5.10 HAZARDOUS MATERIALS, SOLID WASTE, AND POLLUTION PREVENTION

This section discusses the hazardous materials, solid waste, and pollution prevention efforts expected to result from the No Action and Proposed Action Alternatives, including a summary of the regulatory setting, affected environment, and any anticipated environmental consequences.

5.10.1 Definition of Resource

The FAA 1050.1F Desk Reference defines the terms "solid waste," "hazardous waste," "hazardous substance," "hazardous material," and "pollution prevention" in Section 7: Hazardous Materials, Solid Waste, and Pollution Prevention. Those definitions are provided below.

- **Solid Waste** is defined by the implementing regulations of the Resource Conservation and Recovery Act (RCRA) generally as any discarded material that meets specific regulatory requirements. It can include such items as refuse and scrap metal, spent materials, chemical by-products, and sludge from industrial and municipal wastewater and water treatment plants (see 40 CFR Section 261.2 for the full regulatory definition).
- **Hazardous waste** is a type of solid waste defined under the implementing regulations of RCRA. A hazardous waste (see 40 CFR Section 261.3) is a solid waste that possesses at least one of the following four characteristics: ignitibility, corrosivity, reactivity, or toxicity, as defined in 40 CFR part 261 subpart C, or is listed in one of four lists in 40 CFR Part 261 Subpart D, which contains a list of specific types of solid waste that the USEPA has deemed hazardous. RCRA imposes stringent requirements on the handling, management, and disposal of hazardous waste, especially in comparison to requirements for non-hazardous wastes.
- **Hazardous substance** is a term broadly defined under Section 101(14) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (see 42 U.S.C. Section 9601(14)). Hazardous substances include:
    - Any element, compound, mixture, solution, or substance designated as hazardous under Section 102 of CERCLA,
    - Any hazardous substance designated under Section 311(b)(2)(A) or any toxic pollutant listed under Section 307(a) of the Clean Water Act (CWA),
    - Any hazardous waste under Section 3001 of RCRA,
    - Any hazardous air pollutant listed under Section 112 of the Clean Air Act (CAA), and
    - Any imminently hazardous chemical substance or mixture for which the USEPA Administrator has "taken action under" Section 7 of the Toxic Substances Control Act (TSCA).

  Please note that the definition of hazardous substances under CERCLA excludes petroleum products unless specifically listed or designated thereunder.
- **Hazardous material** is any substance or material that has been determined to be capable of posing an unreasonable risk to health, safety, and property when transported in commerce. The term "hazardous materials" includes both hazardous wastes and hazardous substances as well as petroleum and natural gas substances and materials (see 49 CFR Section 172.101).

- *Pollution prevention* describes methods used to avoid, prevent, or reduce pollutant discharges or emissions through strategies such as using fewer toxic inputs, redesigning products, altering manufacturing and maintenance processes, and conserving energy.

5.10.2 Regulatory Context

Federal statutes intended to regulate the handling of hazardous materials and solid waste, and pollution prevention, include the:

- **Resource Conservation and Recovery Act (RCRA)** of 1976, 42 U.S.C. Sections 6901–6992k (as amended by the Hazardous and Solid Waste Amendments of 1984 and the Federal Facilities Compliance Act of 1992) provides for the management of hazardous and solid wastes and regulation of underground storage tanks (USTs) containing chemical and petroleum products. Pursuant to RCRA, the USEPA has established standards for permitting hazardous waste facilities and persons transporting hazardous waste and cleaning up contamination at hazardous waste sites.
- **Pollution Prevention Act (PPA)** of 1990, 42 U.S.C. Sections 13101–13109, was enacted to reduce the amount of hazardous substances, pollutants, and contaminants entering the waste stream prior to recycling. The PPA sought to prevent or reduce pollution at its source, and where that is not possible, recycle such materials rather than disposing of them.
- **Toxic Substances Control Act (TSCA)** of 1976, 42 U.S.C. Sections 2601–2697 (as amended in 2016 by the Frank R. Lautenberg Chemical Safety for the 21st Century Act) establishes a framework for the identification of chemical substances that are manufactured, distributed in commerce, processed, used, or disposed of that may present an unreasonable risk of injury to health or the environment and the evaluation of such risks.
- **Oil Pollution Act (OPA)** of 1990, 33 U.S.C. Sections 2701–2762 was established to improve the nation's ability to prevent and respond to oil spills by expanding the Federal government's ability to respond. The OPA provided new requirements for contingency planning by both government and industry.
- **Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or otherwise known as "Superfund")** of 1980, 42 U.S.C. Sections 9601 et seq. (as amended by the Superfund Amendments and Reauthorization Act of 1986 [SARA or Superfund] and the Community Environmental Response Facilitation Act of 1992) provides a Federal "Superfund" to clean up uncontrolled or abandoned hazardous-waste sites as well as accidents, spills, and other emergency releases of pollutants and contaminants into the environment. Also, Title III of SARA authorized the Emergency Planning and Community Right-to-Know Act (EPCRA).

Together, the CERCLA, RCRA, and OPA provide the Federal government with the authority to (1) clean up contaminated sites or (2) force responsible parties to fund and/or perform the required cleanup of contaminated sites.

The Oil Pollution Prevention regulations (40 CFR Part 112) provide the framework for the USEPA's Oil Spill Prevention, Control, and Countermeasure (SPCC) program, which seeks to prevent oil spills from certain aboveground storage tanks (ASTs) and underground storage tanks (USTs).

Additionally, Illinois statutes that pertain to solid waste are the Environmental Protection Act (415 ILCS 5), Illinois Solid Waste Management Act (415 ILCS 20), the Local Solid Waste Disposal Act (415 ILCS 10), and the Solid Waste Planning and Recycling Act (415 ILCS 15).

International waste management practices are included in the U.S. Department of Agriculture (USDA) Airport and Maritime Operations Manual, which implements USDA regulations 9 CFR 94.5 and 7 CFR 330.400.

5.10.3 Thresholds of Significance

According to FAA Order 1050.1F, Environmental Impacts: Policies and Procedures, the FAA has not established a significance threshold for Hazardous Materials, Solid Waste, and Pollution Prevention. However, the FAA has identified factors to consider that may apply to hazardous materials, solid waste, and pollution prevention, including but not limited to situations in which the Proposed Action would have the potential to:

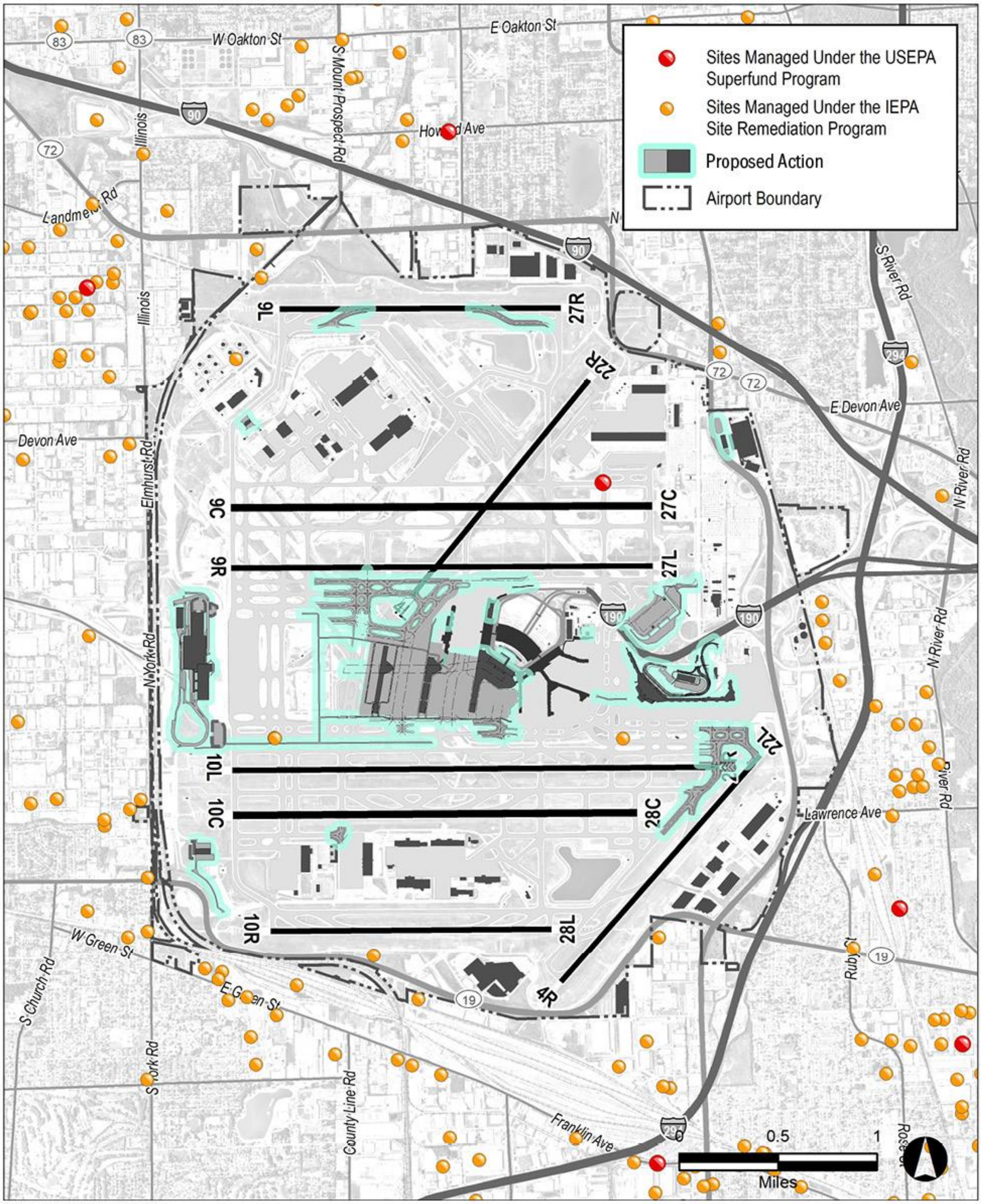
- Violate applicable federal, state, tribal, or local laws or regulations regarding hazardous materials and/or solid waste management,
- Involve a contaminated site,
- Produce an appreciably different quantity or type of hazardous waste,
- Generate an appreciably different quantity or type of solid waste or use a different method of collection or disposal and/or would exceed local capacity, and/or
- Adversely affect human health and the environment.

5.10.4 Affected Environment

This section describes the affected environment at the airport and outlines the methodology used to determine the environmental consequences of hazardous materials, solid waste, and pollution prevention resulting from the Proposed Action. The study area for this section is defined as the all-inclusive, outermost boundaries of all future development sites, as shown in **Exhibit 5.10-1**.

5.10.4.1 Existing Conditions

This section describes the existing conditions at the airport for hazardous materials, solid waste, and pollution prevention within the study area.



Sources: HMMH, CDA, IEPA, EPA

Chicago O'Hare International Airport

Terminal Area Plan and Air Traffic Procedures Environmental Assessment

IEPA CERCLIS Database Sites Located Near and/or On Airport Property

Exhibit 5.10-1

The City of Chicago (the City) addresses the handling protocols for hazardous materials, solid waste, and pollution prevention throughout the Sustainable Airport Manual (SAM)[1], including instructions for (1) planning; (2) design and construction; (3) operations and maintenance; and (4) terminal occupants. These handling and prevention measures cover the design, construction, and operation of existing and future facilities, including the Proposed Action. For example, the following sections of the SAM Design and Construction Chapter are in place to prevent environmental deterioration from hazardous materials and solid waste during the Proposed Action:

- Section 2.1 Construction Activity Pollution Prevention,
- Section 5.2 Building and Infrastructure Reuse,
- Section 5.3 Construction Waste Management,
- Section 5.5 Aggregate Reuse,
- Section 5.6 Material Reuse, and
- Section 7.2 Construction Equipment Maintenance.

The SAM is a regularly revised document available to the public and will be included by reference into all design and construction contracts. The SAM has been published four times, most recently in 2020. The SAM is referenced throughout this section and in **Section 5.10.5** for policies, procedures, and prevention plans.

Hazardous Materials

Airport operations require the use, handling, and storage of hazardous materials including (1) gasoline and diesel fuel for GSE, trucks, and other airside vehicles, (2) aviation fuel for aircraft, (3) de-icing agents, and (4) other hazardous materials. Hazardous materials permitted by the IEPA are stored in ASTs, USTs, warehouses, and other storage buildings on airport property. The City's instructions regarding spill control, response actions, and clean-up, found in the Best Management Practices Manual included as Appendix DC-D of the SAM, reduce the risk of adverse environmental impacts. However, the handling of hazardous materials can create the potential for accidental releases of these substances, resulting in the potential for adverse environmental impacts. A list of USTs can be found in Attachment 1 of **Appendix J**, while a list of open incidents of leaking underground storage tanks (LUSTs) as of October 2021 can be found in Attachment 2 of **Appendix J**.

Two bulk liquid storage facilities (i.e., tank farms) are located at the airport. However, both are outside of the study area. All terminals include an in-ground hydrant fueling system for aircraft refueling. Aircraft and GSE refueling can create the potential for accidental releases of these substances, resulting in the potential for adverse environmental impacts.

Exhibit 5.10-1 shows the locations of all sites listed on the USEPA's Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) and "Cleanups in My Community" databases. One Superfund Site, a former military property, is listed as an active site in the CERCLIS database. The "O'Hare Air Reserve Facilities" (a portion of the former military property) is located on the northeast portion of the airport property within a half mile of the study area. The military property was decommissioned in 1996, and in 2005, ownership of the land was transferred to the City with restrictive covenants prohibiting agricultural and residential use of the property and the installation and use of water supply wells. The U.S. Air Force Civil Engineer Center's *Third Five-Year Review Report* determined that the selected remedies for the former O'Hare Air Reserve Facilities remain protective of human health and the

[1] Chicago Department of Aviation. Sustainable Airport Manual, Version 4. 2020.

environment and are anticipated to remain protective in the future.[2] The Proposed Action would not affect the selected remedies.

Per- and Polyfluoroalkyl Substances (PFAS)

The City recognizes that per- and polyfluoroalkyl substances (PFAS), a class of emerging contaminants, appear likely to become regulated under the RCRA and the CERCLA Program. While there are no present regulations, federal or state, that regulate these substances in the State of Illinois, the USEPA has established a non-regulatory Health Advisory level for Perfluorooctanoic acid (PFOA) and Perfluorooctanesulfonic acid (PFOS) in drinking water at 70 parts per trillion (ppt) (0.07μg/L), individually or combined. As the sponsor of a Part 139 Certified airport, the City has historically been required by the FAA to use aqueous film-forming foams (AFFF) containing PFAS compounds. AFFF is used for firefighting emergencies and for firefighter training in approved locations.

Although it is no longer prohibited to use fluorine-free alternatives to AFFF, Part 139 Certified airports are still required by default to use AFFF for emergencies and training, as existing PFAS-free alternatives do not currently meet the Navy's MilSpec. Additionally, many other materials and products used or expected to be used in the No Action and Proposed Action, respectively, could contain PFAS, as over 4,700 PFAS compounds are found in typical household items, building materials, general consumer waste products, and industrial chemicals. In October 2019, the City issued a memorandum to tenants and contractors describing precautionary measures implemented to address potential PFAS usage.

The memorandum, titled, "*Construction and Demolition (C&D) Debris Disposal and PFAS*," requires that any material that must be hauled off-airport be sampled to determine whether that material contains PFAS and at what concentration. The memorandum states, "All airport contractors, tenants, tenant projects, [Chicago Department of Aviation] CDA projects, and any other project or program that generates material from CDA property must sample the material for PFAS." This memorandum can be found in Attachment 3 of **Appendix J**.

Solid Waste

Solid waste collection and disposal services for O'Hare are currently provided under contract with Waste Management, Inc. This company provides solid waste receptacles and collection containers ranging in size from four to more than 30 cubic yards capacity for airlines, parking garages, the main terminal, concourses, etc. Solid waste collection occurs seven days a week at the airport.

According to the City, approximately 10,222 tons of solid waste were generated at O'Hare in 2015, of which 696 tons were recycled; the solid waste was transferred for disposal at Liberty Landfill in Monticello, Indiana. Four disposal facilities in the Chicago Metropolitan Area have the capacity for refuse material. These sites are presented in **Table 5.10-1**.

The Chicago Municipal Code Section 11-4-1905 requires contractors to recycle at least 50 percent of construction and demolition debris, as measured by weight produced on site. According to the City, approximately 99 percent of all construction and demolition debris from the O'Hare Modernization Program was recycled and prevented from entering area landfills.

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[2] U.S. Air Force Civil Engineers Center's Third Five-Year Review Report, Former O'Hare Air Reserve Station (Illinois), March 2019.

TABLE 5.10-1
REGIONAL LANDFILL CAPACITY AND LIFE EXPECTANCY FOR CHICAGO METROPOLITAN AREA

Landfill	Capacity (yd^3)	Disposal Volume (yd^3)	Average Disposal (5 years)	Life Expectancy (years)
Advanced Disposal Services Zion Landfill	17,725,365	1,706,160	2,153,070	8.2
Countryside Landfill	6,656,403	1,143,435	1,220,717	5.5
Laraway Recycling and Disposal Facility	12,927,133	2,120,010	2,152,240	6
Prairie View Recycling and Disposal Facility	61,391,636	3,840,723	2,431,429	25.2
Total	98,700,537	8,810,328	7,957,456	

Source: IEPA 2020, 2019 Illinois Landfill Capacity Report, https://www2.illinois.gov/epa/topics/waste-management/landfills/landfill-capacity/Documents/landfill-capacity-report-2020.pdf.

Pollution Prevention

The City has outlined all pollution prevention protocols and policies in the SAM, Appendix DC-D, Best Management Practices Manual, including plans for:

- Spill prevention and reporting,
- Storage and collection of recyclables,
- Building and infrastructure reuse,
- Construction waste management,
- Balanced earthwork,
- Aggregate reuse,
- Material reuse,
- Recycled content, and
- Equipment salvage and reuse.

5.10.4.2 Methodology

Hazardous Materials

Existing hazardous materials sites were identified by searching the hazardous sites identified by the USEPA under regulations such as RCRA and CERCLA. Additionally, all above and underground storage tanks were identified and inventoried, including a list of open incidents of LUSTs. The inventory includes such information as location, active or inactive, and substance contained.

Solid Waste

The amount of solid waste generated by the No Action and Proposed Action is based on available studies and surveys completed by the City in direct comparison to the number of enplaned passengers. Additionally, impacts of the alternatives are identified as being in the form of construction, demolition, and land clearing (CDL) waste and general waste after the completion of construction.

Since there is a direct relationship between enplaned passengers and the amount of solid waste generated, solid waste would proportionally increase as passengers increase. Therefore, the ratio of existing solid waste to existing enplaned passengers was used to project future solid waste generation.

5.10.5 Environmental Consequences

This section assesses the potential exposure to hazardous materials, describes the potential for solid waste generation, and outlines the pollution prevention measures that would occur from the Proposed Action.

5.10.5.1 Interim No Action

The Interim (2025) No Action assumes the redevelopment of facilities in the Interim Proposed Action would not be constructed; therefore, this alternative would not result in construction debris. The existing passenger terminals would remain unchanged and would continue to operate at their existing sites. Thus, the existing passenger terminals at the airport would accommodate the increase in passenger activity that is forecast to occur at the airport. The volume of solid waste generated at the airport would also increase. However, the increase in volume of solid waste can be accommodated at the existing disposal facilities without compromising capacity.

Additionally, the City would continue to operate the airport with the existing pollution prevention measures outlined in the SAM. Historically, the use, handling, and storage of hazardous materials on the airport has resulted in accidental releases of these substances. Therefore, as required by federal and state regulations, the City would continue to ensure the reporting and cleanup of such accidental spills by requiring all employees, tenants, and contractors to abide by the pollution prevention policies outlined in **Section 5.10.4**.

5.10.5.2 Build Out No Action

Like the Interim No Action, the Build Out (2032) No Action assumes the redevelopment of facilities would not take place and existing passenger terminals would remain unchanged. Therefore, this alternative would not result in construction debris and, while the volume of solid waste generated at the airport would increase based on the forecast of increased passenger activity, the increase in volume of solid waste can be accommodated at the existing disposal facilities without compromising capacity.

5.10.5.3 Interim Proposed Action

The Interim Proposed Action would be designed to meet the guidelines in the SAM, which, as described in **Section 5.10.4**, includes requirements for sustainable design and construction and operations and maintenance of existing and future facilities.

5.10.5.3.1 Construction Impacts

Hazardous Materials

Implementation of the Interim Proposed Action would result in an increase in solid waste and the handling of hazardous waste. Impacts of the Proposed Action would be in the form of CDL waste and general waste. CDL debris would include concrete, wood, metal, drywall, roofing materials, glass, and other building materials generated during the demolition of a structure. The same types of waste would be generated during construction but would include smaller amounts and would be considered scrap. General waste includes non-hazardous and non-recyclable materials generated at the airport that resembles household waste. All material considered to be solid waste would be disposed of according to all federal, state, and local regulations. Concrete, metal, glass, and other recyclable materials would be recycled if possible.

There would be no change to the handling of hazardous materials because of the Interim Proposed Action. However, the interim Proposed Action does include connections to an existing underground jet fuel hydrant system. The handling of fuel and other hazardous materials associated with installation of the hydrant system would require special treatment in accordance with applicable state and federal laws and regulations. The Best Management Practices Manual is used when handling hazardous materials to prevent spills. While the handling of hazardous material is forecast to increase proportionately with the growth of enplaned passengers, use of best management practices regarding handling and transporting hazardous materials would ensure environmental safety.

