were conducted to look for potential eastern prairie fringed orchid habitat within the project corridor. As recommended by USFWS, suitable habitat was searched on three nonconsecutive days during its bloom period, which is between June 28 and July 11 in 2009 and again in 2010 (i.e., during the orchid's bloom period). No populations of eastern prairie fringed orchid were found (Handel, 2009; Handel, 2010). The project will have no effect on the eastern prairie fringed orchid.

- **Eastern Massasauga Rattlesnake (*Sistrurus catenatus catenatus*) (Status: Federal Candidate Species and State-Endangered).** In northeast Illinois, the eastern massasauga rattlesnake most often occurs in shrubby or grassy habitats in floodplains and riparian corridors. There are no records that definitively place the eastern massasauga rattlesnake in or near the project corridor. There are no habitat corridors that would allow travel between the only known massasauga population in the region and the location of the proposed improvements. Also, suitable habitat in the project corridor is lacking near historical localities (Kuhns, 2009; Kuhns, 2010a). Based on a letter from the USFWS, impacts to the eastern massasauga rattlesnake are not anticipated as a result of the proposed project (Rogner, 2009). Therefore, the project would have "no effect" on the massasauga rattlesnake.

State-Listed Species

In this Tier Two Final EIS, Appendix M contains the results of the natural resource review provided by the IDNR Ecological Compliance and Assessment Tool (EcoCAT) and correspondence with IDNR regarding potential state-listed species within the project corridor. IDNR concluded that adverse effects to state-listed species as a result of the project are unlikely. Consultation under 17 Illinois Administrative Code Part 1075 regarding state-listed species was concluded on February 11 and 14, 2011 (IDNR, 2011; Hamer, 2011).

- **Black-Crowned Night-Heron (*Nycticorax nycticorax*) (Status: State-Endangered).** The black-crowned night-heron is found in many habitat types, including wooded wetland, emergent marshes, and riparian woods. A black-crowned night-heron was observed by INHS at a wet shrubland/marsh located northwest of York Road and Thorndale Avenue during the summer of 2009. No nests were observed (Matthews et al., 2009).

  Based on a follow-up visit in spring 2010, INHS determined that the site where the heron had been observed did not appear to be good foraging habitat or a likely nesting spot (Enstrom, 2010). The nearest known black-crowned night-heron breeding area is approximately eight miles southwest of this site. In the opinion of INHS, the black-crowned night-heron seen near York Road was probably from the known breeding area. No substantial black-crowned night-heron foraging or breeding habitat was observed within the project corridor during the spring 2010 field visit (Enstrom, 2010). Impacts to the black-crowned night-heron within the boundaries of the project corridor are unlikely.

- **Blanding's Turtle (*Emydoidea blandingii*) (Status: State-Endangered).** In northeastern Illinois, Blanding's turtles prefer marsh habitat with abundant cattails and organic substrates, although retention ponds may be used during drought conditions (Kuhns et al., 2007). Within the vicinity of the project, Blanding's turtles have been reported at Ned Brown Forest Preserve (FPDCC, 2010; Kuhns, 2010b). Within the project corridor, the FPDCC did not express any specific concerns regarding wildlife movement to or from the Ned Brown Forest Preserve (Anchor, 2010). The Ned Brown Forest Preserve is 3,700 acres in size and includes various upland and wetland habitat types. The preserve is surrounded by existing development, including interstate roadways and other roads. Due to the large size and various habitat types offered at the preserve, location of the proposed improvements, and the existing barriers to wildlife movement (e.g., roads) bordering the preserve, impacts to the Blanding's Turtle are not anticipated.

- **Kirtland's Snake (*Clonophis kirtlandii*) (Status: State-Threatened).** The habitat of Kirtland's snake includes open, low, grassy areas at the margins of streams, ponds, or ditches (Minton, 1972; Ernst and Barbour, 1989; Bavetz, 1994). Observations have been made in open areas adjacent to floodplain forests. Kirtland's snakes have been collected in vacant lots in urban areas, and this snake has been known to use crayfish burrows, boards, trash and other surface debris for shelter (Ernst and Ernst, 2003).

  One Kirtland's snake was observed in the mid-1980s, approximately two miles southwest of the project corridor (Kuhns, 2010a; FPDDC, 2008). The site where the snake was identified is separated from the project corridor by highly developed land, including a busy five-lane street. It is highly unlikely that Kirtland's snakes (if still present in this location) would be able to successfully enter the proposed project corridor from the site where it has been observed. Impacts to the Kirtland's snake are unlikely within the boundaries of the proposed project corridor (Kuhns, 2010a; Kuhns, 2010b).

3.14.1.5 State Designated Lands

State Designated Lands include Illinois Natural Areas, Land and Water Reserves, and Nature Preserves. According to information provided by the state, no State-Designated Lands are within the project corridor (IDNR and the Illinois Natural Heritage Database, 2011).

3.14.2 Environmental Consequences

This subsection discusses potential impacts to natural resources, including loss of vegetative cover and impacts to wildlife and their habitats. As discussed previously, impacts to threatened and endangered species and state designated lands are not anticipated (see Biological Resources Reviews in Appendix M). Therefore, these topics are not discussed further.

3.14.2.1 Upland Plant Community Impacts

Land Cover

Most vegetative cover types in the project corridor have been altered by urbanization. Thus, few areas contain a dominance of native vegetation. The dominant cover type within the project corridor and immediate vicinity is urban and built-up land consisting of buildings, roads, parking lots, and driveways, intermixed with urban landscaping, open space (including old fields), or limited forested cover.

The Build Alternative is associated primarily with existing roadways and would displace vegetation by expanding the pavement area. Vegetative cover beyond the edge of pavement to the right-of-way line (or limit of disturbance) would be converted to grass with intermittent landscape plantings of trees and shrubs, or vegetated swales. To the extent practicable, the new vegetated areas would incorporate sustainable practices (e.g., plant species requiring little maintenance) and would abide by FAA guidelines regarding wildlife attractants near airports (see subsection 3.14.3). The number of existing invasive or noxious plant species and the degree of infestation within the proposed project corridor are not expected to increase.

The dominant land cover type affected by the Build Alternative would be urban and built-up land. Impacts to this cover type would account for roughly 90 percent of the total acreage in the proposed project corridor. Potential impacts to prairie remnants and wooded areas are discussed below in this subsection. Impacts to surface waters and wetlands are discussed in subsections 3.10.2 and 3.13.2, respectively.

Prairie Remnants

Two disturbed prairie remnants were identified along the I-290 embankment south of Thorndale Avenue (see Exhibit 3-19) (Handel, 2009). One of these prairie remnants (Site 1) is located in the project corridor on the west side of I-290. No lane widening to southbound I-290 is proposed adjacent to Site 1. Prairie remnant Site 2 is located just beyond the project corridor. No direct impacts to either prairie remnant site are anticipated. In the existing condition, both prairie remnant sites are degraded and, due to their location close to I-290, are likely affected by winter deicing activities. Impacts to both prairie remnants from exposure to chloride splash and spray during winter deicing activities could be expected to continue in the proposed condition. See subsection 3.10.3 for additional discussion regarding winter deicing activities and best management practices to minimize their effect.

Wooded Areas

Woodland impacts associated with the proposed project include vegetation removal and potential impacts due to root zone encroachment, soil compaction, and hydrologic modifications. Impacts could be either direct or indirect. Direct woodland impacts would result from the construction and installation of roadways, rail line, ramps, and grading for drainage or stormwater management facilities. Indirect impacts could result from root zone encroachment due to adjacent construction activities, soil compaction, change in hydrology, further fragmentation of woodland resources, and increased edge effect for remaining fragmented woodland.

Winter maintenance activities, particularly deicing, also can have a detrimental effect on wooded areas. The potential for salt spray or other deicing chemicals to affect preserved wooded areas during the winter season is limited in its threat and area of influence. The tree species identified within the wooded areas in the project corridor are generally tolerant of urban environments and subsequent potential salt spray. Salt spray has been found to be particularly detrimental to conifer tree species; however, the number and extent of conifer tree species within the project corridor is limited, and the predominantly deciduous tree species are generally tolerant. See subsection 3.10.3 for additional discussion regarding winter deicing activities and best management practices to minimize their impact.

The forested/wooded resources within the proposed project corridor include closed woodland, scrub-shrub woodland, wooded fencerows, and landscape trees. Based on the results of a tree study (transect/sub-sample methodology) completed for this project (CBBEL, 2011), up to approximately 25,570 trees would be impacted by the Build Alternative.[96] This would include approximately 15,423 trees within the closed woodland

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[96] Total includes trees that are 6 inches and greater DBH for all woodland types. Landscape trees also include trees that are less than 6 inches DBH.

type; 3,949 trees within the scrub-shrub woodland type; 1,341 trees within the wooded fencerow type; and 4,857 trees within the landscape tree woodland type.

The majority of the wooded land within the project corridor is dominated by lower-quality trees and shrubs. No higher-quality stands of native oaks (*Quercus* spp.) or hickories (*Carya* spp.) exist within the project corridor or would be impacted by the proposed project. Due to the adaptability and hardiness of these lower-quality tree species, remaining trees not directly impacted by the proposed project are likely to survive and continue to provide woodland functions and values in the post-construction condition.

The vast majority of closed woodland and scrub-shrub woodland losses would consist of small impacts to the edge of woodlands where the majority of adjacent woodland exists outside the project corridor, but small portions extend slightly into the proposed project corridor. The woodland edges impacted in these areas are highly degraded and have been adversely impacted by adjacent land uses and urbanization. Forest edge does not provide quality nesting habitat for neotropical migrant birds, compared to forest interior habitat. However, forest edge does provide some wildlife habitat (including for other bird species that use woodland edges), windbreaks, shading, and air quality benefits.

The largest closed woodland impact would occur at the northwest quadrant of the intersection of York Road and Thorndale Avenue (11.8 acres). This woodland is surrounded by industrial and commercial development, and the dominant tree species composition and structure indicate that primarily lower-quality and invasive trees would be lost in this area. The largest scrub-shrub woodland impact (13.8 acres) would occur at York Road and Sivert Court. The dominant presence of noxious common buckthorn, gray dogwood, and cut-leaved teasel indicates that adverse environmental impacts resulting from the loss of this scrub-shrub woodland would be minimal. It should be noted that the removal of noxious and invasive woodland and scrub-shrub species can have a net beneficial environmental affect by reducing noxious seed dispersal and subsequent spread into adjacent regional forest preserves.

Impacted landscape woodlands would include a wider variety of more desirable trees, consisting of primarily nursery stock planted along existing roadways and within adjacent, maintained parkways and commercial grounds. The landscape woodlands and associated nursery trees provide primarily aesthetic functions and values in the urbanized environment, and these areas provide little or no natural woodland functions or values typically associated with native woodland. The majority of the planted landscape trees also consist of non-native species and smaller-sized stems. Impacts to the smaller-sized landscape trees, and subsequent replacement of many landscape trees in the post-construction condition would create little or no adverse impacts to the woodland resources of the proposed project corridor.

Wooded Riparian Areas

Riparian areas include the vegetated portion of the regulatory floodplain located adjacent to surface waters. Wooded riparian areas within the proposed project corridor are located adjacent to Addison Creek, Higgins Creek, Meacham Creek, Salt Creek, and Willow

Creek.[97] Riparian areas containing a mixture of wetland, narrow woodland along creek banks, or upland herbaceous plant communities would be impacted by the proposed project, as discussed below.[98]

The largest proposed wooded riparian impact would be at Salt Creek for the construction of the Elgin O'Hare corridor, frontage road, and requisite compensatory flood storage and stormwater detention. The majority of the wooded riparian impacts would be located on the west side of the creek, south of Thorndale Avenue, and would consist of a closed woodland (approximately 3.2 acres). The Salt Creek riparian area includes lower-quality trees and shrubs consisting of predominately box elder, silver maple, green ash, and eastern cottonwood in the overstory and non-native, invasive common buckthorn, and reed canary grass in the mid-canopy and understory, respectively.

Wooded riparian corridors associated with Addison Creek, Higgins Creek, and Willow Creek also would be impacted by the proposed project. These wooded riparian areas are located adjacent to existing transportation corridors and are generally restricted to the tops of the channel banks. Wooded riparian areas include small, isolated (or fragmented) closed woodland areas that extend outward from the creek.[99] The riparian areas consist of predominately herbaceous cover types with relatively narrow widths of lower-quality trees and shrubs containing primarily box elder, common buckthorn, green ash, black cherry, honeysuckle, eastern cottonwood, and gray dogwood. The Meacham Creek riparian corridor that would be impacted by the proposed project consists of primarily marsh habitat with sporadic shrubs within seasonally inundated areas.

The typical woody riparian corridor provides cover for fish and wildlife, keeps streams cool, minimizes bank erosion and promotes bank stability, and adds organic material to the aquatic food chain. Due to the urban nature of the proposed project and the relatively narrow, degraded, and fragmented riparian environment within its corridor, these functions are limited. Subsequently, adverse impacts to riparian corridor functions and values as a result of the proposed project are expected to be minimal and would be mitigated as described below (in subsection 3.14.3) and in subsections 3.10.3 and 3.13.3.

3.14.2.2 Invasive Species

During construction, vegetation is removed and soil is exposed. The seeds of invasive plant species could be deposited on exposed soil surfaces by wind or animal droppings, transported in topsoil, or planted with impure seed mixes. The proposed project's side slopes and ditches would be most susceptible for supporting nuisance species. Invasive plant species could establish populations in idle disturbed areas, if best management practices are not employed.

In the existing condition, non-native and invasive plant species are found throughout the proposed project corridor. Erosion control and landscaping best practices would be used to

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[97] The proposed project corridor crosses Bensenville Drainage Ditch on O'Hare Airport property. Land cover at O'Hare Airport was previously discussed in this subsection. Bensenville Drainage Ditch is not discussed further in this subsection.

[98] Any component of the project in DuPage County that may be local non-IDOT/Illinois Tollway roads may be subject to the DuPage County Countywide Stormwater and Flood Plain Ordinance with respect to riparian impacts.

[99] Riparian impacts to small isolated closed woodlands are located at Willow Creek (South Tributary). The wooded riparian impact at this location is approximately 3 acres, and is part of a larger closed woodland located northwest of the existing Thorndale Avenue and York Road intersection.

minimize the spread of invasive plant species, to the extent practicable. However, even with the use of best management practices, it will be difficult to control the establishment of invasive plants.

All idle disturbed areas would be stabilized in accordance with NPDES permit requirements. By limiting the length of time idle soil is exposed, the potential for invasive species to spread and establish can be minimized. Specific erosion control measures (e.g., seed mixes) would be specified in the project erosion control plan. Earthwork, landscaping, and erosion control would follow the applicable sections of the IDOT and Illinois Tollway standard specifications (including supplemental specifications), Chapter 59 ("Landscape Design") of the *BDE Manual* (IDOT, 2011), and/or the Illinois Tollway's *Erosion and Sediment Control, Landscape Design Criteria* manual (Illinois Tollway, 2012).

These documents include guidance on furnishing and excavating topsoil, and construction requirements for seeding. Seed mixes would be required to meet purity and noxious weed seed requirements. Herbicides and/or other weed control methods would be used to control invasive and noxious plant species within the rights-of-way during operation of the facility.

Due to recent discoveries of emerald ash borer in Illinois, no varieties of ash trees will be planted in the project corridor to mitigate tree loss as part of this project. The removal and disposition of ash trees would comply with USDA/IDOA quarantine restrictions.

3.14.2.3 Wildlife Resource Impacts

The Build Alternative is located predominantly in developed areas associated with existing roadways that provide poor wildlife habitat. Wildlife that uses the available habitat tends to be tolerant of disturbance and human activities. Urban-tolerant wildlife species are generally common adaptable species and include limited numbers of birds, mammals, reptiles, and amphibians.

Wildlife can be affected by transportation projects constructed on new or existing alignment that results in a loss of habitat and cover type, disruption of habitat continuity, and creation of barriers to wildlife movement. Transportation improvement projects can lead to direct and indirect wildlife impacts, such as wildlife/vehicle collisions and loss of habitat (direct impacts). Construction (e.g., grading and equipment operation) could also result in wildlife impacts, as can traffic and construction noise. Many mobile wildlife species would avoid harm due to construction operations, but some mortality is expected, especially to small mammals, amphibians, and reptiles that might be present in construction areas.

Overall, project-related impacts to wildlife would be minimal. Potential wildlife impacts are discussed in the following subsections.

Habitat Loss and Fragmentation

Direct conversion from vegetative cover to paved areas would result in the loss of wildlife habitat for breeding, foraging, and resting. Impacts to wildlife could involve limited population reductions of species or displacement associated with the habitat within the construction limits of the proposed project. The proposed project corridor contains limited areas of high-quality wildlife habitat, and it is expected that the overall effect on wildlife using those areas would be minimal**.** Of the land cover types listed in Table 3-50, the most important type in the proposed project corridor for wildlife are forested lands and urban open space. Surface waters and wetlands are also important to wildlife. Subsections 3.10 and 3.13 discuss the general distribution of aquatic and wetland habitats.

The Build Alternative avoids most of the potentially valuable habitat located near the proposed project corridor. No impacts to forest preserves or state designated lands are proposed. Because the proposed EO-WB project consists primarily of improvements to existing roads and land already dedicated to transportation infrastructure close to developed land, relatively large, protected habitats would remain following improvements.

Habitat fragmentation involves dividing larger continuous habitat (such as woodlands and old fields) into smaller habitat patches. Fragmentation can reduce habitat function and value. Transportation projects can cause fragmentation, thus creating additional edge habitat. However, in regard to this specific project, very little fragmentation would occur. The proposed project would take place primarily adjacent to and within transportation corridors that contain roadways and/or rail lines in the existing condition.

Edge habitat is the boundary between habitat types, such as between woodlands and fields. Some species identified near the project corridor, such as the American robin and the brown-headed cowbird, prefer edge habitat. Edge habitat is usually created at the expense of large continuous habitat—the smaller the habitat patch, the larger the edge effect. Edge effects could result in differences in predation, interspecific competition, and prey availability that may vary near the edge of a habitat when compared to the interior of a larger patch. For example, based on edge effect, nest predation could increase in fragmented wooded patches. Habitat fragmentation would favor species that are more adaptive to edge environments, thereby affecting non-edge species to a greater extent.

Edges often are associated with transportation rights-of-way or urbanized sections of the landscape. Most cover type impacts associated with the Build Alternative include urban and built-up land (including urban open space), which are already disrupted by residential, commercial, and industrial areas, roads, rail, utilities, and other types of development. Most of the forested area and open space impacts that will occur as a result of the proposed project are composed of edge habitat. Widening the transportation corridors, as proposed, generally will relocate the habitat edge. Many of the improvements that upgrade the existing transportation system would have a minimal effect upon wildlife species that have already adapted to edge habitat.

Neotropical migrant birds are a primary wildlife group that could be affected by the displacement and fragmentation of forest habitat. However, there would be little to no fragmentation associated with the proposed EO-WB project improvements. There would be some loss of bird nesting and foraging areas because of conversion of undeveloped land within the proposed right-of-way to highway uses. Some neotropical migrant birds require forested stands of a minimum size and are not found in smaller wooded areas, even if suitable habitat is present. The largest contiguous forested stands in the vicinity of the project corridor include forest preserve properties that will not be affected by the proposed transportation improvements, such as the Ned Brown Forest Preserve. The proposed improvements will not fragment a continuous forested parcel or wooded riparian corridors larger than 20 acres.

The largest woodland impact (13.8 acres) associated with the proposed transportation improvements consists of a scrub-shrub woodland located near York Road and Sivert Court.

The Build Alternative would also impact 11.8 acres of closed woodland located near the northwest corner of Thorndale Avenue and York Road. Both woodland areas are located near the west side of O'Hare Airport in a developed area. Given that the surrounding area includes commercial and industrial land uses, as well as O'Hare Airport, wildlife (such as birds and mammals) that uses the woodlands would likely relocate to available habitat within the developed areas or migrate outside the immediate area. Although developed portions of the adjacent O'Hare Airport are unlikely to provide desirable wildlife habitat, potential increased wildlife usage at the airport due to increased wildlife populations or movement of species may be addressed with wildlife deterrent methods. Impacts to forested areas are discussed in more detail in subsection 3.14.2.1.

Edge habitat may be widely used by several of the relatively urban-tolerant mammals identified near the project corridor. Impacts to neotropical migrant birds are expected to be minimal. Impacts to edge areas would reduce the size of available wildlife habitat, thus forcing relocation of remaining wildlife to interior locations. Forced relocation of wildlife can be expected to increase population densities and increase competition in the remaining interior habitat areas. Given the relatively small impacts to edge habitat compared with remaining cover and the adaptability of the urban-tolerant wildlife known to use these areas, adverse impacts to edge habitat as a result of the project are expected to be negligible.

Traffic Noise

Potential wildlife habitat in the project corridor is close and/or adjacent to existing noise generators, including O'Hare Airport, existing roads, tollways, highways, residential and industrial developed areas, truck routes, and rail lines and yards. Increased traffic associated with the proposed improvements was considered to determine if the proposed project would result in noise traveling farther into the existing adjacent landscape producing potential noise impacts. Current literature (Dooling and Popper, 2007) reveals that the effects of highway noise on birds ranges from negligible (under certain circumstances) to noticeable (e.g., physiological and behavioral responses, masking communication and impairing detection of predators or prey, and hearing damage).[100] Potential noise impacts generally decrease with an increase in distance from the roadway and reduction in noise level.

The USFWS, INHS, IDOT, and consultant staff met on March 4, 2010, to discuss the potential need for a bird survey as part of Tier Two environmental studies. The purpose of the bird survey would be to determine which species (particularly migratory birds, and rare and declining species) could be affected by noise as a result of the proposed EO-WB project improvements. The urban nature of the proposed project corridor, existing noise generators, and existing and projected traffic volumes were discussed with USFWS at the meeting. Based on the high volume of traffic in the existing condition and the relatively long distance between the proposed project corridor and habitat areas of concern, USFWS decided that a bird survey was not necessary to determine the potential noise impacts on birds (Cirton, 2010).

Migratory birds must travel long distances over similar urban landscape prior to reaching or leaving the proposed project corridor and its adjacent habitat. The high traffic volumes and

[100] Traffic noise levels do not reach the threshold that could cause bird hearing loss/damage, and even if the noise levels did, birds are most likely to leave the area that was exposed to the loud noise before damage could occur.

high ambient noise levels associated with the location and context of the proposed improvements affect wildlife habitat use in the existing condition. The future traffic volumes and noise levels that may be attributable to the EO-WB project are not anticipated to alter habitat use, and impacts to migratory birds, if any, are expected to be minimal.

Barriers to Wildlife Movement

Even in the most urban areas, certain corridors allow wildlife to travel between habitat patches. Wildlife use linear corridors, such as rights-of-way, fencerows, and riparian environments for movement, dispersal, and access to habitat divided by roads, rail, or other types of development. Newly constructed or widened roads or rail lines can reduce wildlife movement between adjacent habitats by interrupting established travel routes. However, improvements associated with the proposed project will take place primarily adjacent to and within existing transportation corridors. Many of the existing wildlife corridors, such as streams, are bridged or flow through culverts in the existing condition.

Bridges and culverts could facilitate wildlife movement. Proposed stream crossing structures generally match existing or nearby crossing treatments at each location. An exception is the West Bypass corridor, which would be constructed on new alignment in a reserved transportation corridor, located primarily on O'Hare Airport property. Trees, shrubs, and other vegetation within and adjacent to this corridor have been cleared to make way for future development, including OMP projects. Any potential habitat at O'Hare Airport is managed to discourage wildlife.

Barriers could pose a threat to wildlife because of traffic volumes, speeds, and width of roadway and rail corridors. Roadways and rail lines do not pose barriers to all forms of wildlife equally. Birds and larger mammals are relatively mobile; therefore, the direct loss of habitat as a result of the proposed project would not be as critical as it would be to other species of wildlife. Birds and mammals typically seek other areas in which to forage, breed, and rest. Small, terrestrial wildlife species would be more affected by barriers than birds and larger mammals.

Most reptiles and amphibians that have been identified near the project corridor are less mobile and rely on their immediate habitat. Reptiles and amphibians most likely would be affected by road and rail crossings during breeding, nesting, and seasonal movement. Although negative impacts might occur, overall reptile or amphibian population impacts are not anticipated as a result of the proposed project.

To minimize the potential "barrier effect" of transportation improvements on wildlife, direct impact to large contiguous open spaces, riparian habitat, greenways, and other wildlife corridors have been a minimized or avoided as part of the planning process. The largest contiguous open space habitat types near the proposed project corridor were avoided in Tier One (e.g., Ned Brown Forest Preserve). The large percentage of urban development, habitat fragmentation, and existing transportation infrastructure along the proposed project corridor limits wildlife movement in the existing condition.

Construction Mortality

Wildlife could be affected by construction activities, such as stripping and clearing vegetation, grading, utility installation, moving heavy equipment, and sediment deposition in receiving waters. Relatively mobile species (birds and large mammals) would generally avoid construction mortality. These species can move from the construction area to surrounding habitats during construction. However, some mortality may be expected with slower-moving wildlife (e.g., young animals) or smaller, less mobile animals (e.g., small rodents, reptiles, and amphibians), as habitat is displaced. Increased awareness can help minimize wildlife impacts. Construction noise and activity, in certain instances, can prompt wildlife movement, disrupt travel patterns or behaviors, and result in additional wildlife impacts. However, in this instance, considering that over 90 percent of the project corridor is urban open space or developed land, the small amount of habitat that would be affected by this project should not result in a net negative impact on existing wildlife populations.

Operational Mortality

Operational mortality would most likely result from vehicle/wildlife collisions along the proposed facility. The proposed project corridor is located in an urban setting, and the land use tends to limit the extent and frequency of wildlife use compared to rural areas and large protected open space. The proposed project would take place primarily adjacent to existing roadways and/or rail lines. As such, wildlife corridors along the Build Alternative are generally fragmented in the existing condition, which can limit the movement of urban wildlife. In general, when roads cross existing wildlife corridors, vehicle/wildlife collisions may occur. The frequency of these occurrences is expected to be higher near large contiguous habitats, especially if the habitat is crossed by a road in the existing condition or would be fragmented in the proposed condition. However, for this project, no large contiguous habitats would be fragmented by the proposed EO-WB project.

It is anticipated that the majority of the vehicle/wildlife collisions would be with common animal species in the vicinity of existing greenways that are crossed by the proposed project (e.g., near Salt Creek). The number of collisions most likely to occur in the proposed condition may be affected by factors such as driver awareness, visibility and sight distance, lighting, and weather. A relatively small number of deer/vehicle collisions occur along the project corridor in the existing condition, and these types of collisions would be a safety concern in the proposed condition, too. Deer are relatively mobile, and their mobility exposes them to collisions with vehicles as the deer attempt to cross roadways that have been widened or new roadways in areas not previously served. No negative impact to the overall deer population is expected. Minimal to no loss of species groups is anticipated as a result of operational mortality associated with the proposed EO-WB project.

3.14.3 Measures to Minimize Harm and Mitigation

Avoidance and minimization of impacts to natural resources (including upland plant communities and wildlife resources) was an important component in the development of the proposed project corridor and evaluation of alternates. In general, alternates that could impact special lands (e.g., forest preserves) with large wooded tracts; potential higher-quality forest, prairie, or other plant communities; or other valuable wildlife habitats were eliminated from consideration during the Tier One evaluation. With avoidance of natural resources as a primary objective, most of the proposed project corridor is located along the existing transportation network and on the west side of O'Hare Airport (where wooded land and wetlands already have been cleared or filled for future development). The use of OMP land for the proposed West Bypass corridor helped avoid and minimize socioeconomic and environmental impacts.

3.14.3.1 Upland Plant Communities

Impacts to upland plant communities would consist primarily of common, non-native, and invasive species with relatively low floristic quality. The proposed project limits have been designed to utilize existing roadways and rights-of-way to the extent practicable, which will minimize disturbances to undeveloped open space and commercially developed areas. No roadway alignments through large tracts of undisturbed open space or wooded land are proposed, and disturbances would be limited primarily to woodland edge impacts associated with widening and improving existing roadways and rights-of-way.

No contiguous closed woodland or scrub-shrub woodland communities of 20 acres or more in the proposed project corridor would be impacted. The largest closed woodland and scrub-shrub woodland impacts would be 11.8 acres and 13.8 acres, respectively. In future design phases and during construction, IDOT and Illinois Tollway would investigate and implement measures to minimize impacts to wooded areas.

These measures include:

- Minor refinements in roadway alignment.
- Narrower roadway cross-sections.
- Refined bridge and culvert specifications to minimize impacts to wooded riparian zones.
- Implementation of proper soil erosion and sediment control measures to minimize sediment deposition and indirect adverse impacts in wooded wetland and riparian zones.
- Construction fencing and woodland exclusion zones to reduce compaction of roots and soil.
- Responsible application of deicing salts and herbicides.

Construction activities close to wooded areas can have potential adverse impacts to preserved trees. Destruction of root zones and soil compaction can occur during grading, excavating, and other construction activities. Adverse impacts will be reduced and minimized by implementing a tree protection and preservation plan that may include guidance regarding root pruning in critical root zones close to site grading, tree trunk and/or dripline protection measures, and establishment of exclusion zones to protect wooded land outside the proposed project limits. Efforts will be made to avoid specimen trees identified during the next phase of the project, as practical and feasible.

Mitigation of upland forested areas, wooded riparian environments, and isolated or small groups of trees would comply with guidelines established by IDOT and Illinois Tollway for tree replacement. Tree and vegetation replacement would be guided by IDOT's *Preservation and Replacement of Trees* policy and Chapter 59 ("Landscape Design") of the *BDE Manual* for free roads. Along the proposed toll facility, tree and vegetation replacement would follow the "Criteria for Removal and Replacement of Trees" section and other applicable sections of the *Erosion and Sediment Control, Landscape Design Criteria* manual (Illinois Tollway, 2012). In addition, IDOT and Illinois Tollway will follow the FAA AC No. 150/5200-33B, *Hazardous Wildlife Attractants on or near Airports*, to the extent practicable. The sustainability goals outlined by the EO-WB Advisory Council would be considered throughout the final design process. More detail on the EO-WB project's sustainable goals and recommendations can be found in Appendix A.

Guidelines for replacement of trees and vegetation include the following:

- Replace impacted woodland areas, including woody riparian corridors, and trees that provide screening with tree plantings intended to provide comparable functional values within the right-of-way, to the extent practicable. When this cannot be achieved, plantings outside the right-of-way will be considered.
- Plant replacement trees in suitable locations as close as practical to the removal site.
- Plant no ash trees of any variety within the project corridor, to help control the spread of the emerald ash borer.
- Restore disturbed areas with vegetation as appropriate, with emphasis on native species.
- Encourage contractors to use locally produced (within 200 miles) materials.
- Plant vegetation that has low maintenance requirements.
- Coordinate with FAA, OMP, and local officials, as necessary, regarding proposed plant species.
- Within defined wildlife hazard separation distances, install vegetation that minimizes aircraft/wildlife hazards with particular emphasis on large birds (e.g., waterfowl, gulls, and raptors), small mammals that might attract raptors, and small birds that congregate in flocks (e.g., blackbirds, starlings). In general, avoid the use of landscape materials that provide food and shelter for these types of animals, to the extent practicable. Avoid planting evergreen trees and shrubs, densely branched or foliated trees (e.g., *Acer* spp.), and vegetation that produces wildlife-edible fruit or seeds. The OMP developed a list of plant species to avoid and a list of acceptable plant species for use at O'Hare Airport; see subsection 3.10.3.2.

Disturbance of streamside/riparian vegetation will be kept to a minimum. Areas that are disturbed would be stabilized in accordance with NPDES and CWA Section 404 permit requirements. Erosion controls, stormwater quality/quantity best management practices (e.g., compensatory floodplain storage, bioswales, etc.), trees, shrubs, and other appropriate vegetation would be installed near streams to mitigate for riparian impacts. Coordination with the DRSCW would take place to investigate local sites within the Salt Creek Watershed that could provide additional riparian mitigation, if necessary. However, it should be noted that the project must abide by the FAA hazardous wildlife attractant AC, to the extent practical and feasible, to protect the traveling public. Through future plan reviews, FAA (and USDA-APHIS) will dictate, to a large degree, what types of vegetation can be installed and where along the project corridor (including minimum spacing between tree plantings); with a goal of making the environment fairly uniform and unattractive to wildlife species that are considered the greatest hazards to aviation.

A landscaping plan would be developed during future engineering phases that would identify areas where trees, shrubs, and grasses would be planted on highway side slopes, on back slopes, and in the median, except where clear vision needs to be maintained at highway entrances and exits, intersections, and median openings. Landscape trees and shrubs will be planted along post-construction parkways adjacent to existing commercial and residential developments to replace aesthetic woodland functions and values, as necessary.

3.14.3.2 Wildlife Resources

Development of the Build Alternative included consideration of avoidance, minimization, and mitigation of natural resource impacts. The Build Alternative primarily includes improvements to existing roadways. These roadways are already, for the most part, barriers to wildlife movement. Roadside barriers, such as fences and jersey walls, may restrict wildlife from entering roadways. They can also trap wildlife on the roadway, allowing no means of escape. In areas where there is a higher potential for wildlife activity, such as near the creek crossings and other greenways, fencing and other barriers would be limited to areas necessary for public safety. Short barrier walls that would be implemented as necessary near creek crossings and greenways will be designed mainly to restrict the movement of small animals (including reptiles, amphibians, and smaller mammals) from entering the roadway corridor. The walls would not limit the movement of larger mammals to prevent them from being trapped within the roadway.

Proposed stream crossing structures generally match existing or nearby crossing treatments. New bridges would be required at Higgins Creek (at I-90) and Salt Creek (at the proposed Elgin O'Hare corridor). In general, other crossings consist of culvert extensions, new culverts or bridges on OMP property (where wildlife is managed and discouraged),[101] or no improvements to the existing structure (see Table 3-36).[102] Stream crossings and culvert structure sizing will be designed in accordance with state and federal guidelines regarding floodplain encroachment and hydraulic capacity. All new structures would comply with these guidelines.

Because most of the proposed project corridor is located along an existing transportation network, most of the stream crossings exist in the current condition and would be extended with the roadway improvements. For example, at Meacham Creek, Addison Creek, and the Devon Avenue Tributary (at I-290) the existing box culverts are to remain in place. The culverts will be extended at one or both ends. Because the existing culverts are to remain in place, no additional terrestrial wildlife crossings are proposed at these locations as part of this project.

New creek crossings would be bridged, culverted, or otherwise designed to accommodate expected high water flows, allow the movement of aquatic biota, and not impede low water flows. Per the Illinois Tollway drainage design criteria, culverts are designed for the 50-year peak flow and checked for the 100-year and 500-year peak flows to avoid overtopping.

New culverts located on intermittent or perennial waters of the U.S. will be designed to accommodate fish passage (e.g., embedding the upstream and downstream culvert invert six to 12 inches below the streambed elevation). Existing culverts will be retained and in some cases extended in accordance with appropriate design criteria. The bottom of new culverts

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[101] The O'Hare Airport *Wildlife Hazard Management Plan* strictly limits the type of wildlife which is allowed to cross into the airport.

[102] Because there are no proposed improvements at the West Branch DuPage River, Spring Brook, or Silver Creek – no terrestrial wildlife crossings are proposed at these locations as part of this project.

greater than 48 inches in diameter or height associated with waters of the U.S. will be buried below streambed elevations to maintain a more natural condition for aquatic wildlife, when feasible. Bottomless culverts will be considered in final design, when feasible based on size of the span, geometry, skew, potential environmental impact associated with its installation, and cost. It is important to note that if a culvert is less than 48 inches in diameter, it is very difficult to place riverbed material within the entirety of the pipe. New culverts to be buried include I-90 over Higgins Creek Tributary A, Elmhurst Road over Higgins Creek (if a second culvert alternative is selected during a future design phase), culverts associated with the proposed Elgin-O'Hare Expressway and West Bypass interchange ramps over Willow Creek South Tributary, and culverts associated with the headwaters of Devon Avenue Tributary.

A portion of Willow Creek South Tributary will be slightly shifted as part of the improvements. Within the project corridor, this tributary is located immediately adjacent to Thorndale Avenue and York Road in a heavily developed commercial/industrial area. The tributary is located just west of O'Hare Airport (and drains onto the airport) and portions of the tributary are located within an RPZ. Portions of wooded areas and other potential wildlife habitat that exist near this tributary will be displaced during construction. To meet FAA requirements, vegetation to be re-planted near the airport will consist of species that are unattractive to wildlife. For these reasons, no terrestrial wildlife crossing is proposed for this tributary.

Proposed Willow Creek and Bensenville Drainage Ditch crossings are located immediately adjacent to, or are located on, existing O'Hare Airport property. In accordance with FAA policy to minimize wildlife passage onto O'Hare Airport, no terrestrial wildlife crossings are proposed at these locations. In addition, there are existing upstream drainage structures at York Road, CP railroad, and UP railroad that are not included as part of this project. These upstream drainage structures may limit wildlife passage near the project corridor.

Where new bridges would be installed (e.g., Higgins Creek and Salt Creek), final bridge design would accommodate aquatic biota, small mammal, reptile, and amphibian movement, to the extent practical and feasible. Large terrestrial mammal movements will not be specifically accommodated, beyond that which occurs under existing conditions.

Under existing conditions, wildlife movement at Higgins Creek (at I-90) and Salt Creek (at Thorndale Avenue) is limited. At the I-90 crossing of Higgins Creek, the existing bridge pier and spill through abutments will remain in place. The creek sideslopes are hard-armored with no shelf that would accommodate terrestrial wildlife movement under the existing bridge (see Figure 3-21). The proposed improvements include widening the existing I-90 bridge in-kind and constructing two new bridges over the creek (one to the north and one to the south of I-90) for ramps. Adding a shelf to accommodate terrestrial wildlife passage at the existing bridge is not practical or feasible. A shelf at this location would reduce the waterway opening and add fill in the floodway, which are adverse effects from a hydraulic standpoint.

FIGURE 3-21
EXISTING BRIDGE AT I-90 AND HIGGINS CREEK LOOKING UPSTREAM

Source: DB Sterlin, 2009.

At the Thorndale Avenue crossing of Salt Creek, the existing 2-span, concrete beam bridge will also remain in place. The existing bridge is approximately 134 feet wide and has stub abutments with slopewall/riprap at Salt Creek. Existing Thorndale Avenue will be re-established as a frontage/service road; the bridge will remain in place and is not proposed to be modified. There is no shelf for terrestrial wildlife under the existing bridge and thus wildlife movement is limited in the existing condition. The proposed Elgin-O'Hare Expressway would cross Salt Creek approximately 82 feet south of existing Thorndale Avenue. To accommodate wildlife passage, the proposed crossing would provide an approximately 80-foot wide shelf on the east bank of the creek (roughly two to four feet above the normal water level) with six to eight feet of vertical clearance under the bridge. Providing additional clearance for large mammals (up to 13 feet total vertical clearance) is not practical, as it would require the bridge to be raised an additional two to five feet, and necessitate larger and taller embankments and a higher roadway profile. This could increase floodplain and floodway impacts. Higher roadway embankments would create additional conflicts with nearby ComEd substation overhead power lines, and potentially encroach upon the adjacent Wood Dale – Itasca Reservoir and trail to the south, or upon Thorndale Avenue and existing businesses to the north.

3.14.4 Indirect and Cumulative Natural Resource Impacts

Although some indirect and cumulative impacts to natural resources are likely with the EO-WB project improvements, unlike wetlands, there is little regulatory protection for habitat types, such as wooded areas and old fields, unless they contain jurisdictional wetlands or floodplains, are located in special lands, or provide critical habitat for threatened or endangered species.

The proposed project corridor is located in a densely developed portion of northeastern Illinois with a high percentage of urban and built-up land. Exceptions include preserved open space associated with forest preserves and municipal parks. Over the next several decades, additional development through infilling and selective redevelopment is expected to occur in the vicinity of the proposed EO-WB project improvements. Unprotected open space may be developed to take advantage of better transportation and access following completion of the EO-WB project. This land development has the potential to displace natural resources. Based on information developed by S.B. Friedman & Company (2011), an evaluation of potential development could be prompted by the EO-WB project over the next 30 years. It is estimated that approximately 90 percent of potential development would impact existing urban or built-up land. Almost six percent would impact wooded land, and a little over four percent would impact wetlands/waters, agricultural land, and barren/exposed land (i.e., areas without vegetation or structures).

