ATTACHMENT F-4
ALTITUDE CONTROL CODE DEVELOPMENT MEMORANDUMS

A review of flight track data from the ANMS indicated that some aircraft arriving to and departing from O'Hare commonly fly procedures not represented by standard AEDT profiles. More accurate modeling of those flights required AEDT's Altitude Control Code (ACC) methodology to adjust the standard profiles where necessary along the trajectory to emulate the actual flight profiles seen in the flight track data. The AEDT tracks are duplicated and are indicated by "ACC" appended to the track name in the detailed usage tables in **Attachment F-3**.

The EA team modeled the O'Hare arrival and departure operations for the future conditions using the standard AEDT flight profiles in conjunction with ACC methodology to accurately represent aircraft altitudes along level flight segments. For the future conditions, however, the application of ACCs was informed by the TAAM modeling as opposed to using radar flight track data.

For the future conditions, the default AEDT flight profile data was adjusted to incorporate all lengthy level flight segments (three NM or longer) below 8,000 feet MSL that were simulated in TAAM. Every modeled track in the TAAM simulations was checked for these level segments, and the data was added to the AEDT.

HMMH
700 District Ave, Suite 800
Burlington, Massachusetts 01803
781.229.0707
www.hmmh.com

TECHNICAL MEMORANDUM

To:	Amy Hanson Environmental Specialist Federal Aviation Administration 2300 E. Devon Ave Room 320 Des Plaines, IL 60018
From:	Robert Mentzer Jr., Principal Consultant Sarah Yenson, Senior Consultant
Date:	September 16, 2020
Subject:	Altitude Control Code Methodology for the Existing Condition AEDT Modeling for the Chicago O'Hare International Airport Terminal Area Plan and Air Traffic Procedures Environmental Assessment
Reference:	HMMH Project Number 307171.002.007.012

The Federal Aviation Administration's (FAA) Aviation Environmental Design Tool (AEDT) version 2d Service Pack 2 (AEDT 2d SP2)[1] models noise and emissions using a standard aircraft database. Among the aircraft properties in this database is a set of standard climb and descent procedures[2]. A typical AEDT 2d SP2 standard departure procedure consists of the following procedure statements: 1) Takeoff; 2) Climb to 1,000 feet; 3) Accelerate and retract flaps; 4) Climb to 3,000 feet; 5) Accelerate to 250 knots; 6) Climb to 10,000 feet. The standard procedures in AEDT 2d SP2 can be refined by including altitude control codes (ACC) to represent target altitudes at various points along the flight track that would not normally be present in the standard climb/descent procedure. The use of ACCs is considered a standard modeling method by the FAA and therefore does not require FAA approval as a nonstandard modeling method.

Due to traffic separation requirements in the busy airspace near Chicago O'Hare International Airport (ORD), Air Traffic Control (ATC) uses altitude holds (level-offs) for many operations at the airport. These altitude holds are examples of flight procedures that can be modeled by using ACCs. This memo describes the methodology developed by HMMH to implement ACCs and refine the modeling of altitude holds for the Terminal Area Plan and Air Traffic Procedures (TAP) Environmental Assessment's 2018 Existing Condition scenario.

Before conducting any altitude analysis, model flight tracks[3] were developed from FAA radar flight tracking data and approved by the FAA ATC. The model flight tracks are representative of the primary routes flown by a specific aircraft category (wide body jet, non-wide body jet and propeller-driven aircraft). The type of flight operations (e.g. wide body jet arrivals) used to develop a modeled flight track are assigned to that track bundle for modeling. The flight track bundles are input to AEDT 2d SP2 in only two dimensions as coordinates of longitude and latitude, representing the aircraft's location over the ground. The model assigns altitude according to its database of standard climb and descent profiles for specific aircraft types on each model track if no ACCs are used. When an ACC is assigned to a model flight track, AEDT will modify the standard climb or descent profile to best match the ACC altitude.

[1] AEDT version 2d SP2 is the version of the AEDT available when the modeling for this project started.

[2] AEDT's standard procedures determine the aircraft's modeled altitude, power setting, and speed along a model flight track.

[3] The model flight track bundles generally consist of a main average track and four average sub-tracks representing the dispersion of the actual radar flight track data for a specified route.

1. Quantitative Altitude Hold Analysis

A Python script was used to analyze radar track data for a statistical sample[4] of ORD flight operations in 2018 to identify where constant altitude flight segments occurred and therefore where ACCs should be applied to create an altitude hold for operations in each track bundle. First, the script reads in the representative model tracks for each track bundle from a GIS shapefile, then reads and processes radar track data to allocate radar tracks to the appropriate modeled track, thus populating the track bundles with the representative and the actual flight tracks. The shapefile used to develop this methodology represented 1,567 model tracks. The radar data sample used included radar tracks that were assigned in track bundles for 662 model tracks.

Next, the code removes extraneous points from the radar tracks and clips them to the extent of the study area. In each track bundle, the script determines the altitude profile for each radar track included in the bundle, relating the altitude to the distance along the flight track. Once the track's profile is available, the process identifies altitude holds for each track. The criterion used to identify an altitude hold for modeling is a consistent altitude over at least 3.5 continuous nautical miles (NM)[5] below 7,000 feet (ft) mean sea level (MSL) where a consistent altitude was defined as within 200 ft of the prior altitude measurement. From the altitude profiles for the tracks in each track bundle, the code calculates an average altitude profile for that bundle and identifies where the altitude holds occur for this average profile. In this methodology, only tracks with altitude holds contribute to the altitude profile for the representative track.

Figure 1 shows an example plot of the ground track (top) and altitude profile (bottom) of a representative model track bundle, which includes the modeled representative tracks (red) and the bundled radar tracks, both with altitude holds (blue) and without (gray) altitude holds for arrivals to Runway 9R. Model tracks shown in Figure 1 include a main average track as well as two sub-tracks to represent the dispersion of the radar data. In the figures, the ACCs represented in the altitude profile apply to the main track and the sub-tracks as well.

[4] Twelve weeks of data – one week per month was evaluated to generate the 2018 Existing Condition track data.

[5] The 3.5 NM requirement was retained from the altitude hold analysis performed for the Written Re-Evaluation of the Environmental Impact Statement for the Interim Fly Quiet Runway Rotation Plan (IFQ Re-Eval), where analysis determined that the shortest altitude hold was 3.5 NM.

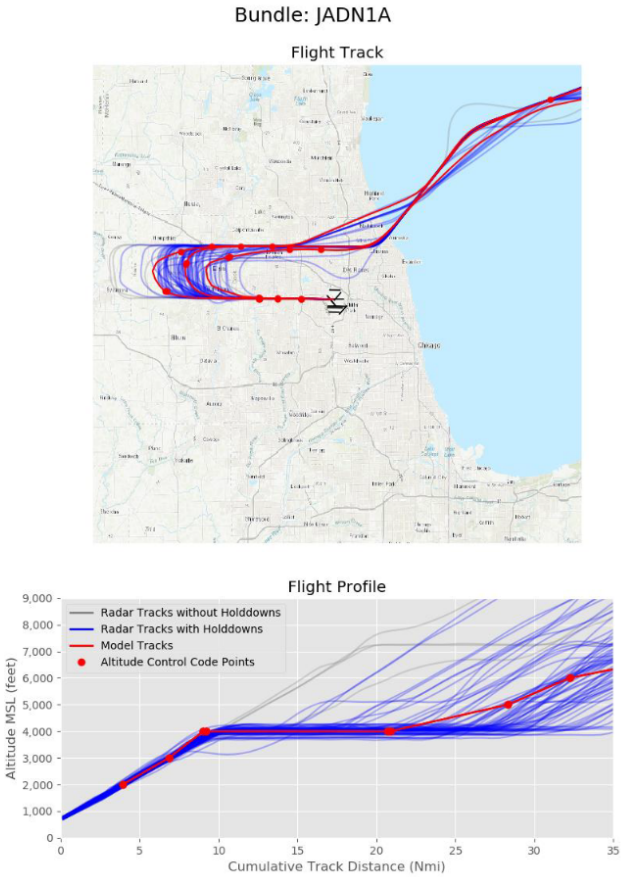

Figure 1: Flight Tracks (top) and Altitude Profiles (bottom) for Modeled Arrival Track JADN1A on Runway 9R

Source: 2018 ANMS CDA and HMMH 2019 analysis

This figure shows a concentration of radar flight tracks performing an altitude hold at an altitude of 4,000 ft MSL. The altitude hold initiation point varies widely, with holds starting beyond 35 NM from the airport to 13 NM from the airport. The altitude hold exit is more consistent at approximately 9 NM from the airport, though some variation exists for it and for the altitude at which the hold occurs. Given the characteristics of this track—a clear common exit from generally common level altitude—its characteristics can be determined reasonably well using the visual and statistical methods. However, though initiation of the altitude hold is more unclear, the use of the Python-based analytical method provides us with a quantitative average distance for where the altitude hold begins.

For this example, the Python script identifies most tracks to be level between 10 and 20 NM, so this track was modeled with ACCs to simulate a level segment at 4,000 ft MSL from 9 to 21 NM. This figure, specifically the descent into the altitude hold, illustrates how the variations in the starting points of the altitude hold contribute to the resulting average descent profile.

Figure 2 shows a larger track bundle (one center backbone and four sub-tracks) for an arrival to Runway 27L. While multiple hold levels can be seen below 7,000 ft, the script determines the lower more conservative altitude hold for the model track bundle. The method identified an average hold altitude of approximately 4,000 ft MSL and calculated the altitude hold entry at about 19 NM. Operations from the blue radar tracks will be assigned to the model tracks with the ACC and operations from the grey radar tracks will be assigned to a duplicate set of model tracks without ACC.

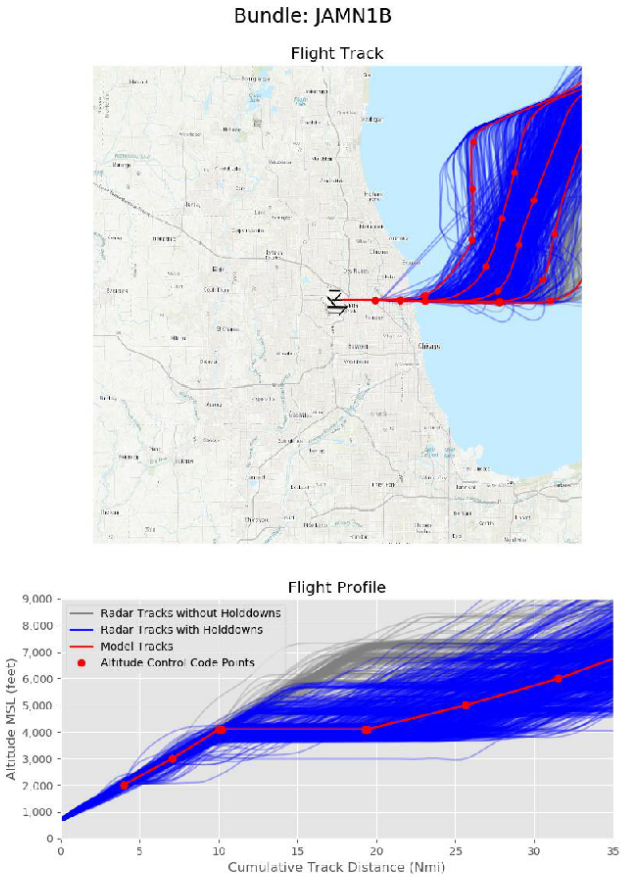

Figure 2: Flight Tracks (top) and Radar Altitude Profiles (bottom) for Modeled Arrival Track JAMN1B on Runway 27L

Source: 2018 ANMS CDA and HMMH 2019 analysis

Though using the automated altitude hold identification method simplifies the identification of the altitude holds, some track bundles still do not have common constant altitude segments. Figure 3 shows such an arrival bundle, with multiple altitude holds indicated. In this case, no one altitude dominated, so the tracks in this bundle were left untouched and not modeled with any ACCs, therefore using the AEDT 2d SP2 default descent profiles.

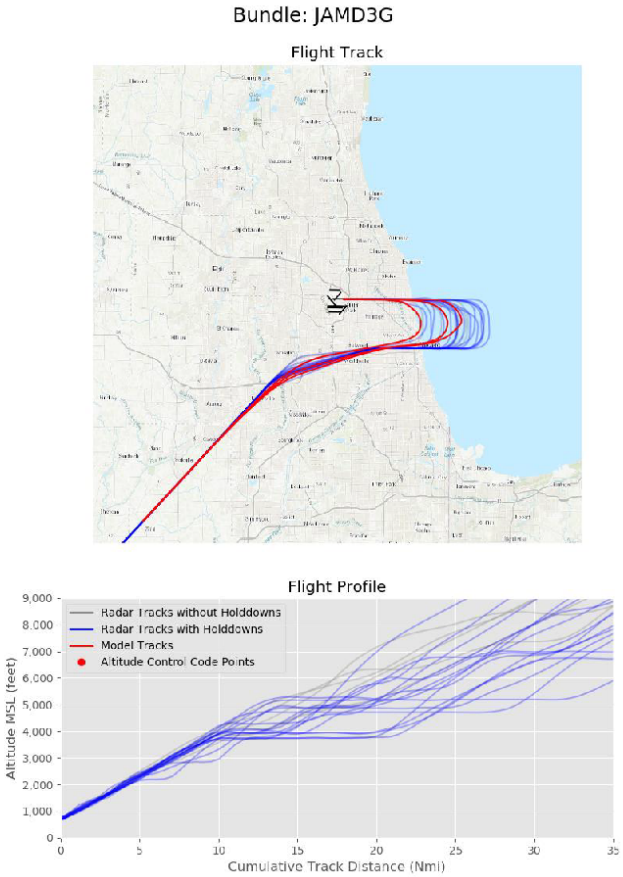

Figure 3: Flight Tracks (top) and Radar Altitude Profiles (bottom) for Modeled Arrival Track JAMD3G on Runway 27L

Source: 2018 ANMS CDA and HMMH 2019 analysis

Figure 4 shows a departure model track bundle for Runway 9R. This bundle shows a reasonably concentrated entry and exit to the hold band for the tracks with altitude holds, and the Python script allows us to quantitatively model an average entry to and exit from the altitude hold.

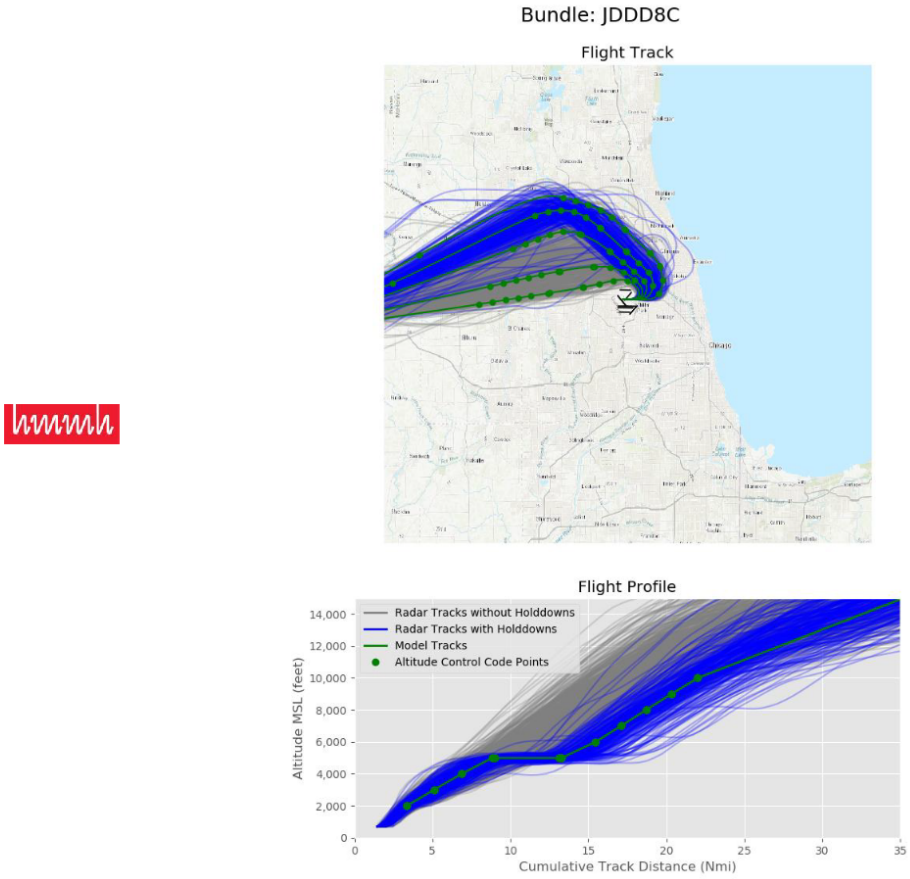

Figure 4: Flight Tracks (top) and Radar Altitude Profiles (bottom) for Modeled Departure Track JDDD8C on Runway 9R

Source: 2018 ANMS CDA and HMMH 2019 analysis

Figure 5 shows a reasonably common entry into an altitude hold, but the multiple altitudes and variable exit points resulted in an inability to calculate a common ACC altitude profile for this track bundle. Thus, this bundle was not modeled using with ACC and used the default AEDT 2d SP2 climb profile.

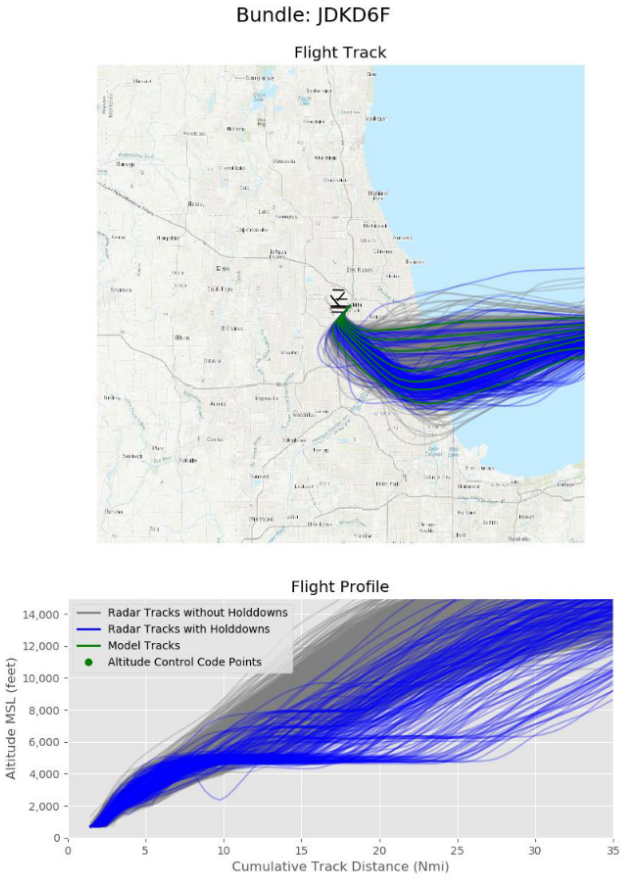

Figure 5: Flight Tracks (top) and Radar Altitude Profiles (bottom) for Modeled Departure Track JDKD6F on Runway 22L

Source: 2018 ANMS CDA and HMMH 2019 analysis

The AEDT 2d SP2 study for the 2018 Existing Condition evaluated 214,276 radar tracks and 662 model tracks. There are additional model tracks not evaluated for ACCs in the AEDT 2d SP2 study due to cloned tracks from different aircraft type categories or intersection departures on Runway 10L-28R.

The methodology described here developed ACCs from 176,441 radar tracks for 397 track bundles, representing 82% of the radar tracks in the study. ACCs were not assigned for the remaining 265 model tracks evaluated. A full listing of all model tracks with ACCs applied and their altitude hold information is given in APPENDIX A.

2. AEDT 2d SP2 Implementation

If it was determined that ACCs should be applied to a modeled flight track, duplicate tracks were created in AEDT 2d SP2, one with ACCs and one without. At each altitude hold, the software adds ACCs to the start and

end of the level segment, specifying the altitude the aircraft should achieve at these points. A transition point, located 1,000 ft inside the altitude hold, ensures that AEDT 2d SP2 handles the altitude hold appropriately. Aside from the altitude hold section of the profiles, ACCs were also added to the tracks at cardinal altitudes (1,000 ft increments) to ensure the climb and descent gradients match the average bundle profile as closely as possible. Finally, a single point was added to the end of the track to simulate the resumed climbing for departures or the beginning of a normal descent for arrivals. Once the ACC processing finishes, the script validates the resulting tracks to verify that the climb and descent profiles are as expected; e.g., arrivals do not climb.

To test the ACC modeling, a simplified model run was performed using the ACC tracks, using each aircraft type represented in the track bundle. Some AEDT 2d SP2 aircraft failed to perform correctly on the ACC track, for example because of the nature of how AEDT 2d SP2 defines their performance profiles, or because they do not have sufficient thrust to reach the specified altitude at the specified distance. These aircraft were reassigned to the non-ACC track, while those that performed correctly on the ACC track were retained on that track.

For each bundle to which ACCs were applied, the fraction of radar tracks with altitude holds was determined and that fraction used to proportionally assign the number of operations to the ACC track. For example, a bundle with two altitude holds and eight without altitude holds would assign 20% of the radar tracks to the ACC altitude profile. Tracks and track bundles that did not have ACCs applied use the AEDT default climb or descent profiles.

APPENDIX A. TRACK BUNDLE DESCRIPTION

The following table lists the 397 model tracks assigned ACCs from the radar data sample. No ACCs were assigned to the remaining 265 model tracks evaluated. These tracks are not listed in the following table.

The following table comes from the 2018 NOMS CDA and HMMH 2019 analysis. The table provides the model track, the runway used, whether the model track is an arrival (A) or departure (D), the altitude at which the altitude hold occurs, the cumulative distances from the airport at which the altitude hold starts and ends, and the number of radar tracks associated with the model track.

Runway	Operation Type	Modeled Track Name	Level Flight Altitude (ft MSL)	Start (NM)	End (NM)	Radar Track Count
4R	A	JABN1A	3,900	9.0	18.9	1
4R	A	JABN1A	5,100	20.4	24.3	1
4R	A	JABN1B	3,900	9.0	14.0	1
4R	A	JABN2A	4,100	9.5	15.0	3
4R	A	JABN2B	4,900	8.5	17.4	5
4R	A	JABN2C	4,900	14.1	18.4	4
4R	A	JABN2D	5,000	10.0	14.0	1
4R	A	JABN2D	4,600	21.4	28.8	1
4R	A	JABN3A	4,900	10.0	18.9	14
4R	A	JABN3B	5,200	9.0	15.5	2
4R	A	JABN3C	5,000	9.5	18.4	2
4R	A	JABN4A	4,900	9.0	14.0	7
4R	A	JABN4A	4,900	14.5	18.4	7
4R	A	JABN4B	5,000	9.0	14.0	4
9L	A	JACD1E	4,800	9.0	22.9	525
9L	A	JACD1F	5,000	9.0	23.9	869
9L	A	JACD1G	4,900	9.5	22.9	954
9L	A	JACD1H	5,100	9.0	25.3	8
9L	A	JACD1I	4,700	10.0	24.3	57
9L	A	JACD1J	4,700	9.0	25.3	25
9L	A	JACD2A	4,800	9.5	29.8	8
9L	A	JACD2A	5,000	37.7	53.0	8
9L	A	JACD2A	4,100	53.5	66.8	8
9L	A	JACD2B	5,100	10.5	16.0	12
9L	A	JACD2C	5,000	9.0	16.9	12
9L	A	JACD2C	5,100	17.4	21.4	12
9L	A	JACD2D	4,900	9.5	23.4	560
9L	A	JACD2E	4,100	9.5	22.4	215
9L	A	JACD3A	5,100	10.0	17.4	11
9L	A	JACD3B	5,400	9.5	20.9	67
9L	A	JACD4A	5,000	9.5	23.9	16

Runway	Operation Type	Modeled Track Name	Level Flight Altitude (ft MSL)	Start (NM)	End (NM)	Radar Track Count
9L	A	JACD4B	5,000	9.5	23.9	4
9L	A	JACD4B	4,100	27.3	31.8	4
9L	A	JACD4B	4,800	35.2	40.6	4
9L	A	JACD4C	4,000	10.0	22.9	3,675
9L	A	JACN1A	4,100	9.0	24.3	14
9L	A	JACN1B	3,900	9.5	23.9	374
9L	A	JACN1C	4,100	9.0	23.4	136
9L	A	JACN2A	4,800	9.0	22.9	25
9L	A	JACN2B	4,800	9.5	26.8	17
9L	A	JACN2C	4,600	9.0	24.8	9
9L	A	JACN4A	4,900	9.5	21.9	259
9L	A	PACD1A	5,100	9.0	19.9	17
9L	A	PACD1A	3,900	20.4	24.8	17
9L	A	PACD1B	4,200	9.5	21.4	7
9L	A	PACD3A	3,900	8.5	25.3	18
9L	A	PACD3A	4,900	25.8	32.2	18
9L	A	PACD4A	4,000	9.5	19.9	102
9L	A	PACN4A	4,900	10.5	20.4	16
9R	A	JADD1A	4,000	9.5	36.7	2
9R	A	JADD1A	5,000	45.1	50.5	2
9R	A	JADD1B	4,900	9.5	19.4	62
9R	A	JADD1B	5,200	19.9	30.3	62
9R	A	JADD1B	4,100	30.8	36.2	62
9R	A	JADD1C	4,000	10.5	30.8	5
9R	A	JADD2A	4,800	13.0	21.4	46
9R	A	JADD2A	4,600	21.9	31.8	46
9R	A	JADD2B	4,100	12.5	41.6	25
9R	A	JADD3B	4,900	14.5	22.9	250
9R	A	JADD3C	3,900	7.6	35.7	2
9R	A	JADD4B	4,000	9.5	26.8	11
9R	A	JADD4B	4,900	27.3	32.7	11
9R	A	JADN1A	4,000	9.0	20.9	69
9R	A	JADN1B	4,000	9.5	22.9	25
9R	A	JADN2A	4,100	9.0	24.8	2
9R	A	JADN2B	4,900	12.0	21.4	4
9R	A	JADN2B	3,900	21.9	25.8	4
9R	A	JADN2C	5,000	18.4	30.8	2

Runway	Operation Type	Modeled Track Name	Level Flight Altitude (ft MSL)	Start (NM)	End (NM)	Radar Track Count
9R	A	JADN3A	4,800	12.5	18.9	6
9R	A	JADN3B	5,000	10.0	14.0	30
9R	A	JADN4A	4,700	9.5	25.8	5
9R	A	JADN4A	5,000	26.3	31.8	5
9R	A	JADN4B	5,300	10.5	22.4	51
10C	A	JAVD1A	5,100	12.0	19.9	1,189
10C	A	JAVD1A	5,400	183.7	191.6	1,189
10C	A	JAVD1C	5,000	13.0	26.3	280
10C	A	JAVD1C	5,000	26.8	30.8	280
10C	A	JAVD2A	5,100	11.5	16.9	438
10C	A	JAVD2B	3,900	12.5	29.3	1,208
10C	A	JAVD2C	4,000	12.0	17.4	282
10C	A	JAVD2D	4,500	13.5	24.3	9
10C	A	JAVD2E	4,800	11.0	29.3	7
10C	A	JAVD2F	4,800	9.5	16.0	7
10C	A	JAVD2F	5,400	16.4	23.4	7
10C	A	JAVD2G	4,100	9.0	33.2	3
10C	A	JAVD2H	4,100	12.5	23.9	276
10C	A	JAVD2H	3,900	24.3	28.8	276
10C	A	JAVD2I	4,400	12.5	28.8	828
10C	A	JAVD2I	4,600	29.3	34.7	828
10C	A	JAVD3A	5,000	12.5	17.9	4,799
10C	A	JAVD3B	5,700	13.5	21.9	931
10C	A	JAVD4A	6,100	13.5	20.4	1,484
10C	A	JAVD4B	4,000	14.5	18.9	68
10C	A	JAVD4D	5,200	12.0	25.3	17
10C	A	JAVD4D	5,000	25.8	31.3	17
10C	A	JAVD4E	5,300	12.5	17.4	22
10C	A	JAVD4E	4,100	17.9	22.9	22
10C	A	JAVD4E	4,900	34.2	38.2	22
10C	A	JAVN1A	3,900	12.5	18.9	15
10C	A	JAVN1A	5,100	19.4	26.3	15
10C	A	JAVN1B	5,300	9.5	15.5	16
10C	A	JAVN1C	4,800	10.0	16.9	427
10C	A	JAVN2A	5,000	10.0	16.9	44
10C	A	JAVN2B	5,000	12.0	25.3	90
10C	A	JAVN2C	5,000	12.5	43.6	22