Any structure to be demolished or renovated would have all friable asbestos-containing materials abated before demolition activities begin. All painted surfaces are assumed to contain lead-based paint, until proven otherwise, and would be disposed of as general construction waste. Materials with lead-based paint may not be blowtorched, sandblasted, chemically stripped, or otherwise handled, to ensure that the substrate material is disposed of by licensed lead-based paint workers. Any abatement procedures for asbestos-containing materials and lead-based paint, if needed, would be completed in accordance with all applicable federal and state rules and regulations.

As described in **Section 5.10.4** (Hazardous Materials, Solid Waste, and Pollution Prevention), a review of the USEPA's CERCLIS database confirmed one Superfund site within the airport boundary and within half a mile of the study area. The U.S. Air Force Civil Engineer Center has determined that the Site, "O'Hare Air Reserve Facilities," (USEPA identification: ILD049484181) remains protective of human health and the environment and is anticipated to remain protective. Therefore, implementation of the Proposed Action is not expected to encounter, disturb, or generate any additional contaminated hazardous waste sites.

Furthermore, construction activities associated with the Proposed Action are expected to include the short-term use of hazardous and non-hazardous materials and generate waste common to construction, including petroleum hydrocarbon-based fuels, lubricants, oils, paints, and cleaning solvents for the construction equipment. These materials would be handled and stored in accordance with all applicable federal, state, or local regulations. During demolition, workers may also come into contact with asbestos and electrical components that contain mercury—such as switches or thermostats—and polychlorinated biphenyls or lead paint coatings. To ensure identification and proper management of any hazardous materials to be encountered during construction, the City would require the contractor to follow all rules and regulations outlined in the City's Best Management Practices Manual, included in the SAM as Appendix DC-D. Therefore, no significant impacts related to hazardous materials would be expected to occur due to the Proposed Action.

Solid Waste

Solid wastes generated during construction of the Proposed Action are expected to include waste materials typical of demolition, building construction, earthwork, and paving projects. Construction and demolition debris associated with the Proposed Action would be recycled to the greatest extent possible as required by the SAM. As part of the requirements in the SAM, a construction waste management program would be implemented with a goal of diverting at least 50 percent of all construction debris, including steel, asphalt, Portland cement concrete (PCC), and clean soil, from receiving landfills. Materials that can be recycled include asphalt millings; masonry (in reusable form or as fill); roofing (in reusable form); metals; plastics (numbered containers, bags, and sheeting); lumber and plywood (in reusable form); cardboard and paper; appliances and fixtures; and windows and doors. Construction waste not diverted, recycled, or reused would be transported to and disposed of in local permitted construction/demolition facilities or in accordance with applicable state and local requirements.

All excess excavated material would be disposed of in accordance with applicable federal, state, and local regulations. Excess soil and construction debris that is not hazardous waste may be disposed of as solid waste. On-road vehicles (trucks) would transport waste to receiving landfills, and construction contractors would manage the storage, transport, and disposal of construction waste in accordance with applicable federal, state, and City of Chicago requirements. If separate disposal methods are required for larger quantities of material, a disposal facility would be identified that is properly permitted to receive excess soils and/or construction debris. It is expected that sufficient disposal capacity will exist to handle the anticipated volumes of waste generated by construction of the Proposed Action. No problems are anticipated with respect to meeting applicable federal, state, or City of Chicago requirements for construction waste management or disposal. The disposal of debris would be coordinated between the contractor and a licensed waste hauler. Therefore, no significant construction-related solid waste impacts should occur.

5.10.5.3.2 Operational Impacts

Interim Proposed Action assumes that solid waste from operations would increase proportionally with the forecasted increase in passengers (e.g., regardless of whether the Proposed Action is implemented or not). However, the increase in volume of solid waste would be accommodated at the existing disposal facilities without compromising capacity.

Additionally, the City would continue to operate the airport with the existing pollution prevention measures outlined in the SAM (including those related to hazardous materials, solid waste, and pollution prevention). Therefore, as required by federal and state regulations, the City would continue to ensure the reporting and cleanup of accidental spills by requiring all employees, tenants, and contractors to abide by the pollution prevention policies outlined in **Section 5.10.4**.

5.10.5.3.3 Permits and Approvals

All permits and approvals required by federal, state, and local regulations for the Interim Proposed Action would be required and obtained by the legally responsible party, as outlined in the SAM. It is unclear at this time if a RCRA generator identification number or treatment, storage, and disposal (TSD) permit would be required for the Interim Proposed Action.

5.10.5.3.4 Mitigation and Minimization

All pollution prevention measures outlined in the SAM and in **Section 5.10.4** are scalable and flexible to meet the needs of the Interim Proposed Action Alternative. Therefore, no additional action is required or foreseen at this time. As discussed in **Section 5.10.4.1**, the SAM is a living document that has been and will be updated regularly, as needed, to address changes in the regulatory framework.

5.10.5.4 Build Out Proposed Action

As in the Interim Proposed Action, the Build Out discussed in this subsection would be designed and operated in coordination with the guidelines in the SAM.

5.10.5.4.1 Construction Impacts

Construction improvements are forecast to require 10 years. The Build Out Proposed Action represents the tenth (and last) year of construction, which contains less construction than the interim proposed action alternative. All construction-related requirements and pollution prevention measures also pertain to construction performed in the Build Out condition. To ensure identification and proper management of any hazardous materials encountered during construction, the City would require the contractor to follow all rules and regulations outlined in the SAM. Therefore, no significant impacts related to hazardous materials are expected or anticipated given adherence to applicable laws and regulations.

5.10.5.4.2 Operational Impacts

As with the Interim Proposed Action, the Build Out Proposed Action assumes that solid waste from operations would increase proportionally with the forecasted increase in passengers (e.g., regardless of whether the Proposed Action is implemented or not). However, the increase in volume of solid waste can be accommodated at the existing disposal facilities without compromising capacity.

Additionally, the City would continue to operate the airport with the existing pollution prevention measures outlined in the SAM (including those related to hazardous materials, solid waste, and pollution prevention). Therefore, as required by federal and state regulations, the City would continue to ensure the reporting and cleanup of accidental spills by requiring all employees, tenants, and contractors to abide by the pollution prevention policies outlined in **Section 5.10.4**.

5.10.5.4.3 Permits and Approvals

All permits and approvals required by federal, state, and local regulations for the Proposed Action would be required and obtained by the legally responsible party, as outlined in the SAM. It is unclear at this time if a RCRA generator identification number or TSD permit would be required for the Proposed Action.

5.10.5.4.4 Mitigation and Minimization

All pollution prevention measures outlined in the SAM and in **Section 5.10.4** above are scalable and flexible to meet the needs of the Proposed Action. Therefore, no additional action is required or foreseen at this time. As discussed in **Section 5.10.4.1**, the SAM is regularly revised and will be updated regularly, as needed, to address changes in the regulatory framework.

5.11 NATURAL RESOURCES AND ENERGY SUPPLY

5.11.1 Definition of Resource

O'Hare is an extensive, unified campus of airfield and terminal building facilities, including interconnected runways, passenger and cargo terminal buildings, access and perimeter roadway systems, utility and stormwater drainage systems, and a variety of other supporting infrastructure and facilities. The construction, operation, and maintenance of these buildings, facilities, and infrastructure consume energy supplies and natural resources.

Operation of O'Hare requires consumption of energy by both stationary airport facilities and mobile vehicles. Energy consumption includes electricity, natural gas, fuel oil, aviation fuel, diesel fuel, and gasoline. Natural resources are expected to be consumed in the form of building materials during construction of the proposed project, which includes both landside and airside projects. Water is used to support construction and ongoing operations of many airport facilities and systems.

This section evaluates and discloses the extent to which the alternatives may impact natural resources and energy supplies within the affected environment.

5.11.2 Regulatory Context

The methodology used to analyze the potential impacts to natural resource and energy supplies is consistent with CEQ guidance and FAA NEPA implementing guidance, including FAA Orders 5050.4B and 1050.1F and the 1050.1F Desk Reference.

FAA Order 5050.4B,[3] Chapter 10, states that the environmental consequences section should:

> Discuss the irreversible and irretrievable commitments of natural resources and energy requirements each reasonable alternative would require. Analyze any project-caused depletion of materials in short supply or substantial, irreversible changes to the natural or cultural environment the reasonable alternatives would cause.

FAA 1050.1F Desk Reference[4] (v2), Section 10, states:

> This impact category provides an evaluation of a project's consumption of natural resources (such as water, asphalt, aggregate, wood, etc.) and use of energy supplies (such as coal for electricity; natural gas for heating; and fuel for aircraft, commercial space launch vehicles, or other ground vehicles). Consumption of natural resources and use of energy supplies may result from construction, operation, and/or maintenance of the proposed action or alternative(s).
>
> It is the policy of the Federal Aviation Administration (FAA) (as discussed in FAA Order 1053.1C, *Energy and Water Management Program for FAA Buildings and Facilities*) consistent with National Environmental Policy Act (NEPA) and the Council on Environmental Quality (CEQ) Regulations, to encourage the development of FAA facilities that exemplify the highest standards of design, including sustainability principles. All elements of the transportation system should be designed with a view to conservation of energy and other resources, pollution prevention, harmonization with the community environment, and sensitivity to the concerns of the traveling public.

[3] Federal Aviation Administration. Order 5050.4B (v2) National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions, April 28, 2006, https://www.faa.gov/airports/resources/publications/orders/environmental_5050_4/media/5050-4B_complete.pdf.

[4] Federal Aviation Administration 1050.1F Desk Reference (v2), February 2020, https://www.faa.gov/about/office_org/headquarters_offices/apl/environ_policy_guidance/policy/faa_nepa_order/desk_ref/media/desk-ref.pdf.

5.11.3 Affected Environment

The CDA makes a concerted effort to conserve natural resources and energy. The CDA commits to implementing environmentally responsible practices through application of its SAM in airport planning and projects. Among other things, the SAM outlines requirements for conservation of natural resources and energy described in this section. The proposed project will be designed and operated in accordance with the goals and objectives of the SAM. Potential impacts of the proposed project on energy resources (electricity, natural gas, petroleum), natural resources and construction materials (water, asphalt, aggregate, wood, etc.) are reported in this section.[5] Natural resource and energy suppliers at O'Hare are summarized in **Table 5.11-1**.

5.11.3.1 Natural Resources

O'Hare is in the Chicago Metropolitan Area, a highly developed urban and suburban area with access to ample natural resources necessary for supporting airport facilities and operations, aircraft operations, and construction projects. Natural resources used at O'Hare include energy, water, and construction materials which are not in short supply.

5.11.3.2 Water Supply

The City of Chicago Department of Water Management is the source agency for potable water at O'Hare. The City's water source is Lake Michigan, and the primary distribution point for the airport's water system is an existing pump station.

As shown in **Table 5.12-2**, the existing baseline (2018) water use at O'Hare was 1,056,800,000 gallons.

5.11.3.3 Energy Supply

Energy is required primarily to light, heat, and cool terminal buildings and to power all airfield lighting. At O'Hare, Commonwealth Edison (ComEd) supplies electrical power, and Peoples Gas supplies natural gas. Diesel fuel is used in the Heating and Refrigeration (H&R) Building, North Airfield Lighting Control Vault, and South Airfield Lighting Control Vault.

TABLE 5.11-1
NATURAL RESOURCE AND ENERGY SUPPLIERS

Resource	Supplier
Natural Gas	Peoples Gas
Electricity	ComEd
Water	City of Chicago Department of Water

[5] FAA 1050.1F Desk Reference, Section 10.2 provides guidance on information that should be included in NEPA documents regarding natural resources and energy supply within the study area. At a minimum, the Desk Reference recommends the document include information on (1) "the suppliers of energy resources found in the area such as power plants, water utilities, sewage disposal utilities, and suppliers of natural gas and petroleum; and (2) the amount of other resources such as water, asphalt, aggregate, and wood a project would use in the construction, operation, and maintenance of a project and identify where the suppliers are located."

5.11.3.4 Natural Resources and Energy Use Baseline

The CDA monitors electricity and natural gas use for O'Hare. Utility meters allow for energy tracking. The CDA currently has more than 700 electricity meters and more than 100 natural gas meters. The CDA provided estimated baseline annual electricity, natural gas, ultra-low sulfur #2 diesel fuel, and water use as shown in **Table 5.11-2**.

The existing baseline (2018) facility electricity use at O'Hare was 324,500,000 kilowatt hours (kWh). The total baseline natural gas use was 10,650,000 therms. The total baseline ultra-low sulfur #2 diesel fuel use was 161,000 gallons. See **Table 5.11-2** for more details on estimated baseline use.

TABLE 5.11-2
ESTIMATED BASELINE (2018) ANNUAL NATURAL RESOURCES AND ENERGY USE

Location	Natural Gas (Therms)	Electricity (kWh)	Ultra-Low Sulfur #2 Diesel Fuel (Gallons)[2]	Water (Gallons)
Terminal 1	-	53,000,000	-	130,000,000
Terminal 2	20,000	27,000,000	-	86,000,000
Terminal 3	30,000	65,000,000	-	190,000,000
Terminal 5	20,000	45,500,000	-	38,000,000
Heating & Refrigeration (H&R) Building[1]	8,400,000	58,000,000	30,000	140,000,000
Elevated Parking Garage	70,000	17,000,000	-	11,000,000
Airport Transit System (ATS)	50,000	10,000,000	-	500,000
Airport Maintenance Complex (AMC)	950,000	4,300,000	-	2,400,000
Multimodal Facility (MMF)	570,000	14,000,000	-	31,000,000
Airfield	100,000	7,000,000	131,000	2,900,000
Hilton Hotel	40,000	5,700,000	-	25,000,000
Other Auxiliary City Buildings	400,000	18,000,000	-	400,000,000
Total	10,650,000	324,500,000	161,000	1,056,800,000

Source: CDA, Estimated Baseline Annual Energy and Water Usage, September 13, 2019

Notes: 1. Hot water for space heating and chilled water space cooling for Terminals 1, 2, 3, 5, and the Hilton Hotel are provided from the Heating & Refrigeration (H&R) Building

2. Diesel Fuel Use estimated based on 2019 data (January - June) projected to represent a full year

Regarding mobile source fuel use, fuel powers aircraft landing and takeoff operations (LTO), aircraft APU, GSE, and employee busing from parking facilities to terminals. Baseline fuel use or vehicle miles traveled are included in **Table 5.11-3**.

TABLE 5.11-3
BASELINE MOBILE SOURCE FUEL USE

Source	Fuel Type	Units	Existing Condition
Aircraft	Jet A	Gallons	108,167,378
Aircraft	Avgas	Gallons	12,539
APU	Jet A	Gallons	1,560,766
GSE	Gasoline	Gallons	2,381,993
	Diesel	Gallons	1,842,801
	Propane	Gallons	21,234
Employee Busing	Gasoline/Diesel	Vehicle Miles Traveled	15,074

Source: Crawford, Murphy & Tilly, Inc./RCH Group, and Mead & Hunt, 2021
Note: APU use is also related to the condition that all passenger gates have gate electrification, which reduces the need for APU to operate while the aircraft are at the gate. However, this use is reflected in the electrical use in Table 5.11-2. GSE also includes electrical use from electric GSE. However, this use is reflected in the electrical use in Table 5.11-2.

Construction materials include concrete, asphalt, aggregate, steel, glass, and water. These resources are abundant in the area and available from various sources and suppliers in surrounding counties.[6]

5.11.4 Environmental Consequences

FAA 1050.1F Desk Reference, Section 10.3, states:

> …The potential impacts of the proposed action and alternative(s) on the natural resources and energy supplies in the study area should be evaluated.

The evaluation of impacts should consider how the No Action and Proposed Action Alternatives directly or indirectly increases demand on the following:

- Utilities servicing the area
- Water sources and availability
- Fuel
- Consumable materials, especially scarce or unusual materials, in and around the study area

Analysis should also consider any state or local rules, ordinances, or guidelines that apply to natural resources, energy supply, and any resulting by-products of increased usage of these resources.

5.11.4.1 Methodology

The demands on natural resources and energy supply were determined for the No Action and Proposed Action Alternatives in each Condition (Interim [2025] and Build Out [2032]) and the two alternatives were then compared.

5.11.4.2 Threshold of Significance

FAA Order 1050.1F, Exhibit 4-1, Significance Determination for FAA Actions, states:

6 COVID-19 related supply chain constraints could influence the future availability of construction materials but cannot be predicted.

> The FAA has not established a significance threshold for Natural Resources and Energy Supply.

However, it does list one factor to consider when evaluating the context and intensity of potential environmental impacts on natural resources and energy supply, which is whether:

> The action would have the potential to cause demand to exceed available or future supplies of these resources.

5.11.4.3 Interim No Action

5.11.4.3.1 Construction Impacts

No project construction is associated with the Interim No Action. Therefore, no construction impacts to natural resources or energy supply would occur under this scenario. Construction may occur on baseline projects, but those have been or will be processed through NEPA outside of this EA, as discussed in the next section. Construction of these baseline projects may result in the use of energy and natural resources.

5.11.4.3.2 Operational Impacts

The No Action Alternative includes baseline projects that do not presently exist. Baseline projects have independent need from the Proposed Action and have been or will be processed through NEPA separately from this EA. These projects are not expected to exceed the available supply of natural resources or water supply in the region, but any possible impacts will be analyzed and processed through separate NEPA documents.

Under the No Action Alternative, the use of energy, water, and other natural resources needed to support the operation of O'Hare's facilities would generally increase in conjunction with increased airport activity projected to occur (see **Section 1.3**), including fuel consumption from more aircraft and GSE operations anticipated in the Interim No Action. Aircraft consume both Jet A and Avgas. Jet A fuel consumption is estimated at 110,797,365 gallons and Avgas fuel consumption is estimated at 12,519 gallons in the Interim No Action, as shown in **Table 5.11-4.**

GSE use in the Interim No Action includes, among other repositioning activities, aircraft tractors used to move aircraft from Terminal 5 to the Terminal Core. Estimates of gasoline, diesel, and propane consumed by GSE in the Interim No Action are shown in **Table 5.11-4**. Energy demands draw from conventional fuel sources readily available in the worldwide marketplace and are not anticipated to exceed future supply.

APUs are onboard engines that power aircraft when taxiing and at the gate when aircraft are not connected to gate electrification systems. APU fuel use represents a function of aircraft fleet mix (and their assigned APU) and the number of operations. Aircraft operations are projected to increase but older aircraft are expected to be replaced with cleaner, more fuel-efficient planes which include their onboard APU. APU use in the Interim No Action results in consumption of 1,189,172 gallons of Jet A fuel, as shown in **Table 5.11-4**.

No changes related to employee busing operations are expected in the Interim No Action.

TABLE 5.11-4
INTERIM NO ACTION ENERGY USE – MOBILE SOURCES

Source	Fuel/Resource Type	Units	Interim No Action
Aircraft	Jet A	Gallons	110,797,365
	Avgas	Gallons	12,519
APU	Jet A	Gallons	1,189,172
GSE	Gasoline	Gallons	2,602,249
GSE	Diesel	Gallons	2,201,776
	Propane	Gallons	38,875
Employee Busing	Gasoline/Diesel	Vehicle Miles Traveled	15,074

Note: APU use is also related to the condition that all passenger gates have gate electrification, which reduces the need for APU to operate while the aircraft are at the gate. However, this use is reflected in the electrical use in Table 5.11-5. GSE also includes electrical use from electric GSE. However, this use is reflected in the electrical use in Table 5.11-5.
Source: Crawford, Murphy & Tilly, Inc./RCH Group and Mead & Hunt, 2021

Estimates of electricity, natural gas, and ultra-low sulfur #2 diesel fuel consumption in the Interim No Action are summarized in **Table 5.11-5**.

Future water demands associated with greater numbers of passengers and employees are expected. Water use in the Interim No Action is approximately one billion gallons, as shown in **Table 5.11-5**. Water demands are not anticipated to exceed future water supply.

TABLE 5.11-5
INTERIM NO ACTION ENERGY AND NATURAL RESOURCE USE – STATIONARY SOURCES

Source	Fuel/Resource Type	Units	Interim No Action
Stationary facilities	Ultra-Low Sulfur #2 Diesel Fuel	Gallons	211,000
Stationary facilities	Natural gas	Therms	11,606,000
Stationary facilities	Electricity	kWh	347,057,000
Stationary facilities	Water	Gallons	1,076,860,000

Source: CDA, CDA ORD Estimated Annual Utility Consumption, November 11, 2021

5.11.4.4 Interim Proposed Action

5.11.4.4.1 Construction Impacts

Construction impacts for natural resources and energy in the Interim Proposed Action are presented in the following two subsections.

5.11.4.4.1.1 Natural Resources

The Interim Proposed Action would increase the use of natural resources at O'Hare such as wood, prefabricated building components, aggregate, sub-base materials, and oils. These materials are readily available from local suppliers and are not rare or in short supply.[7] During construction, water would be used for dust suppression of exposed soils during excavation and grading and cement mixing. The SAM includes provisions that reduce water use during construction.

Additionally, the SAM includes requirements to reduce construction impacts on natural resources, including:

- Creation of a construction waste management plan to divert construction and demolition debris from disposal in landfills and incineration facilities,
- Creation of a balanced earthwork plan to divert soils from landfills, reduce transportation of soil to off-site location, and reuse aggregate and other materials where possible,
- Reuse of building materials and products, where possible, to lessen the impact associated with extraction of new resources,
- Use of building products that incorporate recycled content materials and renewable materials, along with certified wood that encourages responsible forest management, and
- Use of local and regional building materials to reduce impact resulting from transportation of resources.