In general, the majority of the potential development that could be spurred by the Build Alternative is anticipated to take place along the existing interstates and the proposed EO-WB project. Property that is unprotected open space, underdeveloped, or underused may be developed. However, generally speaking, direct impacts to higher-quality natural resources (e.g., Ned Brown Forest Preserve) and resources with regulatory protection (e.g., wetlands) near the project corridor are anticipated to be minimal (see Exhibit 3-21). One example includes the higher-quality natural area and nature preserve at the north end of Ned Brown Forest Preserve located west of Arlington Heights Road and adjacent to the south side of I-90. The proposed EO-WB improvements end at the east side of Arlington Heights Road, and stormwater runoff from the project corridor drains east in this location toward Higgins Creek. The nature preserve is located west of Arlington Heights Road in the Salt Creek Watershed. No direct impacts to the nature preserve at Ned Brown are anticipated from this project. The potential indirect and cumulative impacts of the induced development areas on higher-quality natural resources and wetlands can be managed at the local, state, and federal levels through permit requirements, the implementation of best management practices, and the increasing consideration of sustainable practices.

Excluding special lands, the remaining natural resources near the project corridor are generally confined to relatively small, isolated parcels that are primarily located adjacent to existing roadways, rail lines, and other built-out parcels; in essence, these areas are already fragmented. Development induced by the proposed EO-WB project improvements could cause loss of habitat and increased competition in remaining natural areas. However, in regard to induced or cumulative impacts as a result of this specific project, very little habitat fragmentation is anticipated. Preservation of special lands can reduce fragmentation by protecting habitat resources.

In the vicinity of the project corridor, large contiguous areas of open space are generally located within special lands or are adjacent to waterways. Due to the large percentage of urban development, fragmented habitat, and transportation infrastructure near the project corridor in the existing condition, wildlife movement is limited. No substantial indirect or cumulative impacts to wildlife movement are anticipated.

Future development has the potential to create additional edge effect at the perimeter of larger preserved open space and to displace isolated habitat areas (old fields or small wooded lots) that are not within special lands. The extent of habitat area affected by edge effect could continue to move inward due to the cumulative effect of other developments and projects in the area. Additional developments could further reduce the number and size of remaining open spaces and available habitat.

3.15 Section 4(f)

Significant publicly owned parks, recreational areas, wildlife and waterfowl refuges, and historical sites of national, state, or local significance are afforded special protection under

Section 23 CFR 774, Parks, Recreation Areas, Wildlife and Waterfowl Refuges, and Historic Sites (Section 4[f]). FHWA may not approve the use of Section 4(f) property unless a determination is made that either: (1) there is no feasible and prudent avoidance alternative to the use of land from the property, and (2) the action includes all possible planning to minimize harm to the property resulting from such use; or the FHWA determines that the use of the property, including any measure(s) to minimize harm committed to by the applicant will have a *de minimis* impact on the property.

In Tier One, a preliminary Section 4(f) evaluation concluded that the Selected Alternative could involve three Section 4(f) resources—Medinah Wetlands Forest Preserve, Salt Creek Greenway Trail, and the North Central DuPage Regional Trail (see Section 5 in the *Tier One ROD*). Continued design in Tier Two resulted in the ability to avoid involvement with Medinah Wetlands Forest Preserve and the North Central DuPage Regional Trail. Medinah Wetlands Forest Preserve is no longer within the project corridor. The North Central DuPage Regional Trail does cross the project corridor, but the improvements do not require involvement with the trail. Further discussion is provided in subsections 3.15.1 and 3.15.2 of this document. The Build Alternative continues to require involvement with the Salt Creek Greenway Trail as well as three new resources: the Salt Creek Golf Club and two Schaumburg bicycle paths. The golf club is a Wood Dale Park District property. It is a significant, publicly-owned recreation area that is open to the public and, therefore, qualifies as a Section 4(f) property. The Schaumburg bicycle paths are owned by the Village of Schaumburg and are primarily used for recreation. They are considered significant resources and open to the public. Furthermore, they are in a specific location (bicycle lane or path) along the roadway. Therefore, Section 4(f) applies to these bicycle facilities.

The Tier One preliminary Section 4(f) evaluation also concluded that two publicly-owned parcels potentially impacted by the Selected Alternative, and currently impacted by the Tier Two Build Alternative, do not meet Section 4(f) criteria – the Elk Grove Detention Pond and Majewski Athletic Complex (see subsection 4.6.2 in the Tier One Final EIS). The primary function of the Elk Grove Detention Pond is detention for stormwater runoff from the Rogers Industrial Park in Elk Grove Village and Des Plaines. No formal recreational facilities have ever been developed at the site, nor does Elk Grove Village plan to do so in the future. Its location is within an industrial area; therefore, it is not conducive to recreational uses and does not attract any users. The Elk Grove Detention Pond is not identified on the Elk Grove website as a public park. For these reasons, FHWA does not consider this property a Section 4(f) resource. Impact to this property is discussed in subsection 3.5.2.4 of this document.

The other public land, the Majewski Athletic Complex, is owned by MWRDGC for potential future expansion of the Kirie Wastewater Treatment Plant, and currently leased to the Mount Prospect Park District. The Mount Prospect Park District uses the property for field sports. The lease was originally established in 1980, extended in 1992 and again in 2000, with a renewal date of 2012. The lease does provide for the MWRDGC to recover the property for the agency's corporate purposes with the provision that one-year notice be supplied. This is expected to remain in the lease renewed in 2012 (Morakalis, 2011). The recapture clause in the lease categorically defines the property as a temporary recreational area; the lease is not considered a long-term lease for Section 4(f) purposes; and the land being temporarily used for recreational purposes could be recaptured by the property owners with a one-year notice. Therefore, FHWA does not consider the Majewski Athletic

Complex a Section 4(f) resource. Impact to this property is also discussed in subsection 3.5.2.4 of this document.

Involvement with the Section 4(f) resources, as described below, is temporary. Because the involvement meets the temporary occupancy criteria under 23 CFR 774.13(d) during and after construction, FHWA has concluded that there would be no use of any Section 4(f) properties by the proposed improvements.

3.15.1 Affected Environment

Five Section 4(f) resources are located along the project corridor including one community park, two regional trails, and two community bicycle paths (see Exhibit 3-22).

Salt Creek Golf Club

Salt Creek Golf Club is a public golf course owned by the Wood Dale Park District and located in the northeast quadrant of Thorndale Avenue and Prospect Avenue. When open, it is available for use by any member of the public.

North Central DuPage Regional Trail

The North Central DuPage Regional Trail is primarily an east-west trail extending from Ned Brown Forest Preserve south and west to Mallard Lake Forest Preserve. Plans exist for the trail to be extended west to the Pratts Wayne Woods Forest Preserve to connect with the Illinois Prairie Path. Within the project corridor, the North Central DuPage Regional Trail crosses the Elgin-O'Hare Expressway in the designated bicycle lanes along Plum Grove Road. The trail is a multi-jurisdictional facility coordinated by FPDDC; along this stretch, it is owned and maintained by the Village of Roselle.

Salt Creek Greenway Trail

The Salt Creek Greenway Trail is primarily a north-south path that parallels Salt Creek. It connects Ned Brown Forest Preserve to Brookfield Woods (directly across from Brookfield Zoo). In the project corridor, it crosses Thorndale Avenue in a designated bicycle lane along Mittel Boulevard/Mittel Drive. The Salt Creek Greenway Trail is also a multi-jurisdictional trail coordinated by FPDDC. In the project corridor, it is owned and maintained by the Village of Wood Dale.

Schaumburg Bicycle Path along Springinsguth Road

The Schaumburg Bicycle System includes a path along Springinsguth Road located on the west side of the road and crosses under the Elgin-O'Hare Expressway in Schaumburg. It is separated from the edge of pavement, except where Springinsguth Road travels under the Elgin-O'Hare Expressway. During this stretch, the bicycle path is on the curb adjacent to the roadway.

Schaumburg Bicycle Path along Wright Boulevard

The Schaumburg Bicycle System also includes a path located along Wright Boulevard. Similar to the bicycle path along Springinsguth Road, it is separated from the edge of the pavement, except along the stretch of Wright Boulevard that crosses under the Elgin-O'Hare Expressway where it is on the roadway.

3.15.2 Environmental Consequences

The Build Alternative would result in temporary involvement with four Section 4(f) resources: one community park and three trails. Proposed improvements would be constructed across all four bicycle facilities described in subsection 3.15.1; however, only three bicycle facilities would be affected and are described in greater detail in the following subsections.

Salt Creek Golf Club

A temporary easement would be required for resurfacing the entrance to the Salt Creek Golf Club. Resurfacing is necessary to match the profiles of the entrance and the new pavement along Prospect Avenue. The park entrance is not expected to be closed during construction; access is expected to remain. Access to and from the golf club, however, would be modified with the proposed improvements. Currently, turning movements into and out of the park are not restricted. However, the proposed project improvements would prohibit left turns from the entrance because of proximity to the intersection of Prospect Avenue and the proposed exit ramp terminal. To mitigate this restriction, a U-turn is provided north on Prospect Avenue for those who wish to go southbound from the park.

North Central DuPage Regional Trail

The proposed improvements include the widening of the Elgin-O'Hare Expressway from two lanes in each direction to four lanes in each direction (inclusive of auxiliary lanes) under Plum Grove Road. No work on Plum Grove Road or the trail is proposed. Therefore, the North Central DuPage Regional Trail would remain in its current location and would not be affected by the project.

Salt Creek Greenway Trail

The Salt Creek Greenway Trail will be impacted by mainline, frontage road, and Mittel Boulevard/Mittel Drive improvements. The trail is expected to remain open for the entirety of construction, either in its current location or along a detour route. During construction, the trail may need to be temporarily closed in its current location and moved to the opposite side of the road or offsite for safety or logistical reasons. After construction of the proposed improvements, the trail will be reinstated on the west side of Mittel Boulevard/Mittel Drive as a path separated from the roadway.

Schaumburg Bicycle Path along Springinsguth Road

The Schaumburg Bicycle Path along Springinsguth Road will be impacted by construction along Springinsguth Road and on the Elgin-O'Hare Expressway overhead. The bicycle path will remain open for the duration of construction, either in its current location or along a detour route. During construction, safety or feasibility issues may require the path to be closed in its current location and rerouted temporarily to the opposite side of the road or offsite. After construction, the Schaumburg bicycle path along Springinsguth Road would be reinstated in its current location.

Schaumburg Bicycle Path along Wright Boulevard

The Schaumburg Bicycle Path along Wright Boulevard will be impacted by construction along Wright Boulevard and the Elgin-O'Hare Expressway overhead. The bicycle path will remain open for the duration of construction, either in its current location or along a detour route. For safety or logistical reasons, the path's current location may need to be closed temporarily and rerouted to the opposite side of the street or offsite during construction. Following construction, the bicycle path will be improved as a continuous trail separate from the roadway.

3.15.3 Application of Section 4(f)

As mentioned above, the Build Alternative requires a temporary easement from Salt Creek Golf Club to resurface the entrance to blend the profile of the entrance with the improved roadways along which the park is located. The proposed improvements also would require temporary relocation of the Schaumburg bicycle paths along Springinsguth Road and Wright Boulevard, as well as the Salt Creek Greenway Trail.

According to 23 CFR 774.13(d), if the following criteria are met, temporary involvement with Section 4(f) resources does not constitute a use of the Section 4(f) resources:

1. *Duration must be temporary, i.e., less than the time needed for construction of the project, and there should be no change in ownership of the land;*
2. *Scope of the work must be minor, i.e., both the nature and the magnitude of the changes to the Section 4(f) property are minimal;*
3. *There are no anticipated permanent adverse physical impacts, nor will there be interference with the protected activities, features, or attributes of the property, on either a temporary or permanent basis;*
4. *The land being used must be fully restored, i.e., the property must be returned to a condition which is at least as good as that which existed prior to the project; and*
5. *There must be documented agreement of the official(s) with jurisdiction over the Section 4(f) resource regarding the above conditions.*

3.15.3.1 Salt Creek Golf Course

Involvement with the Salt Creek Golf Course meets the criteria for temporary occupancy and, therefore, is not considered use of a Section 4(f) property. A temporary easement would be obtained for work on the entrance to the golf course, and Wood Dale Park District would retain ownership throughout construction and upon completion. The easement would not be needed longer than the time it would take to perform the construction activities at the entrance. The scope of work is minor; the only modification to the golf course would be the regrading of the entrance to blend the profile of the entrance with the newly improved Prospect Avenue. No interference with usage of the golf course is anticipated. It is expected to remain open during construction; the construction will not cause the need for access to be closed at any time. Efforts will be made to conduct construction work between November 1 and April to avoid heavy use periods. Coordination with the Wood Dale Park District has occurred, and the District has concurred that the temporary occupancy would not result in an adverse effect on the property (see Appendix B).

3.15.3.2 Schaumburg Bicycle Path along Springinsguth Road

Activities involving the Schaumburg bicycle path meet the criteria for temporary occupancy and, therefore are not considered use of a Section 4(f) property. No permanent adverse changes to the bicycle path will occur. Following construction, the bicycle path on Springinsguth Road would be fully restored in its current location off-road north and south of the Elgin-O'Hare Expressway and alongside the roadway where Springinsguth Road travels under the Elgin-O'Hare Expressway. If the condition of the trail is adversely impacted by construction-related activities, it will be returned to at least its original condition. During construction, temporary interference with use of the bicycle path will not occur, but rerouting of the bicycle path may be necessary temporarily.

If the bicycle path in its current location needs to be closed during construction, users will be rerouted on the opposite side of Springinsguth Road in the vicinity of the project corridor, thereby allowing trail users to continue along the same route. Temporary closure of Springinsguth Road may be required for safety or logistical reasons. If that occurs, bicycle path users would be rerouted to Rodenburg Road or Wright Boulevard, depending on their direction of travel. Closure of the bicycle path in its current location, if necessary, will not last longer than the duration of construction. The City of Schaumburg concurred that the potential temporary occupancy of the trail would not cause an adverse effect on the facility (see Appendix B).

3.15.3.3 Schaumburg Bicycle Path along Wright Boulevard

Involvement with the Schaumburg Bicycle Path along Wright Boulevard meets the criteria for temporary occupancy and, therefore, is not considered use of a Section 4(f) property. Activities related to the bicycle path are temporary, and users would not experience disruption in use during or after construction. After construction, the bicycle path would be reinstated in an improved condition, specifically, as a continuous trail on the west side of Wright Boulevard, separate from the roadway through the project corridor. During construction, if the trail in its current location must be closed, the bicycle path will be rerouted to the opposite side of the street so users can experience continuous use of the route. However, it might be necessary to close Wright Boulevard during construction for safety or logistical reasons. If that occurs, bicycle path users will be temporarily rerouted along Rodenburg Road or Mitchell Boulevard. The City of Schaumburg agreed that temporary occupancy of the bicycle path would not cause an adverse effect on the facility (see Appendix B).

3.15.3.4 Salt Creek Greenway Trail

Activities related to the Salt Creek Greenway Trail meet the temporary occupancy criteria and, therefore, are not considered use of a Section 4(f) property. Activities affecting the trail are temporary and would not cause temporary or permanent adverse effects. After construction, the trail will be reinstated in an improved condition, specifically, as a path separate from the road on the west side of Mittel Road/Mittel Boulevard rather than occupying a bicycle lane on the road. The trail would become a continuous path on the west side of the road from the trail in the northwest quadrant of the Mittel Boulevard/westbound Frontage Road intersection to Bauman Court where it currently continues. If the trail would need to be closed during construction, it would be rerouted to the opposite side of the street so the route can be maintained. If Mittel Road/Mittel Boulevard would need to be closed, trail users would be rerouted along Wood Dale Road. Coordination with Wood Dale has been undertaken, and the City agrees that any temporary occupancy of Salt Creek Greenway Trail would not result in an adverse effect on the facility (see Appendix B).

3.15.3.5 Summary

The Build Alternative would require temporary involvement with four Section 4(f) resources—a park and three bicycle paths. A temporary easement would be required from the Wood Dale Park District's Salt Creek Golf Club for regrading the entrance so that it blends with the profile of the improved Prospect Avenue. The Schaumburg Bicycle Paths along Springinsguth Road and Wright Boulevard, as well as the Salt Creek Greenway Trail along Mittel Road/Mittel Boulevard, might be rerouted temporarily during construction for safety and logistical reasons. Because the temporary involvement with these Section 4(f) resources meets the criteria contained in 23 CFR 774.13(d), the involvement does not constitute a use of the Section 4(f) resources.

3.16 Special Waste

"Special waste," as defined in the Illinois Environmental Protection Act (415 ILCS 5/3.475), includes hazardous waste, potentially infectious medical waste, and industrial process waste or pollution control waste.[103] In Illinois, highway projects are screened and evaluated to determine a project's potential involvement with special waste and other regulated substances, such as hazardous substances and petroleum products.

3.16.1 Affected Environment

The project area is largely urbanized and consists of various land uses including aging industrial and railroad land uses; there is potential for the area to contain materials of concern. In accordance with IDOT environmental guidance, a Level I Screening of the project was completed, and it was determined that a Preliminary Environmental Site Assessment (PESA) was required for this project.

The PESA was completed following the guidelines of ISGS, "A Manual for Conducting Preliminary Environmental Site Assessments for Illinois Department of Transportation Highway Projects"[104] and "ISGS red-line guidance document."[105] Since the project area is vast, the PESA divided the project corridor into six geographic sections and corresponding PESA Volumes (1, 2, 2A, 3, 4, and 5) (see Exhibit 3-23). The PESA reports performed by CH2M HILL were submitted to IDOT between June 10, 2010 and February 24, 2012 and included all PESA Volumes (1, 2, 2A, 3, 4, and 5) and five PESA Addendums (Volumes 1, 2, 2A, 3, and 4) (CH2M HILL, 2012). The eleven PESA reports were officially accepted and approved as "Final" by IDOT on March 8, 2012. The March 8, 2012 IDOT acceptance letter is included in Appendix B. According to IDOT policy, the PESA reports required an update or validation. Therefore, a PESA validation was conducted between September 5, 2012 and September 25, 2012. The PESA validation report was submitted to IDOT on September 25, 2012. IDOT reviewed the PESA validation report and officially accepted and approved the document as Final on October 9, 2012 (see Appendix B).

[103] Refer to the Illinois Environmental Protection Act for exceptions.

[104] Erdmann, A.L., Bauer, R.A., Bannon, P.L., and Schneider, N.P. (1996, and draft PESA example [red text guidance]). A manual for conducting preliminary environmental site assessments for Illinois Department of Transportation highway projects. Illinois State Geological Survey Open File Series 1996-5.

[105] CH2M HILL and IDOT. PESA Kickoff Meeting. IDOT Springfield Central Office. Attending: Barbara Stevens, IDOT Chief Environment Section, Steve Gobelman, IDOT Geologic and Waste Assessment Specialist, Debbie Mehra, Special Waste Coordinator, Site Assessment Unit, Anne Erdmann, Director of the Center for Transportation and the Environment, Larry Martin, David Klatt, and Ed Walczak CH2M HILL. ISGS red-line guidance document. August 5, 2009.

Properties within and adjacent to the project corridor, consisting of 27 miles of new and improved expressway and 16 miles of supporting arterial, were evaluated. Properties were field-inspected, screened against Federal and State environmental databases, reviewed for historical information, and interviews[106] were completed if determined necessary during the evaluation process.

Database searches were conducted to identify known or potential contamination from regulated substances within or adjacent to the project corridor. In addition, field inspections were performed to verify locations from the databases, and a checklist describing site features was completed.

The following is a list of the principal databases searched to identify known special waste sites, spills, or enforcement actions.

- USEPA Comprehensive Environmental Response Compensation and Liability Information System (CERCLIS): http://cfpub.epa.gov/supercpad/cursites/srchsites.cfm
- USEPA Resource Conservation and Recovery Act (RCRA): http://www.epa.gov/enviro/html/rcris/rcris_query_java.html
- USEPA Toxic Release Inventory (TRI): http://www.epa.gov/enviro/html/tris/tris_query.html
- Illinois Emergency Management Agency (IEMA): http://tier2.iema.state.il.us/FOIAHazmatSearch/
- IEPA UST: http://webapps.sfm.illinois.gov/ustsearch/
- IEPA Bureau of Land (BOL): http://epadata.epa.state.il.us/land/inventory/
- IEPA Leaking Underground Storage Tank (LUST): http://epadata.epa.state.il.us/land/ust/
- IEPA Brownfields: http://epadata.epa.state.il.us/land/brownfields/
- IEPA Site Remediation Program (SRP): http://epadata.epa.state.il.us/land/srp/
- Emergency Response Notification System (ERNS): http://www.nrc.uscg.mil/apex/f?p=109:1:409463279704121

There are approximately 2,414 first tier parcels and 2,273 second tier parcels that were evaluated as part of the PESA prepared for this project. For purposes of this Tier Two Final EIS, first tier sites are defined as contiguous parcels with a common function, regardless of land use, that intersect or adjoin the project corridor. Second tier sites are parcels that are located adjacent to first tier sites beyond the project boundaries. Part of the PESA screening process was to group the individual parcels into "sites" that are similar in terms of function (e.g., an area with two parcels occupied by a warehouse with one occupant is considered one "site"). This PESA process identified approximately 554 first tier sites that were subsequently addressed by the PESA site inspection, historical review, and reporting process. In addition, there were 1,571 second tier sites evaluated by searching environmental databases, but were not visually inspected or included in a detailed historical or regulatory record review evaluation. The PESA shows first tier sites that contain a recognized environmental condition (REC), *de minimis* condition, or if no sites in the project area are impacted by special waste. Second tier sites that are found in environmental

[106] Limited interviews were conducted to verify site addresses and property information, as detailed in each PESA report.

databases are listed in the "other potential manmade hazards" section of the respective PESA, but are not included in the REC or *de minimis* condition evaluation process. The definitions of REC and *de minimis* condition are as follows:

- According to American Society for Testing Materials (ASTM) E1527-05, a REC is defined as "the presence or likely presence of any hazardous substances or petroleum products on a property under conditions that indicate an existing release, a past release, or material threat of a release of any hazardous substances or petroleum products into structures on the property or into the ground, groundwater, or surface water of the property" (ASTM, 2005). For the EO-WB PESA, the identification of RECs was based on verbal and written input from ISGS on Volume 1 of the EO-WB PESA, as well as examples of REC determinations found in other ISGS prepared PESA reports.
- *De minimis* conditions are defined in ASTM 1527-05 as conditions that "generally do not present a threat to human health or the environment and generally would not be the subject of an enforcement action if brought to the attention of appropriate governmental agencies" (ASTM, 2005). ISGS and IDOT have further refined the definition of *de minimis* conditions to include "normal use of lead-based paint on exteriors and interiors of buildings and structures; use of asbestos-containing materials in building construction; transformers in normal use, unless the transformers were observed to be leaking, appear on an environmental regulatory list, or were otherwise determined to pose a hazard not related to normal use; and agricultural use of pesticides and herbicides" (CH2M HILL and IDOT, 2009). ISGS and IDOT consider any building, regardless of age or building type, to have the potential to contain asbestos-containing materials.

In addition, radon and biological hazards are not considered in a PESA, unless specifically noted, and other potential natural hazards and undermining are not considered RECs or *de minimis* conditions in a PESA. The project area was also screened for CERCLIS sites. The CERCLIS sites are evaluated by USEPA because of a release or potential release of a hazardous substance into the environment. The CERCLIS sites that are evaluated by USEPA and rank high enough to be eligible for USEPA to expend funds for cleanup because the sites pose a risk to human health or the environment are placed on the National Priorities List (NPL). Based on USEPA data reviewed during the EO-WB PESA, a number of CERCLIS sites are located within the project area, but no NPL sites were identified within one mile of the project area (USEPA, 2011).

3.16.2 Environmental Consequences

The PESA results concluded that the project corridor was located on or adjacent to a number of sites that contained RECs and *de minimis* conditions. The PESA studied approximately 554 first tier sites. Of those sites, 448 sites were identified as having a REC or a combination of RECs and *de minimis* conditions (multiple RECs and *de minimis* conditions commonly occur on individual sites). There were 97 sites identified with only *de minimis* conditions, and nine sites were identified as having no REC or *de minimis* condition. Table 3-53 identifies the total number of PESA sites that have RECs, *de minimis* conditions, or no REC or *de minimis* condition.

TABLE 3-53
Summary of First Tier Sites with RECs and DMCs by PESA Volume

	Volume 1	Volume 2	Volume 2A	Volume 3	Volume 4	Volume 5	Total
REC(s) and/or *De minimis* condition(s)	78	81	29	108	107	45	448
De minimis condition(s) only	7	3	1	28	35	23	97
No REC or *de minimis* condition	0	0	1	0	3	5	9
Total	85	84	31	136	145	73	554

Note: The project area is divided into six geographic areas called Volumes.

The PESA evaluation of 1,571 second tier sites resulted in the identification of 301 sites that were found on one or more environmental databases. Table 3-54 shows a summary of the environmental database search for second tier sites.

TABLE 3-54
Summary of Second Tier Sites Identified on Environmental Databases by PESA Volume

	Volume 1	Volume 2	Volume 2A	Volume 3	Volume 4	Volume 5	Total
Total Second Tier sites evaluated	203	72	49	312	355	580	1,571
Second Tier Sites found on environmental databases	23	68	11	88	73	38	301
Environmental Database							
USEPA CERCLIS	1	3	0	2	0	2	8
USEPA RCRA	17	44	7	59	44	25	196
USEPA TRI	3	3	0	8	4	3	21
IEMA	9	32	7	33	30	8	119
IEPA UST	13	21	5	34	18	7	98
IEPA BOL	22	65	10	84	64	36	281
IEPA LUST	10	18	4	26	17	4	79
IEPA Brownfields	0	0	0	0	0	0	0
IEPA SRP	1	3	1	1	2	0	8
ERNS	3	5	3	1	5	1	18

Note: Multiple environmental database numbers may be associated with the same site and are reflected in the table.

An assessment of risk was conducted on the project corridor based upon the types of RECs that were identified on the first tier sites. The ranking guidelines were based primarily on the environmental database and subsequent records review, but were supplemented with site visit information, where appropriate. This ranking system includes "High Risk," "Medium Risk," and "Low Risk" sites. For purposes of this document, the term "risk" is generally defined as the degree to which a site presents a potential environmental hazard that may require special consideration (e.g., avoidance, additional studies, or additional costs for monitoring or disposal) during the roadway design and construction process. The relative risks are assessed based on the available information collected during the PESA process, and are subject to modification based on new information. These risk designations are strictly for general screening and comparison purposes within this document, and should not be considered conclusive, or taken out of the context of this document.

The three individual risk categories are further defined as follows:

- High Risk: Sites where petroleum constituents or other hazardous substances *are documented to have been released into the environment (generally in soil or groundwater), or where petroleum constituents or other hazardous substances are likely present in soil or groundwater as a result of a regulatory listing or other condition*. A High Risk site would be expected to be considered for one or more of the following: site avoidance, design modifications, risk management determination, and additional studies (i.e., Preliminary Site Investigation [PSI] or Phase II Environmental Site Assessment sampling) in order to evaluate the impact of potential contaminated media. The site would likely involve a Special Waste Provision to cover environmental monitoring and potential disposal if subsequent evaluation did not indicate that the affected site area was considered clear of special waste considerations.

- Medium Risk: Sites where petroleum constituents or other hazardous substances have the potential to be present in the environment (generally in soil or groundwater) based upon PESA documentation that petroleum constituents or other hazardous substances *were used or stored on the site, or that site features suggest conditions or activities that are potentially associated with petroleum constituent or other hazardous substance storage or disposal*. Generally, Medium Risk sites do not have specific indication that petroleum constituents or other hazardous substances were actually released into the environment. A Medium Risk site would be expected to be considered for risk management determination and additional studies (i.e., PSI or Phase II Environmental Site Assessment sampling) in order to evaluate the impact of potential contaminated media. The outcome of the additional studies would determine whether avoidance, design modifications, or Special Waste Provisions would be necessary considerations.

- Low Risk: Sites where petroleum constituents or other hazardous substances have a reduced potential to be present in the environment as a result of the site activities based upon available PESA documentation. Per ISGS guidance, potential asbestos-containing material, potential lead-based paint, electrical transformers, natural gas pipelines, sewer facilities, discarded tires, and general trash debris are generally considered *de minimis* conditions related to surface structures and features. These items have a reduced potential to adversely impact soil and groundwater resources and can more readily be addressed by conventional surface demolition, removal, or relocation activities. These items may still involve significant evaluation and associated costs, but for purposes of the PESA and this Tier Two Final EIS, they do not represent conditions that fall under the category of a REC. A Low Risk site would generally not be expected to require additional studies (i.e., PSI soil and groundwater or Phase II Environmental Site

Assessment sampling) in order to evaluate the impact of potential contaminated media. However, conventional surface demolition, removal, or relocation activities, and evaluation of soil for clean fill characterization would be expected, as with all sites in any risk category.

Table 3-55 shows a summary of the High Risk RECs by PESA volume.

TABLE 3-55
Summary of High Risk RECs by PESA Volume

	Volume 1	Volume 2	Volume 2A	Volume 3	Volume 4	Volume 5	Total
Total Number of Sites with High Risk RECs	37	31	12	56	38	12	186
High Risk Category							
Documented release associated with UST/LUST	24	12	7	32	14	6	95
Documented release associated with aboveground storage tank	2	0	0	0	0	1	3
Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)/CERCLIS removal action	1	0	0	4	1	0	6
Highway Authority Agreement	0	0	0	2	0	0	2
Landfill	1	2	0	0	1	0	4
Contaminated fill/past legal or open dumping	2	4	2	7	10	4	29
Electrical substation	0	1	0	0	0	0	1
Former/Current gas station	1	2	0	3	0	0	6
Documented or potential petroleum or hazardous substance contamination in soil, groundwater, or subsurface	14	18	10	27	24	5	98
Total [a]	45	39	19	75	50	16	244

[a] Some sites may appear in multiple high risk categories.

Where possible, High Risk sites that intersected the initial project corridor were avoided when the project corridor was refined. In cases where a site cannot be avoided, further evaluation and investigation will need to be conducted in order to determine the impact of potential contaminated media on the project. As described above, High Risk sites are generally anticipated to require additional evaluation, including the potential for environmental sampling through the completion of a PSI or Phase II Environmental Site Assessment. Even though some sites cannot be avoided, some sites can be designated by IDOT as a Risk Managed Project (RMP) and addressed during construction, whereby the potential risks of the site are evaluated against the proposed work on the site and are not determined to require avoidance, additional investigation in the form of a PSI, or other action unless specific criteria (e.g., depth stipulations) are exceeded. However, if sites are not eligible as a RMP, further studies would likely be required (e.g., PSI, Remedial

Investigation/Feasibility Study, Risk Assessment). In subsequent phases, the sites would be programmed and tasked by IDOT for PSI, if the site is within IDOT jurisdiction.

If the investigations by the Illinois Tollway indicate the presence of impacts that would require environmental monitoring or special waste soil disposal, it is expected that a Special Waste Provision would be prepared by IDOT or the Illinois Tollway, as appropriate, and executed as part of the construction project. The Illinois Tollway will conduct further studies of sites identified in the PESA as high risk, if the site is within Illinois Tollway jurisdiction. The PSI or Phase II Environmental Site Assessment will be scaled to the degree of risk (e.g., sites with multiple RECs and sites with larger proposed excavation areas), and investigated in greater detail than those high-risk sites with only one REC or minimal proposed excavations. Similar to IDOT, the presence of special wastes, as determined by detailed investigations, would likely require Special Waste Provisions that are included as part of the construction project. The Illinois Tollway will manage contaminated sites with the use of site investigations and on a risk-managed basis. The PESA and Phase II Environmental Site Assessments work will be used to characterize the nature and extent of contamination for specific properties, and preferred methods of removal will be identified. This information will be compiled for inclusion in bid documents to guide perspective bidders. Secondly, the risk-managed approach will develop a protocol for the discovery of contamination during construction. Under these conditions, contamination will be managed to avoid unintended migration of contaminants and protect against potential worker exposures. Impacted material would be screened and characterized on a case-by-case basis and further investigations and remediation determined.

3.16.3 Measures to Minimize Harm and Mitigation

The implementation of a Special Waste Provision, for work let by IDOT, would provide planned mitigation procedures during construction. If contaminated soils or water are encountered during construction, the Special Waste Provision will be implemented, and contaminated materials would be removed in compliance with federal and state policies and procedures for their safe removal, handling, and disposal. If contaminated soils, water, or other abnormal conditions indicate the presence of a regulated substance and are encountered during construction at any other site for which a Special Waste Provision does not exist, the contractor will follow the notification procedures outlined in Section 107.19 of the IDOT Standard Specifications for Road and Bridge Construction. Removal and disposal procedures shall follow Section 669 outlined in the Standard Specifications for Road and Bridge Construction. The Illinois Tollway would follow similar procedures as IDOT, particularly for known contamination and the provisions to be included in construction documents. In the case of contaminant discovery during construction, the contractor would follow appropriate procedures for notification, protection of potential worker exposures, and removal and disposal.

3.17 Visual Resources

Visual character and quality of the landscape were considered for the project corridor. Visual quality is inherently subjective; therefore, this analysis is qualitative as opposed to quantitative. Assessing visual quality impacts depends in equal parts on what is seen and who is seeing it. Thus, considering the viewers who may see the project is an important part of assessing its impacts. The viewer might be a motorist using the roadway and looking onto the adjacent landscape, or it might be a neighboring resident or user of nearby property viewing the facility.

3.17.1 Affected Environment

The visual quality and character of the project corridor is a typical mix of urban development with predominantly low-rise commercial and industrial buildings. There is no contrasting landscape or human-built forms that are particularly aesthetically pleasing. Nor does the roadway corridor offer any visual enhancements introduced into the roadway features. The prairie environment that existed before the development of the roadway and the surrounding area is gone from the viewshed; therefore, there is no contrasting landscape that forms a striking and distinctive visual pattern.

From the roadway, the visual character of the area is mostly densely developed commercial and industrial properties with buildings that are large. With the exception of Hamilton Lakes' Development on Thorndale Avenue, little landscaping has occurred on the commercial and industrial properties to increase the attractiveness of the motorists' views. The character of the communities is also largely omitted from the travelers' viewshed. No markers or visual treatments provide motorists with a sense of place. Specific viewsheds along the project corridor are described below.

Along the Elgin-O'Hare Expressway, the viewshed is a mix of trees, industrial and residential properties, and noise walls along portions of the corridor. The downtown Chicago skyline can be seen on clear days from a western portion of the eastbound Elgin-O'Hare Expressway. The view of the Elgin-O'Hare Expressway (see Figure 3-22) from adjacent land uses is obstructed from many locations by mature trees, noise walls, and commercial and industrial buildings. No enhancements have been made to the aesthetic quality of the expressway.

FIGURE 3-22
ELGIN-O'HARE EXPRESSWAY

Source: CH2M HILL, 2009.

Thorndale Avenue also traverses primarily industrial land uses with some residential areas intermixed. However, mature trees line much of the roadway and cover most of the viewshed (see Figure 3-23). In some locations, commercial and industrial properties are dominant where they are closely positioned to the road. Thorndale Avenue is visible from neighboring properties when mature trees or building adjacent to the

FIGURE 3-23
THORNDALE AVENUE

Source: CH2M HILL, 2009.

roadway are not obscuring the view. No aesthetic enhancements have been employed to improve the visual quality of Thorndale Avenue.

The views from I-90 and I-294 are characterized as more urban than the view from the Elgin O'Hare corridor (see Figure 3-24). Except in a few locations, the large industrial buildings are closer to the roadway and are more prominent in the viewshed because any foliage between the roadway and the buildings is shorter than the buildings. The buildings are even more visible where the roadway is on structure. The downtown Chicago skyline can be seen on clear days from the portions of I-90 that are on structure. Advertising billboards, overhead power lines, and road signs are prevalent. I-90 and I-294, because they are primarily on structure or on fill, are very visible from the surrounding area. Further, very little foliage obstructs adjacent land user's view of the interstates. Similar to the Elgin-O'Hare Expressway and Thorndale Avenue, no enhancements were incorporated into their design to improve the aesthetic view of the two interstates.

FIGURE 3-24
I-90

Source: CH2M HILL, 2009.

Along York Road and Green Street/Franklin Avenue, the view west and south is primarily of industrial facilities while the view east and north is of O'Hare Airport and Bensenville Yard operations (see Figure 3-25). Both views in this locale are stark. Planes arriving at and departing from O'Hare Airport are visible from the roadways and provide interest. The south leg of the West Bypass is a combination of dense industrial development, the Bensenville Yard, and airport landscape. The overall visual quality of this area is low.

FIGURE 3-25
GREEN STREET/FRANKLIN AVENUE

Source: CH2M HILL, 2009.

3.17.2 Environmental Consequences

The project corridor would not adversely impact the visual quality of the area, rather it is expected that the project could bring visual unity to the area. First, the quality of the roadway improvement would be consistently applied throughout the corridor. The corridor would no longer be the mixture of expressway, arterial, and collector roads. It would be one uniform strip of roadway with uniform standards. The basic form of the roadway would serve as the foundation to develop an aesthetic theme throughout the corridor. Thus, the proposed improvement is a start in developing a sense of place for the area. The roadway can help shape the visual image of the area, with architectural and landscape features along the right-of-way and at overpasses and interchanges that reflect the values of the communities through which it passes. For reasons of creating pleasing aesthetics in the corridor, the CAAT was formed to develop a set of aesthetic guidelines for the corridor. Their work constitutes the mitigation measures for achieving improved visual quality in the area.

3.17.3 Measures to Minimize Harm and Mitigation

The CAAT, consisting of project team members and representatives from communities along the project corridor, was assembled to develop a set of aesthetic design guidelines to apply to the proposed improvements. The team met four times between fall 2010 and winter 2012, and identified guidelines to apply to hardscape and landscape components of the proposed improvements.

At the first meeting, the team discussed the communities' perceptions of the corridor's existing character, as well as their hopes for what that character might be in the future when the improvements are completed. The IDOT and its consultant team took those concepts and developed potential themes for the corridor aesthetics that were then presented to the team at the second CAAT meeting. Attendees at the second meeting identified "Gateway to the Future" as the common theme to be applied to landscape and hardscape features along the proposed improvements. The CAAT members identified bridges and overpasses as the most important visual or aesthetic features and would like signature gateways to each community to be incorporated into the proposed design. At the third meeting, attendees identified their preferences for the specific design elements of the hardscape and landscape features along the corridor (see Figure 3-26 for examples of design enhancements presented at the meeting for consideration). These preferences were then assembled into the complete set of aesthetic design guidelines, which was presented at the last CAAT meeting.

FIGURE 3-26
CORRIDOR AESTHETICS ADVISORY TEAM ENHANCEMENT OPTIONS

The aesthetic treatment developed for the proposed improvements by the CAAT is consistent with goals established by the Sustainability Working Group of the Governor's Advisory Council. The Sustainability Working Group urged that the historical context of project corridor be incorporated into the design. Landscape and structural items such as bridges, buttresses, and retaining walls should incorporate the aesthetic design guidelines.

3.18 Short-Term Use and Long-Term Productivity

This subsection examines short-term costs and long-term gains for the Build Alternative. The short-term use refers to immediate consequences of the project; long-term use refers to direct or indirect effects on future generations.

Short-term consequences of the Build Alternative include:

- Relocation of residences and impacts on businesses.
- Removal of private properties (residences and businesses) from tax rolls, and commensurate reduction of the property tax base.
- Employment losses associated with loss of businesses.
- Conversion of floodplain and wetland areas to transportation use.
- Inconvenience to residents, business owners, suppliers, and employees during construction.