Runway	Operation Type	Modeled Track Name	Level Flight Altitude (ft MSL)	Start (NM)	End (NM)	Radar Track Count
10C	A	JAVN2D	4,900	10.0	14.5	194
10C	A	JAVN2E	5,800	13.5	28.8	184
10C	A	JAVN2F	5,000	12.5	37.2	50
10C	A	JAVN2F	4,000	37.7	41.6	50
10C	A	JAVN2G	5,100	9.5	16.4	57
10C	A	JAVN2H	5,000	10.0	16.4	307
10C	A	JAVN2I	4,900	13.5	29.8	165
10C	A	JAVN2J	5,100	10.0	18.9	6
10C	A	JAVN3A	4,000	12.5	17.4	289
10C	A	JAVN3B	4,000	10.0	14.0	695
10C	A	JAVN3C	5,000	12.5	16.4	88
10C	A	JAVN4A	4,900	10.0	16.4	34
10C	A	JAVN4B	5,000	9.5	15.0	675
10C	A	PAVD3A	4,900	12.0	18.4	26
10L	A	JAED1A	4,900	10.0	15.0	8
10L	A	JAED1B	5,200	11.0	21.4	8
10L	A	JAED1B	4,900	25.8	33.2	8
10L	A	JAED2A	4,100	11.5	27.3	7
10L	A	JAED2B	5,000	11.5	29.8	14
10L	A	JAED3A	4,000	12.0	22.4	17
10L	A	JAED4A	5,300	13.0	19.4	13
10L	A	JAEN1A	5,000	9.5	16.0	92
10L	A	JAEN1B	5,000	9.0	17.4	5
10L	A	JAEN1C	4,100	9.0	17.9	8
10L	A	JAEN1D	4,900	11.5	19.4	2
10L	A	JAEN1D	5,000	24.4	31.7	2
10L	A	JAEN2A	4,900	9.0	17.9	5
10L	A	JAEN2B	3,600	9.5	17.4	34
10L	A	JAEN2C	4,200	10.5	16.0	40
10L	A	JAEN2D	4,600	12.0	18.4	9
10L	A	JAEN2E	5,100	9.5	13.5	6
10L	A	JAEN2E	5,100	14.0	25.8	6
10L	A	JAEN2F	4,900	12.0	19.9	14
10L	A	JAEN2F	4,200	20.5	24.3	14
10L	A	JAEN2G	4,600	9.6	16.0	14
10L	A	JAEN2H	5,000	12.5	24.8	10
10L	A	JAEN2I	3,800	9.5	16.9	24

Runway	Operation Type	Modeled Track Name	Level Flight Altitude (ft MSL)	Start (NM)	End (NM)	Radar Track Count
10L	A	JAEN3A	5,100	11.0	15.5	9
10L	A	JAEN3B	4,800	10.0	16.4	45
10L	A	JAEN3C	5,000	10.1	15.5	243
10L	A	JAEN3D	4,000	12.5	16.4	3
10L	A	JAEN4A	4,000	9.5	16.4	250
10L	A	JAEN4B	4,600	11.2	17.9	2
10R	A	JAWD1A	4,100	12.0	17.9	3
10R	A	JAWD1B	5,000	11.5	27.3	5
10R	A	JAWD1B	5,300	27.8	36.2	5
10R	A	JAWD1C	3,900	12.0	24.8	39
10R	A	JAWD1C	4,200	25.5	29.3	39
10R	A	JAWD1D	4,600	13.0	35.7	49
10R	A	JAWD1E	4,900	12.5	32.2	70
10R	A	JAWD1F	5,000	13.0	35.2	9
10R	A	JAWD2A	5,100	12.0	27.8	205
10R	A	JAWD2A	4,100	28.3	32.2	205
10R	A	JAWD2B	4,100	12.5	35.2	126
10R	A	JAWD2C	3,900	13.5	26.8	778
10R	A	JAWD2D	5,200	12.5	35.2	593
10R	A	JAWD2E	5,000	12.5	27.8	1,419
10R	A	JAWD2F	5,100	13.5	36.7	889
10R	A	JAWD2G	5,000	12.0	28.3	929
10R	A	JAWD3A	5,000	13.0	19.4	91
10R	A	JAWD3B	5,400	12.5	21.4	266
10R	A	JAWD3C	5,800	14.0	21.4	56
10R	A	JAWD4A	4,100	12.5	23.9	79
10R	A	JAWN1A	4,700	9.0	25.8	3
10R	A	JAWN1B	5,100	12.5	20.4	5
10R	A	JAWN1B	5,400	20.9	26.3	5
10R	A	JAWN2A	3,600	12.0	29.8	162
10R	A	JAWN3A	5,200	13.5	18.4	5
10R	A	JAWN3B	6,200	14.5	20.9	3
10R	A	JAWN4A	4,200	13.0	20.4	5
10R	A	JAWN4A	4,800	20.9	26.8	5
10R	A	JAWN4A	4,200	28.8	36.7	5
10R	A	PAWD3A	5,200	13.0	20.4	140
22L	A	JAKD1A	5,500	10.5	19.9	6

Runway	Operation Type	Modeled Track Name	Level Flight Altitude (ft MSL)	Start (NM)	End (NM)	Radar Track Count
22L	A	JAKD1A	4,100	26.3	33.2	6
22L	A	JAKN1A	5,000	9.5	18.4	2
22L	A	JAKN2A	5,100	10.5	18.4	2
22L	A	JAKN3B	4,000	11.2	30.8	1
22L	A	JAKN3B	3,500	33.7	46.1	1
22L	A	JAKN4A	3,700	18.9	29.8	1
22R	A	JALD1A	5,100	4.1	8.1	3
22R	A	JALD2A	6,500	13.0	17.4	2
22R	A	JALD3A	3,900	13.0	20.4	5
22R	A	JALD3A	5,000	23.4	32.7	5
22R	A	JALD4A	3,900	13.5	17.9	8
27L	A	JAMD1B	4,000	14.0	20.9	2,824
27L	A	JAMD2A	4,900	11.5	19.9	47
27L	A	JAMD2B	5,100	12.0	20.9	292
27L	A	JAMD2E	4,800	13.0	17.9	99
27L	A	JAMD3A	4,200	14.5	18.9	653
27L	A	JAMD3B	4,100	9.0	15.0	28
27L	A	JAMD3B	4,300	15.5	20.9	28
27L	A	JAMD3C	4,600	10.2	22.9	28
27L	A	JAMD3D	4,500	12.5	18.4	753
27L	A	JAMD3F	5,000	13.5	21.9	30
27L	A	JAMD4A	6,100	13.0	16.9	36
27L	A	JAMD4B	5,200	13.5	24.3	3
27L	A	JAMD4C	6,200	13.0	17.4	104
27L	A	JAMD4D	4,100	10.0	15.0	576
27L	A	JAMD4D	4,100	15.5	19.4	576
27L	A	JAMD4E	4,900	9.5	13.5	6
27L	A	JAMN1A	5,000	11.5	16.4	15
27L	A	JAMN1A	4,100	16.9	20.9	15
27L	A	JAMN1B	5,000	10.0	19.4	774
27L	A	JAMN1C	5,000	14.0	19.4	2
27L	A	JAMN2A	6,300	12.0	19.9	36
27L	A	JAMN2A	6,700	25.3	29.3	36
27L	A	JAMN2B	3,800	10.5	15.4	140
27L	A	JAMN2C	4,100	13.0	17.9	673
27L	A	JAMN2D	4,900	11.5	15.5	465
27L	A	JAMN2E	5,800	10.0	23.4	3

Runway	Operation Type	Modeled Track Name	Level Flight Altitude (ft MSL)	Start (NM)	End (NM)	Radar Track Count
27L	A	JAMN3A	3,700	8.5	18.4	10
27L	A	JAMN3A	4,000	18.9	24.4	10
27L	A	JAMN3B	3,900	8.5	19.4	29
27L	A	JAMN3B	5,100	19.9	24.4	29
27L	A	JAMN3C	5,500	9.0	15.0	261
27L	A	JAMN3D	5,900	9.7	15.5	63
27L	A	JAMN3E	5,100	10.5	16.0	459
27L	A	JAMN4A	3,900	10.0	16.4	37
27L	A	JAMN4B	7,200	9.5	15.5	3
27L	A	JAMN4C	5,000	10.5	20.9	118
27L	A	JAMN4D	4,900	9.0	16.0	686
27L	A	PAMD3A	4,100	12.0	19.9	7
27L	A	PAMD3A	4,000	20.5	24.3	7
27L	A	PAMD3A	5,300	24.8	29.3	7
27L	A	PAMD4A	4,000	23.0	26.8	5
27L	A	PAMN4A	9,000	9.5	16.0	5
27L	A	PAMN4B	4,100	8.5	18.4	7
27L	A	PAMN4B	5,200	18.9	23.4	7
27L	A	PAMN4B	3,600	35.2	46.1	7
27R	A	JAND1A	6,400	9.5	23.4	573
27R	A	JAND1B	3,900	9.0	23.4	4,094
27R	A	JAND1C	5,100	10.5	24.4	697
27R	A	JAND1D	5,100	9.0	23.9	120
27R	A	JAND2A	5,000	9.0	30.8	9
27R	A	JAND2B	4,100	9.5	18.4	57
27R	A	JAND2C	4,500	10.5	15.0	17
27R	A	JAND2C	6,500	15.5	20.9	17
27R	A	JAND2C	5,200	21.4	25.3	17
27R	A	JAND2D	5,000	9.5	28.3	23
27R	A	JAND3A	4,800	8.5	12.5	11
27R	A	JAND3A	3,800	13.0	16.9	11
27R	A	JAND3B	4,000	10.0	21.9	7
27R	A	JAND3B	4,900	22.4	26.8	7
27R	A	JAND3C	3,800	9.0	23.4	231
27R	A	JAND3D	4,000	9.0	24.4	387
27R	A	JAND3E	3,900	10.5	24.8	48
27R	A	JAND4A	5,500	9.5	24.8	38

Runway	Operation Type	Modeled Track Name	Level Flight Altitude (ft MSL)	Start (NM)	End (NM)	Radar Track Count
27R	A	JAND4C	3,800	9.0	22.4	5,877
27R	A	JANN1A	4,000	10.0	27.8	3
27R	A	JANN1B	4,000	10.5	23.9	307
27R	A	JANN3A	4,300	8.5	21.9	2
27R	A	JANN3A	4,100	26.3	38.7	2
27R	A	JANN3A	4,800	43.8	55.0	2
27R	A	JANN3B	4,200	9.5	22.9	5
27R	A	JANN3C	4,600	9.5	25.8	6
27R	A	JANN4A	4,900	9.5	23.4	12
27R	A	JANN4A	5,000	23.9	27.8	12
27R	A	JANN4C	5,300	10.5	23.9	320
27R	A	PAND1A	4,000	9.0	20.4	15
27R	A	PAND1A	4,300	37.7	41.6	15
27R	A	PAND2A	4,200	9.5	16.0	6
27R	A	PAND2A	4,000	16.5	30.3	6
27R	A	PAND2A	4,900	30.8	36.7	6
27R	A	PAND3A	4,000	8.1	15.5	44
27R	A	PAND3A	4,400	16.1	19.9	44
27R	A	PAND4A	4,800	9.0	16.9	89
27R	A	PAND4B	3,800	9.0	17.4	50
27R	A	PANN4A	4,900	9.0	16.9	24
27R	A	PANN4A	5,300	32.7	36.7	24
28C	A	JAZD1A	3,600	12.0	23.9	1,654
28C	A	JAZD1A	5,000	31.3	36.2	1,654
28C	A	JAZD1B	3,700	13.0	22.4	9
28C	A	JAZD2A	6,200	13.5	22.4	1,295
28C	A	JAZD2B	4,100	13.0	19.4	796
28C	A	JAZD3B	4,000	13.5	29.8	502
28C	A	JAZD3B	4,800	30.3	34.2	502
28C	A	JAZD3C	4,600	12.0	26.8	2,485
28C	A	JAZD3C	5,000	27.3	31.3	2,485
28C	A	JAZD4A	4,000	13.5	23.9	28
28C	A	JAZD4A	3,800	24.3	31.3	28
28C	A	JAZD4A	9,100	31.8	39.7	28
28C	A	JAZD4A	9,500	40.2	46.1	28
28C	A	JAZD4C	4,700	12.0	22.9	6
28C	A	JAZD4F	4,800	12.5	25.3	108

Runway	Operation Type	Modeled Track Name	Level Flight Altitude (ft MSL)	Start (NM)	End (NM)	Radar Track Count
28C	A	JAZD4F	5,500	25.8	29.8	108
28C	A	JAZD4G	4,100	12.5	23.4	70
28C	A	JAZD4G	4,100	24.0	28.8	70
28C	A	JAZD4I	4,400	13.0	25.8	53
28C	A	JAZN1A	4,200	14.0	19.4	229
28C	A	JAZN1B	4,500	9.0	13.0	15
28C	A	JAZN2A	6,600	12.5	17.4	337
28C	A	JAZN2C	4,000	9.0	15.5	27
28C	A	JAZN2D	4,100	15.9	23.4	13
28C	A	JAZN3A	4,500	9.5	16.9	18
28C	A	JAZN3B	3,600	10.5	14.5	21
28C	A	JAZN3C	3,900	12.5	16.9	84
28C	A	JAZN3D	5,000	11.5	16.4	257
28C	A	JAZN3D	6,400	16.9	20.9	257
28C	A	JAZN3E	4,700	13.0	18.9	620
28C	A	JAZN4A	3,800	10.6	16.4	20
28C	A	JAZN4B	4,100	9.5	15.0	297
28C	A	PAZD3A	4,000	12.5	20.9	219
28C	A	PAZD3A	4,000	21.4	27.3	219
28C	A	PAZD3A	4,300	31.3	35.2	219
28C	A	PAZD3A	4,300	35.7	39.7	219
28R	A	JAOD1B	3,700	12.5	35.7	1
28R	A	JAOD1B	4,100	38.2	42.1	1
28R	A	JAOD1B	5,100	5.1	31.5	1
28R	A	JAOD2A	5,200	11.5	16.9	5
28R	A	JAOD2C	5,100	12.0	24.8	3
28R	A	JAOD3A	5,000	12.5	30.8	7
28R	A	JAOD3B	5,100	12.0	29.8	13
28R	A	JAOD3D	5,100	11.5	16.4	5
28R	A	JAOD4A	4,000	16.4	27.3	1
28R	A	JAOD4A	4,000	8.8	25.5	1
28R	A	JAOD4B	6,000	12.5	17.4	3
28R	A	JAOD4C	5,700	12.5	18.9	3
28R	A	JAOD4C	3,800	19.4	28.8	3
28R	A	JAOD4D	4,700	12.5	26.8	5
28R	A	JAOD4D	5,400	27.3	40.2	5
28R	A	JAOD4E	4,000	9.5	15.0	4

Runway	Operation Type	Modeled Track Name	Level Flight Altitude (ft MSL)	Start (NM)	End (NM)	Radar Track Count
28R	A	JAOD4F	4,900	12.0	33.7	3
28R	A	JAON1A	5,300	9.0	14.0	3
28R	A	JAON1C	4,800	9.0	14.5	21
28R	A	JAON1D	6,400	10.0	15.0	3
28R	A	JAON2C	6,700	9.0	13.5	70
28R	A	JAON2D	7,400	10.0	16.0	20
28R	A	JAON3A	4,000	9.6	15.5	19
28R	A	JAON3B	4,300	9.0	19.9	3
28R	A	JAON3C	4,700	9.5	15.0	18
28R	A	JAON3D	3,600	9.6	16.0	42
28R	A	JAON3E	4,000	10.5	15.5	69
28R	A	JAON3F	4,800	9.5	16.0	10
28R	A	JAON3G	4,200	11.5	17.4	2
28R	A	JAON3H	4,100	9.5	15.0	15
28R	A	JAON3I	4,500	9.0	15.0	14
28R	A	JAON3J	5,100	9.5	16.4	41
28R	A	JAON4B	4,800	9.0	15.0	186
28R	A	JAON4C	5,000	10.0	15.5	9
33	D	JDPD7A	4,900	7.3	11.2	2
33	D	JDPN6D	4,900	10.2	17.1	7
33	D	JDPN7A	4,900	10.2	14.2	3
33	D	JDPN7C	4,900	10.2	22.1	3
33	D	JDPN7F	4,100	11.7	16.7	2
33	D	JDPN7G	4,700	10.2	22.1	3
33	D	JDPN8A	5,000	9.2	14.2	1
33	D	JDPN8A	5,400	4.5	9.4	1
4L	D	JDAN5A	3,800	8.5	13.9	30
4L	D	JDAN7A	4,200	11.0	16.9	7
4L	D	JDAN7C	6,300	6.1	11.5	4
4L	D	JDAN7C	4,900	14.9	21.4	4
9R	D	JDDD4A	5,100	10.6	14.6	36
9R	D	JDDD7A	5,700	9.7	13.6	192
9R	D	JDDD7D	5,100	11.1	15.1	102
9R	D	JDDD8C	4,100	10.2	14.6	979
9R	D	JDDD8D	4,300	9.7	14.1	883
9R	D	JDDD8E	4,400	10.2	14.1	1,595
9R	D	JDDN3A	5,800	10.7	16.1	4

Runway	Operation Type	Modeled Track Name	Level Flight Altitude (ft MSL)	Start (NM)	End (NM)	Radar Track Count
9R	D	JDDN5A	3,300	9.7	14.1	267
9R	D	JDDN6A	4,000	11.1	15.1	207
9R	D	JDDN7A	4,100	9.7	14.6	105
9R	D	JDDN7B	4,800	10.2	15.1	56
9R	D	JDDN7C	5,500	10.2	15.6	65
9R	D	JDDN7D	5,000	10.7	14.6	42
9R	D	JDDN7E	5,000	11.1	15.1	52
9R	D	JDDN8B	5,100	10.7	16.1	110
9R	D	JDDN8C	6,300	9.7	13.6	115
9R	D	JDDN8D	3,500	10.7	14.6	110
9R	D	PDDD5A	3,800	16.6	25.5	49
9R	D	PDDD5B	4,100	20.0	24.5	8
9R	D	PDDD5B	5,000	25.0	29.9	8
9R	D	PDDD5C	3,900	23.5	30.4	11
9R	D	PDDD8A	4,100	10.7	14.6	7
9R	D	PDDD8A	4,100	15.1	38.8	7
9R	D	PDDD8A	4,500	42.3	49.2	7
9R	D	PDDD8B	4,000	9.7	18.6	73
9R	D	PDDD8B	4,000	19.1	26.5	73
9R	D	PDDD8B	5,200	27.0	39.3	73
9R	D	PDDD8C	5,900	10.2	26.0	37
9R	D	PDDD8C	3,900	26.5	36.3	37
9R	D	PDDD8D	4,800	9.7	13.6	5
9R	D	PDDD8D	4,300	14.1	18.1	5
9R	D	PDDD8D	4,800	18.6	30.4	5
9R	D	PDDD8D	5,200	30.9	34.9	5
9R	D	PDDD8D	4,900	43.3	47.2	5
9R	D	PDDD8E	5,200	9.7	22.5	4
9R	D	PDDD8E	4,400	23.0	38.3	4
10C	D	JDVD6B	4,800	9.6	13.6	1
10C	D	JDVD6B	5,100	4.4	8.3	1
10C	D	JDVN5B	5,200	9.1	13.5	26
10C	D	JDVN7B	5,500	11.1	15.5	7
10C	D	JDVN7D	6,200	9.1	15.5	21
10C	D	JDVN8C	6,000	10.1	15.0	7
10L	D	JDED5A	3,800	13.3	17.3	82
10L	D	JDED5B	4,000	13.3	17.7	406

Runway	Operation Type	Modeled Track Name	Level Flight Altitude (ft MSL)	Start (NM)	End (NM)	Radar Track Count
10L	D	JDED5D	4,300	13.8	19.2	294
10L	D	JDED6A	4,800	11.8	15.8	59
10L	D	JDED7A	5,100	11.3	15.8	3,284
10L	D	JDED7B	6,000	11.8	15.8	2,178
10L	D	JDED8B	4,400	12.8	17.3	305
10L	D	JDED8C	3,800	12.8	17.7	126
10L	D	JDED8E	4,100	13.3	17.7	95
10L	D	JDED8H	4,900	11.8	16.7	23
10L	D	JDED8I	5,600	11.3	15.3	58
10L	D	JDEN3B	5,100	13.4	18.2	3
10L	D	JDEN5A	5,300	12.8	16.8	45
10L	D	JDEN6D	4,100	9.3	15.3	22
10L	D	JDEN7E	3,000	12.8	16.8	24
10L	D	JDEN8A	5,200	12.4	16.8	43
10L	D	JDEN8B	5,100	11.8	16.8	16
10L	D	JDEN8C	5,200	12.3	20.7	9
10L	D	JDEN8E	5,100	13.3	18.2	31
10L	D	PDED7A	8,500	25.6	29.6	8
10L	D	WDED5A	3,300	17.7	22.2	5
10L	D	WDED6A	3,100	13.8	17.7	276
10L	D	WDED6B	4,100	11.8	17.7	143
10L	D	WDED6C	4,300	12.3	17.2	100
10L	D	WDEN5A	2,300	12.8	17.2	79
10L	D	WDEN5B	4,900	12.8	17.7	124
10L	D	WDEN5C	4,000	13.8	18.7	23
22L	D	JDKD5A	4,200	10.7	15.6	29
22L	D	JDKD5B	4,200	8.2	12.2	22
22L	D	JDKD5C	4,700	10.7	21.1	2
22L	D	JDKD5D	4,000	7.7	17.6	2
22L	D	JDKD6B	4,500	10.2	15.6	11
22L	D	JDKD8A	4,800	11.2	16.6	92
22L	D	JDKD8B	4,800	10.2	14.6	606
22L	D	JDKN5A	3,800	9.7	28.0	7
22L	D	JDKN5B	4,000	10.2	16.6	6
22L	D	JDKN5D	3,800	15.6	21.5	3
22L	D	JDKN5D	4,000	30.9	36.3	3
22L	D	JDKN6B	4,900	7.8	14.1	8

Runway	Operation Type	Modeled Track Name	Level Flight Altitude (ft MSL)	Start (NM)	End (NM)	Radar Track Count
22L	D	JDKN6C	3,800	9.2	16.1	6
22L	D	JDKN6E	4,900	10.2	16.1	6
22L	D	JDKN7E	5,100	8.7	13.6	169
22L	D	JDKN8A	6,500	10.7	15.6	55
22L	D	JDKN8B	8,300	9.7	14.6	39
22L	D	JDKN8C	3,900	10.7	15.6	6
22L	D	JDKN8D	5,100	9.7	14.1	19
22L	D	PDKD6A	3,900	10.2	26.0	6
22L	D	PDKD8A	4,100	21.6	25.5	12
27L	D	JDMD6A	4,900	9.2	13.6	48
27L	D	JDMD6C	4,900	10.2	15.1	51
27L	D	JDMD8A	5,000	8.3	13.1	7
27L	D	JDMN6A	4,600	8.7	18.5	4
27L	D	JDMN7C	4,900	10.2	14.6	2
28C	D	JDZD5B	5,200	10.1	19.0	2
28C	D	JDZD6E	5,000	5.7	10.1	3
28C	D	JDZD8A	4,900	11.6	15.5	8
28C	D	JDZD8B	4,900	8.1	14.5	3
28C	D	JDZN5A	5,000	12.1	17.0	65
28C	D	JDZN5B	4,800	34.3	38.2	25
28C	D	JDZN5C	5,000	14.1	18.5	29
28C	D	JDZN5D	4,900	11.1	18.0	3
28C	D	JDZN6A	5,100	11.6	17.0	9
28C	D	JDZN6B	4,700	12.2	17.0	45
28C	D	JDZN7A	4,700	11.1	21.0	15
28C	D	JDZN7D	4,800	12.6	16.5	34
28C	D	JDZN8A	5,000	12.1	16.0	23
28R	D	JDOD3A	4,100	10.3	16.3	7
28R	D	JDOD5A	5,100	12.3	16.3	3,536
28R	D	JDOD6B	5,000	12.3	16.3	3,390
28R	D	JDOD6C	5,100	11.3	15.3	459
28R	D	JDOD7B	4,900	11.3	15.3	534
28R	D	JDOD7C	4,100	11.3	15.8	1,066
28R	D	JDOD7F	5,100	11.3	15.3	1,472
28R	D	JDON3A	5,400	9.8	19.7	4
28R	D	JDON3A	5,000	31.5	36.5	4
28R	D	JDON5E	5,000	14.3	22.2	6

Runway	Operation Type	Modeled Track Name	Level Flight Altitude (ft MSL)	Start (NM)	End (NM)	Radar Track Count
28R	D	JDON6A	4,100	13.3	17.2	516
28R	D	JDON6C	4,800	12.3	16.3	563
28R	D	JDON6F	4,000	11.0	17.7	3
28R	D	JDON7A	4,100	10.5	15.3	143
28R	D	JDON7B	3,900	11.3	15.8	253
28R	D	JDON7E	4,100	10.4	15.3	110
28R	D	JDON8C	4,800	13.3	17.7	123
28R	D	JDON8D	4,800	15.9	23.6	174
28R	D	PDOD5A	4,600	14.8	20.2	52
28R	D	PDOD5A	4,900	20.7	35.5	52
28R	D	PDOD5B	5,100	21.7	25.6	30
28R	D	PDOD5B	3,900	26.1	32.1	30
28R	D	PDOD6A	4,200	33.0	37.0	14
28R	D	PDOD6A	3,900	37.5	46.9	14
28R	D	PDOD7A	4,900	13.3	17.3	9
28R	D	PDOD8B	4,000	22.2	26.6	27
28R	D	PDOD8C	4,900	23.2	29.6	43
28R	D	PDOD8D	4,000	20.2	24.7	36

HMMH
700 District Ave, Suite 800
Burlington, Massachusetts 01803
781.229.0707
www.hmmh.com

TECHNICAL MEMORANDUM

To:	Amy Hanson Environmental Specialist Federal Aviation Administration 2300 E. Devon Ave Room 320 Des Plaines, IL 60018
From:	Robert Mentzer Jr., Principal Consultant Sarah Yenson, Senior Consultant
Date:	October 2, 2020
Subject:	Altitude Control Code Methodology for TAAM Track AEDT Modeling for the Chicago O'Hare International Airport Terminal Area Plan and Air Traffic Procedures Environmental Assessment
Reference:	HMMH Project Number 307171.002.007.012

The Federal Aviation Administration's (FAA) Aviation Environmental Design Tool (AEDT) version 2d Service Pack 2 (AEDT 2d SP2)[1] models noise and emissions using a standard aircraft database. Among the aircraft properties in this database is a set of standard climb and descent procedures[2]. A typical AEDT 2d SP2 standard departure climb procedure consists of the following procedure statements: 1) Takeoff; 2) Climb to 1,000 feet; 3) Accelerate and retract flaps; 4) Climb to 3,000 feet; 5) Accelerate to 250 knots; 6) Climb to 10,000 feet. The standard procedures in AEDT 2d SP2 can be refined by including altitude control codes (ACC) to represent target altitudes at various points along the flight track that would not normally be present in the standard climb/descent procedure. The use of ACCs is considered a standard modeling method by the FAA and therefore does not require FAA approval as a nonstandard modeling method.

Due to traffic separation requirements in the busy airspace near Chicago O'Hare International Airport (ORD), Air Traffic Control (ATC) uses altitude holds (level-offs) for many operations at the airport. These altitude holds are examples of flight procedures that can be modeled by using ACCs. This memo describes the methodology developed by HMMH to implement ACCs and refine the modeling of altitude holds for the Terminal Area Plan and Air Traffic Procedures (TAP) Environmental Assessment's Build Out with Project scenario.

Before conducting any altitude analysis, simulated flight tracks were developed using the Total Airspace and Airport Modeler[3] (TAAM), a fast-time simulation software used to model delays and travel times for flight scenarios over all phases of flight. The simulated flight tracks represent the primary routes flown by a specific aircraft category (wide body jet, non-wide body jet and propeller-driven aircraft) that, using TAAM, have been adapted to model travel and delay times representative of different project alternatives. Six different scenarios or experiments are provided for each alternative. The six experiments are:

- Experiment 1: West Flow Visual Flight Rules (VFR) conditions with Land and Hold Short Operations (LAHSO)
- Experiment 2: West Flow VFR conditions without LAHSO
- Experiment 3: West Flow Instrument Flight Rules (IFR) conditions without LAHSO
- Experiment 4: East Flow Visual Flight Rules (VFR) conditions with LAHSO
- Experiment 5: East Flow VFR conditions without LAHSO
- Experiment 6: East Flow IFR conditions without LAHSO

[1] AEDT version 2d SP2 is the version of the AEDT available when the modeling for this project started.

[2] AEDT's standard procedures determine the aircraft's modeled altitude, power setting, and speed along a model flight track.

[3] https://ww2.jeppesen.com/airspace-solutions/total-airspace-and-airport-modeler/

1. Quantitative Altitude Hold Analysis

A Python script analyzed all TAAM tracks for altitude holds using the conditions listed below. To qualify as having an altitude hold, a track had to meet all conditions.