The quantity of natural resources required for construction of the Interim Proposed Action would not place an undue strain on supplies when compared to the Interim No Action. Refer to **Table 5.11-6** for detailed quantities of construction materials associated with projects that are assumed to be underway or complete by the Interim Proposed Action.

[7] COVID-19 related supply chain constraints could influence the future availability of construction materials but cannot be predicted.

TABLE 5.11-6
INTERIM PROPOSED ACTION CONSTRUCTION MATERIALS

CDA Project Number	Proposed Facility Name	Concrete Pavement (CY)	Asphalt Pavement (Tons)	Aggregate (CY)	Building Concrete (CY)	Steel (Tons)	Glass (SF)	Water (Gallons)
2	Satellite 1 Concourse and Associated Apron and Taxiway Pavement (Draft Future ALP Facility T3)	169,000	-	113,000	23,000	8,000	142,800	1,800,000
3	Satellite 2 Concourse and Associated Apron Pavement (Draft Future ALP Facility T2)	117,000	-	78,000	18,000	6,000	119,000	1,400,000
6	Consolidated Baggage, Pedestrian/Moving Walkway, and Utility Tunnel	-	-	-	183,000	12,000	-	14,500,000
8	Terminal 5 Roadway Improvements	-	13,000	6,000	-	-	-	-
9	Terminal 5 Curbside Expansion	4,000	-	4,000	-	-	-	-
11	West Employee Screening Facility (Draft Future ALP Facility T1)	3,000	-	4,000	27,000	8,000	75,000	2,100,000
12	West Employee Ground Transportation Facility and Parking Garage (Draft Future ALP Facility L2)	-	13,000	6,000	29,000	8,000	-	2,300,000
13	West Employee Landside Access	-	13,000	25,000	-	-	-	-
14	West Landside Detention Basins	-	-	-	-	-	-	-
15	Airside Service Roadways	-	13,000	16,000	-	-	-	-
17	Taxiways North of Satellite 2 (Between Relocated Taxiways A and B and Penalty Box Hold Pad)	41,000	-	27,000	-	-	-	-
T1	Temporary Walkway/Extended Jetway from Concourse C (With 6 Gates)	-	-	-	700	300	-	51,000
T2	Temporary Heating and Refrigeration Facility (Near Satellite 2)	-	-	-	2,000	700	-	165,000

CDA Project Number	Proposed Facility Name	Concrete Pavement (CY)	Asphalt Pavement (Tons)	Aggregate (CY)	Building Concrete (CY)	Steel (Tons)	Glass (SF)	Water (Gallons)
Total (Projects Underway or complete by the Interim Condition)	-	334,000	52,000	279,000	282,700	43,000	336,800	22,316,000

Source: CDA, Estimated Total Construction Material Consumption Associated with the Proposed Terminal Area Plan Projects and Proposed Future ALP (Independent Utility) Projects, October 10, 2019

5.11.4.4.1.2 Energy

Construction activities associated with the Interim Proposed Action require consumption of gasoline or diesel fuel to power construction equipment. Energy (primarily in the form of diesel fuel) would be used during construction of the Proposed Action by off-road diesel-powered construction equipment and by on-road diesel-powered delivery and haul trucks. Additional fuel (primarily in the form of gasoline) would be used during construction by worker vehicles traveling to and from the project site. Fuel use would be relatively small and temporary in nature, lasting only the duration of construction for each phase of the Proposed Action, and fuel is widely available in the area. The quantity of fuel required for construction of the Interim Proposed Action would not place an undue strain on supplies when compared to the Interim No Action. The SAM requires use of fuel-efficient and low-emitting vehicles for construction activities, which also reduces fuel use.

Electricity would also be used during construction, primarily for power tools used in construction equipment. These energy expenditures would be relatively small and temporary in nature, lasting only the duration of construction for each phase of the project. Electricity required for construction of the Interim Proposed Action would not place an undue strain on supplies when compared to the Interim No Action. The SAM includes provisions that would contribute to reduced fuel and energy use during construction.

5.11.4.4.2 Operational Impacts

Operational impacts for natural resources and energy in the Interim Proposed Action are presented in the following two subsections.

5.11.4.4.2.1 Natural Resources

The CDA provided documentation that the airport's water pump station has sufficient capacity to supply the airport's future needs based on preliminary modeling of the system. The CDA contacted and received confirmation that the public water utility, the City of Chicago Department of Water Management, has the capacity to supply adequate quantities of water to support the Interim Proposed Action.[8]

Annual water consumption associated with the Interim Proposed Action year is expected to be 3.4 percent higher than for the Interim No Action as shown in **Table 5.11-7**. The Interim Proposed Action includes water use associated with projects to be complete by the interim year in addition to the existing and baseline facilities.

TABLE 5.11-7
INTERIM PROPOSED ACTION WATER USE

Source	Fuel/Resource Type	Units	Interim No Action	Interim Proposed Action	Difference Between Interim No Action and Interim Proposed Action (%)
Stationary facilities	Water	Gallons	1,076,860,000	1,113,360,000	3.4%

Source: CDA, CDA ORD Estimated Annual Utility Consumption, November 11, 2021

[8] CDA email communications with Carl Larson, Utility Manager, Connect Chicago Alliance, October 2019.

Additionally, the SAM includes requirements for water efficiency and management through multiple provisions. These requirements are intended to reduce the burden on municipal water supply and wastewater systems. The SAM requires:

- Monitoring of consumption through installation of permanent water meters that measure the total potable water use for the building and associated grounds, along with tenant spaces, if applicable,
- Installation of high-efficiency fixtures and fittings,
- Water-efficient landscaping that limits or eliminates the need for potable water for irrigation, and
- Reduction of wastewater generation and potable water demand using innovative wastewater technologies.

5.11.4.4.2.2 Energy

Operational activities associated with the Interim Proposed Action require consumption of energy resources in the form of electricity and natural gas during operation of facilities for heating, cooling, lighting, and ventilation systems; consumption of jet fuel and aviation gasoline for aircraft operations; and consumption of gasoline and diesel fuel during operation of ground service equipment.

The SAM includes requirements for energy efficiency and management through multiple provisions. These requirements are intended to reduce the energy intensity of the operation of O'Hare. Among other provisions, it includes:

- Building-level energy metering for tracking energy use and
- Energy optimization measures for lighting systems, HVAC systems, equipment, and appliances, etc.

Energy consumption was evaluated for two key sources:

- Energy required to operate stationary airport facilities and
- Energy required to operate mobile vehicles (aircraft and aircraft APU, ground support vehicles, and employee busing).

Stationary Sources

Electricity and natural gas are readily available from regional sources. The quantity required for operation of the Interim Proposed Action would not have the potential to cause demand to exceed available or future supplies when compared with the No Action Alternative. The CDA contacted public utilities and received confirmation that they have the capacity to supply adequate quantities of both natural gas[9] and electricity[10] to support the Interim Proposed Action.

The CDA estimated future projected energy needs of buildings and facilities. Estimates were based on comparable existing facilities, function, consumption rates (e.g., kWh/per square foot), and/or standard rates from the U.S. Energy Information Administration Commercial Buildings Energy Consumption Survey (CBECS).

[9] John Puka, Engineering Supervisor – Distribution Design Engineering, Peoples Gas, "RE: PGL Capacity for O'Hare Expansion," Email message to Carl Larson, Utility Manager, Connect Chicago Alliance, dated September 27, 2019.

[10] Steve Tribuzzi, Sr. Account Manager, ComEd Large Customer Services – Chicago Region and Steve Kirk, ComEd NB Large Projects Manager – Chicago, "RE: O'Hare Expansion and ComEd Capacity," Email message to Stephen Johnson, Project Manager, APTIM Energy Management Solutions, dated September 11, 2019.

Annual electricity consumption associated with the Interim Proposed Action is expected to be 9.4 percent higher than the Interim No Action. Natural gas consumption is expected to increase slightly from the No Action (3.8 percent). No change is expected for stationary diesel fuel use as shown in **Table 5.11-8**. The Interim Proposed Action includes energy use associated with projects to be complete by the interim year, in addition to the existing and baseline facilities.

TABLE 5.11-8
INTERIM PROPOSED ACTION ENERGY USE – STATIONARY SOURCES

Source	Fuel/Resource Type	Units	Interim No Action	Interim Proposed Action	Difference Between Interim No Action and Interim Proposed Action (%)
Stationary Facilities	Ultra-Low Sulfur #2 Diesel Fuel	Gallons	211,000	211,000	0.0%
Stationary Facilities	Natural gas	Therms	11,606,000	12,046,000	3.8%
Stationary Facilities	Electricity	kWh	347,057,000	379,557,000	9.4%

Note: All passenger gates have gate electrification which reduces the need for aircraft APU to operate while the aircraft are at the gate. This use is reflected in the electrical use above. Additionally, electric GSE obtain electricity from the terminals; this use is reflected in the electrical use above.
Source: CDA, CDA ORD Estimated Annual Utility Consumption, November 11, 2021

Mobile Sources

Fuel consumption associated with the standard aircraft LTO was calculated based on forecast aircraft activity levels. The aircraft activities comprising a LTO consist of both ground-based activities (i.e., ground taxi/idle) as well as above ground level (i.e., approach, climb-out, and takeoff). The energy consumed during the LTO cycle reflects the unique characteristics of the aircraft fleet and specific airport but do not reflect the total fuel consumed during a flight. For example, energy consumed in the LTO cycle reflects departure fuel burn until the aircraft reaches the atmospheric mixing height, which is 2,510 feet above ground level for the Chicago area. Jet A consumption is expected to increase slightly from the Interim No Action (3.5 percent), and Avgas is also expected to increase slightly (3.1 percent), as shown in **Table 5.11-9**. This results from increased taxiing due to construction rerouting.

APUs are onboard engines that power aircraft when taxiing and at the gate when aircraft are not connected to gate electrification systems. The aircraft fleet mix (and their assigned APU), and the number of operations, do not change under the Interim No Action or Interim Proposed Action Alternatives; this is shown in **Table 5.11-9**.

Aircraft towing is required to reposition aircraft from an arrival gate to another gate for departure, to a holding area during long layovers, and for transportation to maintenance hangars. Due to the disconnected nature of the current international (Terminal 5) and domestic (Terminal Core) facilities, aircraft towing and repositioning from Terminal 5 to the Terminal Core is required prior to their next departure, resulting in facility-driven inefficiencies. Aircraft repositioning increases movements on the airfield and terminal area aprons, increasing fuel use associated with these movements. GSE consume gasoline, diesel, and propane, all of which are expected to increase slightly (~one percent) from the Interim No Action as shown in **Table**

5.11-9. The Interim Proposed Action calls for a slight increase in the number of tug-assisted aircraft movements due to the operational impacts of the project resulting from construction phasing at terminal and concourse facilities.

No changes related to employee busing operations are expected in the Interim Proposed Action.

TABLE 5.11-9
INTERIM PROPOSED ACTION MOBILE FUEL USE

Source	Fuel Type	Units	Interim No Action	Interim Proposed Action	Difference between Interim No Action and Interim Proposed Action (%)
Aircraft	Jet A	Gallons	110,797,365	114,694,791	3.5%
	Avgas	Gallons	12,519	12,911	3.1%
APU	Jet A	Gallons	1,189,172	1,189,172	0.0%
GSE	Gasoline	Gallons	2,602,249	2,627,456	1.0%
	Diesel	Gallons	2,201,776	2,223,560	1.0%
	Propane	Gallons	38,875	39,211	0.9%
Employee Busing	Gasoline/Diesel	Vehicle Miles Traveled	15,074	15,074	0.0%

Note: APU use is also related to the condition that all passenger gates have gate electrification, which reduces the need for APU to operate while the aircraft are at the gate. However, this use is reflected in the electrical use in Table 5.11-8. GSE also includes electrical use from electric GSE. However, this use is reflected in the electrical use in Table 5.11-8.
Source: Crawford, Murphy & Tilly, Inc./RCH Group and Mead & Hunt, 2021

5.11.4.5 Build Out No Action

5.11.4.5.1 Construction Impacts

No project construction is associated with Build Out No Action. Therefore, no construction impacts to natural resources or energy supply would occur under the Build Out No Action Alternative. Construction may occur on baseline projects, but those will be processed outside of this EA. Construction of these baseline projects may result in the use of energy and natural resources.

5.11.4.5.2 Operational Impacts

The No Action Alternative includes baseline projects that do not presently exist. Baseline projects have independent need from the Proposed Action and have been or will be processed through NEPA separately from this EA. These projects are not expected to exceed the available supply of natural resources or water supply in the region, but any possible impacts will be analyzed and processed through separate NEPA documents.

Under the Build Out No Action, the use of energy, water, and other natural resources needed to support the operation of O'Hare's facilities would increase in conjunction with the greater airport activity projected to occur (see **Section 1.3**), including fuel consumption from more aircraft and GSE operations anticipated in the Build Out No Action. Jet A fuel consumption is an estimated 126,235,382 gallons and Avgas fuel consumption is an estimated 12,836 gallons in the Build Out No Action, as shown in **Table 5.11-10**.

GSE use in the Build Out No Action includes usage of aircraft tractors for repositioning aircraft from Terminal 5 to the Terminal Core. Estimates of gasoline, diesel, and propane consumed by GSE in the Build Out No Action are shown in **Table 5.11-10**. Energy demands draw from conventional fuel sources readily available in the worldwide marketplace and are not anticipated to exceed future supply.

APU fuel use in the Build Out No Action results in consumption of 995,620 gallons of Jet A fuel, as shown in **Table 5.11-10**.

No changes are expected related to employee busing in the Build Out No Action.

TABLE 5.11-10
BUILD OUT NO ACTION ENERGY USE – MOBILE SOURCES

Source	Fuel/Resource Type	Units	Build Out No Action
Aircraft	Jet A	Gallons	126,235,382
	Avgas	Gallons	12,836
APU	Jet A	Gallons	995,620
GSE	Gasoline	Gallons	2,805,542
	Diesel	Gallons	2,345,319
	Propane	Gallons	35,224
Employee Busing	Gasoline/Diesel	Vehicle Miles Traveled	15,074

Note: APU use is also related to the condition that all passenger gates have gate electrification, which reduces the need for APU to operate while the aircraft are at the gate. However, this use is reflected in the electrical use in Table 5.11-11. GSE also includes electrical use from electric GSE. However, this use is reflected in the electrical use in Table 5.11-11.
Source: Crawford, Murphy & Tilly, Inc./RCH Group, and Mead & Hunt 2021.

Estimates of electricity, natural gas, and ultra-low sulfur #2 diesel fuel consumption in the Build Out No Action are summarized in **Table 5.11-11**.

Increased water demands associated with greater numbers of passengers and employees are expected in the future. Water use in the Build Out No Action is approximately one billion gallons, as shown in **Table 5.11-11**. Water demands are not anticipated to exceed future water supply.

TABLE 5.11-11
BUILD OUT NO ACTION ENERGY AND NATURAL RESOURCE USE – STATIONARY SOURCES

Source	Fuel/Resource Type	Units	Build Out No Action
Stationary facilities	Ultra-Low Sulfur #2 Diesel Fuel	Gallons	211,000
Stationary facilities	Natural gas	Therms	11,606,000
Stationary facilities	Electricity	kWh	347,057,000
Stationary facilities	Water	Gallons	1,076,860,000

Source: CDA, CDA ORD Estimated Annual Utility Consumption, November 11, 2021

5.11.4.6 Build Out Proposed Action

5.11.4.6.1 Construction Impacts

Construction impacts for natural resources and energy in the Build Out Proposed Action are presented in the following two subsections.

5.11.4.6.1.1 Natural Resources

As described in **Section 5.11.4.4.1.1**, the SAM includes requirements to reduce construction impacts on natural resources and water supply.

Construction of the Build Out Proposed Action would increase usage of natural resources at O'Hare such as wood, prefabricated building components, aggregate, sub-base materials, and oils until project completion. These materials are readily available from local suppliers and are not rare or in short supply.[11] During construction, water would be used for dust suppression of exposed soils during excavation and grading and for cement mixing. The quantity of natural resources required for construction of the Build Out Proposed Action would not place an undue strain on supplies when compared to the Build Out No Action. Refer to **Table 5.11-12** for detailed quantities of construction materials associated with all projects that are assumed to be complete between the Interim Proposed Action and Build Out Proposed Action. Additionally, **Table 5.11-12** provides the grand total of materials used over the entire course of the project in the final row.

[11] COVID-19 related supply chain constraints could influence the future availability of construction materials but cannot be predicted.

TABLE 5.11-12
BUILD OUT PROPOSED ACTION CONSTRUCTION MATERIALS

CDA Project Number	Proposed Facility Name	Concrete Pavement (CY)	Asphalt Pavement (Tons)	Aggregate (CY)	Building Concrete (CY)	Steel (Tons)	Glass (SF)	Water (Gallons)
1	O'Hare Global Terminal and Concourse and Associated Apron Pavement	104,000	-	70,000	61,000	20,000	357,000	4,700,000
4	Terminal 1 Concourse B Northeast End Expansion (ALP Building 222)	-	-	-	2,000	1,000	15,000	103,000
5	Terminal 3 Concourse L Stinger One-Gate Addition and Associated Apron Expansion	3,000	-	2,000	2,000	1,000	15,000	90,000
7	Terminal 5 Curbside Addition and Interior Reconfiguration (ALP Building 325)	-	-	-	1,000	1,000	68,000	78,000
10	West Heating and Refrigeration Facility (Draft Future ALP Facility S3)	-	2,000	1,000	4,000	1,000	-	285,000
16	Taxiways K and L Extension (Between Taxiway A11 and Taxiway A13)	17,000	-	12,000	-	-	-	-
Total (Projects completed between Interim Proposed Action and Build Out Proposed Action)		124,000	2,000	85,000	70,000	24,000	455,000	5,256,000

CDA Project Number	Proposed Facility Name	Concrete Pavement (CY)	Asphalt Pavement (Tons)	Aggregate (CY)	Building Concrete (CY)	Steel (Tons)	Glass (SF)	Water (Gallons)
Grand Total Build Out Proposed Action (Full project duration)		458,000	54,000	364,000	352,700	67,000	791,800	27,572,000

Source: CDA, Estimated Total Construction Material Consumption Associated with the Proposed Terminal Area Plan Projects and Proposed Future ALP (Independent Utility) Projects, October 10, 2019

5.11.4.6.1.2 Energy

Construction activities associated with the proposed project require consumption of gasoline or diesel fuel to fuel construction equipment. Energy (primarily diesel fuel) would be used by off-road diesel-powered construction equipment and on-road diesel-powered delivery and haul trucks during construction of the Build Out Proposed Action. Additional fuel (primarily gasoline) would be used during construction by worker vehicles traveling to and from the project site. Fuel use would be relatively small and temporary in nature, lasting only the duration of construction for each phase of the proposed project, and fuel is widely available in the area. The quantity of fuel required for construction of the Build Out Proposed Action would not place an undue strain on supplies when compared to the Build Out No Action. The SAM requires use of fuel-efficient and low-emitting vehicles for construction activities, which also reduces fuel use.

Electricity and natural gas would also be used during construction, primarily for electric power tools and compressed natural gas used in construction equipment. These energy expenditures would be relatively small and temporary in nature, lasting only the duration of construction for each phase of the proposed project. Electricity and natural gas required for construction of the Build Out Proposed Action would not place an undue strain on supplies when compared to the Build Out No Action. The SAM includes provisions that will reduce fuel use and energy use during construction.

5.11.4.6.2 Operational Impacts

Operational impacts for natural resources and energy in the Build Out Proposed Action are presented in the following two subsections.

5.11.4.6.2.1 Natural Resources

The CDA provided documentation that the airport's water pump station has sufficient capacity to supply the airport's future needs based on preliminary modeling of the system. The CDA contacted and received confirmation that the public water utility, the City of Chicago Department of Water Management, has the capacity to supply adequate quantities of water to support the Build Out Proposed Action.[12]

Upon completion of construction of the Build Out Proposed Action, annual water consumption is expected to be 31.53 percent higher than the Build Out No Action, as shown in **Table 5.11-13**. The Build Out Proposed Action includes water use associated with projects to be complete by the Build Out year in addition to the existing and baseline facilities.

TABLE 5.11-13
BUILD OUT PROPOSED ACTION WATER USE

Source	Fuel/ Resource Type	Units	Build Out No Action	Build Out Proposed Action	Difference Between Build Out No Action and Build Out Proposed Action (%)
Stationary facilities	Water	Gallons	1,076,860,000	1,416,360,000	31.5%

Source: CDA, CDA ORD Estimated Annual Utility Consumption, November 11, 2021

[12] CDA email communications with Carl Larson, Utility Manager, Connect Chicago Alliance, October 2019.

As described in **Section 5.11.3,** the SAM includes requirements for water efficiency and management through multiple provisions.

5.11.4.6.2.2 Energy

Operational activities associated with the Build Out Proposed Action require consumption of electricity and natural gas during operation of facilities for heating, cooling, lighting, and ventilation systems; consumption of jet fuel and aviation gasoline for aircraft operations; and consumption of gasoline and diesel fuel during GSE operation.

The SAM includes requirements for energy efficiency and management through multiple provisions. These requirements are intended to reduce the energy intensity of the operation of O'Hare. It includes, among other provisions:

- Building-level energy metering for tracking energy use and
- Energy optimization measures for lighting systems, HVAC systems, equipment and appliances, etc.

For this EA, energy consumption was evaluated for two key sources:

- Energy required to operate stationary airport facilities and
- Energy required to operate mobile vehicles (aircraft and aircraft APU, ground support vehicles, and employee busing).