Long-term benefits to be realized from the Build Alternative include:

- Improved access throughout the project area.
- Improved travel on local and regional roads.
- Better connectivity between automobile and transit modes of transportation.
- Improved transit opportunities for area residents and employees of businesses in the area.
- Economic benefits resulting from the expenditure of construction monies would create an equivalent of 40,500 full-time jobs during the construction period; total value-added (the additional value of a commodity produced over the cost of commodities used to produce it) would be an estimated $3.3 billion over the term of construction; and total output (equivalent to total sales) would be $6 billion over the construction period.
- Improvement of the competitive position of the area by promoting private investment in the redevelopment of underutilized properties, thus growing employment opportunities in the area to new levels.
- Additional economic benefits from construction of the EO-WB project combined with the other improvements would result in $10.6 billion in construction costs over the 13-year period from 2013 through 2025. Annual construction costs would range from $181 million to over $1.4 billion. Total value added for the project would be an estimated $11.6 billion over the construction period, while total sales volume (as measured by total output), would be $21 billion. Between 2013 and 2025, approximately 8,000 to 13,700 jobs would be created annually; and only in the last year, as construction is completed, would jobs decrease to less than 3,000.

The Build Alternative is based on comprehensive transportation planning that considers the need for present and future traffic movement within the context of existing and future land use development and the environment. Therefore, the short-term impacts and use of resources by the proposed action is consistent with the maintenance and enhancement of long-term productivity.

3.19 Irreversible and Irretrievable Commitment of Resources

The Build Alternative would involve committing a range of natural, physical, human, and fiscal resources. Land acquired for constructing the proposed project is considered an irreversible commitment during the period the land is used for highway purposes. Right-of-way requirements would convert land from residential, commercial, and natural resource uses to transportation use. The Build Alternative is generally compatible with land use patterns within the project area, and adjacent land uses would remain consistent.

Fossil fuel, labor, and highway construction materials, such as steel, cement, aggregate, and asphalt, would be required during construction. Considerable labor and natural resources would be used in construction. Those resources generally are irretrievable (although they can be recycled somewhat), but their use overall would not adversely affect continued availability.

The Build Alternative would require irretrievable federal, state, and local funding. Land converted from private to public uses would reduce local tax revenues.

Resources are committed based on the concept that residents in the project area, the region, and the state benefit from the improvements brought about by the proposed project. Improved access to commercial and industrial areas, reduced travel times, and increased economic development are expected to outweigh the commitment of resources in the long-term.

3.20 Permits and Approvals

Implementation of the EO-WB project would require regulatory permits and approvals. The primary federal and state permits and approvals are listed below and briefly described in the following subsections.

- Section 404 of the CWA permit from USACE.
- Section 401 of the CWA water quality certification from IEPA.
- Confirmation that the soil erosion and sediment control plan meets technical standards from the North Cook County and/or Kane/DuPage County SWCD.
- Section 402 of the CWA NPDES construction permit from IEPA.
- Section 402 of the CWA general NPDES permit for pesticide application point source discharges from IEPA.
- Construction in floodplains and floodways of rivers, lakes, and streams permits from IDNR-OWR.
- IWPA approval from IDNR.
- Land or Land Use Release approval from FAA.

- Compliance with FAA AC No. 150/5200-33B, *Hazardous Wildlife Attractants on or near Airports*.
- Amended O'Hare ALP approval from FAA.
- 7460 review and approval from FAA.
- MOU signed by FHWA, IDOT, and Illinois Tollway for the conversion of the existing Elgin-O'Hare Expressway from a freeway for use as a toll road.
- Access Justification Report approval from FHWA.

3.20.1 Section 404 of the Clean Water Act

The Build Alternative would have impacts on surface waters (e.g., creeks) and wetlands (see subsections 3.10 and 3.13, respectively). The discharge of dredge or fill materials into jurisdictional waters of the U.S., including wetlands, is subject to the requirements of Section 404 of the CWA. For the scope of the proposed EO-WB project improvements, federal jurisdiction under Section 404 of the CWA would be assumed for all of the project corridor wetlands.[107]

The permitting strategy for the EO-WB project improvements was discussed with the USACE on July 11, 2012.[108] The proposed EO-WB improvements will be submitted to the USACE as a single and complete project. Due to the extent of potential wetland/waters of the U.S. impacts, it is anticipated that the project will be processed by the USACE as an Individual Permit. The permit application will demonstrate how the project addresses applicable regulations, such as Title 40 CFR Part 230: Section 404(b)(1) "Guidelines for Specification of Disposal Sites for Dredged or Fill Material" and the antidegradation of receiving water bodies. Compensatory mitigation will be provided for the EO-WB project to replace the loss of wetland, stream, or other aquatic resource functions within the Des Plaines River drainage basin.

3.20.2 Section 401 of the Clean Water Act

The Section 404 CWA permit is contingent upon receipt of Section 401 (CWA) water quality certification. States are granted authority to review activities in wetlands and waters of the U.S. and to issue Section 401 water quality certification that the activity is not likely to violate state Water Quality Standards. In Illinois, IEPA issues Section 401 water quality certification. IEPA has granted Section 401 water quality certification for projects that qualify for the USACE Regional Permit Program.[109] Individual water quality certification is required for projects that are reviewed as individual Section 404 CWA permits. Individual water quality certification requires an anti-degradation review, which is subject to public review. A project description and results of the anti-degradation review would be posted on the IEPA website for comment.

[107] The USACE acknowledged this approach at the NEPA/404 merger meeting on February 15, 2011.

[108] Meeting attendees included USACE, Illinois Tollway, and project consultants.

[109] On January 31, 2007, IEPA granted Section 401 water quality certification (with conditions) for all Regional Permits, except for activities in certain waterways as noted in Regional Permits 4 and 8. These waterways do not include the creeks that pass through the project corridor.

3.20.3 Soil and Water Conservation District Review of Erosion and Sedimentation Control Plans

A cooperative agreement between the USACE and the local SWCDs requires a detailed review of erosion and sediment control in conjunction with Section 404 permitting. In North Cook County, review would be conducted by the North Cook County SWCD; whereas, in DuPage County, the review would be conducted by the Kane-DuPage County SWCD. During Section 404 permitting, a soil erosion and sediment control plan for the Build Alternative would be prepared and submitted to the appropriate SWCD office for confirmation that the plan meets technical standards. The soil erosion and sediment control plan would require installation, maintenance, repair, and inspection of soil erosion and sediment control best management practices throughout the construction process.

3.20.4 National Pollutant Discharge Elimination System Construction Permit

This project is anticipated to result in the disturbance of one or more acres of total land area. Accordingly, the project is subject to the requirement for an NPDES permit for stormwater discharges from construction sites. Permit coverage for the project would be obtained either under the IEPA General Permit for Stormwater Discharges from Construction Site Activities (NPDES Permit Number ILR10) or under an individual NPDES permit. Requirements applicable to such a permit would be followed, including the preparation of a SWPPP. Such a plan shall identify potential sources of pollution that may reasonably be expected to affect the quality of stormwater discharges from the construction site. The SWPPP also shall describe and ensure the implementation of practices that would be used to reduce the pollutants in discharges associated with construction site activity and to assure compliance with the terms of the permit. Potential impacts to surface waters as a result of construction activities and measures to minimize harm are discussed in subsection 3.10.

3.20.5 General National Pollutant Discharge Elimination System Permit for Pesticide Application Point Source Discharges

Routine vegetative maintenance (e.g., mowing and/or the use of herbicides) within highway rights-of-way is necessary to preserve motorist visibility (line of sight), prevent sign and signal obstruction, control invasive species, and to avoid other types of vegetation-related travel interference. A General NPDES Permit (NPDES Permit Number ILG87) from IEPA is required for pesticide application point source discharges to waters of the state, including the application of herbicides (that leave a residue) in (or over) the water or at a water's edge. The permit requires the use of pest management measures to minimize pesticide discharge to surface waters, visual monitoring, and record-keeping/reporting.[110] IDOT and/or the Illinois Tollway will obtain permit coverage prior to herbicide application activities near surface waters, as necessary.

3.20.6 Floodway and Floodplain Construction Permits

The IDNR-OWR issues construction permits for work within regulatory floodways and for the encroachment of regulatory floodplains serving a tributary area of 640 acres or more in an urban area, and a tributary area of 6,400 acres or more in a rural area. The purpose of 17

[110] The permit also requires preparation and submittal (to IEPA) of a Pesticide Discharge Management Plan, if the permittee exceeds annual treatment area thresholds.

Illinois Administrative Code 3708 is to provide rules governing construction and filling in the regulatory floodway of rivers, lakes, and streams of Cook, DuPage, Kane, Lake, McHenry, and Will Counties, excluding the City of Chicago. The 17 Illinois Administrative Code 3700 applies to all rivers, lakes, and streams under IDNR jurisdiction, except those defined by 17 Illinois Administrative Code 3708. The Build Alternative would require issuance of these permits. Potential floodplain and floodway impacts are described under subsection 3.12.2.

3.20.7 Interagency Wetland Policy Act-Related Approval

Additional state agency requirements are established under the Illinois IWPA of 1989, so that there is no overall net loss of the state's existing wetland acres or their functional value. The act pertains to state activities (or activities accomplished with state funds) that impact wetlands. For this project, authorization under the IWPA would be sought from IDNR. See subsection 3.13 for a discussion of the project corridor wetlands, their functions, and potential impacts associated with the proposed project.

3.20.8 Compliance with Federal Aviation Administration Advisory Circular Number 150/5200-33B, *Hazardous Wildlife Attractants on or near Airports*

FAA AC 150/5200-33B, *Hazardous Wildlife Attractants on or near Airports*, provides guidance on identifying incompatible land uses and minimizing or eliminating hazardous wildlife attractants in the vicinity of airports. Hazardous wildlife attractants could include solid waste landfills, open water stormwater management facilities, wetlands, woodlands, and landscaped areas. This AC applies to both O'Hare Airport and the Schaumburg Regional Airport in the project area. For O'Hare Airport, the effect of the regulation extends five miles from the airport boundary, and in the case of the Schaumburg Regional Airport, it extends 10,000 feet. As required by FAA, the proposed EO-WB project improvements will implement the AC. Extensive coordination is expected with the FAA and USDA to achieve compliance with the hazardous wildlife attractant AC.

3.20.9 Federal Aviation Administration Concurrent Land Use Approval

Utilization of airport property for the West Bypass corridor is subject to FAA's land use policy. The FAA would only agree to approve airport property for non-aeronautical uses (e.g., roadway uses) if it can be demonstrated that such use is not imperative to the core function of the airfield, and would serve a defined benefit. In general, the analysis has to demonstrate that approving the land for non-aviation uses would result in equal or greater benefit to the airport. The FAA has determined that where the roadway is located in an RPZ, the underlying property would be retained by the City of Chicago ownership. In these cases, the Federal action would be a concurrent land use approval, and compensation for its use will be negotiated between the City of Chicago and the Illinois Tollway. Since 40 percent of the highway corridor on airport property would be in an RPZ, the City of Chicago would grant a permanent easement for the entirety of the EO-WB project that is located on airport property to the Illinois Tollway. The process requires that submittal of the concurrent land use request originate from the land owner (i.e., CDA).

3.20.10 O'Hare Airport Layout Plan Update

Companion to the concurrent land use request would be a request to update the airport's ALP with the inclusion of the proposed West Bypass improvement. The update would include an illustration showing the footprint of the highway corridor on the ALP. The ALP update would be a City of Chicago-generated document and would accompany the request for concurrent land use to the FAA.

3.20.11 Federal Aviation Administration 7460 Review

The FAA regulates airspace and obstacle clearance requirements near airport operations. Obstacle clearance requirements control the height of structures or objects in aircraft operating areas. As such, FAA requires a 7460 review of the proposed transportation improvements and their possible conflicts with controlled air space. Because of the magnitude of this project, FAA has agreed to conduct early review with the objective of achieving a project design that is compatible with airspace and airfield operations. See subsection 3.4.1.3 for a discussion of the results of FAA's airspace review.

3.20.12 Interagency Memorandum of Understanding for the Conversion of a Freeway to Toll Road

The Build Alternative proposes that the new Elgin O'Hare and West Bypass corridors be constructed and operated as tolled facilities, and that the existing Elgin-O'Hare Expressway section between US 20 and Meacham Road be widened and subsequently converted to a tolled facility. The conversion of the existing Elgin-O'Hare Expressway will be achieved with the use of a MOU between FHWA, IDOT, and Illinois Tollway. The terms of the agreement will be subject to the provisions of Section 129(a) of Title 23, United States Code, as amended. In particular, the agreement, as specified in paragraph 3 of Section 129 will place limitations of the use of toll revenue.

3.20.13 Federal Highway Administration Access Justification Report

The Build Alternative requires modifications in access at I-290, a federal-aid interstate highway. Title 23, United States Code, Highways Section 111 (23 U.S.C. 111) stipulates that the Secretary of the U.S. Department of Transportation shall approve plans for access modifications along the Interstate System. The Secretary has delegated the authority to administer 23 U.S.C. 111 to the Federal Highway Administrator pursuant to 49 CFR 1.48(b)(10). The FHWA's decision to approve new or revised access points to the Interstate System should be supported by substantiated information justifying and documenting that decision in the form of an Access Justification Report. Proposals to modify interstate highway access must:

- Consider the planning, environmental, design, safety and operational effects of the proposed change.
- Support the intended purpose of the Interstate System.
- Avoid adverse impacts on safety and operations on of the Interstate System and connecting transportation system.
- Be designed to acceptable standards.

A Final Access Justification Report documenting proposed access modifications at I-290 will be prepared and processed for FHWA approval after the Tier Two ROD is signed.

3.21 Environmental Commitments

Mitigation is required for impacts to natural and human resources that are unavoidable. The project does not impact cultural, historical, or threatened and endangered species; therefore, no mitigation is required for those resources. For resource impacts that require mitigation, the project will adhere to all applicable federal, state, and local laws and regulations. Descriptions of the various mitigation measures and commitments have been organized by their respective discipline. This section summarizes the mitigation measures and commitments that have been made for this project.

3.21.1 Mitigation for Impacts to Natural Resources

Based on the scoping comments received early in Tier Two, mitigation for natural resource impacts (e.g., wetland/waters of the U.S., water quality, etc.) would be a key issue for the EO-WB project. Mitigation has been discussed at various meetings with regulatory/resource agencies and other stakeholders throughout Tier Two. Since publication of the Tier Two Draft EIS, additional coordination relating to mitigation of impacts to natural environments has occurred and commitments have been refined. The resource agencies have been provided with a conceptual water quality best management practice plan for the Build Alternative and over 20 potential wetland/waters mitigation sites for review. The resource agencies will continue to review and discuss the potential wetland/waters mitigation sites, as necessary, so that a final site(s) may be selected. Detailed review of water quality best management practices will take place during the Section 404 CWA permit process. As part of the permit process, applicable design engineering plan sheets showing proposed grading, soil erosion and sediment control, drainage, and post construction water quality/quantity best management practices would be submitted for review prior to construction.

A summary of the natural resource commitments, including these refinements, is provided in the following subsections.

3.21.1.1 Stormwater and Water Quality Best Practices

- Stormwater will be managed by a system of conveyance (e.g., pipes, grassed ditches, and best management practice swales), detention and infiltration. Preliminary engineering plans have been developed for the implementation of an overall stormwater management system (CH2M HILL, 2012). The project will, to the extent practicable, meet the intent of the DuPage County Countywide Stormwater and Flood Plain Ordinance regarding capturing the first flush volume (that typically includes a higher concentration of pollutants compared to later in the storm). Additionally, the best management practices would be designed to detain stormwater (in accordance with FAA regulations, draw down is within 48 hours after the end of the design storm) and allow it to infiltrate into the ground with minimal discharge. The details found in the preliminary engineering plans will be further refined during final design.

- The proposed improvements will comply with FAA AC No. 150/5200-33B, *Hazardous Wildlife Attractants on or near Airports* (dated August 28, 2007), to the extent practicable. Specific requirements pertaining to stormwater management facilities, wetland mitigation, and landscaping are being coordinated with and confirmed by FAA. USDA-APHIS wildlife biology staff will assist FAA with their review. The principal criteria includes no new wildlife attractants (e.g., open water, wetland, or vegetation attractive to wildlife) within five miles of O'Hare Airport and 10,000 feet of Schaumburg Airport. Engineering plans will be submitted to the FAA/USDA-APHIS for review and approval of the best management practice design features within the limits prescribed by the advisory circular, as necessary.

- Best management practices will be implemented in conjunction with the project's drainage conveyance and detention system (which includes detention ponds along the existing Elgin-O'Hare Expressway) to minimize impacts to receiving waters. Detention facilities, grassed ditches, and vegetated buffers will be installed where practicable to minimize transport of sediment, heavy metals, and other pollutants to surface waters. Additional stormwater best management practices (e.g., best management practice swales and infiltration basins/trenches) will be installed where necessary to protect wetlands and surface waters.
- The intent of the best management practice design consists of the implementation of a treatment train program. Multiple best management practices would be installed in series. Each best management practice would have different removal capabilities allowing for treatment of contaminants of concern (e.g., TSS, heavy metals, etc.). The resource agencies agreed, in principle, that that the best management practice concept plan had sufficient detail for this Tier Two Final EIS, and that specific details would be coordinated during the Section 404 CWA permitting process.[111]
- Post construction water quality/quantity best management practices (including vegetative buffers) will be provided to protect wetlands and surface waters (including existing mitigation sites) that are to remain within and adjacent to the project corridor. In particular, a wetland buffer will be incorporated into the plan near wetland Sites 84 and 125 (i.e., wetland sites that INHS identified as having high quality wildlife habitat). Native plant species that meet FAA wildlife hazard safety requirements will be considered when designing seed mixes for the wetland buffers. Specifically, plant species listed in the *OMP Master Specifications*, "Section 02905: Sustainable Airport Landscaping," will be considered when preparing Landscape Plans to address FAA AC guidelines (CDA, 2012).
- The Illinois Tollway will sponsor a chloride water quality initiative with the following objectives:
    - Implementation of chloride water quality best management practices to reduce impacts to receiving waters.
    - Promoting weather-related data sharing with local communities that enables more efficient chloride applications to minimize over-application of road salt.
    - Approaching chloride reduction on a watershed basis by partnering with local municipalities. The outcome of these partnerships will assist in providing a holistic view and approach to chloride application and reduction on a watershed level.

[111] Based on meeting with the FAA, USDA-APHIS, USACE, USEPA, USFWS, IDNR, IDOT, Illinois Tollway, and project consultants on July 23, 2012.

- Additionally, over the next two and half years (by winter 2014/2015 – prior to winter maintenance of the new facility), road salting practices, procedures, and materials will be reviewed by the Illinois Tollway. This review will include evaluation of chloride reduction implementation plan recommendations for chloride TMDL within the watersheds affected by the project. Adjustments will be made where practicable and feasible. Additional operator training will be provided, as necessary, based on this review. The potential use of chloride reduction best management practices, including a water quality monitoring program, will be explored with resource agencies and interested stakeholders.

- Compliance with soil erosion and sediment control requirements will consider the use of the Kane-DuPage and North Cook County SWCD's (via agreements) for soil erosion and sediment control plan review and site inspection during construction.
- Stormwater management strategies that benefit both the roadway and community needs will be considered.
- Identified flooding complaints will be investigated and solutions for drainage concerns will be recommended, as practicable. The IDOT's *Illinois Drainage Manual* (2004), Illinois Tollway's *Drainage Design Manual* (2012), American Council of Engineering Companies of Illinois/IDOT 2006 Drainage Seminar and local Stormwater Management Ordinances will be used to guide the preparation of Location Drainage Study and Hydraulic Report.
- Water quality best management practices will be provided at the proposed system interchange at I-290. As practicable and feasible, stormwater runoff will be treated by stormwater best management practices prior to leaving the proposed right-of-way outlet to the Devon Avenue Tributary ponds.
- It is the intent to drain surface runoff from bridge decks and roadways to ditches or detention ponds via scuppers and storm sewers, prior to discharge to off-site drainageways. As practical and feasible, stormwater runoff from the proposed bridge over Salt Creek will be routed to a stabilized outlet and through additional best management practices, where it can receive treatment prior to discharge into the creek.

3.21.1.2 Wetlands, Surface Waters, and Riparian Mitigation

- Waters of the U.S., including wetlands, which are impacted as a result of the proposed improvements, will be mitigated at determined ratios in locations agreeable to federal and state agencies. During final design, effort will be made to reduce impacts to wetland and waters. Disturbance of streamside/riparian vegetation will be minimized to the extent practicable. Areas that are disturbed would be restored and stabilized in accordance with NPDES and Section 404 CWA permit requirements. Tree and vegetation replacement will be guided by FAA, Illinois Tollway, and IDOT policies.
- Impacted waters of the U.S., including wetlands, will be mitigated at determined ratios at locations within the Des Plaines River basin agreeable to federal and state agencies.
- Wetland/waters mitigation will be implemented off-site, but within the Des Plaines River basin. Potential sites for mitigation have been coordinated with appropriate federal and state regulatory agencies. Mitigation will require one or more sites being

considered to satisfy the mitigation requirements. A final decision regarding wetland mitigation approach and site selection will be completed during the Section 404 CWA permitting process and IWPA review. The mitigation sites will be conveyed (if necessary) to a steward such as a forest preserve district, IDNR, etc. for long term maintenance.

- Acquisition of wetland/waters mitigation sites will be accomplished by one of two methods: 1) an IGA between the Illinois Tollway and land steward that specifies a partnership wherein the build out of mitigation and acquisition of land is accomplished; 2) the Illinois Tollway both acquires and develops the property and conveys to the long term property steward.
- Wetland mitigation approach and site selection will continue to be coordinated with federal and state resource agencies. A list of over 20 potential sites was previously provided for agency review. Based on preliminary agency coordination, that list of 20 sites has been reduced. Additional information regarding these sites was provided to the resource agencies for review and discussion. A final decision regarding wetland mitigation approach and site selection will be completed during the Section 404 CWA permitting process and IWPA review.
- Wetland mitigation at an off-site location will be coordinated with the property owner/entity that will be responsible for long-term management (e.g., forest preserve district) as well as with state and federal resource agencies. As part of this coordination, conceptual plans that identify proposed community types will be prepared.
- Mitigation for unvegetated waters of the U.S. impacts will be provided. Depending on the potential mitigation sites, mitigation for unvegetated waters may include re-meandering channelized streams, removing/replacing existing drain tiles/culverts with stabilized stream channels, stabilizing eroded streambanks, constructing in-stream habitat, creating riparian buffer, etc. (or a combination of these methods).
- Coordination with the DRSCW is taking place to investigate local sites within the Salt Creek Watershed that could provide riparian or waters mitigation.

3.21.1.3 Fish and Wildlife Passage

- Where new bridges over waterways would be installed (e.g., Higgins Creek and Salt Creek), final bridge design would accommodate wildlife movement, to the extent practical and feasible, and to the extent that the existing bridge(s) (which shall remain) allows.
- New culverts at waterways and/or wetlands will be designed to accommodate anticipated high-water flows and not to impede low-water flows to minimize the negative effects to the aquatic ecosystem. Per the Illinois Tollway drainage design criteria, culverts are designed for the 50-year peak flow and checked for the 100-year and 500-year peak flows to avoid overtopping.
- New culverts located on intermittent or perennial waters of the U.S. will be designed to accommodate fish passage (e.g., embedding the upstream and downstream culvert invert six to 12 inches below the streambed elevation). Existing culverts will be retained and in some cases extended in accordance with appropriate design criteria.

- The bottom of new culverts greater than 48 inches in diameter or height associated with waters of the U.S. will be buried below streambed elevations to maintain a more natural condition, when feasible. Bottomless culverts will be considered in final design, when feasible based on size of the span, geometry, skew, potential environmental impact associated with its installation, and cost. It is important to note that if a culvert is less than 48-inches in diameter, it is very difficult to place riverbed material within the entirety of the pipe.

3.21.2 Noise

The determination of proposed noise barriers has been in compliance with FHWA and IDOT guidance on selecting feasible and reasonable locations for barriers. During the Tier Two Draft EIS comment period and after, the benefited receptors from proposed barriers were sent a postcard requesting their vote as to whether or not they want barriers implemented (see subsection 3.8.3.2 for the results of the polling). For all barriers except two, a majority of responses supported implementation of the barriers. Noise barriers that will be implemented include B2, C1, C2, C3, C4, D1, D3, E1, E3, and E6. No responses were received after the distribution of the two postcards that were sent out to benefited receptors for Barrier E2. A third postcard was sent on October 12, 2012, and a final determination of likelihood will be made following the results of that mailing. Based on the voting by benefited receptors, Barrier E4 has been dismissed from further consideration. The implementation of the noise barriers will be carried forward into future phases of the project. The final design aspects of the barriers including adjustments in location, length, height, types of materials, etc. will be determined in final design. Public involvement venues will be used to update the public on final design details for the noise barriers, and their schedule of implementation.

3.21.3 Air Quality

The proposed project has applied the most advanced air quality modeling and has determined that the project conforms with the regional CMAP's *GO TO 2040 Comprehensive Regional Plan* and the IDOT *STIP* (CMAP, 2010; IDOT, 2011a). The Illinois Tollway and IDOT have also considered other air quality measures that would control temporary sources of air pollutants such as construction dust and particulate matter, and construction equipment emissions.

The Illinois Tollway Supplemental Specifications include requirements for dust control and other construction related air quality requirements – see sections 107.36 and 107.37 of the specifications.

The Illinois Tollway specifies that construction equipment shall reduce air emissions with the use of retrofit emission control devices, and/or the use of cleaner burning diesel fuels for equipment greater than 50 horsepower. The retrofit device shall be technology included on USEPA's verified retrofit technology list, or certified by the manufacturer. Air emissions are also reduced with idling restrictions. Diesel powered equipment will not be allowed to idle except for short periods (five minutes) when loading or unloading, when forced to remain motionless in traffic, when necessary to use auxiliary equipment, and when equipment is being repaired.

The contractor will designate a point person to coordinate with the Illinois Tollway on matters of air quality. If adverse air quality conditions arise an appropriate course of action will be determined by the Illinois Tollway and the contractor.

3.21.4 Traffic and Access Management

- Frontage roads will be provided along the east-west corridor at locations noted in the preliminary plans to maintain local access.
- Plans detailing maintenance of traffic during each phase of construction will be developed to specify how traffic flow and access to businesses and other destinations will be maintained.
- Plans will be developed by the Illinois Tollway with emergency service agencies and school systems to ensure that emergency service will not be adversely impacted during construction and that school busing impacts are minimized.
- Efforts will be made to conduct construction activities affecting the Salt Creek Golf Course between November 1 to April, thereby, avoiding heavy use periods.

3.21.5 Sustainability

- Sustainable practices have been incorporated in the Tier One and Tier Two phases of the project, and will be applied to all remaining phases (i.e., final design, construction, operation). Both IDOT's I-LAST sustainable process (IDOT, 2010) and the goals and recommendations stemming from the Governor's Advisory Council have guided the process in Tier One and Tier Two. Future phases of development will be guided by principles that align with the objectives of the Illinois Tollway.

3.21.6 Special Use

- Construction of the West Bypass corridor will be coordinated closely with special uses including O'Hare Airport, CP railroad's Bensenville Yard, and MWRDGC's Touhy flood control reservoir per MOA developed between the Illinois Tollway and each agency.

3.21.7 Aviation

- The FAA's 7460 (airspace compliance) have been performed in both Tier One and Tier Two, and recommendations from those evaluations will be incorporated into the advancing design of the roadway improvements. As final design approaches 60 percent for roadway improvements that are located near or on airport property, an updated 7460 submittal will be prepared for FAA review and evaluation. Based on the recommendations from those reviews, aspects of the improvements will be adjusted, as needed, to maintain compliance with airspace regulations.
- Glideslope analyses have been conducted for each runway at O'Hare Airport to determine any potential conflicts with signal transmission from the antenna to arriving aircraft. Based on the recommendation of the analysis, roadway design features may be adjusted to avoid signal conflicts.

- Conformance with the FAA Wildlife AC will be monitored by the USDA through an IGA between the Illinois Tollway, City of Chicago, and the USDA. The USDA and the Illinois Tollway will develop an overall strategy for the use of practices that would minimize the attraction of birds and wildlife to roadway features specifically detention/retention basins and compensatory storage areas, roadway landscaping within five miles of O'Hare Airport, and 10,000 feet of Schaumburg Airport. The USDA will receive 60 percent complete design plans and will review new open water features of the project and landscape features for compliance. The USDA will advise the Illinois Tollway of any design refinements related to minimizing bird and wildlife attraction.

3.21.8 Residential and Business Relocation

- Relocation of businesses and residences will be performed in compliance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended, and IDOT's *Land Acquisition Policies and Procedures Manual* (IDOT, 2011b), and the Illinois Tollway's land acquisition policies (Illinois Tollway, 2011), as applicable, to all residents and businesses displaced by the proposed improvements. Relocations will be performed sufficiently ahead of construction so that major businesses avoid extended closures or gaps in their operations.

3.21.9 Alternative Transportation Modes

- Preservation of space for transit improvements in the Elgin O'Hare corridor, north leg of the West Bypass corridor, and the I-90 corridor will be provided.

- Space is reserved for bicycle and pedestrian facilities within, adjacent, or crossing select sections of planned roadway improvements. Where the project corridor crosses existing bicycle or state routes, restoration of the facilities will be provided, while new elements of the bicycle and pedestrian plan will be subject to interagency agreements that address jurisdictional responsibility, cost sharing, and long-term maintenance.

3.21.10 Aesthetics

- The aesthetic design guidelines developed by the CAAT will be used as a guide during future phases of project development.

3.21.11 Tree Replacement

- Adverse impacts to wooded areas will be reduced and minimized by implementing a tree protection and preservation plan. Efforts will be made to preserve specimen trees, as practical and feasible.

- Tree and vegetation replacement will be guided by IDOT and Tollway policies, and also by the FAA hazardous wildlife attractant AC.

- No varieties of ash trees (*Fraxinus* spp.) will be planted in the project corridor to mitigate for tree loss as part of this project. The removal and disposition of ash trees will comply with USDA/IDOA quarantine restrictions (7 CFR 301.53, as amended) (IDOA, 2006).

3.21.12 Special Waste

- Contaminated soil or water will be managed as follows: The PESA and Phase II Environmental Site Assessments will be used to characterize the nature and extent of contamination for specific properties, and preferred methods of removal. Information will be compiled for inclusion in bid documents to guide prospective bidders. Depending on the degree of contamination, onsite management may be possible for some materials.
- Contamination encountered during construction will be managed to avoid unintended migration of contaminants and protect against potential worker exposures. Impacted material will be screened and characterized on a case-by-case basis and further investigations and remediation determined. If construction is managed by IDOT, special waste issues will be managed in accordance with the IDOT's "Standard Specifications for Road and Bridge Construction" and "Supplemental Specifications and Recurring Special Provisions" (IDOT, 2012a; IDOT, 2012b).

3.22 Summary of Environmental Consequences

A summary of the environmental impacts are shown in Table 3-56 for the Build Alternative. The project is located in an urban area, and repeated efforts have been made to locate and design a project that fits within the context of its landscape without major impact to natural and socioeconomic resources. The impacts summarized in Table 3-56 are comparatively small for a project of this magnitude and scope. There are only seven residential displacements, and less than 50 business displacements. There are no impacts to historical, cultural, or threatened and endangered species. Impacts to wetlands and waters are 22.8 acres and 2.45 acres, respectively. The conversion of private properties to highway use would remove about $4.5 million annually from the tax rolls. Floodplain encroachments are shown and compensatory storage will be developed in the area to off-set the floodplain loss. The project has the potential to be a sizable economic engine for the area and is projected to stimulate positive economic effects in terms of direct and indirect impact. Among these include: construction employment of 2,000 to 3000 jobs per year for the term of construction (approximately 12 years); permanent employment in the area through new economic development attracted to the area (41,000 jobs by the year 2040); and tax revenue to federal, state, and local governments that total about $730 million during the construction period. The unavoidable impacts shown in Table 3-56 will be re-established through a variety of mitigation measures listed in subsection 3.21.

TABLE 3-56
Summary of Environmental Consequences of the Build Alternative

Resource	Impact
Socioeconomics	
Residential displacements (#)	7
Businesses displaced (employees displaced) (#)	46 (1,332)
Other business impacts (#) [a]	13

TABLE 3-56
Summary of Environmental Consequences of the Build Alternative

Resource	Impact
Proposed right-of-way required (acre)	595
- Business (acre)	375
- Public (acre)	199
- Residential (acre)	21
- Religious Institutions (acre)	0.02
Tax revenue loss ($/%) [b]	$4.5 M/0.13%
Job creation per year during construction period (# employees)	2,000–3,000 [c]
Job creation (permanent number of employees in project area)	41,000
Total economic output during construction period ($)	$6 B
Total federal tax revenue accrued during construction period ($)	$517 M
Total state tax revenue accrued during construction period ($)	$213 M
Annual local tax revenue added (related to new development that would be induced by the project) ($)	$16 M
Potential redevelopment of land (acre)	4,700 [d]
Cultural Resources	
Cultural resources impacted (#)	0
Noise	
Common Noise Environments impacted (#)	24 [e]
Natural Resources	
Stream crossings (total #)	10 [f]
Surface waters impacts (acre)	2.45
Floodplain encroachments (normal to 10 years/10 years to 100 years) (acre-feet)	22.3/35.8
Floodway encroachments (normal to 10 years/10 years to 100 years) (acre-feet)	12.1/15.7
Floodplain encroachments (#transverse/#longitudinal)	12/4
Floodway encroachments (#transverse/#longitudinal)	8/2
Wetland impacts (acre)	23.0
Trees	25,570 [g]
Threatened and endangered species (#)	0

TABLE 3-56
Summary of Environmental Consequences of the Build Alternative

Resource	Impact
Section 4(f) Resource Involvement	
Section 4(f) resources involved/adversely affected (#) [h]	4/0

Note: NA= Not applicable
[a] Represents parking removal and access rerouting.
[b] The tax revenue loss is related to displaced properties removed from the tax base.
[c] Range represents the differing number of employees required in a given year during the construction period. There would be over 40,500 full-time job equivalents created by 2040. These numbers were determined using the IMPLAN model.
[d] The amount of potential redevelopment (4,700 acres) is attributed to the combined development of the EO-WB project, O'Hare Modernization Program (OMP), and I-90 reconstruction. The EO-WB project by itself would cause about the same amount of acreage to redevelop, however, at a different density in some locations.
[e] There is a total of 44 Common Noise Environments.
[f] The Build Alternative will cross the project corridor waterways at 13 general locations. Impacts are proposed at up to 10 of these locations.
[g] Estimated from transect/sub-sample methodology, and includes impacts to trees within closed woodland, scrub-shrub woodland, wooded fencerows, and landscape areas.
[h] Involvement with all four Section 4(f) resources qualifies as temporary occupancy under 23 CFR 774.13(d), and therefore, do not qualify as adverse effects on the resources.