- Altitude hold occurred above 1,000 feet MSL and below 8,000 feet MSL
- Altitude hold occurred within 60 NM track distance from the assigned runway end
- Altitude hold length was at least 3 NM

The script then classified any tracks with altitude holds by experiment, flight mode, time of day, waypoint, and engine category, allowing unique classification of all TAAM tracks by altitude holding pattern, including those without altitude holds. In some cases, tracks within one classification had different altitude hold profiles; for these cases, the script further categorized the tracks into different altitude hold patterns. Figure 1 and Figure 2 illustrate this situation; though the experiment, time of day, flight mode, runway, waypoint, and engine type are the same for both examples, Figure 1's altitude hold is at 5,000 ft MSL, while Figure 2's hold is at 7,000 ft MSL. This resulted in the generation of two altitude hold patterns for this classification.

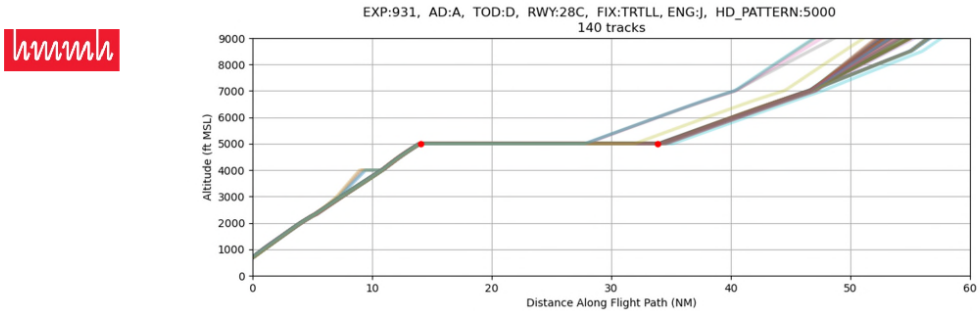

Figure 1: Example TAAM Tracks with Altitude Hold at 5,000 ft MSL for 28C Daytime Jet Arrivals via TRTLL

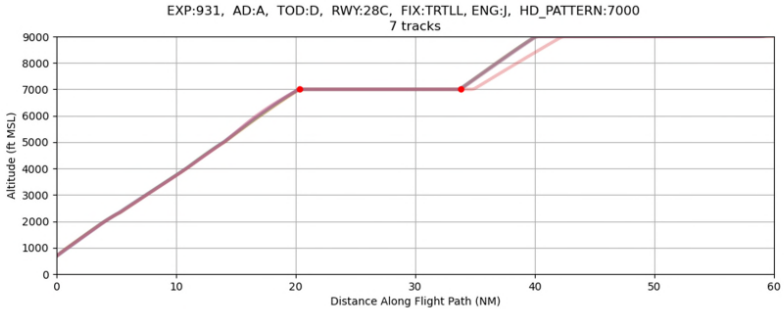

Figure 2: Example TAAM Tracks with Altitude Hold at 7,000 ft MSL for 28C Daytime Jet Arrivals via TRTLL

Finally, the script determines the statistics associated with each altitude hold classification. These statistics include the average beginning and end points of the hold, the hold altitudes and lengths, and the number of TAAM tracks associated with that classification. Table 1 summarizes these statistics for the example shown in this document (Experiment 1 daytime jet arrivals to Runway 28C via TRTLL waypoint). For these parameters, two hold patterns exist: one with a hold at 5,000 ft and one with a hold at 7,000 ft.

Table 1: Altitude Hold Statistics for Experiment 1 Daytime Jet Arrivals to Runway 28C via TRTLL

Exp	Flight Mode	Time of Day	Runway	Waypoint	Engine Category	Altitude Hold Pattern	TAAM Track Count	Hold Altitude (ft MSL)	Altitude Hold Start Distance (NM)	Altitude Hold End Distance (NM)	Altitude Hold Length (NM)
931	A	D	28C	TRTLL	J	5000	140	5000	14.0	33.8	19.8
931	A	D	28C	TRTLL	J	7000	7	7000	20.3	33.8	13.5

2. AEDT 2d SP2 Implementation

Another Python script was used to apply ACCs to AEDT model flight tracks according to the results of the analysis described above. Model tracks were duplicated to allow each altitude hold pattern to have its own ACC. At each altitude hold, the script adds ACCs to the start and end of the level segment, specifying the altitude the aircraft should achieve at these points. A transition point, located 1,000 ft inside the altitude hold, ensures that AEDT 2d SP2 handles the altitude hold appropriately. Aside from the altitude hold section of the profiles, ACCs were also added to the tracks at cardinal altitudes (1,000 ft increments) to ensure the climb and descent gradients match the average bundle profile as closely as possible. Finally, a single point was added to the end of the track to simulate the resumed climbing for departures or the beginning of a normal descent for arrivals. Once the ACC processing finishes, the script validates the resulting tracks to verify that the climb and descent profiles are as expected, e.g., arrivals do not climb.

Figure 3 and Figure 4 show the TAAM tracks from Figure 1 and Figure 2 with ACCs applied. In this example, ten model tracks were created to represent all daytime jet arrivals to runway 28C via TRTLL. Because these arrivals showed altitude holds at both 5,000 and 7,000 ft, two sets of ten tracks were created, one set with an altitude hold at 5,000 ft and one set with a hold at 7,000 ft.

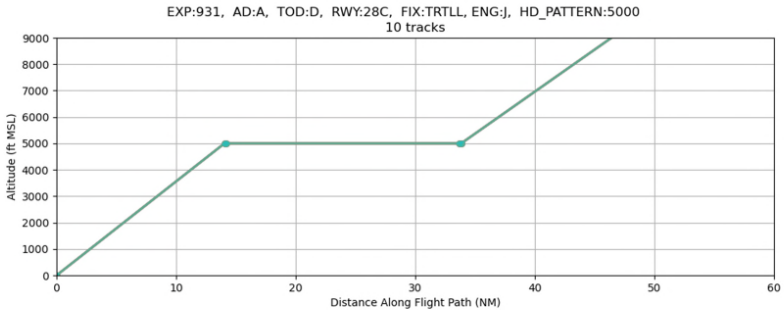

Figure 3: 28C Daytime Jet Arrival TAAM Tracks with Altitude Control Codes Applied at 5,000 ft

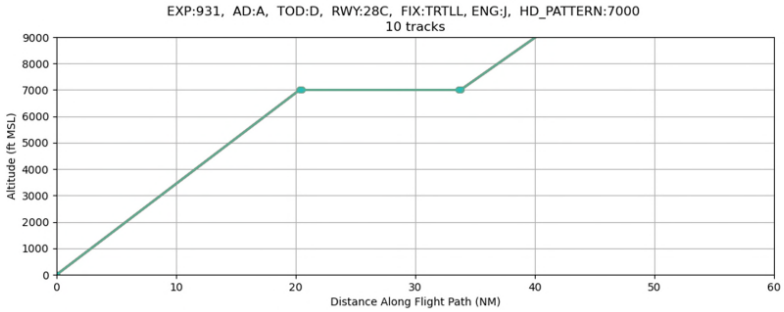

Figure 4: 28C Daytime Jet Arrival TAAM Tracks with Altitude Control Codes Applied at 7,000 ft

ATTACHMENT F-5
LAND USE AND NOISE-SENSITIVE SITE DEVELOPMENT AND RESULTS

F-5.1 Land Use

NEPA requires the review of land uses located in the airport environs to understand the relationship between those land uses and the noise exposure associated with arriving and departing aircraft. This includes delineation of land uses within the 65 DNL and higher aircraft noise exposure contours on the noise contour exhibits and identification of noise sensitive uses that may be noncompatible with that level of noise exposure. Identification of a noise sensitive use within the 65 DNL contour does not necessarily mean that the use is either considered noncompatible or that it is eligible for mitigation. Rather, identification merely indicates that the use is generally considered noncompatible but requires further investigation. Factors that influence compatibility and/or eligibility may include but are not limited to previous sound reduction treatments, current interior noise levels, structure condition, ambient and self-generated noise levels, whether a given use is considered temporary or permanent, and the timeframe within which a given structure was constructed.

This chapter provides a description of recommended land uses that are deemed generally compatible under Appendix A of Part 150.

F-5.1.1. Land Use Compatibility Guidelines

The objective of airport noise compatibility planning is to promote compatible land use in communities surrounding airports. NEPA requires the review of land uses surrounding an airport to determine land use compatibility associated with aircraft activity at the airport.

The FAA has published land use compatibility designations, as set forth in Part 150, Appendix A, Table 1 (reproduced here as **Table F-5.1**). As the table indicates, the FAA generally considers all land uses to be compatible with aircraft-related DNL below 65 dB, including residential, hotels, retirement homes, intermediate care facilities, hospitals, nursing homes, schools, preschools, and libraries. These categories will be referenced throughout this EA. Institutional or Public land use land use consists of schools, hospitals, nursing homes, churches, auditoriums, concert halls, governmental services, transportation and parking. While all of these uses are compatible with aircraft-related DNL below 65 dB, schools are not compatible above 65 DNL with out mitigation and are listed seperately in this EA.

TABLE F-5.1
PART 150 LAND USE COMPATIBILITY WITH YEARLY DAY-NIGHT AVERAGE SOUND LEVELS

Land Use	Yearly Day-Night Average Sound Level [DNL] in Decibels (Key and notes on following page)					
	<65	65-70	70-75	75-80	80-85	>85
Residential Use						
Residential other than mobile homes and transient lodgings	Y	N(1)	N(1)	N	N	N
Mobile home park	Y	N	N	N	N	N
Transient lodgings	Y	N(1)	N(1)	N(1)	N	N
Public Use						
Schools	Y	N(1)	N(1)	N	N	N
Hospitals and nursing homes	Y	25	30	N	N	N
Churches, auditoriums, and concert halls	Y	25	30	N	N	N
Governmental services	Y	Y	25	30	N	N
Transportation	Y	Y	Y(2)	Y(3)	Y(4)	Y(4)
Parking	Y	Y	Y(2)	Y(3)	Y(4)	N
Commercial Use						
Offices, business and professional	Y	Y	25	30	N	N
Wholesale and retail–building materials, hardware and farm equipment	Y	Y	Y(2)	Y(3)	Y(4)	N
Retail trade—general	Y	Y	25	30	N	N
Utilities	Y	Y	Y(2)	Y(3)	Y(4)	N
Communication	Y	Y	25	30	N	N
Manufacturing and Production						
Manufacturing general	Y	Y	Y(2)	Y(3)	Y(4)	N
Photographic and optical	Y	Y	25	30	N	N
Agriculture (except livestock) and forestry	Y	Y(6)	Y(7)	Y(8)	Y(8)	Y(8)
Livestock farming and breeding	Y	Y(6)	Y(7)	N	N	N
Mining and fishing, resource production and extraction	Y	Y	Y	Y	Y	Y
Recreational						
Outdoor sports arenas and spectator sports	Y	Y(5)	Y(5)	N	N	N
Outdoor music shells, amphitheaters	Y	N	N	N	N	N
Nature exhibits and zoos	Y	Y	N	N	N	N
Amusements, parks, resorts and camps	Y	Y	Y	N	N	N
Golf courses, riding stables, and water recreation	Y	Y	25	30	N	N

Sources: FAA Part 150, Appendix A, Table 1, 2007

Key to Table F-5.1
SLUCM: Standard Land Use Coding Manual.

Y(Yes): Land use and related structures compatible without restrictions.
N(No): Land use and related structures are not compatible and should be prohibited.
NLR: Noise Level Reduction (outdoor to indoor) to be achieved through incorporation of noise attenuation into the design and construction of the structure.
25, 30, or 35: Land use and related structures generally compatible; measures to achieve NLR of 25, 30, or 35 dBA must be incorporated into design and construction of structure.

Notes:

The designations contained in this table do not constitute a Federal determination that any use of land covered by the program is acceptable or unacceptable under Federal, State, or local law. The responsibility for determining the acceptable and permissible land uses and the relationship between specific properties and specific noise contours rests with the local authorities. FAA determinations under Part 150 are not intended to substitute federally determined land uses for those determined to be appropriate by local authorities in response to locally determined needs and values in achieving noise compatible land uses.

(1) Where the community determines that residential or school uses must be allowed, measures to achieve outdoor to indoor Noise Level Reduction (NLR) of at least 25 dBA and 30 dBA should be incorporated into building codes and be considered in individual approvals. Normal residential construction can be expected to provide a NLR of 20 dBA, thus, the reduction requirements are often stated as 5, 10, or 15 dBA over standard construction and normally assume mechanical ventilation and closed windows year round. However, the use of NLR criteria will not eliminate outdoor noise problems.
(2) Measures to achieve NLR of 25 dBA must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas, or where the normal noise level is low.
(3) Measures to achieve NLR of 30 dBA must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas or where the normal noise level is low.
(4) Measures to achieve NLR of 35 dBA must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas, or where the normal noise level is low.
(5) Land use compatible provided special sound reinforcement systems are installed.
(6) Residential buildings require an NLR of 25
(7) Residential buildings require an NLR of 30
(8) Residential buildings not permitted

ATTACHMENT F-5.2
NOISE SENSITIVE SITES

F-5.2 NOISE-SENSITIVE FACILITIES

The following memorandum documents the sources and development of the noise sensitive sites used in this EA. **Section F-5.3** presents the DNL results at all of the noise sensitive sites modeled in the PSA for this EA.

HMMH
700 District Avenue, Suite 800
Burlington, Massachusetts 01803
781.229.0707
www.hmmh.com

TECHNICAL MEMORANDUM

To:	Amy Hanson Environmental Protection Specialist Federal Aviation Administration 2300 E. Devon Avenue, Room 320 Des Plaines, IL 60018
From:	Robert Mentzer, Noise Lead Joseph Czech Christopher Emma
Date:	May 6, 2021
Subject:	FINAL REVISED 1 - Noise Sensitive Areas for Chicago O'Hare International Airport Terminal Area Plan and Air Traffic Procedures Environmental Assessment
Reference:	HMMH Project Number 307171.002.007.009

1. Introduction

This memorandum lists the noise sensitive areas or sites for which environmental impacts will be assessed as part of the FAA's obligations under the National Environmental Policy Act of 1969 (NEPA) for the Chicago O'Hare International Airport Terminal Area Plan and Air Traffic Procedures Environmental Assessment (TAP EA). As described in FAA Order 1050.1F, a noise sensitive area is *"an area where noise interferes with normal activities associated with its use. Normally, noise sensitive areas include residential, educational, health, and religious structures and sites, and parks, recreational areas, areas with wilderness characteristics, wildlife refuges, and cultural and historical sites. For example, in the context of noise from airplanes and helicopters, noise sensitive areas include such areas within the DNL 65 dB noise contour…The FAA recognizes that there are settings where the DNL 65 dB standard may not apply. In these areas, the responsible FAA official will determine the appropriate noise assessment criteria based on specific uses in that area."*

Noise modeling for the TAP EA will be performed using FAA's Aviation Environmental Design Tool (AEDT) including modeling noise sensitive areas (hereafter referred to as sites) as described in the FAA Order 1050.1F. This memorandum presents noise sensitive sites for the categories of Learning Institutions, Health Care Facilities, and Places of Worship and Section 4(f) Lands[1] in Sections 2 through 5, respectively, in the Primary Study Area (PSA). Each section begins with a description of the methodology used to compile the category's listing. As the TAP EA follows the recently completed Written Re-Evaluation of the O'Hare Modernization Environmental Impact Statement (EIS) for the Interim Fly Quiet Runway Rotation Program (IFQ Re-Eval), we note which sites from the IFQ Re-Eval[2] remain valid for the TAP EA and which sites are removed/added. All sites from the IFQ Re-Eval were included in the TAP EA if their existence was confirmed by a Google Earth/Maps and/or internet search.

Noise modeling for the TAP EA will also include a uniformly spaced grid, in addition to the noise sensitive sites mentioned herein, to model noise exposure within the area of the Supplemental Study Area (SSA). This uniform grid will facilitate obtaining noise impact results to evaluate any potentially noise sensitive areas within Section 4(f) properties in the SSA (including, but not limited to, noise sensitive areas within national parks, national wildlife and waterfowl refuges, historic sites, and traditional cultural properties).

[1] The '4(f)' part of "Section 4(f)/6(f) lands" refer to lands falling under the US DOT Act of 1966 (now codified at 49 U.S.C. § 303) which protects significant publicly owned parks, recreational areas, wildlife and waterfowl refuges, and public and private historic sites. The '6(f)' part of "section 4(f)/6(f) lands" refers to Section 6(f) of 16 U.S.C. § 4601-8(f) associated with the Land and Water Conservation Fund, which applies if the property was acquired or developed with financial assistance under the Land and Water Conservation Fund State Assistance Program. Section 6(f) lands are not applicable to the TAP EA, i.e., no acquisition.

[2] The IFQ Re-Eval sites were originally developed for the 2005 O'Hare Modernization Program EIS.

For brevity, referenced exhibits are displayed at the end of each section instead of after first mention. Rows in tables are either highlighted in yellow or green. Yellow means the site is new relative to the IFQ Re-Eval. Green is only used once (in Section 5) to denote the recategorization of a Park as a Forest Preserve.

"Municipality" is often listed in the tables. This denotes the city or municipality in which the site resides, not necessarily denoting ownership.

2. Learning Institutions

Learning institutions are schools or libraries. Schools are universities, colleges and public or private facilities teaching Kindergarten through grade 12 (K-12). Section 2.1 addresses the schools while Section 2.2 addresses libraries.

2.1 Universities, Colleges and Other Schools

Our search for universities, colleges, and schools was limited to those within the PSA. Further, per FAA direction, we have omitted any places identified as being a Pre-School or Day-Care only (without a Kindergarten).

Location data on universities/colleges was obtained from the National Center for Education Statistics (NCES) College Navigator https://nces.ed.gov/collegenavigator/ on October 9, 2019. The NCES is the primary federal entity for collecting and analyzing data related to education in the US and other nations. NCES is located within the US Department of Education and the Institute of Education Sciences. NCES fulfills a Congressional mandate to collect, collate, analyze, and report complete statistics on the condition of American education; conduct and publish reports; and review and internationally report on education activities. The College Navigator allows for searching of schools by level of award and institution type. Level of award covers institutions offering Associate's, Bachelor's or Advanced degree programs, and Certificate programs. Institution type covers institutions which are public, private (non-profit and for-profit) offering less than 2-year, 2-year, and 4-year programs. Data pulled from the site included institutions covering all the available categories.

Location data for K-12 was obtained from the Illinois State Board of Education (ILSBE) Directory of Educational Entities (https://www.isbe.net/Pages/Data-Analysis-Directories.aspx) on October 9, 2019. The data set is a master directory of all public and non-public entities that provide direct services to K-12 students in Illinois. It includes contact information, total enrollment, grade levels served and legislative districts for Private and Public Schools, Public Districts and other Public Units (i.e., Regional Programs, Dept. of Corrections, Special Education Cooperatives and Vocational schools). The directory is updated nightly, and annual historical data is available going back to the 2003/2004 school year.

Table 1 and Table 2 list the 90 learning institutions to be considered in the TAP EA, sorted alphabetically by city/municipality and place name. The tables list three universities/colleges and 87 (other types of) schools, all of which are shown in Exhibit 1. All sites in Table 1 were considered in the IFQ Re-Eval except U01, the Logos Evangelical Seminary, that was listed as a Place of Worship in the IFQ Re-Eval and has been re-categorized to a university/college for the TAP EA. Table 2 shows 23 schools not considered in the IFQ Re-Eval (yellow-highlighted).

Table 1. Universities/Colleges for the TAP EA
Source for Names and Addresses: NCES College Navigator

TAP Map ID	Municipality	Name	Street Address	IFQ Map ID	Footnote
U01	Bensenville	Logos Evangelical Seminary	631 IL-83	W14	1
U02	Chicago	Wilbur Wright College	4300 N Narragansett	U2	2
U03	Des Plaines	Choice Career College	2250 Devon Avenue #100	U3	

Note:
1 IFQ modeled Faith International LLC as a Place of Worship
2 IFQ name: Wright College

Table 2. K-12 Schools for the TAP EA

Source for Names and Addresses: ILSBE Directory of Educational Entities

TAP Map ID	Municipality	Name	Street Address	IFQ Map ID	Footnote
S01	Arlington Heights	Laureate Day Schools & Metropolitan Prep Schools	2525 E Oakton Street		
S02	Bensenville	Blackhawk Middle School	250 S Church Road	S1	
S03	Bensenville	Concord Lutheran School	865 S Church Road		
S04	Bensenville	Fenton High School	1000 W Green Street	S3	
S05	Bensenville	Holy Family Catholic School	145 E Grand Avenue	S5	1
S06	Bensenville	Tioga Elementary School	212 W Memorial Road	S6	
S07	Bensenville	Transition Learning Center	6 S Addison Street		
S08	Bensenville	W A Johnson Elementary School	252 Ridgewood Avenue	S8	
S09	Chicago	Beard Elementary School	6445 W Strong Street		
S10	Chicago	Brickton Montessori School	8622 W Catalpa Avenue	S9	
S11	Chicago	Dirksen Elementary School	8601 W Foster Avenue	S10	
S12	Chicago	Edison Park Elementary School	6200 N Olcott Avenue	S11	2
S13	Chicago	Garvy J Elementary School	5225 N Oak Park Avenue	S12	3
S14	Chicago	Immaculate Conception School	7263 W Talcott Avenue	S13	
S15	Chicago	New Horizon Center	6737 W Forest Preserve Avenue		
S16	Chicago	Norwood Park Elementary School	5900 N Nina Avenue	S14	
S17	Chicago	Oriole Park Elementary School	5424 N Oketo Avenue	S15	4
S18	Chicago	Resurrection High School	7500 W Talcott Avenue	S17	
S19	Chicago	St. Eugene School	7930 W Foster Avenue	S19	4
S20	Chicago	St. Monica School	5115 N Mont Clare Avenue		
S21	Chicago	St. Paul Lutheran School	5650 N Canfield Avenue	S20	
S22	Chicago	St. Sava Academy	5701 N Redwood Drive	S18	5
S23	Chicago	Taft High School	6530 W Bryn Mawr Avenue	S21	
S24	Des Plaines	Angel Town Private School	1920 E Touhy Avenue	S23	4
S25	Des Plaines	Iroquois Community School	1836 E Touhy Avenue	S27	
S26	Des Plaines	Maine West High School	1755 S Wolf Road	S28	
S27	Des Plaines	North Cook Young Adult Academy & Region 05 North Cook ISC 1	1001 E Touhy Avenue Ste 200		
S28	Des Plaines	Orchard Place Elementary School	2727 Maple Street	S29	
S29	Des Plaines	Plainfield Elementary School	1850 Plainfield Drive	S31	
S30	Des Plaines	South Elementary School	1535 Everett Avenue	S32	
S31	Des Plaines	St. Stephen Catholic School	1862 Ash Street	S30	6
S32	Elk Grove Village	Adm Richard E Byrd Elementary School	265 Wellington Avenue		
S33	Elk Grove Village	Clearmont Elementary School	280 Clearmont Drive	S34	
S34	Elk Grove Village	Elk Grove High School	500 W Elk Grove Boulevard	S35	

TAP Map ID	Municipality	Name	Street Address	IFQ Map ID	Footnote
S35	Elk Grove Village	Elk Grove Park District Preschool and Early Childhood Center	225 E Elk Grove Boulevard		
S36	Elk Grove Village	Grove Junior High School	777 W Elk Grove Boulevard	S36	
S37	Elk Grove Village	Queen Of The Rosary School	690 W Elk Grove Boulevard	S38	
S38	Elk Grove Village	Ridge Family Center For Learning	650 Ridge Avenue	S39	
S39	Elk Grove Village	Rupley Elementary School	305 Oakton Street	S40	
S40	Elk Grove Village	Salt Creek Elementary School	65 JF Kennedy Boulevard		
S41	Elk Grove Village	Sterling Central - Chicago Campus	404 E Devon Avenue		
S42	Elmhurst	Churchville Middle School	155 E Victory Parkway	S41	7
S43	Elmhurst	Conrad Fischer Elementary School	888 N Wilson Street	S42	
S44	Elmhurst	Pythagoras Childrens Academy	893 N Church Road		
S45	Franklin Park	East Leyden High School	3400 Rose Street	S43	
S46	Franklin Park	Enger Elementary School & Leyden Area Special Education Cooperative	10401 Grand Avenue	S44	8
S47	Franklin Park	North Elementary School	9500 Gage Avenue	S45	
S48	Harwood Heights	St. Rosalie Religious Education	4401 N Oak Park Avenue	S46	9
S49	Harwood Heights	Union Ridge Elementary School	4600 N Oak Park Avenue	S47	
S50	Itasca	Bright Horizons Chancellory	270 Windsor Drive		
S51	Itasca	Elmer H. Franzen Elementary School	730 Catalpa Avenue	S48	
S52	Itasca	F.E. Peacock Junior High School	301 E North Street	S49	
S53	Itasca	Lutheran School Of St. Luke	410 S Rush Street	S50	
S54	Itasca	Raymond Benson Primary School	301 E Washington Street	S53	
S55	Itasca	St. Peter The Apostle School	500 N Cherry Street	S52	4
S56	Melrose Park	Mannheim Middle School	2600 Hyde Park Avenue		
S57	Norridge	J Giles Elementary School	4251 N Oriole Avenue	S55	
S58	Norridge	J Leigh Elementary School	8151 W Lawrence Avenue	S57	
S59	Norridge	Pennoyer Elementary School	5200 N Cumberland Avenue	S58	
S60	Norridge	Ridgewood Community High School	7500 W Montrose Avenue	S59	
S61	Northlake	Mannheim Early Childhood Center	101 W Diversey Avenue		
S62	Northlake	Roy Elementary School	533 N Roy Avenue	S61	
S63	Northlake	St. John Vianney School & Our Lady Montessori School	27 N Lavergne Avenue	S62	10
S64	Northlake	West Leyden High School	1000 N Wolf Road	S63	
S65	Northlake	Westdale Elementary School	99 Diversey Avenue	S64	4
S66	Northlake	Whittier Primary School	338 Whitehall Avenue		
S67	Park Ridge	George B Carpenter Elementary School	300 N Hamlin Avenue		

TAP Map ID	Municipality	Name	Street Address	IFQ Map ID	Footnote
S68	Park Ridge	George Washington Elementary School	1500 Stewart Avenue	S66	
S69	Park Ridge	Jeanine Schultz Memorial School	2101 Oakton Street		
S70	Park Ridge	Lincoln Middle School	200 S Lincoln Avenue		
S71	Park Ridge	Maine South High School	1111 S Dee Road	S67	4
S72	Park Ridge	Mary Seat Of Wisdom	1352 S Cumberland Avenue	S68	
S73	Park Ridge	Ralph J Frost Academy	1177 S Dee Road	S65	11
S74	Park Ridge	St. Andrews Lutheran School	260 N Northwest Hwy		
S75	Park Ridge	St. Paul of the Cross School	140 S Northwest Hwy		
S76	Park Ridge	Theodore Roosevelt Elementary School	1001 S Fairview Avenue		
S77	Rosemont	Rosemont Elementary School	6101 Ruby Street	S69	
S78	Schiller Park	John F Kennedy Elementary School	3945 Wehrman Avenue	S70	
S79	Schiller Park	Kids Island	4141 N Atlantic Avenue	S72	12
S80	Schiller Park	Lincoln Middle School	9750 Soreng Avenue	S71	4
S81	Schiller Park	Washington Elementary School	4835 Michigan Avenue	S74	13
S82	Wood Dale	Childs Voice School	180 Hansen Ct		
S83	Wood Dale	Early Childhood Education Center	543 N Wood Dale Road	S75	
S84	Wood Dale	Holy Ghost School	260 N Wood Dale Road	S76	
S85	Wood Dale	Oakbrook Elementary School	170 S Wood Dale Road	S77	4
S86	Wood Dale	Westview Elementary School	200 N Addison Road	S78	
S87	Wood Dale	Wood Dale Junior High School	655 N Wood Dale Road	S79	4

Notes:

1 *IFQ name: St. Charles Borromeo; St. Charles Borromeo Catholic Church at same location*
2 *IFQ name: Edison Elementary Regional Gifted Center*
3 *IFQ name: Garvy Elementary School; location adjusted/corrected*
4 *IFQ location adjusted/corrected*
5 *IFQ name: Socrates School*
6 *IFQ name: Our Lady Of Destiny Elementary South*
7 *IFQ name: Churchville Junior High School*
8 *IFQ name: Enger Elementary School*
9 *IFQ name: Maple Park Academy, Same location as St Rosalie Catholic Parish*
10 *IFQ name: St. John Vianney School*
11 *IFQ name: Alternative Resource Center*
12 *IFQ name: St. Beatrice School*
13 *IFQ City: Itasca*

* *A previous version of this memo included two additional schools, Bensenville Elementary School and St. Maria Goretti School in Schiller Park. Bensenville Elementary School is where the offices for the Bensenville School District are located and should not have been included. St. Maria Goretti School was permanently closed in June of 2020.*

The only university/college considered in the IFQ Re-Eval but excluded from the TAP EA is Robert Morris College (IFQ ID U1), because this college is not in the PSA. Table 3 lists the 11 learning institutions considered in the IFQ Re-Eval but not included in the TAP EA and the reasons for exclusion. Nearly half are not in the TAP EA's PSA. Please refer to the IFQ Re-Eval for their mapped locations.