Stationary Sources

Electricity and natural gas are readily available from regional sources. The quantity required for operation of the Build Out Proposed Action would not have the potential to cause demand to exceed available or future supplies when compared to the Build Out No Action. The CDA contacted and received confirmation that the public utilities have the capacity to supply adequate quantities of both natural gas[13] and electricity[14] to support the Build Out Proposed Action.

The CDA estimated future projected energy needs of buildings and facilities. Estimates were based on comparable existing facilities, function, consumption rates (e.g., kWh/per square foot), and/or standard rates from the CBECS.

Annual electricity consumption associated with the Build Out Proposed Action is expected to be 43.3 percent higher than the Build Out No Action. Natural gas consumption is expected to increase from the Build Out No Action by 55.2 percent. Stationary diesel fuel use is expected to increase by 28.4 percent, as shown in **Table 5.11-14**. The Build Out Proposed Action includes energy use associated with projects to be complete by the build out year in addition to the existing and baseline facilities. Increases in electricity and natural gas consumption are due to new and expanded structures under the Proposed Action.

[13] John Puka, Engineering Supervisor – Distribution Design Engineering, Peoples Gas, "RE: PGL Capacity for O'Hare Expansion," Email message to Carl Larson, Utility Manager, Connect Chicago Alliance, dated September 27, 2019.

[14] Steve Tribuzzi, Sr. Account Manager, ComEd Large Customer Services – Chicago Region and Steve Kirk, ComEd NB Large Projects Manager – Chicago, "RE: O'Hare Expansion and ComEd Capacity," Email message to Stephen Johnson, Project Manager, APTIM Energy Management Solutions, dated September 11, 2019.

TABLE 5.11-14
BUILD OUT PROPOSED ACTION ENERGY USE – STATIONARY SOURCES

Source	Fuel/Resource Type	Units	Build Out No Action	Build Out Proposed Action	Difference Between Build Out No Action and Build Out Proposed Action (%)
Stationary facilities	Ultra-Low Sulfur #2 Diesel Fuel	Gallons	211,000	271,000	28.4%
Stationary facilities	Natural gas	Therms	11,606,000	18,011,000	55.2%
Stationary facilities	Electricity	kWh	347,057,000	497,457,000	43.3%

Source: CDA, CDA ORD Estimated Annual Utility Consumption, November 11, 2021

Mobile Sources

Fuel consumption associated with the standard aircraft LTO was calculated based on forecast aircraft activity levels. The aircraft activities comprising a LTO consist of both ground-based activities (i.e., ground taxi/idle) and those above ground level (i.e., approach, climb-out, and takeoff). The energy consumed during the LTO cycle reflects the unique characteristics of the fleet and specific airport but does not reflect the total fuel consumed during a flight. For example, energy consumed in the LTO cycle reflects departure fuel burn until the aircraft reaches the atmospheric mixing height, which is 2,510 feet above ground level for the Chicago area. Jet A consumption is expected to decrease slightly from the Build Out No Action (0.8 percent), and Avgas is also expected to decrease slightly (0.7 percent) due to lower taxi times and more efficient aircraft movements (see **Table 5.11-15**).

The aircraft fleet mix (and its assigned APU), as well as the number of operations, do not change under the Build Out No Action or Build Out Proposed Action Alternatives. Therefore, APU use is expected to remain the same as the Build Out No Action, as shown in **Table 5.11-15**.

The Proposed Action would reduce existing aircraft towing operations using GSE. Aircraft towing occurs because of repositioning from an arrival gate to another gate for departure, repositioning to a holding area during long layovers, and transportation to maintenance hangars. Due to the disconnected nature of the existing international (Terminal 5) and domestic (Terminal Core) facilities, aircraft towing and repositioning from Terminal 5 to the Terminal Core is required prior to their next departure if departing from a Terminal Core gate, resulting in facility-driven inefficiencies. Repositioning increases movements on the airfield and terminal area aprons, in turn increasing fuel use associated with these movements. In the Build Out Proposed Action, the updated facilities providing for colocation of code share partners would lead to a decrease in the need to reposition aircraft and lead to decreases from the Build Out No Action Alternative for GSE associated fuel use, as shown in **Table 5.11-15**.

The Proposed Action would relocate employee busing from existing facilities to a new western facility. This is expected to increase vehicle miles traveled for buses in the Build Out Proposed Action as shown in **Table 5.11-15**. The associated increase in fuel use for employee buses would be drawn from readily available conventional fuel sources and are not anticipated to exceed future supply.

TABLE 5.11-15
BUILD OUT PROPOSED ACTION MOBILE FUEL USE

Source	Fuel type	Units	Build Out No Action	Build Out Proposed Action	Difference between Build Out No Action and Build Out Proposed Action (%)
Aircraft	Jet A	Gallons	126,235,382	125,228,466	-0.8%
	Avgas	Gallons	12,836	12,746	-0.7%
APU	Jet A	Gallons	995,620	995,620	0.0%
GSE	Gasoline	Gallons	2,805,542	2,778,667	-1.0%
	Diesel	Gallons	2,345,319	2,313,251	-1.4%
	Propane	Gallons	35,224	34,989	-0.7%
Employee Busing	Gasoline/Diesel	Vehicle Miles Traveled	15,074	17,926	18.9%

Note: APU use is also related to the condition that all passenger gates have gate electrification which reduces the need for APU to operate while the aircraft are at the gate. However, this use is reflected in the electrical use in Table 5.11-14. GSE also includes electrical use from electric GSE. However, this use is reflected in the electrical use in Table 5.11-14.
Source: Crawford, Murphy & Tilly, Inc./RCH Group and Mead & Hunt, 2021

5.11.5 Permits and Approvals

FAA 1050.1F Desk Reference[15] (v2) Section 10.1.1. states:

> No federal permits or certifications are required under this impact category. However, consultation with state and local entities may be necessary to determine if any state or local permits are required.

5.11.6 Mitigation and Minimization

While there will be increased demand for natural resources and energy supply under the Proposed Action, there are adequate supplies; therefore, mitigation is not required. As described earlier in the section, the CDA has identified several sustainability practices in the SAM that are intended to minimize the use of natural resources and energy in project construction and operation.

5.12 SURFACE TRANSPORTATION AND PARKING

This section addresses the effects of increased demand on new and existing roadways (including terminal access roadways). It evaluates the potential impacts of the No Action and Proposed Action Alternatives on O'Hare's surface transportation system. The methodology section below describes the regulatory context for implementing surface transportation projects in the Chicago area. The thresholds of significance used to compare the alternatives are defined in this section, as are the surface transportation's analysis methodologies employed in this study.

[15] Federal Aviation Administration. 1050.1F Desk Reference (v2). February 2020, https://www.faa.gov/about/office_org/headquarters_offices/apl/environ_policy_guidance/policy/faa_nepa_order/desk_ref/media/desk-ref.pdf.

The Existing Condition section provides a brief overview of the various surface transportation elements that comprise the base year transportation system. These include on-airport and off-airport facilities for private and commercial vehicles, including public transit.

The Interim (2025) Condition section compares the No Action and Proposed Action Alternatives for the Interim Condition.

The Build Out (2032) Condition section compares the No Action and Proposed Action Alternatives for the Build Out Condition.

Each subsection includes tables and graphics comparing surface transportation performance measures (e.g., intersection level of service and roadway link volume-to-capacity ratios) for the No Action and Proposed Action Alternatives at key locations in the study area. Intersections and roadway links where thresholds of significance are exceeded are highlighted in the tables and located on an area map.

The O'Hare surface transportation conditions analysis was conducted by the FAA using information collected from the CDA. Data collection included roadway segment counts and intersection turning movement counts (TMC) for roadways in the study area. Microsimulation and macroscopic traffic models (VISSIM and SYNCHRO™), provided by the CDA, were used to develop data inputs for the Air Quality and Noise analyses. Additional information related to surface transportation is included in **Appendix K**.

5.12.1 Definition of Resource

Surface transportation and parking resources include all roadways, parking garages, and surface lots for all vehicle types in a defined area.

5.12.2 Regulatory Context

The Chicago Metropolitan Agency for Planning (CMAP) is the Metropolitan Planning Organization (MPO) for northeastern Illinois, as designated by the governor of Illinois and locally elected officials. CMAP and its Policy Committee develop and approve the policies and strategies for the region's transportation system. The CMAP planning area covers the six-county area of Cook, Lake, McHenry, Will, Kane, and DuPage Counties plus portions of Kendall County. In its role as the decision-making body for transportation planning, the CMAP Policy Committee includes representation from the entire region.

CMAP is responsible for developing northeastern Illinois' Long-Range Regional Transportation Plan (RTP), a required element for eligibility to receive federal funds to improve transit and highway systems. The RTP is based on regional population and growth projections for households and jobs supplied by the Northeastern Illinois Planning Commission (NIPC). Forecasts of financial resources are also used to guide the selection of capital projects to be included in the plan.

A six-year program of surface transportation projects, called the Transportation Improvement Program (TIP), is developed by the various entities responsible for the regional infrastructure and serves as the implementation vehicle for the RTP. These entities include the Illinois Department of Transportation (IDOT), the Illinois State Toll Highway Authority (ISTHA), the City of Chicago, county governments, local governmental units, private transit providers, and the Regional Transportation Authority (RTA) and its service boards: the Chicago Transit Authority (CTA), Metra, and Pace. The TIP is the short-term plan for implementing the RTP's policies and strategies. It is updated continuously and consists of projects that are expected to receive federal funding as well as other non-federally funded projects of regional significance.

The TIP is the basis for conducting the region's transportation-focused air quality analysis, which documents conformity with the SIP in accordance with the requirements of the IEPA and the United States

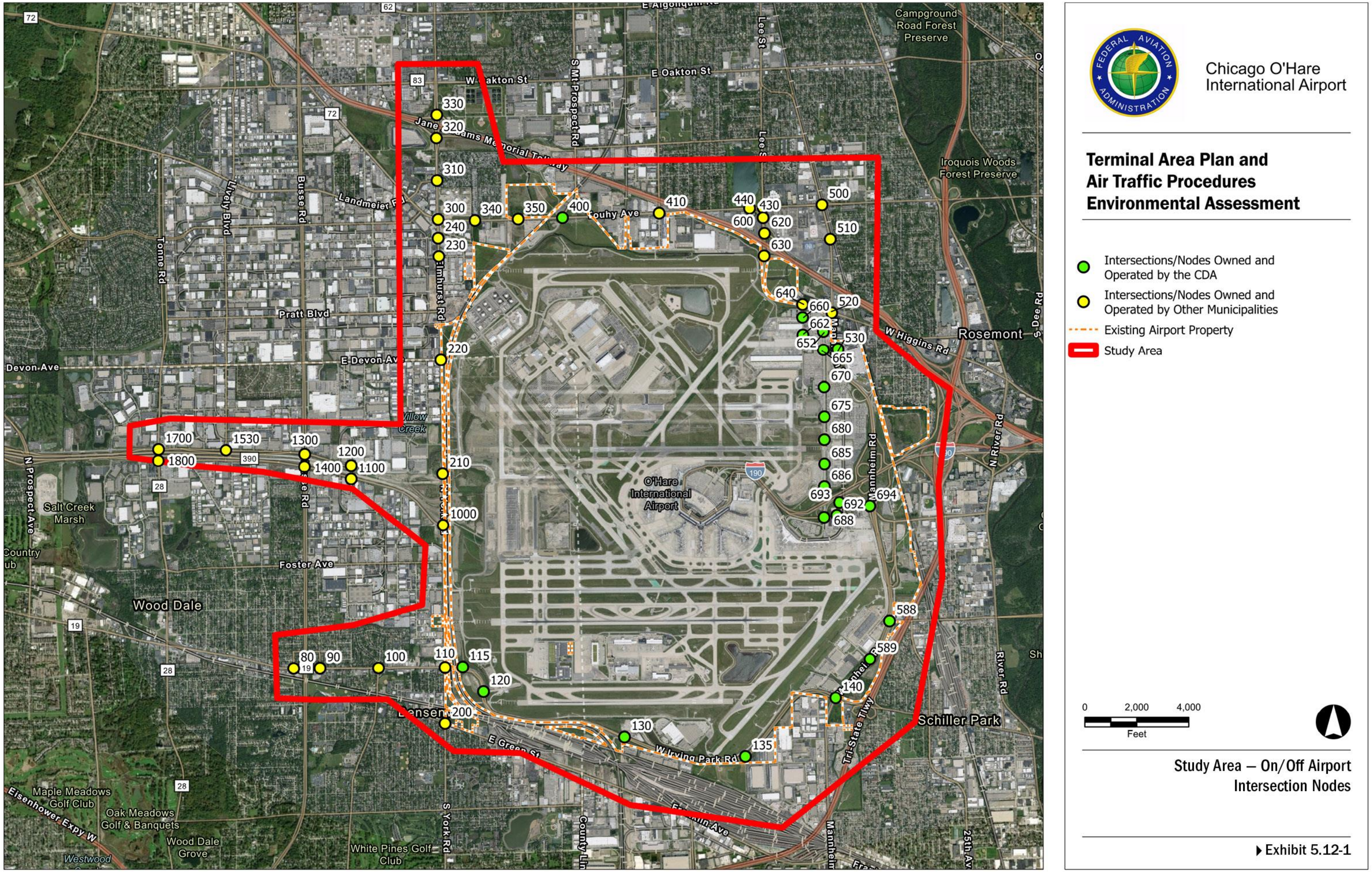
Environmental Protection Agency (USEPA). See **Section 5.3** for further information on the SIP. The TIP also contains a Congestion Management System (CMS), a set of strategies designed to reduce congestion and improve mobility and accessibility. The CMS establishes highway congestion benchmarks in the region and monitors the degree to which the RTP and TIP projects address forecast deficiencies.

At the time that surface transportation studies for the EA were initiated, the 2020 RTP3 and the Fiscal Year (FY) 2001-06 TIP were the region's approved long- and short-range plans. Current transportation investments in the CMAP planning area are now based on the 2030 RTP4 and the FY 2016-21 TIP. Current transportation investments in the CMAP planning area are now based on the 2030 RTP4 and the FY 2004-09 TIP.

5.12.3 Affected Environment

The transportation study area for the EA, as depicted in **Exhibit 5.12-1**, is generally bounded by Irving Park Road on the south side, West/East Touhy Avenue and Interstate Highway 90 (I-90) on the north side, North York Road/South Elmhurst Road on the west side, and North Mannheim Road on the east. Surface Transportation includes on- and off-airport roadways and major parking lots.

Vehicles traveling to the airport from the east side of Chicago use I-90, West Irving Park Road, Lawrence Avenue, and/or West Higgins Road, each of which connect to Mannheim Road and continue east. Because traffic feeds into Mannheim Road, it becomes the eastern terminus of the study area. Irving Park Road was selected as the southern limit due to the railroad yard just south of Irving Park Road, which eliminates any cross connections to Irving Park Road other than South York Road, Mannheim Road, or I-294. York Road/South Elmhurst Road are the western terminus except for West Thorndale Avenue, which begins at the intersection with North Wood Dale Road and a portion of Busse Road from West Thorndale Avenue to East Irving Park Road. Vehicles accessing the airport from the west use West Thorndale Avenue, East Irving Park Road, and possibly East Devon Avenue. Traffic count data exists for all the roadways noted except for East Devon Avenue. Vehicles using East Devon Avenue can be captured on South Elmhurst Road; therefore, East Devon Avenue has been excluded from the study area. On the north side of the project, East Touhy Avenue and I-90 have been established as the northern limits of the study area. Vehicles traveling from the north access the airport via I-90, South Elmhurst Road, Mount Prospect Road, South Wolf Road, Higgins Road, and Mannheim Road, all of which connect to either I-90 and or Touhy Avenue.



Study Area – On/Off Airport Intersection Nodes

Exhibit 5.12-1

ESRI base mapping ArcPro Version 2.8

5.12.4 Methodology

The microsimulation and macroscopic traffic models, VISSIM and SYNCHRO, were provided by the CDA for use in the surface transportation analyses and to estimate travel operational patterns that depict actual roadway link and signalized intersection traffic volumes. **Exhibit 5.12-1** illustrates the interrelationships between the key elements of the surface transportation model. The specific data development, background off- and on-airport transportation, transit and parking improvements, and modeling process are discussed in **Appendix K**.

Performance Measures and Thresholds of Significance

The FAA has not identified a threshold level of significance for impacts to socioeconomics, including surface transportation and parking. FAA Order 1050.1F Desk Reference, Chapter 12, FAA identifies factors to consider when evaluating the context and intensity of potential environmental impacts for socioeconomics. Of these, only one applies to surface transportation and parking, which is whether the Proposed Action has the potential to "…disrupt local traffic patterns and substantially reduce the levels of service of roads serving an airport and its surrounding communities." [16]

A project is considered to have a significant impact if it causes the performance of multiple intersections and roadway links to fall below certain prescribed thresholds. These thresholds are typically set by the local jurisdiction responsible for roadway maintenance and operations, in this case the Chicago DOT for the majority of this study area. Based on the Chicago DOT's August 31, 2021, Traffic Impact Analysis guidelines, surface transportation analysis performance measures for City intersections and roadways include level of service (LOS), vehicle delay, and volume-to-capacity (V/C) ratios. The City does prescribe the use of SYNCHRO analysis but does not prescribe a specific threshold of any metric as acceptable or unacceptable. Rather, the guidelines note that "Improvements should be recommended in order to maintain and/or improve existing [or Future No Action] levels of service" and "with the addition of site [project] traffic, intersection and street network system must operate efficiently and with acceptable queue lengths."[17]

Throughout this EA, on-airport roadways refer to roadways within the terminal area owned and maintained by the CDA. Off-airport roadways include other roadways in the study area that have multiple owners and operators such as the City, other municipalities, or the State of Illinois.

Arterial and intersection capacity analyses for all study intersections and roadway segments were performed using the industry standard National Academy of Sciences Transportation Research Board's Highway Capacity Manual (HCM) methodology.[18] The HCM methodology is used in SYNCHRO to determine performance measures of effectiveness including LOS, V/C ratio, and average vehicle delay (sec/veh). Key performance measures are defined as follows:

LOS is a qualitative measure describing operational conditions of an intersection or any other transportation facility. LOS measures the quality of traffic service and may be determined for intersections, roadway segments, or arterial corridors based on delay, congested speed, V/C ratio, or vehicle density by functional class. Overall delay can be categorized into deceleration delay, stopped delay, and acceleration

[16] Federal Aviation Administration Office of Environment and Energy, "1050.1F Desk Reference," Chapter 12, May 2020, page 12-6, https://www.faa.gov/sites/faa.gov/files/about/office_org/headquarters_offices/apl/desk-ref.pdf.
[17] Chicago Department of Transportation (CDOT), "Policies and Guidelines for Traffic Impact Studies (TIS), August 31, 2021, https://www.chicago.gov/content/dam/city/sites/air-quality-zoning/pdfs/CDOT-Traffic-Impact-Study-Guidelines-8-31-2021.pdf.
[18] Transportation Research Board. 2016. Highway Capacity Manual 6th Edition: A Guide for Multimodal Mobility Analysis. Washington, DC: The National Academies Press. https://doi.org/10.17226/24798.

delay. LOS is a letter designation that corresponds to a certain range of roadway operating conditions ranging from A to F, with A indicating the best operating condition and F indicating the worst (failing) operating condition. LOS for intersections was determined based on HCM signalized and unsignalized average vehicle delay thresholds from SYNCHRO's HCM 2000 reports. Arterial LOS is based on a comparison between modeled travel time and free-flow travel times and was created by using SYNCHRO's arterial reports for each segment and corridor.

