

implementation of regulatory controls and increasing consideration of sustainable policies has shown benefits to water quality and biological resources. With the implementation of these management tools, the deteriorating quality of these resources has subsided and has shown signs of improving.

Overall, the cumulative effects of the proposed improvement and other major projects in the area would be manageable with diligent adherence to managed growth and regulatory controls protecting and preserving natural resources in the area. Communities and resources agencies affected by the proposed transportation improvements have been substantially involved in the planning process for these planned facilities. They have helped to guide the proposed improvements in ways that are compatible with community goals and objectives, and with the policies of resource agencies. Thus, the planning process has measurably addressed and planned for improvements that reflect the values of the affected communities and agencies. As the process advances toward implementation, these same values could be incorporated into the project specific mitigation, interagency agreements, ordinances, and regulations pertaining to the area.

## 4.13 Mitigation Concepts and Commitments

Mitigation measures are provided to compensate for unavoidable impacts. The following are proposals and concepts for mitigating resource losses or managing short- and long-term social effects. Detailed mitigation strategies will be developed during Tier Two environmental studies.

### 4.13.1 Traffic

A traffic management plan will be required during the construction period. The purpose of the plan is to maintain traffic flow and reliable access to residences, businesses, community facilities and services, and local roads during construction. There would be coordination with fire, police, and emergency services to minimize delays and response times during construction.

### 4.13.2 Land Use

Land use mitigation will consist of maintaining or enhancing connectivity, and incorporating roadway design considerations for developed areas. Continued coordination with communities at each successive design level would be conducted on issues such as: identifying opportunities to expand transit, bicycle, and pedestrian movement across or along planned roadway improvements; reviewing alignment details and resultant community impacts; and incorporating roadway design considerations, such as landscaping, buffer areas, and roadway lighting sensitive to adjacent land uses in order to minimize community impacts.

### 4.13.3 Relocations

IDOT will offer relocation assistance, in accordance with the *Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970*, as amended, and IDOT's *Land Acquisition Procedures Manual*, to all occupants of buildings they would purchase and remove. Those policies provide for relocation assistance services to homeowners, renters, and businesses.

Participation under the state and federal policies is without discrimination. IDOT will pay property owners the fair market value for all private property purchased, and relocation assistance.

#### 4.13.4 Water Quality and Hydrology

Measures to mitigate water quality impacts are described conceptually here. They will be detailed in Tier Two environmental studies as to type, extent, and location of mitigation.

BMPs would be implemented that minimize the volume of stormwater runoff discharge and result in physical, chemical, or biological pollutant load reduction, increased infiltration, and evapotranspiration. Proper soil erosion and sediment control measures would be used to minimize erosion and sedimentation for any build alternative. These measures are a condition of Section 404 CWA permits, prescribed in design and construction guidance by IDOT, and would be coordinated with the local Soil & Water Conservation District (SWCD). Erosion control measures consist of applying mulch, straw, soil tackifiers, polymers, erosion control blankets, and vegetative soil stabilization. Vegetative soil stabilization includes temporary and permanent seeding, sodding, ground cover, and dormant seeding. Disturbance of streamside and riparian vegetation would be kept to a minimum. In-stream construction and soil disturbing activities near streams would be conducted during low or normal flow periods. Discharge points would be protected with rock (or an alternative measure) to minimize scour and erosion.

Perimeter sediment control devices would be installed before commencing soil disturbing activities, as necessary. Perimeter silt fence, stabilized construction entrances, drainage inlet protection, ditch checks, diversions, sediment traps, and other appropriate BMPs would be used to control sediment and runoff, and to protect receiving waters during construction.

Stream crossings and structure sizing would be performed in accordance with state and federal guidelines regarding floodplain 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 expected high water flows, to allow movement of aquatic biota, and not to impede low water flows. 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). Compensatory storage and stormwater detention facilities will be analyzed in the design phase of Tier Two and would be considered in accordance with local stormwater ordinances. The requirements for compensatory storage are discussed in subsection 4.4, Floodplains, and for detention in subsection 4.2, Water Resources and Quality. Stormwater facilities and discharges will be monitored and managed during and following construction in accordance with the requirements of the General NPDES Permit No. ILR40.