Table 3. Learning Institutions in the IFQ Re-Eval Excluded from the TAP EA

Source: HMMH analysis

IFQ Map ID	Municipality	Name	Reason
S16	Chicago	Our Savior Lutheran	No longer a school but a retirement home
S22	Des Plaines	Algonquin Middle School	Not in PSA
S24	Des Plaines	Devonshire School	Not in PSA
S25	Des Plaines	Forest Elementary School	Not in PSA
S26	Des Plaines	Friendship Junior High School	Not in PSA
S33	Des Plaines	St. Zachary School	Not in PSA
S37	Elk Grove Village	Lutheran School Of The Holy Spirit	No longer Lutheran School; Same location as Elk Grove High School (TAP S35)
S51	Itasca	New Morning Childrens House	No longer a school but a residence
S54	Norridge	Divine Savior School	Academy of Priscilla at Divine Savior is permanently closed
S56	Norridge	Jolly Fun House (JFH) Educational Academy, Inc.	Closed
S60	Northlake	Parkview Baptist Academy	Church Only (IFQ W74); No longer an Academy

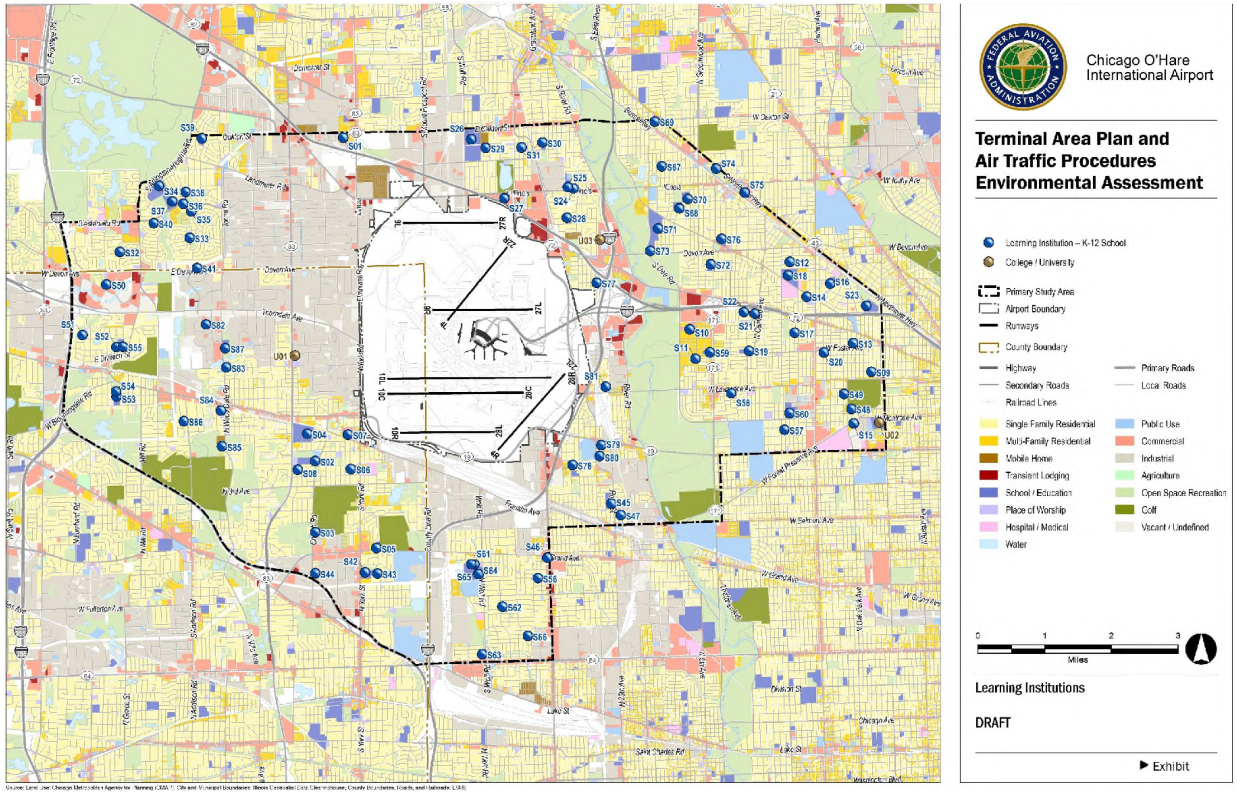

Exhibit 1. University/College Learning Institutions for the TAP EA

2.2 Libraries

For libraries, location data was obtained from the Institute of Museums and Library Services Public Libraries Survey https://www.imls.gov/research-evaluation/data-collection/public-libraries-survey on October 9, 2019. The Public Libraries Survey (PLS) examines when, where, and how library services are changing to meet the needs of the public. This data, supplied annually by public libraries across the country, provides information policymakers and practitioners can use to make informed decisions about the support and strategic management of libraries. At the state level, PLS is administered by Data Coordinators, appointed by the chief officer of the state library agency from each state or outlying area. State Data Coordinators collect the requested data from local public libraries and report it via a web-based reporting system. The most recent survey data available is for FY 2017.

Our search for libraries was limited to those within the PSA.

Table 4 lists the eight libraries to be considered in the TAP EA, sorted alphabetically by city/municipality and place name. These libraries are mapped in Exhibit 2. Two libraries (yellow-highlighted), the public libraries of Elk Grove Village and Park Ridge, not considered in the IFQ Re-Eval are considered for the TAP EA.

All six libraries considered for the IFQ Re-Eval are considered for the TAP EA (but some IDs are different).

Table 4. Libraries for the TAP EA

Source for Names and Addresses: Institute of Museums and Library Services Public Libraries Survey

TAP Map ID	Municipality	Name	Street Address	IFQ Map ID	Footnote
L01	Bensenville	Bensenville Community Public Library	200 South Church Road	L1	1
L02	Elk Grove Village	Elk Grove Village Public Library	1001 Wellington Avenue		
L03	Harwood Heights	Eisenhower Public Library District	4613 North Oketo Avenue	L2	2
L04	Itasca	Itasca Community Library	500 West Irving Park Road	L3	
L05	Northlake	Northlake Public Library District	231 North Wolf Road	L4	3
L06	Park Ridge	Park Ridge Public Library	20 South Prospect Avenue		
L07	Schiller Park	Schiller Park Public Library	4200 Old River Road	L5	
L08	Wood Dale	Wood Dale Public Library District	520 North Wood Dale Road	L6	4

Notes:

1 *IFQ location closed; now at new location*
2 *IFQ name: Eisenhower Library*
3 *IFQ name: Northlake Public Library*
4 *IFQ name: Wood Dale Public Library*

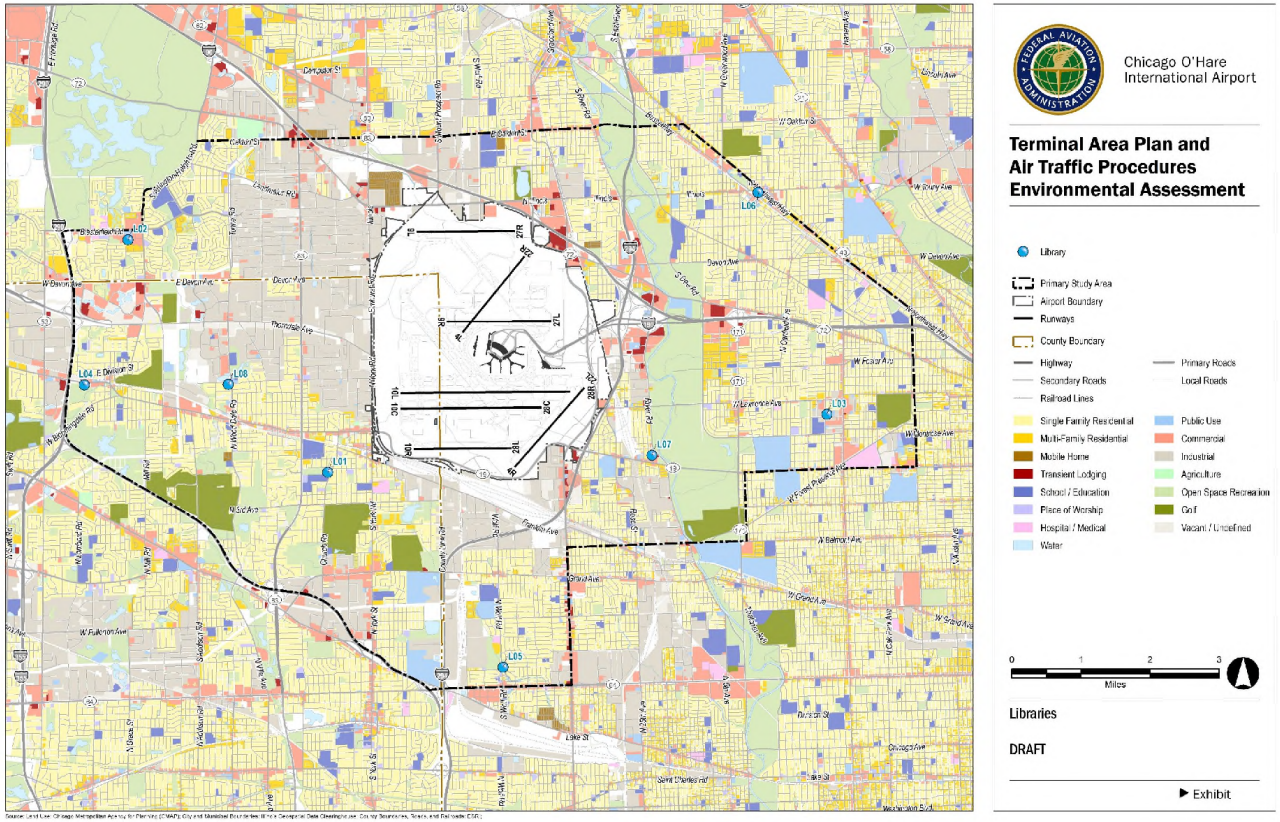

Exhibit 2. Library Learning Institutions for the TAP EA

3. Health Care Facilities

For the purposes of the TAP EA, health care facilities are hospitals and nursing homes.

Hospital data was obtained from the Illinois Department of Public Health (IDPH https://data.illinois.gov/dataset/410idph_hospital_directory) on September 27, 2019. The IDPH is a list of hospitals including facility name, address, phone number, license number, type, and license expiration date.

Nursing homes were obtained from https://data.medicare.gov/data/nursing-home-compare on October 16, 2019. The website contains the official datasets used on the Medicare.gov Nursing Home Compare Website provided by the Centers for Medicare & Medicaid Services. These data allow the comparison of the quality of care at every Medicare and Medicaid-certified nursing home in the country, including over 15,000 nationwide.

Nursing Home Compare is part of an effort to increase the availability and accessibility of information on quality, utilization, and costs for effective, informed decision-making.[3]

Table 5 lists the three hospitals to be considered in the TAP EA. Of the two hospitals considered in the IFQ Re-Eval, Kindred Hospital Chicago Northlake (IFQ ID H2) will not be included in the TAP EA as it is not within the PSA. Two health care facilities (yellow-highlighted), the Maryville Center for Children and the Chicago-Read Mental Health center, not considered in the IFQ Re-Eval, are considered for the TAP EA.

Table 5. Hospital for the TAP EA

Source for Names and Addresses: Illinois Department of Public Health

TAP Map ID	Municipality	Name	Street Address	IFQ Map ID	Footnote
H01	Chicago	Resurrection Medical Center	7435 W Talcott Avenue	H1	
H02	Chicago	Maryville Center for Children	6650 W Irving Park Road		
H03	Chicago	Chicago-Read Mental Health Center	4200 N Oak Park Avenue		

Table 6 list the 16 nursing homes to be considered in the TAP EA, sorted alphabetically by city/municipality and place name. The three hospitals and 16 nursing homes are shown in Exhibit 3. Eleven nursing homes not considered in the IFQ Re-Eval are highlighted in yellow in Table 6.

Of the six Nursing Homes considered for the IFQ Re-Eval, only two are not considered for the TAP EA: Scallabrini Life Center in Franklin Park (IFQ N3) and "Arbor Of Itasca Inc." in Itasca (IFQ N4). These two Nursing Homes no longer exist. Please refer to the IFQ Re-Eval for their mapped locations.

[3] More information about the Skilled Nursing Facility (SNF) Quality Reporting Program can be found by visiting https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/NursingHomeQualityInits/Skilled-Nursing-Facility-Quality-Reporting-Program/SNF-Quality-Reporting-Program-Public-Reporting

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Table 6. Nursing Homes for the TAP EA

Source for Names and Addresses: Medicare.gov Nursing Home Compare Website

TAP Map ID	Municipality	Name	Street Address	IFQ Map ID	Footnote
N01	Bensenville	Bridgeway Of Bensenville	303 E Washington Street	N1	1
N02	Bensenville	Bridgeway Senior Living	111 East Washington Street		
N03	Bensenville	Castle Towers	325 S York Road		
N04	Chicago	Danish Old People's Home	5656 N Newcastle Avenue		2
N05	Chicago	Norwood Life Society Assisted Living Facility	6016 North Nina Avenue		
N06	Chicago	Presence Resurrection Life Center	7370 West Talcott Avenue		
N07	Des Plaines	Asbury Court Nursing & Rehab	1750 Elmhurst Road		
N08	Des Plaines	Generations Oakton Pavilion	1660 Oakton Place		
N09	Elk Grove Village	Alexian Village of Elk Grove	975 Martha Street		
N10	Elmhurst	The Grove of Elmhurst	127 West Diversey Avenue	N2	3
N11	Itasca	Forest View Rehab & Nursing Center	535 South Elm Street		
N12	Norridge	Central Baptist Village	4747 North Canfield Avenue		
N13	Norridge	Norridge Gardens	7001 West Cullom Avenue	N5	4
N14	Northlake	Casa San Carlo	420 N Wolf Road	N6	5
N15	Northlake	Presence Villa Scalabrini N&R	480 North Wolf Road		
N16	Park Ridge	Park Ridge Care Center	665 Busse Highway		

Notes:

1 *IFQ location adjusted/corrected*
2 *Also LS093*
3 *IFQ name: York Convalescent Center Lt*
4 *IFQ name: Norridge Nursing Center; IFQ location adjusted/corrected*
5 *IFQ name: Concord Plaza Assisted Living Center*

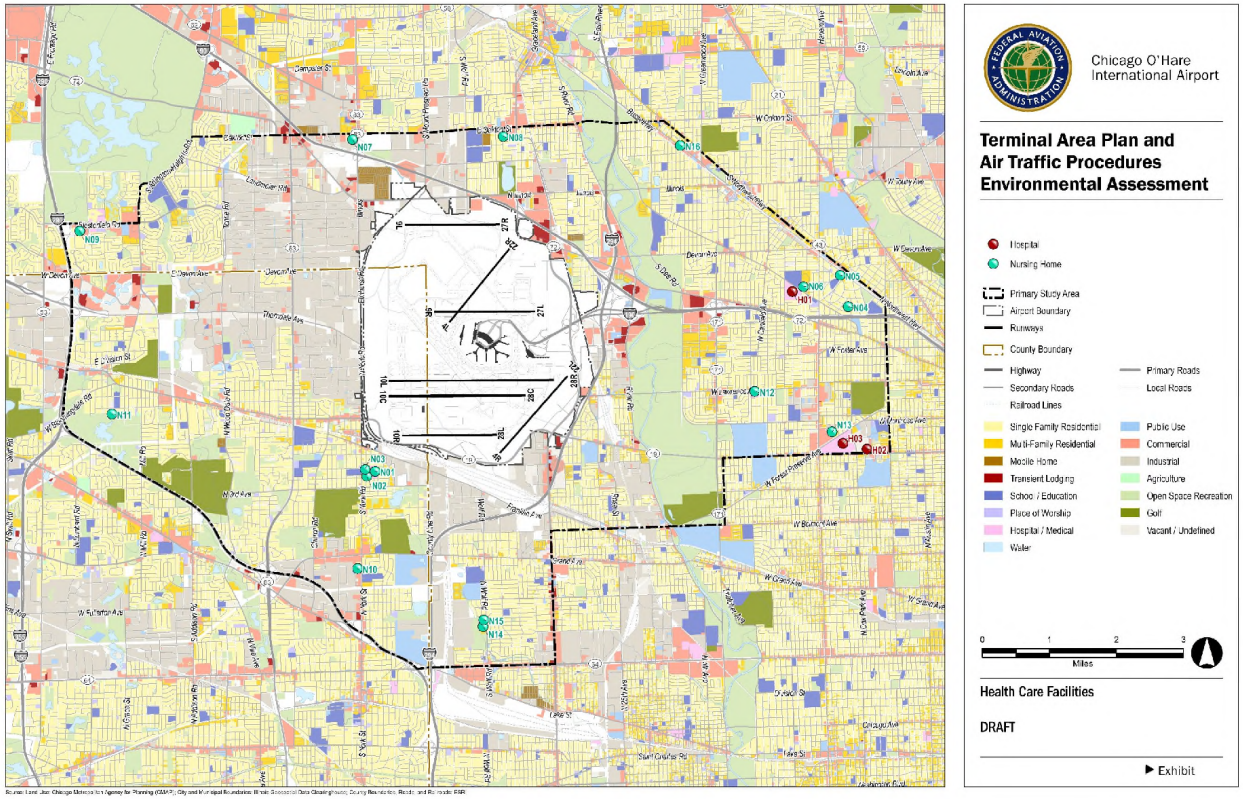

Exhibit 3. Health Care Facilities for the TAP EA

4. Places of Worship

Places of Worship for all faiths are considered within the PSA for the TAP EA. DuPage and Cook counties are the only two relevant counties within the PSA.

For DuPage County, places of worship were obtained from the County's publicly-available real estate parcels database from the County's Geographic Information System (GIS) website (https://gisdata-dupage.opendata.arcgis.com/datasets/parcelsrealestate) on November 11, 2019. The database contains a field called "exemptcode" which identifies the tax exemption status of the property. County staff identified places of worship to have an "exemptcode" of 5. Data was initially filtered by "exemptcode" 5 and by its "propcity" (Property City) field by municipality within the PSA, as in Table 7. Those two filters resulted in 2,219 records which were manually inspected by the "propname" (property name) to identify Places of Worship. By removing sites outside of the PSA, identifying duplicate records of the same location and verifying permanently closed or demolished sites, the data was consolidated to 124 Places of Worship within the PSA.

Cook County provided GIS data of Places of Worship within Cook County and within the PSA, per the FAA official data request.[4] Cook County's data was circa 2013, provided in Geodatabase format.

Table 7. Municipalities within the Primary Study Area
Source: HMMH analysis

Municipality	County	Municipality	County
Addison	DuPage	Melrose Park	Cook
Bensenville	DuPage	Norridge	Cook
Chicago	Cook	Northlake	Cook
Des Plaines	Cook	Park Ridge	Cook
Elk Grove Village	Cook	River Grove	Cook
Elmhurst	DuPage	Rosemont	Cook
Franklin Park	Cook	Schiller Park	Cook
Harwood Heights	Cook	Wood Dale	DuPage
Itasca	DuPage		

Up from 84 sites in the IFQ Re-Eval, the TAP EA will consider the 124 Places of Worship listed in Table 8, sorted alphabetically by city/municipality and place name. The locations are shown in Exhibit 4. The 55 Places of Worship not considered in the IFQ Re-Eval are highlighted in yellow in the table. Evidenced by the many footnotes, our research found slight naming and geographic coordinate updates, relative to the modeling for the IFQ Re-Eval.

[4] File "pow_cook_export.xls" provided by Alice Ferruzzi via File Transfer Protocol, Cook County, October 11, 2019

Table 8. Places of Worship for the TAP EA

Sources for Names and Addresses: DuPage and Cook County GIS

TAP Map ID	Municipality	Name	Street Address	IFQ Map ID	Footnote
W001	Addison	Iglesia Pentecostal Unida Vida Abundante	210 Wood Dale Road		
W002	Addison	Sunny Place Church of God	901 Oak Street	W1	1
W003	Bensenville	Bensenville Bible Church	280 S York Road	W3	
W004	Bensenville	Calvary Baptist Church	306 Park Street	W5	
W005	Bensenville	Faith Community UCC	192 S Center Street	W13	2
W006	Bensenville	First Baptist Church	1215 Foster Street	W7	3
W007	Bensenville	First United Methodist Church	328 Church Road	W4	4
W008	Bensenville	Grace Lutheran Church	950 S York Road	W9	
W009	Bensenville	Grace-Gospel Fellowship	4N220 IL 83	W8	5
W010	Bensenville	Holy Trinity Ukrainian	1009 Church Road	W10	
W011	Bensenville	Jesus Alive Church	219 Pine Lane	W11	
W012	Bensenville	Manav Seva Mandir	101 S Church Road	W12	
W013	Bensenville	St. Alexis Roman Catholic Church	400 Wood Ave	W15	6
W014	Bensenville	St. Charles Borromeo Catholic Church	145 Grand Avenue	W17	7
W015	Bensenville	True Jesus Church	4N550 Church Road	W18	
W016	Bensenville	Ukrainian Christian Pentecostal Church	644 John Street	W19	8
W017	Bensenville	Zion Lutheran Church	865 S Church Road	W20	
W018	Chicago	All Saints Polish National Catholic Church	9201 W Higgins Road	W21	9
W019	Chicago	Bethel Community Church	7601 W Foster Avenue	W22	8
W020	Chicago	Chicago Latvian Zion Evangelical Lutheran Church	6551 W Montrose Avenue		
W021	Chicago	Chicago Unity Church	7534 W Berwyn Avenue	W33	10
W022	Chicago	Church of the Full Gospel	6120 N Harlem Avenue	W23	11
W023	Chicago	Edison Park Lutheran Church	6626 N Oliphant Avenue		
W024	Chicago	Evangelical Covenant Church	8303 W Higgins Road		
W025	Chicago	Evangelical Lutheran Church In America	8765 W Higgins Road		
W026	Chicago	Holy Resurrection Serbian Orthodox Cathedral	5701 N Redwood Drive	W25	
W027	Chicago	Immaculate Conception Church	7211 W Talcott Avenue		
W028	Chicago	Immaculate Conception Monastery	5700 N Harlem Avenue		
W029	Chicago	Northside Calvary Baptist Church	7654 W Berwyn Avenue		
W030	Chicago	Norwood Gospel Chapel	5158 N Nagle Avenue		
W031	Chicago	Norwood Park Evangelical Lutheran Church	5913 N Nina Avenue	W26	8
W032	Chicago	Norwood Park Presbyterian Church	5849 N Nina Avenue		
W033	Chicago	Norwood Park United Methodist Church	6072 N Nickerson Avenue		
W034	Chicago	Our Lady Mother of the Church Roman Catholic Church	8701 W Lawrence Avenue	W27	12

TAP Map ID	Municipality	Name	Street Address	IFQ Map ID	Footnote
W035	Chicago	St. Albans Episcopal Church	6240 N Avondale Avenue	W32	
W036	Chicago	St. Eugene Church	8030 W Foster Avenue		
W037	Chicago	St. James Lutheran Church	5210 N Oketo Avenue	W34	8
W038	Chicago	St. Joseph Ukrainian Church	5000 N Cumberland Avenue	W35	
W039	Chicago	St. Monica Roman Catholic Church	5115 N Montclare Avenue		
W040	Chicago	St. Paul Evangelical Lutheran Church	5650 N Canfield Avenue	W36	
W041	Chicago	St. Sophia Ukrainian Church	5017 N Newcastle Avenue	W37	13
W042	Chicago	St. Thomas Orthodox Church	6099 N Northcott Avenue	W28	14
W043	Chicago	Sts Constantine and Helen Romanian Orthodox Cathedral	5410 N Newland Avenue	W24	15
W044	Des Plaines	Church of Christ	1794 Illinois Street	W40	
W045	Des Plaines	First Presbyterian Church & Cambodian Buddhist Temple	1755 Howard Avenue	W41	16
W046	Des Plaines	Good Shepherd Lutheran Church	1177 Howard Avenue	W42	
W047	Des Plaines	Holy Virgin Protection Cathedral	1800 Lee Street		
W048	Des Plaines	Korean Philippi Presbyterian	1969 E Touhy Avenue	W43	
W049	Des Plaines	Phai Bao Buddhist Temple	1495 Prospect Avenue	W44	17
W050	Des Plaines	Sisters of the Living Word	1958 Illinois Street		
W051	Des Plaines	St. Stephen Catholic Church	1880 Ash Street	W45	18
W052	Elk Grove Village	Christus Victor Lutheran Church	1045 S Arlington Heights Road		
W053	Elk Grove Village	Elk Grove Presbyterian Church	600 E Elk Grove Boulevard	W49	
W054	Elk Grove Village	First Baptist Church	590 Tonne Road	W48	19
W055	Elk Grove Village	Korean-Chinese Church of Chicago	301 Ridge Avenue	W51	20
W056	Elk Grove Village	Lutheran Church Of The Holy Spirit	150 Lions Drive	W52	
W057	Elk Grove Village	Palm Tree Wesleyan Church	545 Landmeier Road	W55	21
W058	Elk Grove Village	Prince of Peace United Methodist Church	1400 S Arlington Heights Road		
W059	Elk Grove Village	Queen of the Rosary Catholic Church	690 W Elk Grove Boulevard	W53	22
W060	Elk Grove Village	Shinnyo En USA Temple	120 E Devon Avenue		
W061	Elk Grove Village	St. Julian Eymard Catholic Church	601 Biesterfield Road		
W062	Elk Grove Village	St. Nicholas Episcopal Church	1072 Ridge Avenue	W54	
W063	Elmhurst	St. Demetrios Church	893 Church Road		
W064	Elmhurst	Vineyard Presbyterian Church	300 Belden Avenue	W58	
W065	Elmhurst	West Sub Community Church	825 Van Auken Street		
W066	Franklin Park	Faith Christian Center	3350 River Road	W60	
W067	Franklin Park	Lombard Gospel Chapel	10200 Pacific Avenue		
W068	Franklin Park	Mt. Calvary Lutheran Church	3222 Rose Street	W61	
W069	Franklin Park	New Testament Church	3344 Lincoln Street		
W070	Franklin Park	St. Pauls United Church of Christ	3342 Calwagner Street		
W071	Harwood Heights	Bethany Baptist Church	6700 W Gunnison Street	W63	
W072	Harwood Heights	Romanian Christian Gospel Assembly	6739 W Montrose Avenue		

TAP Map ID	Municipality	Name	Street Address	IFQ Map ID	Footnote
W073	Harwood Heights	St. Rosalie Catholic Parish	4401 N Oak Park Avenue		
W074	Harwood Heights	St. Rosalie Roman Catholic Church	6740 Montrose Avenue		
W075	Itasca	Bethany United Methodist Church	400 N Walnut Street	W65	
W076	Itasca	Christian Fellowship Church	152 E Devon Avenue	W66	
W077	Itasca	First Presbyterian Church	207 Center Street		
W078	Itasca	Itasca Baptist Church	210 S Walnut Street		
W079	Itasca	Kim Dae Kun Catholic Church	1275 Arlington Heights Road		
W080	Itasca	Lutheran Church of St Luke	410 S Rush Street		23
W081	Itasca	St. Matthew Lutheran Church	733 Catalpa Street		
W082	Itasca	St. Peter the Apostle Church	524 Rush Street		
W083	Itasca	The Center	400 Walnut Street		
W084	Itasca	The Orchard-Itasca	716 George Street		
W085	Melrose Park	Apostles Lutheran Church	10429 Fullerton Avenue		
W086	Melrose Park	Emmanuel Romanian Baptist Church of Chicago	10515 Altgeld Street		
W087	Melrose Park	Iglesia Central Evangelica Ministerios De Cristo	10430 Medill Avenue		
W088	Melrose Park	Solid Rock Community Church and Second Chance Christian Center	10459 Grand Avenue		
W089	Norridge	Acacia Park Evangelical Lutheran Church	4307 Oriole Avenue	W68	
W090	Norridge	Church Of Our Savior	4701 N Canfield Avenue	W69	
W091	Norridge	Divine Savior Catholic Church	7750 W Montrose Avenue	W70	24
W092	Norridge	New Future Mongolian Christian Church	4256 N Oriole Avenue	W64	25
W093	Norridge	Norridge Citadel Corps Salvation Army	8354 W Foster Avenue	W31	26
W094	Norridge	Norridge United Church of Christ	8260 W Foster Avenue		
W095	Norridge	Zion Evangelical Lutheran Church	8600 W Lawrence Avenue	W71	
W096	Northlake	Mission Youth Chicago	100 N Lavergne Avenue		
W097	Northlake	Northlake Lutheran Church	112 N Wolf Road		
W098	Northlake	Parkview Baptist Church	70 W Golfview Drive	W74	
W099	Northlake	St. John The Baptist Melkite Catholic Church	200 E North Avenue	W75	
W100	Northlake	St. John Vianney Church	46 N Wolf Road	W76	
W101	Northlake	St. Peter's Syrian Orthodox Church	150 E Belle Drive	W77	
W102	Northlake	Trinity Presbyterian Church	2788 N Wolf Road	W78	
W103	Park Ridge	First United Methodist Church of Park Ridge	600 S Delphia Avenue		
W104	Park Ridge	Mary Seat Of Wisdom Church	920 Granville Avenue	W79	
W105	Park Ridge	Park Ridge Community Church	621 W Crescent Avenue		
W106	Park Ridge	Park Ridge Presbyterian Church	203 S Lincoln Avenue		
W107	Park Ridge	Redeemer Lutheran Church	818 S Clifton Avenue		
W108	Park Ridge	South Park Church	1414 Courtland Avenue	W80	