The V/C ratio is the ratio of current flow rate to the capacity of the intersection. This ratio is often used to determine sufficiency of capacity on a given roadway. A 1.0 ratio generally indicates that the roadway is operating at capacity. A ratio greater than 1.0 indicates that the facility is operating above capacity, as the number of vehicles exceeds the roadway capacity. V/C ratios above 1.3 indicate super saturated flow.[19]

5.12.5 Existing Condition

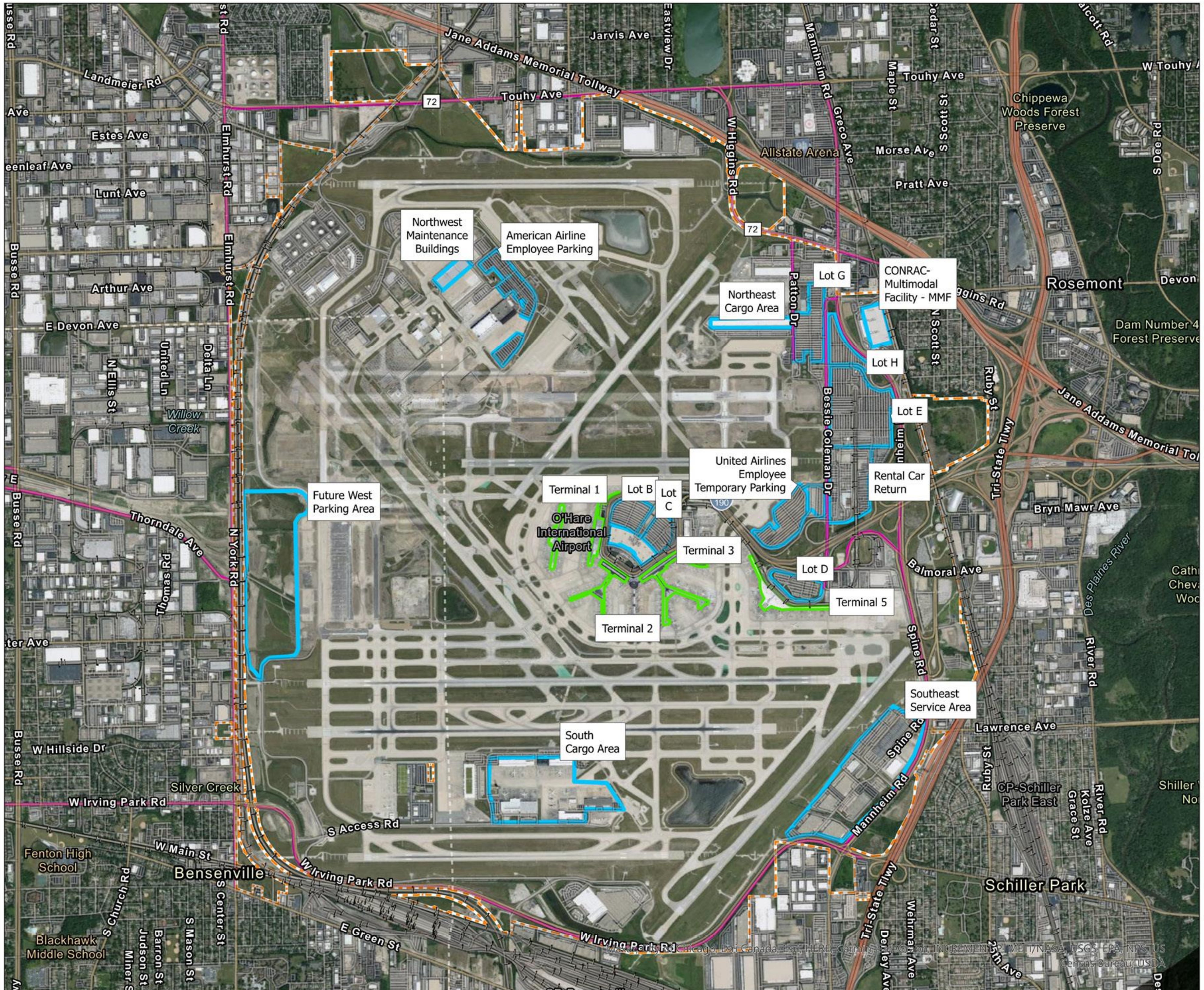
O'Hare is surrounded by a developed surface transportation system that includes the Interstate Highway System, regional highways, major arterial roadways, public transit facilities, and railroads. An expressway/tollway interchange is located just east of the airport. This interchange links the Kennedy Expressway (I-90), the Jane Addams Memorial Tollway (I-90), and the Tri-State Tollway (I-294) with the Airport Access Road (I-190). I-190, which extends from Cumberland Avenue into the airport property, carries most of the vehicular traffic into O'Hare's passenger terminals. The traffic on I-190 west of Mannheim Road is almost exclusively airport-related.

O'Hare also provides on-airport ground transportation facilities to employees, visitors, and passengers, enabling access to both on-airport and off-airport areas. On-airport ground transportation services and facilities include the ATS, the CTA Blue Line, and various shuttle buses. Off-airport services and facilities include Pace buses, taxi and livery services, Metra, and various transportation network providers (TNP).

Multiple major arterial roadways border the airport, such as Mannheim Road (US Route 12/45), Higgins Road (Illinois Route 72), Touhy Avenue, and Irving Park Road (Illinois Route 19). These roadways carry some airport-related traffic but are primarily used for non-airport-related trips. Refer to **Exhibit 5.12-2**, which illustrates the existing airport property, terminals, parking, and roadway segments studied.

On-airport and off-airport facilities were inventoried in the study area to define the potentially affected roadways. Surface transportation data representing the existing conditions were developed by analyzing current field counts and other data provided by the CDA (see **Appendix K**).

[19] Transportation Research Board. 2016. Highway Capacity Manual 6th Edition: A Guide for Multimodal Mobility Analysis. Washington, DC: The National Academies Press. https://doi.org/10.17226/24798.



ESRI base mapping ArcPro Version 2.8

Chicago O'Hare International Airport

Terminal Area Plan and Air Traffic Procedures Environmental Assessment

Legend

- Existing Airport Property
- Roadway Segments
- Terminals
- Parking Lots

0 2,000 4,000
Feet

Transportation Facilities

Exhibit 5.12-2

Table 5.12-1 lists the existing roadway segments for terminal roadways. **Table 5.12-2** lists the existing intersections for airport roadways and provides the intersection node numbers, intersection names, AM/PM delay in seconds, LOS, and V/C ratios. Roadway segments that produced a LOS less than the "D" or a V/C ratio greater than 1.0 are highlighted. Note that off-airport intersections owned and operated by the CDA in **Table 5.12-2** are shown in ***bold italics***.

TABLE 5.12-1 LOS AND V/C RATIOS FOR TERMINAL ROADWAY SEGMENTS, EXISTING CONDITION

Terminal Roadway Segments					Existing Condition (2018)			
					AM Link Capacity		PM Link Capacity	
Link #	Link Name	Roadway	From	To	V/C	LOS	V/C	LOS
1	I-90-WB2	I-190-WB	Bessie Coleman Drive Off-Ramp	Bessie Coleman Drive On-Ramp	0.80	D	0.50	B
2	CVHA-1	Commercial Vehicle Hold Area Access Roadway	Hold Area Lot	I-190 WB On-Ramp	0.07	A	0.38	B
3	Recirc to Terminals	Parking Exit	Parking A-B-C	Terminals 1-2-3	-	-	-	-
4	Park-Enter-1	Parking Entrance	I-190 WB	Parking Recirculation On-Ramp	0.36	B	0.09	A
5	Recirc to Park	Ramp	Recirculation Road	Parking Entrance	0.03	A	0.03	A
6	T1-UL-1	T1 Upper-Level Access	I-190 WB	Through Lane Bypass	0.89	E	0.32	B
7	T1-LL-1	Lower-Level Curbside Entry Roadway	Recirculation Road On-Ramp	Commercial Vehicle Exit	0.10	A	0.20	A
8	T1-LL	Terminal 1 Lower Level	Lower-Level Entrance	Terminal 2-3	-	-	-	-
9	T1-LL	Terminal 1 Lower Level	Lower-Level Entrance	Terminal 2-3	-	-	-	-
10	UL to I-190-EB	Upper-Level Exit Roadway (Terminal 1-3)	Terminal 3 UL Thru Lane Merge with Departures	Merge with Lower Levels	0.73	D	0.24	A
11	LL to Recirc Main	Ramp	Terminal 3 Lower Level	Recirculation Road	0.09	A	0.11	A
12	LL to I-90-EB	Lower-Level Roadway	Terminal 3	I-190 EB	0.21	A	0.49	C
13	Parking Exit Ramp to Recirc	Ramp	Terminal 3 LL Thru Lane	Recirculation Road	-	-	-	-
14	Park Exit 1	Main Parking Exit	Parking Lot	Recirculation Road/I-190 Ramps	0.05	A	0.20	A
15	Recirc Bridge	Recirculation Road	Parking Lot On-Ramp	Parking Lot Exit Ramp	0.16	A	0.30	B
16	I-190-EB3	I-190-EB	Bessie Coleman Drive Exit Ramp	Bessie Coleman Drive SB On-Ramp	0.62	C	0.49	C
17	I-190-EB to BC/T5	I-190 EB Off Ramp	I-190 EB	Bessie Coleman Drive/Terminal 5	0.78	D	0.48	C

Terminal Roadway Segments					Existing Condition (2018)			
					AM Link Capacity		PM Link Capacity	
Link #	Link Name	Roadway	From	To	V/C	LOS	V/C	LOS
18	T5-1	T5 Entry Roadway	West O'Hare Avenue	Terminal 5 Recirculation Road	0.37	B	0.65	D
19	T5-Park Entry	Terminal 5 Parking Entrance	Terminal 5 Lower Curbside Entrance	Parking Lot	0.15	A	0.46	C
20	T5-LL	Terminal 5 Lower-Level Curbside Exit	Parking Lot Entrance	Parking Lot Exit	0.10	A	0.85	E
21	T5-UL	Terminal 5 Upper-Level Curbside Exit	Parking Lot Entrance	Parking Lot Exit	0.46	C	0.19	A
21A	T5 UL/LL Exit	Terminal 5 Exit to Bessie Coleman Drive	Terminal 5 UL/LL Exit	Bessie Coleman Drive	-	-	-	-
21B	T5 UL/LL Exit	Terminal 5 Exit to I-190 EB/Ramp to West O'Hare Avenue	Terminal 5 UL/LL Exit	I-190 EB & Ramp to West O'Hare Avenue	-	-	-	-
21B.1	T5 Exit B	Terminal 5 Exit to I-190 EB	Terminal 5 Exit B Split	I-190 EB	-	-	-	-
21B.2	T5 Exit B	Terminal 5 Exit to West O'Hare Avenue	Terminal 5 Exit B Split	West O'Hare Avenue	0.03	A	0.18	A
22	T5-Park Exit	Terminal 5 Parking Exit	Parking Lot	Terminal 5 Lower Curbside Exit	0.05	A	0.34	B
23	T5-Recirc	Recirculation Ramp	Terminal 5 Curbside Exit	Terminal 5 Curbside Entrance	0.85	E	0.61	D
24	BC to I-190WB	Ramp	Bessie Coleman Drive	I-190 WB	-	-	-	-
25	Recirc to LL	Recirculation Road Ramp	Recirculation Road	Lower-Level Terminal 1-3	-	-	-	-
27	UL to Recirc	Ramp	Terminal 3 UL Thru Lane	Recirculation Road	-	-	-	-
28	T1-UL-IN	Terminal 1 Upper-Level Inner/Outer Roadway	Lower-Level Split	Terminal 2	0.74	D	0.20	A
29	T1-UL-OUT				0.96	E	0.42	C
30	T2-UL-IN	Terminal 2 Upper-Level Inner/Outer Roadway	Terminal 1	Terminal 3	0.36	B	0.24	A
31	T2-UL-OUT				1.34	F	0.37	B
32	T3-UL-IN	Terminal 3 Upper-Level Inner/Outer Roadway	Terminal 2	Terminal 3 Exit	0.69	D	0.28	B
33	T3-UL-OUT				1.01	F	0.34	B

Source: Mead & Hunt, Inc. calculations
Note: There is no Link 26. This was an unused number for all scenarios.

TABLE 5.12-2
AIRPORT ROADWAY INTERSECTIONS, EXISTING CONDITION

Node	Intersection	Existing Condition (2018)		
		AM (PM)		
		Delay	LOS	V/C
80	Spruce Avenue & Irving Park Road	Signal		
		7.9 (4.0)	A (A)	0.42 (0.48)
90	Marshall Road & Irving Park Road	Signal		
		8.9 (5.7)	A (A)	0.41 (0.50)
100	North Church Road & Irving Park Road	Signal		
		11.3 (10.7)	B (B)	0.38 (0.48)
110	York Road & Irving Park Road	Signal		
		37.8 (71.1)	D (E)	0.75 (0.96)
115	I-490 Southbound On- & Off-Ramp & Irving Park Road	-	-	-
		-	-	-
120	*Irving Park Road & South Access Road*	***Signal***		
		10.4 (11.0)	***B (B)***	***0.61 (0.75)***
130	*Taft Avenue & Irving Park Road*	***Signal***		
		12.5 (25.1)	***B (C)***	***0.60 (0.89)***
135	*Seymour Avenue & Irving Park Road*	***Signal***		
		9.3 (11.3)	***A (B)***	***0.58 (0.77)***
140	*Mannheim Road & Irving Park Road*	***Signal***		
		51.8 (44.9)	***D (D)***	***0.91 (0.94)***
200	York Road & Green Street	Signal		
		25.5 (33.5)	C (C)	0.74 (0.81)
210	York Road & Ramp Q5	-	-	-
		-	-	-
220	York Road/South Elmhurst Road & Devon Avenue	Signal		
		24.6 (28.4)	C (C)	0.84 (0.85)
230	South Elmhurst Road & Greenleaf Avenue	-	-	-
		-	-	-
240	South Elmhurst Road & Old Higgins Road/Estes Avenue	-	-	-
		-	-	-
300	South Elmhurst Road & Higgins Road/Touhy Avenue	Signal		
		43.3 (48.0)	D (D)	0.94 (0.98)
310	South Elmhurst Road & Landmeier Road	Signal		
		15.9 (33.1)	B (C)	0.49 (0.56)
320	South Elmhurst Road & I-90 EB Ramps	Signal		
		22.4 (22.5)	C (C)	0.55 (0.59)
330	South Elmhurst Road & I-90 WB Ramps	Signal		
		20.5 (17.8)	C (B)	0.49 (0.49)
340	Old Higgins Road & Touhy Avenue	-	-	-
350	I-490 Northbound Off-Ramp & Touhy Avenue	-	-	-

Node	Intersection	Existing Condition (2018) AM (PM) Delay	LOS	V/C
400	*Mount Prospect Road & Touhy Avenue*	*Signal*		
		22.8 (25.1)	*C (C)*	*0.69 (0.81)*
410	Wolf Road & Touhy Avenue	Signal		
		16.2 (30.8)	B (C)	0.62 (0.71)
430	Lee Street & Touhy Avenue	Signal		
		7.1 (11.5)	A (B)	0.57 (0.66)
440	Lee Street & Touhy Avenue	Signal		
		11.9 (13.2)	B (B)	0.45 (0.54)
500	Mannheim Road & Touhy Avenue	Signal		
		33.3 (53.5)	C (D)	0.77 (1.00)
510	Mannheim Road & Lunt Avenue	Signal		
		4.5 (10.1)	A (B)	0.38 (0.64)
520	Mannheim Road & Higgins Road	Signal		
		34.7 (67.6)	C (E)	0.88 (1.12)
530	*Mannheim Road & Zemke Boulevard*	*Signal*		
		34.8 (35.7)	*C (D)*	*0.76 (0.90)*
588	*Mannheim Road & Lawrence Avenue*	*Signal*		
		13.7 (26.9)	*B (C)*	*0.73 (0.85)*
589	*Mannheim Road & Montrose Avenue*	*Signal*		
		6.6 (15.3)	*A (B)*	*0.57 (0.71)*
600	Lee Street & Mall Entrance	-	-	-
		-	-	-
620	Lee Street & I-90 WB Ramps	Signal		
		19.7 (17.9)	B (B)	0.70 (0.75)
630	Higgins Road/Lee Street & I-90 EB Ramps	Signal		
		5.7 (6.7)	A (A)	0.51 (0.52)
640	Patton Drive & Higgins Road	Signal		
		8.1 (23.8)	A (C)	0.57 (0.77)
652	*Schilling Road & Zemke Road*	*Stop (2-Way)**		
		11.0 (17.8)	*B (C)*	*0.05 (0.32)*
660	*Patton Drive & Johnson Road*	*Stop (All-Way)*		
		8.6 (9.6)	*A (A)*	*0.36 (0.36)*
662	*Patton Drive & Zemke Road*	*Stop (T Int)**		
		10.1 (9.7)	*B (A)*	*0.08 (0.05)*
665	*Bessie Coleman Drive/Schilling Road & Zemke Boulevard*	*Stop (2-Way)**		
		218.5 (>300)	*F (F)*	*1.23 (2.97)*
670	*Bessie Coleman Drive & Lot G Access/Lot H Access*	*Stop (2-Way)**		
		32.1 (62.5)	*D (F)*	*0.01 (0.07)*

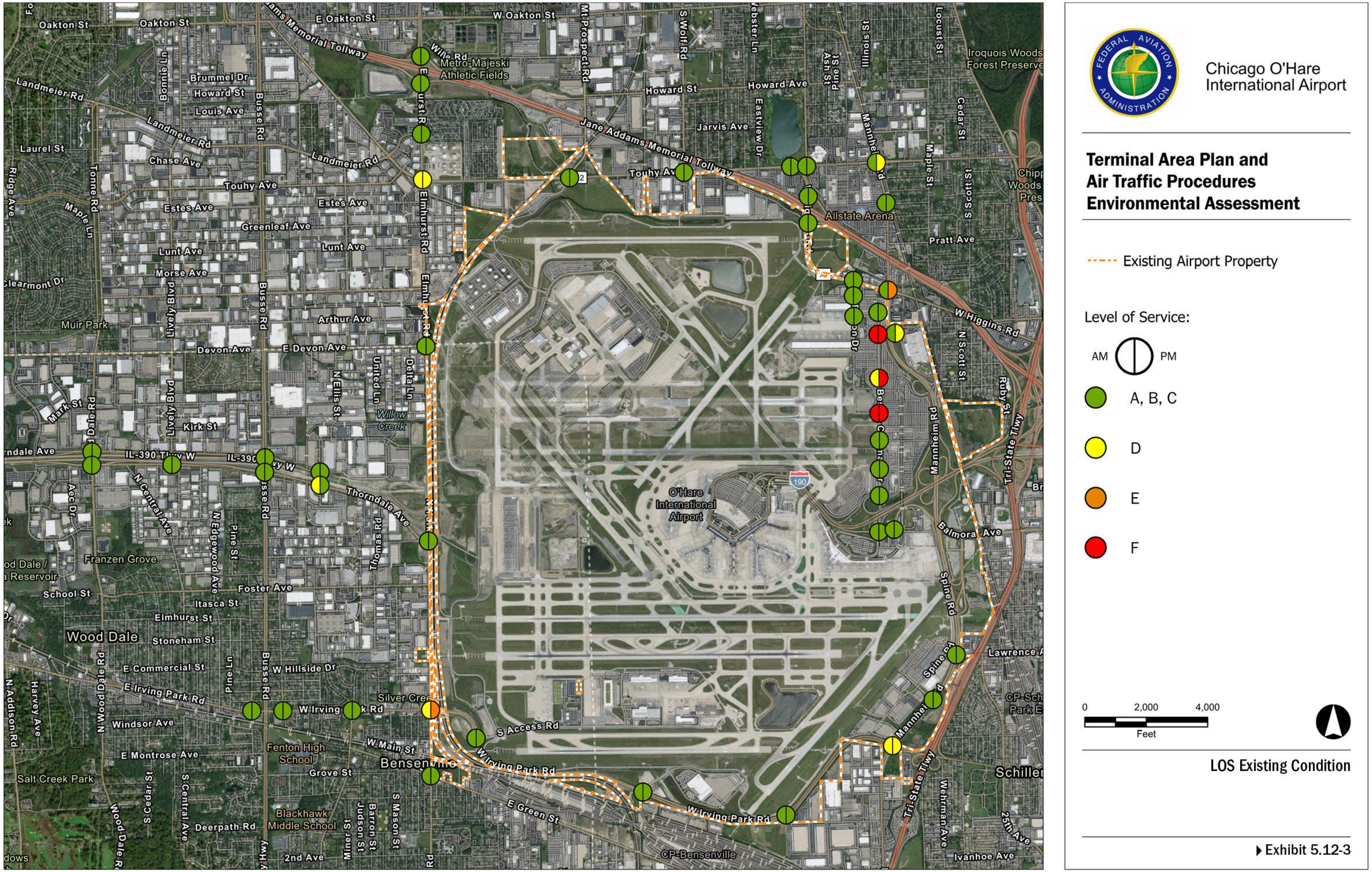
		Existing Condition (2018)		
		AM (PM)		
Node	**Intersection**	**Delay**	**LOS**	**V/C**
675	*Bessie Coleman Drive & Schlitz Road/Lot E Access*	*Stop (2-Way)**		
		69.4 (198.3)	*F (F)*	*0.51 (1.00)*
680	*Bessie Coleman Drive & Rental Car Return*	*Signal*		
		8.1 (4.6)	*A (A)*	*0.25 (0.25)*
685	*Bessie Coleman Drive & Taxi Lot Access*	*Signal*		
		8.8 (24.6)	*A (C)*	*0.46 (0.81)*
686	*Bessie Coleman Drive & I-190 WB Ramps/Rental Car Return*	*Signal*		
		14.1 (24.7)	*B (C)*	*0.46 (0.79)*
688	*Bessie Coleman Drive & I-190 EB Ramps/Balmoral Avenue*	*Signal*		
		30.3 (31.8)	*C (C)*	*0.34 (0.73)*
692	*Balmoral Avenue & Service Road*	*Stop (T Int)**		
		9.1 (19.2)	*A (C)*	*0.06 (0.18)*
693	*West O'Hare Avenue & Airport Exit Roadway*	-	-	-
		-	-	-
694	*West O'Hare Avenue & Manheim Road SB Entrance*	-	-	-
		-	-	-
1000	York Road & Thorndale Avenue	Signal		
		7.4 (29.3)	A (C)	0.49 (0.97)
1100	Supreme Drive & South Thorndale Avenue/Thorndale Avenue	Signal		
		20.8 (27.5)	C (C)	0.33 (0.43)
1200	Supreme Drive & North Thorndale Avenue	Signal		
		36.3 (29.1)	D (C)	0.25 (0.45)
1300	Busse Road & North Thorndale Avenue	Signal		
		13.3 (19.0)	B (B)	0.68 (0.67)
1400	Busse Road & South Thorndale Avenue	Signal		
		20.8 (18.2)	C (B)	0.61 (0.73)
1530	South Thorndale Avenue & Lively Boulevard	Stop (All-Way)		
		7.3 (7.3)	A (A)	0.08 (0.08)
1700	North Wood Dale Road & North Thorndale Avenue	Signal		
		16.8 (25.5)	B (C)	0.35 (0.42)
1800	South Thorndale Avenue & North Wood Dale Road	Signal		
		28.1 (18.4)	C (B)	0.39 (0.35)

Source: Mead & Hunt, Inc. calculations

Exhibit 5.12-3 illustrates the AM/PM LOS using a color code for the existing intersections for the off-airport roadways based on the information shown in **Table 5.12-2**. The following locations have been identified as having an LOS less than "D" and/or a V/C ratio greater than 1.0:

- Link #6 – Terminal 1 upper-level access from I190 westbound to through lane bypass AM Peak LOS E, V/C ratio 0.89,

- Link #20 – Terminal 5 lower-level curbside exit from the parking lot entrance to the parking lot exit PM LOS E, V/C ratio 0.85,
- Link #23 – Terminal 5 recirculation ramp from Terminal 5 curbside exit to curbside entrance AM LOS E, V/C ratio 0.85,
- Link #29 – Terminal 1 upper-level inner/outer roadway lower-level split to Terminal 2 AM LOS E, V/C ratio 0.96,
- Link #31 – Terminal 2 upper-level inner/outer roadway from Terminal 1 to Terminal 3 AM LOS F, V/C ratio 1.34, and
- Link #33 – Terminal 3 upper-level inner/outer roadway from Terminal 2 to Terminal 3 exit AM LOS F, V/C ratio 1.01.



