5.14 ENVIRONMENTAL JUSTICE

This section summarizes the Environmental Justice (EJ) analysis undertaken to determine whether the Proposed Action would have the potential to lead to a disproportionately high and adverse impact to an environmental justice population.

5.14.1 Definition of Resource

As defined in FAA guidance, EJ is the "fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies."

For the purposes of classifying federal data on race and ethnicity, Office of Management and Budget (OMB) recognizes one classification for an ethnic minority, either "Hispanic" or "Latino," and five on race: American Indian or Alaska Native, Asian, Black or African American, Native Hawaiian or Other Pacific Islander, and White.[1]

A racial or ethnic minority is defined as a person who is:

1. Black: a person having origins in any of the black racial groups of Africa,
2. Hispanic or Latino: a person of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin, regardless of race,
3. Asian American: a person having origins in any of the original peoples of the Far East, Southeast Asia, or the Indian subcontinent,
4. American Indian and Alaskan Native: a person having origins in any of the original people of North America or South America (including Central America) and who maintains cultural identification through tribal affiliation or community recognition, or
5. Native Hawaiian and Other Pacific Islander: people having origins in any of the original peoples of Hawaii, Guam, Samoa, or other Pacific Islands.

A low-income person is defined[2] as "a person whose median household income is at or below the Department of Health and Human Services poverty guidelines."

The U.S. Department of Health and Human Services (HHS) 2020 Poverty Guidelines for the 48 Contiguous States and the District of Columbia are reproduced in Table 2 of **Appendix M**.

5.14.2 Regulatory Context

In 1994, President Clinton issued EO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations.[3] EO 12898 implements provisions of Title VI of the Civil Rights Act of 1964, which requires that federal agencies ensure that no person, on account of his or her race, color, or national origin, is excluded from participation in, denied the benefits of, or subjected to discrimination

[1] Office of Management and Budget Revisions to the Standards for the Classification of Federal Data on Race and Ethnicity issued October 30, 1997 (62 FR 210).
[2] DOT Order 5610.2(c) Department of Transportation Actions to Address Environmental Justice in Minority Populations and Low-Income Populations issued May 14, 2021.
[3] Executive Order 12898 Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations issued February 16, 1994 (59 Federal Register 32).

under any program or activity receiving federal financial assistance. The EO also ensures federal agencies identify and address disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations. DOT Order 5610.2(a) directs DOT agencies to implement EJ as part of analyses under NEPA. Relevant regulations and guidance documents include:

- CEQ Environmental Justice: Guidance under NEPA[4]
- Federal Interagency Working Group, Promising Practices for EJ Methodologies in NEPA Reviews Report of the Federal Interagency Working Group on Environmental Justice & NEPA Committee[5]
- Department of Transportation Actions to Address Environmental Justice in Minority Populations and Low-Income Populations[6]
- FAA Policies and Procedures[7] regarding NEPA
- FAA Desk Reference[8]

The FAA has not established a significance threshold for EJ. It has, however, identified a factor to consider, which is if the action would have the potential to lead to a disproportionately high and adverse impact to an EJ population, i.e., a low-income or minority population, due to:

- Significant impacts in other environmental impact categories or
- Impacts on the physical or natural environment that affect an EJ population in a way that the FAA determines are unique to the EJ population and significant to that population. An example of such impacts unique and significant to an EJ population would be those with different patterns of subsistence consumption of fish and wildlife (e.g., indigenous populations).

This EJ analysis was prepared in accordance with the foregoing references and requirements.

5.14.3 Affected Environment

The affected environment is the area where impacts from any of the environmental categories may rise to a level of significance or where the impacts to an EJ population may be disproportionately high and adverse. The noise study area is the largest of the environmental impacts categories and contains all other study areas within it; therefore, it was used to define the affected environment for the EJ analysis.

5.14.3.1 Methodology

Implementation of the Proposed Action would alter aircraft noise exposure around O'Hare in a manner that may be deemed significant. Conversely, analysis with respect to environmental impact categories other than noise, analysis indicates that implementation of the Proposed Action would not be significant. Therefore, this EJ analysis addresses the approach to evaluating EJ effects as it relates to the "Noise and Noise-Compatible Land Use" environmental impact category only. With respect to noise, no analysis of on-airport compatibility was performed as there are no residential uses or populations within the airport boundary. Consequently, the EJ analysis was confined to off-airport areas.

[4] CEQ Environmental Justice: Guidance under the National Environmental Policy Act issued December 10, 1997.
[5] Federal Interagency Working Group on Environmental Justice & NEPA Committee "Promising Practices for EJ Methodologies in NEPA Reviews", March 2016.
[6] DOT Order 5610.2(c) Department of Transportation Actions to Address Environmental Justice in Minority Populations and Low-Income Populations issued May 14, 2021.
[7] FAA Order 1050.1F Environmental Impacts: Policies and Procedures issued July 15, 2015.
[8] FAA Order 1050.1F Environmental Impacts: Policies and Procedures Desk Reference, February 2020.

FAA's analysis did not identify any EJ populations that would uniquely or significantly use natural or man-made resources for this EA. Further, the Proposed Action would not impact the natural and man-made environment in a manner that the FAA determines is unique to the EJ populations and significant to those populations.

The EJ analysis involves a distributional examination of impacts experienced by EJ populations and implementing regulations mentioned previously. EJ analysis of impacts to other environmental resources (e.g., noise) addresses two basic questions:

- Predominantly Borne Test:[9] Would implementation of the Proposed Action have adverse effects that are predominantly borne by an EJ population?
- Meaningfully Greater Test: Would implementation of the Proposed Action have adverse effects on an EJ population that are appreciably more severe or greater in magnitude than the adverse effects that would be experienced by non-EJ populations?

The FAA's noise modeling software, the AEDT, can perform limited analyses of noise effects on EJ populations. To do so, it uses the American Community Survey (ACS) for its screening analyses of race and ethnicity, as well as income and poverty status. The AEDT EJ screening tool identifies areas of potential concern, primarily for outreach purposes. For a detailed analysis to ascertain whether an action would have a disparate impact or disproportionately affect EJ populations, use of additional data sets and geospatial analytical tools outside of the AEDT are warranted.

A specific approach was developed for the Proposed Action that analyzes demographic data for the areas potentially affected to determine reference populations. This approach, described in the following steps a) through e), includes several sub-steps.

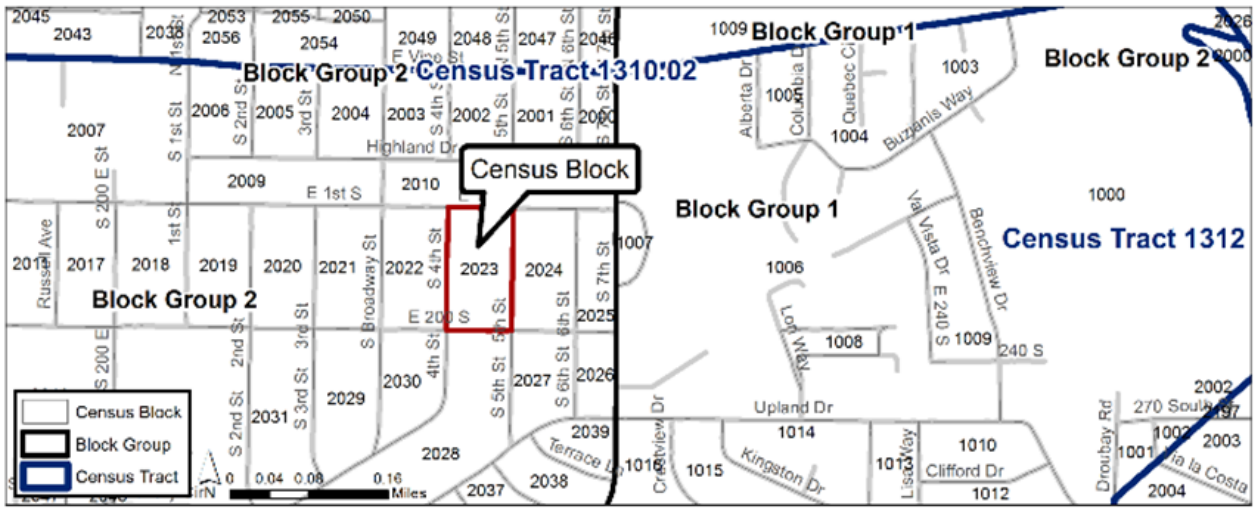
a) **Data Source**. Demographic data is normally used for these analyses, which is readily available from the U.S. Census Bureau (USCB), either from the most recent decennial Census—the most recent being the "2020 Census"—or from the most recent rolling five-year American Community Survey, 2015-2019 (2019 ACS).

   The 2020 Census data has a finer degree of granularity (down to the Census Block) but does not include income/poverty characteristics; decennial census data employ the smallest unit of measure—the Census Block. In contrast, the ACS samples at the next higher level in the Census geographical hierarchy—the Census Block Group.

   Figure 5.14-1 illustrates how the Census Tracts, Census Block Groups, and Census Blocks relate. The smallest unit of measure is the Census Block. Multiple Census Blocks are aggregated into Census Block Groups, and ultimately Census Blocks are aggregated to form Census Tracts.

[9] The Predominantly Borne Test is also known as the Fifty Percent Test referenced in the Federal Interagency Working Group, Promising Practices for EJ Methodologies in NEPA Reviews Report of the Federal Interagency Working Group on Environmental Justice & NEPA Committee (see footnote 6)

FIGURE 5.14-1
EXAMPLES OF CENSUS GEOGRAPHICAL UNITS



Source: U.S. Census Bureau, Geography Reference, downloaded 9/7/2018

For the part of the EJ analysis addressing effects of the Proposed Action on race or ethnicity, the FAA used the 2020 Decennial Census dataset because 1) it offers a greater degree of granularity and 2) at the time of this writing, it is the most recent dataset available for these characteristics.

With respect to income and poverty status, the FAA used the 2019 ACS dataset, available at the Block Group level, because the 2020 Census does not include income/poverty information.

Additionally, DOT Order 5610.2(c) requires the use of HHS "poverty guidelines"[10] as opposed to USCB "poverty thresholds." (Both vary with family size, increasing linearly.) There are minor differences in the income levels that HHS and the USCB use as poverty guidelines for the same size household. Since the AEDT directly relies on Census data without attempting to reconcile it to HHS poverty guidelines, additional geospatial analysis was necessary.

The poverty guidelines are taken from the HHS 2020 Poverty Guidelines for the 48 Contiguous States and the District of Columbia, which are reproduced in Table 2 of **Appendix M**. The HHS guidelines are based on price changes through the previous year; therefore, the 2020 poverty guidelines were chosen because they most closely align with the timeframe of the most recently available 2019 ACS data set.[11] Since the HHS guidelines vary with household size and are reported in whole person intervals, whereas the average household size reported in a particular Census Block or Block Group is not, an interpolation of income values between two intervals was required for subsequent calculations. Additionally, as described further below in step (e), the values were adjusted upward by 150 percent[12] to reflect a higher cost of living in the Chicago region. This factor is also applied for this analysis to remain consistent with the prior approaches done in the 2005 EIS and the 2017 Interim Fly Quiet (IFQ) Re-Evaluation.

b) **Geographical Extent of Population Analysis**. Consistent with the methodology outlined in Promising Practices for EJ Methodologies in NEPA Reviews, EJ analysis involves identifying two

[10] The HHS issued Poverty Guidelines are established annually each January and published in the Federal Register (FR). For 2020, they were published on January 17, 2020 (85 FR 3060). For 2021, they were published on February 1, 2021 (86 FR 7732).
[11] Poverty Guidelines aspe.hhs.gov, October 12, 2021.
[12] Federal Aviation Administration, O'Hare Modernization Final Environmental Impact Statement, July 2005; s. See Section § 5.21.1.3, Definitions.

distinct population sets, each for different purposes: a Reference Community and a Community of Comparison.

i. A "Reference Community" serves as an aid for determining whether "Areas of EJ Concern" are present and where they are situated. The Reference Community serves as an initial benchmark for identifying Areas of EJ Concern within a project or study area. An Area of EJ Concern is one where the racial/ethnic demographics or poverty status of the population equal or exceed that of the Reference Community. The basic question is whether the EJ population potentially affected by a project would be equal to or greater than that of a suitable Reference Community or whether the affected population would exceed 50 percent.[13]

   Identifying an appropriate Reference Community to use as a benchmark enables identification of particular EJ Communities (areas of EJ concern), which may warrant additional analysis and outreach within a project area or study area. For this analysis, the combined Cook County/DuPage County population serves as the Reference Community for identifying EJ Populations. Within the Primary Study Area for noise, if a Census Block or Block Group has a higher percentage of EJ Population than the Reference Community (combined Cook/DuPage Counties), then the Census Block or Block Group is an Area of EJ Concern, warranting more detailed analysis of the geographic distribution of environmental impacts with respect to those populations.

   Identification and detailed analysis of the Reference Community for are found in **Section 5.14.3.2.**

ii. A "Community of Comparison" is then identified to conduct the disproportionate impact analysis (the two-pronged Predominantly Borne and/or Meaningfully Greater Tests previously described). For this analysis, the Community of Comparison includes all Census Blocks experiencing an environmental impact rising to the level of significance. The FAA compared the noise exposure that would occur in the Build Out Proposed Action to that which would occur under the Build Out No Action to see if any areas would be within the DNL 65+ dBA contour and would experience a change of exposure of 1.5 dBA.

iii. Results from the noise analyses indicated that further, detailed demographic analysis was warranted in the southwest quadrant of the airport. The Community of Comparison was further refined to just the households which would experience significant impacts. Comparing the racial/ethnicity composition of specific Census Blocks and the percent of households below the HHS poverty guidelines in a Census Block Group to the Community of Comparison was done, as described in **Section 5.14.4.4**, to assess disproportionate impacts. Census Blocks and Block Groups whose EJ characteristics exceed that of the Community of Comparison by more than 10 percent[14] are deemed to bear a meaningfully greater share of the impacts. This is a generally accepted practice in NEPA analyses.[15]

[13] In instances when the percent of the population that is either "All Other Races" or "Hispanic"/"Latino" or "Below the Poverty Level" would be greater than or equal to 50 percent of a Reference Community—thus exceeding the "predominantly borne" test—the benchmark for identifying those Blocks or Block Groups as Areas of EJ Concern becomes 50 percent.

[14] The phrase "meaningfully greater" to assess disproportionality on or burdens borne by an EJ population is a project- and fact-specific term of art that addresses disparate impacts. The FAA has no agency-specific guidance on quantifying the extent an affected population includes minority or low-income populations compared to a reference community or community of comparison would be substantial or significant. For this EA, FAA chose a 10 percent exceedance value.

[15] See Community Guide to Environmental Justice and NEPA Methods (March 2019) published by the Federal Interagency Working Group on Environmental Justice & NEPA Committee, page 31 where a 10-20 percent value is recommended.

To get a precise estimate of the size of potential EJ populations, average household sizes from the Census Block or Block Group within which the change of exposure grid points are used to estimate the populations affected. The assumption is that the demographic characteristics at the Census Block or Block Group level are sufficiently uniform across either Census geographical unit to apply to the individual parcels.

The demographic characteristics associated with persons experiencing a significant impact are then compared to the demographic characteristics of all persons experiencing an impact from the Proposed Action.

5.14.3.2 Existing Conditions

To assist the FAA in determining impact significance (i.e., context and intensity) with respect to the EJ analysis, tabular data allowing for ready examination of Reference Community and Community of Comparison populations was prepared. Data is presented in a descending hierarchy of geographical units allowing for the assessment in various contexts, including:

- U.S. – provided for context,
- Illinois – provided for context,
- Cook County – provided for context,
- DuPage County – provided for context,
- Combined Cook County/DuPage County –reflects the geographical extent of the Reference Community, and
- Census Blocks and Block Groups intersecting with the Primary Study Area – populations within these geographic units are compared to populations in the Reference Community to identify Areas of EJ Concern. These areas warrant a more detailed EJ analysis of the geographic distribution of environmental effects from the Build Out Proposed Action.

The Reference Community consists of the aggregated population of those Census Blocks and Block Groups that lie within Cook and DuPage Counties in northeast Illinois. Demographic information for the U.S. and State of Illinois are also presented for context. The Primary Study Area for noise lies partially within Cook and DuPage Counties and is shown in **Exhibits 5.14-1** and **5.14-2**.

Table 5.14-1 presents the demographic data of the population residing within the Reference Community with respect to race and ethnicity. **Table 5.14-2** presents demographic data of the same population with respect to income and poverty. As noted previously, data in **Table 5.14-1** is from the 2020 Census, for which the smallest geographical unit of measure is the Census Block. Data in **Table 5.14-2** is from the 2019 ACS, for which the smallest unit of measure is the Census Block Group, which is larger than the Census Block. Since these datasets are from different time periods and use differing geographical units of measure, the population counts in **Tables 5.14-1** and **5.14-2** are not expected to match and, in fact, do not. **Exhibits 5.14-1, 5.14-2,** and **5.14-3**, indicate whether a Census Block or Block Group lying within the Primary Study Area is an Area of EJ Concern with respect to race/ethnicity (**Exhibit 5.14-1**), income/poverty level (**Exhibit 5.14-2**), or both (**Exhibit 5.14-3**).

As shown in **Table 5.14-1**, Census data indicates that the relevant thresholds for race and ethnicity would be Census Blocks where "All Other Races" equaled or exceeded 52.3 percent or where Hispanic/Latino ethnicity exceeded 24.6 percent (**Table 5.14.1**). Since the "All Other Races" threshold of 52.3 percent exceeds

the 50 percent threshold in the Predominantly Borne Test, any Census Block where "All Other Races" exceeds 50 percent are identified in **Exhibit 5.14-1**.

