



U.S. Department
of Transportation
**Federal Aviation
Administration**

Great Lakes Region
Illinois, Indiana, Michigan,
Minnesota, North Dakota,
Ohio, South Dakota,
Wisconsin

2300 East Devon Avenue
Des Plaines, Illinois 60018

December 14, 2011

Mr. Pete Harmet,
IDOT Bureau Chief of Programming,
Illinois Department of Transportation
201 West Center Court
Schaumburg, IL 60196

Attn: Mr. Pete Harmet:

Chicago O'Hare International Airport
Feasibility Study No. 2011-AGL-3913 thru 4424-NRA
Elgin O'Hare West Bypass Tier 2 Feasibility Study

The Illinois Department of Transportation (IDOT) submitted a feasibility study to the FAA to evaluate proposed temporary and permanent potential impacts associated with the Elgin O'Hare West Bypass project. In this submission IDOT provided the FAA the full scope of the project – east boundary being the bypass and the west boundary being located to the west end of Schaumburg Airport. It is the FAA's understanding this feasibility study represents IDOT's 30% design drawings.

It is important that IDOT continue to work closely with the FAA through the design and permitting of the Elgin O'Hare West Bypass Project to ensure consistency with the appropriate FAA policies, Advisory Circulars, and Orders.

The FAA evaluated the information provided by IDOT with the understanding that the engineering is not yet complete and that more information will be provided in either future feasibility studies and/or airspace evaluation construction safety phasing plans.

Based on this preliminary evaluation, we offer the following comments:

- 1) Since this is a feasibility study, the FAA does not provide concurrence or non-concurrence with the Sponsor's proposal. The comments are for planning purposes only. Once the proposed project has reached final design, a Form 7460, Notice of Proposed Construction and Alteration, must be submitted, reviewed, and determined to provide no hazard to the navigable airspace prior to the start of construction. Given the complexity of the proposed project, submitting another feasibility study once design is considered at least 60% complete (and

90% complete) may be prudent given the following comments. When another feasibility study is submitted, the FAA requests that, due to the proposed projects magnitude in size, it is broken into more manageable sections. For FAA evaluation purposes, all work/work areas and permanent locations within the airport boundary shall be submitted to the appropriate Program Manager in the Chicago Airports District Office (CHI-ADO). All work/work areas and permanent locations outside of the airport boundary shall be submitted as an Obstruction Evaluation (OE). If the Sponsor or the Sponsor Representative requires assistance, please contact the appropriate Program Manager in the CHI-ADO.

- 2) It is the FAA's understanding that the elevations provided in the submission were existing elevations, proposed elevations, maximum ground elevations, maximum elevation for temporary equipment, and permanent maximum elevations. Due to differences in elevations provided and the uncertainty of when the elevations would be realized, and to be conservative, the highest provided elevation was used by the FAA during the evaluation process. Based on this approach, some locations, both temporary and permanent, may have penetrations and effects that are greater than what reality will dictate. Please clarify via schedule or proposed work timeframe in future submissions.
- 3) There are IFR effects to the temporary and permanent critical points as provided by the Sponsor. Please see the enclosed spreadsheet for details.
 - a. It is quite possible to work around some of the temporary IFR Impacts. Some mitigation techniques would be lowering the temporary equipment to the given "not to exceed height" (NEH) and coordinating the work schedule with the City of Chicago's STOP Working Group.
 - b. Some of the permanent heights must be mitigated to be below the FAR Part 77 impact height and the NEH due to the loss of CAT II/III capability on the affected runway. No impact to weather minimums at the Airport will be determined to be acceptable.
- 4) There are FAR Part 77 penetrations to the temporary and permanent critical points as provided by the Sponsor. Please see the enclosed Table and Exhibit for details.
 - a. Where practicable, there must be no FAR Part 77 penetrations of any permanent structure on the airfield. For those points that are identified as penetrations to the FAR Part 77 Surfaces (approach, primary, or transitional), these should be mitigated (e.g. reduced in elevation) to the point of no penetration.
 - b. For those penetrations that are beyond the airport boundary, constant burning obstruction lights shall be required for permanent structures. If the structure

is temporary (i.e. a crane), marking and lighting according to specific advisory circulars shall be required.