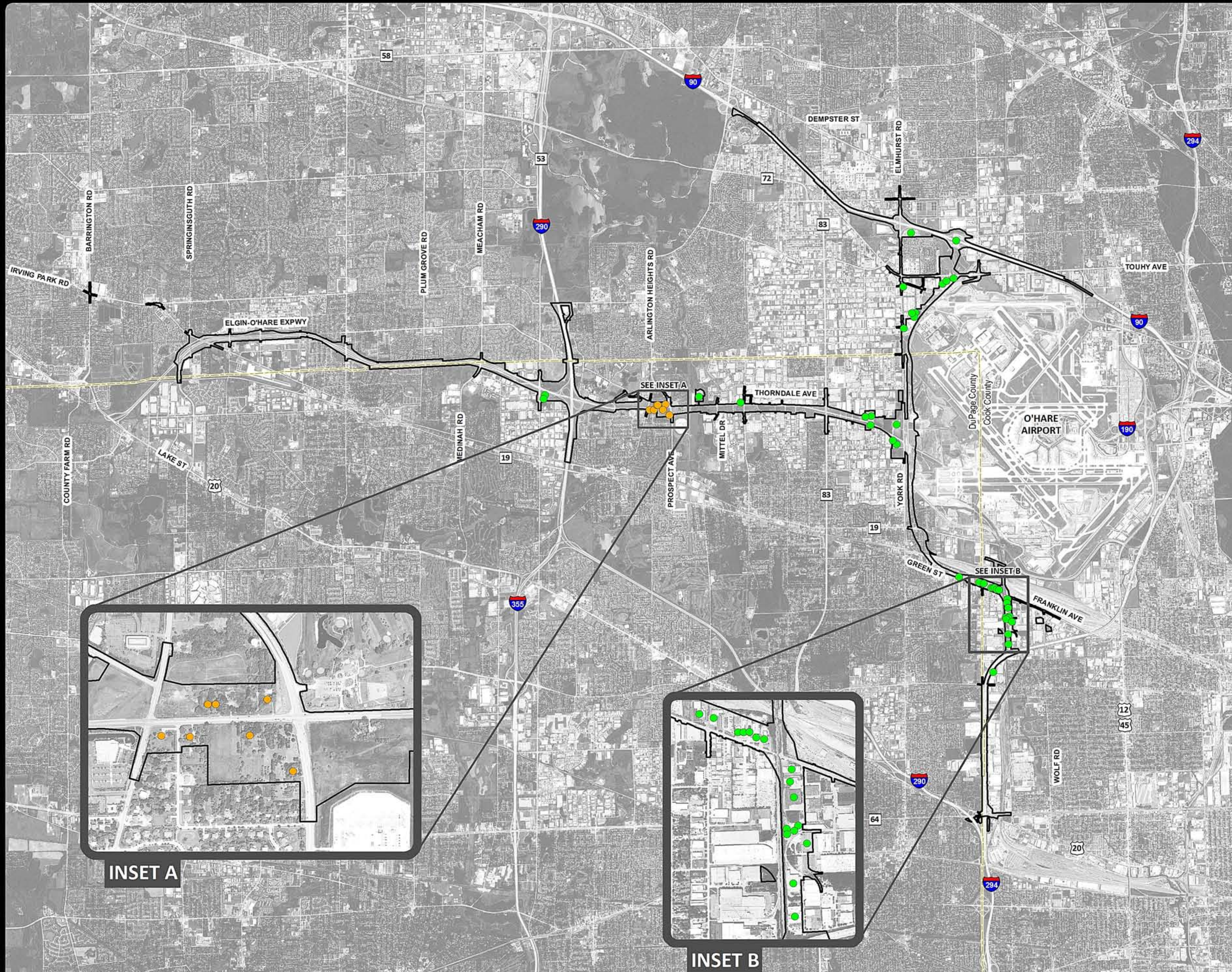

Exhibit 3-1

Displacements

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LEGEND

Census Blocks

- Higher than State and County Averages
- Higher than State Average Only
- Higher than County Average Only
- Lower than State and County Averages
- No Residents
- Displacements
- County Boundary
- Project Corridor

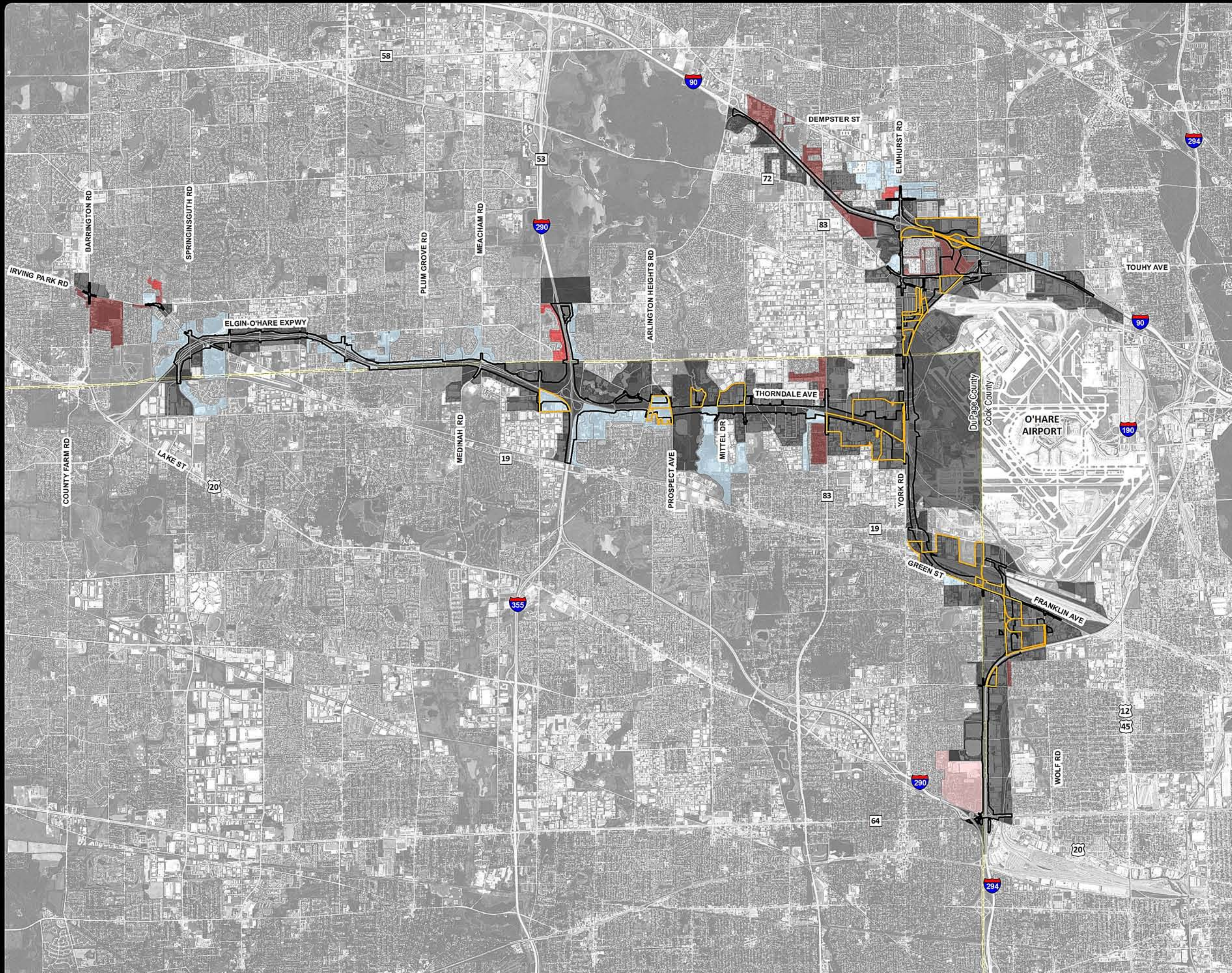
Sources:
- Census Blocks: U.S. Census Bureau, 2010
- Aerial photography: Airphoto USA, 2008
- County Boundary: U.S. Census Bureau, 2010
- Parcel Data: DuPage County, 2006; Cook County, 2007

NORTH

0 0.5 1 2
Miles

Exhibit 3-2A

Percentage of Non-White Population by Census Block



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LEGEND

Census Blocks

- Higher than State and County Averages
- Higher than State Average Only
- Higher than County Average Only
- Lower than State and County Averages
- No Residents
- Displacements
- County Boundary
- Project Corridor

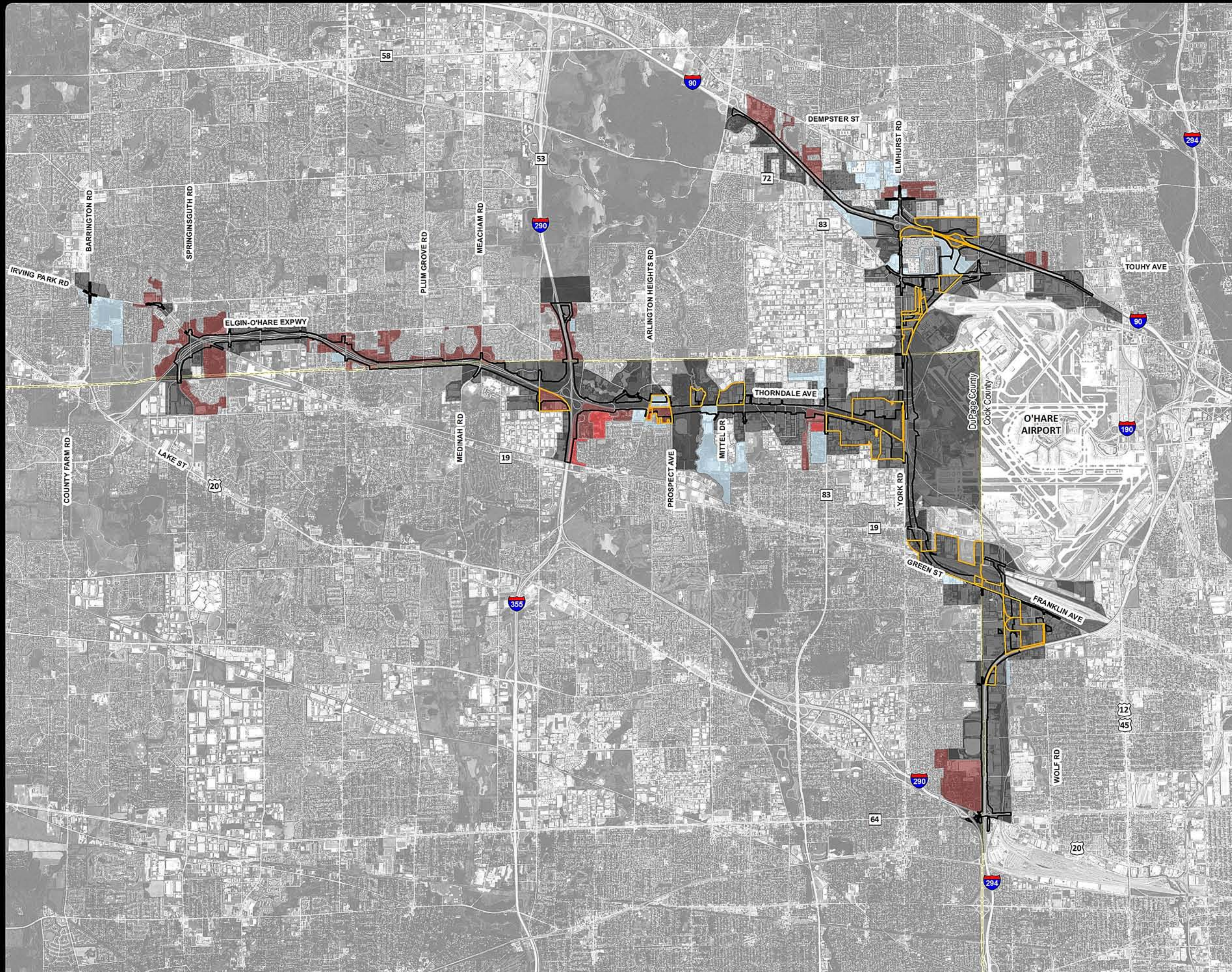
Sources:
- Census Blocks: U.S. Census Bureau, 2010
- Aerial photography: Airphoto USA, 2008
- County Boundary: U.S. Census Bureau, 2010
- Parcel Data: DuPage County, 2006; Cook County, 2007

NORTH

0 0.5 1 2
Miles

Exhibit 3-2B

Percentage of Hispanic Population by Census Block



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LEGEND

Census Blocks

- Higher than State and County Averages
- Higher than State Average Only
- Lower than State and County Averages
- No Residents
- Displacements
- County Boundary
- Project Corridor

NORTH

0 0.5 1 2 Miles

Sources:
- Census Blocks: U.S. Census Bureau, 2010
- Aerial photography: Airphoto USA, 2008
- County Boundary: U.S. Census Bureau, 2010
- Parcel Data: DuPage County, 2006; Cook County, 2007

Exhibit 3-2C

Percentage of Asian Population by Census Block

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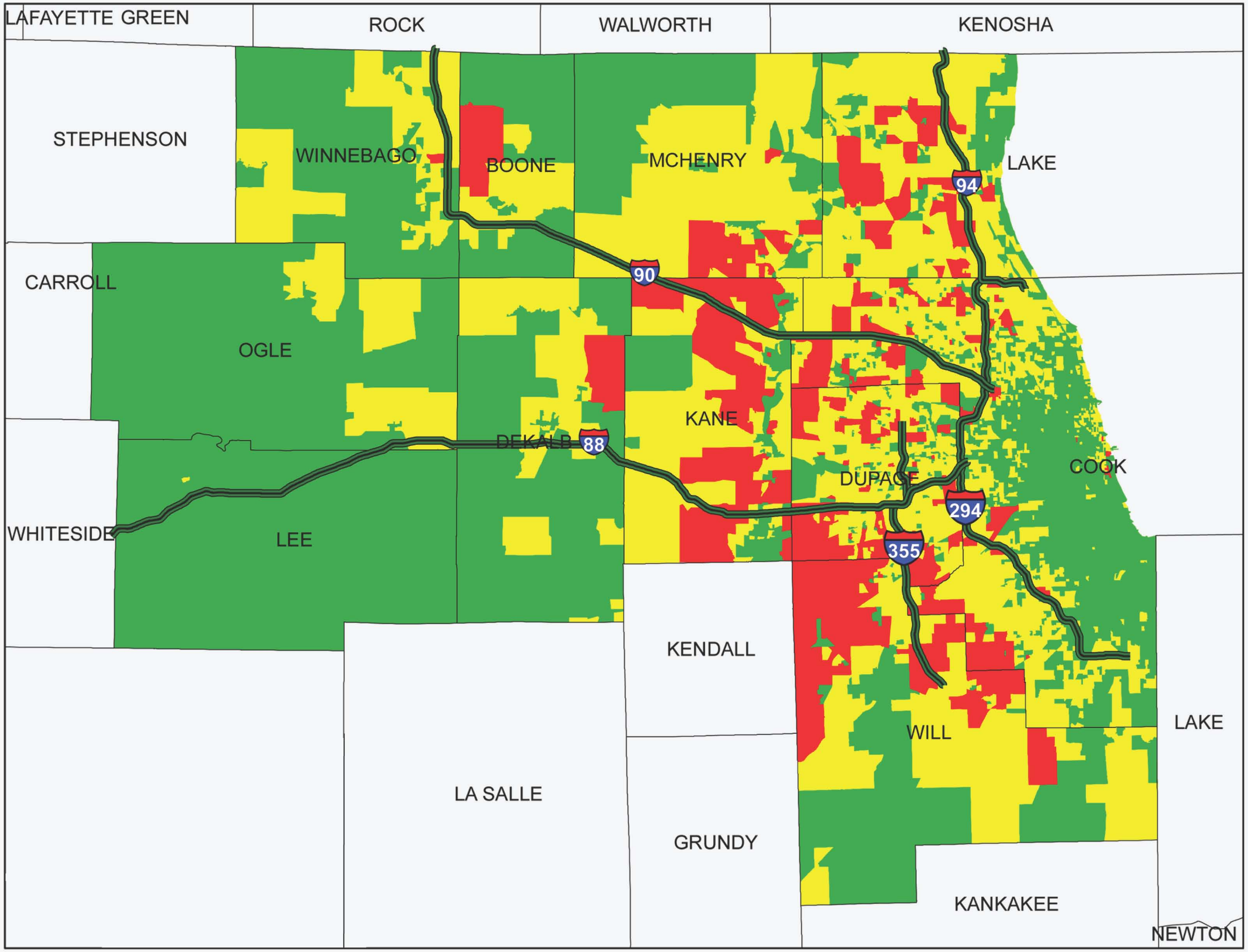


LEGEND

I-PASS Users Per Block Group

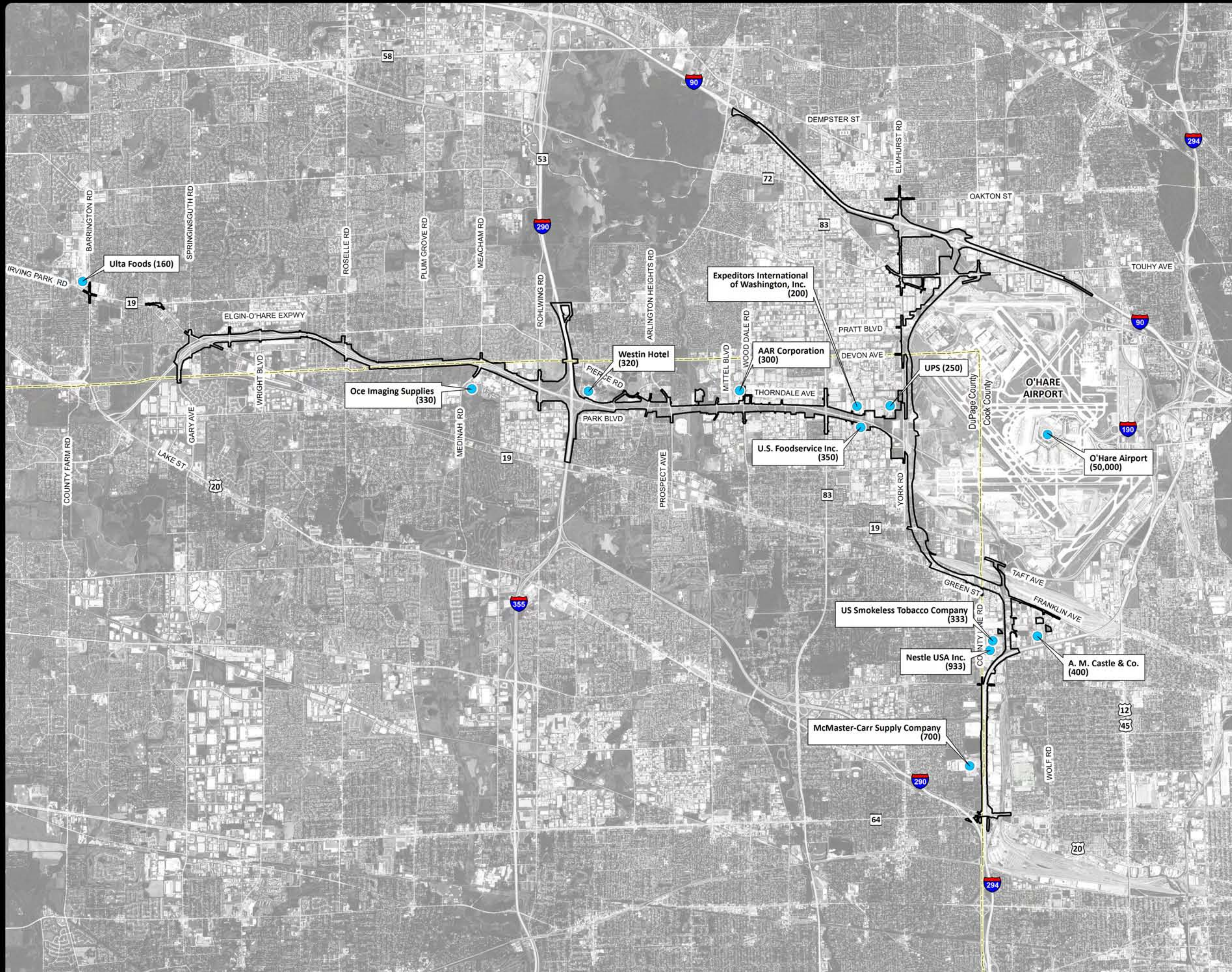
- 0 - 500
- 501 - 2,000
- Over 2,000

Sources:
- Census Block Groups: U.S. Census Bureau, 2010
- I-PASS Users: Illinois Tollway, 2010

NORTH

Exhibit 3-3

I-PASS Users Per Block Group



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LEGEND

- Major Employers (Number of Employees)
- County Boundary
- Project Corridor

Sources:
-Major Employers: Illinois Department of Commerce and Economic Opportunity, 2011
-Aerial photography: Airphoto USA, 2008; City of Chicago, 2009
-County Boundary: Tele Atlas North America, Inc., 2008

NORTH

0 0.5 1 2
Miles

Exhibit 3-4
Major Employers

Path: N:\Idot\070404\GIS\Exhibits\Tier 2\Employers\Exhibit\Major Employers.mxd

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LEGEND

- Business Park/Industrial
- Retail/Entertainment
- Public/Institution
- Hotel
- Mixed Residential/Retail/Office
- Multifamily
- Office
- Open Space/Detention
- Single Family Detached
- Single Family Attached

Source:
- Future Land Use: S.B. Friedman & Company, 2010

NORTH

Exhibit 3-5

Future Land Use

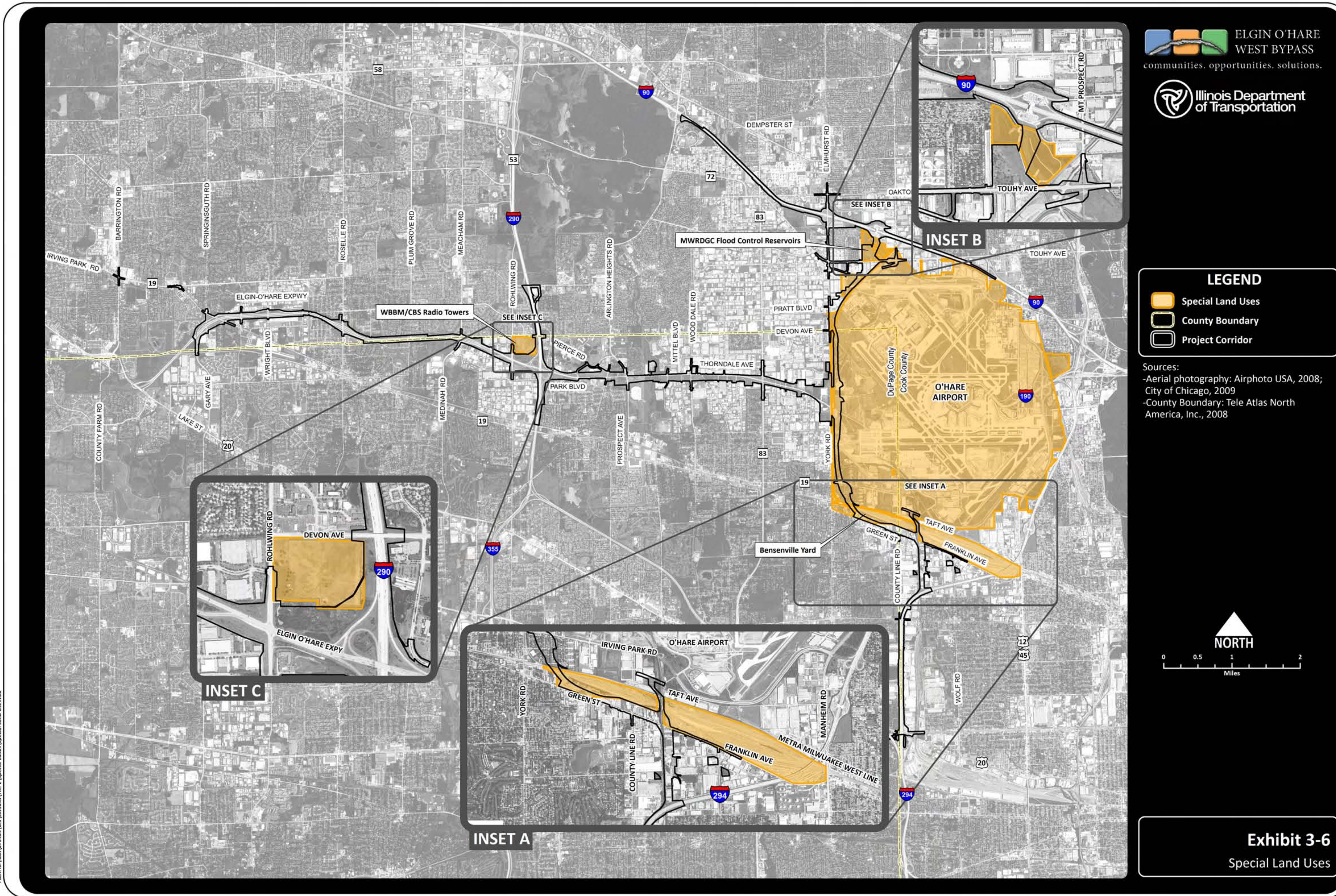
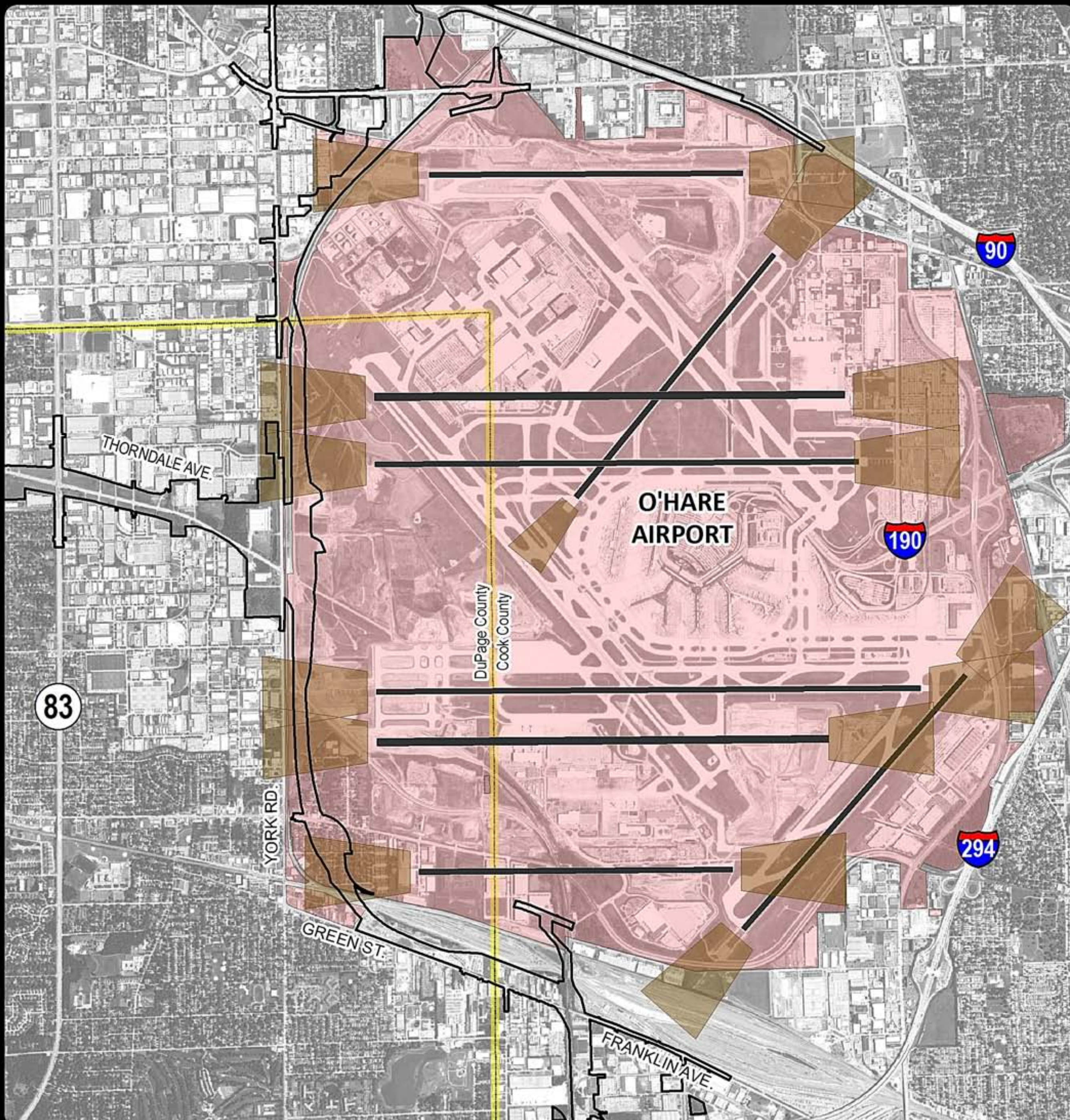


Exhibit 3-6

Special Land Uses



LEGEND

- Future Runway Protection Zone
- Future Runway Configuration
- O'Hare Airport
- Project Corridor
- County Boundary

Sources:
-Aerial photography: Airphoto USA, 2008; City of Chicago, 2009
-Future Runway Protection Zone: City of Chicago, 2003
-Future Runway Configuration: City of Chicago, 2003
-O'Hare Airport: City of Chicago, 2003
-County Boundary: U.S. Census Bureau, 2010

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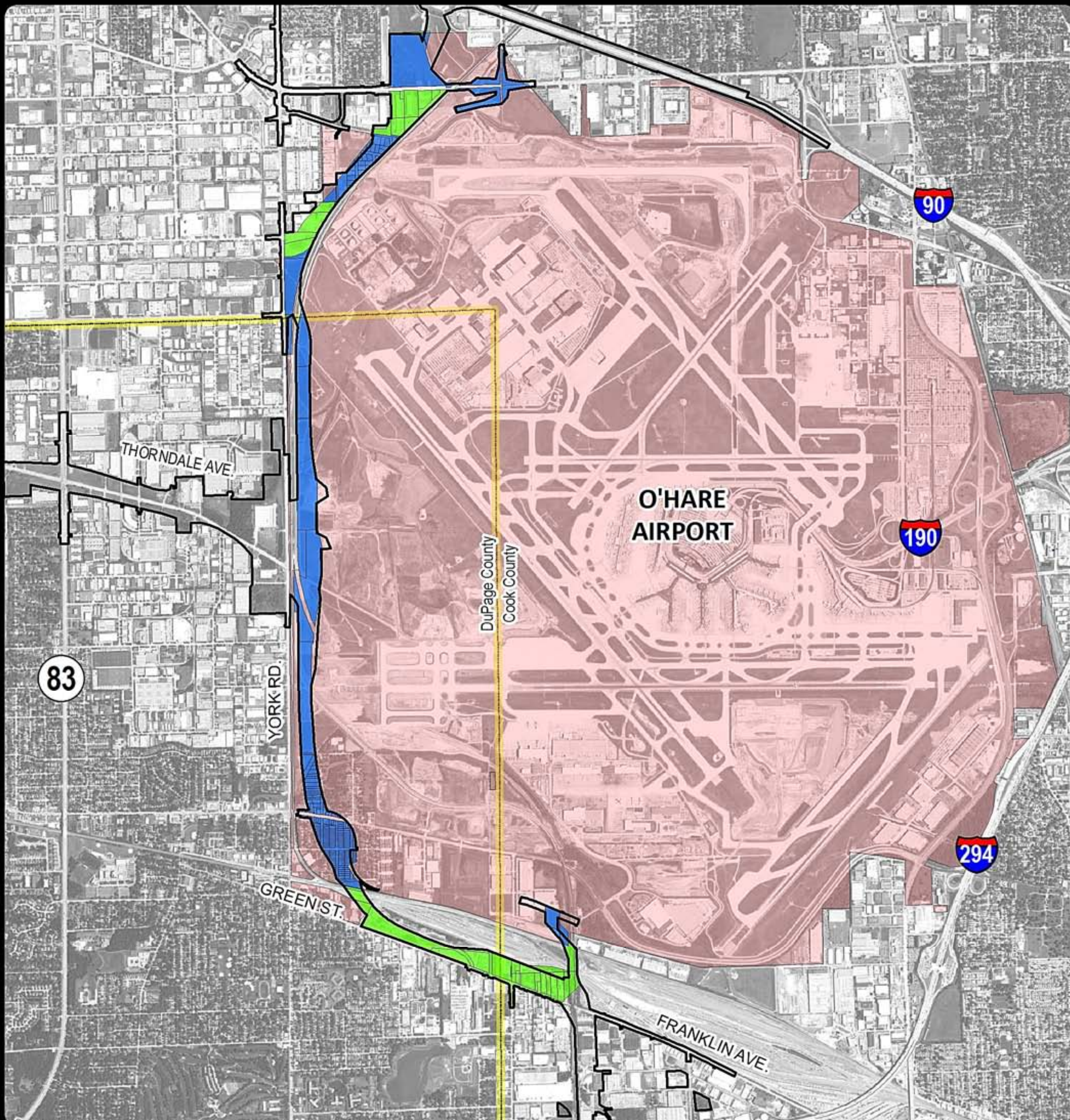
Illinois Department of Transportation

NORTH

0 0.5 1 2 3
Miles

Exhibit 3-7

West Bypass Location on O'Hare Airport



LEGEND

Parcel Ownership

- **Area within project corridor owned or to be owned by the City of Chicago**
- **Area within project corridor owned by others**
- **O'Hare Airport**
- **Project Corridor**
- **County Boundary**

Sources:
-Aerial photography: Airphoto USA, 2008; City of Chicago, 2009
-Parcel Ownership: Dupage County, 2007; Cook County: 2007
-O'Hare Airport: City of Chicago, 2003
-County Boundary: U.S. Census Bureau, 2010

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NORTH

0 0.5 1 2 3
Miles

Exhibit 3-8

Property Ownership Along West Bypass

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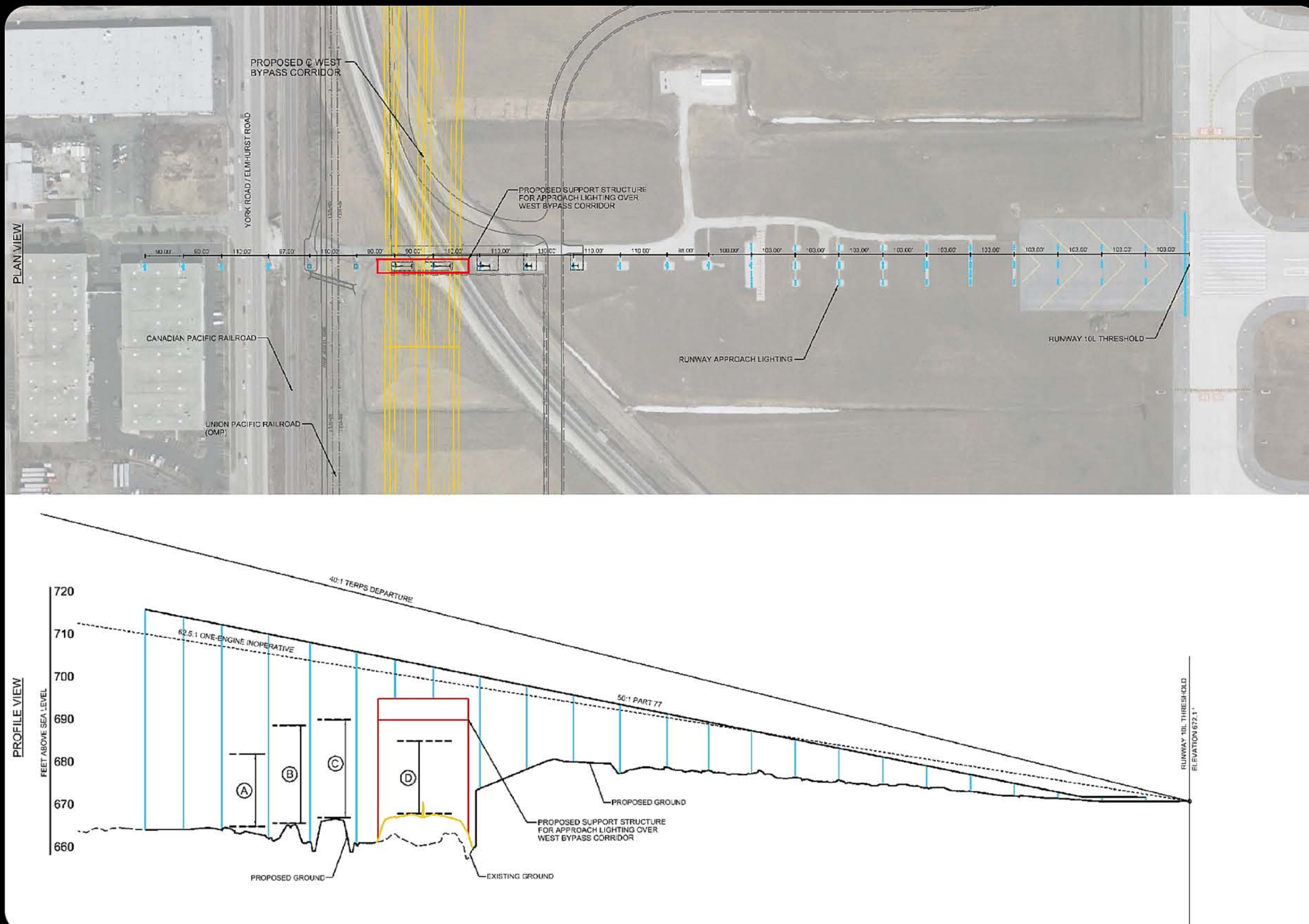

LEGEND

- Runway Approach Lighting
- Ⓐ 17' Required Clearance Over Major Road - York Road/Elmhurst Road
- Ⓑ 23' Required Clearance Over Canadian Pacific Railroad Tracks
- Ⓒ 23' Required Clearance Over Union Pacific Railroad Tracks
- Ⓓ 17' Required Clearance Over Major Road - West Bypass Corridor

Source:
- Chicago Department of Aviation, 2011

NORTH

0 125 250 375 500
Feet

Exhibit 3-9

Runway 10L Approach Lighting Plan and Profile

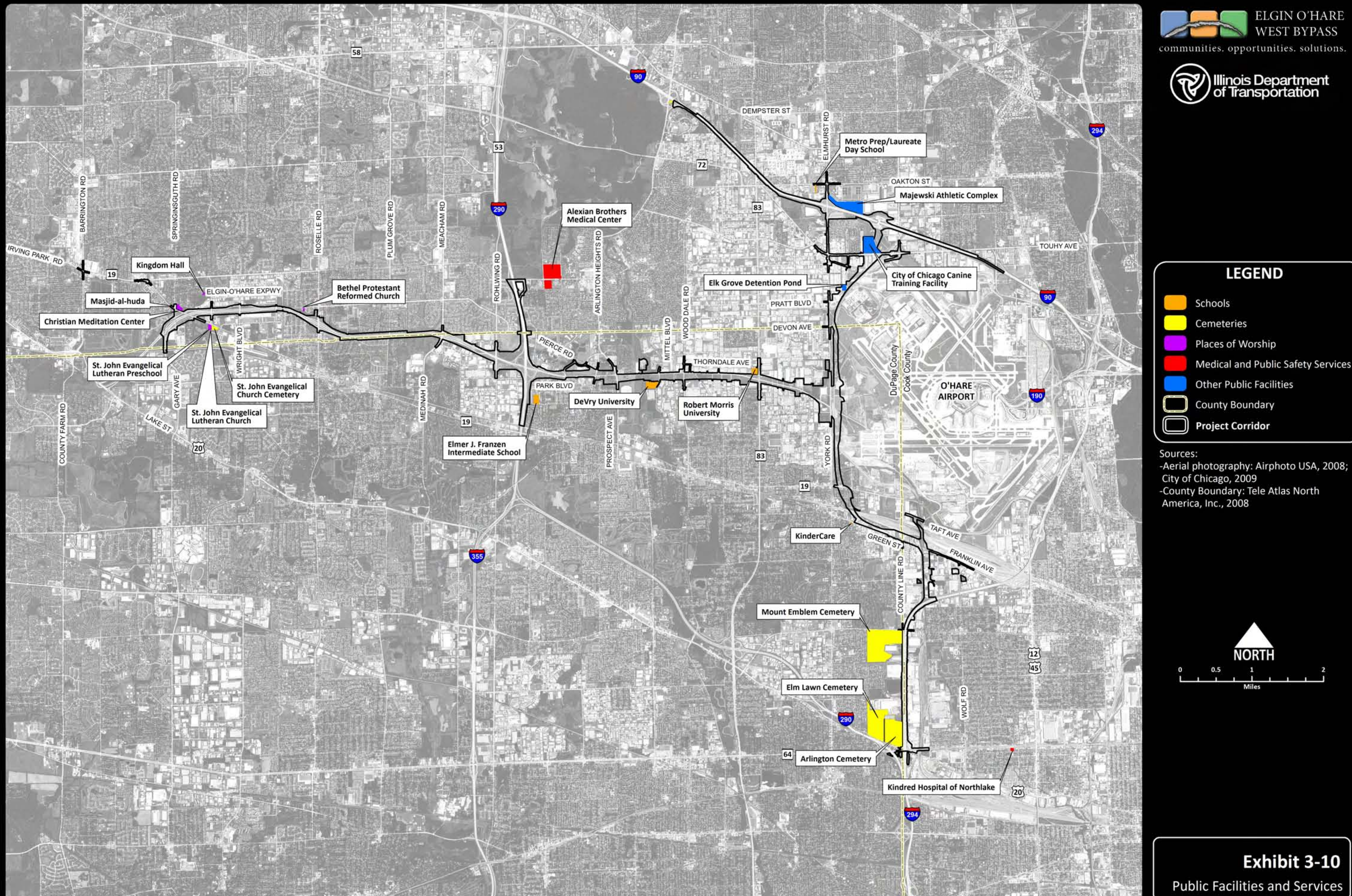

Exhibit 3-10

Public Facilities and Services

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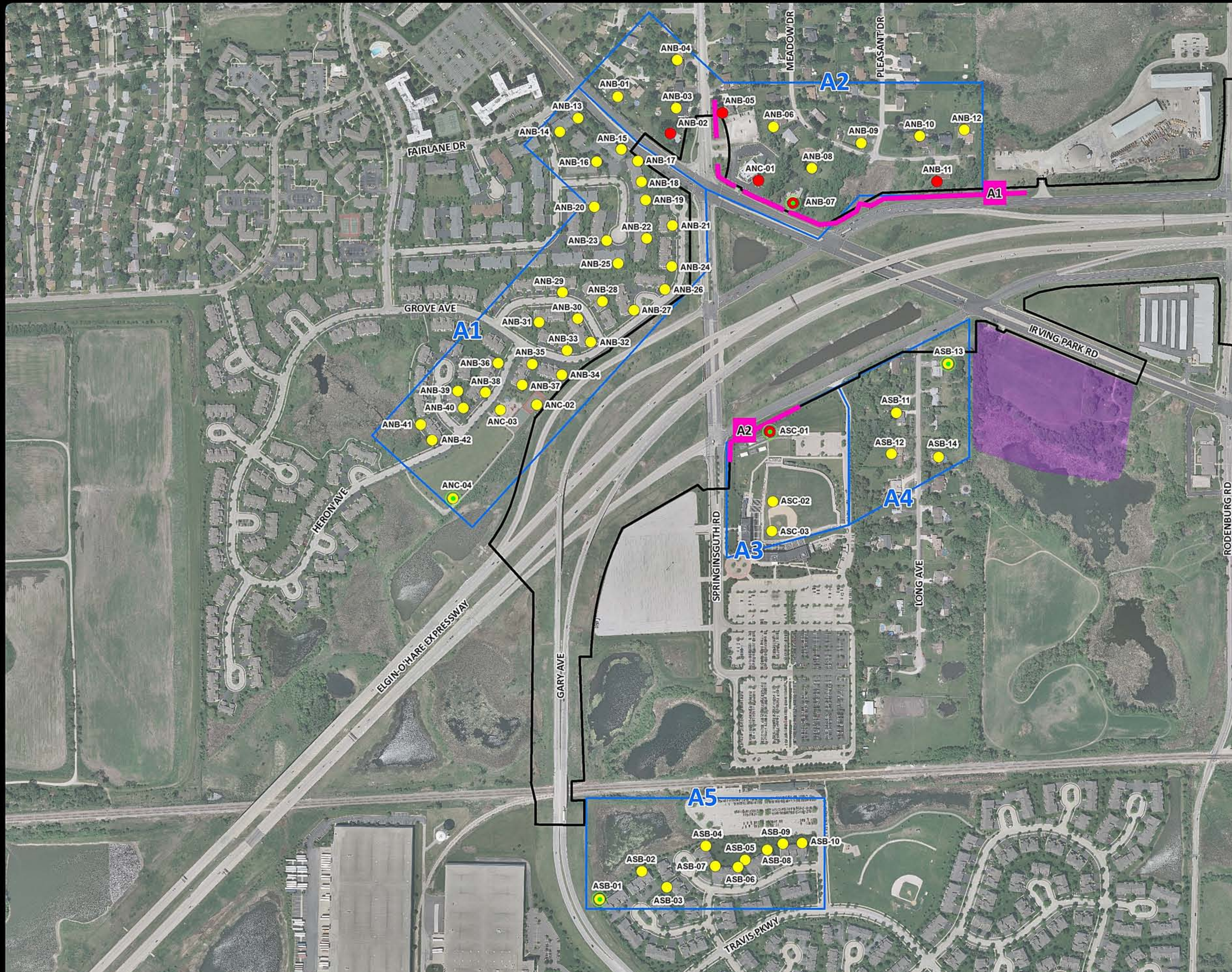

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LEGEND

- Receptors
- Impacted Receptors
- Representative Worst Case Receptors
- Noise Barrier Not to be Implemented
- Common Noise Environment
- Undeveloped Land
- Project Corridor

Note:
- Barrier locations are approximate.