For income and poverty status, Census data indicates that the relevant threshold would be 23.2 percent of households below the poverty level (**Table 5.14-2**). Block Groups that equal or exceed the threshold are identified in **Exhibit 5.14-2**.

TABLE 5.14-1
SELECTED DEMOGRAPHIC CHARACTERISTICS (RACE/ETHNICITY) FOR THE REFERENCE COMMUNITY (COOK & DUPAGE COUNTIES, IL) AND THE PRIMARY STUDY AREA

Census Geography	Total Population	White	% White	All Other Races	% All Other Races	Hispanic/Latino	% Hispanic/Latino	Non-Hispanic/Latino	% Non-Hispanic/Latino
United States	331,449,281	191,697,647	57.8%	139,751,634	42.2%	62,080,044	18.7%	269,369,237	81.3%
Illinois	12,812,508	7,472,751	58.3%	5,339,757	41.7%	2,337,410	18.2%	10,475,098	81.8%
Combined Cook/DuPage County (see note 1)	6,208,418	2,962,813	47.7%	3,245,605	52.3%	1,527,069	24.6%	4,681,349	75.4%
Cook County	5,275,541	2,345,983	44.5%	2,929,558	55.5%	1,382,778	26.2%	3,892,763	73.8%
DuPage County	932,877	616,830	66.1%	316,047	33.9%	144,291	15.5%	788,586	84.5%
Primary Study Area	294,333	195,987	66.6%	98,346	33.4%	77,082	26.2%	217,251	73.8%

Source: USCB, 2020 Decennial Census

Notes:

1) Combined Cook County/DuPage County is used as the Reference Community for this analysis.
2) A bold black border around a cell indicates the threshold percentage of the reference community for All Other Races and Hispanic/Latino populations.
3) Since the All Other Races population of the Reference Community (Combined Cook/DuPage County) is 52.3 percent, thus exceeding the Fifty Percent Predominantly Borne Test, identifying all Census Blocks whose populations are greater than 52.3 percent All Other Races would also necessarily identify any Census Blocks whose populations are greater than the 50 percent threshold of the Reference Community. Any Census Block with a Hispanic/Latino population exceeding that of the Reference Community (24.6 percent) was also identified.
4) Within the Primary Study Area are 4,178 Census Blocks, of which 667 have a population of greater than 50 percent minority, 1,222 have a Hispanic/Latino population exceeding the threshold of 24.6 percent and overall, 1,291 Census Blocks have a population of greater than 50 percent minority, and 24.6 percent are Hispanic/Latino or some combination of the two.

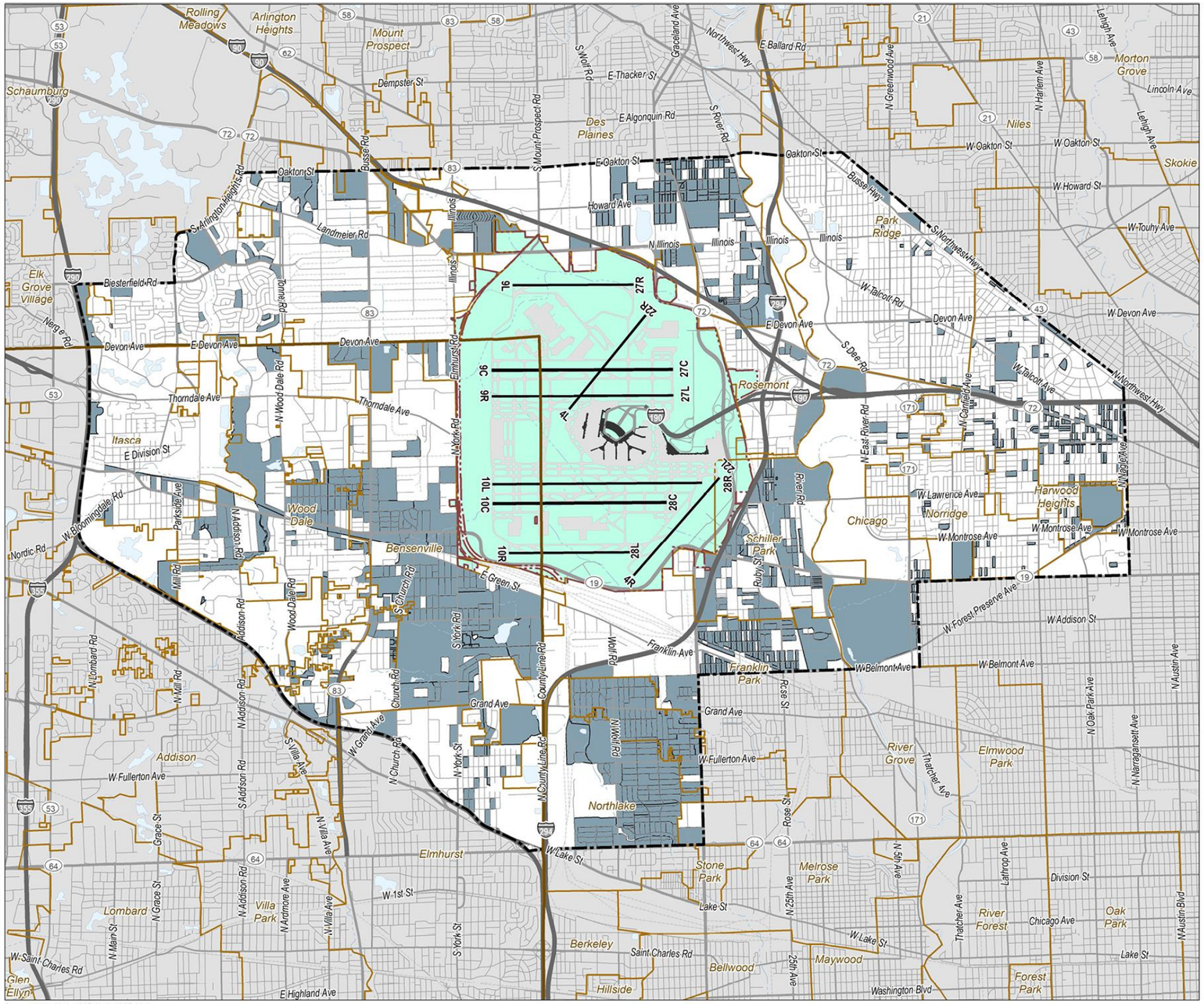
TABLE 5.14-2
SELECTED DEMOGRAPHIC CHARACTERISTICS (INCOME/POVERTY) FOR THE REFERENCE COMMUNITY (COOK & DUPAGE COUNTIES, IL) AND THE PRIMARY STUDY AREA

Census Geography	Total Population	Total Pop in Occupied Units	# of Households	Average House-hold Size	Median Households Income	2020 HHS Poverty Guideline	Proposed EA Poverty Guideline (150%)	# Households Below Poverty	% Households Below Poverty
United States	324,697,795	316,606,796	120,756,048	2.6	$62,843	$19,928	$29,892	28,424,373	23.5%
Illinois	12,770,631	12,473,394	4,846,134	2.6	$65,886	$19,928	$29,892	1,100,389	22.7%
Combined Cook/DuPage County (see note 1)	6,127,335	6,022,467	2,314,899	2.7	$68,828	$20,376	$30,564	538,114	23.2%
Cook County	5,198,275	5,106,417	1,972,108	2.6	$64,660	$19,928	$29,892	480,130	24.3%
DuPage County	929,060	916,050	342,791	2.7	$92,809	$20,376	$30,564	57,984	16.9%
Primary Study Area (Noise)	240,726	238,506	90,719	2.6	$78,992	$19,928	$29,892	16,589	18.3%

Sources: HMMH, 2021; HHS, 2020; USCB, 2019 ACS

Notes:

1) Combined Cook County/DuPage County is used as the Reference Community for this analysis.
2) Within the Study Area are 207 Census Block Groups, of which 56 have a low-income population that exceeds the threshold of the Reference Community (23.2 percent).
3) For "# Below Poverty" and "percent Below Poverty" columns, values for the United States and Illinois rows are taken directly from the Census data. For the remaining rows, poverty guidelines for a Census Block Group are adjusted from the HHS Guidelines by multiplying them by 1.5, consistent with the 2005 EIS and the 2017 IFQ Re-Evaluation, to reflect the cost of living in Chicago.
4) Poverty guidelines are rounded up to the nearest interval (income band) in the Census data (e.g., $29,999 or $34,999) at which household income is reported to estimate number of households below the poverty level.



Chicago O'Hare International Airport

Terminal Area Plan and Air Traffic Procedures Environmental Assessment

Census Blocks with > 50% All Other Races or > 24.6% Hispanic Population

Primary Study Area

Airport Boundary

Existing Runways

County Boundary

Community Boundary

Highway

Primary Roads

Secondary Roads

Local Roads

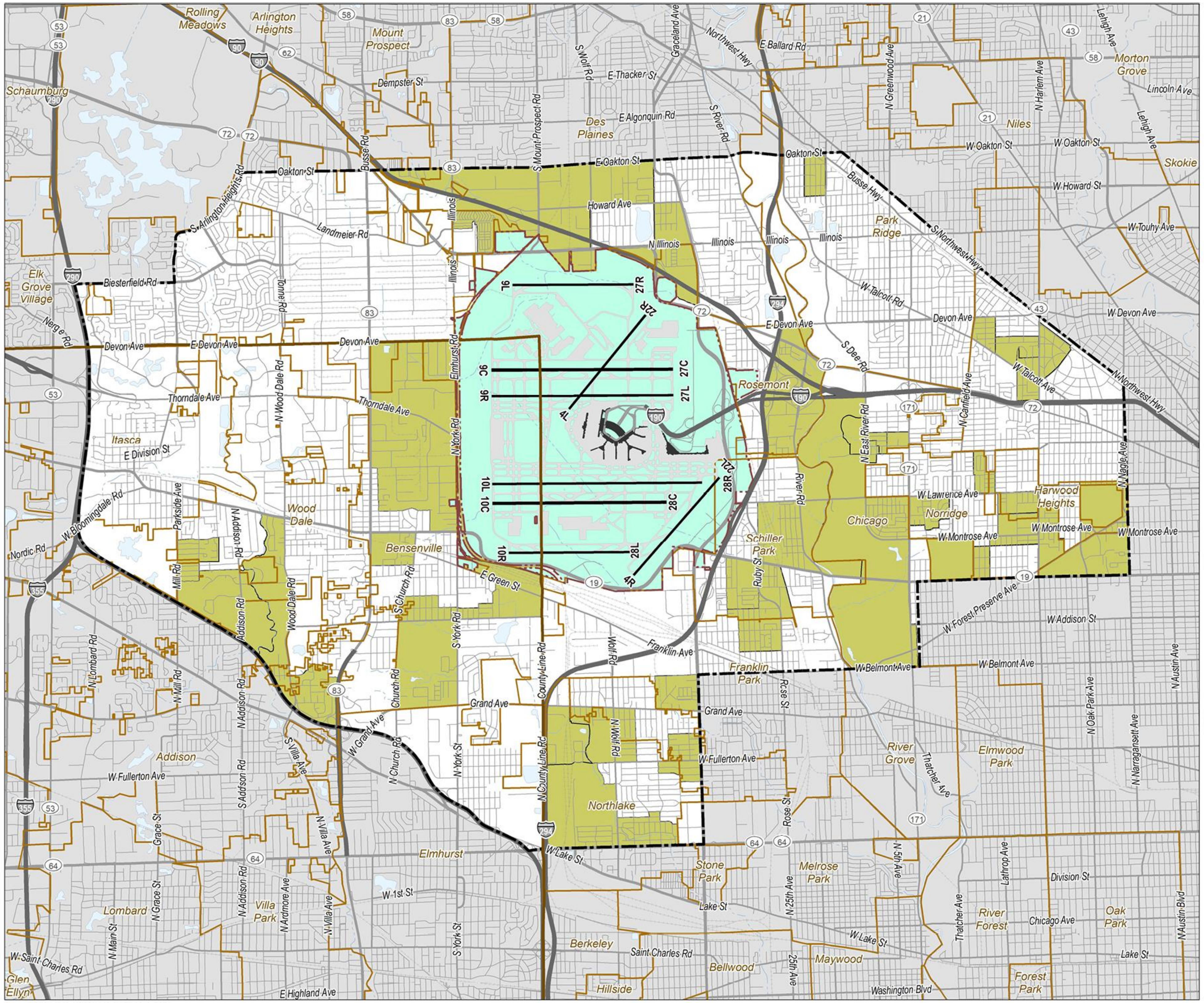
Railroad Lines

0 1 2

Miles

Areas of Environmental Justice Concern with Respect to Race and Ethnicity within the Project Area

Exhibit 5.14-1



Chicago O'Hare International Airport

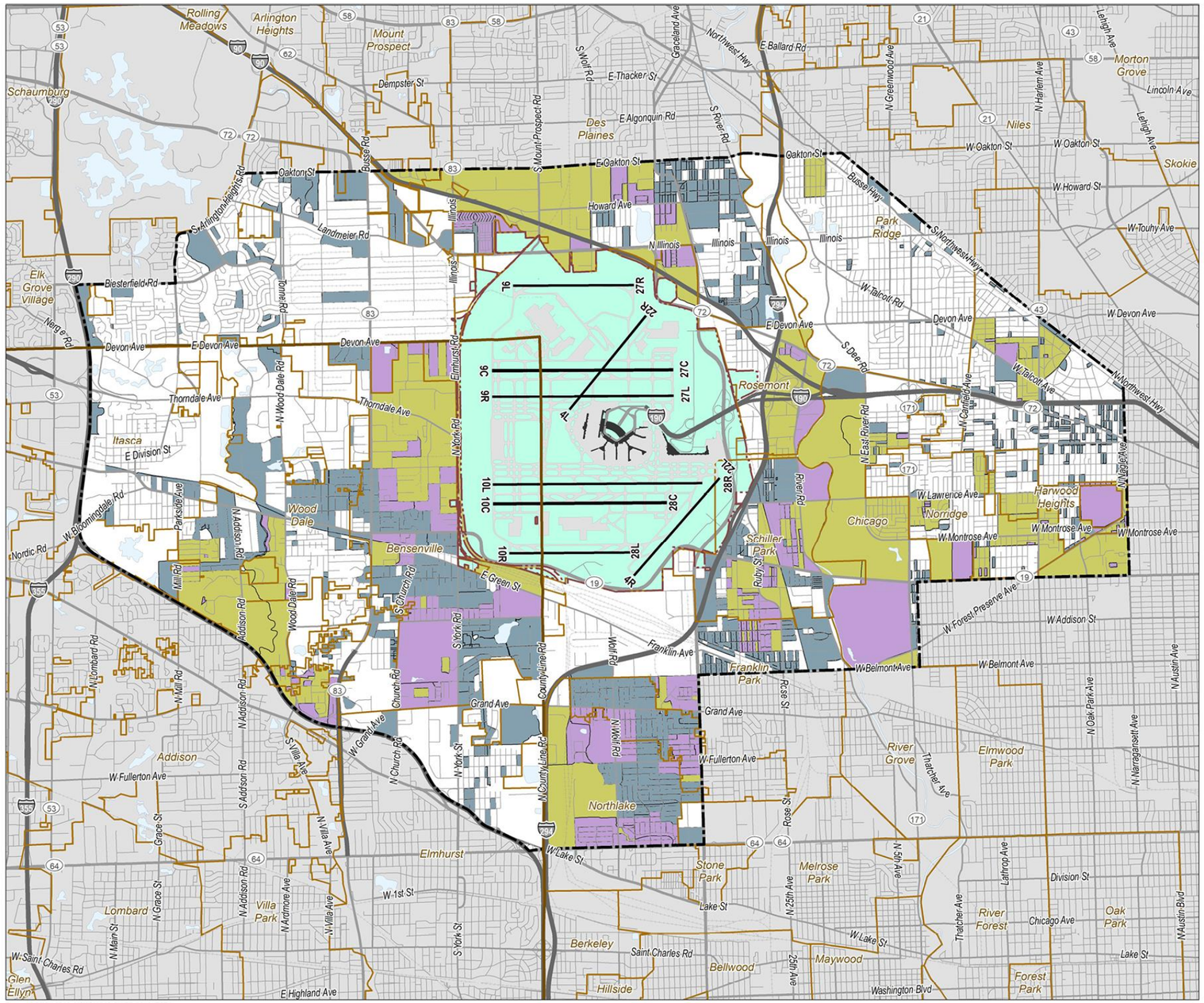
Terminal Area Plan and Air Traffic Procedures Environmental Assessment

- Census Blocks Groups of Low Income/Poverty Status
- Primary Study Area
- Airport Boundary
- Existing Runways
- County Boundary
- Community Boundary
- Highway
- Primary Roads
- Secondary Roads
- Local Roads
- Railroad Lines

0 1 2 Miles

Areas of Environmental Justice Concern with Respect to Income/ Poverty Status within the Project Area

Exhibit 5.14-2



Source:HMMH,2021;,ESRI,2021,;HHS,2020;,USCB,2020;,USCB,2019

Chicago O'Hare International Airport

Terminal Area Plan and Air Traffic Procedures Environmental Assessment

- Census Blocks with > 50% All Other Races or > 24.6% Hispanic Population
- Census Blocks Groups of Low Income/Poverty Status
- Census Blocks with > 50% All Other Races or > 24.6% Hispanic Population within Census Block Groups of Low income/Poverty Status
- Primary Study Area
- Airport Boundary
- Existing Runways
- County Boundary
- Community Boundary
- Highway
- Primary Roads
- Secondary Roads
- Local Roads
- Railroad Lines

0 1 2
Miles

Areas of Environmental Justice Concern with Respect to Both Race/Ethnicity and Income/Poverty Status within the Project Area

▸ Exhibit 5.14-3

5.14.4 Environmental Consequences

5.14.4.1 Interim No Action

As described previously in **Section 5.14.3,** analysis of EJ impacts requires that any impacts considered be caused by the Proposed Action. For the Interim (2025) No Action, no actions of the project would occur; therefore, any changes to the environment are not and cannot be a consequence of the Proposed Action. As such, no EJ analysis was conducted for this scenario.