- 5) As the City of Chicago and their airline partners work through the timing of the north airfield components of the O'Hare Modernization Program Completion Phase, it is possible that construction will begin for the Elgin O'Hare West Bypass when Runway 14R/32L and Runway 14L/32R are still operational.
 - a. The light planes must be protected for these two runways and the 6 parallel east/west runways that exist or will exist – meaning that the light lanes must be protected from moving vehicles as well as permanent structures.
 - b. There is preliminary evidence that speed pass interrogators (such as the IPass) may cause interference with some portions of the instrument landing system (ILS); particularly the localizer or glide slope signals. The ILS approaches to the majority of the runways are CAT II/III runways with tolerances tighter than CAT I ILS approaches. Please take this under consideration when deciding where to place toll booths.
 - c. Tying back to the IFR Impacts and the FAR Part 77 penetrations, please consider the height of roadway lighting, especially those that will be placed on top of overpass bridges and at intersections. The FAA must ensure that the approach planes and the departure planes of the runways are protected.
 - d. Commercial signage (i.e. rotating/moving billboards) that may be installed along the proposed west bypass must exclude the new LED lighting. The lighting has been reported to provide distractions to pilots when they are on final approach. Additionally, we recommend that there are no moving signs, no flashing signs, no significant color change, no pulsing intensity, and etcetera. Signs that include steady state lighting and are facing exactly parallel (thus viewed exactly perpendicular to the runway centerline) to the runway centerline are preferred.
- 6) The following glide slope facilities may be affected by the proposed bypass – Runway 9L, Runway 10, proposed Runway 9C, proposed Runway 9R, proposed Runway 10C, and proposed Runway 10R. These facilities must be studied and modeled on an individual basis. Please provide topographical information of the proposed contour out to 3000 feet from the approach end of each potentially affected runway. Additionally, CAT III Flight Inspection Tolerance must be modeled.
- 7) Preliminary results indicate that there is a significant impact to at least one ASDE-X RU located on the northwest side of the airport and impacts to the ASLF-2 on the west side of the airport. Further analysis must be done for the ASR-9. Please provide all current and future FAA facilities for a more in depth evaluation.

- 8) If the following points remain (see table below) at their proposed locations, the contractor will only be allowed to work at those locations when the weather is above and forecast to stay above CAT II/III minimums or at night when the associated runway(s) are closed.

Temporary

Airspace Case Number	Point Number
2011-AGL-3927-NRA	Point EOWB-PT 127
2011-AGL-3941-NRA	Point EOWB-PT 133A
2011-AGL-3971-NRA	Point Q4-PT 5
2011-AGL-3976-NRA	Point Q4-PT 5A
2011-AGL-4004-NRA	Point EOWB-PT 117
2011-AGL-4005-NRA	Point EOWB-PT 118
2011-AGL-4006-NRA	Point EOWB-PT 119
2011-AGL-4046-NRA	Point U3-PT 2
2011-AGL-4047-NRA	Point U3-PT 3
2011-AGL-4063-NRA	Point EOWB-PT 138
2011-AGL-4064-NRA	Point EOWB-PT 139
2011-AGL-4065-NRA	Point EOWB-PT 140
2011-AGL-4070-NRA	Point EOWB-PT 145
2011-AGL-4078-NRA	Point EOWB-PT 138A
2011-AGL-4079-NRA	Point EOWB-PT 139A
2011-AGL-4080-NRA	Point EOWB-PT 140A
2011-AGL-4110-NRA	Point V3-PT 3A
2011-AGL-4121-NRA	Point W2-PT 1

- 9) The proposed permanent obstructions located at the points listed below must be lowered to or below the NEH or these proposed locations will create a significant and unacceptable impact on air traffic. Please see attached exhibit that graphically depicts the location of the permanent points that penetrate the Part 77 surfaces. Also, please see the attached Table 1 that indicates the proposed permanent Part 77 obstructions by denoting the Point # column in the color orange and the permanent IFR effect in the color red.