ESRI base mapping ArcPro Version 2.8

5.12.6 Environmental Consequences

5.12.6.1 On-Airport Roadways – Interim No Action and Interim Proposed Action

This section presents information on the potential impacts on surface transportation expected to result from the Interim No Action to the Interim Proposed Action for the airport roadways. The LOS and V/C ratios were determined for the on-airport terminal roadway segments for each condition and are shown in **Table 5.12-3**. Roadway segments that result in a LOS lower than existing conditions are highlighted in the tables.

Table 5.12-3 illustrates the AM/PM LOS and V/C ratios for the Interim No Action and Interim Proposed Action on airport roadways. The following locations have been identified as having a LOS less than "D" and/or a V/C ratio greater than 1.0:

- Link #6 – Terminal 1 upper-level access from I-190 westbound to through lane bypass AM Peak LOS E, V/C ratio 0.91 for Interim No Action and
- Link #6 – Terminal 1 upper-level access from I-190 westbound to through lane bypass AM Peak LOS E, V/C ratio 0.91 for Interim Proposed Action.

As the LOS E locations are the same in the existing Interim No Action and Interim Proposed Action, there is no significant impact to the on-airport roadways from the project's Interim Action.

TABLE 5.12-3
LOS AND V/C RATIOS FOR TERMINAL ROADWAY SEGMENTS, INTERIM NO ACTION AND INTERIM PROPOSED ACTION

Terminal Roadway Segments					Interim No Action				Interim Proposed Action			
					AM Link Capacity		PM Link Capacity		AM Link Capacity		PM Link Capacity	
Link #	Link Name	Roadway	From	To	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS
1	I-90-WB2	I-190-WB	Bessie Coleman Drive Off-Ramp	Bessie Coleman Drive On-Ramp	0.82	D	0.37	B	0.82	D	0.37	B
2	CVHA-1	Commercial Vehicle Hold Area Access Roadway	Hold Area Lot	I-190 WB On-Ramp	0.06	A	0.43	C	0.06	A	0.43	C
3	Recirc to Terminals	Parking Exit	Parking A-B-C	Terminals 1-2-3	-	-	-	-	-	-	-	-
4	Park-Enter-1	Parking Entrance	I-190 WB	Parking Recirculation On-Ramp	0.38	B	0.10	A	0.38	B	0.10	A
5	Recirc to Park	Ramp	Recirculation Road	Parking Entrance	0.03	A	0.04	A	0.03	A	0.04	A
6	T1-UL-1	T1 Upper-Level Access	I-190 WB	Through Lane Bypass	0.91	E	0.33	B	0.91	E	0.33	B
7	T1-LL-1	Lower-Level Curbside Entry Roadway	Recirculation Road On Ramp	Commercial Vehicle Exit	0.06	A	0.20	A	0.06	A	0.20	A
8	T1-LL	Terminal 1 Lower Level	Lower-Level Entrance	Terminal 2-3	-	-	-	-	-	-	-	-
9	T1-LL	Terminal 1 Lower Level	Lower-Level Entrance	Terminal 2-3	-	-	-	-	-	-	-	-
10	UL to I190-EB	Upper-Level Exit Roadway (Terminal 1-3)	Terminal 3 UL Thru Lane Merge with Departures	Merge with Lower Levels	0.76	D	0.27	B	0.76	D	0.27	B

Terminal Roadway Segments					Interim No Action				Interim Proposed Action			
					AM Link Capacity		PM Link Capacity		AM Link Capacity		PM Link Capacity	
Link #	Link Name	Roadway	From	To	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS
11	LL to Recirc Main	Ramp	Terminal 3 Lower Level	Recirculation Road	0.02	A	0.03	A	0.02	A	0.03	A
12	LL to I-90-EB	Lower-Level Roadway	Terminal 3	I-190 EB	0.12	A	0.48	C	0.12	A	0.48	C
13	Parking Exit Ramp to Recirc	Ramp	Terminal 3 LL Thru Lane	Recirculation Road	-	-	-	-	-	-	-	-
14	Park Exit 1	Main Parking Exit	Parking Lot	Recirculation Rd/I-190 Ramps	0.04	A	0.23	A	0.04	A	0.23	A
15	Recirc Bridge	Recirculation Road	Parking Lot On Ramp	Parking Lot Exit Ramp	0.10	A	0.29	B	0.10	A	0.29	B
16	I-190-EB3	I-190-EB	Bessie Coleman Drive Exit Ramp	Bessie Coleman Drive SB On-Ramp	0.61	C	0.55	C	0.61	C	0.55	C
17	I-190-EB to BC/T5	I-190 EB Off Ramp	I-190 EB	Bessie Coleman Drive/Terminal 5	0.74	D	0.42	B	0.74	D	0.42	B
18	T5-1	T5 Entry Roadway	West O'Hare Avenue	Terminal 5 Recirculation Road	0.34	B	0.65	D	0.34	B	0.65	D
19	T5-Park Entry	Terminal 5 Parking Entrance	Terminal 5 Lower Curbside Entrance	Parking Lot	0.15	A	0.46	C	0.15	A	0.46	C
20	T5-LL	Terminal 5 Lower-Level Curbside Exit	Parking Lot Entrance	Parking Lot Exit	0.07	A	0.40	B	0.07	A	0.40	B
21	T5-UL	Terminal 5 Upper-Level Curbside Exit	Parking Lot Entrance	Parking Lot Exit	0.18	A	0.08	A	0.18	A	0.08	A
21A	T5 UL/LL Exit	Terminal 5 Exit to Bessie Coleman Drive	Terminal 5 UL/LL Exit	Bessie Coleman Drive	-	-	-	-	-	-	-	-

Terminal Roadway Segments					Interim No Action				Interim Proposed Action			
					AM Link Capacity		PM Link Capacity		AM Link Capacity		PM Link Capacity	
Link #	Link Name	Roadway	From	To	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS
21B	T5 UL/LL Exit	Terminal 5 Exit to I-190 EB/Ramp to West O'Hare Avenue	Terminal 5 UL/LL Exit	I-190 EB & Ramp to West O'Hare Avenue	-	-	-	-	-	-	-	-
21B.1	T5 Exit B	Terminal 5 Exit to I-190 EB	Terminal 5 Exit B Split	I-190 EB	-	-	-	-	-	-	-	-
21B.2	T5 Exit B	Terminal 5 Exit to West O'Hare Avenue	Terminal 5 Exit B Split	West O'Hare Avenue	-	-	-	-	-	-	-	-
22	T5-Park Exit	Terminal 5 Parking Exit	Parking Lot	Terminal 5 Lower Curbside Exit	0.06	A	0.36	B	0.06	A	0.36	B
23	T5-Recirc	Recirculation Ramp	Terminal 5 Curbside Exit	Terminal 5 Curbside Entrance	0.05	A	0.27	B	0.05	A	0.27	B
24	BC to I-190-WB	Ramp	Bessie Coleman Drive	I-190-WB	0.79	D	0.53	C	0.79	D	0.53	C
25	Recirc to LL	Recirculation Road Ramp	Recirculation Road	Lower-Level Terminal 1-3	0.17	A	0.54	C	0.17	A	0.54	C
27	UL to Recirc	Ramp	Terminal 3 UL Thru Lane	Recirculation Road	0.08	A	0.27	B	0.08	A	0.27	B
28	T1-UL-IN	Terminal 1 Upper-Level Inner/Outer Roadway	Lower-Level Split	Terminal 2	0.70	D	0.25	B	0.70	D	0.25	B
29	T1-UL-OUT											
30	T2-UL-IN	Terminal 2 Upper-Level Inner/Outer Roadway	Terminal 1	Terminal 3	0.70	D	0.25	B	0.70	D	0.25	B
31	T2-UL-OUT											
32	T3-UL-IN	Terminal 3 Upper-Level Inner/Outer Roadway	Terminal 2	Terminal 3 Exit	0.70	D	0.25	B	0.70	D	0.25	B
33	T3-UL-OUT											

Source: Mead & Hunt, Inc. calculations
Note: There is no Link 26. This was an unused number for all scenarios.

5.12.6.2 Airport Intersections – Interim No Action and Interim Proposed Action

This section presents information on the potential impacts on surface transportation expected to result from the Interim No Action to the Interim Proposed Action for the off-airport intersections. The LOS and V/C ratios were determined for the off-airport roadway segments for each condition and are shown in **Table 5.12-4**. Note: Intersections owned and operated by the CDA are shown in ***bold italics*** in the table. Refer to **Exhibits 5.12-4** and **5.12-5** for illustrations of the LOS for Interim No Action and Proposed Action.

The results show the following intersections have a LOS reduction to E or F from the Interim No Action to the Interim Proposed Action:

- Location 520 – Mannheim Road and Higgins Road AM Peak LOS D to E and V/C 0.92 to 1.29,
- Location 630 – Higgins Road/ Lee Street and I-90 EB Ramps AM Peak LOS C to F and V/C 0.76 to 1.13,
- Location 665 (Owned and Operated by the CDA) – Bessie Coleman Drive/Schilling Road and Zemke Boulevard AM Peak LOS B to F and V/C 0.35 to 2.00, and
- Location 685 (Owned and Operated by the CDA) – Bessie Coleman Drive and Taxi Lot Access PM Peak LOS E to F and V/C 0.97 to 1.05

FAA Order 1050.1F identifies the factors to consider as whether the Interim Proposed Action would have the potential to include a disruption in local traffic patterns that substantially reduce levels of service of the roads serving the airport (see **Section 5.12.4**). The City defines the thresholds as no degradation in intersection operation that creates unacceptable queue lengths and V/C ratios. Both thresholds apply to all roadways owned and operated by the City of Chicago and other municipalities. Only three study intersections degrade to a LOS E or F from a LOS D or better. While four intersections see a reduction in LOS to E or F and a V/C ratio over 1.0 (at capacity), only one minor intersection in the vast transportation network at the airport results in a V/C ratio over 1.3. Although the results of the macroscopic analysis (HCM LOS and V/C ratio) indicate degradation in intersection operations below a desired threshold, the microsimulation analysis indicates that traffic can be processed through each of these intersections without residual impacts to any adjacent intersections. Therefore, the Interim Proposed Action does not result in significant impacts to the transportation network.

TABLE 5.12-4
AIRPORT ROADWAY INTERSECTIONS, INTERIM NO ACTION AND INTERIM PROPOSED ACTION

		Interim No Action			Interim Proposed Action		
		AM (PM)			AM (PM)		
Node	**Intersection**	**Delay**	**LOS**	**V/C**	**Delay**	**LOS**	**V/C**
		Signal			Signal		
80	Spruce Avenue & Irving Park Road	7.9 (3.8)	A (A)	0.48 (0.53)	7.9 (3.9)	A (A)	0.48 (0.51)
		Signal			Signal		
90	Marshall Road & Irving Park Road	10.2 (4.5)	B (A)	0.51 (0.56)	10.3 (4.5)	B (A)	0.51 (0.54)
		Signal			Signal		
100	North Church Road & Irving Park Road	11.1 (12.4)	B (B)	0.49 (0.54)	11.2 (12.3)	B (B)	0.49 (0.51)
		Signal			Signal		
110	York Road & Irving Park Road	42.6 (76.1)	D (E)	0.89 (0.96)	45.9 (71.5)	D (E)	0.94 (0.96)
115	I-490 Southbound On- & Off-Ramp & Irving Park Road						
		Signal			**Signal**		
120	***Irving Park Road & South Access Road***	**8.6 (10.6)**	**A (B)**	**0.57 (0.66)**	**8.3 (11.4)**	**A (B)**	**0.59 (0.66)**
		Signal			**Signal**		
130	***Taft Avenue & Irving Park Road***	**14.1 (32.3)**	**B (C)**	**0.59 (0.74)**	**16.5 (30.0)**	**B (C)**	**0.62 (0.74)**
		Signal			**Signal**		
135	***Seymour Avenue & Irving Park Road***	**10.1 (19.4)**	**B (B)**	**0.61 (0.67)**	**9.8 (14.0)**	**A (B)**	**0.62 (0.66)**
		Signal			**Signal**		
140	***Mannheim Road & Irving Park Road***	**42.0 (38.2)**	**D (D)**	**0.80 (0.71)**	**43.3 (37.6)**	**D (D)**	**0.86 (0.74)**
		Signal			Signal		
200	York Road & Green Street	36.2 (31.7)	D (C)	0.82 (0.78)	43.8 (31.0)	D (C)	0.88 (0.76)
210	York Road & Ramp Q5						

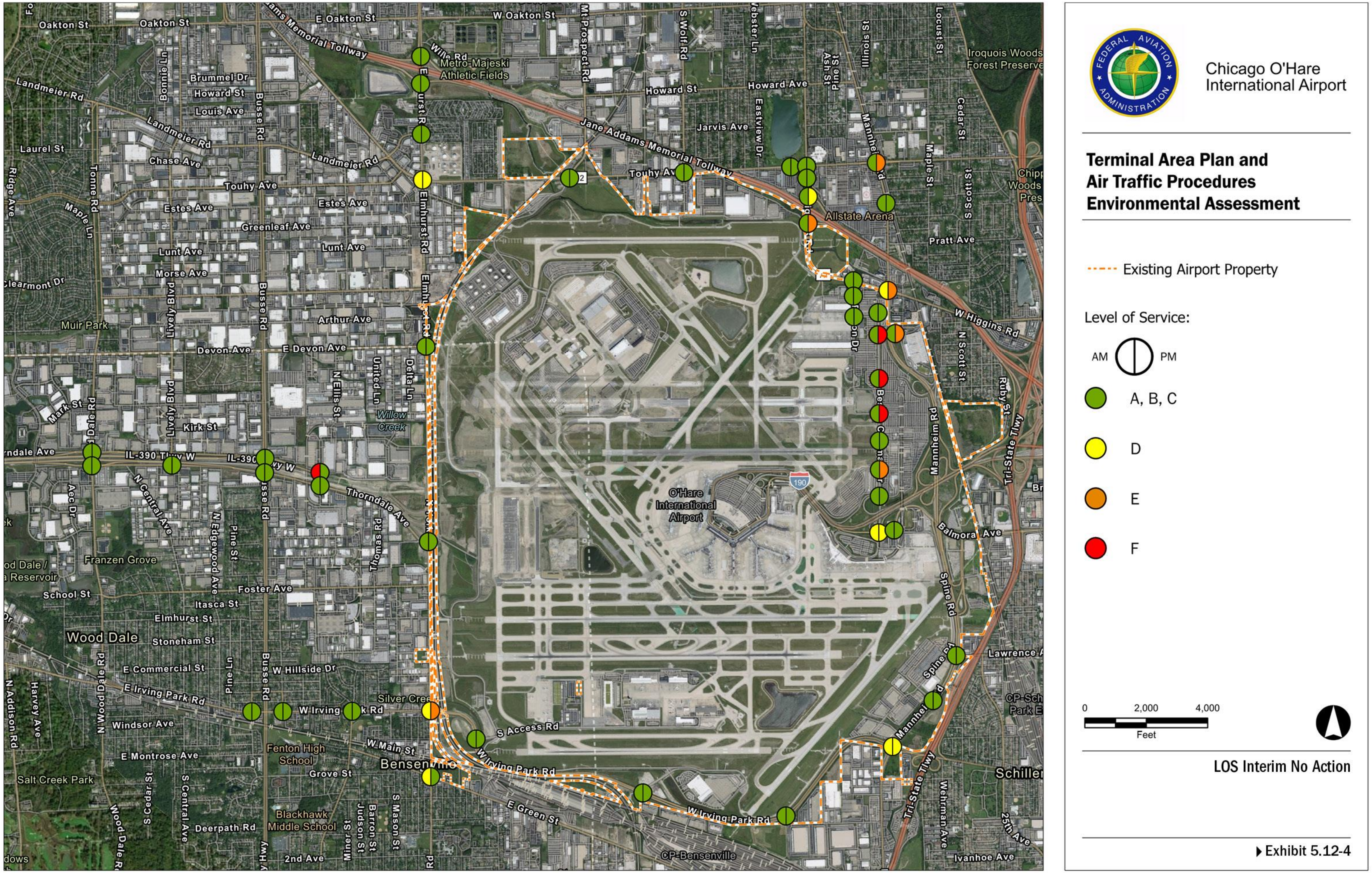
Node	Intersection	Interim No Action AM (PM) Delay	LOS	V/C	Interim Proposed Action AM (PM) Delay	LOS	V/C
220	York Road/South Elmhurst Road & Devon Avenue	Signal			Signal		
		18.8 (25.5)	B (C)	0.72 (0.88)	16.2 (21.5)	B (C)	0.74 (0.82)
230	South Elmhurst Road & Greenleaf Avenue						
240	South Elmhurst Road & Old Higgins Road/Estes Avenue						
300	South Elmhurst Road & Higgins Road/Touhy Avenue	Signal			Signal		
		40.8 (44.4)	D (D)	0.90 (0.96)	43.9 (44.3)	D (D)	0.95 (0.92)
310	South Elmhurst Road & Landmeier Road	Signal			Signal		
		15.6 (26.0)	B (C)	0.65 (0.81)	15.4 (25.4)	B (C)	0.69 (0.81)
320	South Elmhurst Road & I-90 EB Ramps	Signal			Signal		
		27.5 (28.9)	C (C)	0.87 (0.85)	28.5 (32.4)	C (C)	0.90 (0.82)
330	South Elmhurst Road & I-90 WB Ramps	Signal			Signal		
		28.0 (33.5)	C (C)	0.76 (0.85)	29.0 (30.8)	C (C)	0.78 (0.88)
340	Old Higgins Road & Touhy Avenue						
350	I-490 Northbound Off Ramp & Touhy Avenue						
400	***Mount Prospect Road & Touhy Avenue***	***Signal***			***Signal***		
		16.1 (13.2)	***B (B)***	***0.71 (0.72)***	***17.6 (15.3)***	***B (B)***	***0.80 (0.60)***
410	Wolf Road & Touhy Avenue	Signal			Signal		
		22.2 (23.4)	C (C)	0.65 (0.62)	21.8 (26.0)	C (C)	0.75 (0.50)
430	Lee Street & Touhy Avenue	Signal			Signal		
		12.1 (16.6)	B (B)	0.70 (0.75)	15.8 (13.9)	B (B)	0.84 (0.59)
440	Lee Street & Touhy Avenue	Signal			Signal		

Node	Intersection	Interim No Action			Interim Proposed Action		
		AM (PM)			AM (PM)		
		Delay	LOS	V/C	Delay	LOS	V/C
		16.0 (22.4)	B (C)	0.47 (0.71)	15.5 (24.3)	B (C)	0.46 (0.69)
500	Mannheim Road & Touhy Avenue	Signal			Signal		
		28.2 (59.0)	C (E)	0.76 (1.03)	30.4 (66.0)	C (E)	0.89 (1.04)
510	Mannheim Road & Lunt Avenue	Signal			Signal		
		14.2 (11.3)	B (B)	0.38 (0.59)	11.7 (11.4)	B (B)	0.43 (0.65)
520	Mannheim Road & Higgins Road	Signal			Signal		
		38.0 (64.0)	D (E)	0.92 (1.13)	78.4 (49.6)	E (D)	1.29 (0.95)
530	*Mannheim Road & Zemke Boulevard*	*Signal*			*Signal*		
		21.8 (67.8)	*C (E)*	*0.59 (1.06)*	*42.5 (45.3)*	*D (D)*	*0.84 (0.78)*
588	*Mannheim Road & Lawrence Avenue*	*Signal*			*Signal*		
		10.3 (21.6)	*B (C)*	*0.68 (0.71)*	*10.6 (20.7)*	*B (C)*	*0.67 (0.77)*
589	*Mannheim Road & Montrose Avenue*	*Signal*			*Signal*		
		13.0 (16.0)	*B (B)*	*0.50 (0.67)*	*16.1 (19.5)*	*B (B)*	*0.62 (0.72)*
600	Lee Street & Mall Entrance	Signal			Signal		
		16.6 (15.3)	B (B)	0.76 (0.70)	27.4 (18.6)	C (B)	0.99 (0.65)
620	Lee Street & I-90 WB Ramps	Signal			Signal		
		22.2 (41.3)	C (D)	0.81 (1.01)	35.3 (25.1)	D (C)	1.02 (0.89)
630	Higgins Road/Lee Street & I-90 EB Ramps	Signal			Signal		
		32.7 (79.3)	C (E)	0.76 (1.10)	80.1 (60.7)	F (E)	1.13 (0.98)
640	Patton Drive & Higgins Road	Signal			Signal		
		12.2 (21.5)	B (C)	0.71 (0.77)	31.0 (19.0)	C (B)	0.96 (0.57)
652	*Schilling Road & Zemke Road*	*Stop (2-Way)*			*Stop (2-Way)*		
		10.0 (17.5)	*A (C)*	*0.04 (0.31)*	*10.1 (15.5)*	*B (C)*	*0.04 (0.27)*