5.14.4.2 Build Out No Action

Much like the above Interim No Action scenario, and as stated in **Section 5.14.3**, analysis of EJ impacts requires that any impacts considered be caused by the Proposed Action. Because the Build Out (2032) No Action does not involve any action of the proposed plan, any changes to the environment are not a consequence of the Proposed Action. Therefore, no EJ analysis was conducted for this scenario.

5.14.4.3 Interim Proposed Action

No effects that rise to a level of potential significance for any environmental impact categories occur in populated areas under the Interim Proposed Action. In addition, there are no impacts to the physical or natural environment that affect EJ populations in any way that is unique or significant to EJ populations. Thus, no detailed EJ analysis is presented.

5.14.4.3.1 Construction Impacts

All construction is planned to take place on airport property. No populations reside on the airport and therefore any on-airport resources affected would not be available to general and EJ populations. Any off-airport impacts would not differentially impact an EJ population. There would be no disproportionate and adverse impacts on EJ populations resulting from construction.

5.14.4.3.2 Operational Impacts

Changes implemented for the Interim Proposed Action would involve changes to operations and their impacts. No effects that rise to a level of potential significance for any environmental impact categories occur in populated areas with the Interim Proposed Action. As stated in **Section 5.14.3.1**, there are no impacts to the physical or natural environment that affect EJ populations in any way that is unique or significant to EJ populations. Thus, no detailed EJ analysis is presented.

5.14.4.4 Build Out Proposed Action

Significant effects on the noise environment (and therefore EJ impacts) are anticipated for the Build Out Proposed Action. Noise impacts exceeding the threshold of significance are predicted in nine Census Blocks within two Block Groups listed in **Tables 5.14-3** and **5.14-4**.

In **Table 5.14-3**, total counts for population, households and racial demographics were taken directly from the 2020 Census. The average household size and racial and ethnic percentages were calculated based on these totals for the analysis in **5.14.4.4.2** to estimate the demographic makeup of the population potentially experiencing a significant impact. The overall makeup of the affected Census Blocks (comprised of 886 people in 429 dwellings) is 51.4 percent "White," 48.6 percent "All Other Races." It is 34.5 percent "Hispanic/Latino." Most of the affected Census Blocks were not initially identified as EJ Areas of Concern

when compared to the Reference Community (**Exhibit 5.14-4**). The potentially affected Census Blocks are labeled with the Block ID (the last 4 digits of the Census ID) in that **Exhibit 5.14-4**.

For the income and poverty data in **Table 5.14-4**, total population and number of households came directly from the 2019 ACS. For each Block Group, the average household size was calculated from the population count and number of households. The total number of households below the poverty level was initially calculated by counting the total households in income intervals below the established the EA poverty level (150 percent of HHS guidelines). To this result, an additional set of households were added from the income interval containing the poverty threshold. For that income interval, a weighted average was applied based on how much the poverty level exceeds the lower bound of the income interval.

For example, if a Block Group had a calculated poverty threshold of $27,876 (based that Block Group's average household size), this threshold would fall within the $25,000-$30,000 Census income interval. The threshold is 58 percent of the $5,000 interval range.[16] Therefore, 58 percent of households in that reported income range for this Block Group would be added to the total number of households whose income is below the poverty threshold (i.e., the total number of households in income intervals below $25,000).

Block Group 170438408023 has 15 households below the proposed poverty level out of 388 households in the Block Group, indicating that 3.8 percent of the households have an income below the poverty level calculated for this Block Group. Block Group 170438408025 has 76 households below the poverty level out of 462 total in the group, indicating that 16.5 percent of the households in this second Block Group have an income below its calculated poverty level. Neither Block Group exceeded the Reference Community threshold of 23.2 percent to be identified as an EJ Area of Concern (**Exhibit 5.14-5**). These poverty rates are used in the Community of Comparison Analysis in **Section 5.14.4.4.2**. Overall, the two impacted Block Groups contain 850 households with a population of 2,397 with an average poverty rate of 10.1 percent. The two Block Groups are labeled with their Census IDs in **Exhibit 5.14-5**.

[16] In this example, Block Group 170438408023 has a calculated poverty threshold of $27,876 (based an average household size of 2.3 persons per dwelling unit). The lower bound of the $25,000-$30,000 Census income interval ($25,000) is subtracted from that Block Group's calculated poverty threshold ($27,876), resulting in a difference of $2,876. This difference is then divided by the income interval width ($5,000). The resulting percentage (58%) is then applied as a weighting within this income interval to allocate a portion of all households in this Block Group and income interval in order to estimate poverty status within this interval only. For intervals below $25,000 in this Block Group, the Census-reported number of households in those intervals are included without any weighting. The purpose of the weighting is to allocate households within the income interval where the poverty threshold occurs.

TABLE 5.14-3
DEMOGRAPHIC CHARACTERISTICS (RACE/ETHNICITY) OF CENSUS BLOCKS EXPERIENCING A POTENTIALLY SIGNIFICANT IMPACT FROM THE BUILD OUT PROPOSED ACTION

Census Block	Total Population	Number of Households	Average Household Size	White	% White	All Other Races	% All Other Races	Hispanic/Latino	% Hispanic/Latino	Non-Hispanic/Latin	% Non-Hispanic/Latino
170438408023007	15	4	3.8	4	26.7%	11	73.3%	6	40.0%	9	60.0%
170438408023008	9	1	9.0	3	33.3%	6	66.7%	1	11.1%	8	88.9%
170438408023009	149	87	1.7	67	45.0%	82	55.0%	59	39.6%	90	60.4%
170438408023010	0	0	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%
170438408023011	0	0	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%
170438408023012	0	0	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%
170438408023013	421	222	1.9	214	50.8%	207	49.2%	88	20.9%	333	79.1%
170438408023014	74	49	1.5	62	83.8%	12	16.2%	13	17.6%	61	82.4%
170438408025002	218	66	3.3	105	48.2%	113	51.8%	139	63.8%	79	36.2%
Summary	886	429	2.1	455	51.4%	431	48.6%	306	34.5%	580	65.4%

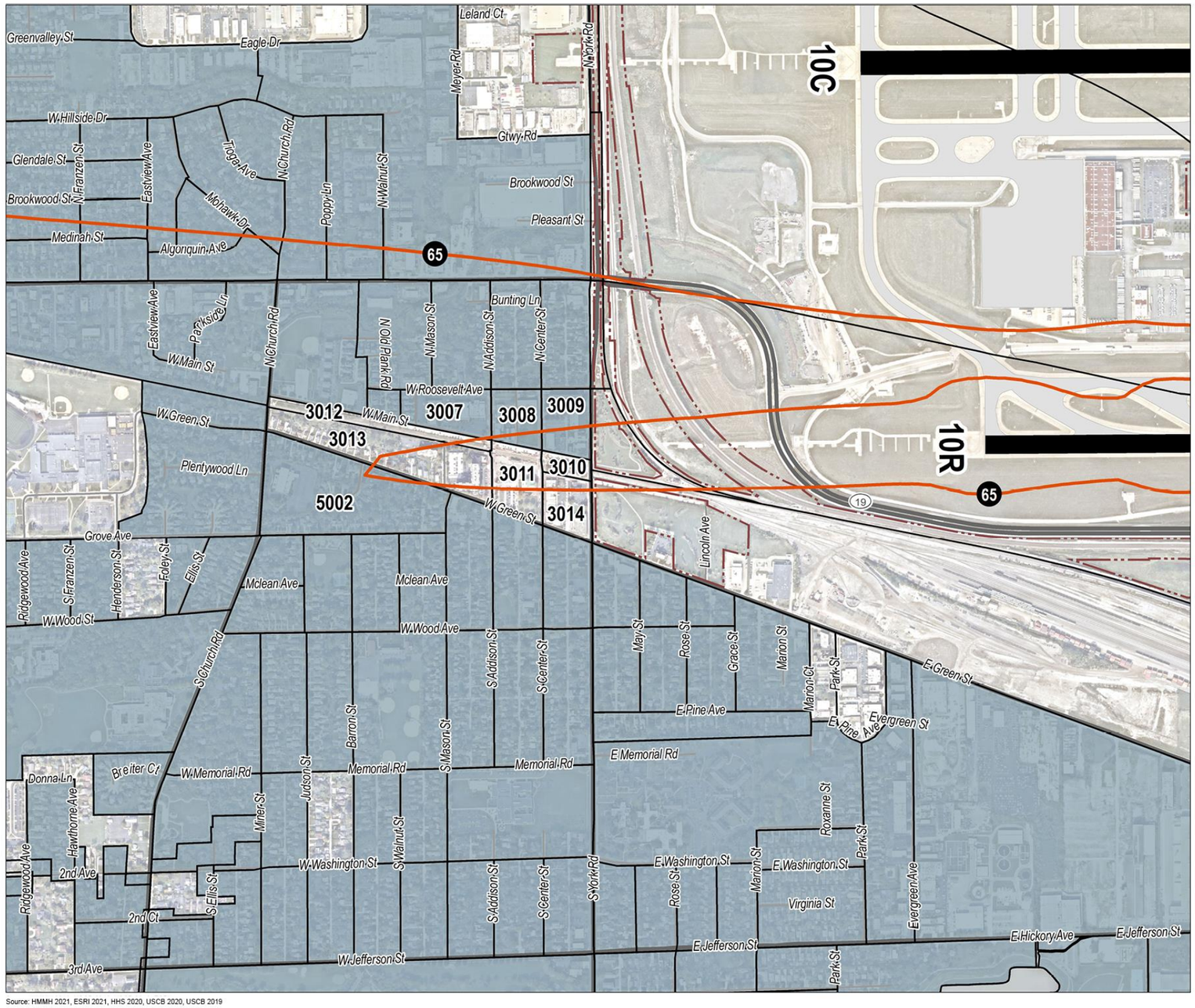
Sources: HMMH, 2021; USCB, 2020
Note: The totals for Total Population, Number of Households, Populations of White and Hispanic/Latino persons were taken directly from Census data. The other data was calculated from those values.

TABLE 5.14-4
SELECTED DEMOGRAPHIC CHARACTERISTICS (INCOME/POVERTY) FOR AREAS OF CENSUS BLOCK GROUPS EXPERIENCING A POTENTIALLY SIGNIFICANT IMPACT FROM THE BUILD OUT PROPOSED ACTION

Census Block Group	Total Population	Number of Households	Average Household Size	2020 HHS Poverty Guideline	Proposed EA Poverty Guideline (150%)	# Households Below Poverty Level	% Households Below Proposed EA Poverty Level
170438408023	900	388	2.3	$18,584	$27,876	15	3.8%
170438408025	1497	462	3.2	$22,616	$33,924	76	16.5%
Summary	2397	850	2.8	$20,824	$31,236	91	10.1%

Sources: FAA-Source-Indented; ORD_RSIP_June2015 database: City of Chicago; 2010 U.S. Census Bureau Census Block Population Data

Note: The totals for Total Population and Number of Households were taken directly from Census data. The average household size was calculated from this data. The count and percentage of households below the poverty level were calculated using the method described in Section 5.14.3.2 (adjustment by 150 percent and reconciling USCB household income intervals to HHS poverty guidelines intervals).



Source: HMMH 2021, ESRI 2021, HHS 2020, USCB 2020, USCB 2019

Chicago O'Hare International Airport

Terminal Area Plan and Air Traffic Procedures Environmental Assessment

Build Out Proposed Action 65 DNL Noise Contour

Census Blocks with > 50% All Other Races or > 24.6% Hispanic Population

3011 Census Block ID for Significantly Impacted Blocks

Airport Boundary

County Boundary

Current Runway Pavement

Highway

Primary Roads

Secondary Roads

Local Roads

Railroad Lines

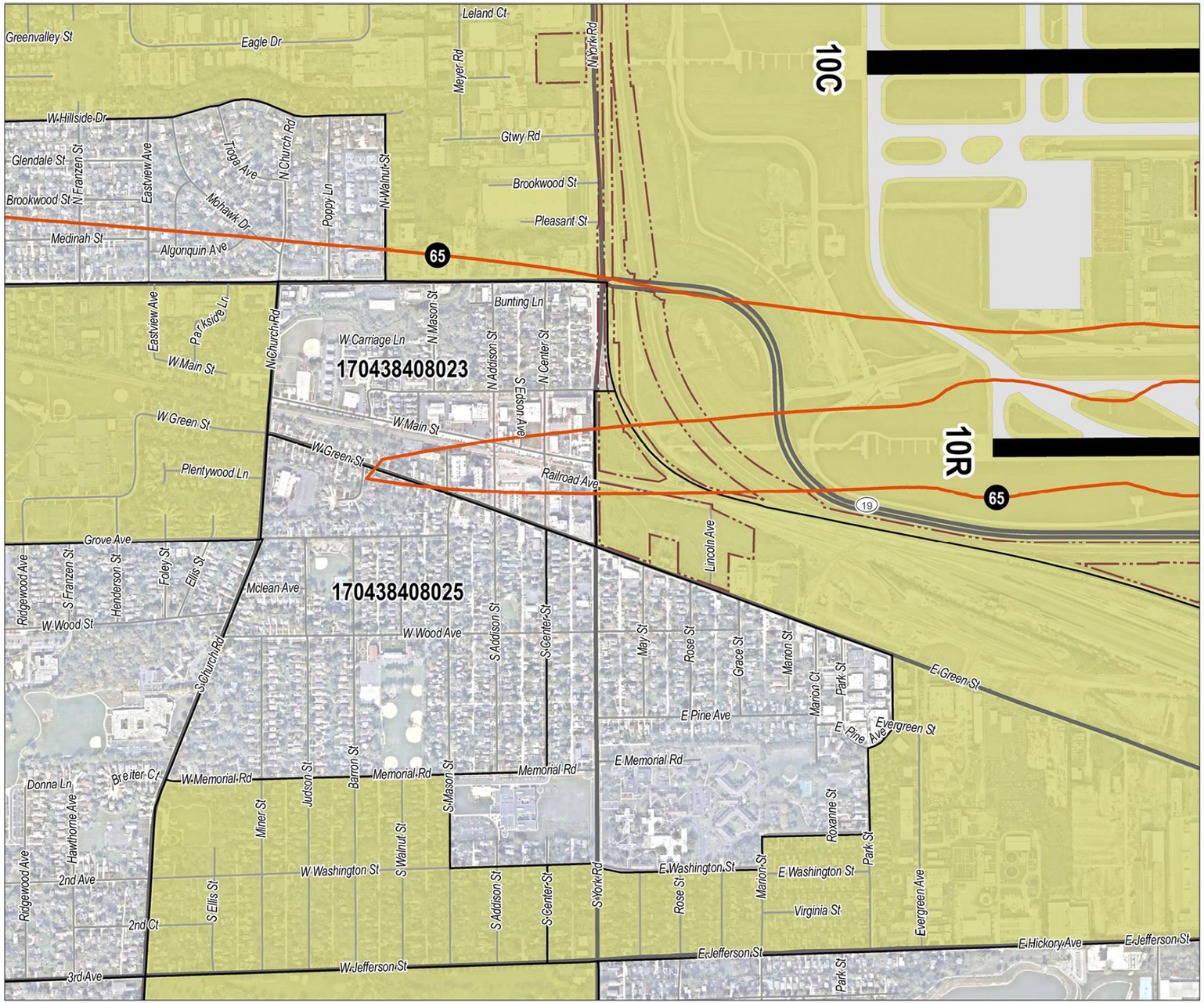
Note: Refer to Noise Contour Exhibits in Section 5.5.7

0 800 1,600

Feet

Census Blocks with Areas of Environmental Concern with Respect to Income and Poverty Intersecting Areas Potentially Experiencing a Significant Noise Impact from Build Out Proposed Action

▸ Exhibit 5.14-4



Source:HMMH 2021,ESRI 2021, USCB 2020

Chicago O'Hare International Airport

Terminal Area Plan and Air Traffic Procedures Environmental Assessment

Build Out Proposed Action 65 DNL Noise Contour

Census Block Groups of Low Income/Poverty Status

170438408023 Census ID for Significantly Impacted Block Groups

Airport Boundary

County Boundary

Current Runway Pavement

Highway

Primary Roads

Secondary Roads

Local Roads

Railroad Lines

Note: Refer to Noise Contour Exhibits in Section 5.5.7

0 800 1,600
Feet

Census Blocks with Areas of Environmental Concern with Respect to Income and Poverty Intersecting Areas Potentially Experiencing a Significant Noise Impact from Build Out Proposed Action

Exhibit 5.14-5

Once the impacted Census Blocks were cross-referenced with parcel data, significant impacts on dwellings within two Blocks were found, as detailed in **Section 5.14.4.4.2**.

5.14.4.4.1 Construction Impacts

As stated in **Section 5.14.4.3.2**, all construction impacts are anticipated to occur on airport property. With no population living in the area where impacts are anticipated, no EJ analysis is necessary.