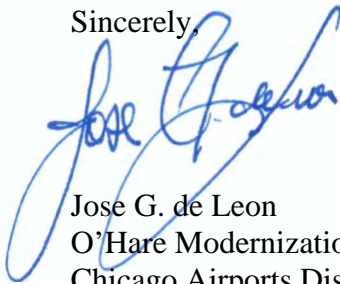
Permanent

Airspace Case Number	Point Number
2011-AGL-4189-NRA	Point EOWB-PT 124
2011-AGL-4224-NRA	Point Q1-PT 2
2011-AGL-4225-NRA	Point Q1-PT 3
2011-AGL-4232-NRA	Point Q4-PT 5
2011-AGL-4237-NRA	Point Q4-PT 5A
2011-AGL-4262-NRA	Point EOWB-PT 117

2011-AGL-4263-NRA	Point EOWB-PT 118
2011-AGL-4264-NRA	Point EOWB-PT 119
2011-AGL-4265-NRA	Point EOWB-PT 120
2011-AGL-4266-NRA	Point EOWB-PT 121
2011-AGL-4319-NRA	Point EOWB-PT 137
2011-AGL-4320-NRA	Point EOWB-PT 138
2011-AGL-4321-NRA	Point EOWB-PT 139
2011-AGL-4328-NRA	Point EOWB-PT 146
2011-AGL-4329-NRA	Point EOWB-PT 147
2011-AGL-4376-NRA	Point W1-PT 1
2011-AGL-4378-NRA	Point W2-PT 1
2011-AGL-4379-NRA	Point W2-PT 2

If you have any questions or require further clarification, please contact Richard Kula at (847) 294-7507 or me at (847) 294-8409.

Sincerely,



Jose G. de Leon
O'Hare Modernization Program Manager
Chicago Airports District Office

cc: Mr. Michael Boland, City of Chicago
ORD ATCT/ATM
ORD ATCT/NPPM
AGL 600
AGL 200
AJV-15
CSA FPO AJW3743
AJW.C15A

Table 1
Chicago O'Hare International Airport
Elgin O'Hare West Bypass Tier Two Preliminary Engineering Phase Study
Airspace Case #2011-AGL-3913 thru 4424-NRA
Evaluated Points