Other stormwater control practices may be needed to mitigate water quality impacts. In addition to detention facilities, other practices, such as vegetated basins/buffers, infiltration basins, and bioswales, would be evaluated to minimize transport of sediment, heavy metals, and other pollutants. Deicing management practices, such as anti-icing chemicals and additives, can minimize salt application quantities. These practices will be evaluated further in Tier Two environmental studies.

Accidental spills of hazardous materials and wastes during construction or operation of the transportation system require special response measures. Occurrences would be handled in accordance with local government response procedures. The first response typically is through the fire department and emergency service personnel to ensure public safety and to prevent harm to the environment. Depending on the nature of the spill, the Illinois Emergency Management Agency (IEMA), and as necessary, IDNR or IEPA, would be notified to provide additional instruction regarding cleanup. Refueling or maintenance of construction equipment would not be allowed within 100 feet of wetlands or water bodies to avoid other accidental spills.

#### **4.13.5 Wetland Mitigation**

Measures to mitigate wetland impacts,<sup>36</sup> conceptually defined here, will be detailed in Tier Two. As required by USACE and IDNR regulations, final design of the preferred alternative will incorporate wetland avoidance and minimization objectives prior to the development of the project mitigation plan. Much has been done in the Tier One study to coordinate with the USACE and IDNR to avoid and minimize impacts on wetlands. Unavoidable wetland impacts will require compensatory wetland mitigation. The compensatory wetland mitigation design will establish and implement wetland compensation objectives, apply established ratios for compensation commensurate with required impacted wetlands, identify locations for wetland compensation sites, site engineering and development, and plans for long-term monitoring and maintenance of the mitigation wetlands.

##### **4.13.5.1 Wetland Impact Avoidance and Minimization**

Recognizing the conceptual engineering detail of the build alternatives, further efforts will be made in future phases of work for the preferred alternative to avoid and minimize additional wetland impacts beyond the efforts in Tier One. Avoidance and minimization can be accomplished in the following ways:

- Alignment shifts of roadways
- Narrower roadway cross-section with the use of:
  - Narrower center median
  - Narrower shoulder
  - Retaining walls
  - Steeper roadway embankments
  - Enclosed drainage systems
  - Bridging critical wetland resources

Avoiding and minimizing impacts to wetland resources may be constrained by other critical resources or local issues. When a choice must be made between wetlands and other critical resources, some resources or project issues may be afforded priority over wetland loss. For example:

- Avoidance of public recreational lands protected under Section 4(f)
- A disproportionate amount of residential and business relocations
- Maintenance of minimum safety requirements

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<sup>36</sup> Jurisdictional wetland and other waters of the U.S. impacts will require compensatory mitigation under Section 404 of the CWA.

#### 4.13.5.2 Compensatory Wetland Mitigation

Objectives for mitigation will be established in consultation with regulatory and resource agencies on the following major issues:

- Purchase of mitigation credits from a commercial wetland bank
- Type of compensatory wetland mitigation
- In-kind replacement
- Functional replacement
- Ratio of wetland mitigation replacement
- Location of wetland mitigation replacement

The State of Illinois, in the IWPA, has established compensatory wetland mitigation ratios for all state-funded projects. The established ratios generally are more stringent than those established by the USACE. The highest mitigation ratio of 5.5:1 will apply for wetland impacts in the following cases:

- Alteration of wetlands that contain state- or federal-listed threatened or endangered species
- 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 a Floristic Quality Index (Swink and Wilhelm, 1994) of 20 or more

The compensation ratios shown in Table 4-31 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, etc.) requiring elevated compensatory wetland mitigation as well.

Compensation ratios for impacts to High Quality Aquatic Resources will be developed with the regulatory agencies on a case-by-case basis during Tier Two.