5.14.4.4.2 Operational Impacts

All effects which may rise to a threshold of significance in populated areas would be due to operational changes (see **Section 5.14.4.3.2**). For the EJ analysis, the Community of Comparison is the subset of the impacted Blocks/Block Groups containing only those specific households affected as shown in **Tables 5.14-5** and **5.14-6**. This was calculated from a geospatial analysis multiplying the count of households experiencing a significant impact by the average household size of each household's Block/Block Group. The total persons of each demographic (**Table 5.14-5**) and households below the poverty level (**Table 5.14-6**) were obtained by applying their respective ratios to the whole population. This would imply a level of uniformity to the distribution of these populations, but the assumption is made based on the most granular data available.

Race and ethnicity analysis is based on the decennial Census while income and poverty are based on the ACS. These datasets have differing population and housing counts, resulting in different average household sizes. Therefore, the total counts of persons affected differ between the two analyses.

For the Build Out Proposed Action, three Census Blocks in two Census Block Groups have significant noise impacts occurring in populated areas. The three Blocks are located southwest of the airport near Runway 10R, as shown in **Exhibits 5.14-6** and **5.14-7**. Of the potentially affected Blocks (**Table 5.14-5**), the Blocks ending in "3009" and "3013" are in the first listed Block Group (170438408023 in **Table 5.14-6**) while the Block ending in "5002" is part of the second Block Group (170438408025).

The affected population is estimated to be 227 (50.1 percent) white persons and 216 (49.9 percent) of all other races. This population is estimated to have 102 (23.6 percent) Hispanic/Latino persons and 331 non-Hispanic/Latino (76.4 percent). Comparison of the Block demographics to the Community of Comparison shows that two Blocks, "3009" and "5002", have EJ impacts. The Blocks are 55.9 percent and 51.8 percent "All Other Races," respectively. Both Blocks exceed the Community of Comparison and, with more than 50 percent "All Other Races," the Predominantly Borne Test. Block "3009" is 39.6 percent Hispanic/Latino, which exceeds the Community of Comparison and the Meaningfully Greater Test (with a threshold of 33.6 percent Hispanic/Latino). Block 5002 is 63.8 percent Hispanic/Latino, which exceeds the Community of Comparison, Meaningfully Greater Test, and Predominantly Borne Test.

With respect to poverty, nine (4.3 percent) households overall, containing approximately 22 people, would be below the poverty level calculated for the Proposed Action out of a total of 227 households and 530 people. Out of four households in Block Group 170438408025, one is below the poverty threshold, a Meaningfully Greater poverty level than the Community of Comparison.

TABLE 5.14-5
ESTIMATED POPULATION COUNTS (RACE/ETHNICITY) FOR AREAS OF EJ CONCERN FOR RACE/ETHNICITY EXPERIENCING A POTENTIALLY SIGNIFICANT IMPACT FROM THE BUILD OUT PROPOSED ACTION

Census Block	Total Population	Number of Households	Average Household Size	White	% White	All Other Races	% All Other Races	Hispanic	% Hispanic	Non-Hispanic	% Non-Hispanic
Community of Comparison	433	227	1.9	217	50.1%	216	49.9%	102	23.6%	331	76.4%
170438408023009	***34***	***20***	***1.7***	***15***	***44.1%***	***19***	***55.9%***	***13***	***39.6%***	***21***	***60.4%***
170438408023013	386	203	1.9	196	50.8%	190	49.2%	81	20.9%	305	79.1%
170438408025002	***13***	***4***	***3.3***	***6***	***48.2%***	***7***	***51.8%***	***8***	***63.8%***	***5***	***36.2%***

Sources: HMMH, 2021; USCB, 2020

Notes: 1) Census Blocks 170438408023007, 170438408023008, 170438408023010, 170438408023011, 170438408023012, and 170438408023014 (six Census Blocks) are not presented because although they would experience a 1.5 dB increase from Build Out Proposed Action and, lie within the 65 DNL count, there would not be impacted residential dwellings within this portion of the contour.

2) **Census Blocks with bolded values** indicate Areas of EJ Concern – i.e., % All Other Races or % Hispanic population is greater than Reference Community – whose value is also greater than threshold (% All Other Races or % Hispanic) established by Community of Comparison or exceeds 50 percent. The percentages in the Community of Comparison to which specific Areas of EJ Concern – Race/Ethnicity (Census Blocks) are compared and enclosed within a box. For the Build Out Proposed Action, no Census Blocks met the condition of both experiencing a significant impact and having racial and/or ethnic population percentages that were meaningfully greater than the threshold (<10 percent) established by the Community of Comparison. If any Blocks did meet this condition, they would have been presented in this table as **bolded without italics**.

3) ***Census Blocks with Bolded/Italics*** values indicates an Area of EJ Concern whose value is either meaningfully greater (>10 percent) than the threshold established by the Community of Comparison or greater than 50 percent. Meaningfully greater for % All Other Races would be greater than 59.9 percent and for %Hispanic would be greater than 33.6 percent. For % All Other Races, the 50 percent threshold (Predominantly Borne) is reached prior to the 59.9 percent threshold (Meaningfully Greater).

4) Census Blocks with non-bold/non-italic values indicate areas that would experience a significant impact from noise; however, these blocks have not been identified as Areas of EJ Concern.

TABLE 5.14-6
ESTIMATED POPULATION COUNTS (RACE/ETHNICITY) FOR AREAS OF EJ CONCERN FOR POVERTY AND INCOME EXPERIENCING A POTENTIALLY SIGNIFICANT IMPACT FROM THE BUILD OUT PROPOSED ACTION

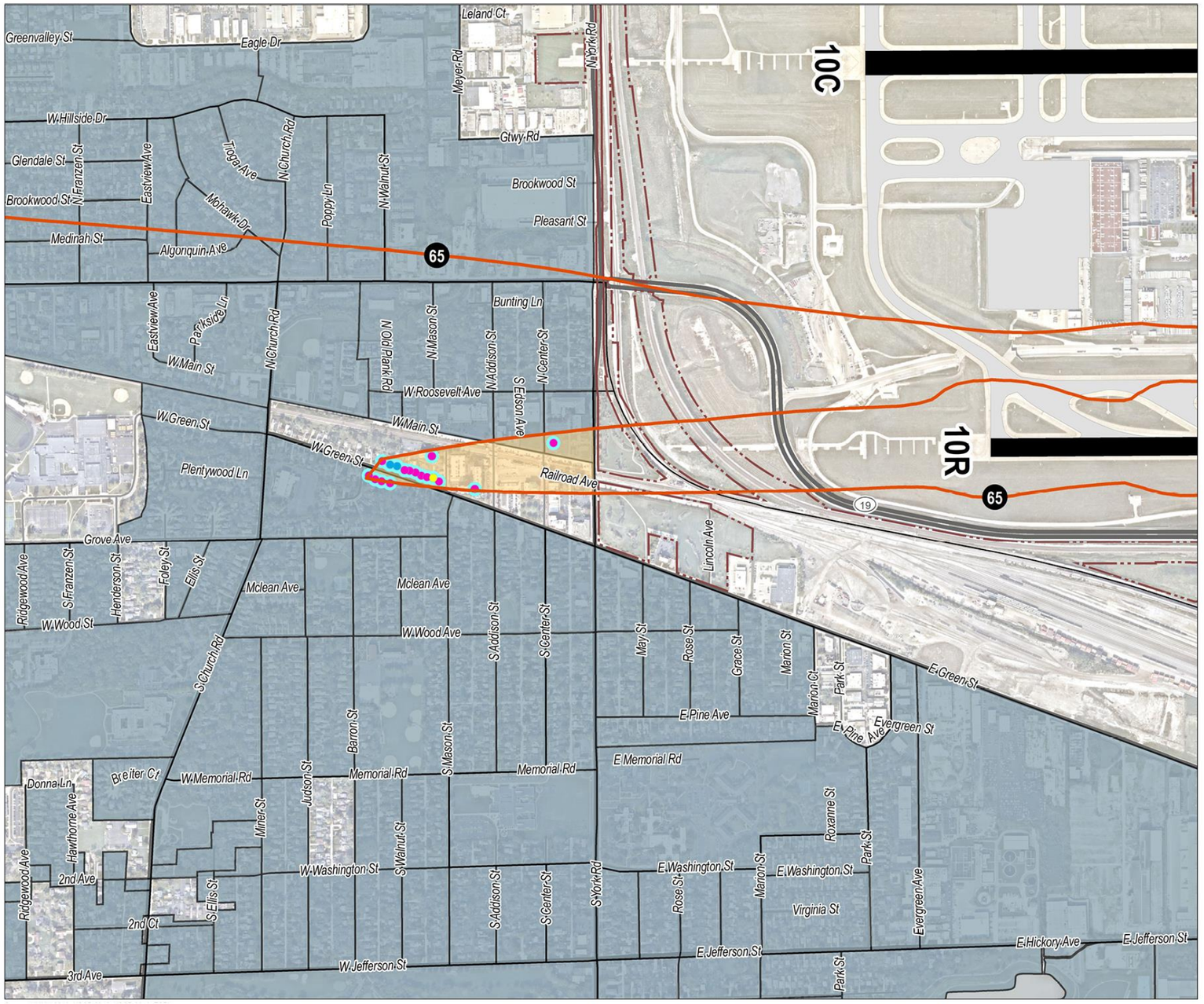
Census Block Group (Portion)	Total Affected Population	Number of Households	Average Household Size	Median House-hold Income	2020 HHS Poverty Guide-line	Proposed EA Poverty Guideline (150%)	# Households Below Poverty Level	% Households Below Proposed EA Poverty Level
Community of Comparison	530	227	2.3	$77,725	$18,584	$27,876	9	4.0%
170438408023	517	223	2.3	$77,426	$18,584	$27,876	8	3.8%
170438408025	***13***	***4***	***3.2***	***$91,111***	***$22,616***	***$33,924***	***1***	***16.5%***

Sources: HMMH, 2021; HHS, 2020; CDA, 2021; USCB, 2019

Notes: 1) **Census Blocks with Bolded Values** indicates an Area of EJ Concern – i.e., % Households Below Proposed EA Poverty Level – whose value is also greater than threshold (% Households Below Proposed EA Poverty Level) established by the Community of Comparison or exceeds 50 percent. The percentage in the Community of Comparison to which specific Areas of EJ Concern – Income/Poverty (Census Block Groups) are compared is enclosed within a box. For the Build Out Proposed Action, no Census Blocks Groups met the condition of both experiencing a significant impact and having a percentage of households below the poverty level that were meaningfully greater than the threshold (<10 percent) established by the Community of Comparison. If any Block Groups did meet this condition, they would have been presented in this table as **bold without italics**.

2) ***Census Blocks with Bolded/Italics*** values indicates an Area of EJ Concern whose value is meaningfully greater (>10 percent) than the threshold established by the Community of Comparison or 50 percent. Meaningfully greater for % Households Below Proposed EA Poverty Level would be greater than 14.0 percent.

3) Census Blocks with non-bold/non-italic values indicate areas that would experience a significant impact from noise; however, these Blocks have not been identified as Areas of EJ Concern.



Source: HMMH 2021, ESRI 2021, USCB 2020

Chicago O'Hare International Airport

Terminal Area Plan and Air Traffic Procedures Environmental Assessment

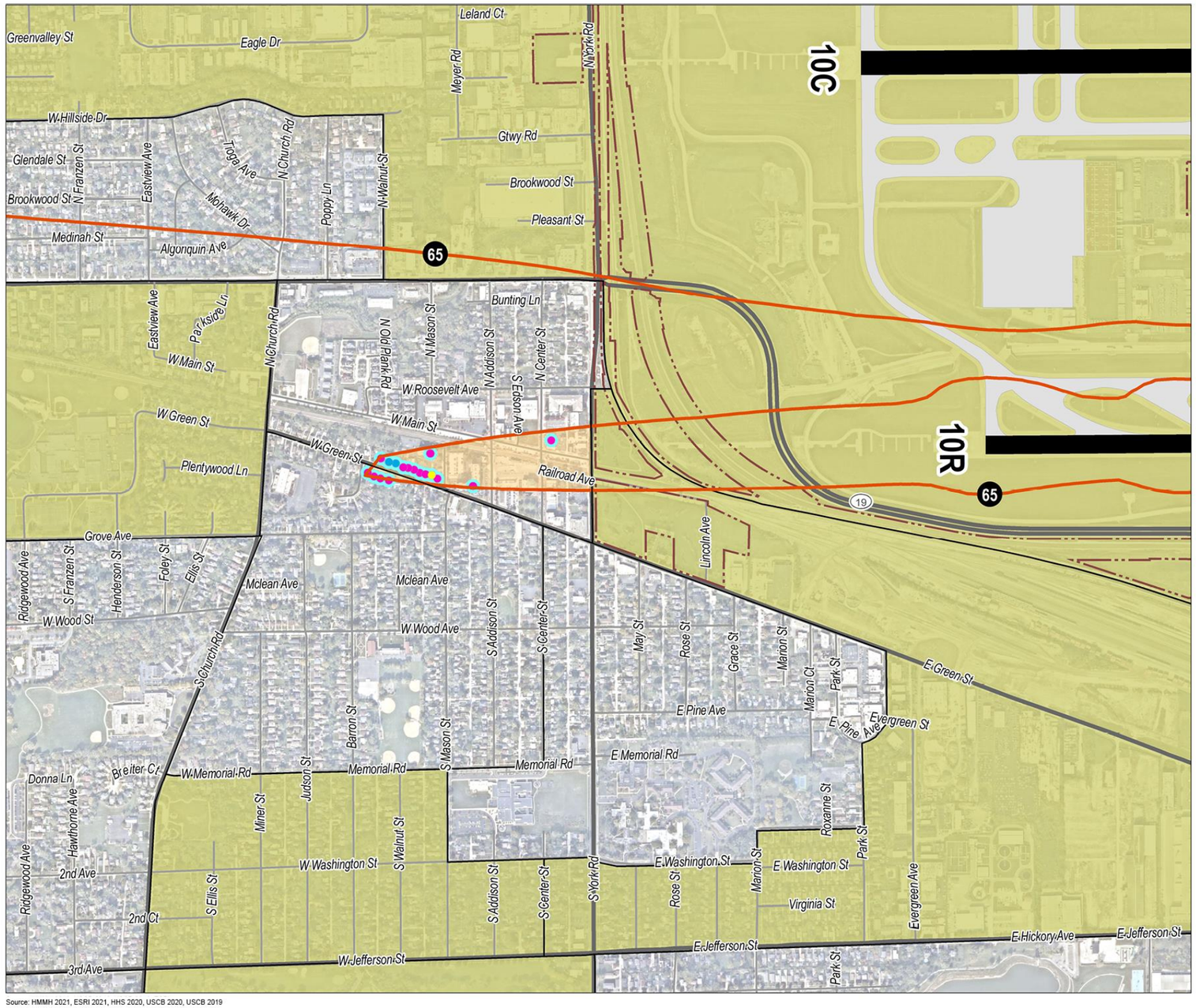
- Build Out Proposed Action 65 DNL Noise Contour
- Census Blocks with > 50% All Other Races or > 24.6% Hispanic Population
- Community of Comparison
- Sound Insulated Property
- Partially Insulated Property
- Pending
- Not Insulated
- Property within 65 DNL Contour with a 1.5 dB Increase
- Airport Boundary
- County Boundary
- Current Runway Pavement
- Highway
- Primary Roads
- Secondary Roads
- Local Roads
- Railroad Lines

Note: Refer to Noise Contour Exhibits in Section 5.5.7

0 800 1,600
Feet

Households Potentially Experiencing Significant Noise Impacts and Areas of Environmental Concern with Respect to Race/Ethnicity

▸ Exhibit 5.14-6



Source: HMMH 2021, ESRI 2021, HHS 2020, USCB 2020, USCB 2019

Chicago O'Hare International Airport

Terminal Area Plan and Air Traffic Procedures Environmental Assessment

- Build Out With Project 65 DNL Noise Contour
- Census Block Groups of Low Income/Poverty Status
- Community of Comparison
- Sound Insulated Property
- Partially Insulated Property
- Pending
- Not Insulated
- Property within 65 DNL Contour with a 1.5 dB Increase
- Airport Boundary
- County Boundary
- Current Runway Pavement
- Highway
- Primary Roads
- Secondary Roads
- Local Roads
- Railroad Lines

Note: Refer to Noise Contour Exhibits in Section 5.5.7

0 800 1,600
Feet

Households Potentially Experiencing Significant Noise Impacts and Areas of Environmental Concern with Respect to Poverty and Income

▸ Exhibit 5.14-7

5.14.4.4.3 Permits and Approvals

No permits specific to EJ are applicable.

5.14.4.4.4 Mitigation and Minimization

FAA Order 1050.1F Desk Reference describes in Section 12.2.4 that "Environmental justice impacts may be avoided or minimized through communicating early and consistently with the public and allowing ample time for public coordination." In conjunction with this EA, the FAA has engaged in targeted outreach to EJ Areas of Concern where a potential significant impact may occur. Specifically, focused mailings describing the Proposed Action and the analyses undertaken have been sent to these communities. These mailings augment the scoping efforts previously undertaken.