EOWB Tier Two Preliminary Engineering Phase Feasibility Study - Central

Point #	Latitude	Longitude	Ex Ground El	Prop. El	Max Ground El	Max Equip Height - Temp	Max Equip Height - Perm	Max El - Temp	Max El - Perm	NEH - Temp	IFR Effect - Temp (in feet)	Part 77 Penetrations - Temp (in feet)	NEH - Perm	IFR Effect - Perm (in feet)	Part 77 Penetrations - Perm (in feet)
ELM-PT9	41° 59' 3.488" N	87° 56' 23.235" W	660.3532	660.3532	660.3532	25	17	685.3532	677.3532	NA	None	None	NA	None	None
ELM-PT10	41° 58' 54.066" N	87° 56' 23.099" W	661.082	661.3504	661.3504	25	17	686.3504	678.3504	NA	None	None	NA	None	None
EOWB - PT 1	41° 58' 57.433" N	87° 57' 27.337" W	677.261	706.5912	706.5912	50	35	756.5912	741.5912	NA	None	None	NA	None	None
EOWB - PT 2	41° 58' 54.004" N	87° 57' 10.750" W	666.4365	698.8837	698.8837	50	35	748.8837	733.8837	NA	None	None	NA	None	None
EOWB - PT 3	41° 58' 50.280" N	87° 56' 52.898" W	675.9258	675.8757	675.9258	50	35	725.8757	710.8757	NA	None	None	NA	None	None
EOWB - PT 4	41° 58' 45.588" N	87° 56' 36.859" W	661.5921	682.6806	682.6806	50	35	732.6806	717.6806	NA	None	None	NA	None	None
EOWB - PT 5	41° 58' 34.758" N	87° 56' 19.864" W	660.8133	701.7253	701.7253	50	35	751.7253	736.7253	NA	None	None	NA	None	None
EOWB - PT 6	41° 58' 26.112" N	87° 56' 14.070" W	713.9581	696.8091	713.9581	50	35	746.8091	731.8091	NA	None	None	NA	None	None
EOWB- PT 122	41° 58' 8.337" N	87° 56' 17.367" W	661.533	668.7941	668.7941	50	35	718.7941	703.7941	717 feet	Proposed obstacle penetrates RWY 28 Departure Surface by 2	RWY 10 Approach Surface by 15	NA	None	None
EOWB- PT 123	41° 58' 15.636" N	87° 56' 17.252" W	676.1572	672.4883	676.1572	50	35	722.4883	707.4883	717 feet	Proposed obstacle penetrates RWY 28 Departure Surface by 10	RWY 10/28 Transitional Surface by 23	NA	None	RWY 10/28 Transitional Surface by 8
EOWB- PT 124	41° 58' 18.011" N	87° 56' 17.215" W	693.882	673.6903	693.882	50	35	723.6903	708.6903	718 feet	Proposed obstacle penetrates RWY 28 Departure Surface by 26	RWY 10/28 Transitional Surface by 6	718 feet	Proposed obstacle penetrates the RWY 28 Departure Surface by 11	None
EOWB- PT 125	41° 58' 23.077" N	87° 56' 17.135" W	697.146	675.6818	697.146	50	35	725.6818	710.6818	NA	None	None	NA	None	None
EOWB- PT 126	41° 58' 54.727" N	87° 56' 17.213" W	658.7987	662.5747	662.5747	50	35	712.5747	697.5747	NA	None	RWY 9R/27L Transitional Surface by 14	NA	None	None
EOWB- PT 127	41° 59' 2.008" N	87° 56' 17.383" W	647.506	663.0338	663.0338	50	35	713.0338	698.0338	712 feet	Proposed obstacle penetrates the proposed RWY 27L Departure Surface by 1	Proposed RWY 9R/27L Approach Surface by 13	NA	None	None
EOWB- PT 128	41° 59' 6.047" N	87° 56' 17.477" W	654.7155	664.578	664.578	50	35	714.578	699.578	713 feet	Proposed obstacle penetrates the proposed RWY 27L Departure surface by 2. Penetrates RWY 9R extension Approach surface by 1 foot. Raises S-ILS DA 50. ILS CAT II/III NA.	Proposed RWY 9R Approach Surface by 15	NA	None	None
EOWB- PT 129	41° 59' 8.171" N	87° 56' 17.527" W	654.1217	664.0024	664.0024	50	35	714.0024	699.0024	713 feet	Proposed obstacle penetrates the proposed RWY 27L Departure Surface by 1	Proposed RWY 9R Approach Surface by 14	NA	None	None
EOWB- PT 130	41° 59' 9.326" N	87° 56' 17.554" W	653.3913	663.4178	663.4178	50	35	713.4178	698.4178	713 feet	Proposed obstacle penetrates the proposed RWY 27L Departure Surface by 1	Proposed RWY 9R/27L Transitional Surface by 14	NA	None	None
EOWB- PT 131	41° 59' 10.563" N	87° 56' 17.581" W	652.0577	662.7918	662.7918	50	35	712.7918	697.7918	NA	None	Proposed RWY 9C/27C Transitional Surface by 13	NA	None	None
EOWB- PT 132	41° 59' 11.733" N	87° 56' 17.594" W	653.0139	662.1994	662.1994	50	35	712.1994	697.1994	NA	None	Proposed RWY 9C Approach Surface by 13	NA	None	None