TAP Map ID	Municipality	Name	Street Address	IFQ Map ID	Footnote
W109	Park Ridge	St. Andrews Lutheran Church	914 Elm Street		
W110	Park Ridge	St. Mary's Episcopal Church	316 S Prospect Avenue		
W111	Park Ridge	St. Paul Lutheran Church and Ministries	5650 N Canfield Avenue		
W112	Park Ridge	St. Paul of the Cross Church	230 S Washington Avenue		
W113	Rosemont	Our Lady of Hope Catholic Church	9711 W Devon Avenue		
W114	Schiller Park	Grace Community Evangelical Free Church	4244 Grace Street	W81	27
W115	Schiller Park	International Christian Assembly Of God	9628 Irving Park Road	W82	
W116	Schiller Park	St. Beatrice Church	4141 Atlantic Avenue	W83	
W117	Schiller Park	St. Maria Goretti Catholic Church	3802 Scott Street		
W118	Wood Dale	Agape Family Church	140 Hemlock Avenue		
W119	Wood Dale	Calvary Evangelical Lutheran Church	107 Wood Dale Road	W84	
W120	Wood Dale	Christian Congregation	120 Mill Road	W85	
W121	Wood Dale	First Baptist Church-Wood Dale	292 Oak Meadows Drive	W86	
W122	Wood Dale	Holy Ghost Church	254 Wood Dale Road		
W123	Wood Dale	St. Peter's Latvian Evangelical Lutheran Church	450 Forest Preserve	W87	28
W124	Wood Dale	Wood Dale Community United Methodist	206 Wood Dale Road		

Notes:

1 *IFQ name: Sunnyplace Church of God; IFQ location adjusted/corrected*
2 *IFQ name: Peace Church United Christ; IFQ Address Corrected from 192 Center St*
3 *IFQ name: First Spanish Baptist Church; aka Primera Iglesia Bautista*
4 *IFQ name: Bensenville United Methodist Church*
5 *IFQ name: Grace Gospel Center*
6 *IFQ name: St. Alexis*
7 *IFQ name: St. Charles Borromeo; IFQ location adjusted/corrected; Same location as Holy Family School*
8 *IFQ location adjusted/corrected*
9 *IFQ name: All Saints Cathedral Parish PNCC*
10 *IFQ name: St. Andrew Presbyterian Church; IFQ location adjusted/corrected*
11 *IFQ name: Church of the Full Gospel Inc.; IFQ location adjusted/corrected.*
12 *IFQ name: Our Lady Mother of Church*
13 *IFQ address 5017 N Newcastle Avenue.*
14 *IFQ name: Our Savior Evangelical Lutheran Church; IFQ location adjusted/corrected*
15 *IFQ name: First Korean Presbyterian Church; IFQ location adjusted/corrected; aka The Romanian Orthodox Metropolia of the Americas*
16 *IFQ name: First Presbyterian Church; IFQ location adjusted/corrected*
17 *IFQ name: Phat Bao Temple*
18 *IFQ name: aka St. Stephen Protomartyr Parish; IFQ location adjusted/corrected*
19 *IFQ name: First Baptist Church of Elk Grove Village*
20 *IFQ name: Gethsemane Presbyterian Church*
21 *IFQ name: Wesleyan Community Church*
22 *IFQ name: Queen Of The Rosary Church; IFQ location adjusted/corrected*
23 *Same location as Lutheran School of St. Luke (554)*
24 *IFQ name: Divine Savior*
25 *IFQ name: Northside Arabic Church; IFQ city: Harwood Heights*
26 *IFQ name: Sisters of The Living Word*
27 *IFQ name: Grace Community Evangelical*
28 *IFQ name: St. Peter's Latvian Lutheran Church*

Table 9 lists the 15 Places of Worship considered in the IFQ Re-Eval but excluded from the TAP EA for the reasons given. Most of the sites listed in Table 9 are either no longer Places of Worship, closed or not in the PSA. Four of the listings in Table 9 are covered by other categories, e.g., Libraries, Universities and Schools. Please refer to the IFQ Re-Eval for their mapped locations.

Table 9. Places of Worship in the IFQ Re-Eval Excluded from the TAP EA

Source: HMMH analysis

IFQ Map ID	Municipality	Name	Reason
W2	Arlington Heights	Baptist General Conference	Property changed to "Converge MidAmerica"; Not a Place of Worship
W6	Bensenville	Cornerstone Christian Assembly	Property changed to Bensenville Community Public Library (L01)
W14	Bensenville	Faith International LLC	Property changed to Logos Evangelical Seminary (University/College) (U01)
W16	Bensenville	St. Bede's Episcopal Church	Closed
W29	Chicago	Living Witness Apostolic Faith Temple	IFQ name: Our Saviors English Lutheran Church; IFQ address: 6016 N Nina Avenue; not in PSA
W30	Chicago	Sisters Of Charity Bvm	Property changed to St Eugene School (TAP S20)
W38	Des Plaines	Dunamis Presbyterian Church	Not in PSA; IFQ name Brentwood Baptist Church
W46	Des Plaines	St. Zachary Catholic Church	Not in PSA
W39	Des Plaines	Taiwan Christian Church	Not in PSA; Same location as St Zachary School (IFQ S33)
W47	Des Plaines	Trinity Lutheran Church	Not in PSA
W50	Elk Grove Village	Evangelical Lutheran Church	this is an Archives building for the Lutheran Church in America; not a Place of Worship
W57	Elmhurst	Chicago Church Of Christ Inc.	Property converted to commercial use
W67	Itasca	Hanmee Presbyterian Church	IFQ location adjusted/corrected; not in PSA
W73	Northlake	Iglesia Bautista Hispana	Closed
W72	Northlake	Uturn Covenant Church	Not in PSA

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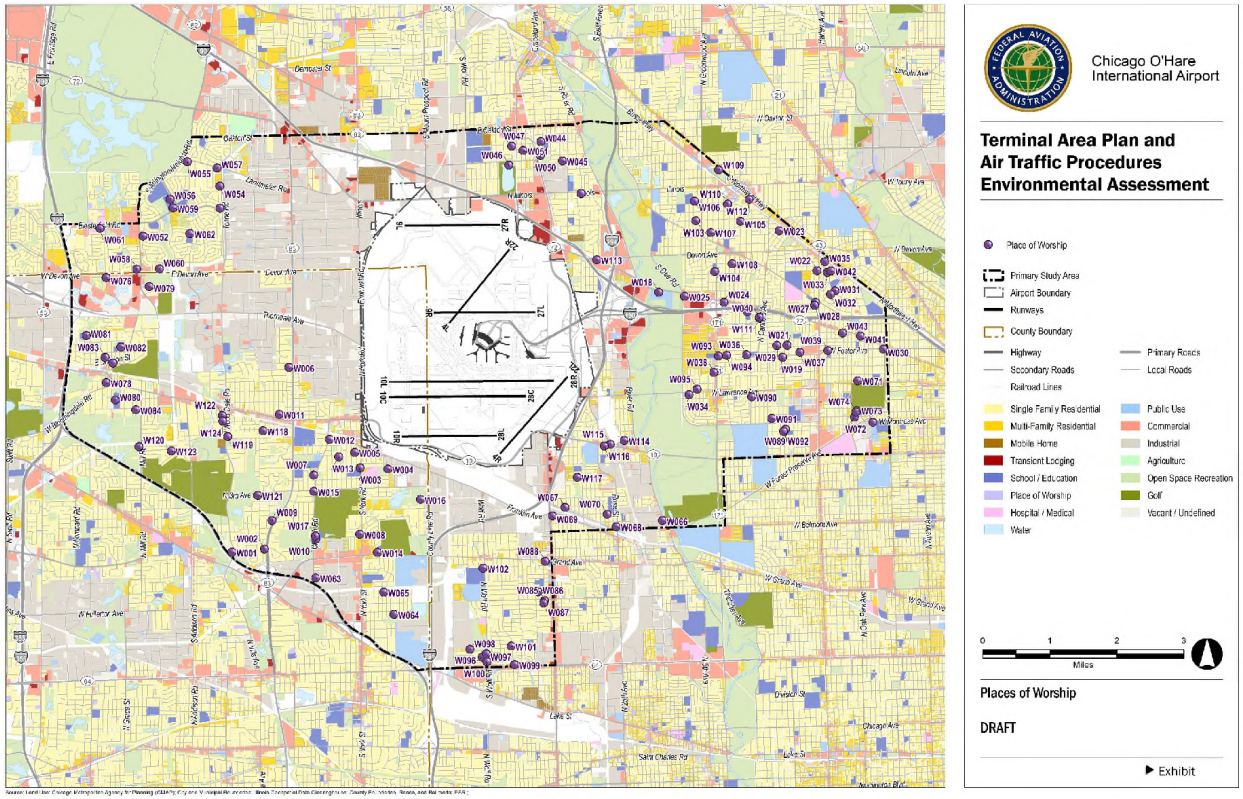


Exhibit 4. Places of Worship for the TAP EA

5. Section 4(f) Lands

Section 5.1 addresses all Section 4(f) lands except historic/cultural sites. Section 5.2 addresses the latter. Section 6(f) lands were not addressed because they would not be applicable to the TAP EA, i.e., no acquisition of property.

5.1 Non-Historic/cultural

The PSA of the TAP EA does not include any wildlife refuges or waterfowl refuges but does include parks, recreational areas, and forest preserves. The source of this data was primarily the research and field verification by Synergy Consultants Inc. (Synergy). Synergy's data was supplemented with, and compared to, the parks modeled in the IFQ Re-Eval. Our audit included verifying that points corresponded to the actual parcels and entities with which they were associated, checking if sites were included in the IFQ Re-Eval/Synergy's data product/both, verifying that the structure had not changed relative to the IFQ Re-Eval, and verifying basic details like the name of the location.

The resulting Parks, Recreational Areas and Forest Preserves are listed in Table 10 and Table 11 sorted alphabetically by city/municipality and place name. The tables list 218 parks and 31 Forest Preserve sites, all of which are shown in Exhibit 5. Unless otherwise noted, all modeled points are within 100 feet of the position used during the IFQ Re-Eval. The tables show 117 parks and 29 Forest Preserves not considered in the IFQ Re-Eval (yellow-highlighted). One site, Salt Creek Park, was listed as a Park in the IFQ Re-Eval; it has been recategorized as a Forest Preserve and is highlighted in green in Table 11.

Table 10. Parks and Recreational Areas for the TAP EA
Source: Synergy Consultants Inc. 2019 and HMMH analysis

TAP Map ID	Municipality	Name	IFQ Map ID	Footnote
P001	Addison	Oak Knoll Park		
P002	Bensenville	AHAI Meeting Rooms		
P003	Bensenville	Ballet Room		
P004	Bensenville	Bensenville Skate Park		
P005	Bensenville	Bensenville Theatre		
P006	Bensenville	Bensenville Water Park & Splash Pad		
P007	Bensenville	Creekside Park		
P008	Bensenville	Deer Grove Leisure Center	P11	1
P009	Bensenville	Deer Park		
P010	Bensenville	Di Orio Park	P2	1, 2
P011	Bensenville	East Gazebo		
P012	Bensenville	Edge Ice Arena on Jefferson		
P013	Bensenville	Edge on John Ice Arena		
P014	Bensenville	Fischer Farm		
P015	Bensenville	Kremples Park	P3	1
P016	Bensenville	Liberty Field		
P017	Bensenville	Lions Park	P4	
P018	Bensenville	Memorial Field		
P019	Bensenville	Mohawk Park		
P020	Bensenville	North Beach Fishing Area		

TAP Map ID	Municipality	Name	IFQ Map ID	Footnote
P021	Bensenville	Outer Edge Climbing Area		
P022	Bensenville	Outer Edge Team Course		
P023	Bensenville	Pavilion		
P024	Bensenville	Pine Room		
P025	Bensenville	Pines Park	P5	
P026	Bensenville	Playground		
P027	Bensenville	Poplar Park	P6	
P028	Bensenville	Rose Park	P7	
P029	Bensenville	South Beach Fishing Area		
P030	Bensenville	Sunrise Park	P9	1
P031	Bensenville	Sunset Park	P10	1
P032	Bensenville	The Water's Edge Aquatic Center		
P033	Bensenville	Veterans Park (East)	P12	1, 3
P034	Bensenville	West Gazebo		
P035	Bensenville	White Pines Golf Course		
P036	Bensenville	Woodcrest Park	P13	
P037	Bensenville	Woodside Park	P14	
P038	Bensenville	Bensenville Library Garden of Knowledge	PX-196	1
P039	Bensenville	Breiter-Palm Park	PX-198	4
P040	Bensenville	Legends Golf Course	PX-215	
P041	Bensenville	Library District Park	PX-197	
P042	Bensenville	Redmond Park	PX-194	
P043	Bensenville	Terrace Park	PX-193	1
P044	Bensenville	Veteran's Park West - Bensenville City Park	PX-195	
P045	Chicago	Centennial Park		
P046	Chicago	Grandparents Park	P15	
P047	Chicago	Monument Park		
P048	Chicago	Mulberry Point Park	P16	
P049	Chicago	Myrtle Point Park	P17	
P050	Chicago	Norwood Circle Park	P18	
P051	Chicago	Norwood Park	P19	
P052	Chicago	Olympia Park		
P053	Chicago	Oriole Park	P20	
P054	Chicago	Summerdale Park	P21	
P055	Chicago	Village Entrance		
P056	Des Plaines	Administrative and Leisure Center	P22	5
P057	Des Plaines	Apache Park	P23	
P058	Des Plaines	Arndt Park	P24	
P059	Des Plaines	Donald Stephens Park North		

TAP Map ID	Municipality	Name	IFQ Map ID	Footnote
P060	Des Plaines	Eaton Field Park		
P061	Des Plaines	Iroquois Pool		6
P062	Des Plaines	Izaak Walton League		
P063	Des Plaines	Lake Park	P25	
P064	Des Plaines	Maine West High School Parkland		
P065	Des Plaines	Mckay Neils Park	P26	
P066	Des Plaines	Orchard Place Elementary School Park		7
P067	Des Plaines	Orchard Place School Park at Plainfield Elementary		8
P068	Des Plaines	Seminole Park	P27	
P069	Des Plaines	South School Parkland		9
P070	Des Plaines	Majewski Metro Park In Des Plaines	PX-205	
P071	Elk Grove Village	Andrews Park	P30	
P072	Elk Grove Village	Appleseed Park	P31	
P073	Elk Grove Village	Athletic Fields	P32	
P074	Elk Grove Village	Audubon Park	P33	
P075	Elk Grove Village	Audubon Skate Park		
P076	Elk Grove Village	Burbank Park	P35	
P077	Elk Grove Village	Fairchild Park	P36	
P078	Elk Grove Village	J. M. Heffern Park	P34	10
P079	Elk Grove Village	Jack A Claes Pavilion		
P080	Elk Grove Village	Jumpsn Jiggles Indoor Playground & Carousel		
P081	Elk Grove Village	Lions Park	P37	
P082	Elk Grove Village	Muir Park	P38	
P083	Elk Grove Village	Olmstead Park	P39	
P084	Elk Grove Village	Pirates' Cove Children's Theme Park		
P085	Elk Grove Village	Pocket Park #1 (Under Construction)	PP1	
P086	Elk Grove Village	Pocket Park #2 (under construction)	PP2	
P087	Elk Grove Village	Pocket Park #3	PP3	11
P088	Elk Grove Village	Pocket Park #4	PP4	11
P089	Elk Grove Village	Pocket Park #5	PP5	11
P090	Elk Grove Village	Pocket Park #6 (Future)	PP6	1
P091	Elk Grove Village	Pocket Park #7	PP7	11
P092	Elk Grove Village	Pocket Park #8 (Future)	PP8	
P093	Elk Grove Village	Pocket Park #9 (Existing)	PP9	
P094	Elk Grove Village	Pocket Park #10 (Future)	PP10	
P095	Elk Grove Village	Pocket Park #11 (Future)	PP11	
P096	Elk Grove Village	Pocket Park #12 (Existing)	PP12	
P097	Elk Grove Village	Pocket Park #13 (Future)	PP13	1

TAP Map ID	Municipality	Name	IFQ Map ID	Footnote
P098	Elk Grove Village	Pocket Park #15 (Existing)	PP15	1
P099	Elk Grove Village	Pocket Park #16 (Future)	PP16	1
P100	Elk Grove Village	Pocket Park #17 (Future)	PP17	1
P101	Elk Grove Village	Pocket Park #18 (Existing)	PP18	
P102	Elk Grove Village	Pocket Park #19 (Future)	PP19	
P103	Elk Grove Village	Pocket Park #22		
P104	Elk Grove Village	Rainbow Falls Waterpark		
P105	Elk Grove Village	Roosevelt Park		12
P106	Elk Grove Village	Sanders Park	P41	
P107	Elk Grove Village	Sheila Ray Adult Center		
P108	Elk Grove Village	Udall Park	P42	
P109	Elk Grove Village	Elk Grove Park District (Salt Creek & Clearmont Drive)	PX-202	1, 13
P110	Elk Grove Village	Hattendorf Park (Al Hattendorf Center)	PX-214	
P111	Elk Grove Village	Ridge Park (Field)	PX-213	
P112	Elk Grove Village	Salt Creek Park	PX-210	14
P113	Elk Grove Village	Village Green	PX-201	
P114	Elmhurst	Conrad Fischer Park		15
P115	Elmhurst	Crestview Park		
P116	Franklin Park	Centre at North Park		16
P117	Franklin Park	Discovery Park	P49	17
P118	Franklin Park	Franklin Park Ice Arena		
P119	Franklin Park	Franklin Park Pool		
P120	Franklin Park	Iceland Park	P44	
P121	Franklin Park	James Park	P45	
P122	Franklin Park	Junction Park		
P123	Franklin Park	Linden Park	P46	
P124	Franklin Park	North Park	P47	
P125	Franklin Park	Robinson And Crusoe Park	P50	
P126	Franklin Park	Rodger Hammil Square		
P127	Franklin Park	Ruby-Addison Park	P51	
P128	Franklin Park	Sunflower Nature Center		
P129	Franklin Park	Veterans Memorial Park		
P130	Harwood Heights	Harwood Heights Recreation Center		
P131	Harwood Heights	Norridge Park District Facilities Complex		18
P132	Harwood Heights	Norridge Rec Center-East		
P133	Harwood Heights	St. Rosalie's Kiddie Park	P52	
P134	Itasca	Benson Park	P54	

TAP Map ID	Municipality	Name	IFQ Map ID	Footnote
P135	Itasca	Country Club Park	P56	
P136	Itasca	Franzen Park	P57	
P137	Itasca	Franzen Play for All Community Park		19
P138	Itasca	Happy Acres Park	P55	20
P139	Itasca	Historical Depot Museum		
P140	Itasca	Itasca Caribbean Water Park		
P141	Itasca	James Clayson Park		
P142	Itasca	Peacock Park	P58	21
P143	Itasca	Schiller Park	P59	
P144	Itasca	Springbrook Nature Center		
P145	Itasca	St Peters Field		
P146	Itasca	Unnamed Park		
P147	Itasca	Washington Park	P60	
P148	Itasca	Wesley G. Usher Memorial Park		
P149	Melrose Park	Leyden Township Park Site		
P150	Melrose Park	Westdale Park		
P151	Norridge	Iron Ball Park		
P152	Norridge	Norridge Park	P61	
P153	Northlake	Centerpoint Recreation & Preserve		
P154	Northlake	Ful-Roy Park		
P155	Northlake	Grant Park Recreation Center		
P156	Northlake	Jerome Park		
P157	Northlake	Kahl Park		
P158	Northlake	Millennium Park		
P159	Northlake	Nagle-Perri Park		
P160	Northlake	Posphalla Park		22
P161	Northlake	Veterans Park District Preschool		
P162	Park Ridge	Brickton Park	P62	
P163	Park Ridge	Centennial Park	P63	1
P164	Park Ridge	Cumberland Park		
P165	Park Ridge	Hinkley Park		
P166	Park Ridge	Hodges Park		
P167	Park Ridge	Jaycee Park	P64	
P168	Park Ridge	Maine Park Leisure Center		
P169	Park Ridge	Ridge Park		
P170	Park Ridge	Rotary Park		
P171	Park Ridge	South Park		

TAP Map ID	Municipality	Name	IFQ Map ID	Footnote
P172	Park Ridge	Southwest Park	P65	
P173	Park Ridge	Wildwood Nature Center		
P174	Rosemont	Allstate Arena		
P175	Rosemont	Barry Recreational Center		
P176	Rosemont	Burgermeister Park		
P177	Rosemont	Donald E. Stephens Athletic Complex		23
P178	Rosemont	Donald Stephens Park S1		
P179	Rosemont	Donald Stephens Park S2		
P180	Rosemont	Dunne Park		
P181	Rosemont	Margaret J. Lange Park		
P182	Rosemont	Monument Park		
P183	Rosemont	Parkway Bank Park Entertainment District		
P184	Rosemont	Rosemont Health & Fitness		
P185	Rosemont	Rosemont Housing Complex Park		
P186	Rosemont	Rosemont Theatre		
P187	Rosemont	Stephens Rec Isle		
P188	Rosemont	The Dome at the Parkway Bank Sports Complex		
P189	Rosemont	Westin Park		
P190	Schiller Park	"Bark" Park		
P191	Schiller Park	Clocktower Park		
P192	Schiller Park	Edward E. Bluthardt Recreation Center		
P193	Schiller Park	Fairview Park	P66	
P194	Schiller Park	Kennedy Park	P67	24
P195	Schiller Park	North Village Park	P68	
P196	Schiller Park	Schiller Park Recreation Department		
P197	Schiller Park	Shelton Field		
P198	Schiller Park	Skate Park		
P199	Schiller Park	Stalica Park	P69	
P200	Schiller Park	Dooley Memorial Park	P70	25
P201	Wood Dale	Ash Woods Park		
P202	Wood Dale	Brookwood Park	P71	
P203	Wood Dale	Cabin Nature Center		
P204	Wood Dale	Calvary Park		
P205	Wood Dale	Central Park	P72	
P206	Wood Dale	Community Park	P73	
P207	Wood Dale	Franzen Grove Park		
P208	Wood Dale	Georgetown Park		

TAP Map ID	Municipality	Name	IFQ Map ID	Footnote
P209	Wood Dale	Hyatt-Hubbard Site		
P210	Wood Dale	Lake Mini-Ha-Ha		
P211	Wood Dale	Lionwood Park	P74	
P212	Wood Dale	Mohawk Manor Park		
P213	Wood Dale	Veteran's Memorial Park	P75	
P214	Wood Dale	White Oak Park	P76	
P215	Wood Dale	Wood Dale Recreation Complex		
P216	Wood Dale	Wood Dale Water Park	P77	
P217	Wood Dale	Woodlands at White Oak Park		
P218	Wood Dale	Salt Creek Golf Club	PX-207	

Note:

1 *Location differs from IFQ Re-Eval more than 100 ft*
2 *IFQ name: Diorio Park*
3 *IFQ name: Veteran's Park*
4 *IFQ name: Palm-Breiter Park*
5 *IFQ name replaced 'and' with '&'*
6 *Pool adjacent to school (S25)*
7 *Park adjacent to school (S28)*
8 *Park adjacent to school (S29)*
9 *Park adjacent to school (S330)*
10 *IFQ name: Bartrum Park*
11 *IFQ listed as "Under Construction"*
12 *Park adjacent to school (S32)*
13 *IFQ name: Elk Grove Park District (Salt Creek Placid Avenue)*
14 *IFQ name: Salt Creek Field; Park adjacent to school (S40)*
15 *Park adjacent to school (S43)*
16 *Co-located with Sunflower Nature Center*
17 *IFQ name: Pine Park*
18 *Combines Earl J Field Memorial Playground, Norridge Fitness Center, Norridge Recreation Center and the Harwood Heights Water Park*
19 *Park adjacent to school (S51)*
20 *IFQ name: Clayson Park*
21 *IFQ name Typo: Peacoak Park*
22 *Park adjacent to school (S66)*
23 *Adjacent to school (S77)*
24 *IFQ name: Kennedy Park/Memorial Pool*
25 *IFQ name: Wm. M. Dooley Memorial Park*

Table 11. Forest Preserve Lands for the TAP EA

Source: Synergy Consultants Inc. 2019 and HMMH analysis

TAP Map ID	Municipality	Name	IFQ Map ID
FP01	Addison	The Preserve at Oak Meadows	
FP02	Bensenville	Fisher Woods Forest Preserve	
FP03	Chicago	Catherine Chevalier Woods	
FP04	Chicago	Che Che Qua Woods	
FP05	Chicago	Indian Boundary Golf Course	
FP06	Chicago	Robinson Woods South	
FP07	Chicago	Schiller Park Model Airplane Flying Field	
FP08	Chicago	Schiller Playfield	
FP09	Chicago	Schiller Woods East	
FP10	Chicago	Schiller Woods North	
FP11	Des Plaines	Algonquin Woods	
FP12	Des Plaines	Blanding Grove Family Picnic Area	
FP13	Des Plaines	Blue Beech Family Picnic Area	
FP14	DuPage County	Salt Creek Park	P29
FP15	Elk Grove Village	Elk Grove Forest Preserve (Salt Creek East)	FP-2
FP16	Itasca	Salt Creek Marsh (north)	
FP17	Itasca	Salt Creek Marsh (south)	
FP18	Itasca	Songbird Slough Forest Preserve	
FP19	Maine Township	Iroquois Woods	
FP20	Park Ridge	Axehead Lake	
FP21	Park Ridge	Chippewa Woods	
FP22	Park Ridge	Dam No. 4 Woods East	
FP23	Park Ridge	John E Traeger Picnic Area	
FP24	Schiller Park	Indian Boundary Family Picnic Area	
FP25	Schiller Park	Irving Park Canoe Landing	
FP26	Schiller Park	River Bend Family Picnic Area	
FP27	Schiller Park	Robinson Homestead Family Picnic Area	
FP28	Schiller Park	Schiller Woods South	
FP29	Schiller Park	Schiller Woods-West	
FP30	Wood Dale	Maple Meadows Golf Club	
FP31	Wood Dale	Wood Dale Grove Forest Preserve	

Table 12 lists 18 sites modeled in the IFQ Re-Eval but excluded from the TAP EA and the reason. The primary reasons for exclusion were the site being outside of the PSA or the site having been demolished or deemed non-existent.