Additional steps can also be taken to mitigate the underlying significant noise impact, which for this analysis would be sound insulation of households to decrease the noise impact to below the threshold of significance. Based on the results shown in **Table 5.14-6**, it is expected that 227 residences would experience a potentially significant noise impact from the Build Out Proposed Action. These residences are in areas of EJ concern. From housing data provided by the CDA, 224 of these residences have already been sound insulated, leaving three residences[17] (approximately 1.3 percent) that were not previously sound insulated under the CDA's RSIP. Two of the three residences are scheduled for completion in 2022 as part of the CDA's ongoing RSIP. The third residence has declined the invitation for sound insulation; therefore, the FAA has determined that the residence is compatible for noise purposes. Sound insulation would decrease the noise impact on the three dwellings to a level that is considered less than significant, which would also mitigate the related EJ effects. The population affected in the 227 households would range from 530 to 433 people, depending on which Census data is used. Of this affected population, an estimated six persons would reside in dwellings that have not been mitigated to date.[18]

As noted above, no effects that rise to a level of potential significance for any environmental impact categories occur in populated areas with the Proposed Action. In addition, no impacts to the physical or natural environment that affect EJ populations in any way that is unique or significant to EJ populations. Therefore, no mitigation steps would be taken; however, noise mitigation already in effect would remain.

5.15 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

This section summarizes the assessment of potentially irretrievable and irreversible resource commitments. These resource commitments would occur because of implementing the Proposed Action.

5.15.1 Definition of Resource Category

Irreversible commitment of resources considers the use or planned use of a resource that will cause the loss of future options. It applies primarily to impacts of the use of nonrenewable resources, such as minerals or cultural resources, or to those factors, such as soil productivity, that are renewable only over long periods of time. Irretrievable resource commitments are those commitments that lead to the loss of production, harvest, or other use of natural resources. It is important to consider whether natural or human-made

[17] Of these three residences, one has accepted the CDA's offer for sound insulation and is in Phase 18 of the CDA's comprehensive Residential Sound Insulation Program (RSIP). The second residence has also accepted the CDA's offer and is in Phase 19. The third residence has been provided eight opportunities for inclusion in the RSIP.

[18] The three residences that are not mitigated all lie within Census Block 170438408023013. Based on the average household size (1.9 persons per dwelling unit) for this Census Block, it is estimated that six persons reside in those three dwellings.

resources would be expended during the implementation of the Proposed Action, what natural materials would be used in the construction of structures included in the Proposed Action, and whether biological or cultural resources would be physically altered in implementing the Proposed Action.

Resource commitments from the Proposed Action would result from:

- Construction activities associated with the terminal and airfield projects as described in **Appendix A,**
- Ongoing operations of the new and existing facilities, along with aircraft operations on and in the vicinity of the airfield, and
- Ongoing maintenance activities associated with these facilities.

5.15.2 Regulatory Context

NEPA Section 102(2)(c)(v) and CEQ regulations (40 CFR 1502.16) require that an EIS include consideration and discussion of the irreversible and irretrievable commitments of resources that may occur should a Proposed Action be implemented. FAA Order 1050.1F *Environmental Impacts: Policies and Procedures Desk Reference*, February 2020, indicates that such discussion and consideration are not required for an EA. The FAA evaluated the potential for irreversible and irretrievable commitments of resources for each environmental resource category, and the findings are presented in this section.

5.15.3 Methodology

The analytical approach taken relies on qualitative assessment—synthesizing the analyses performed in each environmental impact category presented in this chapter—as well as noting resource commitments implied in the project descriptions that comprise the Proposed Action. The approach for determining irretrievable and irreversible resource commitments for each impact category includes two main objectives: first, characterizing the resource commitments for each impact category of implementation that the Proposed Action would implicate; second, assessing whether those resource commitments would be irreversible or irretrievable.

Additional resource commitments may arise from mitigation proposals used to remedy anticipated environmental consequences in each impact category. These resource commitments were evaluated similarly to resource commitments of the Proposed Action—by analyzing the descriptions and activities of the mitigation proposals.

Resource commitments identified by this review were further characterized based on whether they are irretrievable or irreversible based on the definitions provided in the introduction of each environmental resource category in **Chapter 5**. **Section 5.15.4** provides an overview of the potential for the Proposed Action to irreversibly or irretrievably commit (degrade) the resources. **Section 5.15.5** presents commitments from the perspective of the environmental impact categories.

5.15.4 Irreversible and Irretrievable Resource Commitments Implied by the Proposed Action

Implementation of the Proposed Action (both Interim and Build Out) would involve committing a range of natural, physical, human, and fiscal resources. Construction of terminal facilities, airfield improvements, and support facilities (Groups 1, 3, and 4) implies and entails consumption of raw materials and resources (e.g., steel, cement, aggregate, asphalt, minerals, wood products, etc.) in a manner generally considered irretrievable. Fossil fuel, labor, and similar resources would be required during construction and would also be irretrievably consumed during ongoing operations of the proposed facilities. Similarly, for Group

5, ongoing operations would irretrievably consume fuel and labor, although not in a manner appreciably different from the No Action Alternative.

While the use of fossil fuels, water, and construction materials is irretrievable, recycling and sustainability planning of designs and operation can address this to a degree. The Proposed Action Alternative's overall uses of these resources would not be anticipated to adversely affect their continued availability. Conversion of land use from land used for a detention basin to a hotel (the hotel next to the MMF in Group 2) is similarly an irreversible commitment of resources for the duration of period that such land is used for such purposes. Lastly, selection and implementation of the Proposed Action would require an irretrievable commitment of fiscal resources (i.e., funding).

5.15.5 Irreversible and Irretrievable Resource Commitments by Resource Category

This section outlines irreversible and irretrievable commitments through the lens of the environmental impact categories presented in this EA.

1. **Air Quality**
   Based on the analysis presented in **Section 5.3,** there would be irreversible commitments of resources affecting air quality from the Proposed Action. Since the Proposed Action is contemplated in the statewide implementation plan, no mitigation measures are required.

2. **Climate**
   No mitigation measures are required for the impacts on climate based on the analysis in **Section 5.4**. For reasons like those indicated in Item #9 below, Natural Resources and Energy Supply, irreversible resource commitments would be expected from the impacts on climate arising from the Proposed Action.

3. **Noise and Noise-Compatible Land Use**
   Resource commitments related to noise impacts arise from mitigation and minimization of those impacts. Mitigation and minimization activities described in **Section 5.5.9** include construction activities for a residential sound insulation program. These activities would result in irretrievable or irreversible resource commitments.

4. **Historical, Architectural, and Cultural Resources**
   The analysis presented in **Section 5.6.3.3** shows no adverse effects to off-airport historical, architectural, archeological, or cultural resources. There would, however, be a minor degree of irreversible commitment of historical resources associated with the Proposed Action, specifically the Group 1 terminal construction. Minor alteration to historic resources—Terminal 1 and the Rotunda—would occur. In consultation with the Illinois SHPO, minimization and mitigation of effects to these resources have been incorporated into the design of the new facilities. These efforts in avoiding an adverse effect under Section 106 of National Historic Preservation Act of 1966 and 36 CFR 800 indicate that sufficient integrity and characteristics of these resources would remain after this irreversible commitment of historic resources.

5. **DOT Act, Section 4(f)**
   The analysis presented in **Section 5.7.4** shows that there would not be a physical taking or constructive use of Section 4(f) properties (e.g., historic sites, parks, or refuges) located off-airport. With respect to on-airport sites, a *de minimis* physical use of certain historic sites (i.e., the Rotunda

and Terminal 1) would occur. Consequently, as noted in Item #4 above, Historical, Architectural, and Cultural Resources, a reversible, *de minimis* use and commitment of this resource would occur.

6. **Biological Resources**
   As discussed in **Section 5.8**, construction activities associated with the Proposed Action would result in loss of some habitat for common biotic species, as well as a loss of open lands due to West Side Development Area construction. These losses imply resource commitments that would be largely irreversible. The increase in impervious area would be an irreversible commitment of resources since it is not easily possible to restore the natural setting. However, the area does not currently have a natural setting since it has been graded many times over the last ten years. Finally, the Proposed Action would not impact listed species. While some common species would be forced to relocate or perish from construction, these species are adapted to the human environment and the local populations would not suffer irretrievable harm since they would relocate or repopulate quickly. There would be no irreversible or irretrievable resource commitments related to listed or common species.

7. **Visual Effects**
   No irretrievable or irreversible resource commitments are expected with respect to light emissions and visual effects (see **Section 5.9**).

8. **Hazardous Materials, Solid Waste, and Pollution Prevention**
   The analysis presented in **Section 5.10** indicates that construction and operation of the Terminal facilities, airport hotels, airfield improvements, and aircraft operations would result in irreversible or irretrievable commitment of resources pertaining to this impact category. Standard design processes and adherence to applicable federal, state, and local laws and regulations regarding hazardous materials and or solid waste management would mitigate this somewhat but would nonetheless commit resources such as landfill capacity and storage/disposal/remediation sites for contaminants and solid waste.

9. **Natural Resources and Energy Supply**
   The Natural Resources and Energy Supply impact category has three main areas of irretrievable and irreversible resource commitments: construction materials, physical setting, and energy resources. However, none of these commitments are anticipated to unduly tax or constrain the resources available in the greater Chicago area or Midwest region.

   - *Construction Materials:* Based on the analysis presented in **Section 5.11**, the construction associated with the Proposed Action relies largely on nonrenewable natural resources and materials—concrete, asphalt, glass, steel, etc. Therefore, the commitment of these resources for the Proposed Action would be both irretrievable and irreversible. Water use associated with construction activities would also be an irretrievable resource commitment.
   - *Physical Setting:* The irreversible resource commitments related to the physical setting are limited to the increase in impervious surfaces resulting from construction of the Proposed Action. This change in physical setting is considered an irreversible resource commitment.

- *Energy Resources:* Construction associated with the Proposed Action would require consumption of gasoline or diesel to fuel construction equipment. This fuel consumption is considered a commitment of irretrievable resource since the fuels are not renewable. Electricity and natural gas would also be used during the construction. Nonrenewable sources of electricity and natural gas resources are considered irretrievable; however, any electricity produced in a renewable fashion would not be considered irretrievable. The operation of the facilities after construction would also require the use of energy. Energy consumption based on jet fuel, aviation gas, and other nonrenewable energy sources is considered an irretrievable commitment of resources. Furthermore, the Proposed Action would result in an increase in use of energy resources from electricity and natural gas. Natural gas energy use and nonrenewable sources of electricity are considered irretrievable commitments of resources. If electricity used for operations comes from renewable sources, the energy resource would not be considered an irreversible or irretrievable resource commitment.

10. Water Resources

Based on the analysis conducted in **Section 5.13,** no impacts to floodplains and surface waters would occur; therefore, no irretrievable or irreversible resource commitments related to those resources would occur.

Water resources used in construction activities and operation of the new facilities would be considered an irretrievable resource commitment. Additionally, while no mitigation is needed for the impacted wetlands discussed in **Section 5.13** because they do not provide functions that rise to a level requiring mitigation, these impacts nonetheless would constitute an irreversible resource commitment.

11. Environmental Justice

For reasons similar to those listed in Item #3 above, Noise and Noise-Compatible Land Use, the mitigation and minimization activities described in **Section 5.14.4.4.4** describe activities for which irretrievable or irreversible resource commitments would be expected.

5.16 CUMULATIVE IMPACTS

This section describes the potential cumulative effects of the No Action Alternative and the Proposed Action Alternative when considered with past, present, and reasonably foreseeable future actions (see **Table 5.16-1**). Past actions include those that occurred in the five years prior to 2018. Present and reasonably foreseeable future actions include those that were implemented after 2018 or would be implemented by 2032 regardless of what agency (federal or non-federal) or person undertakes such other actions.[19] For this (EA, due to the duration of Proposed Action implementation timeline (10 years), cumulative impact analysis concluded at the end of the timeline since projects beyond 10 years are not reasonably foreseeable. In addition, no projects are known beyond 2032. On-airport projects include prior and other planned and approved projects at O'Hare. Off-airport projects include known major surface transportation projects

[19] CFR 40 Part 1502.21 "Incomplete or Unavailable Information." Accessed at: https://www.ecfr.gov/current/title-40/chapter-V/subchapter-A/part-1502.

within the Surface Transportation study area. Cumulative impacts are the total combined impacts on the environment from the Proposed Action and other past, present, or reasonably foreseeable actions.

5.16.1 Air Quality

This section describes the significance threshold(s) pertaining to air quality, describes methodologies used to determine the potential cumulative air quality effects from the No Action Alternative and the Proposed Action, and describes potential cumulative air quality impacts. The air quality impacts associated with implementation of the No Action Alternative and the Proposed Action Alternative are *de minimis* and would not result in a significant impact to air quality.

5.16.1.1 Methodology

Emissions originating from aviation activity were calculated using AEDT, Version 2d Service Pack 2, FAA's required model at the time this environmental analysis was initiated. Emissions quantified as part of this process were compared to NAAQS significance thresholds. For more information regarding air quality methodology, including dispersion modeling, see **Section 5.3.3.1**.

5.16.1.2 Thresholds of Significance

Exhibit 4-1 of FAA Order 1050.1F defines FAA's significance threshold for air quality as an action that "would cause pollutant concentrations to exceed one or more of the NAAQS, as established by the U.S. Environmental Protection Agency (USEPA) under the Clean Air Act (CAA), for any of the time periods analyzed, or to increase the frequency or severity of any such existing violations." **Table 5.3-1** in **Section 5.3** displays all applicable NAAQS.

5.16.1.3 No Action Alternative

Under the No Action Alternative (Interim and Build Out Conditions), the Proposed Action would not be implemented. The cumulative construction and operational impacts for the Interim No Action Alternative are displayed in the criteria air pollutants emissions inventory (**Table 5.3-6** in **Section 5.3**). Additionally, **Table 5.3-10** in **Section 5.3** displays the criteria air pollutant emissions associated with the Build Out No Action Alternative. In both cases, aircraft emissions are the biggest contributors to each criteria pollutant, and all criteria air pollutants are in compliance. Therefore, no cumulative impacts with past, present, or foreseeable actions would occur.

TABLE 5.16-1
CUMULATIVE PROJECTS LIST

Past Projects	Project Name
P-1	Taxiway Modifications; Revisions to Approved TWs for Runway 9C/27C, RW 9R Extension and Associated TWs, and TQs K & L
P-2	Mannheim Road: Widening of Mannheim Road to 3 Lanes Each Direction between Higgins and Irving Park – IDOT

Past Projects	Project Name
P-3	Expansion of I-90 Interchange at Elmhurst Road (add Elmhurst Road on-ramps to WB I-90 and EB I-90 off-ramps to Elmhurst Road)
P-4	Irving Park Road and York Road Intersection Improvements
P-5	I-90 Improvements
P-6	I-90 Add Lanes from I-294 to Illinois Route 53
P-7	York/Thorndale Grade Separation and Interchange Improvements
P-8	I-190 Interchange with Mannheim Road and Bessie Coleman Drive Reconfiguration
P-9	I-294 Interchange with Balmoral Avenue Reconstruction and Reconfiguration
P-10	Modifications to Sections of Touhy Avenue, Mannheim Road, Bessie Coleman Drive and Other Roads
P-11	Joint Use Rental Car and Parking Facility: Revised Lane Configurations at Intersections and Road Sections
P-12	Balmoral Avenue SB Tunnel
P-13	Metra Commuter Station Expansions
P-14	Storage & Multi-Waste Management Facility at Airport Repair and Construction (ARC) Complex
P-15	Fire Fighter Training and Simulator Building – ARFF
P-16	South Airfield Drainage Improvements
P-17	Fuel Farm Sewage Lift Station Replacement
P-18	West Perimeter Service/Security Road at O'Hare
P-19	Improvements to Building 8500
P-20	Snow Dump 1A Reconstruction
P-21	Runway 4L/22R Rehabilitation, Taxiway C Reconstruction, and Realignment of Service Road around the Runway 22R Safety Area
P-22	Hilton Hotel Renovation (Interior)
P-23	Airport Transit System (ATS) Lot E Station Canopy Demolition
P-24	Airside Service Road Bridge Across I-190
P-25	Building 519 Demolition (Former Burlington Building)
P-26	Building 521 Renovation for Airport Police

Past Projects	Project Name
P-27	Detention Basin South of Runway 9L/27R and West of ARFF Training Facility
P-28	I-190 Corridor Reconfiguration Near Interchange with Mannheim Road
P-29	Runway 9C/27C Construction
P-30	Runway 15/33 Decommissioning
P-31	Main Fuel Farm Expansion (Two Additional Fuel Tanks)
P-32	Delta Cargo Building Construction
P-33	Airport Transit System (ATS) Building Expansion and Maintenance Track Relocation
P-34	Airport Transit System (ATS) Track Extension to Multimodal Facility (MMF)
P-35	Emergency and Standby Power System Generator and Switchgear Building
P-36	Airport Maintenance Complex (AMC) Expansion (ALP Building 512)
P-37	Airport Rescue and Firefighting (ARFF) Station 1 Modifications
P-38	North Airfield Airport Surface Detection Equipment Model X Installation
P-39	Terminal 3 Concourse L Extension "Stinger" (5 Gates)
P-40	Miami Beach Lift Station Relocation and Upgrade
P-41	American Airlines Ground Equipment Maintenance (GEM) Building
P-42	American Airlines Hazardous Material Storage Building
P-43	American Airlines Maintenance Hangar 2
P-44	American Airlines Truck Wash Building
P-45	Low Level Windshear Alert System (LLWAS) 1 Relocation
P-46	Central De-icing Facility (CDF)
P-46a	CDF Crossfield Taxiways
P-46b	CDF Ramp Control Tower
P-46c	CDF South Airport Surveillance Radar Relocation
P-46d	CDF Taxiway J Construction
P-46e	CDF Taxiway Z Construction