EOWB- PT 133	41° 59' 17.899" N	87° 56' 17.444" W	677.4568	661.1874	677.4568	50	35	711.1874	696.1874	712 feet	Proposed obstacle penetrates the proposed RWY 27C Departure Surface by 6	Proposed RWY 9C Approach Surface by 28	NA	None	Proposed RWY 9C Approach Surface by 13
EOWB- PT 134	41° 59' 25.133" N	87° 56' 16.946" W	692.5342	676.5578	692.5342	25	17	701.5578	693.5578	712 feet	Proposed obstacle penetrates the proposed RWY 27C Departure Surface by 6	Proposed RWY 9C/27C Transitional Surface by 19	NA	None	Proposed RWY 9C/37C Transitional Surface by 11
EOWB- PT 128A*	41° 59' 6.047" N	87° 56' 17.477" W	654.7155	665.078	665.078	50	35	715.078	700.078	713 feet	Proposed obstacle penetrates the proposed RWY 27L Departure Surface by 3	Proposed RWY 9R Approach Surface by 16	NA	None	Proposed RWY 9R Approach Surface by 1
EOWB- PT 129A*	41° 59' 8.171" N	87° 56' 17.527" W	654.1217	666.1536	666.1536	50	35	716.1536	701.1536	713 feet	Proposed obstacle penetrates the proposed RWY 27L Departure Surface by 4	Proposed RWY 9R Approach Surface by 17	NA	None	Proposed RWY 9R Approach Surface by 2
EOWB- PT 130A*	41° 59' 9.326" N	87° 56' 17.554" W	653.3913	666.7381	666.7381	50	35	716.7381	701.7381	713 feet	Proposed obstacle penetrates the proposed RWY 27L Departure Surface by 4 and proposed RWY 27C Departure Surface by 3.	Proposed RWY 9R/27L Transitional Surface by 17	NA	None	Proposed RWY 9R/27L Transitional Surface by 2
EOWB- PT 131A*	41° 59' 10.563" N	87° 56' 17.581" W	652.0577	667.3641	667.3641	50	35	717.3641	702.3641	713 feet	Proposed obstacle penetrates the proposed RWY 27L Departure Surface by 4 feet and proposed RWY 27C Departure Surface by 5 feet.	Proposed RWY 9C/27C Transitional Surface by 18	NA	None	Proposed RWY 9C/27C Transitional Surface by 3
EOWB- PT 132A*	41° 59' 11.733" N	87° 56' 17.594" W	653.0139	667.9566	667.9566	50	35	717.9566	702.9566	713 feet	Proposed obstacle penetrates the proposed RWY 27L Departure Surface by 4 feet and proposed RWY 27C Departure Surface by 5 feet.	Proposed RWY 9C Approach Surface by 18	NA	None	Proposed RWY 9C Approach Surface by 3
EOWB- PT 133A*	41° 59' 17.899" N	87° 56' 17.444" W	677.4568	671.078	677.4568	50	35	727.4568	706.078	713 feet	Proposed obstacle penetrates the proposed RWY 27C Departure Surface by 15 feet and proposed RWY 9C Approach Surface by 13 feet. Raises S-ILS DA 50 feet. ILS CAT II/III NA.	Proposed RWY 9C Approach Surface by 28	NA	None	Proposed RWY 9C Approach Surface by 13
EOWB- PT 134A*	41° 59' 25.133" N	87° 56' 16.946" W	692.5342	667.6843	692.5342	25	17	717.5342	684.6843	712 feet	Proposed obstacle penetrates the proposed RWY 27C Departure Surface by 6	Proposed RWY 9C/27C Transitional Surface by 19	NA	None	Proposed RWY 9C/27C Transitional Surface by 11
FRONT - PT 1	41° 58' 49.634" N	87° 56' 57.791" W	672.0032	675.4371	675.4371	25	17	700.4371	692.4371	NA	None	None	NA	None	None
O8- PT 1	41° 58' 51.398" N	87° 56' 47.899" W	667.6052	670.0504	670.0504	50	35	720.0504	705.0504	NA	None	None	NA	None	None
P2 - PT 1	41° 58' 46.291" N	87° 56' 40.758" W	662.2176	683.069	683.069	50	35	733.069	718.069	NA	None	None	NA	None	None
P2 - PT 2	41° 58' 33.850" N	87° 56' 26.393" W	666.0618	715.7502	715.7502	50	35	765.7502	750.7502	NA	None	None	NA	None	None
P2 - PT 3	41° 58' 24.001" N	87° 56' 18.562" W	670.7713	680.4716	680.4716	50	35	730.4716	715.4716	NA	None	None	NA	None	None
P5 - PT 1	41° 58' 15.515" N	87° 56' 16.156" W	679.7186	671.844	679.7186	50	35	721.844	706.844	NA	None	RWY 10/28 Transitional Surface by 28	NA	None	RWY 10/28 Transitional Surface by 13
P5 - PT 2	41° 58' 42.790" N	87° 56' 16.631" W	668.9838	704.8714	704.8714	50	35	754.8714	739.8714	NA	None	None	NA	None	None
P5 - PT 3	41° 58' 46.843" N	87° 56' 23.044" W	665.2214	694.3542	694.3542	50	35	744.3542	729.3542	NA	None	None	NA	None	None
P5 - PT 4	41° 58' 47.919" N	87° 56' 26.001" W	661.7753	689.6161	689.6161	50	35	739.6161	724.6161	NA	None	None	NA	None	None