Table 12. Park and Forest Preserve Sites in the IFQ Re-Eval Excluded from the TAP EA

Source: HMMH analysis

IFQ Map ID	City	Name	Reason (Footnote)
P1	Bensenville	Bretman Park	1
P8	Bensenville	Schuster Park	1
P40	Elk Grove Village	Osborn Park	2
PX-203	Elk Grove Village	Debra Park	2
PX-200	Elk Grove Village	Hanson Park	2
PX-212	Elk Grove Village	Huntington Chase Park	2
PX-204	Elk Grove Village	Johnson Park	2
PX-209	Elk Grove Village	Marshall Field	2
PX-206	Elk Grove Village	Mwrd Preservation Area	2
PX-199	Elk Grove Village	Veteran's Memorial Park	2
PX-211	Elk Grove Village	Woodland Meadows	2
PP14	Elk Grove Village	Pocket Park #14 (Future)	3
PP20	Elk Grove Village	Pocket Park #20 (Future)	2
P43	Franklin Park	Hawthorne Park	2
PX-208	Wood Dale	Sbl Park	4
FP-3	Bensenville	Silver Creek (Dupage County Forest Preserve)	1
FP-1	Elk Grove Village	Elk Grove Forest Preserve (Salt Creek West)	5
FP-4	Elk Grove Village	Ned Brown Preserve (Busse Woods)	2

Note:

1 Modeled in IFQ but was acquired/demolished prior to IFQ
2 Not in PSA
3 Does not exist
4 Does not exist; Co-located with Prince of Peace United Methodist Church (W58)
5 Co-located with Forest Preserve FP15

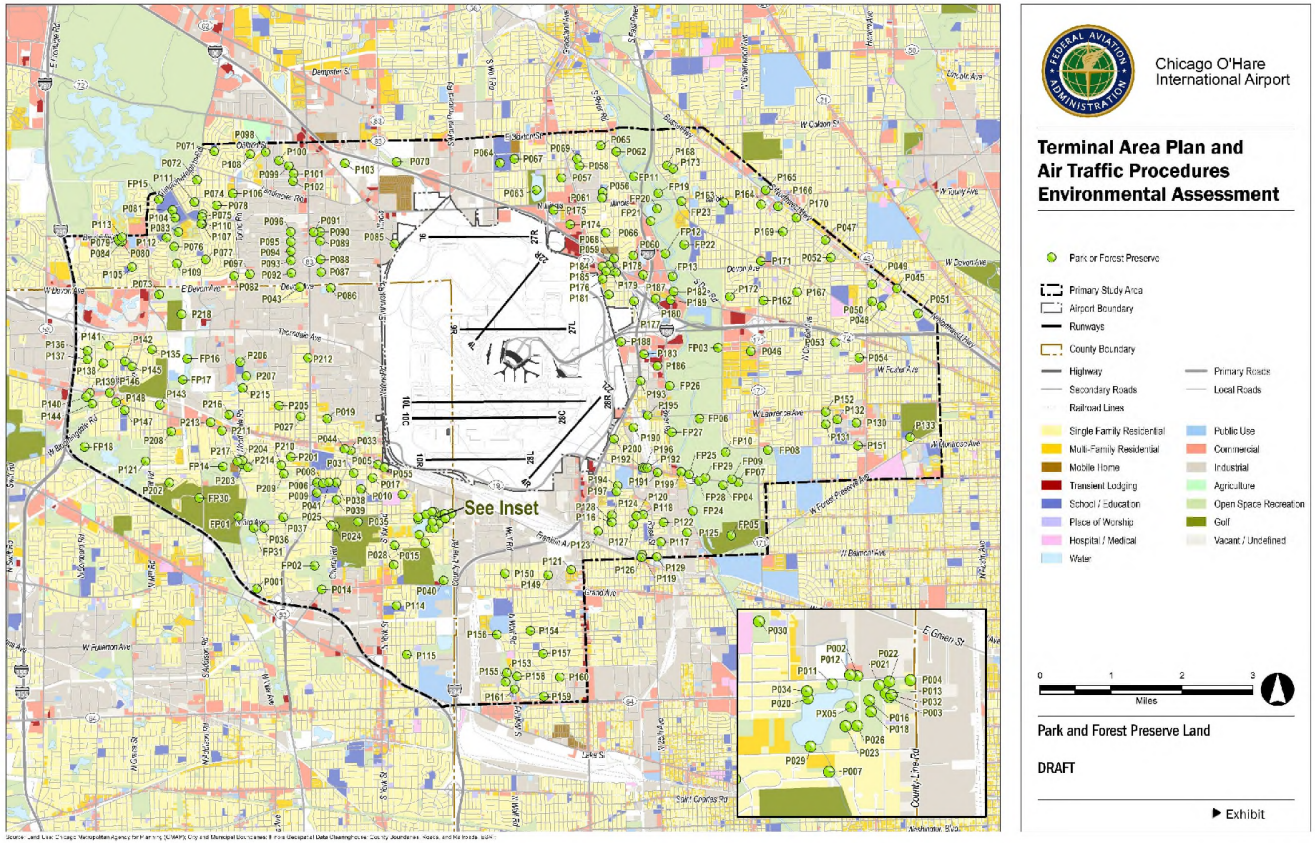


Exhibit 5. Park and Forest Preserve Land for the TAP EA

5.2 Historic/Cultural (Section 106 sites)

As stated in the FAA Order 1050.1F Desk Reference, "*Historical, architectural, archeological, and cultural resources encompass a range of sites, properties, and physical resources relating to human activities, society, and cultural institutions. Such resources include past and present expressions of human culture and history in the physical environment, such as prehistoric and historic archaeological sites, structures, objects, districts, which are considered important to a culture or community. Historical, architectural, archeological, and cultural resources also include aspects of the physical environment, namely natural features and biota, that are a part of traditional ways of life and practices and are associated with community values and institutions.*" As this is primarily referring to sites falling under Section 106 of the National Historic Preservation Act (NHPA), they are often referred to as "Section 106 sites".

HMMH will identify the following properties and sites within the SSA for further analysis: "*potentially noise sensitive areas within Section 4(f) properties (including, but not limited to, noise sensitive areas within national parks, national wildlife and waterfowl refuges and historic sites, including traditional cultural properties)*". Noise results from the uniformly spaced grid will be used for these sites if they exist. If a reportable change is identified, further evaluation of that site will be conducted.

The source of Section 106 site data was primarily the research and verification by Mead & Hunt Inc. Our audit included verifying the points correspond to the actual parcels and entities with which they are associated, checking if sites were included in the IFQ Re-Eval/Mead & Hunt's data product/both, verifying that land use had not changed relative to the IFQ Re-Eval, and verifying basic details like the name of the location.

The study teams search for historical sites were limited to those within the PSA.

The resulting 262 sites are listed in Table 13 and Table 14. Table 13 contains 13 properties listed or eligible to be listed on the National Register of Historical Places (NRHP). NRHP-listed and NRHP-eligible sites were given the 'HN' map ID prefix. Table 14 lists 249 locally important historical sites (LS). Sites not considered in the IFQ Re-Eval are highlighted in yellow in the tables, consisting of four historic sites (Table 13) and 136 LS (Table 14).

The 262 Section 106 sites are shown on Exhibit 6 and the four inset areas identified in Exhibit 6 are shown on Exhibit 7. The inset areas show large sets of Section 106 sites in small geographic areas of the map.

Table 13. Historic Properties for the TAP EA

Source: Mead & Hunt Inc. 2019 and HMMH analysis

TAP Map ID	Municipality	Name	NRHP Listed or Eligible	IFQ Map ID	Footnote
HN01	Bensenville	Churchville School	Listed	HP-1	1
HN02	Bensenville	Green Street School (Commercial Property)	Eligible	HP-4	1
HN03	Chicago	Bridge over JFK Expressway (I-90) carrying Canfield Avenue	Eligible		
HN04	Chicago	Wingert House	Listed	HP-11	
HN05	Chicago	Immaculate Conception Monastery	Listed		2
HN06	Chicago	Noble-Seymour-Crippen House	Listed	HP-3	
HN07	Chicago	Chicago & North Western Railroad Depot	Listed	HPN-4	3
HN08	Chicago	Rest Haven Cemetery	Eligible	HP-6	1
HN09	Chicago	Old Control Tower	Eligible	HP-9	4
HN10	Chicago	United Terminal 1	Eligible	HP-8	5
HN11	Chicago	Rotunda	Eligible		4
HN12	Chicago	Norwood Park Historical District	Listed	HP-2	6
HN13	Park Ridge	Pickwick Theater Building	Listed		

Notes:

1 *IFQ location adjusted/corrected*
2 *Other Name: Passionist Fathers Monastery; Also W028*
3 *IFQ name: Chicago & NW Depot; location adjusted/corrected*
4 *On airport*
5 *On airport; IFQ name: United Terminal 1 and CTA Transfer Station*
6 *IFQ location adjusted/corrected to southwest corner of district*

Table 14. Locally Important Historic Sites for the TAP EA

Source: Mead & Hunt Inc. 2021 and HMMH analysis

TAP Map ID	Municipality	Name	Address	IFQ Map ID	Footnote
LS001	Bensenville	Faith Community UCC	192 Center St	LS-57	2
LS002	Bensenville	Private Home (1866)	4N030 Church Rd	LS-540	1
LS003	Bensenville	Private Home (1920)	9 E Pine Ave	LS-552	
LS004	Bensenville	Private Home (1894)	110 E Pine Ave	LS-553	1
LS005	Bensenville	Fischer Farm	16W680 Grand Ave		
LS006	Bensenville	Private Home (1903)	180 May St	LS-527	1
LS007	Bensenville	Private Home (1923)	185 May St	LS-528	1
LS008	Bensenville	Veteran's Park West	118 N Church Rd		
LS009	Bensenville	Residence	214 Park St	LS-73	
LS010	Bensenville	Private Home (1918)	184 Rose St	LS-529	
LS011	Bensenville	Residence	185 Rose St		
LS012	Bensenville	Private Home (1922)	143 S Addison St	LS-521	
LS013	Bensenville	Private Home (1922)	150 S Addison St	LS-522	
LS014	Bensenville	Private Home (1924)	168 S Addison St	LS-523	
LS015	Bensenville	Private Home (1922)	169 S Addison St	LS-524	
LS016	Bensenville	Private Home (1925)	201 S Addison St	LS-525	
LS017	Bensenville	Janker's Building	202 S Addison St	LS-90	
LS018	Bensenville	Private Home (1868)	437 S Addison St	LS-526	1
LS019	Bensenville	Theatre/Stores	9-23 S Center St	LS-58	3
LS020	Bensenville	Private Home (1900)	145 S Center St	LS-530	1
LS021	Bensenville	Private Home (1925)	155 S Center St	LS-531	
LS022	Bensenville	Private Home (1894)	156 S Center St	LS-532	1
LS023	Bensenville	Private Home (1900)	160 S Center St	LS-533	1
LS024	Bensenville	Residence	164 S Center St	LS-59	
LS025	Bensenville	Peace Church Manse/ Private Home (1903)	166 S Center St	LS-534	4
LS026	Bensenville	Private Home (1919)	181 S Center St	LS-535	
LS027	Bensenville	Private Home (1922)	202 S Center St	LS-536	
LS028	Bensenville	Private Home (1919)	206 S Center St	LS-537	
LS029	Bensenville	Private Home (1925)	240 S Center St	LS-538	
LS030	Bensenville	Private Home (1925)	244 S Center St	LS-539	
LS031	Bensenville	Zion Lutheran Church	865 S Church Rd		
LS032	Bensenville	Private Home (1918)	138 S Mason St	LS-502	
LS033	Bensenville	Private Home (1911)	141 S Mason St	LS-503	1
LS034	Bensenville	Private Home (1906)	145 S Mason St	LS-504	1
LS035	Bensenville	Private Home (1903)	146 S Mason St	LS-505	1
LS036	Bensenville	Private Home (1919)	158 S Mason St	LS-506	

TAP Map ID	Municipality	Name	Address	IFQ Map ID	Footnote
LS037	Bensenville	Private Home (1925)	166 S Mason St	LS-508	
LS038	Bensenville	Private Home (1924)	169 S Mason St	LS-507	
LS039	Bensenville	Private Home (1920)	172 S Mason St	LS-511	
LS040	Bensenville	Private Home (1900)	173 S Mason St	LS-510	1
LS041	Bensenville	Private Home (1921)	175 S Mason St	LS-509	
LS042	Bensenville	Private Home (1921)	180 S Mason St	LS-512	
LS043	Bensenville	Private Home (1923)	196 S Mason St	LS-513	
LS044	Bensenville	Private Home (1925)	201 S Mason St	LS-514	
LS045	Bensenville	Private Home (1924)	176 S Walnut St	LS-549	1
LS046	Bensenville	Private Home (1922)	188 S Walnut St	LS-550	
LS047	Bensenville	Private Home (1924)	196 S Walnut St	LS-551	
LS048	Bensenville	Private Home (1904)	14 S York Rd	LS-541	1
LS049	Bensenville	Private Home (1907)	158 S York Rd	LS-542	1
LS050	Bensenville	Residence	165 S York Rd	LS-75	
LS051	Bensenville	Residence	180 S York Rd	LS-76	
LS052	Bensenville	Private Home (1905)	181 S York Rd	LS-544	1
LS053	Bensenville	Private Home (1912)	192 S York Rd	LS-545	1
LS054	Bensenville	Private Home (1912)	217 S York Rd	LS-546	
LS055	Bensenville	Professional Center	100 W Green St	LS-63	5
LS056	Bensenville	Private Home (1919)	301 W Green St	LS-515	
LS057	Bensenville	Private Home (1923)	309 W Green St	LS-516	
LS058	Bensenville	Private Home (1923)	313 W Green St	LS-517	
LS059	Bensenville	Private Home (1919)	317 W Green St	LS-518	
LS060	Bensenville	Private Home (1907)	507 W Green St	LS-519	1
LS061	Bensenville	Private Home (1872)	517 W Green St	LS-520	1
LS062	Bensenville	Korthauer Log House	714 W Wood Ave	LS-86	
LS063	Chicago	Commercial	6625 N Avondale Ave		
LS064	Chicago	Residence	5700 N Natoma Ave		
LS065	Chicago	Residence	5228 N New England Ave		
LS066	Chicago	Residence	5232 N New England Ave		
LS067	Chicago	Residence	5661 N New Hampshire Ave		
LS068	Chicago	Residence	5666 N New Hampshire Ave		
LS069	Chicago	Residence	5669 N New Hampshire Ave		
LS070	Chicago	Residence	5673 N New Hampshire Ave		
LS071	Chicago	Residence	5678 N New Hampshire Ave		
LS072	Chicago	Residence	5681 N New Hampshire Ave		

TAP Map ID	Municipality	Name	Address	IFQ Map ID	Footnote
LS073	Chicago	Residence	5682 N New Hampshire Ave		
LS074	Chicago	Residence	5685 N New Hampshire Ave		
LS075	Chicago	Residence	5688 N New Hampshire Ave		
LS076	Chicago	Residence	5692 N New Hampshire Ave		
LS077	Chicago	Residence	5693 N New Hampshire Ave		
LS078	Chicago	Residence	5697 N New Hampshire Ave		
LS079	Chicago	Residence	5617 N Newark Ave		
LS080	Chicago	Residence	5623 N Newark Ave		
LS081	Chicago	Residence	5627 N Newark Ave		
LS082	Chicago	Residence	5642 N Newark Ave		
LS083	Chicago	Residence	5647 N Newark Ave		
LS084	Chicago	Residence	5653 N Newark Ave		
LS085	Chicago	Residence	5656 N Newark Ave		
LS086	Chicago	Residence	5659 N Newark Ave		
LS087	Chicago	Residence	5662 N Newark Ave		
LS088	Chicago	Residence	5667 N Newark Ave		
LS089	Chicago	Residence	5631 N Newcastle Ave		
LS090	Chicago	Residence	5637 N Newcastle Ave		
LS091	Chicago	Residence	5647 N Newcastle Ave		
LS092	Chicago	Residence	5655 N Newcastle Ave		
LS093	Chicago	Danish Old People's Home	5656 N Newcastle Ave		6
LS094	Chicago	Residence	5667 N Newcastle Ave		
LS095	Chicago	Residence	6626 N Northwest Hwy		
LS096	Chicago	Mixed use - commercial/residential	6714 N Northwest Hwy		
LS097	Chicago	Mixed use - commercial/ residential	6718 N Northwest Hwy		
LS098	Chicago	Chicago-Read Mental Health Center	4200 N Oak Park Ave		7
LS099	Chicago	Residence	6134 N Olcott Ave		
LS100	Chicago	Edison Park Elementary School	6200 N Olcott Ave		8
LS101	Chicago	Residence	6554 N Oliphant Ave		
LS102	Chicago	Residence	6438 N Oxford Ave		
LS103	Chicago	Residence	6453 N Oxford Ave		
LS104	Chicago	Residence	6454 N Oxford Ave		
LS105	Chicago	Residence	6456 N Oxford Ave		
LS106	Chicago	Residence	720 S Lincoln Ave		
LS107	Chicago	Forest Preserve Garage	8800 W Belmont Ave		
LS108	Chicago	Residence	6800 W Hobart Ave		
LS109	Chicago	Residence	6803 W Hobart Ave		
LS110	Chicago	Residence	6804 W Hobart Ave		

TAP Map ID	Municipality	Name	Address	IFQ Map ID	Footnote
LS111	Chicago	Residence	6813 W Hobart Ave		
LS112	Chicago	Residence	6819 W Hobart Ave		
LS113	Chicago	Residence	6822 W Hobart Ave		
LS114	Chicago	Residence	6826 W Hobart Ave		
LS115	Chicago	Residence	6829 W Hobart Ave		
LS116	Chicago	Residence	6833 W Hobart Ave		
LS117	Chicago	Multi-family residence	6836 W Hobart Ave		
LS118	Chicago	Residence	6843 W Hobart Ave		
LS119	Chicago	Residence	6852 W Hobart Ave		
LS120	Chicago	Residence	6865 W Hobart Ave		
LS121	Chicago	Residence	6883 W Hobart Ave		
LS122	Chicago	Residence	6905 W Hobart Ave		
LS123	Chicago	Residence	6915 W Hobart Ave		
LS124	Chicago	Residence	6921 W Hobart Ave		
LS125	Chicago	Residence	6925 W Hobart Ave		
LS126	Chicago	Residence	6932 W Hobart Ave		
LS127	Chicago	Residence	6938 W Hobart Ave		
LS128	Chicago	Residence	6949 W Hobart Ave		
LS129	Chicago	Residence	6953 W Hobart Ave		
LS130	Chicago	Residence	6721 W Hurlbut St		
LS131	Chicago	Residence	6727 W Hurlbut St		
LS132	Chicago	Residence	6732 W Hurlbut St		
LS133	Chicago	Residence	7327 W Myrtle Ave		
LS134	Elk Grove Village	Elk Grove Park District Farmhouse Museum	399 Biesterfield Rd	LSS-3	1
LS135	Elmhurst	Fischer Windmill at Mt. Emblem Cemetery	520 E Grand Ave		
LS136	Franklin Park	Residence	3234 25th Ave		
LS137	Franklin Park	Residence	3238 25th Ave		
LS138	Franklin Park	Kirchhoff, Henry, House	10067 Franklin Ave		
LS139	Franklin Park	Victor Fluid Power	3412 River Rd		
LS140	Harwood Heights	Durocraft Homes point 1	5101 N Oconto Ave	LS-251	9
LS141	Harwood Heights	Durocraft Homes point 2	5129 N Octavia Ave		
LS142	Harwood Heights	Durocraft Homes point 3	5102 N Odell Ave		
LS143	Harwood Heights	Durocraft Homes point 4	7223 W Foster Ave		
LS144	Harwood Heights	Durocraft Homes point 5	7337 W Foster Ave		
LS145	Itasca	Historical Depot Museum	101 Catalpa Ave		
LS146	Itasca	Residence	226 N Elm St		
LS147	Itasca	Second School, Apartments	311 N Elm St		

TAP Map ID	Municipality	Name	Address	IFQ Map ID	Footnote
LS148	Itasca	Commercial	209 N Walnut Ave		
LS149	Itasca	Doctor's Memorial	217 N Walnut Ave		
LS150	Itasca	Residence	105 S Maple St		
LS151	Itasca	Residence	126 S Maple St		
LS152	Itasca	Residence	118 S Walnut Ave		
LS153	Itasca	Unknown	126 S Walnut St		
LS154	Itasca	Itasca Baptist Church	210 S Walnut Ave		
LS155	Itasca	Commercial	101 W Orchard St		
LS156	Itasca	Commercial	111 W Orchard St		
LS157	Itasca	Commercial	115 W Orchard St		
LS158	Itasca	Unknown	125 W Orchard St		
LS159	Park Ridge	Residence	231 Belle Plaine Ave	LS-460	
LS160	Park Ridge	Residence	916 Cleveland Ave		
LS161	Park Ridge	Residence	202 Columbia Ave	LS-371	
LS162	Park Ridge	Residence	203 Columbia Ave	LS-382	
LS163	Park Ridge	Residence	218 Courtland Ave		
LS164	Park Ridge	Residence	321 Courtland Ave	LS-445	
LS165	Park Ridge	Residence	411 Courtland Ave		
LS166	Park Ridge	Residence	412 Courtland Ave	LS-390	
LS167	Park Ridge	Residence	421 Courtland Ave	LS-391	
LS168	Park Ridge	Residence	524 Courtland Ave		
LS169	Park Ridge	Residence	708 Courtland Ave	LS-392	1
LS170	Park Ridge	Residence	840 Courtland Ave	LS-381	10
LS171	Park Ridge	Residence	908 Courtland Ave	LS-418	
LS172	Park Ridge	Residence	1429 Courtland Ave	LS-385	
LS173	Park Ridge	Residence	1439 Courtland Ave	LS-386	1
LS174	Park Ridge	Commercial	616 Devon Ave	LS-461	1
LS175	Park Ridge	Residence	945 Florence Dr		
LS176	Park Ridge	Clue House	720 Garden St		
LS177	Park Ridge	Residence	1113 Garden St		
LS178	Park Ridge	Residence	1105 Harrison St		
LS179	Park Ridge	Residence	211 Lake Ave	LS-409	
LS180	Park Ridge	Residence	225 Lake Ave	LS-410	1
LS181	Park Ridge	Residence	228 Lake Ave	LS-411	1
LS182	Park Ridge	Residence	234 Lake Ave	LS-412	1
LS183	Park Ridge	Residence	244 Lake Ave	LS-413	1
LS184	Park Ridge	Residence	328 Lake Ave		

TAP Map ID	Municipality	Name	Address	IFQ Map ID	Footnote
LS185	Park Ridge	Residence	122 N Delphia Ave		
LS186	Park Ridge	Residence	241 N Greenwood Ave		
LS187	Park Ridge	Residence	15 N Knight Ave		
LS188	Park Ridge	Residence	202 N Lincoln Ave		
LS189	Park Ridge	Residence	317 Oak St		
LS190	Park Ridge	Hodges House	325 Oak St	LS-320	11
LS191	Park Ridge	Helen Unseth House	808 Park Plaine Ave		
LS192	Park Ridge	Residence	704 Parkwood Ave		
LS193	Park Ridge	Residence	928 Prairie Ave		
LS194	Park Ridge	Residence	1003 Prairie Ave		
LS195	Park Ridge	Residence	600 S Clifton Ave	LS-378	1
LS196	Park Ridge	Residence	321 S Crescent Ave	LS-448	
LS197	Park Ridge	Residence	322 S Crescent Ave		
LS198	Park Ridge	Residence	325 S Crescent Ave	LS-446	
LS199	Park Ridge	Residence	333 S Crescent Ave		
LS200	Park Ridge	Residence	413 S Crescent Ave	LS-449	
LS201	Park Ridge	Residence	432 S Crescent Ave		
LS202	Park Ridge	Residence	505 S Crescent Ave	LS-450	
LS203	Park Ridge	Residence	506 S Crescent Ave		
LS204	Park Ridge	Residence	601 S Crescent Ave	LS-452	1
LS205	Park Ridge	Residence	823 S Crescent Ave	LS-441	
LS206	Park Ridge	Residence	925 S Crescent Ave	LS-453	1
LS207	Park Ridge	Residence	1305 S Crescent Ave	LS-343	12
LS208	Park Ridge	Residence	1433 S Crescent Ave	LS-444	
LS209	Park Ridge	Residence	315 S Cumberland Ave	LS-456	
LS210	Park Ridge	Residence	401 S Cumberland Ave	LS-457	
LS211	Park Ridge	Residence	424 S Cumberland Ave		
LS212	Park Ridge	Residence	431 S Cumberland Ave		
LS213	Park Ridge	Residence	224 S Fairview Ave		
LS214	Park Ridge	Residence	309 S Fairview Ave	LS-333	1
LS215	Park Ridge	Residence	316 S Fairview Ave		
LS216	Park Ridge	Residence	321 S Fairview Ave		
LS217	Park Ridge	Residence	400 S Fairview Ave		
LS218	Park Ridge	Residence	404 S Fairview Ave	LS-440	
LS219	Park Ridge	Residence	413 S Fairview Ave	LS-379	
LS220	Park Ridge	Residence	420 S Fairview Ave	LS-429	
LS221	Park Ridge	Residence	602 S Fairview Ave	LS-431	1

TAP Map ID	Municipality	Name	Address	IFQ Map ID	Footnote
LS222	Park Ridge	Residence	24 S Greenwood Ave		
LS223	Park Ridge	Residence	100 S Greenwood Ave		
LS224	Park Ridge	Commercial	19 S Prospect Ave	LS-289	
LS225	Park Ridge	Park Ridge Post Office	164 S Prospect Ave		
LS226	Park Ridge	Residence	316 S Prospect Ave	LS-359	1
LS227	Park Ridge	Residence	412 S Prospect Ave	LS-370	
LS228	Park Ridge	Residence	413 S Prospect Ave	LS-361	1
LS229	Park Ridge	Residence	500 S Prospect Ave	LS-362	
LS230	Park Ridge	Residence	601 S Prospect Ave	LS-363	1
LS231	Park Ridge	Residence	715 S Prospect Ave		
LS232	Park Ridge	Residence	718 S Prospect Ave	LS-364	1
LS233	Park Ridge	Residence	1521 S Prospect Ave	LS-357	1
LS234	Park Ridge	Residence	506 S Western Ave		
LS235	Park Ridge	Residence	228 Stanley Ave		
LS236	Park Ridge	Residence	424 Talcott Pl	LS-368	13
LS237	Park Ridge	Residence	430 Talcott Pl	LS-369	14
LS238	Park Ridge	Commercial	203 Vine Ave		
LS239	Park Ridge	Residence	225 Vine Ave		
LS240	Park Ridge	Residence	230 Vine Ave		
LS241	Park Ridge	Residence	332 Vine Ave	LS-335	
LS242	Park Ridge	Residence	404 Vine Ave	LS-336	1
LS243	Park Ridge	Residence	514 Vine Ave	LS-464	
LS244	Park Ridge	Residence	1000 W Crescent Ave	LS-443	
LS245	Park Ridge	Town of Maine Cemetery	2101 W Touhy Ave		
LS246	Schiller Park	20 Corner Store	4851 Michigan Ave	LS-482	1
LS247	Schiller Park	21 Siemer's Home	4262 Ruby St	LS-480	1
LS248	Wood Dale	Residence	174 Harvey Ave	LS-486	1
LS249	Wood Dale	Residence	262 N Hemlock Ave	LS-487	1

Note:

1 *IFQ location adjusted/corrected*
2 *IFQ name: Peace Church; location and street address corrected*
3 *IFQ address: 23 S Center St*
4 *IFQ name: Private Home (1903)*
5 *IFQ confused Peace Church Manse at 166 S Center St with the professional center at 100 W Green St*
6 *Senior Community; Also N04*
7 *Also a Hospital (H03)*
8 *Also a School (S12)*
9 *IFQ location adjusted/corrected; four additional points added to cover district*
10 *IFQ address 317 Oak Street; address and location adjusted/corrected*
11 *IFQ address 428 W Talcott; address and location adjusted/corrected*
12 *IFQ address 842 Courtland Avenue; address and location adjusted/corrected*
13 *IFQ address 429 W Talcott Road; address and location adjusted/corrected*
14 *IFQ address 430 W Talcott Road; address and location adjusted/corrected*

*Note – The prior version of this memorandum included 3 locations for the Durocraft Homes in Harwood Heights. Two additional sites were added to better reflect the area of this district which resulted in the renumbering of the remaining locations in the table.

Table 15 and Table 16 list 25 sites (combined) modeled in the IFQ Re-Eval but excluded from the TAP EA and the reasons for exclusion. Table 15 has 4 historical sites and Table 16 has 21 LS. The primary reasons for exclusion were the site being outside of the PSA, the structure having been demolished or the appropriate Historical Society determining the site to be nonextant.