Past Projects	Project Name
P-47	Foreign Object Debris (FOD) Disposal Area Relocation
P-48	United Airlines Facility Maintenance (FMS)
P-49	United Airlines Ground Equipment Maintenance (GEM) Building
P-50	United Airlines Widebody Hangar 5/5A
P-51	Airport Rescue and Firefighting (ARFF) Station 2 Relocation
P-52	Taxiways K and L Extension and Associated Improvements (Between Taxiway SS and Taxiway A11)
P-52a	Lift Station 18 Relocation
P-52b	Tank Farm Road Relocation
P-52c	Taxiways K and L Extension
P-53	United Airlines 180-Day Storage Building
P-54	United Airlines Move Team and Provisioning (AOS) Building
P-55	Detention Basin North of Temporary United Airlines Parking Lot
P-56	United Airlines Temporary Employee Parking Lot Relocation to Bravo Pad
P-57	East Airfield Lighting Control Vault (EALCV) Construction
P-58	Multi-Fuel Facility/Chicago Travel Plaza
P-59	Aeroterm/Air Canada Cargo Building Parking Lot West Expansion
P-60	United Parcel Service Parking Lot Improvements (South Cargo Area)
P-61	Runway 4L-22R Reconstruction
P-61a	Runway 22R Localizer Relocation (Clear of Taxiways North of Satellite 2)
P-61b	Taxiway NN Fillet Modification
P-62	Central De-icing Facility (CDF) Support Facilities/Pavement Area Modifications
P-62a	CDF Truck Rack Facility
P-62b	CDF United Airlines De-icing Administrative Building
P-62c	CDF American Airlines De-icing Administrative Building
P-63	Ground Run-Up Enclosure (GRE) Relocation

Past Projects	Project Name
P-63a	MMF Vehicle Service Center/Quick Turn Around
P-63b	MMF Quick Turn Around (QTA) Support Building
P-63c	MMF Customer Service Center
P-63d	Basin Modifications in Parking Lots E and F and MMF Ramp C
P-63e	Airport Transit System (ATS) Support Building in Lot F
P-63f	Traction Power Substation Building in Lot E
P-64	South Airfield Airport Surface Detection Equipment Model X Augmentation Tower
P-65	West Airfield Lighting Control Vault (WALCV)
Present and Reasonably Foreseeable Future Projects	**Project Name**
C-1	Runway 10C/28C Runway Status Lights (RWSL) Equipment Building
C-2	Runway 9C/27C Taxiway Modifications
C-2a	Airside Service Road Connector Across Taxiway Z
C-2b	Distance Measuring Equipment (DME) Relocation Site
C-2c	Fuel Line Relocation
C-2d	Ground Run-Up Enclosure (GRE) Relocation
C-2e	Guard Post 2 Relocation
C-2f	Hangar Road Relocation
C-2g	National Weather Service Weather Station Main and Backup Sites Relocations
C-2h	Runway 9C End Elevation Increase
C-2i	Runway 9C/27C NAVAID Shelters
C-2j	Salt Dome Demolition and Future Service Road Realignment
C-3	Revisions to Pavement Removal Associated with Former Runway 14L/32R (Includes New Taxilane C5 Pavement to Hold Aircraft)
C-4	Runway 9R/27L Runway Status Lights (RWSL) Equipment Building

Present and Reasonably Foreseeable Future Projects	Project Name
C-5	Chicago Police Canine Facility Relocation
C-6	Fuel Farm Administration and Control Building Construction and Pump Pad Replacement (West of Main Fuel Farm)
C-7	Rental Car Vehicle Storage/Maintenance Lots Revisions
C-7a	Revisions to Rental Car Vehicle Storage/Maintenance Lots
C-7b	Cell Phone Parking Lot Relocation
C-7c	Crash Lot Relocation
C-8	Lee Street Improvements (I-90 Exit Ramp), Higgins/Patton Intersection Improvements, Johnson Road Improvements, and Building 850 Parking Lot Relocation
C-9	North Employee/Long-Term Parking Lot Improvements (North of the Aviation Administration Building)
C-10	Terminal 3 Concourse L Stinger Two-Gate Addition and Associated Apron Pavement
C-10a	Former AT&T Garage (Existing CDA Storage) Demolition
C-10b	City Substation Building Demolition
C-11	Northwest Suburban Municipal Joint Action Water Agency (NSMJAWA) Generator Building
C-12	South Detention Basin Expansion
C-12a	West Side Expansion to Taxiway F
C-12b	North Side Expansion to Taxiway RR
C-12c	Demolition of Taxiway HH (South of Taxiway RR)
C-12d	Demolition of Taxiway JJ (from Taxiway HH to Taxiway JJ1)
C-12e	Central Detention Basin to South Detention Basin Connection Tunnel
C-12f	Central Detention Basin Pump Station Demolition
C-13	Central Detention Basin Fill
C-14	Relocation of Remote Transmitter/Receiver U (RTR-U)/Low Level Windshear Alert System (LLWAS) 16/Remote Unit (RU) 11/Airport Surface Detection Equipment Model X (ASDE-X)/Fixed-Target Reflector (FTR) (ALP Building 062)
C-15	Terminal 1 Concourse C Airline Lounge Expansion

Present and Reasonably Foreseeable Future Projects	Project Name
C-16	Terminal 5 Parking Garage - Phase I Relocation and Pedestrian Bridge Replacement
C-17	Northeast Cargo Snow Removal Pad
C-18	Runway 4L/22R Unidirectional Operations Changes
C-19	Airport Maintenance Complex (AMC) Expansion (Northeast), Salt Storage Relocation (ALP Building 501), and Detention Basin
C-20	Leak Repairs to Concourse B & C Pedestrian Tunnel – Construction
C-21	Runway 4L/22R Partial Reconstruction – Construction
C-22	Runway 4R/22L Rehabilitation and Rehabilitation of Taxiways Y, Y1, Y2, Y3, Y4, and V
C-23	Airport Maintenance Center (AMC) Building Renovations
C-24	Runway 9R/27L Rehabilitation
C-25	Taxiway LL Phase 2 Extension
C-26	Runway 10L/28R Rehabilitation
C-27	Runway 9R/27L Extension
C-28	Bravo Hold Pad Reconfiguration – Aircraft Hold-pad Construction
C-29	Taxiways A and B Relocation Phase 2
C-30	Infrastructure Asset Tagging Program
C-31	Airport Geographic Information System (GIS)
C-32	Airport Wide Pump Improvements
C-33	202.2A West Pump Pad Improvements
C-34	203.2C West Tank Farm Electrical & Control Upgrades
C-35	210.2E East Pump Pad Improvements
C-36	2GDBF New West Administration Building & Other Facility Renovations
C-37	312.1B Truck Rack & Vehicle Fueling Facility
C-38	313.1C-2 Super Satellite Enabling & Decommissioning

Present and Reasonably Foreseeable Future Projects	Project Name
C-39	315.1A New South Transmission Mains
C-40	314.1E.1 Vault Mods, EFSO and Related
C-41	Ring Tunnel Exhaust System, EM Haz gas, and smoke evac
C-42	H&R Ventilation and Pressurization – Design & Construction
C-43	Ring Tunnel – Electrical and Lighting Infrastructure
C-44	H&R Study Phase 2 – Testing, Balancing, (TAB and Commissioning Reports)
C-45	Upgrade Domestic Water Converters in H&R and Ops Tower
C-46	Comprehensive Sewer Televising Program
C-47	T1 & T3 Back-up Heat Exchange Pump
C-48	Sewer Main Lining- Construction
C-49	Fire Hydrant and Backflow Prevention Improvements
C-50	Domestic Water Pump Control Upgrades at H&R
C-51	Water Main Automatic Meter Readers Replacement
C-52	T2, T3, and Rotunda Heat Exchangers
C-53	Pedestrian Tunnels – Civil & Architectural Renovation (Construction)
C-54	United North Parking Lot Rehab – Design & Construction
C-55	Spine Road Relocation – Design & Construction
C-56	90" JAWA Relocation – Design & Construction
C-57	Concourse K Concessions Infrastructure Upgrades
C-58	Concourse L Renovation
C-59	L Concourse HVAC System Upgrades – Design & Construction
C-60	Ramp Tower Improvements - T1
C-61	Replacement of Rotunda Air Handling Units – Construction
C-62	Restroom Modernization Program – International - Phase 1

Present and Reasonably Foreseeable Future Projects	Project Name
C-63	Restroom Modernization Program – International - Phase 2
C-64	Terminal 1 - HVAC System Upgrades – Construction
C-65	Terminal 5 Design/Development/Procurement/CIP Management
C-66	T5 Comm. Room/Baggage Control Room HVAC Upgrades
C-67	Terminal Building ADA Improvements
C-68	Terminal LED Lighting Program – 2019
C-69	Ramp Tower Improvements – T3 L & K
C-70	T5 GIDS, Common Use Recheck Area, Baggage Make-up Monitors
C-71	Terminal 5 Security Camera Upgrades
C-72	Terminal 5 Self Park Upgrades
C-73	Terminal 1 Roof Replacement – Construction
C-74	H/K Skylight Repairs
C-75	Concourses H/K Public Area Architectural Renovations
C-76	Concourse B & C Public Area Architectural Renovations
C-77	Terminal 5 Fuel System and EFSO Upgrades
C-78	Terminal 5 Ticket Counter Baggage Scales
C-79	Common-Use Jet-bridge, PC Air, 400 Hz Replacements – T5
C-80	Guardbooth Replacement at Terminals
C-81	Terminal 3 LL Sprinkler System Conversion from Wet to Dry System
C-82	T1 – Terminal and Concourse Storm Sewer Repairs; Roof Drains & Oil/Water Separators
C-83	T3 – Terminal and Concourse Storm Sewer Repairs; Roof Drains & Oil/Water Separators
C-84	T1 B/C Terminal Apron Level Exterior Repairs (Masonry, Columns, Walls)
C-85	T3 G,H,K,L Term. Apron Level Exterior Repairs (Masonry, Columns, Walls)
C-86	Terminal Apron Level Exterior Repairs (Masonry, Columns, Walls) – T5

Present and Reasonably Foreseeable Future Projects	Project Name
C-87	Terminal Apron Level Overhead Roll-up Door Replacement – T1 B&C
C-88	Terminal Apron Level Overhead Roll-up Door Replacement – T3 G,H,K,L
C-89	Terminal Apron Level Overhead Roll-up Door Replacement – T5
C-90	Terminal Building ADA Improvements – T5
C-91	Terminal Core Upper-Level Expansion Joints
C-92	Terminal Domestic Water Infrastructure Improvements T1, B, C
C-93	Terminal Domestic Water Infrastructure Improvements T3, G, H, K, L
C-94	Terminal Fiber and Comm. Infrastructure Improvements T5
C-95	Common-Use Jet-bridge, PC Air, 400 Hz Replacements
C-96	Terrazzo Replacement in Concourse G, H, & K
C-97	T3 New Concessions/Freight Elevator – Design & Construction
C-98	T1 Exterior Emergency Stairwell Removal & Replacement
C-99	T3 Exterior Emergency Stairwell Removal & Replacement
C-100	T5 BAS & Fire Alarm System Controls Upgrades
C-101	T5 Common & Maintenance Area LED Lighting Upgrades
C-102	Concourse C Ramp Level Ceiling Replacement Drive Aisles
C-103	Fire Alarm System Replacements – Design & Construction
C-104	T5 HVAC Equipment & Controls Replacements & Upgrades
C-105	G,H/K & L Concourse Window, Gasket, and Panel Replacement
C-106	Concourse B & C Holdroom Architectural Renovations
C-107	Concourse G Holdroom Architectural Renovations
C-108	Concourse H/K Holdroom Architectural Renovations
C-109	Concourse G Public Area Architectural Renovations
C-110	T3 LL Metal Pan Ceiling Replacement Drive Aisles

Present and Reasonably Foreseeable Future Projects	Project Name
C-111	T3 G,H,K & L Roof Repairs
C-112	T5 Curtainwall Repairs & Replacement – Design & Construction
C-113	T5 Power Distribution Panels & Switchgear Upgrades & Recertification
C-114	T5 Architectural Renovations – Public Areas and Holdrooms
C-115	Elgin-O'Hare Western Bypass (IL-490)
C-116	Future Fly Quiet Program (Proposal is in development. No environmental review completed to date.)

5.16.1.4 Proposed Action

Implementation of the Proposed Action would result in temporary, one-time, construction-related criteria pollutant emissions. Criteria air pollutants associated with the Interim Proposed Action are presented in **Table 5.3-14** in **Section 5.3**. Criteria air pollutants associated the Build Out Proposed Action are presented in **Table 5.3-20** in **Section 5.3**. When the Interim Proposed Action and the Build Out Proposed Action are compared to the Interim No Action and Build Out No Action, respectively, the impacts are essentially the same aside from a minimal increase across all sources (except non-airport motor vehicles).

As discussed in **Section 5.3.7**, a number of projects at O'Hare that either have been or will be processed separately for NEPA are forecast to continue through the first six years of implementation of the Proposed Action. To disclose the potential cumulative impact of emissions, criteria air pollutant emissions inventories were conducted on those projects (referred to as Baseline Projects). A summary of total criteria pollutant emissions associated with the construction of the Proposed Action and Baseline Projects over the first six years of implementation of the Proposed Action are presented in **Table 5.3-26** in **Section 5.3**.

5.16.1.5 Mitigation and Minimization

As discussed in **Section 5.3**,the Proposed Action would not cause or contribute to any exceedances of the NAAQS nor delay attainment of the O_3 standard (for which the Chicago area is designated "nonattainment"). In addition, the air pollutant and pollutant precursor emissions that would result from the Proposed Action are included in the Illinois SIP, and as such, no mitigation measures are required. Regardless, the CDA is committed to implementing best practices to reduce public health and the environmental effects during construction and operation of the Proposed Action to the extent practicable. These best practices are described in the City's SAM. (See **Section 5.3.6** for more details).

5.16.2 Climate

This section describes the significance threshold(s) pertaining to climate, the methodologies used to determine cumulative GHG emissions associated with the No Action and Proposed Action Alternatives and the potential cumulative climate impacts. As discussed in **Section 5.4**, neither the No Action nor the Proposed Action would result in significant impacts on climate.

5.16.2.1 Methodology

As discussed in **Section 5.4.2**, there are currently no accepted methods of determining significance for aviation project-related GHG emissions, given the small percentage of emissions contributed. Consistent with FAA 1050.1F Desk Reference, a projection of the GHG emissions was estimated. The analysis in this EA relies on a combination of the AEDT and Version 2d Service Pack 2 to calculate GHG emissions associated with the No Action and Proposed Action Alternatives. Since the FAA has not established significance thresholds for climate, this section focuses on the disclosure of GHG emissions rather than on the effect determination.

5.16.2.2 Thresholds of Significance

The FAA has not established a significance threshold for climate.

5.16.2.3 No Action Alternative

Under the No Action Alternative (Interim and Build Out Conditions), the Proposed Action would not be implemented. Operations are forecast to increase under the No Action Alternative. GHG emissions associated with the Interim No Action are presented in **Table 5.3-3** in **Section 5.3**. Emissions associated with the Build Out No Action are presented in **Table 5.3-4** in **Section 5.3**.

5.16.2.4 Proposed Action

The Proposed Action would result in temporary (construction) sources and permanent (operational) sources of GHG emissions.

Construction-related sources of GHG emissions would occur only in the ten-year duration of the construction activities associated with the Proposed Action. These emissions are presented in **Table 5.3-2** in **Section 5.3.** As shown, the level of CO_2 varies from year to year, with the greatest level expected to occur in the second year of construction. GHG emissions associated with construction of the Interim Proposed Action can be found in **Table 5.3-5** in **Section 5.3**. As shown in the table, CO_2 emissions would increase approximately 0.1 million metric tons of CO_2 for the Interim Proposed Action compared to the Interim No Action. GHG emissions associated with the construction of the Build Out Proposed Action can be found in **Table 5.3-7** in **Section 5.3**. Similarly to the previous scenario, emissions of CO_2 would increase approximately 0.1 million metric tons for the Build Out Proposed Action when compared to the Build Out No Action.

Operational sources of CO_2 would occur during construction of the Proposed Action and after it has been completed. The potential for cumulative impacts to GHG emissions would result from the emissions associated with previously approved Baseline Projects (i.e., reasonably foreseeable emissions). These projects are considered to be present and/or reasonably foreseeable future actions and are forecast to continue through implementation of the Proposed Action. To disclose the potential cumulative increase in emissions, a GHG emissions inventory was prepared for the Baseline Projects. **Table 5.3-26** in **Section 5.3** presents the cumulative emissions (i.e., emissions resulting from present and reasonably foreseeable future actions) that would occur over the first six years of the Proposed Action.

5.16.2.5 Mitigation and Minimization

There are currently no regulatory standards for GHG emissions. Therefore, the estimated increase in airport-related emissions for the Proposed Action Alternative does not require mitigation. Regardless, the

CDA is committed to using best practices to reduce effects on public health and the environment during construction and operation of the Proposed Action. These emissions-related best practices are described in the City of Chicago's SAM. (See **Section 5.4.6** for more details).

5.16.3 Noise and Noise-Compatible Land Use

This section describes the significance threshold(s) pertaining to noise and noise-compatible land use. It also describes methodologies used to determine what, if any, effects the No Action and Proposed Action Alternatives would have on noise, as well as their potential effects on land use.

5.16.3.1 Methodology

Methods to describe existing noise conditions and forecast the future noise environment rely extensively on the FAA's required model for noise analysis, the AEDT, Version 2d Service Pack 2. Noise exposure is depicted by lines that delineate noise levels, also referred to as noise contours.