Source:
 NEH, IFR Effects, Part 77 - FAA
 Remaining Information - IDOT
 * DENOTES TUNNEL OPTION FOR WEST BYPASS / UNION PACIFIC RAILROAD GRADE SEPARATION

Table 1
Chicago O'Hare International Airport
Elgin O'Hare West Bypass Tier Two Preliminary Engineering Phase Study
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Evaluated Points

P5 - PT 5	41° 58' 49.221" N	87° 56' 39.207" W	662.4944	693.414	693.414	30	17	723.414	710.414	NA	None	None	NA	None	None
P5 - PT 6	41° 58' 50.854" N	87° 56' 51.681" W	672.9511	676.475	676.475	50	35	726.475	711.475	NA	None	None	NA	None	None
P8 - PT 1	41° 58' 33.125" N	87° 56' 22.974" W	665.9705	727.8673	727.8673	50	35	777.8673	762.8673	NA	None	None	NA	None	None
P8 - PT 2	41° 58' 33.120" N	87° 56' 18.230" W	665.8813	730.8845	730.8845	50	35	780.8845	765.8845	NA	None	None	NA	None	None
P8 - PT 3	41° 58' 34.658" N	87° 56' 14.883" W	667.8228	727.0269	727.0269	50	35	777.0269	762.0269	NA	None	None	NA	None	None
P8 - PT 4	41° 58' 45.888" N	87° 56' 14.780" W	662.2205	686.1071	686.1071	50	35	736.1071	721.1071	NA	None	None	NA	None	None
P8 - PT 5	41° 58' 54.867" N	87° 56' 15.971" W	654.975	661.7444	661.7444	50	35	711.7444	696.7444	710 feet	Proposed obstacle penetrates the proposed RWY 27L Departure Surface by 2	Proposed RWY 9R/27L Transitional Surface by 15	NA	None	None
Q1- PT 1	41° 58' 54.257" N	87° 56' 10.623" W	663.212	683.1623	683.1623	25	17	708.1623	700.1623	701 feet	Proposed obstacle penetrates the proposed RWY 27L Departure Surface by 8	Proposed RWY 9R/27L Transitional Surface by 2	NA	None	None
Q1- PT 2	41° 58' 53.040" N	87° 56' 17.039" W	659.3514	691.1104	691.1104	50	35	741.1104	726.1104	713 feet	Proposed obstacle penetrates the proposed RWY 27L Departure Surface by 29	Proposed RWY 9R/27L Transitional Surface by 18	713 feet	Proposed obstacle penetrates the proposed RWY 27L Departure Surface by 14 feet	Proposed RWY 9R/27L Transitional Surface by 3
Q1- PT 3	41° 58' 52.271" N	87° 56' 21.557" W	661.9045	693.5491	693.5491	50	35	743.5491	728.5491	722 feet	Proposed obstacle penetrates the proposed RWY 27L Departure Surface by 21	Proposed RWY 9R/27L Transitional Surface by 9	722 feet	Proposed obstacle penetrates the proposed RWY 27L Departure Surface by 6 feet	None
Q1- PT 4	41° 58' 50.657" N	87° 56' 41.933" W	665.8932	698.4862	698.4862	25	17	723.4862	715.4862	NA	None	None	NA	None	None
Q1- PT 5	41° 58' 50.690" N	87° 56' 45.517" W	665.9756	695.3051	695.3051	30	17	725.3051	712.3051	NA	None	None	NA	None	None