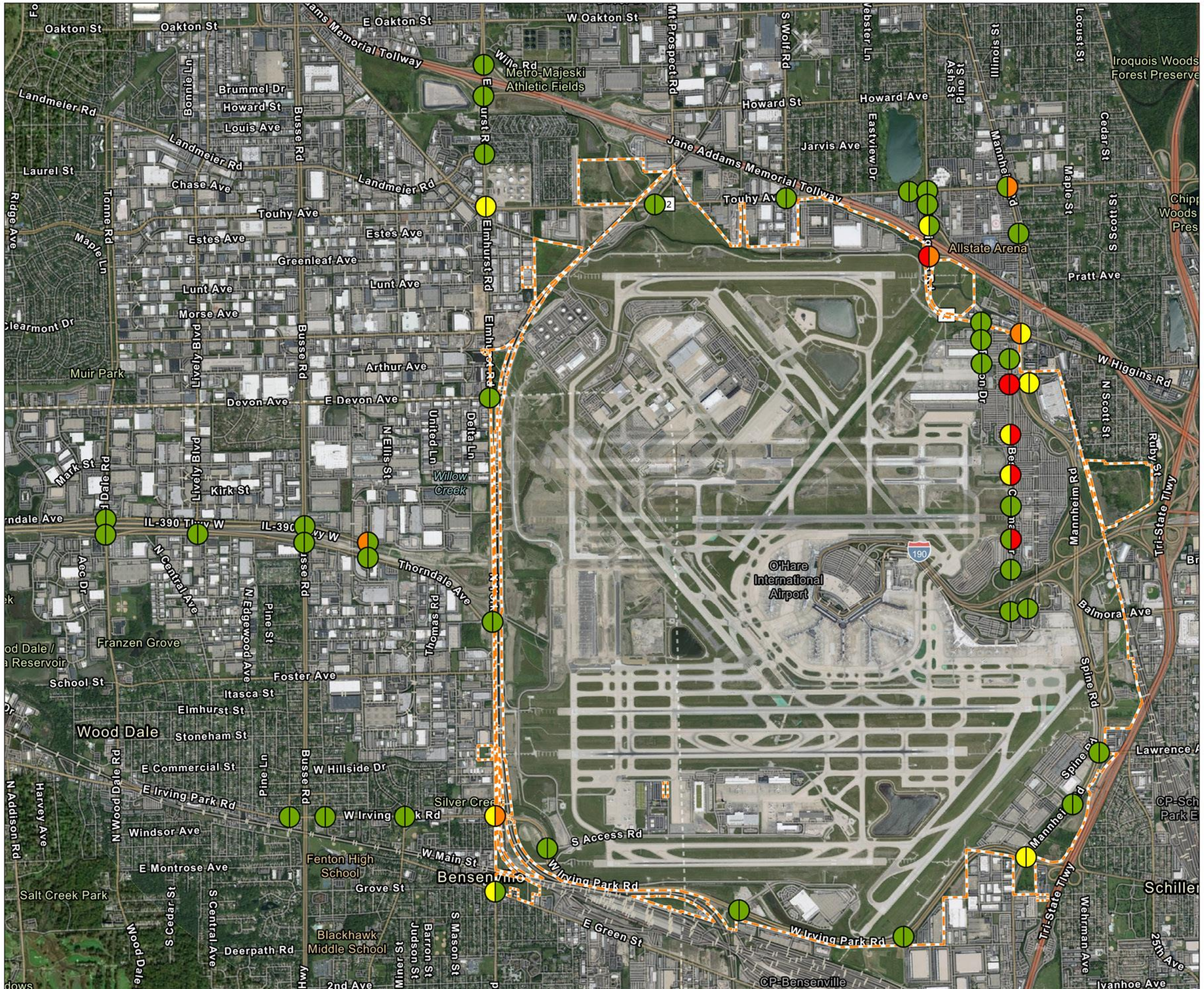
Node	Intersection	Interim No Action			Interim Proposed Action		
		AM (PM)			AM (PM)		
		Delay	LOS	V/C	Delay	LOS	V/C
660	Patton Drive & Johnson Road	Stop (All-Way)			Stop (All-Way)		
		11.2 (10.5)	B (B)	0.57 (0.39)	10.5 (10.2)	B (B)	0.52 (0.38)
662	Patton Drive & Zemke Road	Stop (T Int)			Stop (T Int)		
		9.9 (10.4)	A (B)	0.04 (0.16)	9.7 (10.5)	A (B)	0.03 (0.17)
665	*Bessie Coleman Drive/Schilling Road & Zemke Boulevard*	*Stop (2-Way)*			*Stop (2-Way)*		
		13.4 (>300)	*B (F)*	*0.35 (7.24)*	*>300 (>300)*	*F (F)*	*2.00 (2.60)*
670	*Bessie Coleman Drive & Lot G Access/Lot H Access*	*Stop (2-Way)*			*Stop (2-Way)*		
		15.4 (>300)	*C (F)*	*0.03 (0.31)*	*31.3 (85.5)*	*D (F)*	*0.07 (0.67)*
675	*Bessie Coleman Drive & Schlitz Road/Lot E Access*	*Stop (2-Way)*			*Stop (2-Way)*		
		15.9 (>300)	*C (F)*	*0.08 (1.13)*	*28.3 (229.0)*	*D (F)*	*0.15 (0.85)*
680	*Bessie Coleman Drive & Rental Car Return*	*Signal*			*Signal*		
		14.8 (11.6)	*B (B)*	*0.16 (0.49)*	*10.4 (10.5)*	*B (B)*	*0.20 (0.30)*
685	*Bessie Coleman Drive & Taxi Lot Access*	*Signal*			*Signal*		
		16.5 (76.7)	*B (E)*	*0.56 (0.97)*	*23.4 (98.4)*	*C (F)*	*0.57 (1.05)*
686	*Bessie Coleman Drive & I-190 WB Ramps/Rental Car Return*	*Signal*			*Signal*		
		24.2 (24.2)	*C (C)*	*0.51 (0.63)*	*15.6 (24.8)*	*B (C)*	*0.38 (0.75)*
688	*Bessie Coleman Drive & I-190 EB Ramps/Balmoral Avenue*	*Signal*			*Signal*		
		40.3 (41.2)	*D (D)*	*0.53 (0.87)*	*31.4 (28.9)*	*C (C)*	*0.52 (0.62)*
692	*Balmoral Avenue & Service Road*	*Stop (T Int)*			*Stop (T Int)*		
		9.0 (13.9)	*A (B)*	*0.06 (0.12)*	*9.0 (16.5)*	*A (C)*	*0.06 (0.15)*
693	*West O'Hare Avenue & Airport Exit Roadway*						
694	*West O'Hare Avenue & Manheim Road SB Entrance*						
1000	York Road & Thorndale Avenue	Signal			Signal		

Node	Intersection	Interim No Action			Interim Proposed Action		
		AM (PM)			AM (PM)		
		Delay	LOS	V/C	Delay	LOS	V/C
		7.6 (24.7)	A (C)	0.56 (0.89)	8.0 (21.9)	A (C)	0.63 (0.84)
1100	Supreme Drive & South Thorndale Avenue/Thorndale Avenue	Signal			Signal		
		89.5 (33.6)	F (C)	0.30 (0.45)	74.5 (33.2)	E (C)	0.30 (0.43)
1200	Supreme Drive & North Thorndale Avenue	Signal			Signal		
		25.6 (29.3)	C (C)	0.42 (0.54)	26.4 (29.4)	C (C)	0.42 (0.49)
1300	Busse Road & North Thorndale Avenue	Signal			Signal		
		19.9 (33.2)	B (C)	0.81 (0.87)	19.9 (32.3)	B (C)	0.81 (0.86)
1400	Busse Road & South Thorndale Avenue	Signal			Signal		
		28.2 (18.8)	C (B)	0.66 (0.79)	28.2 (18.7)	C (B)	0.66 (0.79)
1530	South Thorndale Avenue & Lively Boulevard	Stop (All-Way)			Stop (All-Way)		
		7.8 (7.9)	A (A)	0.25 (0.25)	7.8 (7.9)	A (A)	0.25 (0.25)
1700	North Wood Dale Road & North Thorndale Avenue	Signal			Signal		
		22.1 (35.0)	C (C)	0.53 (0.75)	22.1 (34.9)	C (C)	0.53 (0.75)
1800	South Thorndale Avenue & North Wood Dale Road	Signal			Signal		
		25.9 (27.7)	C (C)	0.65 (0.50)	25.9 (27.7)	C (C)	0.65 (0.50)

Source: Mead & Hunt, Inc. calculations



ESRI base mapping ArcPro Version 2.8



ESRI base mapping ArcPro Version 2.8

Chicago O'Hare International Airport

Terminal Area Plan and Air Traffic Procedures Environmental Assessment

Existing Airport Property

Level of Service:

AM PM

A, B, C

D

E

F

0 2,000 4,000 Feet

LOS Interim Proposed Action

Exhibit 5.12-5

5.12.6.3 On-Airport Roadways – Build Out No Action and Build Out Proposed Action

This section presents information on the potential impacts on surface transportation for the on-airport roadways expected to result from the Build Out No Action to the Build Out Proposed Action. The LOS and V/C ratios were determined for the on-airport terminal roadway segments for each condition and are shown in **Table 5.12-5**. Roadway segments that produced a LOS less than the acceptable "D" or a V/C ratio greater than 1.0 are highlighted in the table.

TABLE 5.12-5
LOS AND V/C RATIOS FOR TERMINAL ROADWAY SEGMENTS, BUILD OUT NO ACTION AND BUILD OUT PROPOSED ACTION

Terminal Roadway Segments					Build out No Action				Build Out Proposed Action			
					AM Link Capacity		PM Link Capacity		AM Link Capacity		PM Link Capacity	
Link #	Link Name	Roadway	From	To	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS
1	I-90-WB2	I-190-WB	Bessie Coleman Drive Off-Ramp	Bessie Coleman Drive On-Ramp	0.94	E	0.40	B	0.82	D	0.40	B
2	CVHA-1	Commercial Vehicle Hold Area Access Roadway	Hold Area Lot	I-190 WB On-Ramp	0.09	A	0.46	C	0.08	A	0.50	C
3	Recirc to Terminals	Parking Exit	Parking A-B-C	Terminals 1-2-3	-	-	-	-	-	-	-	-
4	Park-Enter-1	Parking Entrance	I-190 WB	Parking Recirculation On-Ramp	0.43	C	0.11	A	0.37	B	0.09	A
5	Recirc to Park	Ramp	Recirculation Road	Parking Entrance	0.03	A	0.04	A	0.03	A	0.04	A
6	T1-UL-1	T1 Upper-Level Access	I-190 WB	Through Lane Bypass	1.03	F	0.35	B	0.90	E	0.33	B
7	T1-LL-1	Lower-Level Curbside Entry Roadway	Recirculation Road On-Ramp	Commercial Vehicle Exit	0.10	A	0.22	A	0.08	A	0.24	A
8	T1-LL	Terminal 1 Lower Level	Lower-Level Entrance	Terminal 2-3	-	-	-	-	-	-	-	-
9	T1-LL	Terminal 1 Lower Level	Lower-Level Entrance	Terminal 2-3	-	-	-	-	-	-	-	-
10	UL to I-190-EB	Upper-Level Exit Roadway (Terminal 1-3)	Terminal 3 UL Thru Lane Merge with Departures	Merge with Lower Levels	0.86	E	0.29	B	0.75	D	0.27	B
11	LL to Recirc Main	Ramp	Terminal 3 Lower Level	Recirculation Road	0.03	A	0.03	A	0.02	A	0.03	A
12	LL to I-90-EB	Lower-Level Roadway	Terminal 3	I-190 EB	0.19	A	0.50	C	0.16	A	0.55	C

Terminal Roadway Segments					Build out No Action				Build Out Proposed Action			
					AM Link Capacity		PM Link Capacity		AM Link Capacity		PM Link Capacity	
Link #	Link Name	Roadway	From	To	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS
13	Parking Exit Ramp to Recirc	Ramp	Terminal 3 LL Thru Lane	Recirculation Road	-	-	-	-	-	-	-	-
14	Park Exit 1	Main Parking Exit	Parking Lot	Recirculation Rd/I-190 Ramps	0.06	A	0.24	A	0.05	A	0.27	B
15	Recirc Bridge	Recirculation Road	Parking Lot On-Ramp	Parking Lot Exit Ramp	0.15	A	0.30	B	0.12	A	0.33	B
16	I-190-EB3	I-190-EB	Bessie Coleman Drive Exit Ramp	Bessie Coleman Drive SB On-Ramp	0.72	D	0.58	C	0.62	D	0.61	C
17	I-190-EB to BC/T5	I-190 EB Off-Ramp	I-190 EB	Bessie Coleman Drive/Terminal 5	0.84	E	0.45	C	0.73	D	0.43	B
18	T5-1	T5 Entry Roadway	West O'Hare Avenue	Terminal 5 Recirculation Road	0.35	B	0.81	E	0.70	D	0.73	D
19	T5-Park Entry	Terminal 5 Parking Entrance	Terminal 5 Lower Curbside Entrance	Parking Lot	0.14	A	0.46	C	0.15	A	0.46	C
20	T5-LL	Terminal 5 Lower-Level Curbside Exit	Parking Lot Entrance	Parking Lot Exit	0.15	A	1.11	F	0.14	A	0.43	C
21	T5-UL	Terminal 5 Upper-Level Curbside Exit	Parking Lot Entrance	Parking Lot Exit	0.36	B	0.23	A	0.44	C	0.14	A
21A	T5 UL/LL Exit	Terminal 5 Exit to Bessie Coleman Drive	Terminal 5 UL/LL Exit	Bessie Coleman Drive	-	-	-	-	-	-	-	-
21B	T5 UL/LL Exit	Terminal 5 Exit to I-190 EB/Ramp to West O'Hare Avenue	Terminal 5 UL/LL Exit	I-190 EB & Ramp to West O'Hare Avenue	-	-	-	-	-	-	-	-
21B.1	T5 Exit B	Terminal 5 Exit to I-190 EB	Terminal 5 Exit B Split	I-190 EB	-	-	-	-	-	-	-	-
21B.2	T5 Exit B	Terminal 5 Exit to West O'Hare Avenue	Terminal 5 Exit B Split	West O'Hare Avenue	-	-	-	-	-	-	-	-
22	T5-Park Exit	Terminal 5 Parking Exit	Parking Lot	Terminal 5 Lower Curbside Exit	0.05	A	0.36	B	0.06	A	0.36	B
23	T5-Recirc	Recirculation Ramp	Terminal 5 Curbside Exit	Terminal 5 Curbside Entrance	0.05	A	0.38	B				
24	BC to I-190-WB	Ramp	Bessie Coleman Drive	I-190-WB	0.90	E	0.57	C	0.78	D	0.55	C

Terminal Roadway Segments					Build out No Action				Build Out Proposed Action			
					AM Link Capacity		PM Link Capacity		AM Link Capacity		PM Link Capacity	
Link #	**Link Name**	**Roadway**	**From**	**To**	**V/C**	**LOS**	**V/C**	**LOS**	**V/C**	**LOS**	**V/C**	**LOS**
25	Recirc to LL	Recirculation Road Ramp	Recirculation Road	Lower-Level Terminal 1-3	0.26	B	0.57	C	0.22	A	0.62	D
27	UL to Recirc	Ramp	Terminal 3 UL Thru Lane	Recirculation Road	0.13	A	0.28	B	0.11	A	0.31	B
28	T1-UL-IN	Terminal 1 Upper-Level Inner/Outer Roadway	Lower-Level Split	Terminal 2	0.79	D	0.27	B	0.69	D	0.25	B
29	T1-UL-OUT	Terminal 1 Upper-Level Inner/Outer Roadway	Lower-Level Split	Terminal 2	0.79	D	0.27	B	0.69	D	0.25	B
30	T2-UL-IN	Terminal 2 Upper-Level Inner/Outer Roadway	Terminal 1	Terminal 3	0.79	D	0.27	B	0.69	D	0.25	B
31	T2-UL-OUT	Terminal 2 Upper-Level Inner/Outer Roadway	Terminal 1	Terminal 3	0.79	D	0.27	B	0.69	D	0.25	B
32	T3-UL-IN	Terminal 3 Upper-Level Inner/Outer Roadway	Terminal 2	Terminal 3 Exit	0.79	D	0.27	B	0.69	D	0.25	B
33	T3-UL-OUT	Terminal 3 Upper-Level Inner/Outer Roadway	Terminal 2	Terminal 3 Exit	0.79	D	0.27	B	0.69	D	0.25	B

Source: Mead & Hunt, Inc. calculations
Note: There is no Link 26. This was an unused number for all scenarios.

Table 5.12-5 illustrates the AM/PM LOS and V/C ratios for the Build Out No Action airport roadways. The following locations have been identified as having a LOS less than "D" and/or a V/C ratio greater than 1.0:

- Link #1 – I-90 westbound from I-190 westbound to Bessie Coleman Drive Off-Ramp AM Peak LOS E, V/C ratio 0.94 Build Out No Action,
- Link #6 – Terminal 1 upper-level access from I190 westbound to through lane bypass AM Peak LOS F, V/C ratio 1.03 Build Out No Action,
- Link #10 – Upper-level to I-190 eastbound from Upper-level roadway exit terminal 1-3 to Terminal 3 Upper-level through lane merge with departures AM Peak LOS E, V/C ratio 0.86 for Build Out No Action,
- Link #17 – I-190 eastbound to Bessie Coleman Drive/Terminal 5 AM peak LOS E, V/C ratio 0.84 for Build Out No Action,
- Link #18 – Terminal 5 entry roadway to Terminal 5 recirculation Road PM peak LOS E, V/C ratio 0.81 for Build Out No Action,
- Link #20 – Terminal 5 Lower-level curbside exit parking lot entrance to parking lot exit, PM peak LOS F, V/C ratio 1.11 for Build Out No Action, and
- Link #24 – Bessie Coleman Drive to I-190 westbound ramp, AM peak LOS E, V/C ratio 0.90 for Build Out No Action.

Table 5.12-5 also illustrates the AM/PM LOS and V/C ratios for the and Build Out Proposed Action. The following location has been identified as having a LOS less than "D":

- Link #6 – Terminal 1 upper-level access from I-190 westbound to through lane bypass AM Peak LOS E, V/C ratio 0.90 for Build Out Proposed Action.

All the links listed above except Link #6 show an improved LOS from an E or F to a D or greater for the No Action to Proposed Action. At Link #6, the LOS improves from F to E during the Build Out No Action to Proposed Action. Note that intersections owned and operated by the CDA in **Table 5.12-5** are shown in ***bold italics***.

5.12.6.4 Airport Intersections – Build Out No Action and Build Out Proposed Action

This section presents information on the potential impacts on surface transportation for the airport intersections expected to result from the Build Out No Action to the Build Out Proposed Action. The LOS and V/C ratios were determined for the off-airport roadway segments for each condition and are shown in **Table 5.12-6**. Based on the results shown in the table for Build Out No Action and Proposed Action, there are acceptable AM/PM intersection levels of service. Refer to **Exhibits 5.12-6** and **5.12-7** for illustrations of the LOS for Build Out No Action and Proposed Action.