The noise contour analysis includes considerations such as:

- Number of aircraft operations by type,
- Types of aircraft,
- Day/nighttime distribution by type,
- Flight tracks,
- Runway utilization by type,
- Flight profiles,
- Typical operational procedures, and
- Average meteorological conditions.

For the purposes of this EA, data was taken from a variety of sources, including, but not limited to, CDA-surveyed runway coordinates and AEDT, FAA, and 2018 ANMS Data. See **Section 5.5.4** for more details.

5.16.3.2 Thresholds of Significance

FAA Order 1050.1F, Exhibit 4-1 provides the FAA's significance threshold for noise and noise-compatible land use. It states, "The action would increase noise by DNL [Day-Night Average Sound Level] 1.5 dB or more for a noise sensitive area that is exposed to noise at or above the DNL 65 dB noise exposure level, or that will be exposed at or above the DNL 65 dB level due to a DNL 1.5 dB or greater increase, when compared to the no action alternative for the same timeframe. For example, an increase from DNL 65.5 dB to 67 dB is considered a significant impact, as is an increase from DNL 63.5 dB to 65 dB."

5.16.3.3 No Action Alternative

Under the No Action Alternative (Interim and Build Out Conditions), the Proposed Action would not be implemented. Under the Existing Condition, the area exposed to 65 DNL or greater is approximately 10,280 acres. This area consists of a mixture of single-family homes, multi-family homes, and public parks, including 58 noise-sensitive sites. Within this area, 4,844 housing units and six schools have been sound insulated by the CDA, while 2,411 housing units and one school have not been sound insulated.[20] For both

[20] ORD Residential Sound Insulation Program, January 2021 database: City of Chicago.

the Interim No Action and the Build Out No Action, no cumulative increase in noise exposure would occur within any DNL noise contour. Therefore, no cumulative impacts with past, present, or foreseeable actions would occur.

5.16.3.4 Proposed Action

The Proposed Action would not cause any reportable cumulative change in noise levels. A comparison between the Interim No Action and the Interim Proposed Action DNL contours for the Proposed Action, along with any significant and reportable changes in noise, can be found in **Exhibit 5.5-21** in **Section 5.5** and **Exhibit 5.5-22** in **Section 5.5**. Information pertaining to the Build Out No Action and the Build Out Proposed Action can be found in **Exhibits 5.5-23** and **5.5-24** in **Section 5.5**.

5.16.3.4.1 Construction Impacts

Construction noise would temporarily increase sound levels in the immediate vicinity of construction and land clearing activities, with construction vehicles and equipment generating noise levels as high as 75 to 95 dB within 50 feet of their operation. Construction would take place on airport property; therefore, it is unlikely that area residents would experience any increase in noise during construction hours. Overall, construction noise associated with the Interim Proposed Action and the Build Out Proposed Action is expected to have little to no noise impact to sensitive land use or facilities. Any impact that does occur is expected to be minor and temporary.

5.16.3.4.2 Operational Impacts

Table 5.5-11 in **Section 5.5** presents noise exposure associated with the Interim Proposed Action, and **Exhibit 5.5-16** in **Section 5.5** presents the DNL noise contours associated with the Interim Proposed Action. Under the Interim Proposed Action, the area exposed to 65 DNL or greater is approximately 11,600 acres. This area contains mostly single-family homes, with the remainder consisting of a mixture of multi-family homes and public parks, including 47 noise-sensitive sites. Of the 9,156 housing units in this area, 4,533 housing units have been sound insulated by the CDA, and 223 are scheduled to be sound insulated as part of Phases 18 and 19.[21]

Table 5.5-13 in **Section 5.5** presents noise exposure associated with the Build Out Proposed Action, and **Exhibit 5.5-20** in **Section 5.5** presents the DNL noise contours associated with the Build Out Proposed Action. Under the Build Out Proposed Action, the area exposed to 65 DNL or greater is approximately 12,600 acres. This area consists of a mixture of single-family homes, multi-family homes, and public parks, including 67 noise-sensitive sites. Of the 11,379 housing units in this area, 5,102 housing units and seven schools have been sound insulated by the CDA, 266 housing units are scheduled to be sound-insulated as part of Phases 18 and 19, and one school has not been sound-insulated.[22]

Operations are forecast to increase independent of the Proposed Action. Change in noise exposure occurring independently of the Proposed Action will be mitigated by the CDA as part of its ongoing RSIP. **Exhibit 5.5-21** and **Exhibit 5.5-22** in **Section 5.5** presents a comparison between the Interim No Action and Interim Proposed Action DNL contours. Under the Interim Proposed Action, the level of change associated with the Proposed Action Alternative within the 65 DNL or greater contours is significant in a small area between West Green Street and the airport boundary in Bensenville; however, the areas of significant noise

[21] ORD Residential Sound Insulation Program, January 2021 database: City of Chicago.
[22] Ibid.

change do not overlay any non-compatible land use. Therefore, there are no significant noise impacts for the Interim Proposed Action.

Exhibits 5.5-23 and **5.5-24** in **Section 5.5** presents a comparison between the Build Out No Action and Build Out Proposed Action contours. Under the Build Out Proposed Action, the level of change associated with the Proposed Action is significant in areas extending west through Bensenville and Wood Dale. Furthermore, the areas of significant noise change overlay 2.9-acres of non-compatible land use in Bensenville, including residential areas and one school. There are 227 residential housing units that would be exposed to a significant noise impact with the Proposed Action; 224 have been previously mitigated with sound insulation by the CDA, making them compatible structures. Two of the three remaining residences are scheduled to be completed in 2022 as part of the CDA's ongoing RSIP for the OMP. One residence declined the invitation for sound insulation; therefore, the FAA has determined that the residence is compatible for noise purposes. The CDA and the FAA will evaluate one school that would be exposed to a significant noise impact for potential eligibility for school sound insultation.

5.16.3.5 Mitigation and Minimization

As discussed in **Section 5.16.3.4.1**, any potential noise impacts associated with the construction of the Interim Proposed Action and the Build Out Proposed Action would be minor and temporary. These impacts can be reduced using construction timing and staging. To further minimize potential noise impacts, construction equipment would be maintained to meet manufacturers' operating specifications. Additionally, impacts related to the delivery of materials may be minimized by requiring that the contractor use designated haul routes that directly connect to the airport and avoid residential and other noise-sensitive areas.

The Future Fly Quiet Program could be a measure that would change nighttime operational noise at O'Hare. While the Future Fly Quiet Program is listed in **Table 5.16-1**, it has not been analyzed by FAA for cumulative impact purposes because the program has not been finalized, and it has not undergone environmental review. It is not known how the potential program would affect noise contours and any of the off-airport properties that would be in an area of significant noise change.

5.16.4 Historical, Architectural, Archeological, and Cultural Resources

This section describes the significance threshold(s) pertaining to historical, architectural, archeological, and cultural resources. This section also describes methodologies used to determine the potential effects of the No Action and Proposed Action Alternatives on those resources and the potential historical, architectural, archeological, and cultural resource impacts. For the purposes of this section, the Interim and Build Out Conditions are irrelevant since the analysis evaluates the totality of the conditions; therefore, the No Action Alternative and the Proposed Action Alternative will be referred to by their overall titles: the No Action Alternative and the Proposed Action Alternative, respectively.

5.16.4.1 Methodology

The methodology for determining potential historic, architectural, archeological, and cultural resource impacts was to apply the guidance provided by the NHPA, Section 106 (36 CFR Part 800). The general steps in the process include: 1) establishing the APE; 2) identifying any resources in the area; and 3) determining whether the resources, if any, are included or eligible for inclusion on the NRHP or are protected by other related statutes such as the Native American Graves Protection and Repatriation Act.

An on-airport APE and an off-airport APE include direct and indirect disturbance areas, as shown on **Figures 5.6-1** and **5.6-2** in **Section 5.6**.

The FAA provides a factor to consider in evaluating the context and intensity of potential environmental impacts. This factor occurs when a proposed action would result in a finding of adverse effect through the process outlined in Section 106 of the NHPA. However, an adverse effect finding does not automatically trigger a significant impact determination.

An undertaking has an effect on an historic property when the undertaking may alter the characteristics of the property that qualify the property for inclusion in the NRHP. For the purpose of determining effect, alteration to features of the property's location, setting, or use may be relevant—depending on a property's significant characteristics—and should be considered.

5.16.4.2 Thresholds of Significance

The FAA has not established a significance threshold for historical, architectural, archeological, and cultural resources.

5.16.4.3 No Action Alternative

Under the No Action Alternative (Interim No Action and Build Out No Action), the Proposed Action would not be implemented. Under the No Action Alternative, no ground-disturbing activities would occur. The airport would continue to operate and serve forecast aviation demands. As described in **Section 5.6.2.1.2**, evaluation of the on-airport APE identified three historic, architectural, archeological, or cultural properties that are recommended as eligible for listing on the NRHP. Due to the absence of ground disturbance, no contribution to cumulative impacts regarding NRHP resources would occur as a result of the No Action Alternative.

5.16.4.4 Proposed Action

Construction of the Proposed Action would involve ground-disturbing activities, including excavation and grading, as well as new buildings and pavement within the on-airport APE. As described in **Section 5.6.2.1.2**, evaluation of this APE identified three on-airport properties as eligible for the NRHP. The Illinois SSHPO concurred with the FAA's determinations of eligibility in letters dated September 12, 2019 and December 18, 2019 (see **Appendix G**). Identified historic properties were presented to Section 106 consulting parties during a meeting on August 3, 2021, and are listed in **Table 5.6-1** in **Section 5.6**. Furthermore, as described in **Section 5.6.3**, the FAA has determined that there would be no adverse effect on Terminal 1 or the Rotunda.The FAA has also determined that there would be no effect on the CDA Control Tower.

Operation of the Proposed Action would not result in modification or disturbance of any off-airport historic, architectural, archeological, or cultural resource. Therefore, no cumulative impacts associated with past, present, or reasonably foreseeable future projects would occur as a result of the Proposed Action.

5.16.4.5 Mitigation and Minimization

Because there are no significant cumulative impacts expected under the Proposed Action, no mitigation is warranted.

5.16.5 Department of Transportation Act, Section 4(f)

5.16.5.1 Methodology

The methodology for identifying impacts to Section 4(f) properties first involves the identification of public parks, recreation areas, wildlife/waterfowl refuges of national, state, or local significance, and historic sites of national, state, or local significance. A determination is made as to how and whether the Proposed Action would have a "use" of Section 4(f) properties either directly or indirectly.

5.16.5.2 Threshold of Significance

Exhibit 4-1 of FAA Order 1050.1F provides the FAA's significance threshold for Section 4(f) properties, which states that a significant impact would occur if "the action involves more than a minimal physical use of a Section 4(f) resource or constitutes a 'constructive use' based on an FAA determination that the aviation project would substantially impair the Section 4(f) resource."

5.16.5.3 No Action Alternative

Under the No Action Alternative (Interim No Action and Build Out No Action), the Proposed Action would not be implemented. The No Action Alternative would not result in any direct or indirect use of any Section 4(f) resource. Therefore, no effect to Section 4(f) resources would occur under the No Action Alternative.

5.16.5.4 Proposed Action

As mentioned in **Section 5.7.2.2**, the Proposed Action would result in no effect to the CDA Control Tower and no adverse effect under Section 106 to the Rotunda and Terminal 1. As a result, the FAA has determined that there would be no impact for the CDA Control Tower and a *de minimis* impact for Terminal 1 and the Rotunda under Section 4(f).

Since all construction activity will occur on-airport, analysis of off-airport impacts was limited to constructive use. The FAA also determined that the Proposed Action would not result in a constructive use effect on any off-airport Section 4(f) properties.

As a result, the Proposed Action would not have a significant impact on any Section 4(f) properties. Therefore, no constructive use of any Section 4(f) properties in the vicinity of the airport would occur.

5.16.5.5 Mitigation and Minimization

No significant cumulative Section 4(f) resource impacts would occur with the Proposed Action, and no mitigation measures are warranted.

5.16.6 Biological Resources

5.16.6.1 Methodology

The methodology for identifying impacts to biological resources is based on identifying listed threatened and endangered species present in the study area and determining, through coordination and consultation with federal and state resource agencies, whether these threatened or endangered species would be affected by the Proposed Action. It also includes identifying non-listed species and habitat that supports those species.

5.16.6.2 Threshold of Significance

Exhibit 4-1 of FAA Order 1050.1F provides the FAA's significance threshold for biological resources (including fish, wildlife, and plants). A significant impact to biological resources would occur when the "U.S. Fish and Wildlife Service or the National Marine Fisheries Service determines that the action would be likely to jeopardize the continued existence of a Federally-listed threatened or endangered species, or would result in the destruction or adverse modification of federally-designated critical habitat." As discussed in **Section 5.8.4**, the FAA has not established a significance threshold for non-listed species; however, FAA Order 1050.1F lists factors to consider when determining significance for non-listed species.

5.16.6.3 No Action Alternative

Under the No Action Alternative (Interim and Build Out Conditions), the Proposed Action would not be implemented. No impacts to upland plant communities or wetlands would occur under the No Action Alternative. The regional ecosystem would remain unchanged. No suitable habitat for threatened or endangered species is present on the airport. Therefore, no effect to threatened or endangered species would occur under the No Action Alternative.

5.16.6.4 Proposed Action

Both the Interim Proposed Action and the Build Out Proposed Action would contribute to the cumulative loss of previously disturbed habitat on the airport that supports common biotic species. The Proposed Action would also result in an increase in the amount of impervious surface on the airport. The loss of these habitats would not impact any threatened or endangered species.

5.16.6.5 Mitigation and Minimization

No significant cumulative biological resource impacts would occur with the Proposed Action, and no mitigation measures are warranted. Regardless, the CDA would incorporate BMPs into project construction practices to minimize impacts to habitats on the airport. These may include BMPs for erosion and sediment control and installation of silt curtains and berms.

5.16.7 Light Emissions and Visual Impacts

5.16.7.1 Methodology

The methodology for identifying impacts related to light emissions and visual impacts is based on whether new sources of light emissions would occur and whether arriving aircraft would have a change in light intensity.

5.16.7.2 Threshold of Significance

The FAA has not established a significance threshold for light emission and visual impacts.

5.16.7.3 No Action Alternative

Under the No Action Alternative (Interim and Build Out Conditions), the Proposed Action would not be implemented. No new light sources would occur with the No Action Alternative, and no contribution to the additional light sources when considering all cumulative projects would occur.

As described in **Section 5.9.4.1** for the No Action Alternative, the offset approach currently in use would not exist; therefore, there would be a change in the position of the aircraft's light emissions with respect to a viewer's position on the ground. None of the cumulative projects would result in any change in arriving aircraft; therefore, no cumulative light emissions and visual impacts would occur under the No Action Alternative.

5.16.7.4 Proposed Action

New light sources would occur under the Proposed Action with the development of the Group 2 buildings. However, these light sources would generally be shielded and not visible to off-airport land uses. Thus, the Proposed Action would not contribute to additional light sources that would occur with the cumulative projects.

The Proposed Action would not change the current approaches for arriving aircraft on Runway 10R and Runway 28L. Therefore, the Proposed Action would not contribute to any cumulative impacts associated with light intensity of arriving aircraft.

5.16.7.5 Mitigation and Minimization

No significant cumulative light emissions or visual impacts would occur with the Proposed Action, and no mitigation measures are warranted.

5.16.8 Hazardous Materials, Solid Waste, and Pollution Prevention

5.16.8.1 Methodology

The methodology for analyzing hazardous materials impacts is based on identifying sites containing hazardous materials and underground storage tanks and determining whether any of the sites would be affected. The methodology for analyzing solid waste impacts is based on identifying the generation of solid waste by individuals during construction.

5.16.8.2 Threshold of Significance

The FAA has not established a significance threshold for hazardous materials, solid waste, and pollution prevention; however, as described in **Section 5.10.3**, the FAA has identified factors to consider that may apply to hazardous materials, solid waste, and pollution prevention.

5.16.8.3 No Action Alternative

Under the No Action Alternative (Interim No Action and Build Out No Action), the Proposed Action would not be implemented. The No Action Alternative would not result in any impacts to known hazardous materials sites. In addition, an increase in solid waste generated would be proportional with the forecast of increased passenger activity that would occur under the No Action Alternative. In addition, the pollution prevention measures outlined in the SAM would continue to be implemented. Thus, no cumulative hazardous materials or solid waste impacts would occur under the No Action Alternative.

5.16.8.4 Proposed Action

The Proposed Action would be designed and operated in coordination with the SAM. During construction, all rules and regulations outlined in the SAM would be followed, and no significant impacts related to hazardous materials would occur. An increase in solid waste generated would be proportional to the

forecast of increased passenger activity that would occur under the Proposed Action, and the pollution prevention measures outlined in the SAM would continue to be implemented. Thus, no cumulative hazardous materials or solid waste impacts would occur under the Proposed Action.

5.16.8.5 Mitigation and Minimization

No significant cumulative impacts related to hazardous materials, solid waste, or pollution prevention would occur with the Proposed Action, and no mitigation measures are warranted.

5.16.9 Natural Resources and Energy Supply

This section describes the significance threshold(s) pertaining to natural resources and energy supply. This section also describes the methodologies used to determine the potential cumulative effects of the No Action and Proposed Action Alternatives on those resources as well as potential cumulative natural resource and energy supply impacts.