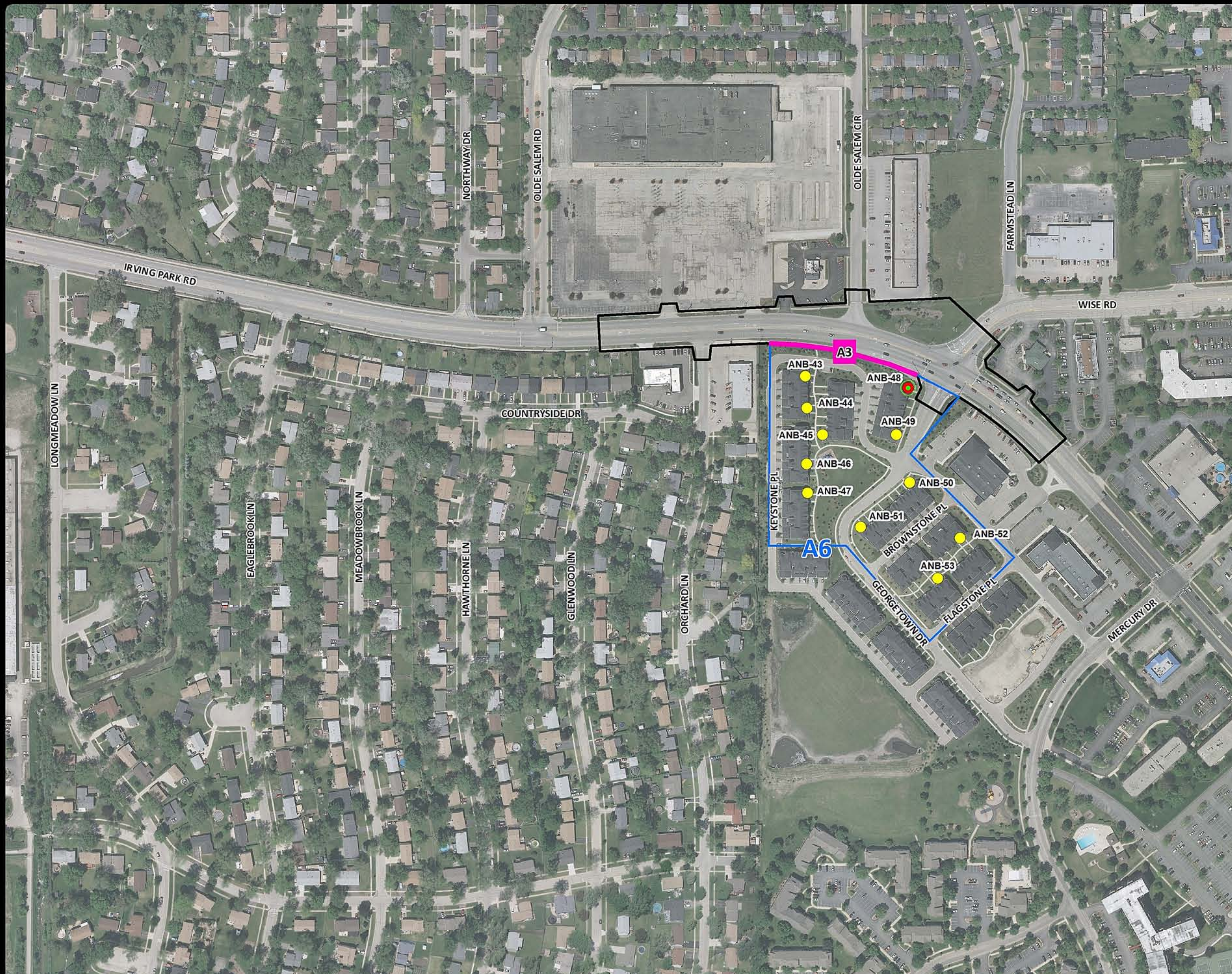
Source:
- Aerial photography: City of Chicago, 2009

NORTH

0 125 250 500
Feet

Exhibit 3-11A

Noise Receptors
Section A



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Illinois Department of Transportation

LEGEND

- Receptors
- Impacted Receptors
- Representative Worst Case Receptors
- Noise Barrier Not to be Implemented
- Common Noise Environment
- Project Corridor

Note:
- Barrier locations are approximate.

Source:
- Aerial photography: City of Chicago, 2009

Exhibit 3-11B

Noise Receptors
Section A

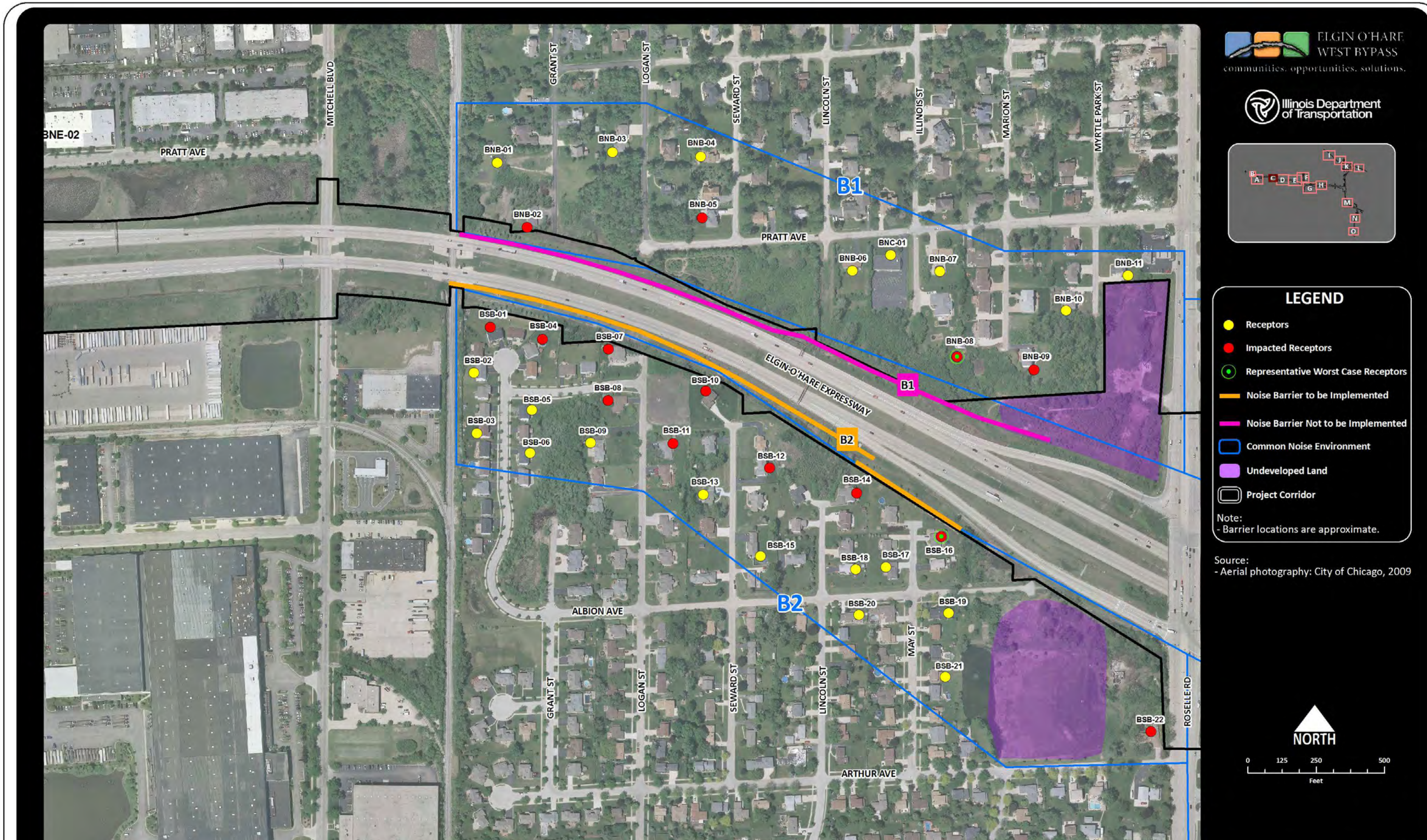
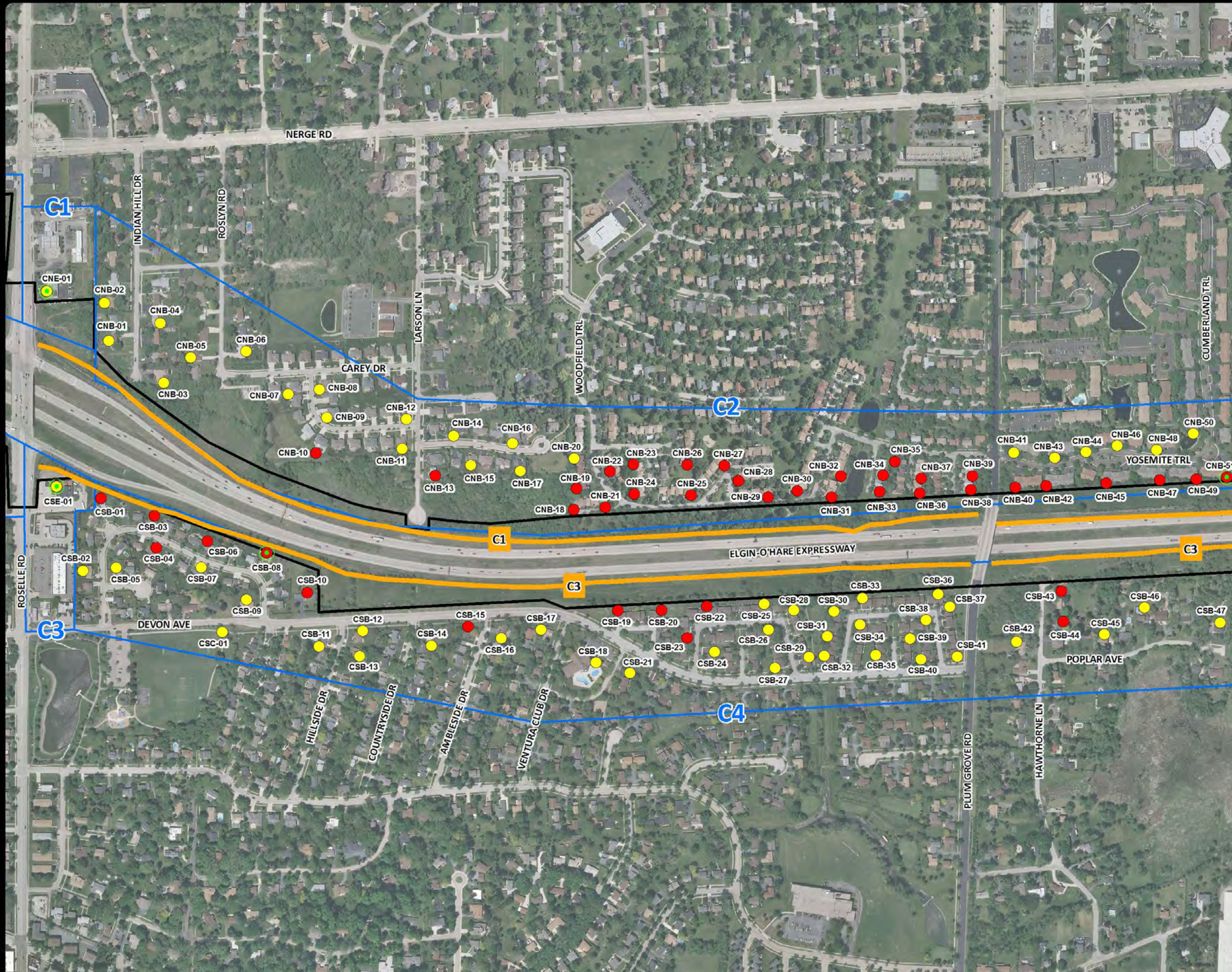


Exhibit 3-11C

Noise Receptors
Section B



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Illinois Department of Transportation

LEGEND

- Receptors
- Impacted Receptors
- Representative Worst Case Receptors
- Noise Barrier to be Implemented
- Common Noise Environment
- Project Corridor

Note:
- Barrier locations are approximate.

Source:
- Aerial photography: City of Chicago, 2009

NORTH

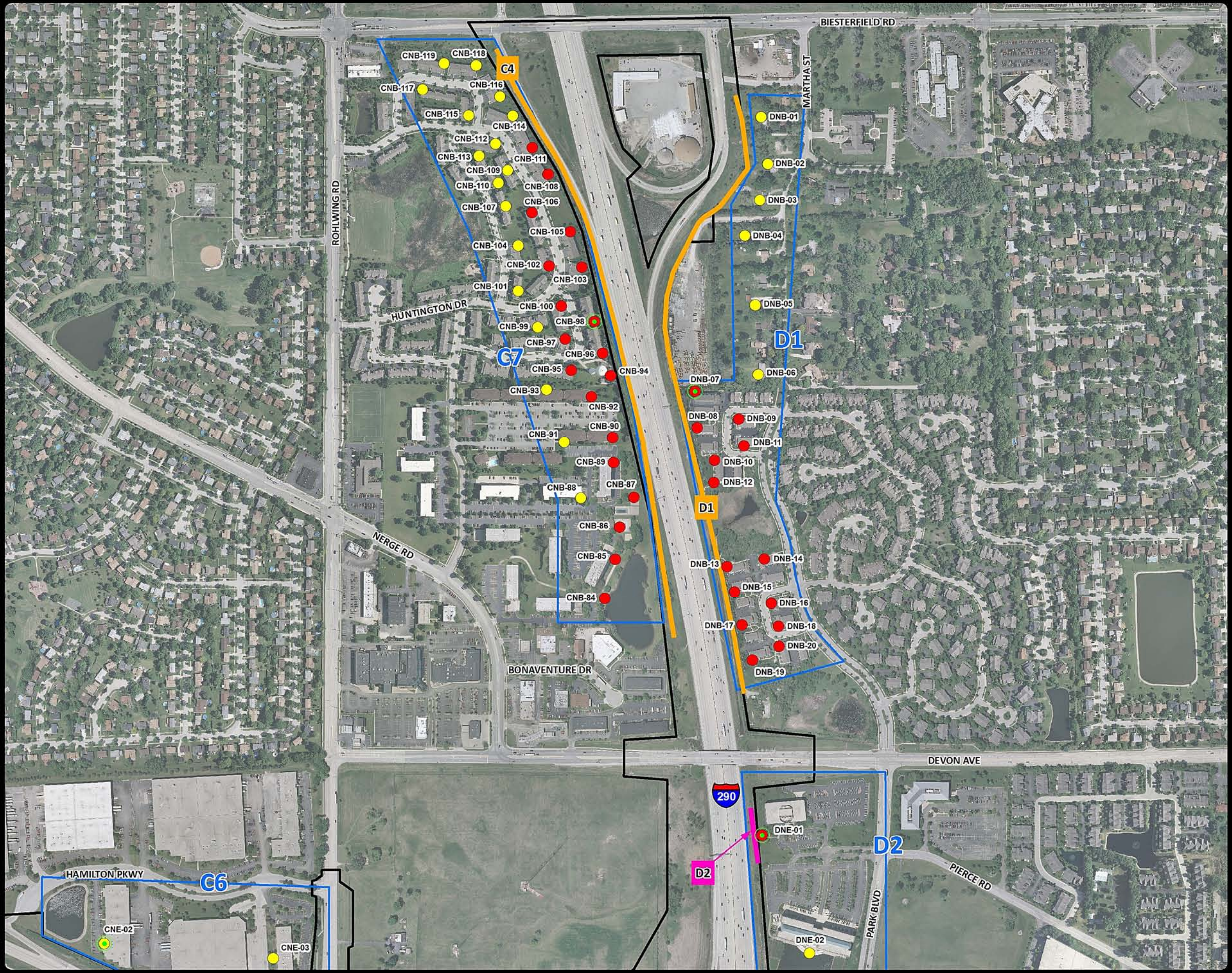
0 125 250 500
Feet

Exhibit 3-11D

Noise Receptors
Section C

Exhibit 3-11E

Noise Receptors
Section C



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LEGEND

- Receptors
- Impacted Receptors
- Representative Worst Case Receptors
- Noise Barrier to be Implemented
- Noise Barrier Not to be Implemented
- Common Noise Environment
- Project Corridor

Note:
- Barrier locations are approximate.

Source:
- Aerial photography: City of Chicago, 2009

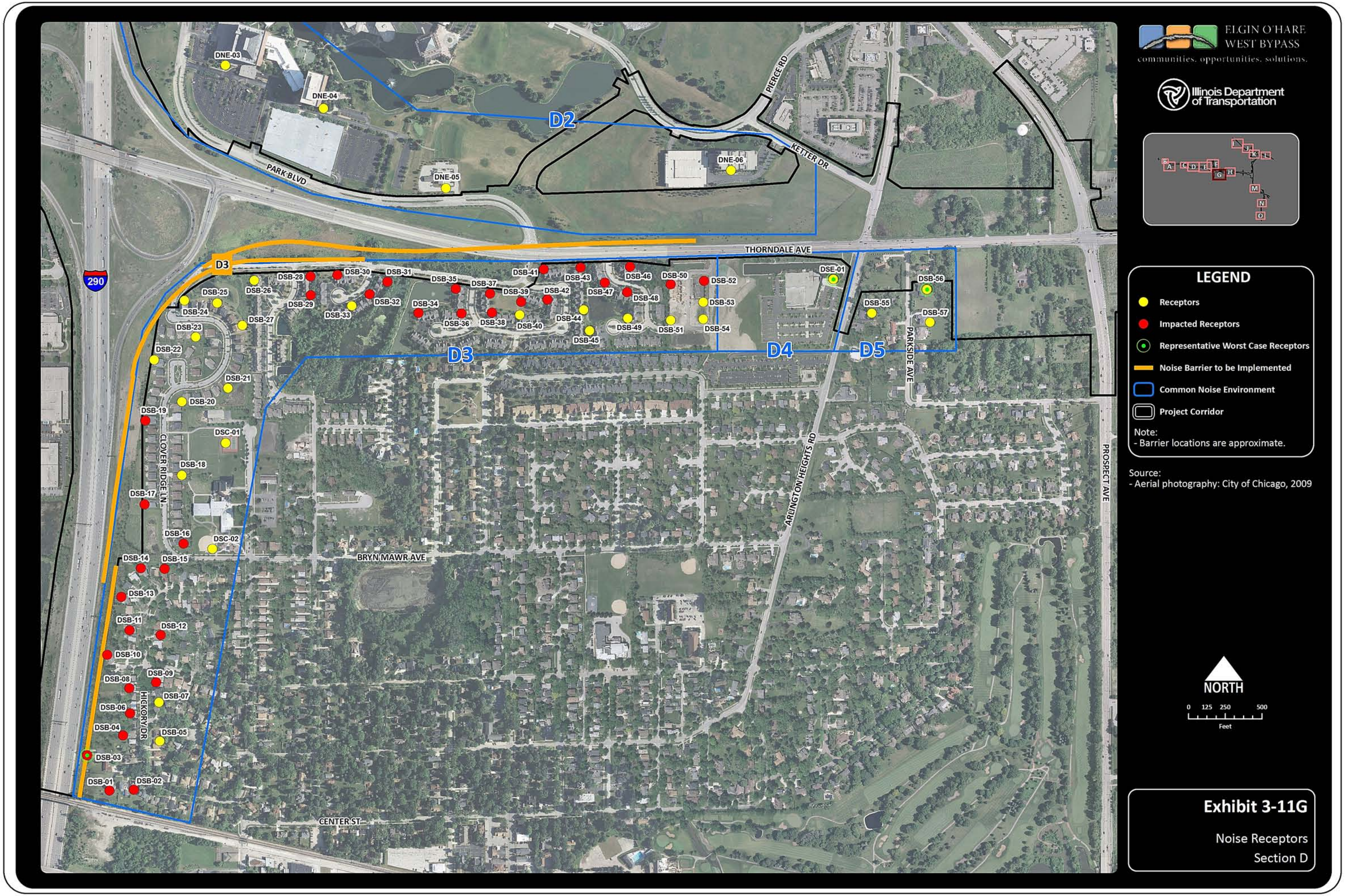
NORTH

0 125 250 500

Feet

Exhibit 3-11F

Noise Receptors
Section C & D



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Illinois Department of Transportation
LEGEND
Receptors
Impacted Receptors
Representative Worst Case Receptors
Noise Barrier to be Implemented
Common Noise Environment
Project Corridor
Note:
- Barrier locations are approximate.
Source:
- Aerial photography: City of Chicago, 2009
NORTH
0 125 250 500
Feet
Exhibit 3-11G
Noise Receptors
Section D
D2
D3
D4
D5
290
PARK BLVD
PIERCE RD
KETTER DR
THORNDALE AVE
PARKSIDE AVE
CLOVER RIDGE LN
HICKORY DR
BRYN MAWR AVE
ARLINGTON HEIGHTS RD
PROSPECT AVE
CENTER ST
DNE-03
DNE-04
DNE-05
DNE-06
DSE-01
DSC-01
DSC-02
DSB-01
DSB-02
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DSB-57

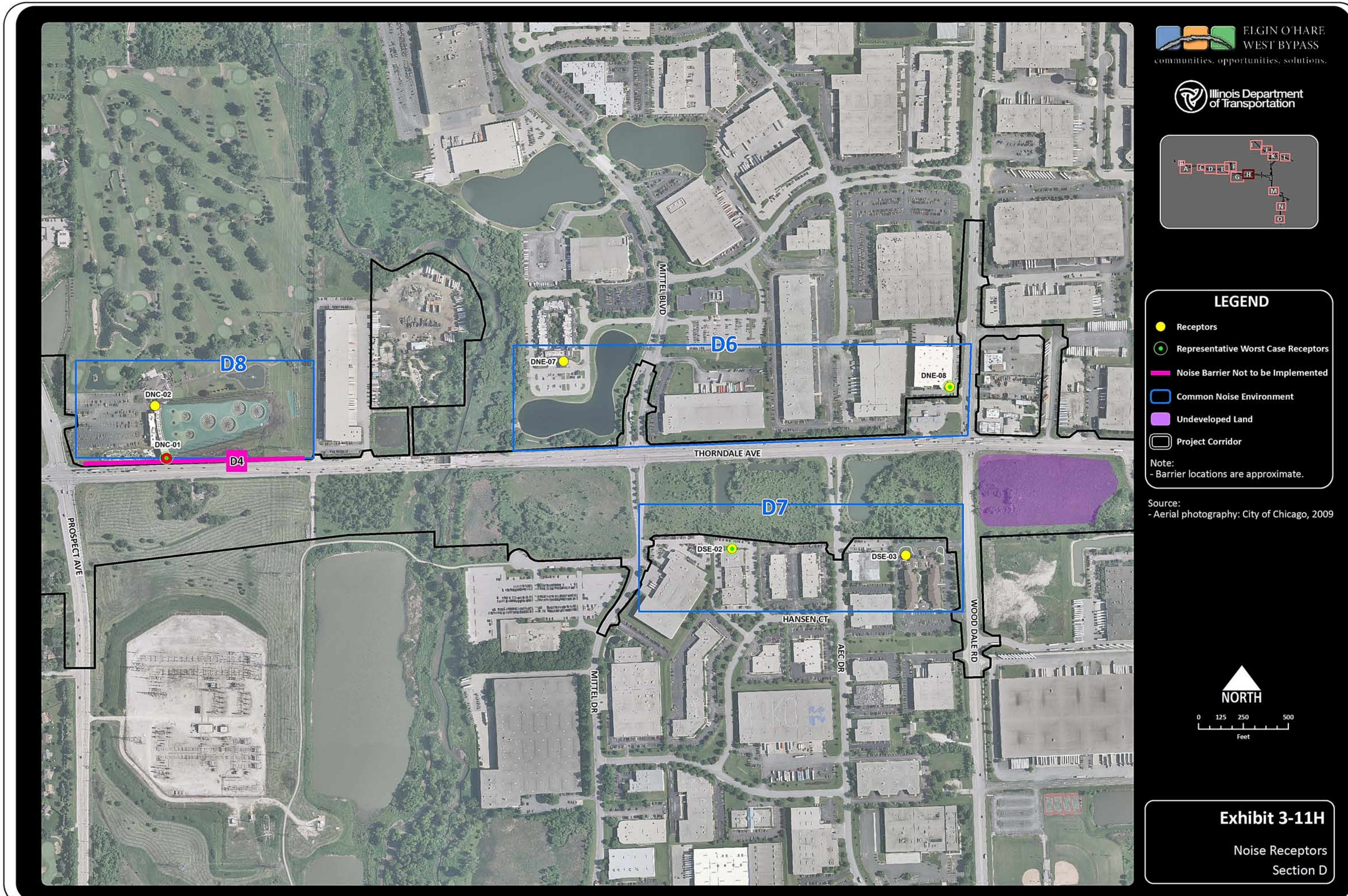

Exhibit 3-11H

Noise Receptors
Section D

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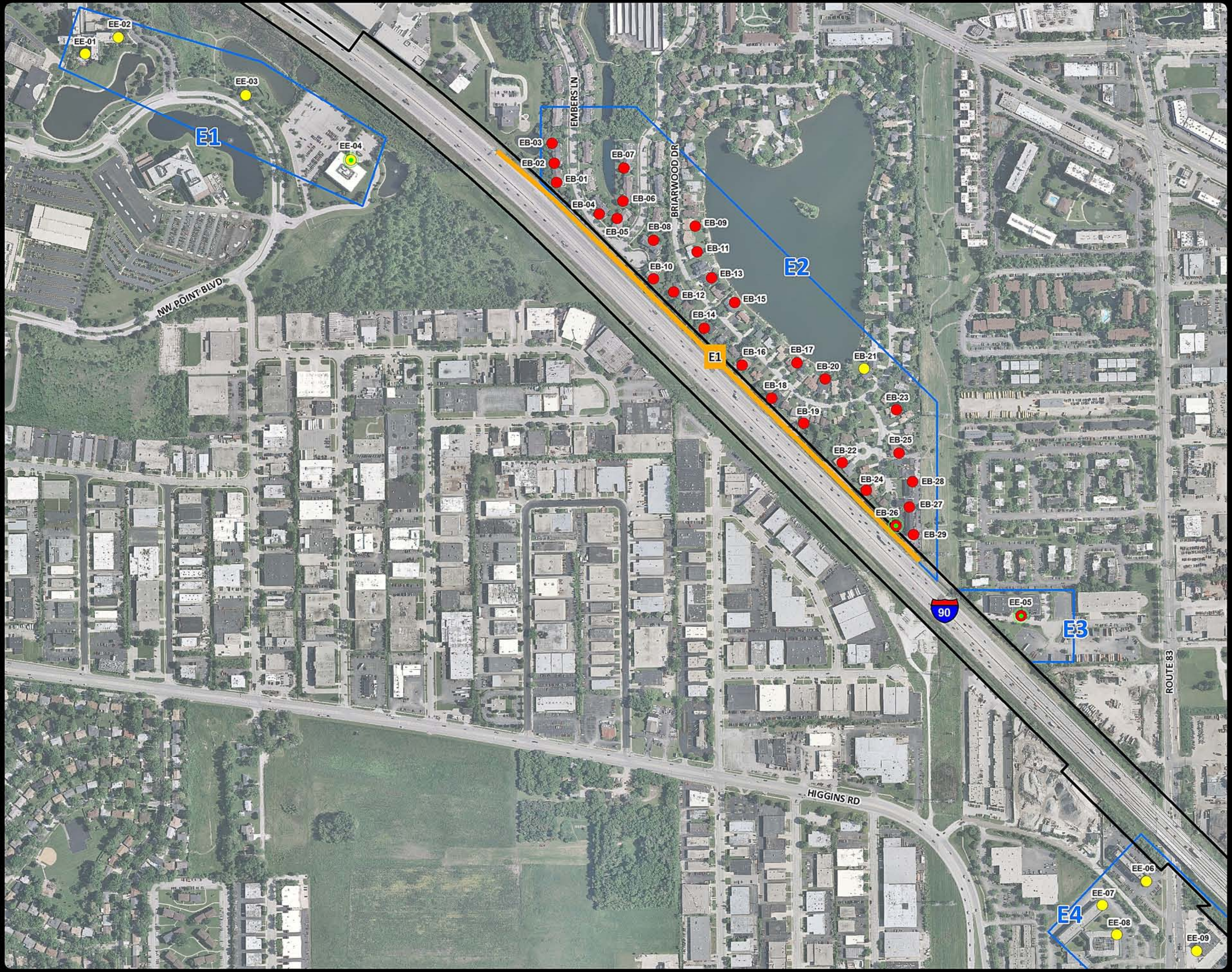


LEGEND

- Receptors
- Impacted Receptors
- Representative Worst Case Receptors
- Noise Barrier to be Implemented
- Common Noise Environment
- Project Corridor

Note:
- Barrier locations are approximate.

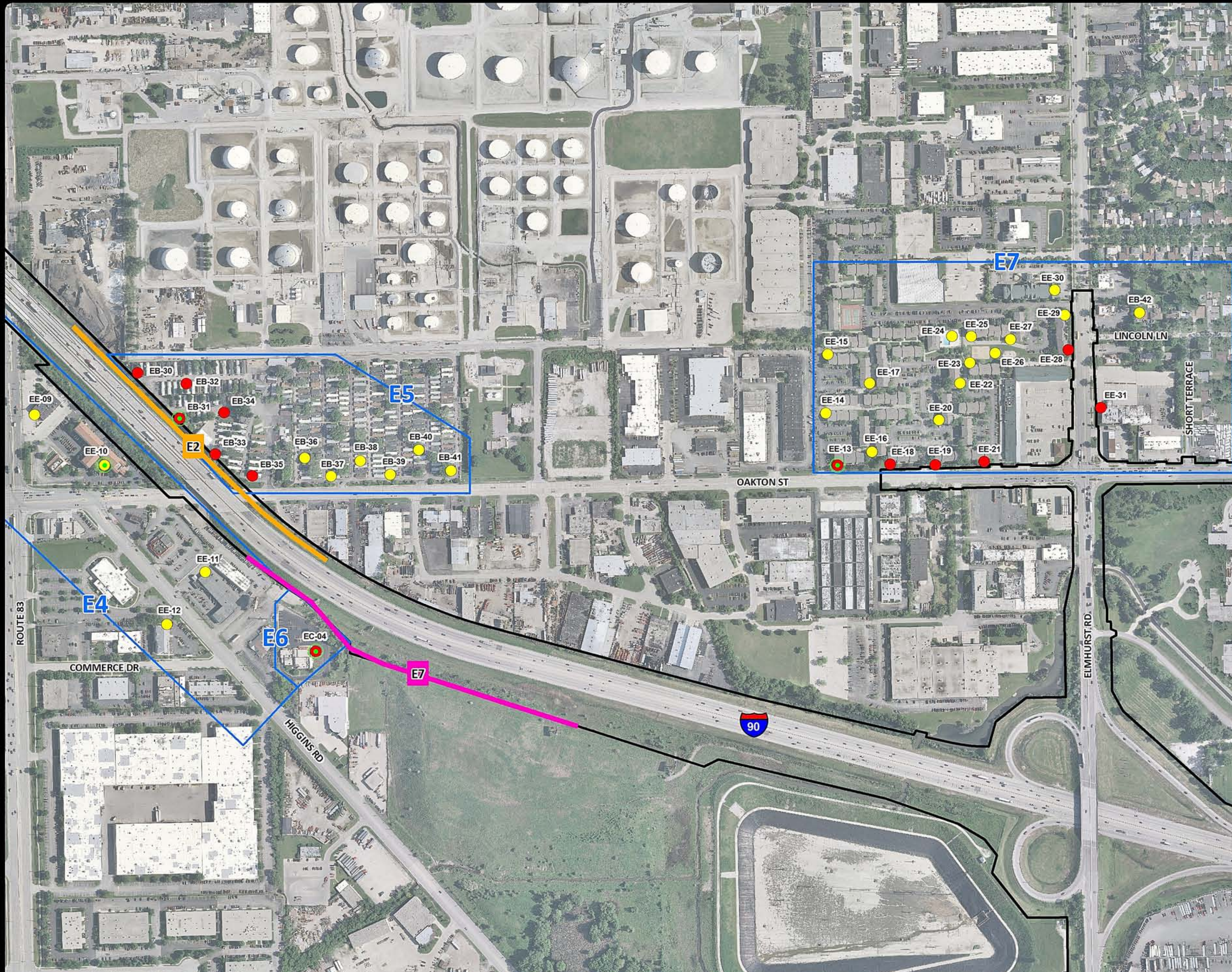
Source:
- Aerial photography: City of Chicago, 2009

NORTH

0 125 250 500
Feet

Exhibit 3-11I

Noise Receptors
Section E



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LEGEND

- Receptors
- Impacted Receptors
- Representative Worst Case Receptors
- Noise Barrier to be Implemented
- Noise Barrier Not to be Implemented
- Common Noise Environment
- Project Corridor

Note:
- Barrier locations are approximate.

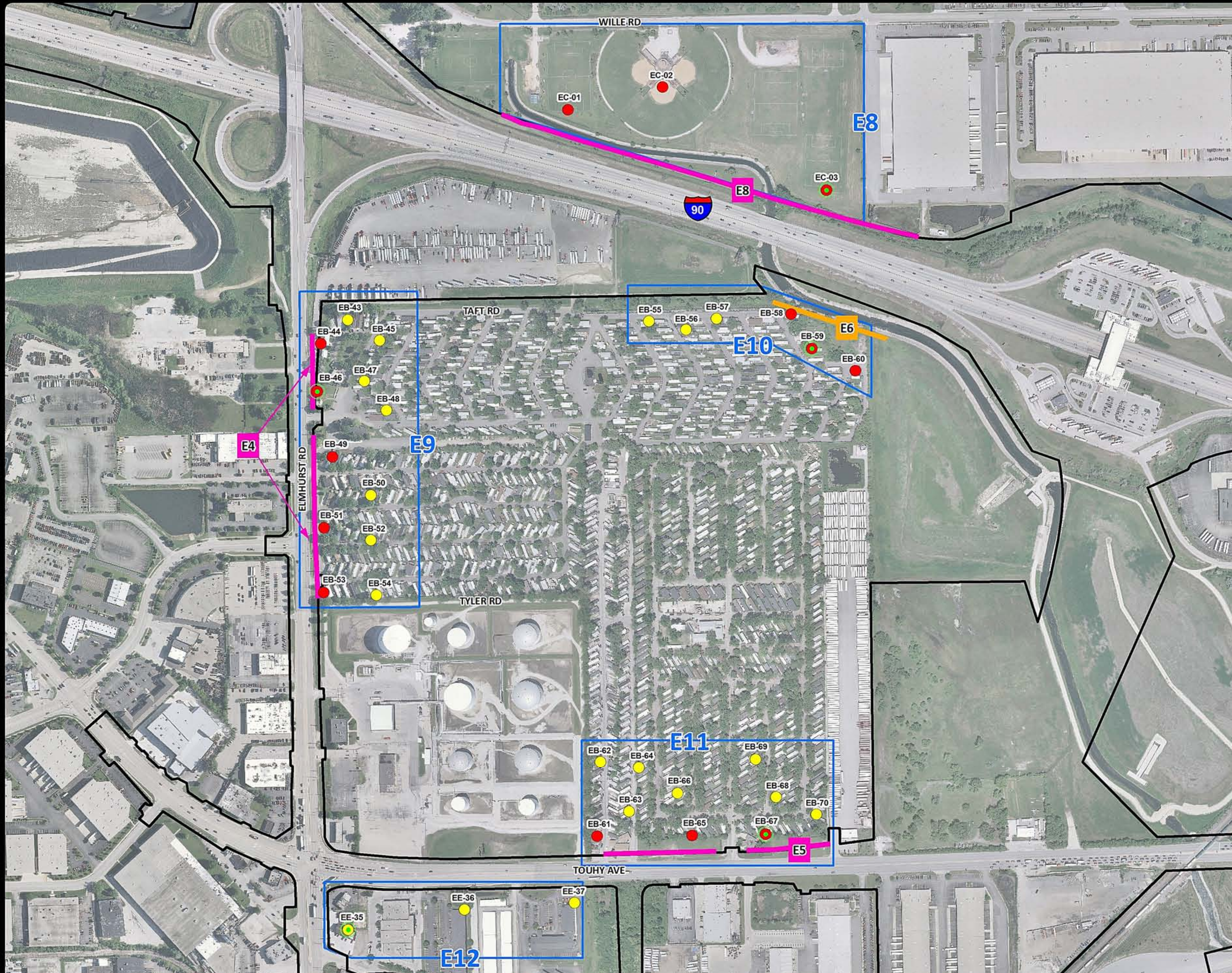
Source:
- Aerial photography: City of Chicago, 2009

NORTH

0 125 250 500
Feet

Exhibit 3-11J

Noise Receptors
Section E



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Illinois Department of Transportation

LEGEND

- Receptors
- Impacted Receptors
- Representative Worst Case Receptors
- Noise Barrier to be Implemented
- Noise Barrier Not to be Implemented
- Common Noise Environment
- Project Corridor

Note:
- Barrier locations are approximate.

Source:
- Aerial photography: City of Chicago, 2009

NORTH

0 125 250 500
Feet

Exhibit 3-11K

Noise Receptors
Section E

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Illinois Department of Transportation

LEGEND

- Receptors
- Impacted Receptors
- Representative Worst Case Receptors
- Noise Barrier to be Implemented
- Common Noise Environment
- Project Corridor

Note:
- Barrier locations are approximate.