TABLE 5.12-6
ROADWAY INTERSECTIONS, BUILD OUT NO ACTION AND BUILD OUT PROPOSED ACTION

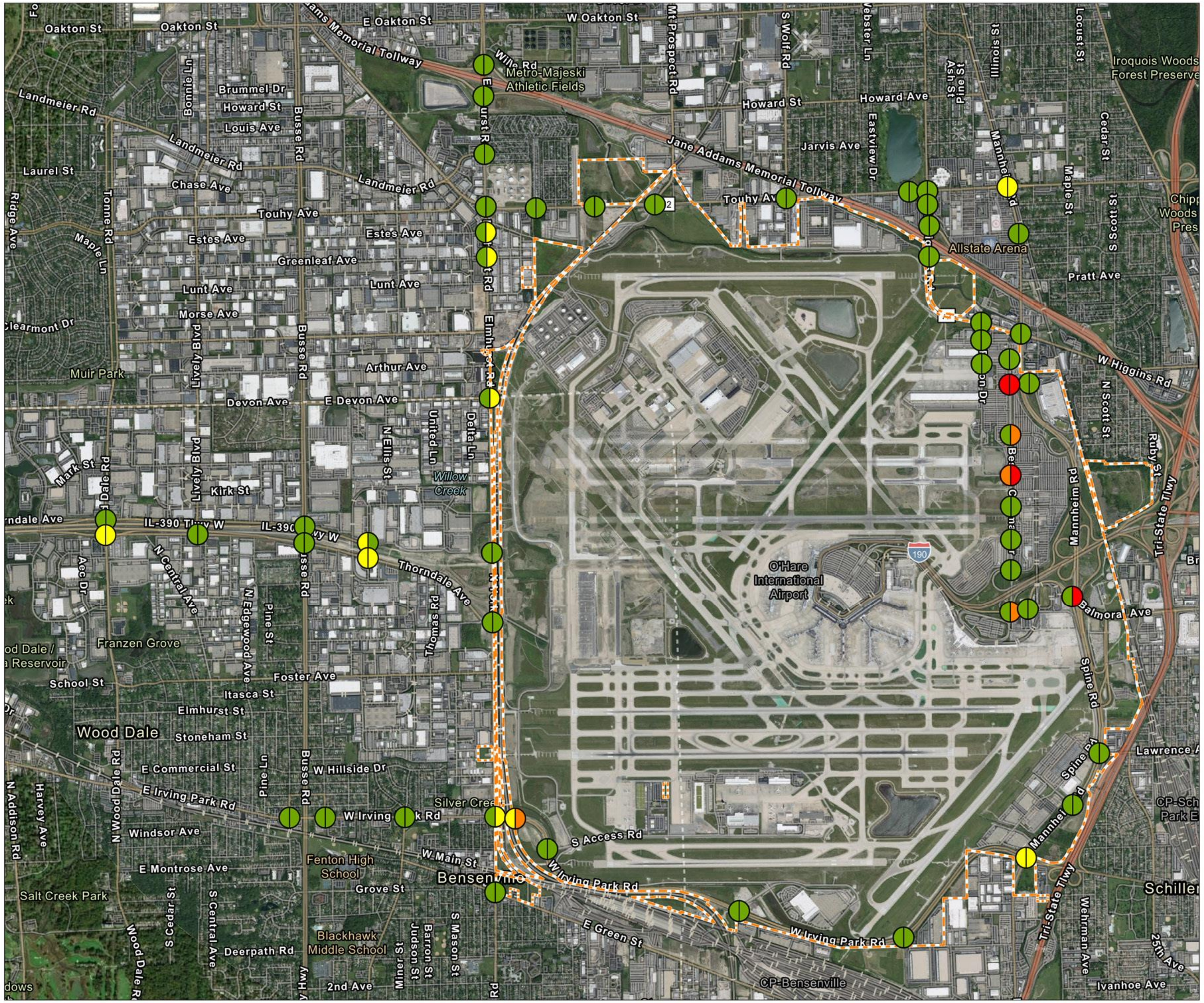
Node	Intersection	Build Out No Action			Build Out Proposed Action		
		AM (PM)			AM (PM)		
		Delay	LOS	V/C	Delay	LOS	V/C
80	Spruce Avenue & Irving Park Road	Signal			Signal		
		7.7 (4.1)	A (A)	0.48 (0.51)	7.9 (4.1)	A (A)	0.45 (0.51)
90	Marshall Road & Irving Park Road	Signal			Signal		
		11.4 (5.5)	B (A)	0.47 (0.54)	11.1 (5.5)	B (A)	0.44 (0.54)
100	North Church Road & Irving Park Road	Signal			Signal		
		10.7 (11.8)	B (B)	0.45 (0.53)	10.3 (11.8)	B (B)	0.41 (0.53)
110	York Road & Irving Park Road	Signal			Signal		
		30.0 (47.7)	C (D)	0.64 (0.94)	30.7 (56.1)	C (E)	0.76 (1.00)
115	I-490 Southbound On- & Off-Ramp & Irving Park Road	Signal			Signal		
		39.1 (65.6)	D (E)	0.70 (0.81)	62.5 (55.2)	E (E)	0.59 (0.95)
120	*Irving Park Road & South Access Road*	*Signal*			*Signal*		
		22.7 (18.6)	*C (B)*	*0.77 (0.61)*	*20.9 (18.3)*	*C (B)*	*0.62 (0.67)*
130	*Taft Avenue & Irving Park Road*	*Signal*			*Signal*		
		22.1 (32.2)	*C (C)*	*0.55 (0.74)*	*22.4 (33.6)*	*C (C)*	*0.73 (0.71)*
135	*Seymour Avenue & Irving Park Road*	*Signal*			*Signal*		
		12.3 (13.8)	*B (B)*	*0.41 (0.63)*	*17.1 (14.4)*	*B (B)*	*0.68 (0.63)*
140	*Mannheim Road & Irving Park Road*	*Signal*			*Signal*		
		35.5 (41.0)	*D (D)*	*0.67 (0.75)*	*43.1 (41.7)*	*D (D)*	*0.85 (0.78)*
200	York Road & Green Street	Signal			Signal		
		25.2 (25.5)	C (C)	0.72 (0.82)	23.9 (32.8)	C (C)	0.61 (0.95)
210	York Road & Ramp Q5	Signal			Signal		
		0.2 (0.2)	A (A)	0.39 (0.35)	0.3 (0.2)	A (A)	0.46 (0.37)
220	York Road/South Elmhurst Road & Devon Avenue	Signal			Signal		
		21.7 (36.3)	C (D)	0.55 (0.56)	21.7 (31.2)	C (C)	0.61 (0.55)
230	South Elmhurst Road & Greenleaf Avenue	Signal			Signal		
		34.1 (43.5)	C (D)	0.80 (0.84)	36.3 (39.3)	D (D)	0.87 (0.81)

Node	Intersection	Build Out No Action			Build Out Proposed Action		
		AM (PM)			AM (PM)		
		Delay	LOS	V/C	Delay	LOS	V/C
240	South Elmhurst Road & Old Higgins Road/Estes Avenue	Signal			Signal		
		24.6 (49.7)	C (D)	0.61 (0.63)	25.8 (43.9)	C (D)	0.68 (0.62)
300	South Elmhurst Road & Higgins Road/Touhy Avenue	Signal			Signal		
		28.0 (30.5)	C (C)	0.62 (0.48)	28.4 (32.0)	C (C)	0.62 (0.47)
310	South Elmhurst Road & Landmeier Road	Signal			Signal		
		13.5 (27.4)	B (C)	0.51 (0.67)	10.6 (36.0)	B (D)	0.48 (0.63)
320	South Elmhurst Road & I-90 EB Ramps	Signal			Signal		
		20.8 (26.1)	C (C)	0.59 (0.62)	18.3 (25.4)	B (C)	0.57 (0.62)
330	South Elmhurst Road & I-90 WB Ramps	Signal			Signal		
		26.1 (18.1)	C (B)	0.65 (0.56)	23.5 (18.9)	C (B)	0.61 (0.55)
340	Old Higgins Road & Touhy Avenue	Signal			Signal		
		12.7 (18.8)	B (B)	0.52 (0.58)	14.4 (13.7)	B (B)	0.60 (0.53)
350	I-490 Northbound Off-Ramp & Touhy Avenue	Signal			Signal		
		18.0 (14.6)	B (B)	0.62 (0.46)	22.9 (16.4)	C (B)	0.80 (0.49)
400	***Mount Prospect Road & Touhy Avenue***	***Signal***			***Signal***		
		16.7 (27.5)	***B (C)***	***0.76 (0.85)***	***24.4 (25.3)***	***C (C)***	***0.80 (0.73)***
410	Wolf Road & Touhy Avenue	Signal			Signal		
		19.3 (27.5)	B (C)	0.62 (0.63)	23.3 (30.0)	C (C)	0.79 (0.56)
430	Lee Street & Touhy Avenue	Signal			Signal		
		15.1 (18.0)	B (B)	0.65 (0.67)	10.8 (17.1)	B (B)	0.78 (0.66)
440	Lee Street & Touhy Avenue	Signal			Signal		
		17.2 (24.3)	B (C)	0.40 (0.51)	18.7 (26.7)	B (C)	0.33 (0.50)
500	Mannheim Road & Touhy Avenue	Signal			Signal		
		38.5 (46.6)	D (D)	0.70 (0.90)	37.6 (35.5)	D (D)	0.74 (0.91)
510	Mannheim Road & Lunt Avenue	Signal			Signal		
		7.8 (13.4)	A (B)	0.31 (0.47)	7.0 (11.7)	A (B)	0.36 (0.47)
520	Mannheim Road & Higgins Road	Signal			Signal		
		30.3 (34.3)	C (C)	0.49 (0.70)	32.4 (56.4)	C (E)	0.71 (1.07)
530	***Mannheim Road & Zemke Boulevard***	***Signal***			***Signal***		
		32.5 (28.4)	***C (C)***	***0.51 (0.83)***	***25.5 (36.3)***	***C (D)***	***0.43 (0.68)***

Node	Intersection	Build Out No Action			Build Out Proposed Action		
		AM (PM)			AM (PM)		
		Delay	LOS	V/C	Delay	LOS	V/C
588	*Mannheim Road & Lawrence Avenue*	*Signal*			*Signal*		
		14.0 (11.5)	*B (B)*	*0.60 (0.54)*	*12.4 (12.4)*	*B (B)*	*0.64 (0.58)*
589	*Mannheim Road & Montrose Avenue*	*Signal*			*Signal*		
		16.8 (28.8)	*B (C)*	*0.53 (0.73)*	*17.5 (27.8)*	*B (C)*	*0.59 (0.75)*
600	Lee Street & Mall Entrance	Signal			Signal		
		7.4 (11.9)	A (B)	0.53 (0.46)	12.6 (16.3)	B (B)	0.77 (0.44)
620	Lee Street & I-90 WB Ramps	Signal			Signal		
		16.1 (12.8)	B (B)	0.54 (0.39)	13.6 (14.7)	B (B)	0.70 (0.32)
630	Higgins Road/Lee Street & I-90 EB Ramps	Signal			Signal		
		25.6 (25.0)	C (C)	0.62 (0.52)	28.9 (34.0)	C (C)	0.74 (0.48)
640	Patton Drive & Higgins Road	Signal			Signal		
		6.1 (24.1)	A (C)	0.40 (0.53)	7.3 (35.5)	A (D)	0.60 (0.90)
652	*Schilling Road & Zemke Road*	*Stop (2-Way)*			*Stop (2-Way)*		
		11.0 (11.0)	*B (B)*	*0.05 (0.03)*	*10.8 (10.8)*	*B (B)*	*0.05 (0.03)*
660	*Patton Drive & Johnson Road*	*Stop (All-Way)*			*Stop (All-Way)*		
		8.8 (9.1)	*A (A)*	*0.38 (0.36)*	*8.2 (10.7)*	*A (B)*	*0.22 (0.47)*
662	*Patton Drive & Zemke Road*	*Stop (T Int)*			*Stop (T Int)*		
		10.0 (9.9)	*A (A)*	*0.09 (0.04)*	*9.9 (9.8)*	*A (A)*	*0.09 (0.04)*
665	*Bessie Coleman Drive/Schilling Road & Zemke Boulevard*	*Stop (2-Way)*			*Stop (2-Way)*		
		218.5 (149.1)	*F (F)*	*1.23 (1.00)*	*23.5 (83.2)*	*C (F)*	*0.25 (0.73)*
670	*Bessie Coleman Drive & Lot G Access/Lot H Access*	*Stop (2-Way)*			*Stop (2-Way)*		
		21.6 (38.2)	*C (E)*	*0.14 (0.04)*	*22.3 (34.4)*	*C (D)*	*0.14 (0.08)*
675	*Bessie Coleman Drive & Schlitz Road/Lot E Access*	*Stop (2-Way)*			*Stop (2-Way)*		
		41.0 (173.2)	*E (F)*	*0.35 (0.98)*	*23.9 (69.3)*	*C (F)*	*0.22 (0.58)*
680	*Bessie Coleman Drive & Rental Car Return*	*Signal*			*Signal*		
		8.1 (6.3)	*A (A)*	*0.22 (0.24)*	*12.0 (7.2)*	*B (A)*	*0.21 (0.14)*
685	*Bessie Coleman Drive & Taxi Lot Access*	*Signal*			*Signal*		
		13.8 (10.0)	*B (A)*	*0.54 (0.43)*	*18.8 (12.3)*	*B (B)*	*0.48 (0.36)*
686	*Bessie Coleman Drive & I-190 WB Ramps/Rental Car Return*	*Signal*			*Signal*		
		23.6 (26.9)	*C (C)*	*0.49 (0.58)*	*20.0 (34.4)*	*C (C)*	*0.48 (0.91)*

Node	Intersection	Build Out No Action			Build Out Proposed Action		
		AM (PM)			AM (PM)		
		Delay	LOS	V/C	Delay	LOS	V/C
688	*Bessie Coleman Drive & I-190 EB Ramps/Balmoral Avenue*	*Signal*			*Signal*		
		29.4 (57.9)	*C (E)*	*0.38 (1.04)*	*28.4 (50.1)*	*C (D)*	*0.35 (0.67)*
692	*Balmoral Avenue & Service Road*	*Stop (T Int)*			*Stop (T Int)*		
		9.6 (19.1)	*A (C)*	*0.06 (0.14)*	*9.4 (13.6)*	*A (B)*	*0.06 (0.09)*
693	*West O'Hare Avenue & Airport Exit Roadway*	*Stop (T Int)*			*Stop (T Int)*		
					10.6 (10.6)	*B (B)*	*0.12 (0.17)*
694	*West O'Hare Avenue & Manheim Road SB Entrance*	*Stop (2-Way)*			*Stop (2-Way)*		
		10.4 (284.5)	*B (F)*	*0.06 (1.11)*	*10.9 (>300)*	*B (F)*	*0.07 (2.78)*
1000	York Road & Thorndale Avenue	Signal			Signal		
		4.0 (9.2)	A (A)	0.47 (0.55)	4.2 (8.4)	A (A)	0.54 (0.57)
1100	Supreme Drive & South Thorndale Avenue/Thorndale Avenue	Signal			Signal		
		38.9 (32.4)	D (C)	0.12 (0.21)	38.5 (28.2)	D (C)	0.11 (0.25)
1200	Supreme Drive & North Thorndale Avenue	Signal			Signal		
		43.9 (44.9)	D (D)	0.45 (0.22)	44.0 (49.4)	D (D)	0.40 (0.21)
1300	Busse Road & North Thorndale Avenue	Signal			Signal		
		34.8 (34.8)	C (C)	0.75 (0.75)	20.8 (25.8)	C (C)	0.58 (0.80)
1400	Busse Road & South Thorndale Avenue	Signal			Signal		
		20.5 (20.5)	C (C)	0.60 (0.60)	22.3 (15.1)	C (B)	0.60 (0.68)
1530	South Thorndale Avenue & Lively Boulevard	Stop (All-Way)			Stop (All-Way)		
		7.9 (7.9)	A (A)	0.26 (0.26)	7.9 (7.4)	A (A)	0.26 (0.14)
1700	North Wood Dale Road & North Thorndale Avenue	Signal			Signal		
		22.8 (22.8)	C (C)	0.48 (0.48)	22.0 (38.1)	C (D)	0.47 (0.75)
1800	South Thorndale Avenue & North Wood Dale Road	Signal			Signal		
		41.0 (41.0)	D (D)	0.55 (0.55)	40.8 (27.4)	D (C)	0.55 (0.52)

Source: Mead & Hunt, Inc. calculations



ESRI base mapping ArcPro Version 2.8

Chicago O'Hare International Airport

Terminal Area Plan and Air Traffic Procedures Environmental Assessment

Existing Airport Property

Level of Service:

AM PM

A, B, C

D

E

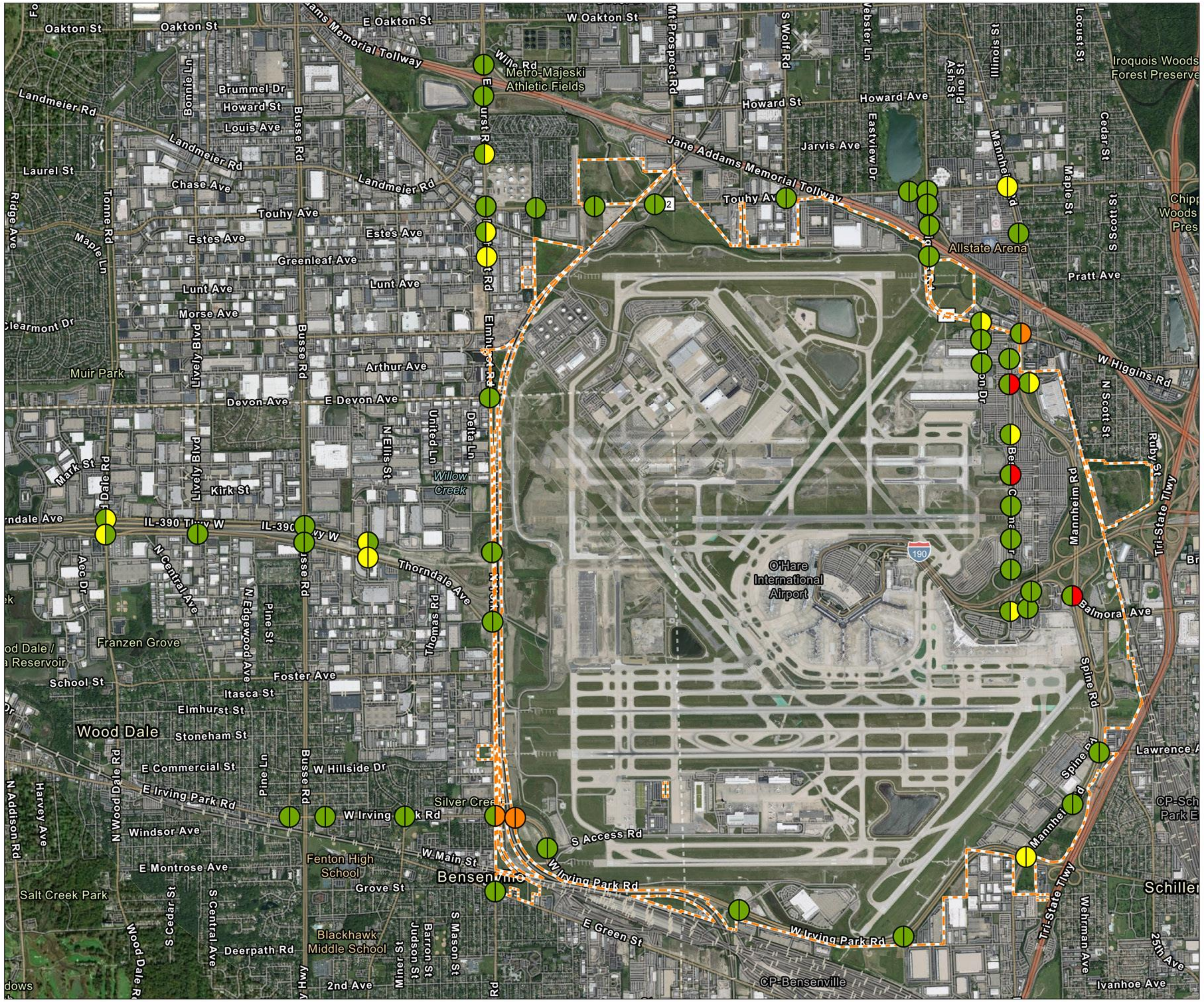
F

0 2,000 4,000

Feet

LOS Build Out No Action

Exhibit 5.12-6



Chicago O'Hare International Airport

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AM PM

A, B, C

D

E

F

0 2,000 4,000 Feet

LOS Build Out Proposed Action

Exhibit 5.12-7

Table 5.12-6 illustrates the AM/PM LOS and V/C ratios for the Build Out No Action and Build Out Proposed Action off-airport roadways. The following locations have been identified as having a LOS less than "D" and or a V/C ratio greater than 1.0:

- Location 110 – York Road and Irving Park Road (PM) for Build Out Proposed Action; degradation PM D to PM E from V/C ratio 0.94 to 1.00,
- Location 115 (Owned and Operated by the CDA) – I-490 Southbound On- and Off-Ramp & Irving Park Road (PM) for Build Out No Action; degradation AM D to AM E from V/C ratio 0.70 to 0.59,
- Location 520 – Mannheim Road and Higgins Road (PM) for Build Out Proposed Action; degradation PM C to PM E from V/C ratio 0.70 to 1.07,
- Location 665 (Owned and Operated by the CDA) – Bessie Coleman Drive/Schilling Road & Zemke Boulevard (AM and PM) for Build Out No Action; improvement AM F to AM C,
- Location 670 (Owned and Operated by the CDA) – Bessie Coleman Drive & Lot G Access/Lot H Access (PM) for Build Out No Action; improvement PM E to PM D,
- Location 688 (Owned and Operated by the CDA) – Bessie Coleman Drive & I-190 EB Ramps/Balmoral Avenue (PM) for Build Out Proposed Action; improvement PM E to PM D, and
- Location 694 (Owned and Operated by the CDA) – West O'Hare Avenue & Manheim Road SB Entrance (PM) for Build Out Proposed Action; remains as a PM F with a V/C ratio increase from 1.11 to 2.78 (2-way stop intersection and V/C ratios increase with increase in volume on the minor roadway).

Of these intersections, the following have a LOS reduction:

- Location 110 – York Road and Irving Park Road (PM) for Build Out Proposed Action; degradation PM D to PM E from V/C ratio 0.94 to 1.00,
- Location 115 (Owned and Operated by the CDA) – I-490 Southbound On- and Off-Ramp & Irving Park Road (PM) for Build Out No Action; degradation AM D to AM E from V/C ratio 0.70 to 0.59, and
- Location 520 – Mannheim Road and Higgins Road (PM) for Build Out Proposed Action; degradation PM C to PM E from V/C ratio 0.70 to 1.07.

FAA Order 1050.1F identifies the factors to consider as whether the Proposed Action would have the potential to include a disruption in local traffic patterns that substantially reduce levels of service of the roads serving the airport (see **Section 5.12.4**). For intersections evaluated in this EA, the City defines the thresholds as no degradation in intersection operation that creates unacceptable queue lengths and V/C ratios. Only three study intersections would degrade to a LOS E or F from a LOS D or better. Only one had a V/C ratio over 1.0 (over capacity) but is still below 1.3 (super saturated flow as described in **Section 5.12.4)**. Although the results of the macroscopic analysis (HCM LOS and V/C ratio) indicate degradation in intersection operations below a desired threshold, the microsimulation analysis indicates that traffic can be processed through each of these intersections without residual impacts to any adjacent intersections. Therefore, the Build Out Proposed Action would not result in significant impacts to the transportation network.