Location of the compensatory wetland mitigation sites would be determined following agreement on the wetland replacement ratio and other mitigation objectives. Appropriate environmental studies would be conducted for the selected mitigation sites, including an evaluation of the environmental features of the site, existing resources, suitability for wetland resource creation and restoration and potential effects of mitigation creation at the selected location. The environmental studies would include historic/archaeological surveys, biological surveys, and potential for threatened and endangered species.

TABLE 4-31  
IDNR Wetland Compensation Ratios

Degree of Adverse Impact	Onsite	Offsite	Out-of-Basin
Minimal alteration	1.0:1 <sup>a</sup> / 1.5:1 <sup>b</sup>	1.5:1	2.0:1
Significant alteration	1.5:1	2.0:1	3.0:1
Destruction	2.5:1	4.0:1	5.5:1

<sup>a</sup>This ratio applies to all other types of wetland vegetation, substrate, or wetland type except those wetlands that have woody vegetation, subject to USACE approval.

<sup>b</sup>This ratio applies if the vegetation of the affected wetland is woody.

Preferences for mitigation are as follows:

1. Wetland mitigation banking within a USACE-approved bank.<sup>37</sup>
2. Onsite – within the same hydrologic unit and less than one mile from the project site.<sup>38</sup>
3. Offsite, within basin – the same hydrologic unit but more than one mile from the project site.
4. Offsite, out of basin – compensation not provided within the watershed of affected wetlands.

The following compensatory wetland mitigation strategies may be used with the above preferences:

- One overall compensation site
- Larger sites (as opposed to scattered smaller sites), to facilitate long-term management for a composite of desired wetland functions, values, and biodiversity
- 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 providing in-kind replacement of impacted wetlands and streambank ecosystems
- Sites supporting a diverse ecosystem with hydrologic/ecologic connections to other ecosystems and associated riparian areas
- Sites that have a high likelihood of success
- Restoration and enhancement of existing wetlands
- Participation in wetland creation programs (e.g., FPDCC)
- Acquisition/land protection

#### 4.13.6 Floodplain Mitigation

Floodplain impact mitigation will be based on IDOT guidelines in conjunction with the Illinois Department of Natural Resources-Office of Water Resources (IDNR-OWR), as well as local ordinances for floodplain management and mitigation.

Examples of mitigation measures to be considered during Tier Two of the study include:

- At locations where a longitudinal floodplain encroachment would occur, practicable alternatives such as shifting alignment, lowering profile, constructing structures, etc. would be explored to avoid or minimize encroachments on the floodplain.

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<sup>37</sup> The option most preferred is mitigation bank credits. See the *Compensatory Mitigation for Losses of Aquatic Resources: Final Rule* (April 10, 2008).

<sup>38</sup> Mitigation site selection will consider the potential to attract waterfowl and other bird species that might pose a threat to aircraft. FAA Advisory Circular, *Hazardous Wildlife Attractants On or Near Airports*, (Advisory Circular No: 150/5200-33B) recommends that wetland mitigation projects that may attract hazardous wildlife be sited at least 10,000 feet from the air operations area of an airport serving turbine-powered aircraft, 5,000 feet from the air operations of an airport serving piston-powered aircraft, and five statute miles if the attractant may cause hazardous wildlife movement into or across the approach or departure airspace.

- At locations where a transverse floodplain encroachment would occur, the proposed roadway should span over the floodplain to greatly reduce encroachments.
- Designs of embankment slopes and roadway profiles would be considered to reduce filling of the floodplain.
- Retaining walls would be considered in an effort to reduce potential floodplain impacts.
- Compensatory storage would be provided to comply with regulation requirements. Table 4-18 and Table 4-19 provide an estimated compensatory storage volume for each alternative.

Effort would be made to minimize open water surfaces within 10,000 feet from the end of runways at O'Hare Airport. Measures to mitigate floodplain impacts will be further identified and refined during the Tier Two environmental studies.