Source:
- Aerial photography: City of Chicago, 2009

NORTH

0 125 250 500
Feet

Exhibit 3-11L

Noise Receptors
Section E

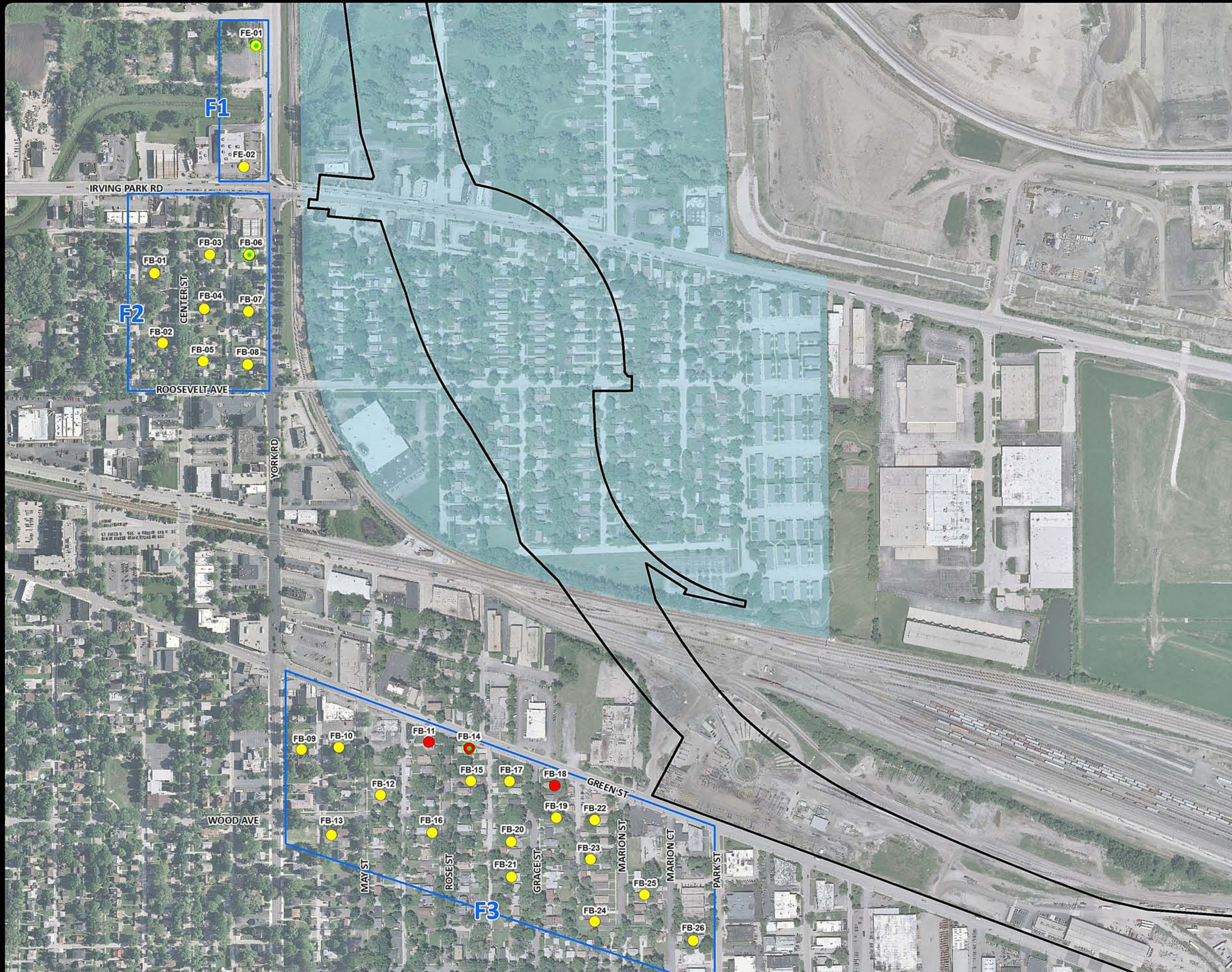

Exhibit 3-11M

Noise Receptors
Section F

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LEGEND

- Receptors
- Representative Worst Case Receptors
- Common Noise Environment
- Project Corridor

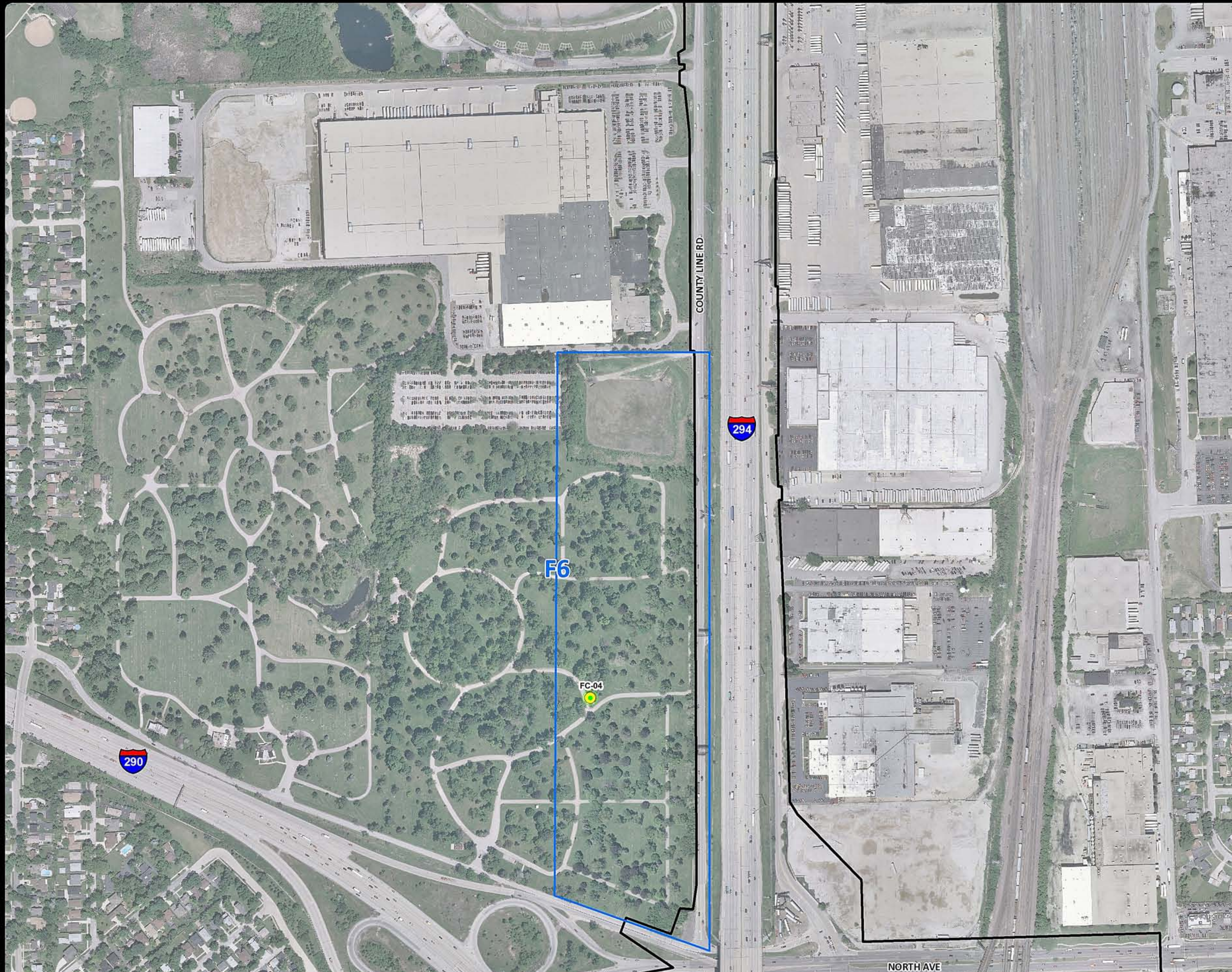
Source:
- Aerial photography: City of Chicago, 2009

NORTH

0 125 250 500
Feet

Exhibit 3-11N

Noise Receptors
Section F



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LEGEND

- Receptors
- Representative Worst Case Receptors
- Common Noise Environment
- Project Corridor

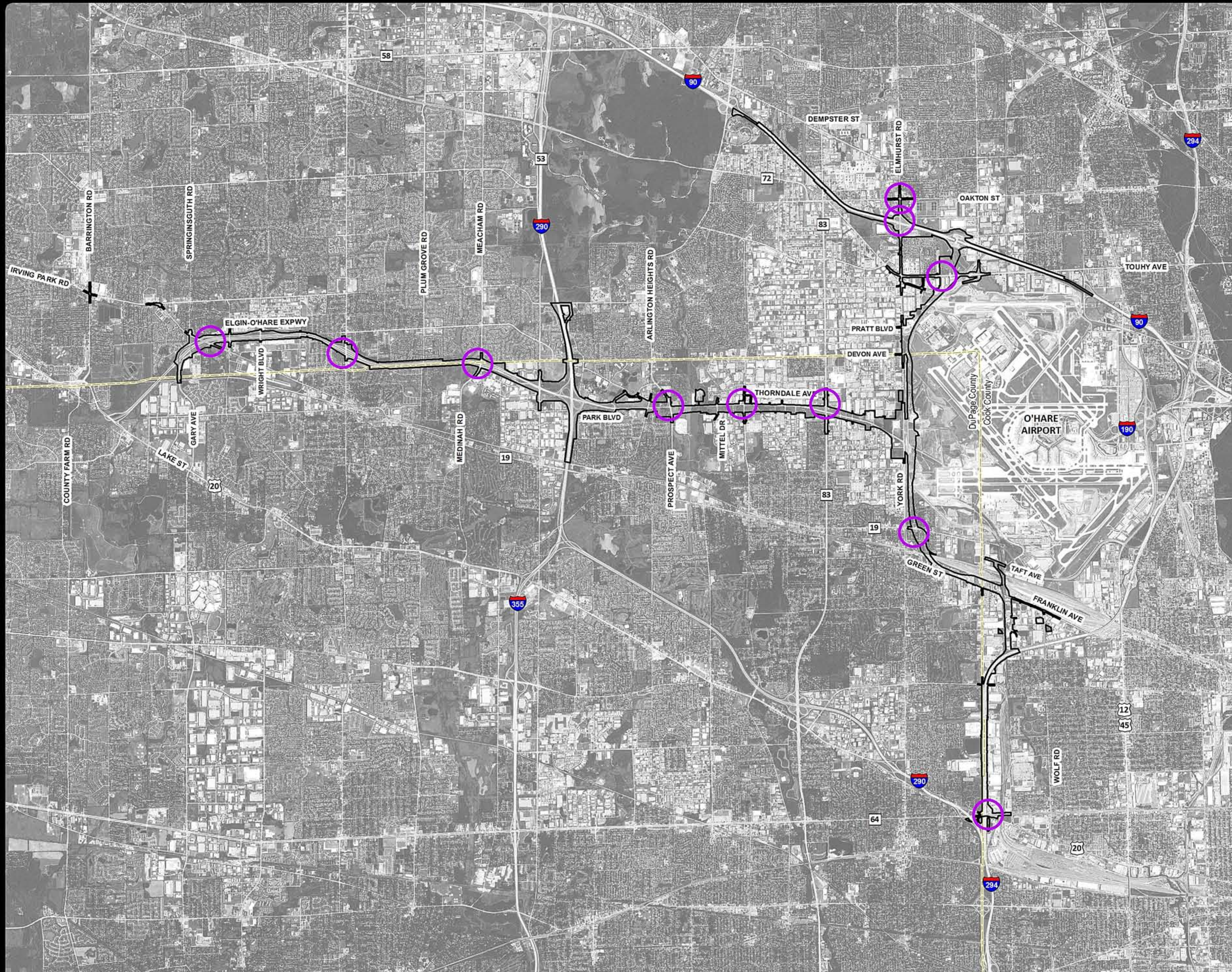
Source:
- Aerial photography: City of Chicago, 2009

NORTH

0 125 250 500
Feet

Exhibit 3-11O

Noise Receptors
Section F



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LEGEND

- COSIM Prescreen Locations
- County Boundary
- Project Corridor

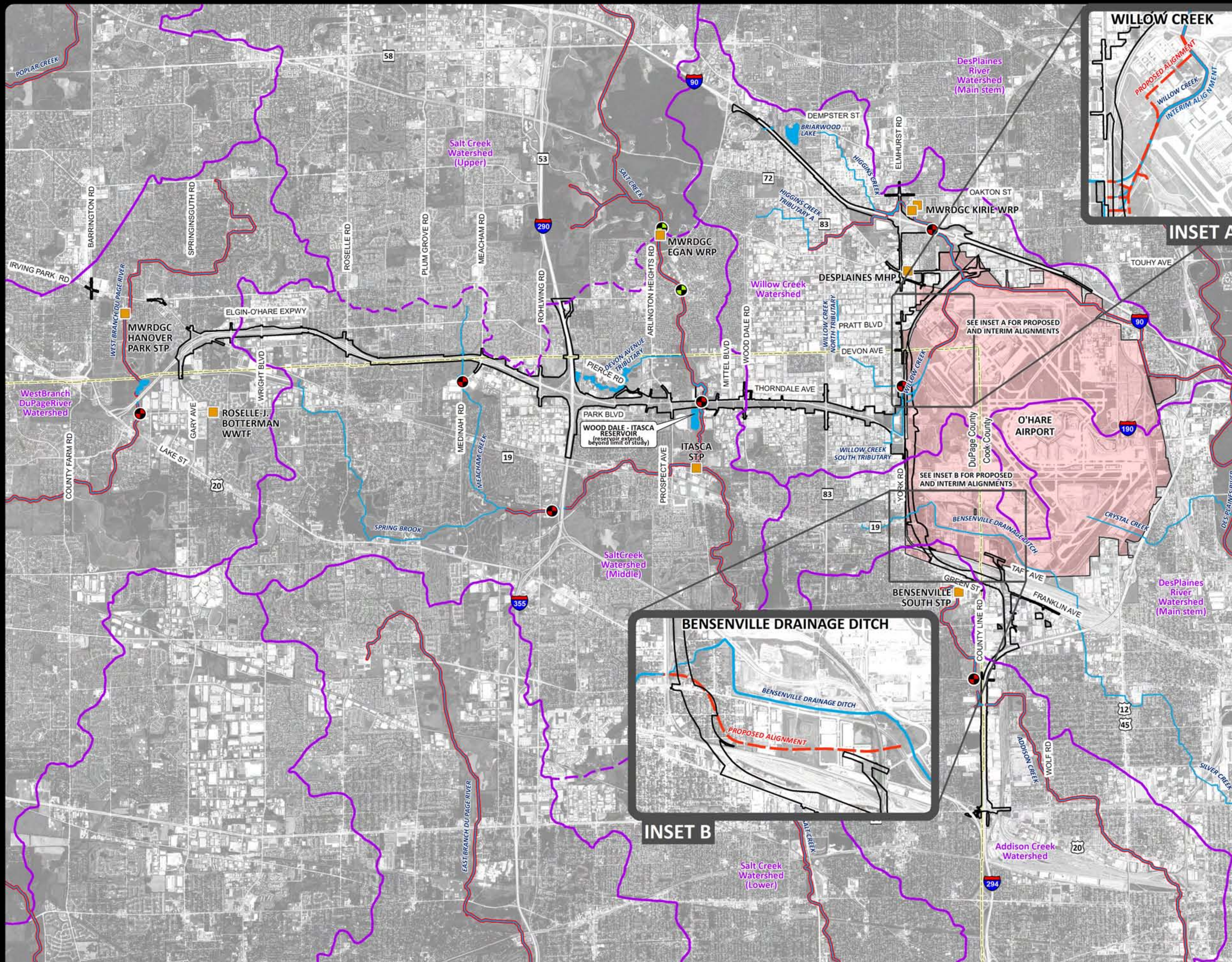
Source:
- Aerial photography: Airphoto USA, 2008; City of Chicago, 2011
- County Boundary: U.S. Census, 2010

NORTH

0 0.5 1 2
Miles

Exhibit 3-12

Carbon Monoxide Screen for Intersection Modeling (COSIM) Prescreen Locations



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LEGEND

- Surface Waters
- Impaired Stream Segments
- Wastewater Treatment Plant Outfalls (within 2 miles upstream & 1 mile downstream)
- Stream Sampling Sites
- DRSCW Chloride Monitoring Sites (DRSCW = DuPage River Salt Creek Workgroup)
- Watershed Boundary
- O'Hare Airport
- County Boundary
- Project Corridor

Notes:
- Stream sampling data for Bensenville Drainage Ditch collected by Headrick (2002) within OMP limits. Sampling site was located at portion of ditch that was relocated and is not shown on exhibit.
- Two of the DRSCW monitoring sites are located beyond the limits of this exhibit and are not shown.
- Stream widths are not to scale.

Sources:
- Surface Waters: Cook County, 2006; DuPage County, 2009; IEPA, 2006; Matthews and Zercher, 2010; and Matthews, et al., 2011
- Impaired Streams 303(d): IEPA, 2010
- Stream Sampling Sites: Wetzel, et al., 2010a; Wetzel, et al., 2010b
- DRSCW chloride monitoring data: McCracken, 2011
- Wastewater Treatment Plant Outfalls: IEPA, 2002
- Watershed Boundary: IEPA, 2002
- O'Hare Airport: City of Chicago, 2003
- Aerial photography: Airphoto USA, 2008; City of Chicago, 2009
- County Boundary: Tele Atlas North America, Inc., 2008

NORTH

0 0.5 1 2
Miles

Exhibit 3-13

Surface Water Resources

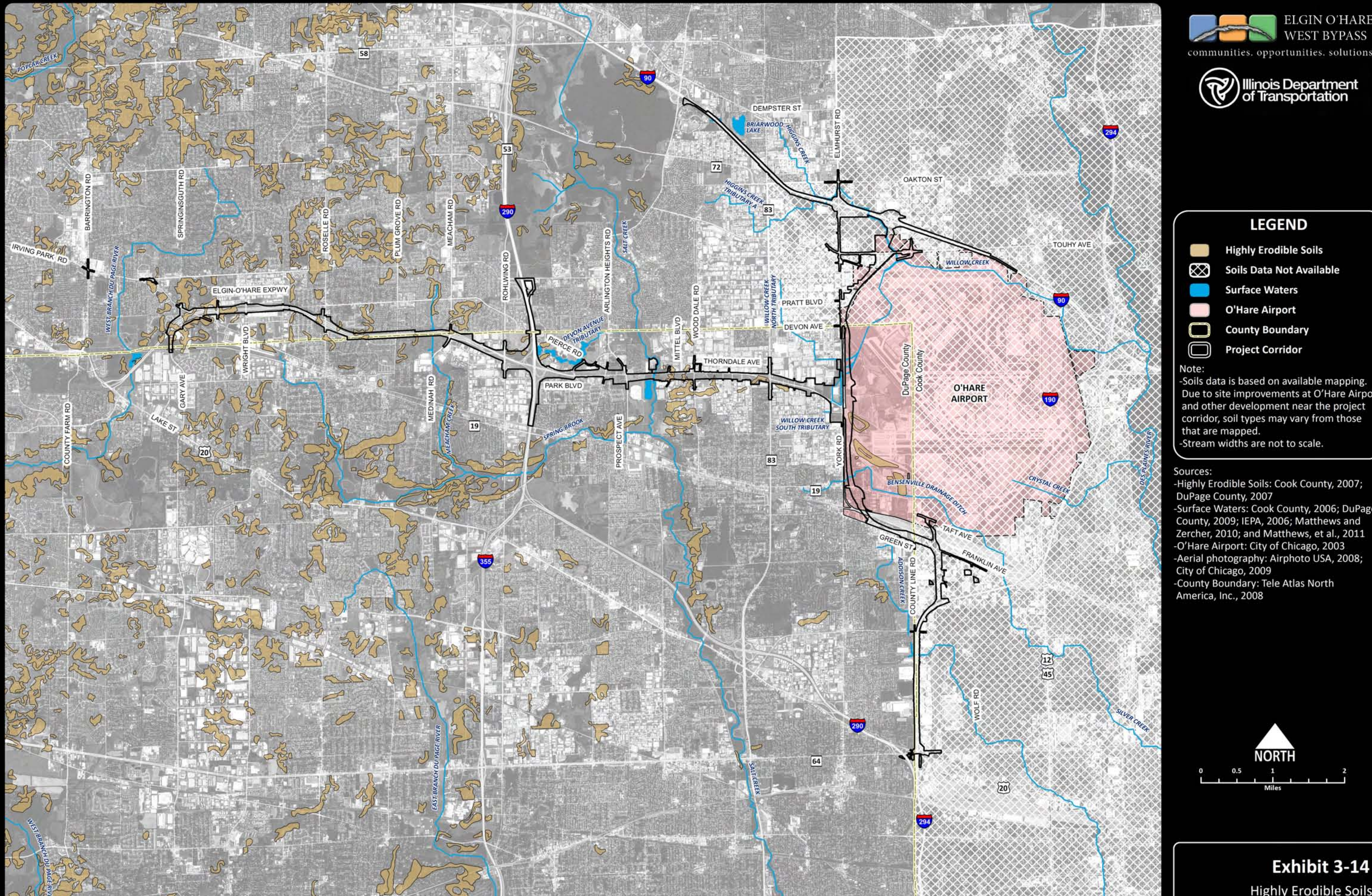
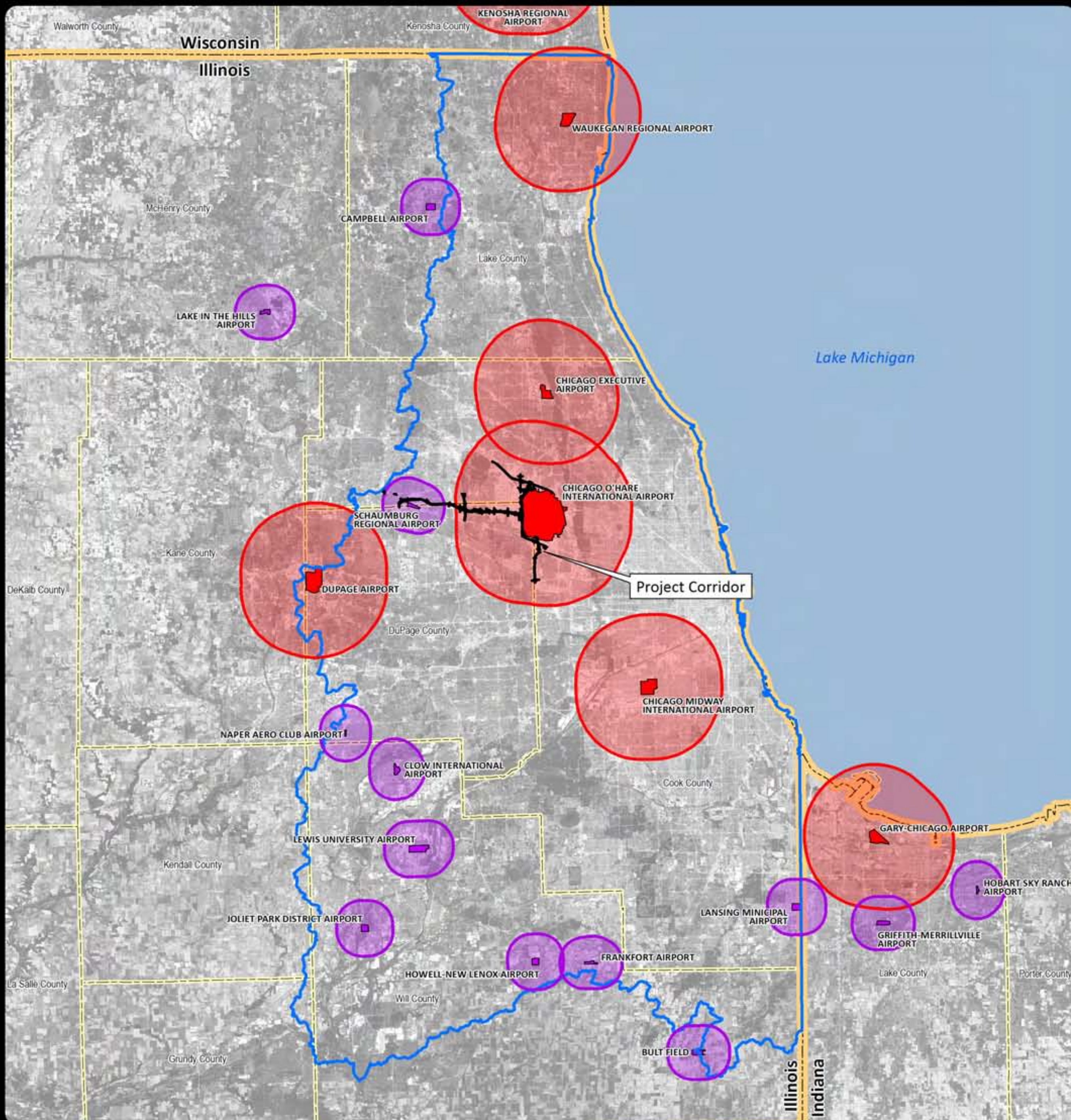


Exhibit 3-14
Highly Erodible Soils



LEGEND

Wildlife Hazard Separation Distances

- Airports With 5-Mile Separation Distance
- Airports With 10,000-Foot Separation Distance
- Des Plaines River and Lake Michigan Tributaries Drainage Basin (in Illinois)
- County Boundary
- State Boundary

Sources:
-Wildlife Hazard Separation Distances: Federal Aviation Administration Advisory Circular No. 150/5200-33B
-Des Plaines River and Lake Michigan Tributaries Drainage Basin (in Illinois) : IDOT Wetlands Action Plan, 1998
-O'Hare Airport: City of Chicago, 2003
-Aerial photography: Airphoto USA, 2008
-State and County Boundary: Tele Atlas North America, Inc., 2008

Note: Only airports/airport buffers directly adjacent to the Des Plaines River and Lake Michigan Tributaries Drainage Basin are shown.

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NORTH

0 5 10 20
Miles

Exhibit 3-15
Federal Aviation Administration
Wildlife Hazard Separation Distances

Path: N:\Idot\070404\GIS\Exhibits\Tier 2\OMP 5Mile Buffer\Airport Buffer Exhibit Small.mxd

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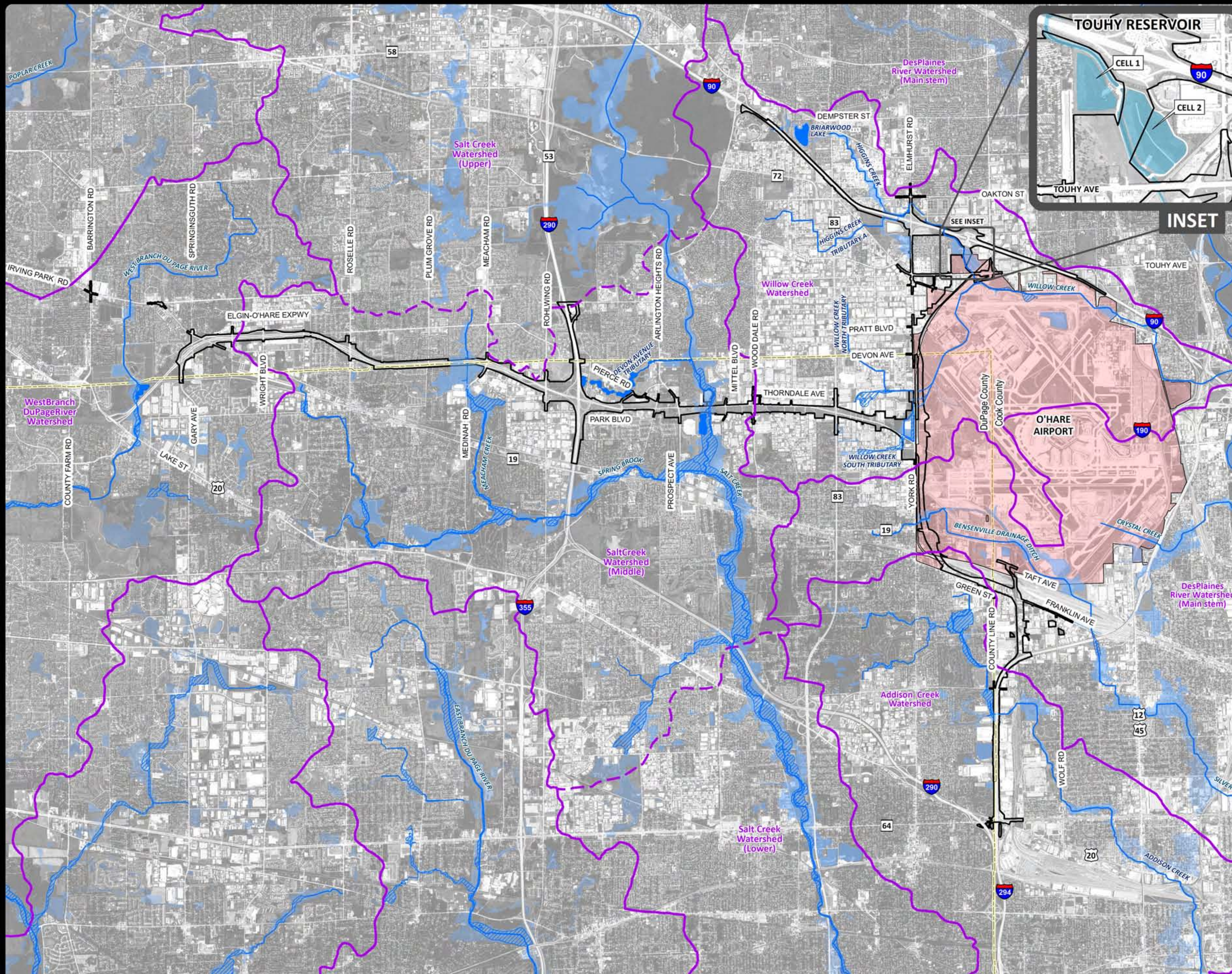

LEGEND

- 100-Year Floodplain
- Floodway
- Watershed Boundary
- Surface Waters
- O'Hare Airport
- County Boundary
- Project Corridor

Note:
-Stream widths are not to scale.

Sources:
-100-Year Floodplain and Floodway: CBBEL, 2006; FEMA, 1993; FEMA, 2004; FEMA, 2008
-Surface Waters: Cook County, 2006; DuPage County, 2009; IEPA, 2006; Matthews and Zercher, 2010; and Matthews, et al., 2011
-Watershed Boundary: IEPA, 2002
-O'Hare Airport: City of Chicago, 2003
-Aerial photography: Airphoto USA, 2008; City of Chicago, 2009
-County Boundary: Tele Atlas North America, Inc., 2008

NORTH
0 0.5 1 2
Miles

Exhibit 3-16
100-Year Floodplains and Floodways

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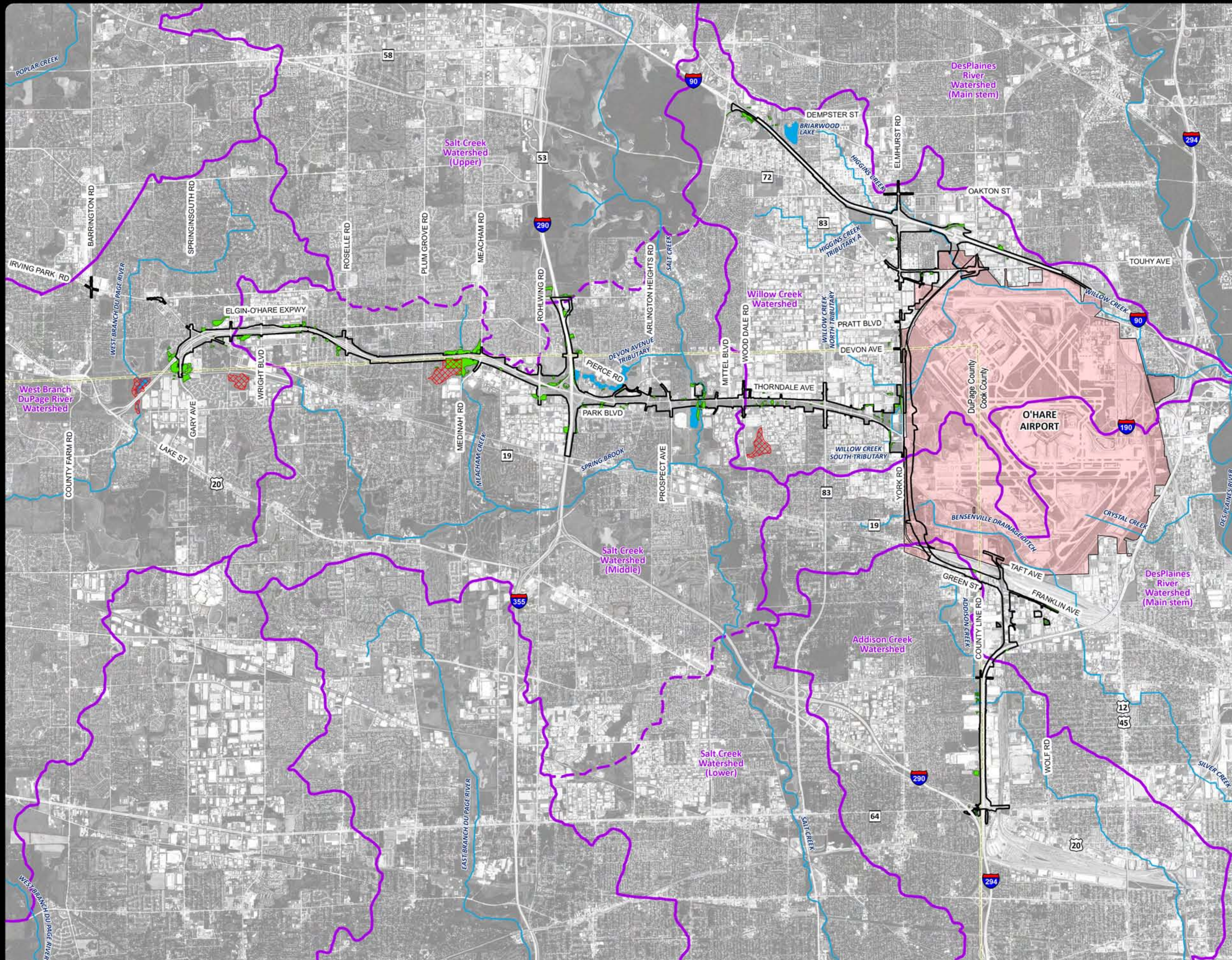


LEGEND

- Wetlands
- Mapped Critical Wetlands
- Surface Waters
- Watershed Boundary
- O'Hare Airport
- County Boundary
- Project Corridor

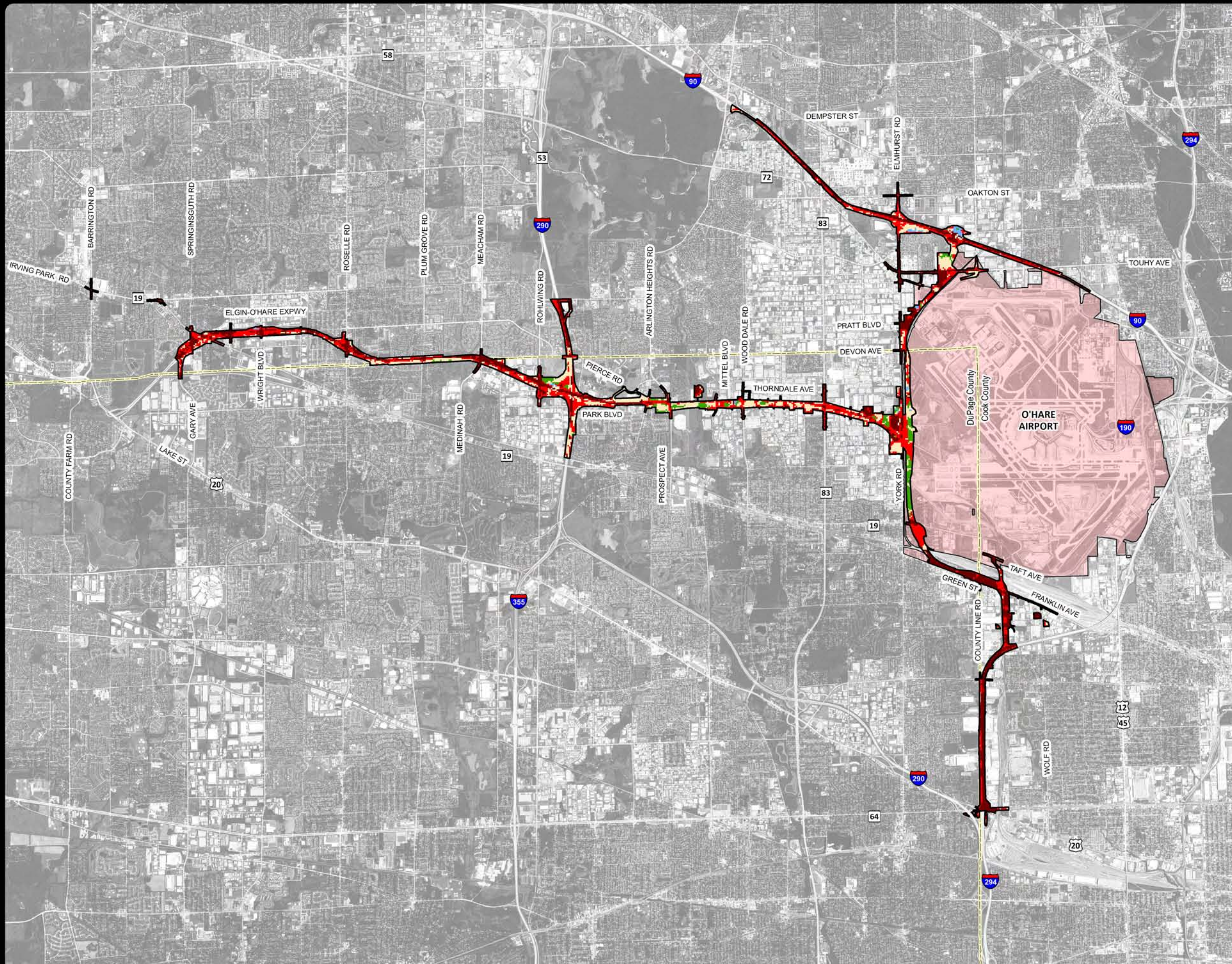
Notes:
-Detailed wetland information is located in wetland appendix.
-Stream widths are not to scale.

Sources:
-Surface Waters: Cook County, 2006; DuPage County, 2009; IEPA, 2006; Matthews and Zercher, 2010; and Matthews, et al., 2011
-Watershed Boundary: IEPA, 2002
-Wetlands: Matthews et al., 2009; Matthews et al., 2010; Matthews et al., 2011
-Mapped Critical Wetlands: DuPage County Wetland Inventory, 2006
-O'Hare Airport: City of Chicago, 2003
-Aerial photography: Airphoto USA, 2008; City of Chicago, 2009
-County Boundary: Tele Atlas North America, Inc., 2008

NORTH

0 0.5 1 2
Miles

Exhibit 3-17
Wetlands



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LEGEND

Mapped Land Cover

- High Density Urban Land
- Low/Medium Density Urban Land
- Urban Open Space
- Mapped Woodland
- Other
- O'Hare Airport
- County Boundary
- Project Corridor

Note:
Land cover is based on available mapping. Actual cover types may vary from those that are mapped. Woodland within O'Hare Airport has been cleared for improvements.