Table 15. Historic Sites in the IFQ Re-Eval Excluded from the TAP EA

Source: HMMH analysis

IFQ Map ID	Municipality	Name	Footnote
HP-5	Bensenville	Gas Service Station (Vacant)	1
HP-10	Bensenville	Schwerdtfeger Farmstead (Vacant)	1
HP-7	Bensenville	St. Johannes Cemetery	1
HPN-24	Chicago	Old Edgebrook District	2

Note:
1 Modeled in IFQ but was acquired/demolished prior to IFQ
2 Not in PSA

Table 16. Locally Important Historic Sites in the IFQ Re-Eval Excluded from the TAP EA

Source: Mead & Hunt Inc. 2019 and HMMH analysis

IFQ Map ID	City	Name	Reason
LS-83	Bensenville	A.G. Chessman	Structure at 123 Sievert Ct demolished in 2016; Believed to be nonextant per correspondence with Bensenville local history assistant at Bensenville Public Library
LS-88	Bensenville	Chippewa School, Formerly Bhs	Nonextant per correspondence with Bensenville local history assistant at Bensenville Public Library
LS-91	Bensenville	Fanzen's Mill Memorial	Not considered an historic property but will be noted in APE document.
LSS-1	Bensenville	Geodesic Dome	Demolished in 2009; Nonextant per correspondence with Bensenville local history assistant at Bensenville Public Library
LS-547	Bensenville	Private Home (1870)	Structure at location demolished in 2012; confirmed with history assistant at Bensenville Public Library
LS-548	Bensenville	Private Home (1910)	Duplicate of HP-4
LS-66	Bensenville	Railroad Monument	Not considered an historic property but will be noted in APE document.
LS-62	Bensenville	St. John Church	Nonextant per correspondence with Bensenville local history assistant at Bensenville Public Library
LS-79	Bensenville	Tioga Elementary School	New school built over the historic one; see S07
LSS-2	Elk Grove Village	Elk Grove Cemetery	Not in PSA
LSS-4	Elk Grove Village	Historic Tonne House	Demolished in 2011; Nonextant per correspondence with Elk Grove Historical Society
LSS-5	Elk Grove Village	Original Farmhouse – 1	Not in PSA
LSS-6	Elk Grove Village	Original Farmhouse - 2	Nonextant per correspondence with Elk Grove Historical Society
LS-249	Franklin Park	Commercial	Building Demolished in 2007; Not in PSA
LS-389	Park Ridge	Residence - 300 Courtland Avenue	Nonextant, confirmed by Mead & Hunt
LS-384	Park Ridge	Residence - 300 Courtland Avenue	Nonextant, confirmed by Mead & Hunt
LS-388	Park Ridge	Residence – 308 Courtland Avenue	Nonextant, confirmed by Mead & Hunt
LS-455	Park Ridge	Residence - 1100 N Cumberland Avenue	Not in PSA
LS-430	Park Ridge	Residence - 521 S Fairview Avenue	Appears that house at 521 S Fairview is newly built. House in HARGIS does not match current house on parcel.
LS-340	Park Ridge	Residence - 122 Vine Avenue	Park Ridge Historical Society believes to be nonextant.
LS-481	Schiller Park	Alexander Robinson House	Nonextant per correspondence with Schiller Park Historic Commission

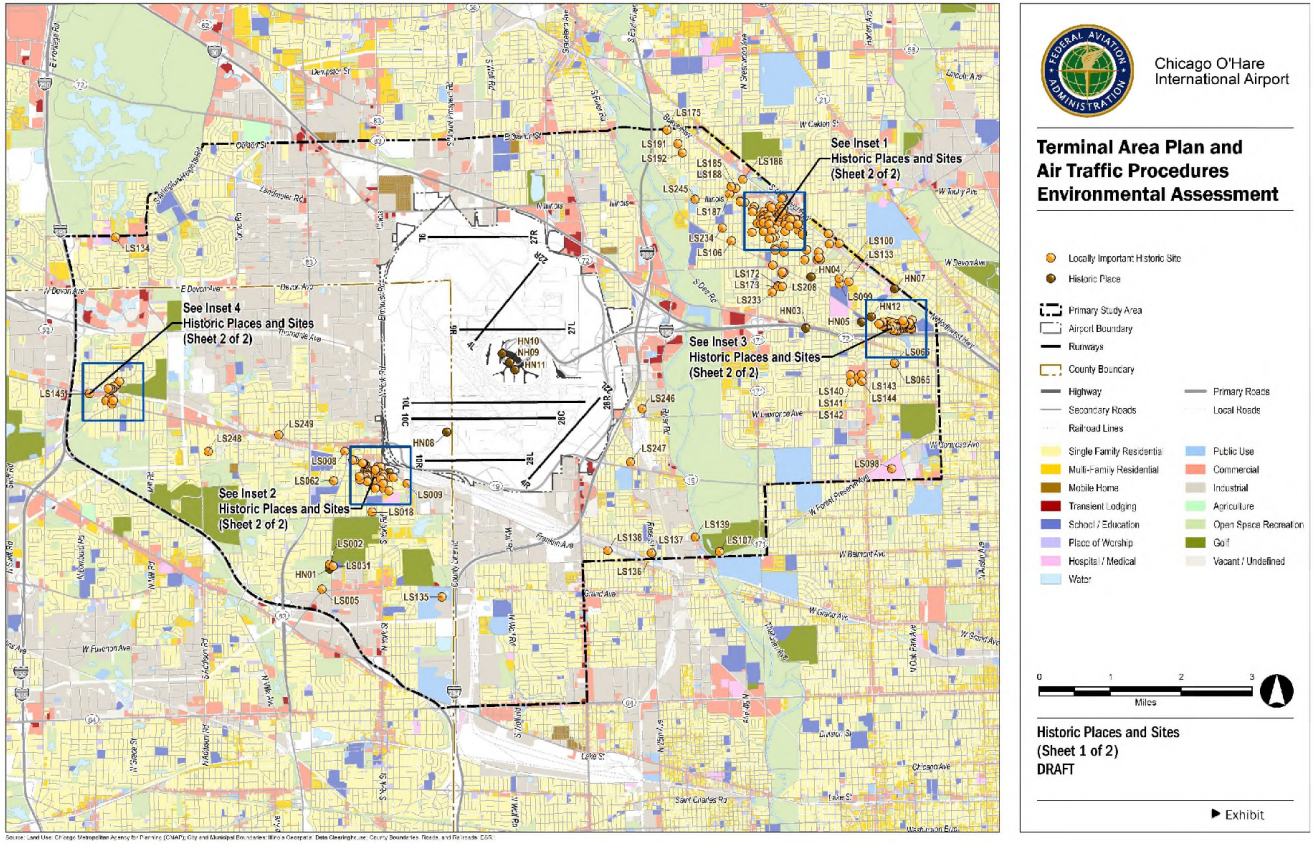


Exhibit 6. Overview of Historic/Cultural Sites for the TAP EA

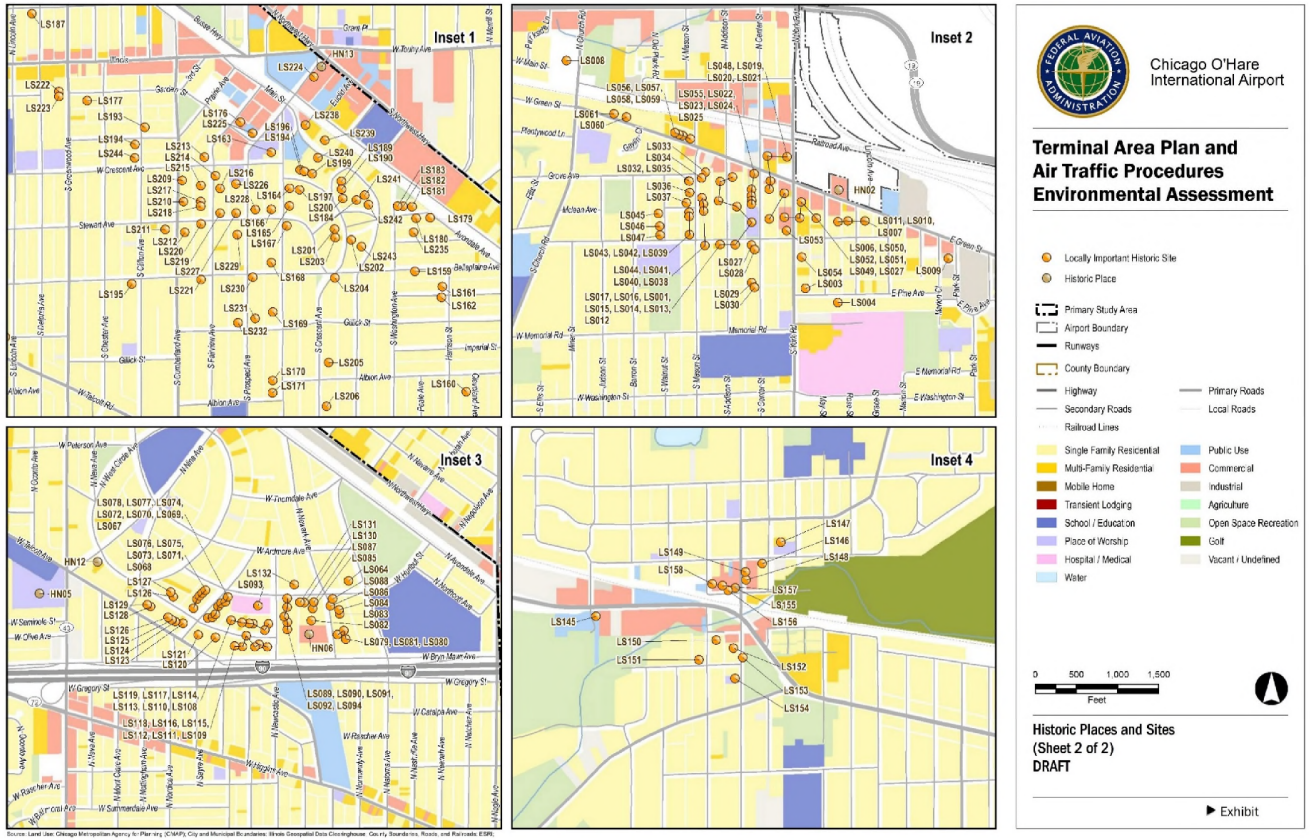


Exhibit 7. Insets for Historic/Cultural Sites for the TAP EA

F-5.3. NOISE-SENSITIVE FACILITIES ANALYSIS

FAA has published guidelines relating the compatibility of land use types to airport sound levels. These guidelines are defined in Federal Aviation Regulations (FAR), 14 CFR Part 150 as shown in **Table F-5.1**. These guidelines delineate the compatibility parameters for residential, public, commercial, manufacturing and production, and recreational land uses and determines the various types of noise-sensitive facilities. Learning institutions (e.g., public/private schools, universities, and libraries), healthcare facilities (e.g., hospitals and nursing homes), and places of worship (e.g., churches, temples, and synagogues) are considered noise-sensitive non-residential facilities. **Exhibits 1** through **Exhibit 4** in **Section F-5.2** display the modeled noise-sensitive facilities within the PSA by number:

- 87 public and private schools (grades K-12), three colleges/universities, and eight libraries
- Three hospitals and 16 nursing homes
- 124 places of worship

Section F-5.3.1 includes tables listing all of the modeled noise-sensitive facilities in the PSA along with their DNL, which was computed with the AEDT. Further discussion and DNL results for Section 4(f) lands can be found in **Appendix H** and further discussion and DNL results for Historical (Section 106) sites can be found in **Appendix G.**

F-5.3.1. Inventory of Noise-Sensitive Facilities

Tables F-5.2 through **Table F-5.4** show results of DNL analyses at each of the facilities listed in the following three subsections, respectively. Each table provides the DNL value at each facilities along with the change in DNL between the no action and the proposed action alternative for each condition.

F-5.3.2. Learning Institutions

A total of 98 learning institutions—87 schools, three universities or colleges, and eight libraries—are listed in **Table F-5.2**. Those institutions included in the School Sound Insulation Program (SSIP) SSIP are noted; these learning centers either have completed insulation or are funded for the program. Of the 87 schools in **Table F-5.2**, sound insulation for 66 have been completed by the SSIP.

F-5.3.2. Health Care Facilities

Health care facilities include hospitals and nursing homes. A total of three hospitals and 16 nursing homes are located in the PSA. **Table F-5.3** identifies each health care facilities modeled.

F-5.3.3. Places of Worship

This section includes any place of worship by various religions, including churches, synagogues, temples, and other religious places. A combined total of 124 places of worship are located within the PSA. **Table F-5.4** identifies each place of worship modeled.

TABLE F-5.2
DNL VALUES AT LEARNING INSTITUTIONS

Map ID	Municipality	Name	Existing Conditions DNL (dB)	Interim Condition			Build Out Condition			Note
				No Action DNL (dB)	Proposed Action DNL (dB)	Change in DNL (dB)	No Action DNL (dB)	Proposed Action DNL (dB)	Change in DNL (dB)	
Universities/Colleges										
U01	**Bensenville**	**Logos Evangelical Seminary**	**67.9**	**66.8**	**66.5**	**-0.3**	**67.2**	**66.8**	**-0.4**	—
U02	Chicago	Wilbur Wright College	57.1	57.9	58.0	0.1	58.6	58.6	0.0	—
U03	Des Plaines	Choice Career College	61.6	62.2	62.2	0.0	62.6	62.5	-0.1	—
K-12 Schools										
S01	Arlington Heights	Laureate Day Schools & Metropolitan Prep Schools	54.0	55.8	55.5	-0.3	56.3	56.0	-0.3	—
S02	Bensenville	Blackhawk Middle School	59.2	57.2	57.7	0.5	57.0	57.7	0.7	1
S03	Bensenville	Concord Lutheran School	55.0	52.6	52.8	0.2	52.5	53.0	0.5	—
S04	Bensenville	Fenton High School	64.2	61.0	62.8	1.8	60.9	63.4	2.5	1
S05	Bensenville	Holy Family Catholic School	55.9	53.7	53.9	0.2	54.1	53.8	-0.3	1
S06	Bensenville	Tioga Elementary School	58.2	56.6	56.7	0.1	56.6	56.8	0.2	1
S07	**Bensenville**	**Transition Learning Center**	**66.4**	**62.0**	**64.8**	**2.8**	**62.1**	**65.8**	**3.7**	2
S08	Bensenville	W A Johnson Elementary School	58.3	56.3	56.7	0.4	56.0	56.6	0.6	1
S09	Chicago	Beard Elementary School	61.6	63.1	63.1	0.0	63.8	63.6	-0.2	—
S10	Chicago	Brickton Montessori School	63.5	62.2	62.2	0.0	62.6	62.7	0.1	—
S11	Chicago	Dirksen Elementary School	64.1	63.6	63.5	-0.1	64.1	64.1	0.0	1
S12	Chicago	Edison Park Elementary School	58.6	60.2	60.1	-0.1	60.9	60.8	-0.1	1
S13	Chicago	Garvy J Elementary School	59.8	58.8	58.8	0.0	59.5	59.3	-0.2	1
S14	Chicago	Immaculate Conception School	63.3	62.5	62.5	0.0	63.1	63.0	-0.1	1
S15	Chicago	New Horizon Center	57.2	58.2	58.2	0.0	58.9	58.9	0.0	—
S16	Chicago	Norwood Park Elementary School	60.9	62.2	62.1	-0.1	62.9	62.7	-0.2	1
S17	Chicago	Oriole Park Elementary School	62.0	59.4	59.4	0.0	59.9	60.0	0.1	1
S18	Chicago	Resurrection High School	59.7	62.3	62.2	-0.1	63.0	62.9	-0.1	1

Map ID	Municipality	Name	Existing Conditions DNL (dB)	Interim Condition			Build Out Condition			Note
				No Action DNL (dB)	Proposed Action DNL (dB)	Change in DNL (dB)	No Action DNL (dB)	Proposed Action DNL (dB)	Change in DNL (dB)	
S19	Chicago	St. Eugene School	62.5	61.5	61.4	-0.1	62.0	62.0	0.0	1
S20	Chicago	St. Monica School	60.6	60.4	60.3	-0.1	61.1	60.9	-0.2	1
S21	**Chicago**	**St. Paul Lutheran School**	**65.3**	**61.4**	**61.4**	**0.0**	**61.8**	**61.9**	**0.1**	1
S22	**Chicago**	**St. Sava Academy**	**65.7**	**61.8**	**61.8**	**0.0**	**62.3**	**62.4**	**0.1**	1
S23	Chicago	Taft High School	62.5	59.8	59.8	0.0	60.4	60.3	-0.1	1
S24	Des Plaines	Angel Town Private School	58.3	59.6	59.7	0.1	59.8	59.9	0.1	–
S25	Des Plaines	Iroquois Community School	58.6	59.9	60.1	0.2	60.1	60.3	0.2	–
S26	Des Plaines	Maine West High School	53.5	54.2	54.4	0.2	54.5	54.4	-0.1	1
S27	Des Plaines	North Cook Young Adult Academy & Region 05 North Cook ISC 1	57.0	59.2	59.3	0.1	59.5	59.4	-0.1	–
S28	**Des Plaines**	**Orchard Place Elementary School**	**65.4**	**66.7**	**66.6**	**-0.1**	**67.3**	**66.9**	**-0.4**	1
S29	Des Plaines	Plainfield Elementary School	53.8	54.7	54.9	0.2	55.0	55.0	0.0	1
S30	Des Plaines	South Elementary School	55.5	56.6	56.8	0.2	56.8	57.0	0.2	–
S31	Des Plaines	St. Stephen Catholic School	55.0	56.2	56.4	0.2	56.4	56.5	0.1	1
S32	Elk Grove Village	Adm Richard E Byrd Elementary School	58.3	58.2	57.8	-0.4	59.1	59.0	-0.1	1
S33	Elk Grove Village	Elk Grove Park District Preschool and Early Childhood Center	60.0	61.4	60.8	-0.6	62.2	62.0	-0.2	1
S34	Elk Grove Village	Clearmont Elementary School	56.0	56.4	56.0	-0.4	57.2	57.0	-0.2	1
S35	Elk Grove Village	Elk Grove High School	59.9	61.0	60.4	-0.6	61.8	61.6	-0.2	1
S36	Elk Grove Village	Grove Junior High School	58.5	59.4	58.9	-0.5	60.3	60.0	-0.3	1
S37	Elk Grove Village	Queen Of The Rosary School	58.0	58.7	58.2	-0.5	59.5	59.3	-0.2	1
S38	Elk Grove Village	Ridge Family Center For Learning	57.1	58.3	57.7	-0.6	59.2	58.7	-0.5	1
S39	Elk Grove Village	Rupley Elementary School	55.2	56.6	56.1	-0.5	57.6	56.8	-0.8	1
S40	Elk Grove Village	Salt Creek Elementary School	60.8	61.1	60.7	-0.4	62.0	62.0	0.0	–
S41	Elk Grove Village	Sterling Central - Chicago Campus	58.9	62.0	61.5	-0.5	62.8	62.4	-0.4	–

Map ID	Municipality	Name	Existing Conditions DNL (dB)	Interim Condition			Build Out Condition			Note
				No Action DNL (dB)	Proposed Action DNL (dB)	Change in DNL (dB)	No Action DNL (dB)	Proposed Action DNL (dB)	Change in DNL (dB)	
S42	Elmhurst	Churchville Middle School	54.9	52.8	52.9	0.1	53.2	53.0	-0.2	1
S43	Elmhurst	Conrad Fischer Elementary School	55.6	53.5	53.6	0.1	54.0	53.6	-0.4	1
S44	Elmhurst	Pythagoras Childrens Academy	53.7	51.6	51.8	0.2	51.8	52.3	0.5	—
S45	Franklin Park	East Leyden High School	56.5	56.0	56.0	0.0	56.1	56.2	0.1	1
S46	Franklin Park	Enger Elementary School & Leyden Area Special Education Cooperative	57.2	56.4	56.5	0.1	56.6	55.9	-0.7	1
S47	Franklin Park	North Elementary School	55.9	55.4	55.4	0.0	55.6	55.6	0.0	1
S48	Harwood Heights	St. Rosalie Religious Education	60.3	61.2	61.2	0.0	61.9	61.7	-0.2	—
S49	Harwood Heights	Union Ridge Elementary School	62.9	64.2	64.2	0.0	64.8	64.7	-0.1	1
S50	Itasca	Bright Horizons Chancellory	59.2	61.3	60.9	-0.4	61.9	61.2	-0.7	—
S51	Itasca	Elmer H. Franzen Elementary School	56.6	58.3	58.2	-0.1	58.9	58.6	-0.3	1
S52	Itasca	F.E. Peacock Junior High School	58.3	59.8	59.7	-0.1	60.2	60.0	-0.2	1
S53	**Itasca**	**Lutheran School Of St. Luke**	**64.1**	**63.9**	**64.1**	**0.2**	**64.5**	**65.0**	**0.5**	1,3
S54	**Itasca**	**Raymond Benson Primary School**	**64.1**	**64.5**	**64.6**	**0.1**	**65.1**	**65.5**	**0.4**	1
S55	Itasca	St. Peter The Apostle School	58.5	59.9	59.9	0.0	60.3	60.2	-0.1	1
S56	Melrose Park	Mannheim Middle School	57.7	56.7	56.9	0.2	56.9	56.2	-0.7	1
S57	Norridge	J Giles Elementary School	57.5	59.0	58.9	-0.1	59.4	59.8	0.4	1
S58	**Norridge**	**J Leigh Elementary School**	**66.1**	**66.9**	**66.9**	**0.0**	**67.4**	**67.3**	**-0.1**	1
S59	Norridge	Pennoyer Elementary School	63.3	62.3	62.2	-0.1	62.8	62.9	0.1	1
S60	Norridge	Ridgewood Community High School	60.4	61.4	61.3	-0.1	61.9	61.9	0.0	1
S61	Northlake	Mannheim Early Childhood Center	63.3	61.2	61.2	0.0	61.5	60.6	-0.9	—
S62	Northlake	Roy Elementary School	59.7	58.1	58.2	0.1	58.4	57.6	-0.8	1
S63	Northlake	St. John Vianney School & Our Lady Montessori School	58.7	56.8	56.9	0.1	57.2	56.6	-0.6	1
S64	Northlake	West Leyden High School	62.5	60.3	60.3	0.0	60.6	59.8	-0.8	1

Map ID	Municipality	Name	Existing Conditions DNL (dB)	Interim Condition			Build Out Condition			Note
				No Action DNL (dB)	Proposed Action DNL (dB)	Change in DNL (dB)	No Action DNL (dB)	Proposed Action DNL (dB)	Change in DNL (dB)	
S65	Northlake	Westdale Elementary School	63.3	61.2	61.2	0.0	61.5	60.6	-0.9	1
S66	Northlake	Whittier Primary School	57.6	56.3	56.5	0.2	56.6	55.9	-0.7	1
S67	Park Ridge	George B Carpenter Elementary School	56.6	55.9	56.2	0.3	56.2	56.3	0.1	–
S68	Park Ridge	George Washington Elementary School	60.6	61.1	61.1	0.0	61.7	61.5	-0.2	1
S69	Park Ridge	Jeanine Schultz Memorial School	55.2	54.5	55.0	0.5	54.9	55.1	0.2	–
S70	Park Ridge	Lincoln Middle School	58.6	59.0	59.0	0.0	59.5	59.4	-0.1	1
S71	Park Ridge	Maine South High School	63.2	63.7	63.7	0.0	64.3	64.0	-0.3	1
S72	Park Ridge	Mary Seat Of Wisdom	59.8	61.8	61.5	-0.3	62.3	62.3	0.0	1
S73	Park Ridge	Ralph J Frost Academy	61.7	61.5	61.5	0.0	61.8	61.8	0.0	–
S74	Park Ridge	St. Andrews Lutheran School	55.1	56.0	55.8	-0.2	56.5	56.6	0.1	1
S75	Park Ridge	St. Paul of the Cross School	56.4	57.7	57.5	-0.2	58.3	58.3	0.0	–
S76	Park Ridge	Theodore Roosevelt Elementary School	59.7	60.9	60.6	-0.3	61.5	61.4	-0.1	1
S77	**Rosemont**	**Rosemont Elementary School**	**66.7**	**69.0**	**69.0**	**0.0**	**69.6**	**69.5**	**-0.1**	1
S78	Schiller Park	John F Kennedy Elementary School	59.5	58.9	58.7	-0.2	59.0	59.0	0.0	1
S79	Schiller Park	Kids Island	61.0	60.5	60.3	-0.2	60.6	61.2	0.6	1
S80	Schiller Park	Lincoln Middle School	59.9	59.4	59.2	-0.2	59.5	59.7	0.2	1
S81	**Schiller Park**	**Washington Elementary School**	**71.4**	**71.3**	**71.1**	**-0.2**	**71.8**	**71.7**	**-0.1**	1
S82	Wood Dale	Childs Voice School	63.2	63.2	63.0	-0.2	63.8	63.4	-0.4	–
S83	**Wood Dale**	**Early Childhood Education Center**	**64.2**	**65.5**	**65.3**	**-0.2**	**65.8**	**65.8**	**0.0**	1
S84	Wood Dale	Holy Ghost School	63.5	62.8	63.2	0.4	63.1	63.8	0.7	1
S85	Wood Dale	Oakbrook Elementary School	59.8	57.9	60.0	2.1	57.7	60.5	2.8	1
S86	Wood Dale	Westview Elementary School	60.7	60.3	60.8	0.5	60.6	61.3	0.7	1
S87	Wood Dale	Wood Dale Junior High School	63.8	63.3	63.3	0.0	63.8	63.5	-0.3	1

Map ID	Municipality	Name	Existing Conditions DNL (dB)	Interim Condition			Build Out Condition			Note
				No Action DNL (dB)	Proposed Action DNL (dB)	Change in DNL (dB)	No Action DNL (dB)	Proposed Action DNL (dB)	Change in DNL (dB)	
Libraries										
L01	Bensenville	Bensenville Community Public Library	60.0	57.9	58.5	0.6	57.7	58.6	0.9	—
L02	Elk Grove Village	Elk Grove Village Public Library	59.8	59.9	59.5	-0.4	60.8	60.9	0.1	—
L03	Harwood Heights	Eisenhower Public Library District	63.4	64.3	64.2	-0.1	64.9	64.7	-0.2	—
L04	Itasca	Itasca Community Library	60.5	62.7	62.6	-0.1	63.3	63.4	0.1	—
L05	Northlake	Northlake Public Library District	59.1	57.2	57.3	0.1	57.6	56.9	-0.7	—
L06	Park Ridge	Park Ridge Public Library	55.9	57.1	56.9	-0.2	57.7	57.7	0.0	—
L07	Schiller Park	Schiller Park Public Library	60.7	60.5	60.3	-0.2	60.6	61.5	0.9	—
L08	**Wood Dale**	**Wood Dale Public Library District**	**64.4**	**66.2**	**66.0**	**-0.2**	**66.6**	**66.6**	**0.0**	—

Notes:
1) Sound-insulated
2) Newly included within the DNL 65 dB and significantly impacted by noise due to the Build Out Proposed Action
3) Newly included within the DNL 65 dB due to the Build Out Proposed Action

Bold text – At least one condition has a DNL greater than or equal to 65 dB

Source: NCES College Navigator (names and addresses)
ILSBE Directory of Educational Entities (names and addresses)
Institute of Museums and Library Services Public Libraries Survey (names and addresses)
HMMH, 2021

TABLE F-5.3
DNL VALUES AT HEALTH CARE FACILITIES

Map ID	Municipality	Name	Existing Conditions DNL (dB)	Interim Condition			Build Out Condition			Note
				No Action DNL (dB)	Proposed Action DNL (dB)	Change in DNL (dB)	No Action DNL (dB)	Proposed Action DNL (dB)	Change in DNL (dB)	
Hospitals										
H01	Chicago	Resurrection Medical Center	62.0	63.5	63.5	0.0	64.2	64.1	-0.1	–
H02	Chicago	Maryville Center for Children	53.8	55.1	55.1	0.0	55.6	56.2	0.6	–
H03	Chicago	Chicago-Read Mental Health Center	54.9	56.3	56.3	0.0	56.8	57.3	0.5	–
Nursing Homes										
N01	Bensenville	Bridgeway Of Bensenville	58.6	57.2	57.1	-0.1	57.3	57.3	0.0	–
N02	Bensenville	Bridgeway Senior Living	58.0	56.5	56.5	0.0	56.6	56.7	0.1	–
N03	Bensenville	Castle Towers	58.6	57.1	57.1	0.0	57.2	57.3	0.1	–
N04	Chicago	Danish Old People's Home	63.3	60.5	60.5	0.0	61.1	61.0	-0.1	–
N05	Chicago	Norwood Life Society Assisted Living	59.7	60.9	60.8	-0.1	61.6	61.5	-0.1	–
N06	Chicago	Presence Resurrection Life Center	61.1	63.1	63.1	0.0	63.8	63.7	-0.1	–
N07	Des Plaines	Asbury Court Nursing & Rehab	54.0	55.6	55.4	-0.2	56.1	55.8	-0.3	–
N08	Des Plaines	Generations Oakton Pavilion	54.0	54.9	55.1	0.2	55.2	55.2	0.0	–
N09	Elk Grove Village	Alexian Village of Elk Grove	59.5	58.8	58.4	-0.4	59.8	59.8	0.0	–
N10	Elmhurst	The Grove of Elmhurst	54.7	52.5	52.7	0.2	52.8	52.8	0.0	–
N11	Itasca	Forest View Rehab & Nursing Center	61.7	61.1	61.5	0.4	61.7	62.2	0.5	–
N12	**Norridge**	**Central Baptist Village**	**65.8**	**67.1**	**67.1**	**0.0**	**67.6**	**67.5**	**-0.1**	–
N13	Norridge	Norridge Gardens	56.7	57.9	57.9	0.0	58.5	58.7	0.2	–
N14	Northlake	Casa San Carlo	59.8	57.9	58.0	0.1	58.3	57.6	-0.7	–
N15	Northlake	Presence Villa Scalabrini N&R	60.1	58.1	58.2	0.1	58.5	57.8	-0.7	–
N16	Park Ridge	Park Ridge Care Center	55.6	55.0	55.2	0.2	55.4	55.5	0.1	–