#### 4.13.7 Biological Resources

Mitigation of upland forested areas will comply with guidelines established by the IDOT for habitat replacement. Tree replacement will be in accordance with IDOT's Tree Removal and Replacement Policy. Guidelines for tree and vegetation replacement include:

- Replacing losses of forest habitat associated with large wooded tracts (10 acres or more):
  - Replacing existing native hardwoods
  - Replacing non-native species with native hardwoods
  - Replacing indigenous understory
- Replacing losses for other tree and vegetation material:
  - Replacing scattered landscape material per IDOT's *Guidelines for Use of Landscape Items*
  - Replacing trees and vegetation on Section 4(f) lands to be coordinated with the agency having jurisdiction over the subject property

An attempt will be made to minimize and mitigate impacts to wildlife. The alternatives primarily include improvements to existing roadways. These roadways are already, for the most part, barriers to wildlife movement.

As streams provide avenues of wildlife movement, bridges or culverts can be installed where practical to provide additional corridors of 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 large numbers of wildlife are present, such as forest preserves, fencing and other barriers would be limited to areas necessary for public safety. For project sections that are new roadways or alignments, features to facilitate wildlife movement and reduce vehicle/wildlife collisions would be incorporated into the plans where possible.

For sensitive wildlife areas, such as forest preserves and critical wetlands, large box culverts can be installed where practical to serve as avenues for wildlife movement. Culverts combined with low barrier walls along the roadway would provide a safer means of crossing the roadway. Short barrier walls in sensitive areas would be designed mainly to restrict the

movement of small animals, including reptiles, amphibians, and smaller mammals. The walls would not limit the movement of larger mammals in order to prevent them from being trapped within the roadway.

As part of Tier Two, additional studies will be conducted to determine the potential presence of threatened and endangered species. If threatened or endangered species are encountered that have not yet been recorded, a plan would be developed to avoid affecting that species. If avoidance is impractical, a mitigation plan would be developed and coordinated with the USFWS or IDNR through the formal consultation process.

Plans for staged construction may be incorporated into the final plans for a preferred alternative to minimize disruption of breeding seasons for sensitive species. During Tier Two, coordination with USFWS and/or the owners of adjacent natural areas (e.g., forest preserve districts) will take place as necessary to obtain input on best practices and available mitigation strategies to avoid or minimize potential wildlife impacts. Detailed mitigation strategies will be developed during Tier Two environmental studies.

#### 4.13.8 Special Lands

If it is determined in Tier Two that implementation of the Preferred Alternative requires the use of Section 4(f) properties, IDOT would coordinate with FHWA and the Section 4(f) entity affected or the IDNR to determine appropriate mitigation measures where avoidance and minimization measures are not feasible or prudent. IDNR requires the substitution of replacement property having equal fair market value and comparable outdoor recreational usefulness, quality, and location in order to convert property purchased with OSLAD funds to transportation uses. These mitigation measures would be documented in a Memorandum of Agreement signed by IDOT and IDNR.

#### 4.13.9 Visual Resources

The following general principles will be considered during Tier Two project design to mitigate for visual impacts:

- Provide a smooth transition to existing topography at grading limits
- Consult with stakeholders on noise barrier and retaining wall design to soften the contrast with the adjacent land uses/environment
- Design stormwater management facilities to be functional and aesthetically pleasing
- Consider directional street lighting to minimize light pollution
- Preserve vegetation or stabilize disturbed parts of the right-of-way with vegetation using native plant species, where appropriate
- Reduce median widths at creek crossings to minimize disturbance of vegetation and terrain, providing motorists with the opportunity to become aware of these resources

Construction of the build alternatives would result in the loss of wooded areas. Replacement trees would be required as mitigation measures in accordance with the IDOT's Policy D&E-18, *Preservation and Replacement of Trees*. Replacing trees on Section 4(f) lands will be coordinated with the agency having jurisdiction over the subject property, and may

require more restrictive tree replacement requirements. Planting a variety of native trees rather than a single species would mitigate, to some degree, the tree impacts, while helping to offset the contrast of fill slopes or cuts. The installation of native trees, shrubs, grasses, and forbs could minimize right-of-way maintenance. Visual discontinuity associated with approach slopes to bridges could be softened by installing groups of trees and shrubs, helping to blend these features into the surrounding environment.