Sources:
-Mapped Land Cover: USDOA et al., 2002
-O'Hare Airport: City of Chicago, 2003
-Aerial photography: Airphoto USA, 2008; City of Chicago, 2009
-County Boundary: Tele Atlas North America, Inc., 2008

NORTH

0 0.5 1 2
Miles

Exhibit 3-18

Mapped Land Cover

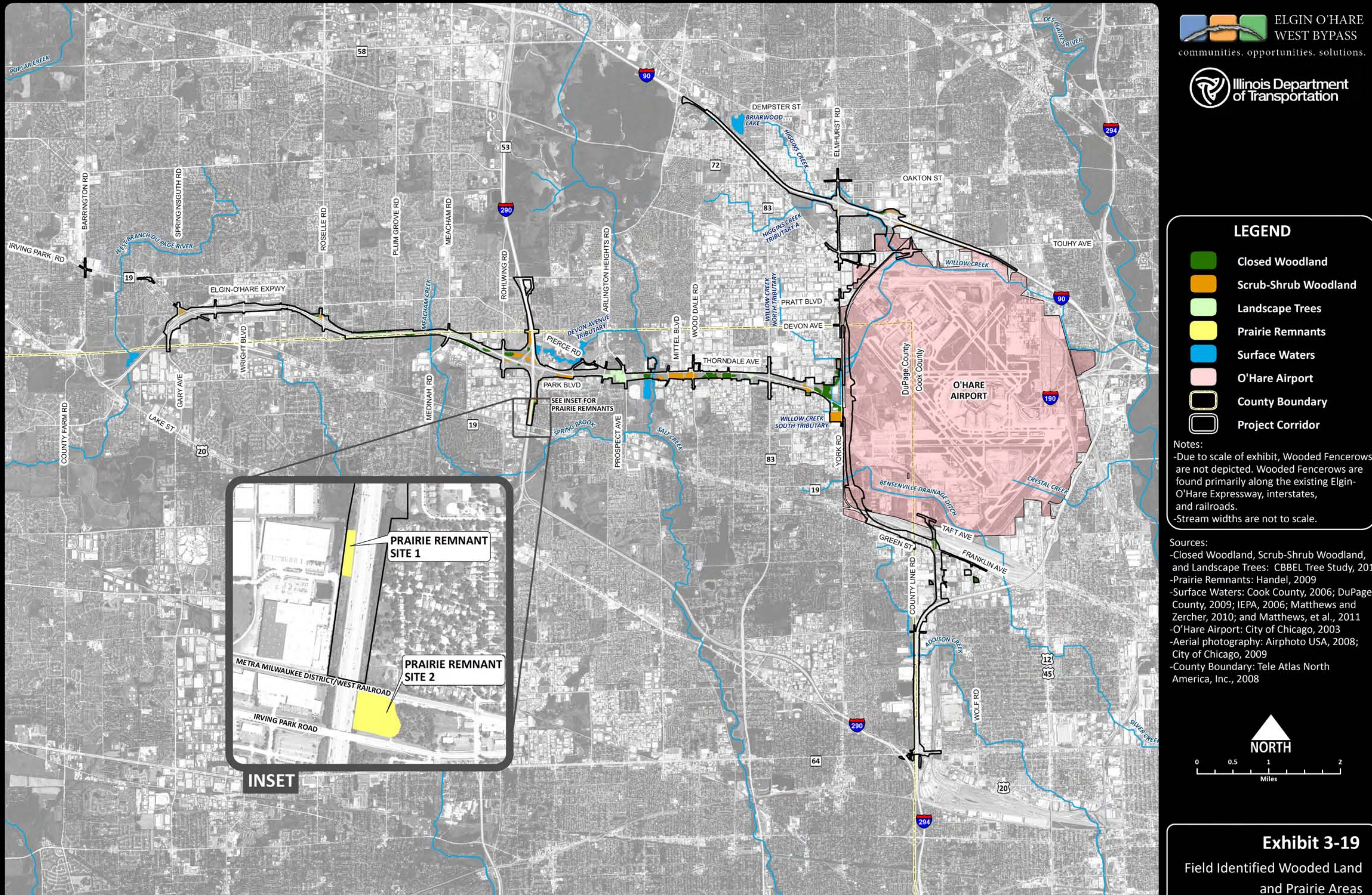

Exhibit 3-19

Field Identified Wooded Land and Prairie Areas

Path: N:\idot\070404\GIS\Exhibits\Tier 2\Tree Survey\Exhibits\Tree Survey Exhibit.mxd

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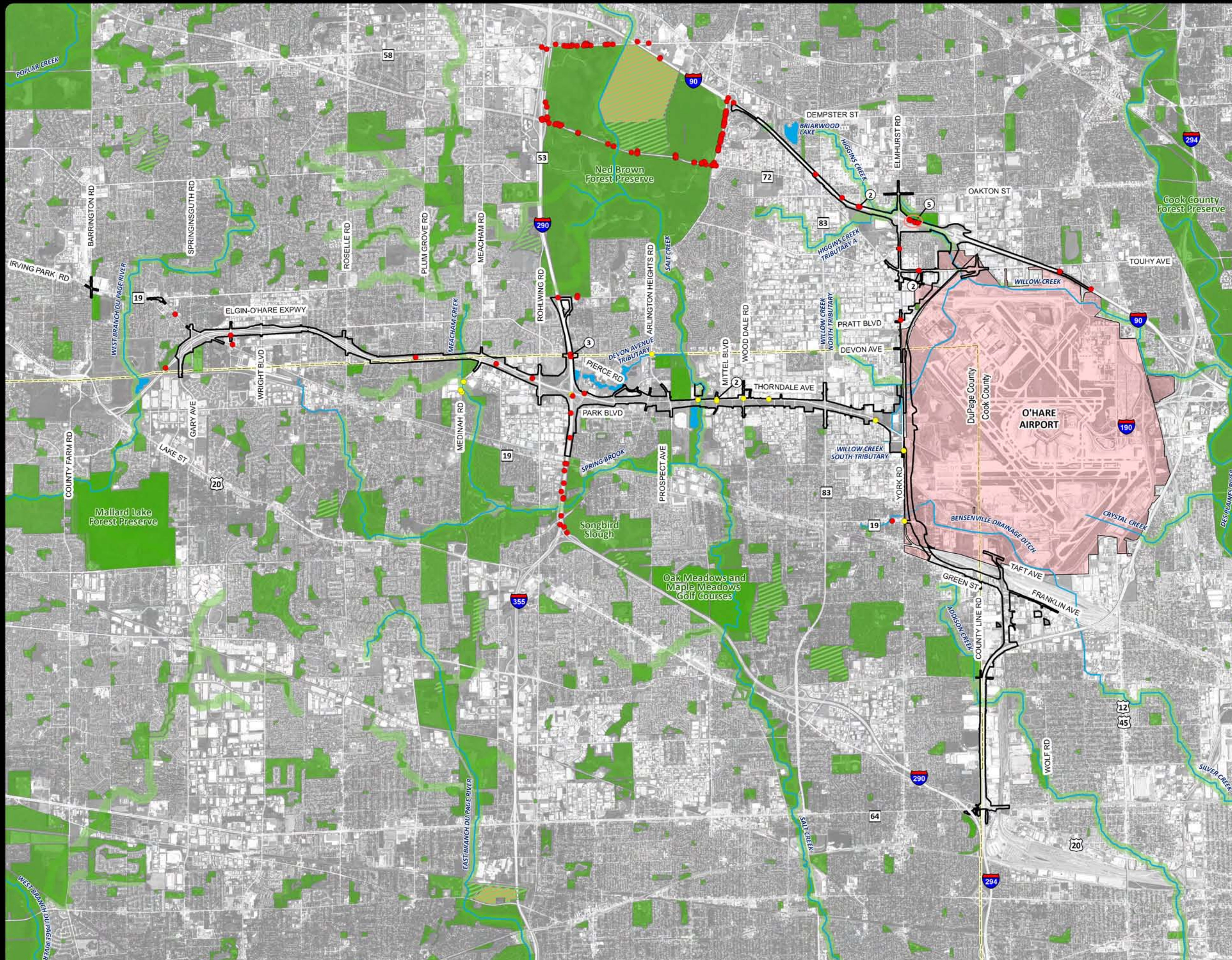

LEGEND

- Vehicle/Animal Collisions
- Existing Greenways and Other Special Lands
- Proposed Greenway
- Illinois Natural Areas
- Illinois Nature Preserves
- Surface Waters
- O'Hare Airport
- County Boundary
- Project Corridor

Notes:
-Only reported crashes near project corridor are shown.
-Vehicle/Animal Collisions in red are based on IDOT data.
-Vehical/ Animal Collisions in yellow are based on DuPage County data.
-Greenways are not shown within O'Hare Airport.
-Stream widths are not to scale.

Sources:
-Vehicle/Animal Collisions: DuPage County Transportation Data Management System, 2010; IDOT, 2010
-Special Lands: FPDDC, 2011; Tele Atlas North America, Inc., 2008
-Existing and Proposed Greenways: CMAP, 2009
-Illinois Natural Areas: IDNR Natural Heritage Database, 2011
-Illinois Nature Preserves: Illinois Nature Preserves Commission, 2008
-Surface Waters: Cook County, 2006; DuPage County, 2009; IEPA, 2006; Matthews and Zercher, 2010; and Matthews, et al., 2011
-O'Hare Airport: City of Chicago, 2003
-Aerial photography: Airphoto USA, 2008; City of Chicago, 2009
-County Boundary: Tele Atlas North America, Inc., 2008

NORTH

0 0.5 1 2
Miles

Exhibit 3-20

Vehicle/Animal Collisions and Greenways

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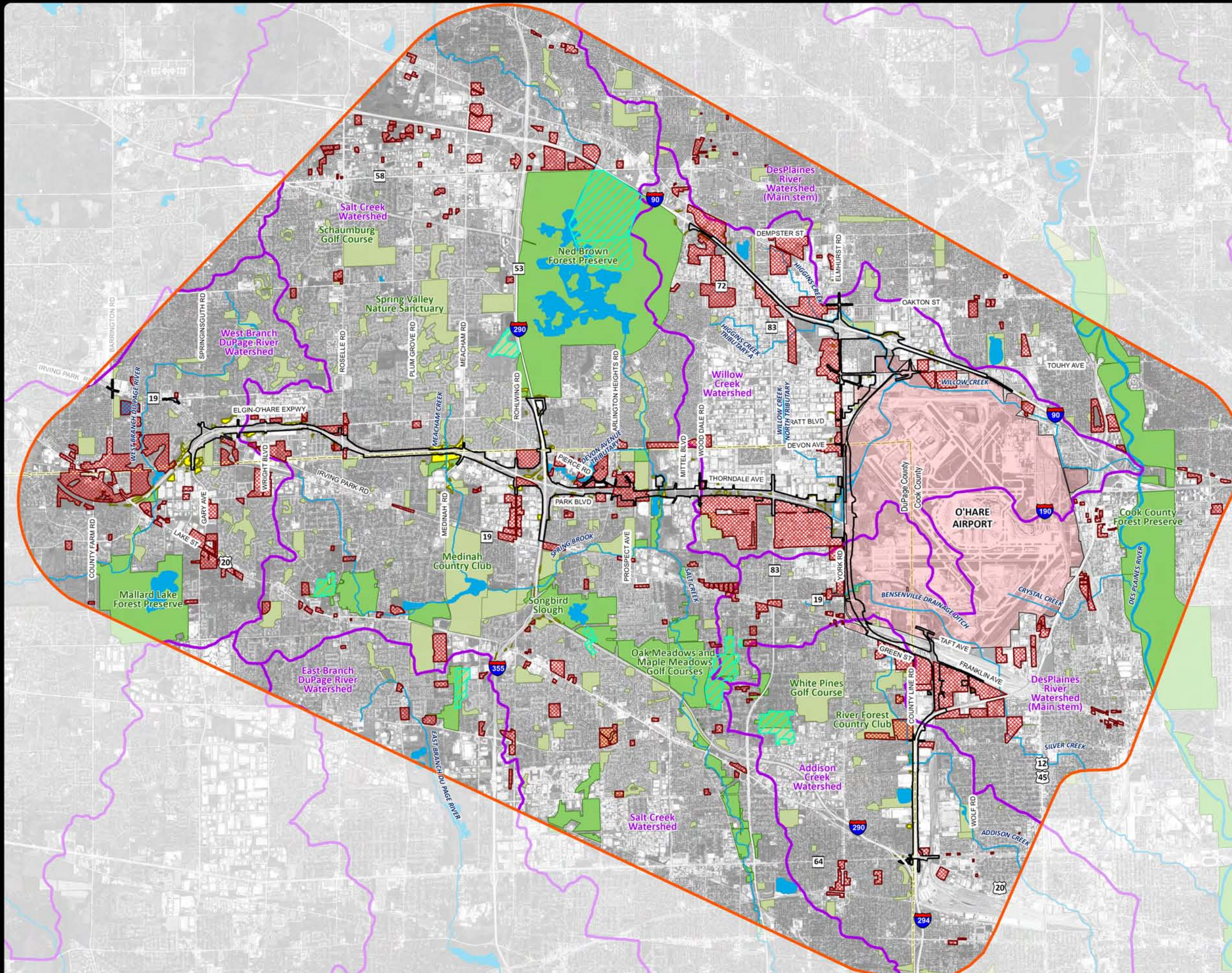

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LEGEND

- Areas of Potential Development
- Wetlands
- Forest Preserves
- Community Parks
- Illinois Nature Preserves & Natural Areas
- Surface Water
- Watershed Boundary
- O'Hare Airport
- County Boundary
- Project Corridor

Sources:
-Areas of Potential Development: S.B. Friedman & Company, 2011
-Forest Preserves: FPDDC, 2011; Tele Atlas North America, Inc., 2008
-Community Parks: Local Municipalities, 2011; Tele Atlas North America, Inc., 2008
-Illinois Nature Preserves & Natural Areas: IDNR Natural Heritage Database, 2011; Illinois Nature Preserves Commission, 2008
-Surface Waters: Cook County, 2006; DuPage County, 2009; IEPA, 2006; Matthews and Zercher, 2010; and Matthews, et al., 2011
-Watershed Boundary: IEPA, 2002
-Wetlands: DuPage County Wetland Inventory, 2006; Matthews et al., 2009; Matthews et al., 2010; Matthews et al., 2011; and National Wetlands Inventory, 2005
-O'Hare Airport: City of Chicago, 2003
-Aerial photography: Airphoto USA, 2008; City of Chicago, 2009
-County Boundary: Tele Atlas North America, Inc., 2008

NORTH
0 0.5 1 2
Miles

Exhibit 3-21
Natural Resources: Indirect and Cumulative Impacts

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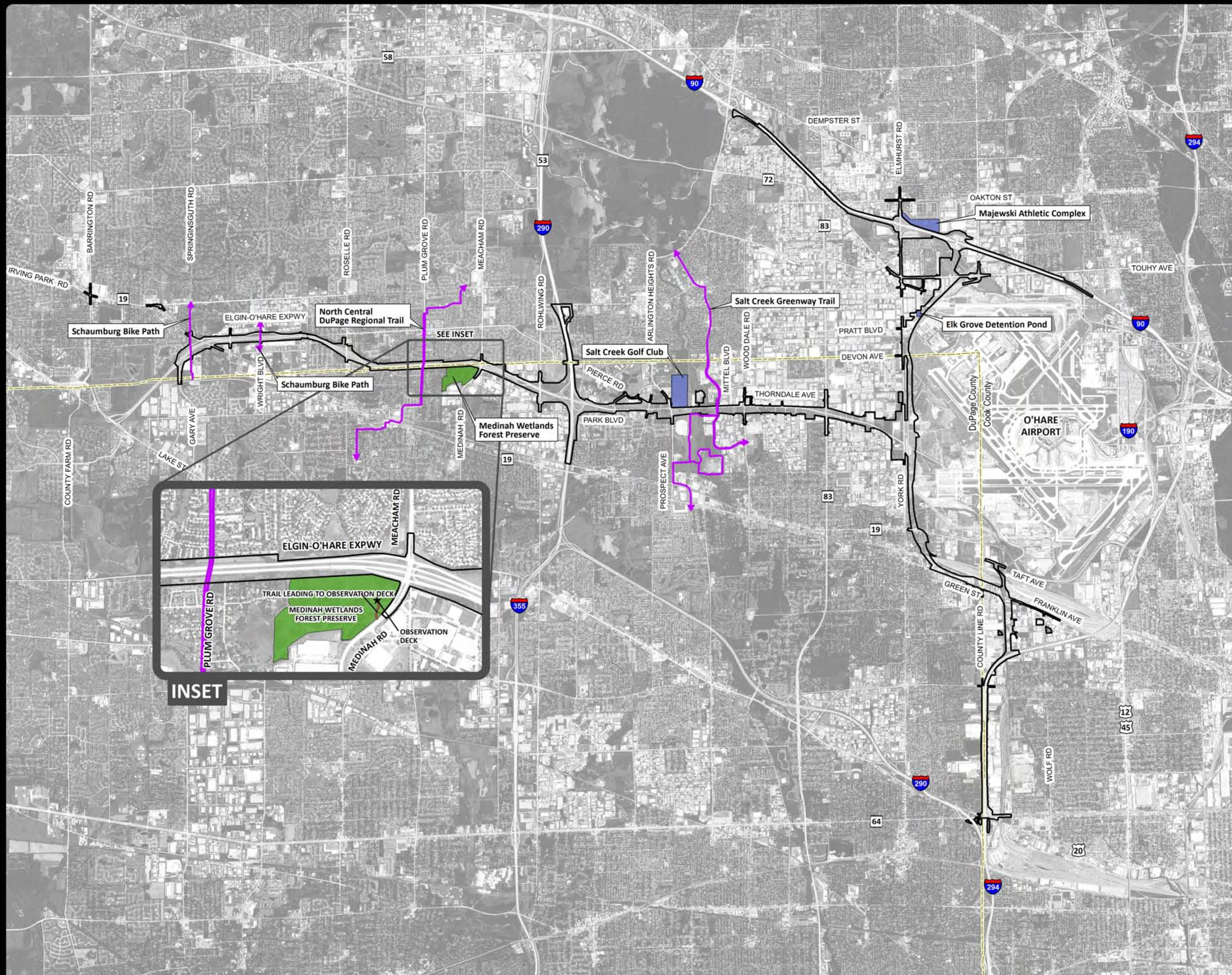

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LEGEND

- Forest Preserves
- Community Parks
- Bicycle Facilities
- County Boundary
- Project Corridor

Sources:
- Forest Preserves: FPDDC, 2011; Tele Atlas North America, Inc., 2008
- Community Parks: Local Municipalities, 2011; Tele Atlas North America, Inc., 2008
- Bicycle Facilities: DuPage County, 2009; FPDDC, 2009; Roselle, 2010
- O'Hare Airport: City of Chicago, 2003
- Aerial photography: Airphoto USA, 2008; City of Chicago, 2009
- County Boundary: Tele Atlas North America, Inc., 2008

NORTH

0 0.5 1 2 Miles

Exhibit 3-22

Resources Considered for Section 4(f) Applicability

Path: N:\idot\070404\GIS\Exhibits\Tier 2\Special Lands\Special Lands.mxd

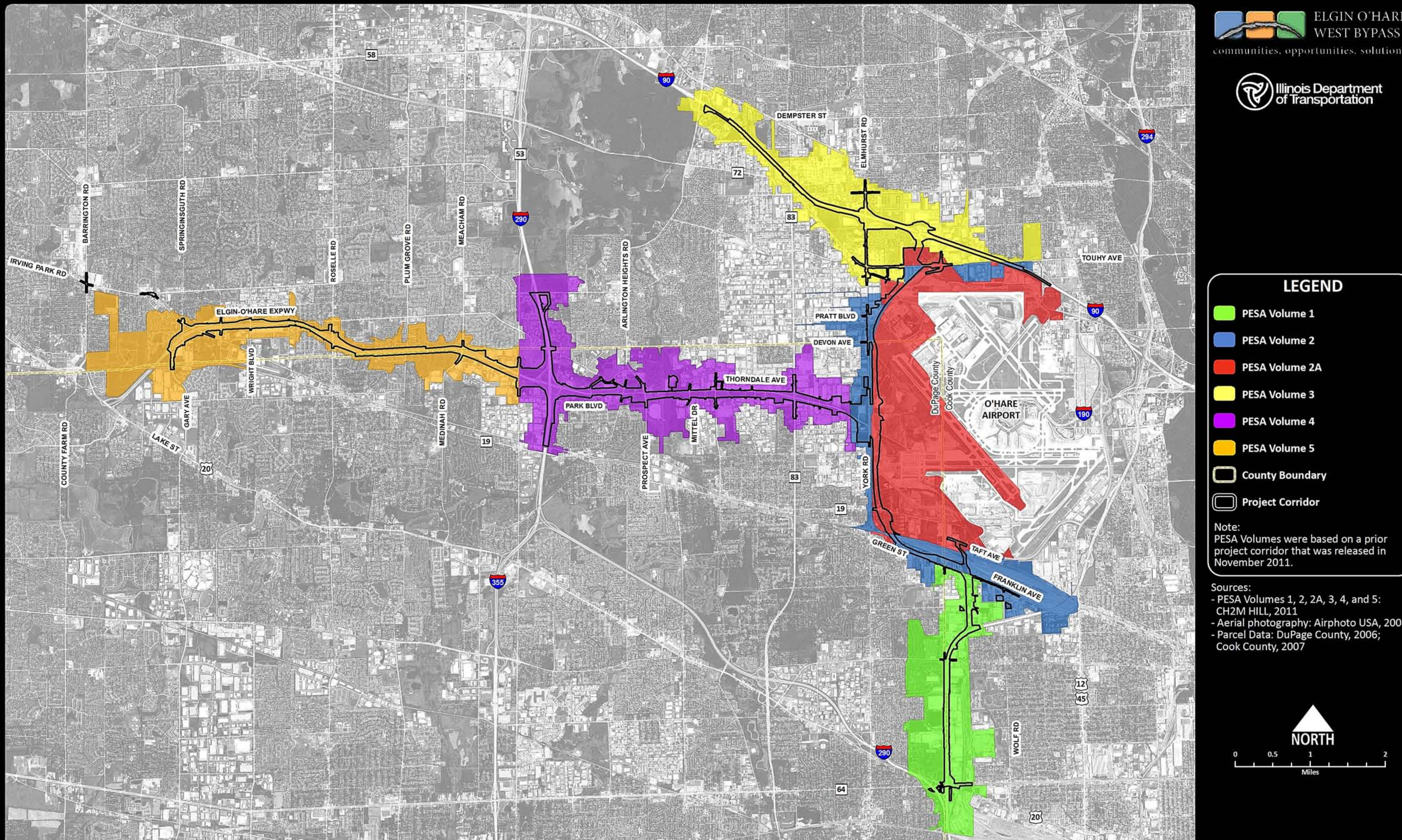


Exhibit 3-23

Preliminary Environmental Site Assessment (PESA) Volumes

SECTION 4

Agency Coordination and Public Involvement

This section describes the regulatory requirements associated with NEPA, SAFETEA-LU, and Context Sensitive Solutions (CSS), as well as the communication strategies that have been developed consistent with those requirements. Also described are the public and agency outreach activities that have been conducted throughout the project.

Tier Two of the EO-WB project has been a continuation of the extensive agency coordination and public involvement process that was prevalent throughout Tier One. Given the scope and scale of the project and the numerous stakeholders that are affected by the project, IDOT has organized a public and agency outreach program that seeks valued input and works toward a consensus solution that balances the many factors influencing this project. In Tier One, coordination with stakeholders, community leaders, and regulatory agencies led to decisions about the type and location of transportation improvements that satisfied the needs of the area.

As the EO-WB project has advanced to Tier Two, the focus has been on the design details; therefore, stakeholders, community leaders, and regulatory agencies have been providing their views on topics such as interchange configurations, lane requirements, access, drainage provisions, and noise impact mitigation. Every step of the Tier Two process for the EO-WB project continues to be vetted with community leaders, regulatory agency representatives, and the public at large. In Tier Two, project team members have conducted more than 200 meetings with community leaders, local agencies, area businesses, and regulatory agencies. Governor Pat Quinn, recognizing the project's national and regional importance, convened an Advisory Committee in late 2010 to investigate and recommend approaches to implement the project.

4.1 Public and Agency Coordination Requirements and Communication Strategy

4.1.1 Legal Requirements

The NEPA, SAFETEA-LU, and CSS each contain objectives and requirements for public and agency outreach for federally sponsored highway projects.

- NEPA has formal communication requirements with those most affected by the proposed project. Among these is the requirement to identify regulatory agencies with jurisdiction or special expertise in an environmental resource and invite them to participate as "cooperating agencies." Such agencies are asked to provide input on the project early and regularly during the NEPA approval process. The Council on Environmental Quality (CEQ) also mandates that the lead agency "scope" or solicit concerns from federal, state, local, and tribal agencies, as well as any interest groups, early in the process. Finally, CEQ requires that comments be solicited from agencies and the public on the Draft EIS. Illinois developed a NEPA/404 Merger Agreement, which assembles IDOT, FHWA, and regulatory resource agencies on a consistent basis to obtain input at key project milestones, including Purpose and Need, Alternatives to be Considered, and Preferred Alternative. This ensures that the agencies' input is incorporated into the project's process early and often, minimizing the possibility for issues to arise later in the process and causing a delay in the project schedule.

- SAFETEA-LU includes a set of agency and public involvement measures that increases the required level of public participation. Specifically, SAFETEA-LU adds "participating agency" as a category for agencies. Agencies or organizations that have a specific interest in the outcome of the project will be allowed to serve as a participating agency, which provides them access to project information as it is developed. SAFETEA-LU also requires that the public be involved in the development of the purpose and need, as well as in the determination of the reasonable alternatives to be considered in the Draft EIS. According to SAFETEA-LU, lead agencies are required to develop and make available a coordination plan that structures public and agency participation during the environmental review process.
- CSS is a strategy for developing a transportation solution that improves safety and mobility and that reflects the project's surroundings or "context." The emphasis of CSS is the development of projects that fit within their environment and result in a community asset. At the heart of CSS is public outreach, designed to seek from stakeholders the project needs and the solutions that best satisfy those needs without community disruption. In Tier Two, CSS has been used effectively to assess a range of creative design measures that result in a project that fits within its environment.

4.1.2 Objectives

This project seeks not only to develop the optimal transportation solution for the needs of the project area but also to create a transportation solution consensus. Interaction with community representatives, resource agencies, members of the public, and other stakeholders is critical to achieving these goals.

4.1.3 Outreach Methods

The core of the EO-WB project's outreach program is a structured hierarchy of meetings. These include one-on-one meetings with communities and agencies, working group meetings with transportation engineers and planners, public meetings, Governor's Advisory Council, and project management team (PMT) meetings. The value of each of these types of meetings is the opportunity to conduct in-depth conversations about particular issues important to the attendees. Other aspects of the outreach program include the project newsletters, public meetings, and the project website.

4.1.3.1 Outreach Groups

Several outreach groups were formed to assist in developing the proposed EO-WB project. The following subsections briefly describe each of these outreach groups.

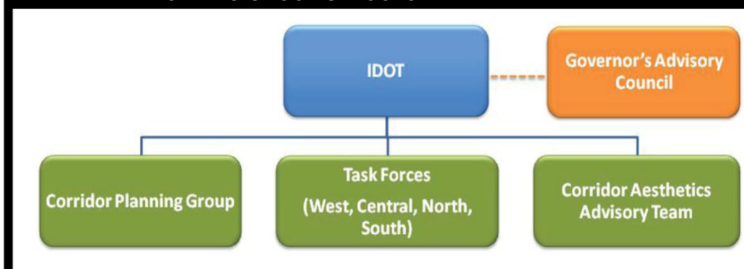
Project Organization

The project is being guided by a management team (PMT), which consists of the lead agencies and consultant team. The PMT establishes technical direction, renders policy decisions, establishes the overall project schedule, reviews deliverables, and more. Per CSS, a Project Study Group (PSG) was assembled for this project (see Figure 4-1). Its primary responsibilities are to facilitate project development and make recommendations to the PMT. It consists of four discipline-focused working groups—Geometrics Working Group (GWG), Environmental

Working Group (EWG), Drainage Working Group (DWG) and Transit Working Group (TWG). These groups consist of FHWA, IDOT, and project consultants, as well as representatives from discipline-related organizations (e.g., Illinois Tollway, Regional Transportation Authority [RTA]).

FIGURE 4-1
PROJECT STUDY GROUP ORGANIZATION CHART

FIGURE 4-2
EXTERNAL WORKING GROUP STRUCTURE



External working groups were assembled to contribute to specific aspects of the project. They include the Corridor Planning Group (CPG), Task Forces, and a CAAT. In addition, Governor Quinn has created the Elgin O'Hare – West Bypass Advisory Council (see Figure 4-2).

Corridor Planning Group

The CPG membership consists of representatives from each of the 27 communities and two counties in the project area. The CPG, which represents the views of all the stakeholder communities, was assembled to obtain input and consensus on key decision points throughout the study process. The membership of the CPG is presented in the Appendix A of the *Stakeholder Involvement Plan*.

Task Force Groups

The Task Force Group membership includes representatives of municipalities, counties, and other governmental organizations in the project area. Members may also include representatives from other organizations with an interest in topics being discussed at meetings (e.g., CP railroad, CMAP, Chicagoland Bicycle Federation). During meetings, attendees are organized into four geographic groups (west, central, north, and south) to better address the needs and interests specific to each section of the project corridor.

Corridor Aesthetics Advisory Team

This team consists of project team members and representatives from communities immediately adjacent to the proposed facility. The team is tasked primarily with developing a set of aesthetic design guidelines to apply to the proposed improvements. The CAAT membership is presented in Appendix A of the *Stakeholder Involvement Plan*.

Governor's Advisory Council

The Governor's Advisory Council is an organization of representatives from public and nongovernmental agencies, including IDOT, Illinois Tollway, Illinois Finance Authority, CDA, RTA, DuPage County Board of Commissioners, DuPage Mayors and Managers Conference, West Central Municipal Conference, and Northwest Municipal Conference. Its mission is to advise the governor and make recommendations that would advance the project, including financing, economic impact, sustainable practices, and workforce diversity. The Governor's Advisory Council comprises four topic-related groups—Project Financing, Sustainability, Economic Impact, and Diversity. Project team members acted in an ex officio role that involved attending meetings and providing project-specific information as requested.

Speakers' Bureaus

Project team members are attending functions conducted by local community groups to apprise them of project updates or to discuss a project-related topic that is of particular interest to the organization. Attending these functions has provided the project team with an understanding of issues relating to active local organizations.

NEPA/404 Merger Process

The NEPA/404 merger process consists of representatives from federal and state regulatory resource agencies meeting at major project milestones to discuss the project. The goal of the NEPA/404 Merger Group is to involve regulatory resource agencies early and at key project milestones to minimize the potential for unforeseen issues that may arise during the later stages of the NEPA and Section 404 permitting processes. The major topics of the meetings include scoping, project updates, and concurrence on the project's purpose and need, alternatives to be carried forward, and preferred alternative.

4.1.3.2 Outreach Tools

In addition to regularly scheduled meetings with stakeholders, the project team utilized other methods for disseminating information and obtaining input.

Newsletters

Newsletters are distributed at key milestones during the project to notify area residents and stakeholders of recent project decisions and upcoming activities. A mailing list is maintained and updated regularly so that information is being sent to those requesting it.

Website

The project website (www.elginohare-westbypass.org) began service on September 7, 2007 and continues to be updated and maintained with current information. General project information, project documents, and meeting materials are available for viewing and downloading. Viewers are able to access information, such as the project's purpose and need, alternatives screening process, and newsletters. An events calendar with dates of all of the public outreach meetings is maintained and displayed on the website. A page is provided for those who wish to submit comments. Responses to comments are provided and entered into the project record.

Public Information Meetings

Public information meetings (PIMs) have been held at project milestones, and the public is encouraged to attend. These meetings help to maintain public awareness of project developments and alternatives that are being evaluated while providing a forum for general public input, including concerns and comments regarding project alternatives. Attendees are apprised of project activities through various public informational techniques, such as project boards, handouts, and presentations that summarize the project work and findings. The meetings are advertised in newsletters, on the website, by flyers, and in public notices placed in area newspapers. Opportunities for the public to provide written (comment forms) and verbal comments (through a court reporter) are available at the meetings. Spanish translation is provided, as appropriate.

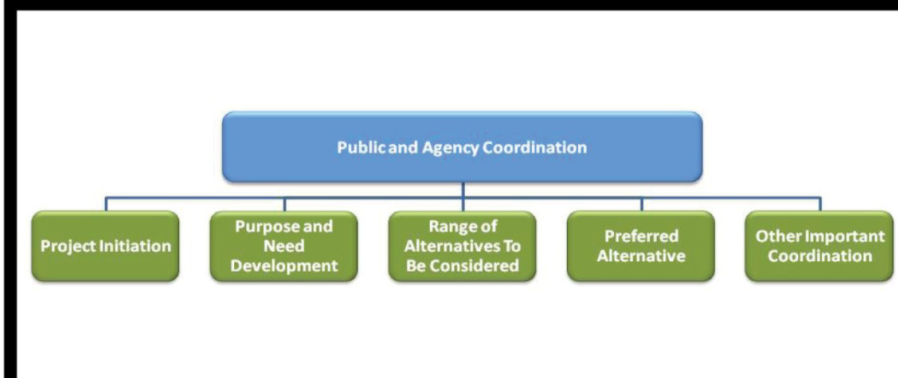
Community Meetings

Reaching consensus on project alternatives and design requires continuous communication with communities affected by the proposed improvements. Meeting with the officials of these communities before and after project decisions are reached ensures that preferences of the communities are considered during the decisionmaking process. Community meetings are conducted to coincide with project milestones, such as elimination or selection of project alternatives and PIMs.

4.2 Public and Agency Coordination

The remainder of this chapter describes the public and agency coordination that occurred at each milestone of the project including project initiation, solidification of the project's purpose and need, identification of the alternatives to be considered in this document, and finally, the identification of the Preferred Alternative. The coordination that has occurred with regulatory (and other) agencies, which ensures that the project not only complies with regulatory policies but also minimizes environmental and social impacts, is described (see Figure 4-3).

FIGURE 4-3
PUBLIC AND AGENCY COORDINATION



4.2.1 Project Initiation

A number of activities required by NEPA, SAFETEA-LU, and CSS occurred at the outset of Tier Two to begin the project process, including notification of project startup, identification of cooperating and participating agencies, data gathering, the establishment of guidelines for project operations, and scoping. Such activities occurred at several different venues, including project working group meetings, NEPA/404 merger meetings, and public outreach events.

4.2.1.1 Project Initiation Requirements

Stakeholder Involvement Plan

As mentioned, SAFETEA-LU requires the development of a coordination plan that establishes the public outreach and involvement structure of the project. As such, a rigorous *Stakeholder Involvement Plan* was developed. The *Stakeholder Involvement Plan* ensures that all legal requirements are satisfied; it documents how agencies, stakeholders, and other members of the public are incorporated into the project's process; and it reflects the unique coordination and communication needs of the project. The *Stakeholder Involvement Plan* identifies stakeholders, along with lead, cooperating, and participating agencies, and their project roles. The *Stakeholder Involvement Plan* defines the methods of how stakeholder input would be obtained and utilized. Finally, the *Stakeholder Involvement Plan* describes the multiple tools used to reach out to stakeholders to keep them informed of the project activities and to obtain their input.

Timeframe Agreement

A timeframe agreement, consisting of a schedule for project-related activities, has been developed for Tier Two per SAFETEA-LU. It was adopted by FHWA and IDOT on June 8, 2010, and was updated, as necessary. It identifies the dates that milestones are expected to be completed and identifies the actual dates that the milestones were completed.

Notice of Intent

The CEQ requires that a Notice of Intent (NOI) to prepare an EIS be published in the Federal Register. The NOI contains information regarding the proposed action and potential alternatives for improvements, the planned scoping process, and contact information for the project. The NOI for the EO-WB project was published in the Federal Register on June 8, 2011 and December 20, 2011.

Identification of Lead, Cooperating, and Participating Agencies

The FHWA and IDOT are typically joint lead agencies for transportation projects in Illinois, and this project is no exception. However, because a portion of the proposed improvements (i.e., a portion of the West Bypass corridor) is on O'Hare Airport property, and because the project requires adherence to a number of aviation requirements and regulations, FAA has been added as a joint lead agency. A MOU between FHWA, IDOT, and FAA regarding joint leadership was signed on May 6, 2011 (see Appendix B). In the fall of 2011, the Illinois Tollway also joined as a joint lead agency, following the agency's passage of a funding package to finance the Elgin-O'Hare Expressway and West Bypass corridors as toll roads, in addition to financing other projects in their system. NEPA and CEQ require lead agencies to invite other agencies with regulatory jurisdiction or expertise in an environmental resource relevant to the project as cooperating agencies. These agencies provide early and regular input on the project, including relevant information required to develop the EIS and timely comments on the project's environmental documentation. They also provide input on the project's purpose and need, alternatives screening analysis (including selection of the Build Alternative), and the preferred alternative. Invitation letters to cooperating agencies were mailed on July 8, 2011 (see Appendix B). The FTA and USEPA agreed to participate as cooperating agencies in Tier Two.

Agencies without jurisdiction or special expertise, but with an interest in the project, were invited to be participating agencies, per SAFETEA-LU. Invitation letters to these agencies were mailed on July 8, 2011. Agencies that accepted the invitation are listed in Appendix A of the *Stakeholder Involvement Plan*. Participating agencies are expected to provide timely comments on the project's purpose and need, study methodologies, range of alternatives, environmental impact analyses, and the preferred alternative.

Scoping

Scoping is a process that CEQ requires in implementing NEPA. Regulatory agencies and stakeholders are asked to describe important issues that relate to the project, as well as other issues that do not require detailed analysis. It can be a formal or informal process. For the EO-WB project, scoping took place at several venues—CPG meeting, NEPA/404 Merger Group meeting, and PIM Number 1 (see subsection 4.2.1.2). Scoping activities that occurred at these meetings are described in the following subsections.

4.2.1.2 Project Initiation Activities

A number of activities occurred to kickoff Tier Two of the EO-WB project. These activities ranged from internal project team meetings to meetings with regulatory resource agencies and area communities. These are described below.

Project Team Meetings

- **Project Management Team Meetings**. The PMT provided the foundation from which the project would develop. The scope of Tier Two engineering, environmental, and public involvement activities were determined by the PMT. The timeframes agreement, *Stakeholder Involvement Plan*, and cooperating and participating agencies to be invited were solidified. Strategies for validating the project's purpose and need, screening the project alternatives, and identifying the build alternative(s) were determined at PMT meetings. The determination to add FAA and the Illinois Tollway as joint lead agencies was made by the PMT.
- **Project Study Group (Working Group) Meetings.** The GWG, TWG, DWG, and EWG were assembled at the outset of the project to design solutions for achieving the project's purpose and need and ensuring that those solutions meet regulatory requirements while they minimize environmental and socioeconomic impacts. The GWG was charged with developing roadway alternatives for both the ICP and 2040 Build Alternative. In the development of both, the GWG worked closely with the TWG and DWG to incorporate the transit facilities that the TWG recommended and the drainage solutions that the DWG identified into the GWG's proposed design. The EWG communicated regularly with the other working groups to ensure that the proposed roadway, transit, and drainage features of the project minimized impacts to sensitive resources, complied with environmental regulations, and optimized the opportunities for mitigation.

Agency and Public Involvement Meetings

The project team also met with regulatory resource agencies and members of the public to initiate Tier Two of the EO-WB project. These are identified in Table 4-1 and are described below.

TABLE 4-1
Stakeholder Opportunities: Project Initiation

• One-on-one Community Meetings: November and December 2009; January, March, April, May, June, October, and November 2010	• NEPA/404 merger meeting: September 2010
• Illinois Tollway: February, March, May, July, and October 2010 and January 2011	• Newsletter Number 9: September 2010
• FAA: June, July, and November 2010	• PIM: September 2010
• Speakers' Bureaus: June and November 2010; February, September, and November 2011	• Regulatory Resource Agencies: December 2010
• Project CPG/Task Force Meeting: August 2010	

- **Regulatory Resource Agency Coordination.** On September 9, 2010, members from the EO-WB project team attended the NEPA/404 merger meeting to present an overview of Tier Two and conduct scoping. Because the USACE was not in attendance at the September 9, 2010, NEPA/404 merger meeting, a separate meeting was held on December 17, 2010, to conduct scoping with USACE representatives. Representatives of USEPA and USFWS were in attendance also. The following were identified at the meetings as important topics to address in Tier Two:
  - Evaluating the possibility of reducing air emissions during construction by using locally sourced materials (e.g., spoil from the OMP).
  - Using the MOVES model to evaluate $PM_{2.5}$ emissions if it is decided that a hot-spot quantitative analysis should be conducted.
  - Evaluating greenhouse gas effects.
  - Evaluating noise impacts in environmental justice areas.
  - Seeking to improve water quality at all creeks in the project corridor.
  - Incorporating water quality and quantity best management practices.
  - Considering various mitigation options that satisfy the regulatory agencies.
  - Evaluating green infrastructure practices and using recycled materials.

Other Agency Meetings

Project team members met or corresponded with agencies that have an interest in the project as part of initiating Tier Two. At these meetings, information was gathered so that the project engineers could consider sensitive resources during the alternatives development and refinement stages.

- **Federal Aviation Administration.** The FAA became involved in the project because improvements are proposed near and on O'Hare Airport property, which is regulated by the FAA. Restrictions related to airspace, navigational aids, and the conversion of airport property to surface transportation uses were all potential actions requiring FAA approvals. Therefore, the FAA agreed to join Tier Two as a joint lead agency with the agreement that their actions and the impact of those actions be fully disclosed in the EIS being prepared for the EO-WB project.
- **Illinois Tollway.** The Illinois Tollway has been involved in both Tier One and Tier Two of the process for the EO-WB project. In the early stages of the project, the Illinois Tollway's interest was to ensure congruence between the proposed improvements and the existing tollway facilities. Data that were shared included existing and projected traffic numbers, as well as ongoing and planned projects along the tollway facilities within the project corridor. These data were used to determine the scope and limits of project-related work along tollway facilities. Illinois Tollway staff was also a member of the EWG, DWG, and GWG and attended meetings and provided input on Illinois Tollway requirements with regard to environmental processes and design components. Additionally, the evaluation of funding sources concluded that tolling was the only viable solution for project implementation. As such, the Illinois Tollway agreed to implement the project and joined as a lead agency in 2011.

Public and Stakeholder Outreach Activities

- **Corridor Planning Group and Task Force Meeting.** A newsletter was issued in September 2010 announcing the start of Tier Two, and outlining the public involvement activities that lay ahead. The CPG and Task Forces had been assembled for the first time a month earlier to initiate their involvement in Tier Two. In their working session they addressed the following topics:
  - Local roadway design improvements under consideration.
  - Financing strategies and the potential effects of tolling the roadway versus keeping it a freeway.
  - Transit station locations, parking, and access along the existing Elgin O'Hare corridor.
- **Community Meetings.** During the project initiation stage, 19 community meetings were held during the six months between November 2009 and April 2010 to introduce the scope and schedule for Tier Two, a recap of Tier One, the alternative development approach in Tier Two, and the travel forecasting required to support the sizing and extent of the improvements. Some of the highlights of these meetings included:
  - Briefing the communities on the *Tier One ROD*, and how that decision affects work in Tier Two, particularly the development of alternatives.
  - Briefing on Tier Two scope and schedule, consisting of detailed engineering and environmental studies that would advance the project to the next stage to include final design and construction. Tier Two would be completed by the end of 2012, and deliverables would consist of a Tier Two Final EIS and ROD, a design study report, financial plan, project management plan, location drainage report, and an Access Justification Report for I-290.
  - An overview of the traffic forecasting to support Tier Two. Traffic forecasting would be completed through 2040 for both the No-Build Alternative and Build Alternative. The approach supporting the forecasting included a unique approach to population and employment forecasts for the area built on a market-based real estate assessment, wherein the development potential of the area was evaluated with and without transportation improvements.
  - An overview of the alternative development process was presented, emphasizing that for this phase of work, alternatives were in the form of design refinements, including mainline sizing, interchange alternates, and preservation of transit in the corridor.
  - An interchange study for North Avenue/I-294 that was conducted separately by the City of Northlake, which was integrated into the EO-WB project process. The objective of early meetings was to exchange information on preliminary engineering concepts in the locale of North Avenue, share traffic forecast data, establish a schedule for deliverables, and identify other data input critical to preparation of timely deliverables.
- **Public Information Meeting.** The PIM Number 1 in Tier Two was held in Itasca, Illinois, on September 21, 2010 and was attended by 158 people. Display materials included:
  - Tier One corridor location decision.
  - Comparison of level of detail between Tier One and Tier Two.
  - Tier Two Alternative development process.
  - Interchange locations.
  - Financing options and funding sources.
  - Transit facilities and station locations.