Notes:
Bold text – At least one condition has a DNL greater than or equal to 65 dB

Source: Illinois Department of Public Health (names and addresses)
Medicare.gov Nursing Home Compare website (names and addresses)
HMMH, 2021

TABLE F-5.4
DNL VALUES AT PLACES OF WORSHIP

Map ID	Municipality	Name	Existing Conditions DNL (dB)	Interim Condition			Build Out Condition			Note
				No Action DNL (dB)	Proposed Action DNL (dB)	Change in DNL (dB)	No Action DNL (dB)	Proposed Action DNL (dB)	Change in DNL (dB)	
Universities/Colleges										
W001	Addison	Iglesia Pentecostal Unida Vida Abundante	52.6	52.8	53.7	0.9	52.7	53.9	1.2	—
W002	Addison	Sunny Place Church of God	53.0	53.1	53.3	0.2	52.8	53.9	1.1	—
W003	Bensenville	Bensenville Bible Church	58.8	57.3	57.3	0.0	57.3	57.5	0.2	—
W004	Bensenville	Calvary Baptist Church	59.1	57.8	57.7	-0.1	58.0	57.9	-0.1	—
W005	Bensenville	Faith Community UCC	61.1	59.1	59.5	0.4	59.1	59.8	0.7	—
W006	**Bensenville**	**First Baptist Church**	**67.8**	**67.3**	**67.0**	**-0.3**	**67.7**	**67.4**	**-0.3**	—
W007	Bensenville	First United Methodist Church	58.2	56.2	56.6	0.4	55.9	56.5	0.6	—
W008	Bensenville	Grace Lutheran Church	55.2	53.3	53.6	0.3	53.5	53.5	0.0	—
W009	Bensenville	Grace-Gospel Fellowship	54.3	53.8	54.0	0.2	53.5	54.4	0.9	—
W010	Bensenville	Holy Trinity Ukrainian	54.9	52.5	52.7	0.2	52.5	53.0	0.5	—
W011	Bensenville	Jesus Alive Church	64.7	63.5	63.6	0.1	63.7	64.1	0.4	—
W012	**Bensenville**	**Manav Seva Mandir**	**65.2**	**61.2**	**63.7**	**2.5**	**61.1**	**64.5**	**3.4**	1
W013	Bensenville	St. Alexis Roman Catholic Church	60.2	58.2	58.7	0.5	58.2	58.8	0.6	—
W014	Bensenville	St. Charles Borromeo Catholic Church	55.8	53.7	53.9	0.2	54.1	53.7	-0.4	—
W015	Bensenville	True Jesus Church	56.9	54.8	55.2	0.4	54.6	55.1	0.5	—
W016	Bensenville	Ukrainian Christian Pentecostal Church	60.4	58.5	58.4	-0.1	58.9	58.2	-0.7	—
W017	Bensenville	Zion Lutheran Church	55.0	52.6	52.8	0.2	52.6	53.0	0.4	—
W018	**Chicago**	**All Saints Polish National Catholic Church**	**65.2**	**68.1**	**68.1**	**0.0**	**68.7**	**68.6**	**-0.1**	—
W019	Chicago	Bethel Community Church	61.8	61.5	61.4	-0.1	62.1	61.9	-0.2	—
W020	Chicago	Chicago Latvian Zion Evangelical Lutheran Church	57.9	58.8	58.8	0.0	59.4	59.3	-0.1	—
W021	Chicago	Chicago Unity Church	61.7	60.0	59.9	-0.1	60.5	60.5	0.0	—

Map ID	Municipality	Name	Existing Conditions DNL (dB)	Interim Condition			Build Out Condition			Note
				No Action DNL (dB)	Proposed Action DNL (dB)	Change in DNL (dB)	No Action DNL (dB)	Proposed Action DNL (dB)	Change in DNL (dB)	
W022	Chicago	Church of the Full Gospel	59.2	60.6	60.5	-0.1	61.3	61.2	-0.1	—
W023	Chicago	Edison Park Lutheran Church	59.9	61.2	61.0	-0.2	61.9	61.6	-0.3	—
W024	**Chicago**	**Evangelical Covenant Church**	**65.3**	**64.3**	**64.3**	**0.0**	**64.9**	**64.9**	**0.0**	—
W025	**Chicago**	**Evangelical Lutheran Church In America**	**64.7**	**66.6**	**66.6**	**0.0**	**67.2**	**67.1**	**-0.1**	—
W026	**Chicago**	**Holy Resurrection Serbian Orthodox Cathedral**	**65.8**	**62.2**	**62.2**	**0.0**	**62.7**	**62.8**	**0.1**	—
W027	Chicago	Immaculate Conception Church	63.7	62.0	62.0	0.0	62.6	62.5	-0.1	—
W028	Chicago	Immaculate Conception Monastery	64.1	61.5	61.6	0.1	62.1	62.1	0.0	—
W029	Chicago	Northside Calvary Baptist Church	61.9	60.2	60.2	0.0	60.8	60.7	-0.1	—
W030	Chicago	Norwood Gospel Chapel	59.3	58.7	58.6	-0.1	59.5	59.2	-0.3	—
W031	Chicago	Norwood Park Evangelical Lutheran Church	61.6	62.3	62.2	-0.1	63.0	62.8	-0.2	—
W032	Chicago	Norwood Park Presbyterian Church	62.3	62.3	62.3	0.0	63.0	62.9	-0.1	—
W033	Chicago	Norwood Park United Methodist Church	59.4	60.7	60.6	-0.1	61.4	61.3	-0.1	—
W034	**Chicago**	**Our Lady Mother of the Church Roman Catholic Church**	**67.9**	**68.3**	**68.2**	**-0.1**	**68.8**	**68.7**	**-0.1**	—
W035	Chicago	St. Albans Episcopal Church	58.7	59.4	59.3	-0.1	60.0	60.0	0.0	—
W036	Chicago	St. Eugene Church	62.7	61.7	61.7	0.0	62.3	62.2	-0.1	—
W037	Chicago	St. James Lutheran Church	61.2	60.4	60.3	-0.1	61.0	60.9	-0.1	—
W038	**Chicago**	**St. Joseph Ukrainian Church**	**65.2**	**66.2**	**66.2**	**0.0**	**66.8**	**66.7**	**-0.1**	—
W039	Chicago	St. Monica Roman Catholic Church	60.5	59.7	59.6	-0.1	60.4	60.2	-0.2	—
W040	**Chicago**	**St. Paul Evangelical Lutheran Church**	**65.0**	**61.1**	**61.2**	**0.1**	**61.6**	**61.7**	**0.1**	—
W041	Chicago	St. Sophia Ukrainian Church	60.4	58.2	58.2	0.0	58.9	58.8	-0.1	—
W042	Chicago	St. Thomas Orthodox Church	59.3	60.4	60.3	-0.1	61.1	61.0	-0.1	—
W043	Chicago	Sts Constantine and Helen Romanian Orthodox Cathedral	61.2	58.5	58.5	0.0	59.1	59.1	0.0	—
W044	Des Plaines	Church of Christ	55.4	56.4	56.6	0.2	56.6	56.7	0.1	—
W045	Des Plaines	First Presbyterian Church & Cambodian Buddhist Temple	57.0	58.4	58.6	0.2	58.6	58.8	0.2	—

Map ID	Municipality	Name	Existing Conditions DNL (dB)	Interim Condition			Build Out Condition			Note
				No Action DNL (dB)	Proposed Action DNL (dB)	Change in DNL (dB)	No Action DNL (dB)	Proposed Action DNL (dB)	Change in DNL (dB)	
W046	Des Plaines	Good Shepherd Lutheran Church	54.8	56.3	56.5	0.2	56.5	56.5	0.0	—
W047	Des Plaines	Holy Virgin Protection Cathedral	54.4	55.6	55.7	0.1	55.8	55.8	0.0	—
W048	Des Plaines	Korean Philippi Presbyterian	58.3	59.3	59.5	0.2	59.6	59.6	0.0	—
W049	Des Plaines	Phai Bao Buddhist Temple	55.8	57.1	57.3	0.2	57.3	57.4	0.1	—
W050	Des Plaines	Sisters of the Living Word	56.0	57.3	57.5	0.2	57.5	57.7	0.2	—
W051	Des Plaines	St. Stephen Catholic Church	55.0	56.3	56.5	0.2	56.5	56.6	0.1	—
W052	Elk Grove Village	Christus Victor Lutheran Church	60.0	60.2	59.8	-0.4	61.1	61.1	0.0	—
W053	Elk Grove Village	Elk Grove Presbyterian Church	58.9	60.4	59.8	-0.6	61.3	60.8	-0.5	—
W054	Elk Grove Village	First Baptist Church	56.6	58.4	57.8	-0.6	59.3	58.6	-0.7	—
W055	Elk Grove Village	Korean-Chinese Church of Chicago	55.5	56.7	56.2	-0.5	57.7	57.0	-0.7	—
W056	Elk Grove Village	Lutheran Church Of The Holy Spirit	57.4	58.0	57.6	-0.4	58.9	58.6	-0.3	—
W057	Elk Grove Village	Palm Tree Wesleyan Church	56.1	57.6	57.1	-0.5	58.6	57.9	-0.7	—
W058	Elk Grove Village	Prince of Peace United Methodist Church	58.8	59.7	59.2	-0.5	60.4	60.1	-0.3	—
W059	Elk Grove Village	Queen of the Rosary Catholic Church	58.7	59.3	58.8	-0.5	60.2	60.0	-0.2	—
W060	Elk Grove Village	Shinnyo En USA Temple	59.0	60.5	60.0	-0.5	61.2	60.9	-0.3	—
W061	Elk Grove Village	St. Julian Eymard Catholic Church	59.6	59.3	58.9	-0.4	60.3	60.4	0.1	—
W062	Elk Grove Village	St. Nicholas Episcopal Church	61.2	62.2	61.6	-0.6	63.0	62.9	-0.1	—
W063	Elmhurst	St. Demetrios Church	53.7	51.6	51.8	0.2	51.8	52.3	0.5	—
W064	Elmhurst	Vineyard Presbyterian Church	55.3	53.2	53.3	0.1	53.6	53.2	-0.4	—
W065	Elmhurst	West Sub Community Church	55.6	53.5	53.7	0.2	54.0	53.7	-0.3	—
W066	Franklin Park	Faith Christian Center	55.2	55.2	55.2	0.0	55.3	55.3	0.0	—
W067	Franklin Park	Lombard Gospel Chapel	57.3	56.8	56.7	-0.1	56.9	56.6	-0.3	—
W068	Franklin Park	Mt. Calvary Lutheran Church	55.7	55.2	55.3	0.1	55.4	55.3	-0.1	—
W069	Franklin Park	New Testament Church	57.8	57.1	57.1	0.0	57.2	56.8	-0.4	—
W070	Franklin Park	St. Pauls United Church of Christ	56.2	55.8	55.8	0.0	55.9	55.9	0.0	—
W071	Harwood Heights	Bethany Baptist Church	62.6	64.3	64.3	0.0	64.9	64.7	-0.2	—

Map ID	Municipality	Name	Existing Conditions DNL (dB)	Interim Condition			Build Out Condition			Note
				No Action DNL (dB)	Proposed Action DNL (dB)	Change in DNL (dB)	No Action DNL (dB)	Proposed Action DNL (dB)	Change in DNL (dB)	
W072	Harwood Heights	Romanian Christian Gospel Assembly	59.2	60.1	60.1	0.0	60.7	60.6	-0.1	—
W073	Harwood Heights	St. Rosalie Catholic Parish	60.6	61.5	61.5	0.0	62.1	62.0	-0.1	—
W074	Harwood Heights	St. Rosalie Roman Catholic Church	60.4	61.3	61.3	0.0	61.9	61.8	-0.1	—
W075	Itasca	Bethany United Methodist Church	58.4	60.4	60.3	-0.1	60.8	60.7	-0.1	—
W076	Itasca	Christian Fellowship Church	59.1	59.9	59.5	-0.4	60.6	60.0	-0.6	—
W077	Itasca	First Presbyterian Church	59.2	61.4	61.3	-0.1	61.9	61.8	-0.1	—
W078	**Itasca**	**Itasca Baptist Church**	**62.5**	**64.2**	**64.2**	**0.0**	**64.8**	**65.0**	**0.2**	2,3
W079	Itasca	Kim Dae Kun Catholic Church	60.0	62.7	62.3	-0.4	63.3	62.7	-0.6	—
W080	**Itasca**	**Lutheran Church of St Luke**	**64.1**	**63.9**	**64.1**	**0.2**	**64.5**	**65.0**	**0.5**	2
W081	Itasca	St. Matthew Lutheran Church	56.8	58.4	58.2	-0.2	59.0	58.7	-0.3	—
W082	Itasca	St. Peter the Apostle Church	58.4	59.7	59.6	-0.1	60.1	59.9	-0.2	—
W083	Itasca	The Center	58.4	60.4	60.3	-0.1	60.8	60.7	-0.1	—
W084	Itasca	The Orchard-Itasca	63.3	62.6	62.9	0.3	63.2	63.7	0.5	—
W085	Melrose Park	Apostles Lutheran Church	57.2	56.3	56.5	0.2	56.6	55.8	-0.8	—
W086	Melrose Park	Emmanuel Romanian Baptist Church of Chicago	57.8	56.8	56.9	0.1	57.0	56.2	-0.8	—
W087	Melrose Park	Iglesia Central Evangelica Ministerios De Cristo	57.3	56.3	56.5	0.2	56.6	55.9	-0.7	—
W088	Melrose Park	Solid Rock Community Church and Second Chance Christian Center	57.6	56.7	56.8	0.1	56.9	56.2	-0.7	—
W089	Norridge	Acacia Park Evangelical Lutheran Church	58.1	59.5	59.4	-0.1	59.9	60.2	0.3	—
W090	**Norridge**	**Church Of Our Savior**	**65.6**	**66.5**	**66.5**	**0.0**	**67.0**	**66.9**	**-0.1**	—
W091	Norridge	Divine Savior Catholic Church	60.4	61.4	61.3	-0.1	61.9	62.0	0.1	—
W092	Norridge	New Future Mongolian Christian Church	57.8	59.3	59.2	-0.1	59.7	60.0	0.3	—
W093	Norridge	Norridge Citadel Corps Salvation Army	63.2	62.4	62.3	-0.1	62.9	62.9	0.0	—
W094	Norridge	Norridge United Church of Christ	63.1	62.1	62.0	-0.1	62.6	62.6	0.0	—
W095	**Norridge**	**Zion Evangelical Lutheran Church**	**67.5**	**68.7**	**68.8**	**0.1**	**69.3**	**69.2**	**-0.1**	—
W096	Northlake	Mission Youth Chicago	58.8	56.9	57.0	0.1	57.3	56.6	-0.7	—

Map ID	Municipality	Name	Existing Conditions DNL (dB)	Interim Condition			Build Out Condition			Note
				No Action DNL (dB)	Proposed Action DNL (dB)	Change in DNL (dB)	No Action DNL (dB)	Proposed Action DNL (dB)	Change in DNL (dB)	
W097	Northlake	Northlake Lutheran Church	58.9	57.0	57.1	0.1	57.4	56.7	-0.7	—
W098	Northlake	Parkview Baptist Church	58.8	56.8	56.9	0.1	57.3	56.6	-0.7	—
W099	Northlake	St. John The Baptist Melkite Catholic Church	57.9	56.3	56.4	0.1	56.7	56.0	-0.7	—
W100	Northlake	St. John Vianney Church	58.7	56.8	56.9	0.1	57.2	56.5	-0.7	—
W101	Northlake	St. Peter's Syrian Orthodox Church	58.5	56.9	57.0	0.1	57.3	56.5	-0.8	—
W102	Northlake	Trinity Presbyterian Church	63.2	61.2	61.3	0.1	61.5	60.7	-0.8	—
W103	Park Ridge	First United Methodist Church of Park Ridge	62.4	63.3	63.2	-0.1	64.0	63.7	-0.3	—
W104	Park Ridge	Mary Seat Of Wisdom Church	60.1	62.5	62.3	-0.2	63.1	63.1	0.0	—
W105	Park Ridge	Park Ridge Community Church	61.1	62.3	62.1	-0.2	63.0	62.7	-0.3	—
W106	Park Ridge	Park Ridge Presbyterian Church	58.6	59.1	59.0	-0.1	59.6	59.5	-0.1	—
W107	Park Ridge	Redeemer Lutheran Church	61.3	62.3	62.1	-0.2	63.0	62.7	-0.3	—
W108	Park Ridge	South Park Church	59.2	61.1	60.9	-0.2	61.7	61.7	0.0	—
W109	Park Ridge	St. Andrews Lutheran Church	55.2	56.0	55.8	-0.2	56.5	56.6	0.1	—
W110	Park Ridge	St. Mary's Episcopal Church	58.3	59.3	59.2	-0.1	59.9	59.8	-0.1	—
W111	**Park Ridge**	**St. Paul Lutheran Church and Ministries**	**65.2**	**61.2**	**61.3**	**0.1**	**61.7**	**61.8**	**0.1**	—
W112	Park Ridge	St. Paul of the Cross Church	57.1	58.4	58.1	-0.3	59.0	58.9	-0.1	—
W113	Rosemont	Our Lady of Hope Catholic Church	62.5	63.2	63.2	0.0	63.5	63.5	0.0	—
W114	Schiller Park	Grace Community Evangelical Free Church	61.3	61.0	60.8	-0.2	61.2	62.1	0.9	—
W115	Schiller Park	International Christian Assembly Of God	61.3	61.0	60.8	-0.2	61.1	62.0	0.9	—
W116	Schiller Park	St. Beatrice Church	61.3	60.8	60.6	-0.2	60.9	61.7	0.8	—
W117	Schiller Park	St. Maria Goretti Catholic Church	58.7	58.2	58.1	-0.1	58.3	58.2	-0.1	—
W118	Wood Dale	Agape Family Church	61.6	60.4	60.8	0.4	60.3	61.3	1.0	—
W119	Wood Dale	Calvary Evangelical Lutheran Church	60.8	59.4	60.7	1.3	59.3	61.3	2.0	—
W120	Wood Dale	Christian Congregation	58.4	57.2	58.8	1.6	57.5	59.2	1.7	—
W121	Wood Dale	First Baptist Church-Wood Dale	55.1	54.9	55.2	0.3	54.6	55.5	0.9	—

Map ID	Municipality	Name	Existing Conditions DNL (dB)	Interim Condition			Build Out Condition			Note
				No Action DNL (dB)	Proposed Action DNL (dB)	Change in DNL (dB)	No Action DNL (dB)	Proposed Action DNL (dB)	Change in DNL (dB)	
W122	Wood Dale	Holy Ghost Church	63.1	62.5	62.9	0.4	62.7	63.4	0.7	—
W123	Wood Dale	St. Peter's Latvian Evangelical Lutheran Church	58.8	57.2	59.1	1.9	57.2	59.6	2.4	—
W124	Wood Dale	Wood Dale Community United Methodist	61.8	61.4	61.8	0.4	61.5	62.3	0.8	—

Notes:
1) Exposed to a reportable increase in noise due to the Build Out Proposed Action
2) Newly included within the 65 DNL due to the Build Out Proposed Action
3) W078 is also a local historic site (LS154)

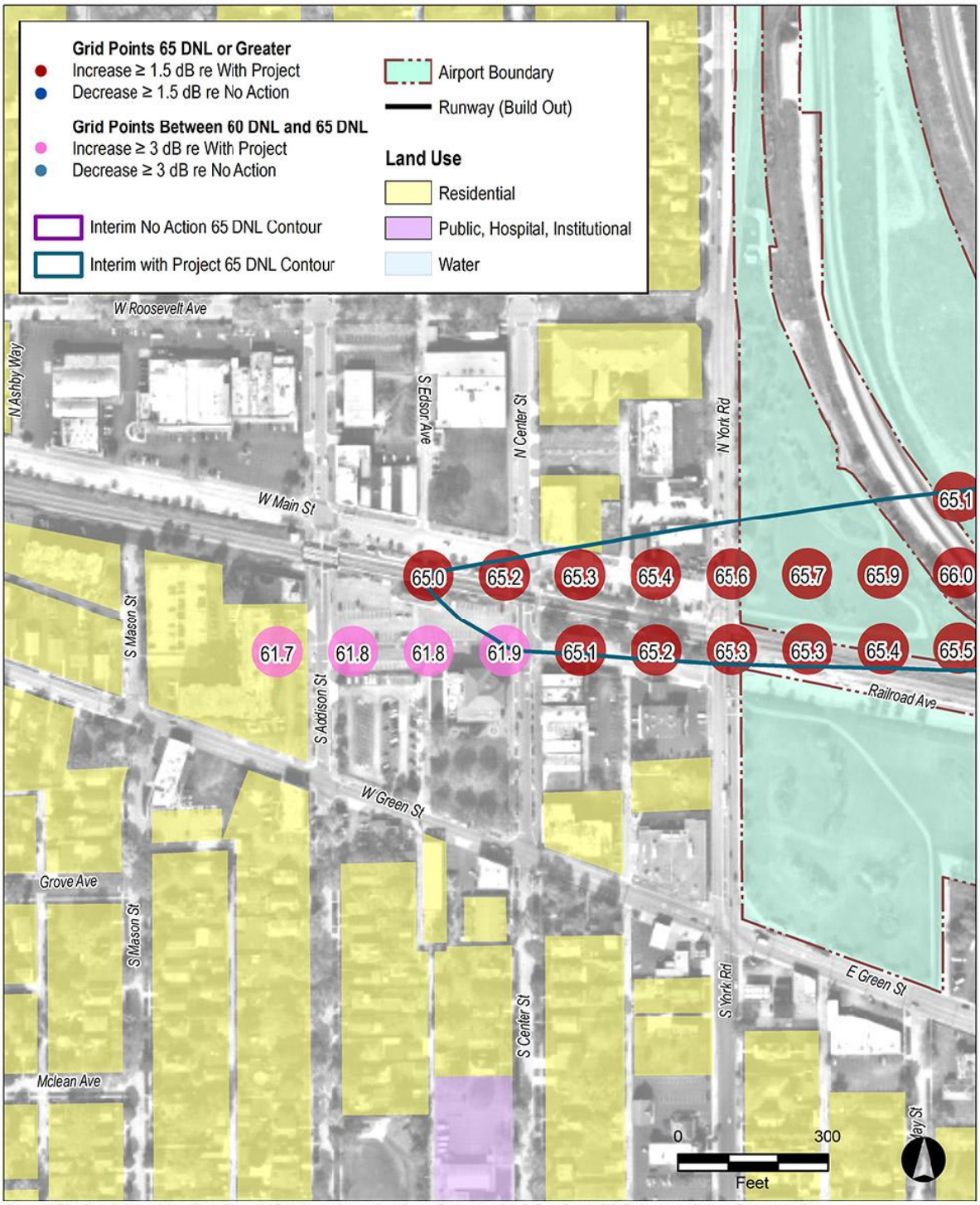
Bold text – At least one condition has a DNL greater than or equal to 65 dB

Source: Cook County GIS
DuPage County GIS parcel database
HMMH, 2021

ATTACHMENT F-6
GRID POINT ANALYSIS EXHIBITS

The following Exhibits provide the DNL values at the modeled grid locations where there is either a significant or reportable change in noise within the Primary Study Area between the No Action and the Proposed Action. There were no significant or reportable changes outside of the Primary Study Area. There are also no five decibel (dB) reportable changes in noise between the DNL 45 dB and the DNL 60 dB for either the Interim or Build Out Proposed Action.

- **Exhibit F-6.1** Interim Proposed Action DNL with Interim No Action and Proposed Action DNL Change
- **Exhibit F-6.2** Build Out Proposed Action DNL with Build Out No Action and Proposed Action DNL Change



Source: HMMH, Ricondo & Associates, Illinois Geospatial Data Clearinghouse, Cook County Government GIS, DuPage County GIS, Environmental Systems Research Institute

Chicago O'Hare International Airport

Terminal Area Plan and Air Traffic Procedures Environmental Assessment

Interim Proposed Action DNL with Interim No Action and Proposed Action Dnl Change

Exhibit F-6.1

Chicago O'Hare International Airport
Terminal Area Plan and Air Traffic Procedures Environmental Assessment

Build Out Proposed Action DNL with Build Out No Action and Proposed Action DNL Change

Exhibit F-6.2

ATTACHMENT F-7

NOISE RESEARCH PROGRAM UPDATE

The definition of DNL 65 dB as the level of significant noise exposure has been validated as an appropriate threshold to inform environmental determinations for land use planning and for the consistent and equitable assessment of federal actions under the National Environmental Policy Act (see FICON 1992 and FICAN 2018, downloadable from www.fican.org). Additionally, an evaluation of the level of change in noise resulting from a proposed FAA Federal action under the National Environmental Policy Act, must consider a range of factors including but limited to any increases in operations associated to the action. Use of a 1.5 dB increase resulting in a DNL 65 dB or greater noise exposure as the definition of a significant impact provides an effective and consistent way to assess proposed actions nationally, across all types of proposed actions. The FAA recognizes that noise levels below this threshold may still be of concern to community members and is supporting research to understand the impacts of aviation noise at all noise levels and is participating in outreach to better understand and address community concerns.

F.1 NATIONAL ENVIRONMENTAL SURVEY

The FAA conducted a nationwide survey regarding annoyance related to aircraft noise. For detailed information on the survey, please review the survey introduction and read the survey report.[1] Further information on FAA's aircraft noise research program, can also be found on a Federal Register notice published on January 13, 2021.[2] This notice invited comments on the FAA's aircraft noise research program, including the survey, through a 90-day total period which closed on April 14, 2021. The FAA is currently reviewing the over 4,000 comments received to this docket (FAA-2021-0037-001).

The FAA will not make any determinations based on the findings of these research programs for the FAA's noise policies, including any potential revised use of the Day-Night Average Sound Level (DNL) noise metric, until it has carefully considered public and other stakeholder input along with any additional research needed to improve the understanding of the effects of aircraft noise exposure on communities.

F.2. FAA REAUTHORIZATION ACT OF 2018

F.2.1. Section 188 Report to Congress

Congress directed an evaluation of alternative metrics in Senate Appropriations Report 116 109 (pg. 42) for fiscal year 2019 and the FAA Reauthorization Act of 2018 (Pub. L. 115 254) requested the FAA to provide this report in response to:

[1] https://www.airporttech.tc.faa.gov/Products/Airport-Safety-Papers-Publications/Airport-Safety-Detail/ArtMID/3682/ArticleID/2845/Analysis-of-NES

[2] https://www.federalregister.gov/documents/2021/01/13/2021-00564/overview-of-faa-aircraft-noise-policy-and-research-efforts-request-for-input-on-research-activities

- **Section 188:** Study regarding day night average sound levels. Within one year the Administrator shall evaluate alternative metrics to current average day night level standard, such as use of actual noise sampling to address community airplane noise concerns.

While not directed to include in a report, the information contained in the Section 188 Report also fulfills the FAA's response to:

- **Section 173:** Alternative airplane noise metric evaluation. Within one year complete the ongoing evaluation of alternative metrics to the current Day Night Level (DNL) 65 standard.

https://www.faa.gov/about/reauthorization/

F.2.1. Section 188 Report Purpose and Goals

The FAA's goal in responding to the request made under Section 188 of the 2018 Reauthorization is to present:

- An overview of community noise exposure, including the history and use of DNL
- An overview and balanced discussion of applicable noise metrics and their use in appropriate situations
- A discussion explaining why no single noise metric can cover all situations
- A discussion explaining the difference between measurement and modeling
- The role of supplemental noise metrics, and how their use in applicable situations is encouraged to better inform the public

As discussed in the FAA Reauthorization Section 188 Report to Congress, the Aviation Safety and Noise Abatement Act (ASNA) of 1979 directed the FAA to:

- Establish a single system of measuring noise, for which there is a highly reliable relationship between projected noise exposure and surveyed reactions of people to noise, to be uniformly applied in measuring the noise at airports and the areas surrounding such airports.

ASNA also required FAA to establish a single system for determining the exposure of individuals to noise which results from the operations of an airport and which includes, but is not limited to, noise intensity, duration, frequency, and time of occurrence;

These obligations were met through the definition of the Day-Night Level (DNL) metric, which is an equivalent sound level noise metric with acoustic A-weighting, 24-hour averaging, and a nighttime noise penalty. While the DNL metric is FAA's primary decision-making noise metric, other supplemental metrics can be used where warranted to support further disclosure and to aid in the public understanding of community noise effects.

https://www.faa.gov/sites/faa.gov/files/2021-11/Day-Night_Average_Sound_Levels_COMPLETED_report_w_letters.pdf