Given the relatively flat terrain in the study area, the most visually apparent features of the project would generally be bridges and interchanges. The appearance of typical overpass structures with steep approach slopes could be enhanced through structures, earthwork, and landscape design. Bridges would be designed to appear unified and to present a cohesive image for motorists passing through the area, and for others within the viewshed.

These principles would be considered and specific design elements developed and refined during Tier Two environmental studies or the final design. Stakeholder input could continue as part of the context sensitive design.

#### **4.13.10 Air Quality**

Construction will occur during Tier Two. Construction will be required to comply with applicable state and local air quality regulations.

#### **4.13.11 Noise**

All construction equipment would be required to have mufflers constructed in accordance with the manufacturers' specifications. Mufflers and exhausts must be maintained in good working order. Daily operating hours for construction would coincide with the construction schedule needs, unless otherwise specified.

Tier Two noise abatement measures for reducing traffic noise levels to residential and other properties will be evaluated for reasonableness and feasibility, and follow the guidance provided by the FHWA policies and procedures, 23 CFR 772; IDOT's *BDE Manual Section 26-6* (2002a); and IDOT's *Highway Traffic Noise Assessment Manual* (2007a).

Measures to reduce traffic noise, including traffic management measures, comprehensive land use planning, shifting the roadway location, and noise barriers will be examined during the Tier Two environmental studies.

#### **4.13.12 Special Waste**

Each build alternatives and south bypass connection option might encounter special waste sites. The extent and nature of materials requiring special handling will be the focus of further studies in Tier Two. A PESA will be completed to determine areas with recognized environmental conditions. A response to the PESA will be required to determine sites that require a Preliminary Site Investigation (PSI). The PSI will determine soil and environmental impacts, special waste handling requirements, and construction worker safety considerations. The areas of contamination would be managed in accordance with federal and state laws and regulations and in a manner that would protect human health and the environment.

### 4.13.13 Borrow and Disposal

The requirements for borrow and disposal of unused excavated material have not been determined in Tier One. The borrow and disposal requirements for the project will be determined as part of Tier Two. The amount and location of borrow cannot be ascertained until preliminary engineering design has been fully developed and refined in final design. Borrow sites would be identified and a site plan prepared, including an excavation plan, haul route plan, and end use plan. Appropriate environmental studies would be conducted for the borrow areas, including an evaluation of the environmental features of the sites and their potential environmental effects.

To the extent possible, materials cut from the project corridor with the proper engineering properties would be used for fill. The contractor would dispose of unusable excavated material in accordance with state and local regulations and other special provisions to ensure protection of wetlands and other waters. All waste and demolition material from the project would also be disposed of in accordance with applicable regulations.

## 4.14 Permits / Certifications

Regulatory permits would be required for any build alternative. Regulatory agencies, such as the USACE, are not being requested to consider issuing permits at this time; however, a general coordination approach is taking place. Detailed studies would be required as part of formal permit applications and consultations, which will be completed in Tier Two. Such studies would include formal wetland delineations, biological surveys, or searches for threatened and endangered species for the selected alternative. Issuance of regulatory permits would require detailed engineering plans for the preferred alternative.

This study does not include developing detailed engineering plans for any alternatives. Submittal of permit applications to pertinent regulatory agencies would not take place until after selection of a preferred alternative and development of final engineering plans in Tier Two. Avoidance and minimization strategies required to obtain permits would be developed at that time.

Permits could include at least the following:

- Section 404 of the CWA from the USACE
- Section 401 of the CWA Water Quality Certification from the IEPA
- NPDES permit from the IEPA
- IDNR-OWR permits for impacts to regulatory floodways and stream crossings
- Coordination with the North Cook County and/or Kane/DuPage County SWCD for soil erosion and sediment control review

The build alternative will have impacts on surface waters and wetlands. 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. The permitting process for the preferred alternative would vary, depending upon implementation as a single project or a phased project. If the preferred alternative is implemented as a single project, an individual permit most likely would be required from the USACE-Chicago District for all jurisdictional wetland impacts associated with the project. If the preferred alternative is phased or