5.16.9.1 Methodology

This EA evaluates potential impacts of the Proposed Action on natural resources and energy supplies in the study area. The demands on natural resources and energy supply were determined for the No Action Alternative, the Interim Propsoed Action, and the Build Out Proposed Action. Projected demands were compared to the baseline to determine change and how the different scenarios would influence natural resource consumption and the relative availability of resources, such as:

- Utilities servicing the area,
- Water resources,
- Electricity consumption,
- Fuel consumption, and
- Consumable materials—especially scarce or unusual materials—in and around the study area.

Potentially significant effects could occur if the action would potentially cause demand to exceed available or future supplies of these resources, which include aviation and surface vehicle fuel, construction material, and electrical power.

5.16.9.2 Thresholds of Significance

The FAA has not established a significance threshold for natural resources and energy supply; however, as stated in **Section 5.10.4.1**, the FAA does list one factor to be considered when evaluating the context and intensity of potential impacts on natural resources and energy supply.

5.16.9.3 No Action Alternative

5.16.9.3.1 Construction Impacts

Under the No Action Alternative (Interim No Action and Build Out No Action), the Proposed Action would not be implemented. Under the No Action Alternative, no construction-related consumption of natural resources is anticipated. Therefore, the No Action Alternative would not cause or contribute to cumulative natural resources impacts.

5.16.9.3.2 Operational Impacts

Under the No Action Alternative (Interim No Action and Build Out No Action), the Proposed Action would not be implemented. Under the No Action Alternative, the consumption of materials considered rare or regionally unavailable would not occur. The demand for aviation fuel would not exceed available regional supplies. The airport would continue using energy, water, and other natural resources as needed to support the overall operation of O'Hare's facilities. This includes the fuel consumption associated with increased aircraft and GSE operations, which is expected to occur regardless of the Proposed Action (see **Chapter 1**). Energy and water demands draw from conventional and readily available fuel sources and are not anticipated to exceed future supply. Additionally, no changes to employee busing operations are expected in the Interim No Action or Build Out No Action. Therefore, the overall No Action Alternative would not cause or contribute to cumulative impacts to energy supply or consumption of resources.

5.16.9.4 Proposed Action

5.16.9.4.1 Construction Impacts

Temporary increases associated with the Proposed Action include construction-related use of materials, such as aggregates and subbase materials for foundations; roadways, wood, steel, and concrete for building construction; and fuels and oils needed to operate heavy machinery. The cumulative quantity of natural resources required to construct the Proposed Action would not place undue strain on the quantity of supplies in the area. None of the materials needed for construction of the Interim Proposed Action or the Build Out Proposed Action are considered to be cost-prohibitive, unusual, or regionally unavailable. Fuel, electricity, and natural gas use for construction would be relatively small and temporary in nature, lasting only for the duration of construction for each phase of the Proposed Action. Further, these fuel sources are widely available in the area. Therefore, construction of the Proposed Action would not result in cumulative impacts to natural resources or energy supply.

5.16.9.4.2 Operational Impacts

Operational activities associated with the Proposed Action require use of electricity and natural gas for heating, cooling, and ventilation systems for facilities; consumption of jet fuel and aviation gasoline for aircraft operations; and consumption of gasoline and diesel fuel during operation of ground service equipment. Increases in electricity and natural gas consumption are due to new and expanded strucutres under the Proposed Action. Electricity and natural gas are readily available from regional sources, as well as the worldwide marketplace, and needs are not anticipated to exceed future supply. Additionally, the CDA has confirmed that local public utilities have the capacity to supply adequate quantities of both natural gas and electricity to support the cumulative operation of the overall Proposed Action Alternative, including the Intertim Proposed Action, the Build Out Proposed Action, and all associated Baseline Projects (see **Section 5.11** for more details).

No changes in employee busing operations would occur under the Interim Proposed Action; however, the Build Out Proposed Action intends to relocate employee busing facilities from the existing location to a new western facility. This change is expected to increase vehicle miles traveled, but the associated increase in fuel use is not anticipated to result in supply shortages. Therefore, operation of the Proposed Action would not cause or contribute to cumulative impacts related to energy consumption.

As verified by the CDA (see **Section 5.11.4.1**), the airport's water pump station has sufficient capacity to supply all future water needs based on preliminary modeling. Additionally, the City of Chicago Department of Water Management has the capacity to supply adequate quantities of water for the Proposed

Action. Therefore, the operation of the Proposed Action would not cause or contribute to cumulative impacts related to water supply.

5.16.9.5 Mitigation and Minimization

No cumulative impacts are expected. Therefore, no mitigation of cumulative impacts is required. As described in **Section 5.11**, the CDA's SAM specifies a number of sustainability requirements that would minimize the use of natural resources and energy during the construction and operation of the Proposed Action.

5.16.10 Surface Transportation and Parking

This section describes the significance threshold(s) pertaining to surface transportation and parking. This section also describes the methodologies used to determine the potential cumulative effects of the No Action and Proposed Action Alternatives on those categories and the potential cumulative surface transportation and parking impacts.

5.16.10.1 Methodology

As described in **Section 5.12.4**, two traffic models, VISSIM and SYNCHRO, were collected from 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** presents the relationships 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.**

5.16.10.2 Thresholds of Significance

The FAA has not identified a threshold level of significance for impacts to socioeconomics, including surface transportation and parking; however, as discussed in **Section 5.12.4**, FAA Order 1050.1F Desk Reference identifies one factor that applies to surface transportation and parking.

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. These thresholds are defined for LOS and V/C ratios (see **Section 5.12.2**). 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. 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. For this EA, a significant impact (threshold of significance) on roadway operations is defined as an increase in the V/C ratio. 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.

5.16.10.3 No Action Alternative

Under the No Action Alternative (Interim No Action and Build Out No Action), the Proposed Action would not be implemented. **Table 5.12-3** in **Section 5.12.4** presents LOS and V/C ratios for surface traffic on-airport

roadway segments for the Interim No Action. This analysis takes into account the surface traffic generated by all of the cumulative projects. As shown in the table, all on-airport roadway segments have an acceptable LOS under the Interim No Action. As a result, no cumulative impacts to on-airport roadways would occur with the Interim No Action. **Table 5.12-4** in **Section 5.12.4** presents LOS and V/C ratios determined for surface traffic on off-airport roadway segments under the Interim No Action. Under the Interim No Action, all off-airport roadway segments are within an acceptable range of LOS. Therefore, no cumulative impacts pertaining to off-airport roadway segments would occur. For reference, **Exhibit 5.12-4** in **Section 5.12.4** presents a visual representation of the LOS accounting for surface traffic that would occur with all of the cumulative projects, including the Interim No Action.

Table 5.12-5 in **Section 5.12** presents LOS and V/C ratios for surface traffic on terminal roadway segments for the Build Out No Action. Under the Build Out No Action, six on-airport roadway locations with an unacceptable LOS have been identified (see **Section 5.12.8**). **Table 5.12-6** in **Section 5.12** presents LOS and V/C ratios for surface traffic on off-airport roadway segments for the Build Out No Action. Under the Build Out No Action, three off-airport intersections with an unacceptable LOS have been identified. For reference, **Exhibit 5.12-6** in **Section 5.12** presents a visual representation of the LOS accounting for surface traffic that would occur with all of the cumulative projects.

5.16.10.4 Proposed Action

As shown in **Table 5.12-3** in **Section 5.12**, the LOS for all on-airport roadway segments are acceptable. The LOS would be the same under the Interim Proposed Action and the Interim No Action, which indicates that there will be no cumulative impacts to on-airport roadways under the Interim Proposed Action. **Table 5.12-4** in **Section 5.12** presents LOS and V/C ratios determined for surface traffic on off-airport roadway segments under the Interim No Action compared with the Interim Proposed Action. Under the Interim Proposed Action, all off-aiprort roadways fall within an acceptable range of LOS. Therefore, no cumulative impacts to off-airport roadways will occur under the Interim Proposed Action. **Exhibit 5.12-5** in **Section 5.12** presents a visual representation of the LOS under the Interim Proposed Action.

As shown in **Table 5.12-5** in **Section 5.12,** one on-airport roadway location was identified as having an unacceptable LOS (E) and a high V/C ratio (0.90) under the Build Out Proposed Action**.** However, under the Build Out No Action, this location is identified as having an LOS F and a V/C ratio of 1.03. Therefore, under the Build Out Proposed Action, this location would operate at a better LOS and have a lower V/C ratio than the Build Out No Action. As a result, the Build Out Proposed Action does not contribute to any cumulative impacts regarding on-airport roadways. **Table 5.12-6** in **Section 5.12** indicates a cumulative decrease in LOS during the Build Out Proposed Action would occur at three off-airport locations (nodes 110, 115, and 520); however, due to a combination of factors, including V/C ratio, intentional overestimates, etc., there are no cumulative significant impacts, and mitigation is not needed to prevent degredation at these locations (see **Section 5.12.9**). Each remaining location presented in the table is identified as having an acceptable LOS. Therefore, the Build Out Proposed Action will not contribute to cumulative impacts for off-airport roadways. For reference, **Exhibit 5.12-7** in **Section 5.12** presents a visual representation of the LOS under the Build Out Proposed Action.

5.16.10.5 Mitigation and Minimization

No cumulative impacts are expected. Therefore, no mitigation of cumulative impacts is required.

5.16.11 Water Resources

This section describes significance threshold(s) and cumulative impacts pertaining to water resources, including wetlands, floodplains, surface waters, and water quality. This section also describes methodologies used to determine potential effects and identifies the potential water resource impacts of the No Action and Proposed Action Alternatives, as well as mitigation measures, if needed.

5.16.11.1 Methodology

5.16.11.1.1 Wetlands

As described in **Section 5.13.3.1**, the footprint of the Proposed Action (including a 50-foot buffer to consider the potential extent of grading limits and ground disturbance) were compared to delineated wetlands to determine direct impacts, if any, to wetlands. Any wetland impacts identified were classified as natural or artificial to determine whether permitting or mitigation will be required.

5.16.11.1.2 Floodplains

Changes to drainage patterns, increases in impervious surface area, and changes in the configuration and capacities of storm sewer and detention basins can affect the potential for flooding. To determine the Proposed Action's direct impacts, the footprint was compared to existing FEMA regulatory floodplain/floodway maps (including approved LOMRs) to determine direct floodplain impacts.

The potential exists for indirect impacts resulting from changes in drainage patterns and increases in impervious surfaces.

5.16.11.1.3 Surface Waters

Airside stormwater includes stormwater associated with de-icing chemicals. At O'Hare, de-icing chemicals are collected into the airport's internal collection system operated under its NPDES permit. The Future Airport Layout Plan Drainage Systems Engineering Report (August 2019) is the basis of the methodology and analysis for the Proposed Action. It also forms the foundation of the surface water analysis for the following landside projects evaluated in this EA:

- The hotel development adjacent to the multi-modal facility on the east side of the airport south of Zemke Road (CDA Project #22),
- The Centralized Distribution and Receiving Facility (CDA Project #35), and
- Western Land Reserve Area (CDA Projects #10, 11, 12, 13, 14).

5.16.11.2 Thresholds of Significance

5.16.11.2.1 Wetlands

FAA Order 1050.1F, Exhibit 4-1, defines the FAA's significance threshold for wetlands, which states that a significant impact would occur if "the action would:

- Adversely affect a wetland's function to protect the quality or quantity of municipal water supplies, including surface waters and sole source and other aquifers;
- Substantially alter the hydrology needed to sustain the affected wetland system's values and functions or those of a wetland to which it is connected;
- Substantially reduce the affected wetland's ability to retain floodwaters or storm runoff, thereby threatening public health, safety, or welfare (the term welfare includes cultural, recreational, and scientific resources or property important to the public);
- Adversely affect the maintenance of natural systems supporting wildlife and fish habitat or economically important timber, food, or fiber resources of the affected or surrounding wetlands;
- Promote development of secondary activities or services that would cause the circumstances listed above to occur; or
- Be inconsistent with applicable state wetland strategies."

5.16.11.2.2 Floodplains

FAA Order 1050.1F, Exhibit 4-1 defines the FAA's significance threshold for floodplains, which states, "The action would cause notable adverse impacts on natural and beneficial floodplain values."

5.16.11.2.3 Surface Waters

FAA Order 1050.1F, Exhibit 4-1, defines the FAA's significance threshold for surface waters, which states,"The action would:

- Exceed water quality standards established by federal, state, local, and tribal regulatory agencies;
- Contaminate public drinking water supply such that public health may be adversely affected."

5.16.11.3 No Action Alternative

Under the No Action Alternative (Interim No Action and Build Out No Action), the Proposed Action would not be implemented. As discussed in **Section 5.13.4.1**, it is assumed that under the Interim No Action, all cumulative projects (including baseline projects) will have gone through required planning and environmental reviews to identify and design any permitting and/or mitigation actions needed to offset impacts that may have occurred before (or concurrent with) project implementation. Therefore, no cumulative impacts are associated with the Interim No Action. As discussed in **Section 5.13.4.2**, under the Build Out No Action, it is assumed that the airport will continue to operate and maintain its drainage and surface water infrastructure system in accordance with regulatory requirements. Therefore, no cumulative impacts are associated with the Build Out No Action. Consequently, no cumulative impacts are associated with the No Action Alternative.

5.16.11.4 Proposed Action

Cumulative impacts associated with construction of the Interim Proposed Action and Build Out Proposed Action would be temporary. The primary construction impacts would be associated with quality of surface water due to erosion and siltation from ground disturbing activities. However, as discussed in **Section 5.13.4**, the CDA has established requirements designed to mitigate construction impacts. Therefore, construction of the Proposed Action does not contribute to cumulative impacts.

Projects associated with the Proposed Action that would take place near or within the existing terminal and taxiway area would occur on land that has previously been heavily disturbed. A total of 1.17 acres of non-jurisdictional wetlands would be affected under the Interim Proposed Action. Under the Build Out Proposed Action, an additional 0.31 acre of non-jurisdictional wetlands would be affected, resulting in a cumulative total of 1.48 acres of wetland impact.

No portion of the Proposed Action would fall within the 100-year floodplain or floodway. Both the Interim and Build Out Proposed Action would result in a cumulative increase in impervious surface area and changes to stormwater infrastrucure and drainage patterns. However, as discussed in **Section 5.13.4.3**, adequate storage exists to meet the regulatory release rate and storage requirement for the Proposed Action. Additionally, under both the Interim Proposed Action and the Build Out Proposed Action, there would be no cumulative impacts to floodplains. Therefore, under the Proposed Action, no cumulative impacts to floodplains would occur.

5.16.11.5 Mitigation and Minimization

Wetlands that would be impacted by the Proposed Action at O'Hare are not natural and are characterized as small, isolated areas with relatively low water quality and limited runoff storage function due to their small sizes. These wetlands are not jurisdictional under the CWA and do not provide functions that rise to a level requiring mitigation. However, efforts would be made to minimize impacts during design.

No portion of the Proposed Action would fall within the 100-year floodplain or floodway. Therefore, the Proposed Action would not result in impacts to regulated floodplains.

Impacts to water quality during construction would be minimized through the use of Storm Water Pollution Prevention Plans, which include erosion control plans and BMPs. The use of silt fences and/or vegetative filter strips to buffer drainages would also be included in the erosion control plans. Additionally, areas of disturbance would be re-vegetated to minimize erosion.

Based on the information above, the impacts to water resources can be mitigated and minimized such that no significant cumulative impacts result from the Proposed Action.

5.16.12 Environmental Justice

This section describes the regulations, affected environment, significance threshold(s), and methodology of analysis and identifies the potential cumulative effects of the No Action and Proposed Action Alternatives on environmental justice populations.

5.16.12.1 Methodology

The analysis in this section, consistent with FAA requirements, considers the potential for the Proposed Action to result in a disproportionately high and adverse impact on EJ populations.

5.16.12.2 Thresholds of Significance

FAA Order 1050.1F does not provide a significance threshold for EJ; however, it does provide a number of factors to consider in evaluating the context and intensity of potential environmental impacts. These include when "the action would have the potential to lead to a disproportionately high and adverse impact to an environmental justice population (i.e., a low-income or minority population) due to:

- Significant impacts in other environmental impact categories or

- Impacts on the physical or natural environment that affect an environmental justice population in a way that the FAA determines are unique to the environmental justice population and significant to that population."

5.16.12.3 No Action Alternative

Under the No Action Alternative (Interim No Action and Build Out No Action), the Proposed Action would not be implemented. Therefore, no EJ analysis was conducted. Because no action would be taken, no cumulative impacts would occur as a result of the Interim No Action or Build Out No Action.

5.16.12.4 Proposed Action

5.16.12.4.1 Construction Impacts

Under both the Interim and Build Out Proposed Action Alternatives, construction of all projects would take place only on airport property. No direct impacts would occur to EJ populations. Thus, the Interim and Build Out Proposed Action would not have significant cumulative impacts associated with EJ.

5.16.12.4.2 Operational Impacts

Significant effects on the noise environment (and therefore EJ impacts) are anticipated for the Build Out Condition of the Proposed Action Alternative (see **Section 5.14**). However, mitigation measures previously implemented and measures that are scheduled to be completed in 2022 as part of the CDA's RSIP would decrease the noise impact on the dwellings to a level that is considered less than significant. Therefore, no impacts to the physical or natural environment would occur that would also uniquely and significantly affect EJ populations. Additionally, FAA determined that the Proposed Action would not disproportionately burden racial or ethnic minorities, nor would it disproportionately burden low-income populations. Therefore, the Proposed Action would not result in significant cumulative impacts.

5.16.12.5 Mitigation and Minimization

Because no significant cumulative impacts are expected under the Proposed Action, no mitigation is warranted.

5.16.13 Summary of Cumulative Impacts

A review of the above environmental resource categories indicates that there would be no significant cumulative impacts associated with the Proposed Action.