- Bicycle and pedestrian facilities.
- Aesthetic design considerations.

The meeting produced 17 written comments, consisting of general support for the project, questions about bicycle and transit accommodations, questions about interchange access, possible diversion of traffic to arterial routes from a tolled facility, personal property impacts, local drainage issues, and informational requests (i.e., exhibit materials, maps). The comment period remained open until October 12, 2010, and yielded two more comments.

- **Website.** The updated project website was launched November 11, 2010 with Tier Two information. Information for users to view or download included an overview of Tier Two, with schedule and objectives, and with exhibits showing preliminary engineering activities (interchange alternates at the nine interchange areas), environmental constraints, and preliminary options for financing and construction sequencing.
- **Speakers' Bureau.** An overview of Tier Two was provided at the meetings of the Chicago Society of American Military Engineers Post on June 16, 2010; NAI Hiffman – Association of Industrial Real Estate Brokers on November 9, 2010; the Transportation and Highway Engineering conference at the University of Illinois on February 22, 2011; the Naperville Chamber of Commerce on September 19, 2011; the Roadbuilders' Association on September 21, 2011; and the Illinois Section of American Society of Civil Engineers on November 10, 2011.

4.2.2 Purpose and Need Development

The purpose and need that was developed in Tier One was revisited in Tier Two after it was determined that the project's planning horizon would be updated from 2030 to 2040 to be consistent with the newly adopted regional transportation plan, *GO TO 2040 Comprehensive Regional Plan* (CMAP, 2010). The expectation was that the purpose and need statements (e.g., improve regional and local travel, improve travel efficiency) from Tier One would remain valid in Tier Two, but the updated travel analysis stemming from new 2040 travel forecasts would be used to update the detailed technical discussion in the document. During several public involvement events and regulatory resource agency meetings, the public, stakeholders, resource agencies, and community representatives were informed that the purpose and need statement was being updated to 2040. These meetings included: PIM Number 1 in September 2010, the second CPG and Task Force meeting in November 2010, a meeting with resource agencies in December 2010, community meetings in January 2011, and the NEPA/404 merger meeting in February 2011. Recipients of Newsletter Number 10, which was distributed in March 2011, were apprised that the project's purpose and need statement was being updated to reflect 2040 forecasts and were invited to the April 2011 PIM.

In early 2011, the 2040 traffic analysis was completed, the PMT and joint lead agencies reassessed the project's purpose and need statement, and (ultimately) the purpose and need statement was validated for Tier Two. The Purpose and Need, along with the updated traffic analysis, were presented for public review and comment at the April 2011 PIM. An exhibit describing the project's transportation needs was displayed alongside traffic analysis results, which influence the project's needs. The exhibit highlighted traffic analysis results that had changed between the 2030 and 2040 analyses. The 2040 traffic analysis results were presented to the CPG, Task Force, and communities in July 2011.

Regulatory resource agencies had a preview of the updated purpose and need statement at the February and June 2011 NEPA/404 merger meetings. Concurrence was granted at the September 2011 NEPA/404 merger meeting.

4.2.3 Identification of the Range of Alternatives to be Considered

Development and evaluation of project alternatives were the products of much coordination and input from technical working groups and the public. This process started with the development of a strategy or methodology for the development of alternatives. The result of this work concluded that the process in Tier Two would be very different from Tier One. Whereas, the location of the proposed improvements was established in Tier One, the work in Tier Two focused on the refinement of design features within the preferred project corridor with the objective of assembling the least impactive, most cost-effective, and travel-efficient project elements that would be part of the complete Build Alternative. Thus, Tier Two was a detailed examination of design alternates for the facility type (i.e., freeway, toll road, or a combination), interchange types, mainline requirements, transit requirements, and drainage. Stakeholder participation was integral to this process as it advanced through each element of design.

4.2.3.1 Approach to Project Refinements

The methodology for developing the design features of the proposed project was primarily the work of the technical project team. The technical team conceived the overall approach and used the GWG as its principal sounding board. Once the concept was developed, various groups provided input, including comments from working groups (i.e., EWG, DWG), the communities via the one-on-one meetings, agencies, CPG, public meeting venues, newsletters, and the website. The stakeholders universally supported the proposed methodology. The opportunities for stakeholders to provide input on the methodology for developing and evaluating project alternatives are listed in Table 4-2.

TABLE 4-2
Stakeholder Opportunities: Project Refinements

• Community One-on-One Meetings: March – June 2010	• PIM: September 2010
• CPG/Task Force Meeting: August 2010	• NEPA/404 Merger Meeting: February 2011
• Newsletter Number 9: September 2010	

4.2.3.2 Development of the Facility Type Alternates

The examination of facility type alternates was used to evaluate funding options. Developing the facility as a freeway, toll road, or combination were considered. In the consideration of each, numerous funding options were evaluated, ranging from traditional public monies (e.g., federal highway funds, state funding) to user fees to public-private partnership options. The assessment of funding options quickly arrived at the conclusion that for a project of this magnitude, public monies would be severely constrained in the current economic climate and the foreseeable future. Alternatively, user fees were examined with the project implemented as a new element of the Illinois Tollway system or developed as a public-private partnership, wherein a private concern would construct and operate the facility. Stakeholders were fully informed of the funding options for the project. Facility-type options were presented for public input and comments several times (see Table 4-3).

TABLE 4-3
Stakeholder Opportunities: Development of Facility Type Alternates

• CPG/Task Force Meetings: August 2010 – September 2011	• Community One-on-One Meetings: November 2010 – July 2011
• NEPA/404 Merger Meetings: September 2010, February 2011, June 2011, September 2011	• Newsletter Number 10: March 2011
• PIMs: September 2010 and April 2011	• PIM: April 2011
• Finance Working Group: September 2011 – November 2011	

Stakeholders were provided with frequent opportunities to supply input on the selection of a preferred facility type alternate. Acknowledging that public monies were limited, stakeholders agreed that user fees would generate the funding necessary to develop the project in the most expeditious timeframe. The final recommendation from the Governor's Advisory Council identified the Illinois Tollway as the preferred implementer. In September 2011, the Illinois Tollway Board of Directors enacted a system toll increase that would finance their 15-year capital improvement program, *Move Illinois: The Illinois Tollway Driving the Future*, which includes the EO-WB project (Illinois Tollway, 2011). The program would provide $3.1 billion (estimated funding at the mid-point of construction) in funding for the project. The project budget identifies an additional $300 million to be contributed by others. The Council's finance working group reconvened in September 2011, under the guidance of DuPage County, to assess the funding options for the monies to be contributed by others.

In October 2011, Elk Grove Village presented a proposal to the finance working group that included deferring the north leg of the West Bypass corridor from the Illinois Tollway's capital improvement program in order to reduce the overall cost of the project to eliminate the need for $300 million in funding from other sources. In response to the proposal, the Illinois Tollway and IDOT assessed the ramifications of deferring the north leg of the West Bypass corridor including the effects on the overall scope of the project, the project's purpose and need, the Illinois Tollway cost share policy, and funding needed to complete the north leg of the West Bypass corridor at a future date. On November 30, 2011, the Illinois Tollway presented a summary of their analysis of the proposal, specifically that the preferred course of action would be to maintain the originally conceived ICP. Work has resumed by the finance working group in search of funding sources for the $300 million.

4.2.3.3 Development of the Interchange Type Alternates

The development of the interchange alternates prompted the most stakeholder involvement. Stakeholders provided their input regarding interchange type alternates on frequent occasions (see Table 4-4). Access was considered a priority by all communities; therefore, the configuration of the interchanges to provide the optimal access was of critical interest. The consideration of interchange alternates was grouped into nine areas (see Exhibit 2-4A). In some cases, an area included only one interchange, while other areas included several related interchange locations. The technical arm of the team developed up to seven alternates in each of the nine areas. These alternates were further reviewed by the GWG for compliance with standards, constructability, and operational characteristics. The EWG examined the alternates in terms of their impacts on environmental resources, and slight adjustments in the configuration of alternates were made in many cases to avoid loss of resource or to reduce impacts to commercial and industrial properties.

TABLE 4-4
Stakeholder Opportunities: Development of Interchange Type Alternates

• Community One-on-One Meetings: March 2010 – December 2011	• Newsletter Number 9: September 2010
• OMP: March – October 2010	• PIMs: September 2010 and April 2011
• CPG/Task Force Meetings: August 2010 – September 2011	• Regulatory Resource Agencies: July, September, and October 2011
• NEPA/404 Merger Meetings: September 2010, February 2011, June 2011, September 2011	

Once the working groups were satisfied with the range of alternates, the stakeholders were engaged. Project team members met with the communities affected by the interchange alternatives in each of the nine areas to present the various interchange forms and discuss the advantages and disadvantages of each. The affected communities provided their reaction as to how well the interchange alternates addressed their community interests. In general, the villages of Roselle and Schaumburg supported alternates that provided good service, limited impacts to adjacent properties, and were compatible with transit operations. The Village of Itasca expressed support for maximizing access between I-290 and the Elgin-O'Hare Expressway and surrounding development. Optimizing access to planned redevelopment of aging properties was of great interest to the Village of Wood Dale. Bensenville supported geometric features that provided improved access to existing businesses. Franklin Park expressed support for maximizing access to the industrial businesses while reducing displacements. Elk Grove Village expressed interest in providing the greatest access to area businesses with the least impact on local roadway operations. The design team, after receiving input from the communities, improved the interchange designs to better address the needs of the communities. As such, the input from the communities was central to many of the decisions that were made regarding the interchange alternates carried forward in the process.

4.2.3.4 Agency Concurrence

In the summer of 2011, agreement was reached on the recommended alternates for the various design features. These recommended features were brought together to form the Build Alternative. At that time, concurrence on the alternates to be carried forward was requested from the regulatory resource agencies in the NEPA/404 Merger Group. The project team briefed the merger agencies on the process of developing alternates on two occasions (February 15, 2011 and June 28, 2011).

On September 8, 2011, formal concurrence was sought. The agencies deferred concurrence pending further information regarding the use of best management practices for water quality enhancement and regarding details concerning the interchange alternates. Specific information regarding available right-of-way also was requested to determine if the Build Alternative would provide for sufficient space to incorporate best management practices. Following the September

8 meeting, five separate discussions/meetings were conducted with the USACE, USEPA, and USFWS. During the series of meetings, the agencies were presented with detailed mapping of the proposed project, interchange alternates, the right-of-way, and an assessment of potential locations for best management practices.

It was generally agreed that the analysis of interchange alternates was complete, and that the incorporation of best management practices could be accomplished with the recommended alternates. It was further agreed that best management practices would be described as an element of the proposed improvement, and that the potential locations for best management practices be discussed in the Draft EIS, and a more specific concept for the location, type, and scale of best management practices be prepared for inclusion in the Final EIS. Overall, the agencies were satisfied that the alternative development process was appropriate to Tier Two, and concurrence was solicited from FHWA via correspondence. Concurrence was granted by all parties in October 2011 for the alternates (Build and No-Build Alternatives) to be carried forward (see Appendix B).

4.2.3.5 Development of Aesthetic Features

A unique component of the development process for the alternates is the definition of an overall concept for integrating aesthetic features into the EO-WB project improvement plan. To address these requirements, the proposed project created the CAAT, made up of representatives of each of the communities immediately adjacent to the planned improvements, as well as members of groups and agencies with an interest in the overall aesthetics of the corridor.

A series of four workshops were conducted. The first workshop focused on corridor character. CAAT members identified several key words to describe the existing conditions or the future vision for each section of the corridor. Some words, such as "gateway" and "multimodal," were common to all sections. However, for the most part, the descriptors in the west and central sections were more rustic, including "quaint" and "prairie," while the north and south sections were more urban or industrial in nature such as "efficient," "aviation," and "economic engine."

The group selected an overall theme for the project to discuss at the second meeting. The preference was for a signature gateway theme. "Gateways to the Future" was chosen and featured a simple continuous palette of landscape and hardscape throughout the corridor with customized elements highlighting each community. The third meeting focused on specific design elements, ranging from low-cost to signature elements that could be implemented within the corridor. The final meeting included endorsement of a set of design guidelines that, in addition to defining specific applications and areas of enhancement, highlights the following project objectives:

- Aesthetics should be scalable and appropriate for the multiple users in these corridors.
- Aesthetics should highlight and support new functions and improved efficiency of the corridors.
- Aesthetics should highlight improved areas of accessibility.
- Sustainable best management practices should be considered in selecting aesthetic treatments.

4.2.3.6 Development of Other Roadway Features

The development of the Build Alternative considered several other features that would have an impact on the project footprint or right-of-way requirements. Among these were the transit, drainage, best management practices, and bicycle/pedestrian elements. Transit has been a widely accepted element of the overall project, and there has been strong support for its inclusion from the early stages of Tier One.

In Tier Two, the focus has been on the details of transit including its right-of-way needs, station location, and parking. A technical analysis of the space requirements for right-of-way was conducted and accepted by the TWG. In regular meetings with the transit providers, it was concurred that a median width of 60 feet would be sufficient for either BRT or LRT, and the right-of-way would be expanded to 90 feet at station locations. The station locations were of great interest to the communities, and their comments and opinions about station locations were requested at a meeting with each community. Two adjustments in station location were affected by these comments—the Hamilton Lakes' Development station and the Wood Dale station. Additionally, the Village of Hanover Park requested extending transit service to its community from the Schaumburg station. An examination of six alternates identified one that has been recommended for inclusion in the overall transit solution. Companion to the station location input, communities offered ideas about preferred locations for station parking (see Exhibit 2-7 for station locations).

The bicycle and pedestrian element of the plan drew interest from all affected communities. In the development of the plan, all affected communities were engaged with the particulars of the plan, and each provided its input on local bicycle and pedestrian needs, linkages to activity centers, and local bikeways. The final plan provides predominately east-west bicycle facilities with other elements serving north-south travel.

Drainage is an issue important to all areas in northeastern Illinois. Whereas, many communities already experience flooding issues, the management of stormwater from a large transportation facility was of concern. IDOT clarified that the implementation of roadway drainage would take into consideration IDOT and Illinois Tollway criteria, and ordinances of DuPage and Cook counties. Several communities suggested that IDOT should consider drainage solutions that address the roadway needs, as well as existing community needs. The existing needs for several communities are being examined further, including Village of Franklin Park, City of Wood Dale, Bloomingdale Township, and Village of Itasca, as well as CDA.

Stakeholder opportunities for the development of other roadway features, such as transit, drainage, and bicycle/ pedestrian accommodations, are listed in Table 4-5.

TABLE 4-5
Stakeholder Opportunities: Development of Other Roadway Features

• RTA: October 2009 – November 2011	• PIMs: September 2010 and April 2011
• Community One-on-One Meetings: March 2010 – July 2011	• NEPA/404 Merger Meetings: September 2010, February 2011, June 2011, September 2011
• OMP: May – October 2010; December 2011	• Active Alliance: November 2010 and October 2011
• MWRDGC: June – October 2010; September 2011	• CPG/Task Force Meetings: August 2010 – March 2011

4.2.4 Identification of the Preferred Alternative

The Preferred Alternative was identified after extensive coordination with community leaders and regulatory resource agencies, and receiving input from affected residents and business owners. The Tier Two Draft EIS, which presented alternatives under consideration, was distributed to libraries, community leaders, stakeholders, and regulatory resource agencies for review and comment. A Public Hearing was held to provide the opportunity for area residents and other stakeholders to view the Tier Two Draft EIS and engineering drawings, and also to ask questions to the project team members. Meetings were held with community leaders to gain input on the design details of the Build Alternative. Consultation occurred regularly with regulatory resource agencies regarding environmental and socioeconomic impacts of the project and appropriate mitigation measures. Coordination activities are described in the following subsections.

4.2.4.1 Tier Two Draft EIS and Public Hearing Comments

The Tier Two Draft EIS was published and distributed for public review and comment in March 2012. The Notice of Availability was published in the Federal Register on March 30, 2012, signaling the beginning of the comment period. The comment period continued until May 14, 2012. During that time, a Public Hearing was held on April 18, 2012 to encourage input and comments on the proposed plan.

Comments were received from various sources including regulatory resource agencies, interest groups, special districts, municipalities, and the public, as summarized below.

The regulatory resource agency comments stressed the importance of implementing effective best management practices for reducing impacts to water quality and wetlands while honoring the FAA's requirements for reducing the wildlife attractants near airports. Other agency comments included consideration of fish and wildlife passage at greenways/stream crossings, and an interest in wetland and waters mitigation.

Interest groups/authorities commented on a variety of issues including: potential chloride pollution and practices to reduce chloride impact to receiving waters; bicycle and pedestrian compliance with Complete Streets Policy; concerns about an exit ramp location on I-294 that would impact the Maywood Sportsmen's Club; preserving fire department access to hydrants; providing emergency vehicle turn-a-rounds; impacts to the Touhy Flood Control Reservoirs; and approval of a construction sequencing plan by the owning agency.

The general public comments were specific to private property impacts, noise barrier locations, design issues, and requests for information (e.g., maps).

Each of the comments received during the comment period were reviewed. Detailed responses have been written and sent to everyone that commented during the Tier Two Draft EIS comment period. Appendix B contains a copy of the comments and the responses that were prepared by IDOT.

4.2.4.2 Coordination with Communities and Other Stakeholders

The municipalities have been engaged in the project throughout the development process, and have contributed to a solution that is compatible with their individual needs and the needs of the project as a whole. Since the circulation of the Tier Two Draft EIS, the communities were asked to review the engineering drawings for those portions of the project that affect their community. Individual meetings were conducted with all of the affected communities between April and July of 2012. Most of the communities suggested design changes that would affect details of the project, but did not affect the overall concept. Among the major comments were shifting the location of an off-ramp along I-294, provision of a continuous frontage road between IL 83 and York Road, and an improved circulation pattern in the Hamilton Lakes' Development. Recommendations for further refinements of the intersection options at IL 72 and Elmhurst Road were also received from communities, including Elk Grove Village. Project team members worked with community representatives to develop an intersection improvement that met the traffic needs of the area without major disruption to surrounding commercial and industrial properties. In late July 2012, a meeting was held with stakeholders to review the final design details of the preferred intersection type. At that meeting, it was agreed that the Quadrant Bypass (Old Higgins Road) Alternate is the preferred alternate (see Appendix B for concurrence letter from Elk Grove Village).

In June 2012, IDOT hosted the last CPG meeting. The presentation summarized the Public Hearing comments, status of the Tier Two Final EIS, project sequencing during implementation, and transition to the Local Advisory Committee under the leadership of the Illinois Tollway.

4.2.4.3 Agency Concurrence

A project update was presented to the NEPA/404 merger group in June 2012. A comparison of the No-Build and Build Alternatives was provided, in addition to a comparison of the interchange alternates at the Elmhurst Road and I-90 interchange and intersection alternates at the IL 72 and Elmhurst Road intersection. Concurrence of the Preferred Alternative and alternates was requested and received at the September 6, 2012 NEPA/404 Merger Meeting. The Build Alternative is the Preferred Alternative, the diverging diamond (Alternate 4) is the preferred alternate at the Elmhurst Road and I-90 interchange location, and the Quadrant Bypass (Old Higgins Road) Alternate is the preferred alternate at the IL 72 and Elmhurst Road intersection location.

4.2.5 Other Coordination

Coordination with regulatory/resource and public safety agencies was required to ensure that the improvements are compliant with environmental regulations and minimize environmental and social impacts. The following topics required additional coordination with the agencies to ensure that these stipulations were satisfied.

4.2.5.1 Bird Survey

The USFWS, INHS, IDOT, and the project team met on March 4, 2010, to discuss the potential need for a bird survey as part of Tier Two environmental studies. This meeting was held in response to the Tier One Draft EIS comment letter from USFWS and a subsequent meeting on December 1, 2009, to discuss the letter. The purpose of the bird survey would be to determine which species (particularly migratory birds, or rare and declining species) could be affected by noise as a result of the proposed EO-WB project improvements. Five potential bird survey sites were discussed with USFWS at the meeting. These sites were identified by the project team prior to the meeting, based on an aerial review and a field visit by INHS, IDOT, and consultant staff.

The urban nature of the project corridor, existing noise generators, and existing and projected traffic volumes were also discussed with USFWS at the meeting. USFWS requested that additional information regarding the traffic volumes be provided for its review. In an e-mail dated March 31, 2010, USFWS stated that bird surveys were not necessary to determine the potential noise impacts on birds. This determination was based on the high volume of traffic in the existing condition and the relatively long distance between the project corridor and habitat areas of concern.

4.2.5.2 Mitigation

Mitigation of natural resource impacts has been discussed with the cognizant resource agencies for an extended period of time (see Table 4-6). The primary issues have included the use of best management practices for enhancing the quality of roadway runoff before reaching local receiving waters, reduction of chlorides being discharges to local waterways, consideration of fish and wildlife passage at stream crossings, restoration of displaced wetland/waters, application of practices that would reduce air pollutants during construction, and compliance with the FAA's Wildlife Advisory Circular. Repeated meetings on these topics have resulted in mitigation measures that will benefit the environment for the long-term (see subsection 3.21). At the agency meeting in July 2012, concurrence was reached on all of the major mitigation strategies and the manner they would be presented in the Tier Two Final EIS.

TABLE 4-6
Summary of Meetings/Discussions Regarding Wetland Mitigation and/or Water Quality Best Management Practices

• USACE, USEPA, USFWS: December 17, 2010	• USEPA: September 14, 2011
• CPG/Task Force Meeting: January 25, 2011	• FAA, USACE, USFWS: September 21, 2011
• FAA: March 21, 2011	• USACE, USEPA, USFWS: October 12, 2011
• IDNR: May 13, 2011	• USACE, USEPA, USFWS: January 30, 2012
• FAA, USACE, USEPA, USFWS: July 15, 2011	• FAA, USACE, USEPA, USFWS: March 7, 2012
• USACE, USEPA, IEPA, IDNR, USDA, USFWS, FAA: July 23, 2012	

4.2.5.3 Air Quality Analysis

Several agencies have been consulted to develop the methodology for the air quality impact analysis. IDOT and FHWA had multiple telephone calls and meetings with USEPA, IEPA, and CMAP to determine the methodology for the $PM_{2.5}$ quantitative hot-spot analysis and methodology for the MSAT analysis. It was determined that MOVES would be used for the air quality analysis for both $PM_{2.5}$ and MSAT. The local methodology and analysis results were discussed at Tier Two interagency consultation meetings, which were attended by FHWA, USEPA, IDOT, IEPA, FTA, and CMAP.

4.2.5.4 Section 4(f)

The proposed improvements would require temporary involvement with four Section 4(f) resources: the Salt Creek Golf Course, two Schaumburg Bicycle Paths, and the Salt Creek Greenway Trail. A temporary easement would be required at the golf course entrance to blend the profile of the driveway and the improved Prospect Avenue. Safety or logistical reasons may require the temporary rerouting of the three bicycle facilities during construction. The Wood

Dale Park District is the owner with jurisdiction over the golf course, the Village of Schaumburg is the owner with jurisdiction over the two Schaumburg Bicycle Paths, and the City of Wood Dale is the owner with jurisdiction over the Salt Creek Greenway Trail where it crosses the project corridor. In the summer of 2011, the proposed improvements and how they would temporarily affect the resources were discussed with the owners with jurisdiction. Bicycle facility detours that may be temporarily required were determined during these conversations. Subsequently, written concurrence was obtained from the owners with jurisdiction that the temporary involvement with the resources would not adversely impact the function of the resources (see Appendix B).

4.2.5.5 O'Hare Airport

Coordination has occurred with CDA and OMP personnel regarding project activities that involve O'Hare Airport property and OMP projects. As a portion of the West Bypass corridor will be located on O'Hare Airport property, discussions have been held with CDA chief counsel regarding the requirements involved in using airport property for roadway improvements under FAA's Land Use Release policy. In January 2012, it was determined that any conversations regarding the use of airport property for the roadway would be deferred until after the Tier Two ROD is completed. Meetings have also occurred with CDA and OMP staff in order to relay project status, discuss compatibility of the EO-WB project with planned airport projects, review advancing design work for the EO-WB project, and exchange information helpful to the analysis and design of the EO-WB project.

4.2.5.6 Emergency Response

Fire and police personnel from local departments along the project corridor were consulted to determine how emergency responders utilize the existing facility and the ways in which the proposed improvements would impact emergency response during and after construction. Emergency response facilities located in the communities were identified, such as the number and location of police and fire stations, fire districts, service areas (if more than one station exists). Emergency responder's activities and standards for response time were discussed. Routes used through the communities and primary routes to frequently accessed hospitals during emergency responses were identified. Any restrictions for travel on limited-access facilities were discussed.

The consensus was that emergency response within the project area will benefit from the completed EO-WB project. However, many challenges were noted and discussed, including the provision of local access before, during, and after construction, as well as availability of alternative routes before, during, and after construction.

Emergency response personnel also provided input with regard to activities that have potential to minimize impacts to emergency response activities and expressed the need for additional coordination as the project moves forward. These methods are described in subsection 3.5.4.

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None

3.19 – Irreversible and Irretrievable Commitment of Resources

None

3.20 – Permits and Approvals

None

3.21 – Environmental Commitments

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None

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SECTION 6

List of Preparers

The following individuals were directly involved in the preparation of the Final EIS. Their responsibilities included collecting and analyzing data, evaluating impacts, identifying mitigation, consulting with agencies, and writing or reviewing sections of the Final EIS.

Name	Qualifications	Primary Responsibilities
Federal Highway Administration		
Matt Fuller	M.S., Civil Engineering; 13 years of experience.	Document Review; Federal Compliance
Mike Hine, P.E.	B.S., Civil Engineering; 36 years of experience.	Document Review; Federal Compliance
Federal Aviation Administration		
Jose DeLeon	M.B.A., Marketing and Economics; B.S., Operations Management/Quality and Performance Management; 12 years of experience.	Joint Lead Agency Reviewer
Amy Hanson	B.S., Environmental Science; 14 years of experience.	Joint Lead Agency Reviewer
Rich Kula	M.P.A., Aviation Administration; B.S., Aerospace Administration, Professional Pilot Technology; 19 years of experience.	Joint Lead Agency Reviewer
Illinois Department of Transportation		
IDOT Central Office, Bureau of Design and Environment		
Jim Curtis, P.G.	B.S., Geology and Geophysics; 21 years of experience.	Special Waste Technical Review
Brad Koldehoff	M.A., Anthropology/Archaeology; B.A., Anthropology; 30 years experience.	Archaeology and Historic Coordination Analysis and Review
Charles Perino	Ph.D, Botany; M.S., Botany; B.S., Geology; 29 years of experience.	Natural Resource Analysis and Review
Walt Zyznieuski	M.A., Environmental Studies; B.S., Geography; 30 years of experience.	Air and Noise Impact Analysis and Review; General Content Review

Name	Qualifications	Primary Responsibilities
IDOT District 1, Bureau of Programming		
Pete Harmet, P.E.	B.S., Civil Engineering; 25 years of experience.	Project Manager; General Review
Sam Mead	14 years of experience.	Environmental Unit Head; Environmental Review and Coordination
Vanessa Ruiz	B.A., Environmental Studies; 11 years experience.	Environmental Review and Coordination
Jason Salley, P.E.	B.S., Civil Engineering; 11 years of experience.	Geometric Review
Rick Wojcik, P.E.	M.B.A.; B.S., Civil/Structural Engineering; 26 years of experience.	Hydraulics Section Chief; Drainage Review
Illinois Tollway		
Paul Kovacs, P.E.	B.S., Civil Engineering; 28 years of experience.	Joint Lead Agency Reviewer
Adam Lintner, P.E.	B.S., Civil Engineering; 13 year of experience.	Joint Lead Agency Reviewer
Greg Stukel, P.E.	M.S., B.S., Civil Engineering; 25 years of experience.	Joint Lead Agency Reviewer
Bryan Wagner	B.S., Environmental Management; 4.5 years of experience.	Joint Lead Agency Reviewer
Rocco Zucchero	M.S., Urban Planning and Policy; B.S. Organizational Leadership; 20 years of experience.	Joint Lead Agency Reviewer
AECOM		
William Barbel	Civil Engineering and Environmental disciplines; 46 years of experience.	Environmental Review; Air Quality and Noise
CH2M HILL (EIS Contractor)		
Sarah Archer	B.A., Interdisciplinary Studies; 6 years of experience.	Agency/Public Coordination; Document Editing; Research
Libby Braband	Graduate Studies Urban Planning and Public Policy; B.S., Public Affairs; 17 years of experience.	Agency/Public Coordination
Brian Connor, P.E.	B.S., Civil Engineering;11 years of experience.	Functional and Geometric Plan Design
Chris DeRosia, P.E.	B.S., Civil Engineering; 8 years of experience.	Bicycle/Pedestrian Studies
Matt Gavin, P.E.	M.S., Environmental Geotechnics; B.S., Civil & Environmental Engineering; 14 years of experience.	Geotechnical Engineering
Ed Granzow	Graduate Studies Public Administration; B.A., Social Ecology; 35 years of experience.	Travel Demand Analysis
Debbie Flaws	B.A., English; 11 years of experience.	Document Editing; Special Waste Analysis; Alternatives Analysis

Name	Qualifications	Primary Responsibilities
Aimee King	M.S., Interdisciplinary Ecology; 10 years of experience.	Section 4(f) Analysis; GIS Analysis and Exhibits; Agency/Public Coordination; Social and Economic Analyses
Larry Martin	Graduate Studies Interdisciplinary Engineering; B.A., Urban Planning; over 40 years of experience.	Deputy Project Manager; Environmental Lead
Amarpal Matharu, P.E.	M.B.A., Management Information Systems; M.S., Civil Engineering; 17 years of experience.	Travel Demand Analysis
Keith Mockenhaupt, P.E., S.E.	B.S., Civil Engineering; 25 years of experience.	Structural Engineering
Jason Moller, P.E.	B.S., Civil Engineering; 9 years of experience.	Functional and Geometric Plan Design
Kevin Nichols, P.E.	M.S., Civil Engineering; B.S., Civil Engineering; 34 years of experience.	Functional and Geometric Plan Design Manager
Christine Norrick, AICP	M.U.P., Urban Planning; 25 years of experience.	Socioeconomics; Land Use; Alternatives Analysis
Dante Perez-Bravo, P.E.	M.S., Civil Engineering; B.S., Civil Engineering; 7 years of experience.	Travel Demand Analysis
Lidia Pilecky, P.E.	B.S., Civil Engineering; 28 years of experience.	Project Manager
Cheng Soong, P.E.	M.S., Civil Engineering; 40 years of experience.	Functional and Geometric Plan Design
Athreya Sreenivasan	M.S., Civil Engineering; 11 years of experience.	Travel Demand Analysis
Brett Weiland	B.S., Environmental Science; 11 years of experience.	Noise Analysis
Christopher B. Burke Engineering, LTD		
Emily Anderson, P.E.	M.S., Civil Engineering; 5 years of experience.	Drainage Engineering and Analysis
Jedd Anderson, CWS, CPESC	B.A., Geology; 22 years of experience.	Groundwater Analysis; Technical Quality Control
Elizabeth Gilson, CWS, Arborist	M.S., Natural Resource Ecology; 9 years of experience.	Tree Study
Eric Japsen, CWS, CPESC	M.S., Natural Resource Management; 17 years of experience.	Tree Study
Tom Kehoe, CWS, CPESC	B.A., Biology;17 years of experience.	Special Waste
Pete Knysz, CWS, CPESC	M.S., Biology; 16 years of experience.	Water Resources, Wetlands, and Natural Resource Analysis; Agency Coordination/Public Involvement; Technical Quality Control; Document Exhibits
Mike Matkovic, P.E.	B.S., Civil Engineering; 28 years of experience.	Quality Control; Public Involvement

Name	Qualifications	Primary Responsibilities
Tom McArdle, CWS, CPESC, Arborist	M.S., Forest Ecology; 24 years of experience.	Special Waste; Natural Resource Analysis
Robert Sliwinski, CPESC	M.S., Zoology/Aquatic Ecology; 19 years of experience.	Natural Resource Analysis
Dave Walters	B.A., Geography and Environmental Planning; 21 years of experience.	GIS Development; Impact Analysis; Document Exhibits
Chinliang Wang, P.E.	M.S., Civil Engineering; M.A., Creative Planning and Ecological Management; 43 years of experience.	Drainage Quality Control; Agency Coordination/Public Involvement
Landrum & Brown		
Jeffery Jackson	B.S., Aviation Management; 11 years of experience.	Noise and Air Analysis
Erich Neumann	B.S., Social Sciences (Geography); 10 years of experience.	GIS Development; Impact Analysis; Document Exhibits; Special Waste Analysis
Vlecides-Schroeder Associates, Inc.		
Jessica Rinks	M.S., Public Administration; B.S.; 7 years of experience.	Transit Alternatives Development and Analysis
Ryan Ruehle	Graduate Studies in Urban Planning; B.S.; 5 years of experience.	Transit Alternatives Development and Analysis
Joanne Schroeder	Graduate Studies in Urban and Regional Planning; B.A.; 34 years of experience.	Transit Alternatives Development and Analysis
STV, Inc.		
Paul Bobby, P.E.	B.S., Civil Engineering; 13 years of experience.	Freight Rail Coordination and Analysis
Patrick Bryant, P.E.	B.S., Civil Engineering; 17 years of experience.	Freight Rail Coordination and Analysis
HR Green, Inc.		
T. Scott Creech, P.E.	M.S., B.S., Civil Engineering; 25 years of experience.	Technical Oversight
Ronald Krall, P.E.	B.S., Civil Engineering; 20 years of experience.	Technical Oversight
Sean LaDieu	B.S., Civil Engineering; 20 years of experience.	Technical Review
Huff & Huff		
Linda Huff	M.B.A.; B.S., Chemical Engineering; 32 years of experience.	Technical Review
Jim Novak	Post-Graduate Studies in Earth Science; B.A., Geography and Environmental Studies; 24 years of experience.	Technical Review

Name	Qualifications	Primary Responsibilities
Parsons Brinckerhoff		
Allan Hodges	M.S., Urban Planning; B.S., Community Development; 42 years of experience.	Technical Review
Steve Ott	M.S., Resource Development (Environmental Policy and Law); B.S., Landscape Architecture; 32 years of experience.	Technical Review
Steve Nadalis, P.E.	M.B.A., B.S. Civil Engineering; 30 years experience.	Technical Review

SECTION 7

Final Environmental Impact Statement Distribution List

The following entities received a copy of this Final EIS. Those recipients with an asterisk (*) before their names provided substantive comments on the Draft EIS. These comments and IDOT's responses are summarized in Section 4 and included in Appendix B of this document.

Federal Agencies

*U.S. Army Corps of Engineers, Chicago District
U.S. Department of Homeland Security, Federal Emergency Management Agency
U.S. Department of Homeland Security, Transportation Security Administration
*U.S. Department of the Interior, Fish and Wildlife Service
U.S. Department of Transportation, Federal Transit Administration
*U.S. Environmental Protection Agency, Region V – Office of Environmental Review
U.S. Environmental Protection Agency, Headquarters

State Agencies

*Illinois Department of Agriculture, Bureau of Land and Water Resources
*Illinois Department of Natural Resources
*Illinois Environmental Protection Agency, Director
Illinois Historic Preservation Agency, State Historic Preservation Officer
Illinois State Police

Elected Officials—Federal

Eighth Congressional District, Congressman Joe Walsh
Fifth Congressional District, Congressmen Mike Quigley
Fifty-Fifth Representative District, Representative Randy Ramey
Fifty-Fourth Representative District, Representative Tom Morrison
Fifty-Sixth Representative District, Representative Michelle Mussman
Fifty-Third Representative District, Representative Sidney H. Mathias
Forty-Fifth Representative District, Representative Franco Coladipietro
Forty-First Representative District, Representative Chris Nybo
Forty-Forth Representative District, Representative Fred Crespo
Forty-Seventh Representative District, Representative Patti Bellock
Forty-Sixth Representative District, Representative Dennis Reboletti
Ninth Congressional District, Congresswoman Janice Schakowsky
Sixth Congressional District, Congressmen Peter Roskam
U.S. Senator Richard Durbin
U.S. Senator Mark Kirk

Elected Officials—State

Fourth Legislative District, Senator Kimberly Lightford
Seventh Representative District, Representative Karen Yarbrough
Seventy-Eighth Representative District, Representative Camille Lily
Seventy-Seventh Representative District, Representative Angelo Saviano
Sixty-Fifth Representative District, Representative Rosemary Mulligan
Sixty-Sixth Representative District, Representative David Harris
Tenth Legislative District, Senator John Mulroe
Thirty-Ninth Legislative District, Senator Don Harmon
Thirty-Third Legislative District, Senator Dan Kotowski
Twentieth Representative District, Representative Michael McAuliffe
Twenty-Eighth Legislative District, Senator John Millner
Twenty-First Legislative District, Senator Ronald Sandlack
Twenty-Fourth Legislative District, Senator Kirk Dillard
Twenty-Second Legislative District, Senator Michael Noland
Twenty-Seventh Legislative District, Senator Matt Murphy
Twenty-Third Legislative District, Senator Carole Pankau

Local Units of Government

Bloomingdale Township
Chicago Transit Authority
City of Chicago Department of Aviation
City of Chicago Department of Aviation, O'Hare Modernization Program
City of Chicago, Department of Transportation
City of Chicago, Department of Transportation, Division of Project Development
City of Des Plaines
City of Elmhurst
City of Northlake
City of Park Ridge
City of Rolling Meadows
City of Wood Dale
Cook County Highway Department
DuPage County Board
DuPage County Department of Economic Development and Planning
DuPage County Division of Transportation
DuPage County Transportation Planning Group
Forest Preserve District of DuPage County
Kane-DuPage County Soil and Water Conservation District
*Metra
*Metropolitan Water Reclamation District of Greater Chicago
Pace Suburban Bus Service
Regional Transportation Authority
Village of Addison
Village of Arlington Heights
Village of Bartlett

Village of Bensenville
Village of Berkeley
Village of Bloomingdale
*Village of Elk Grove
Village of Franklin Park
Village of Hanover Park
Village of Hillside
Village of Hoffman Estates
Village of Itasca
Village of Melrose Park
Village of Mount Prospect
Village of Norridge
*Village of Roselle
Village of Rosemont
Village of Schaumburg
Village of Schiller Park
Village of Villa Park

Interested Groups and Individuals

*Active Transportation Alliance
Bensenville Chamber of Commerce
Canadian Pacific Railroad
*Chicago Metropolitan Agency for Planning
Chicago Wilderness Consortium
Conservation Foundation of DuPage County
DuPage Mayors & Managers Conference
*DuPage River Salt Creek Workgroup
Elmhurst Memorial Healthcare
Greater O'Hare Association of Industry and Commerce
Northwest Municipal Conference
Salt Creek Watershed Network
Union Pacific Railroad
West Central Municipal Conference
Wood Dale Chamber of Commerce

Public Libraries

Addison Public Library
Arlington Heights Memorial Library
Austin-Irving Chicago Public Library
Bartlett Public Library
Bensenville Community Library
Berkeley Public Library
Bloomingdale Public Library
City of Des Plaines Library
Elk Grove Village Public Library
Elmhurst Library

Franklin Park Public Library
Hanover Park Branch Library
Harold Washington Chicago Public Library
Hillside Public Library
Hoffman Estates Public Library
Itasca Community Library
Melrose Park Public Library
Mount Prospect Public Library
Northlake Public Library
Oriole Park Chicago Public Library
Park Ridge Library
Roden Chicago Public Library
Rolling Meadows Library
Roselle Public Library
Schaumburg Township Library
Schiller Park Public Library
Villa Park Public Library
West Addison Chicago Public Library
Wood Dale Public Library