Q3- PT 1	41° 58' 42.675" N	87° 56' 10.442" W	664.9385	668.97	668.97	25	17	693.97	685.97	NA	None	None	NA	None	None
Q4- PT 1	41° 58' 55.400" N	87° 56' 11.228" W	663.5565	662.3908	663.5565	25	17	687.3908	679.3908	NA	None	None	NA	None	None
Q4- PT 2	41° 59' 2.009" N	87° 56' 15.775" W	654.9826	662.6533	662.6533	25	17	687.6533	679.6533	NA	None	None	NA	None	None
Q4- PT 3	41° 59' 9.197" N	87° 56' 16.329" W	654.2283	662.8906	662.8906	50	35	712.8906	697.8906	711 feet	Proposed obstacle penetrates the proposed RWY 27L Departure Surface by 2 feet and proposed RWY 27C by 1 foot	Proposed RWY 9R/27L Transitional Surface by 15	NA	None	None
Q4- PT 4	41° 59' 10.692" N	87° 56' 16.428" W	654.8861	662.073	662.073	50	35	712.073	697.073	712 feet	Proposed obstacle penetrates the proposed RWY 27L Departure Surface by 1	Proposed RWY 9C/27C Transitional Surface by 15	NA	None	None
Q4- PT 5	41° 59' 17.884" N	87° 56' 16.482" W	695.0258	660.3161	695.0258	50	35	710.3161	695.3161	711 feet	Proposed obstacle penetrates the proposed RWY 9C Approach Surface by 34 feet, S-ILS 09C raises DA 50 feet, ILS CAT II/III NA. Proposed obstacle penetrates proposed RWY 27C Departure Surface by 33 feet	Proposed RWY 9C Approach Surface by 47	711 feet	Proposed obstacle penetrates the proposed RWY 27C Departure Surface by 19 feet and proposed RWY 9C Approach Surface. ILS or LOC RWY 9C, raises DA by 50 feet, CAT II/III NA.	Proposed RWY 9C Approach Surface by 32
Q4- PT 1A*	41° 58' 55.400" N	87° 56' 11.228" W	663.5565	662.3908	663.5565	25	17	687.3908	679.3908	NA	None	None	NA	None	None
Q4- PT 2A*	41° 59' 2.009" N	87° 56' 15.775" W	654.9826	662.4268	662.4268	25	17	687.4268	679.4268	NA	None	None	NA	None	None
Q4- PT 3A*	41° 59' 9.197" N	87° 56' 16.329" W	654.2283	666.2168	666.2168	50	35	716.2168	701.2168	711 feet	Proposed obstacle penetrates the proposed RWY 27C Departure Surface by 5 feet and proposed RWY 27L surface by 6 feet	Proposed RWY 9R/27L Transitional Surface by 19	NA	None	Proposed RWY 9R/27L Transitional Surface by 4
Q4- PT 4A*	41° 59' 10.692" N	87° 56' 16.428" W	654.8861	667.0048	667.0048	50	35	717.0048	702.0048	711 feet	Proposed obstacle penetrates the proposed RWY 27C Departure Surface by 6 feet and proposed RWY 27L surface by 5 feet	Proposed RWY 9C/27C Transitional Surface by 19	NA	None	Proposed RWY 9C/27C Transitional Surface by 4
Q4- PT 5A*	41° 59' 17.884" N	87° 56' 16.482" W	695.0258	670.7908	695.0258	50	35	720.7908	705.7908	711 feet	Proposed obstacle penetrates the proposed RWY 9C Approach Surface by 34 feet, S-ILS 09C raises DA 50 feet, ILS CAT II/III NA. Proposed obstacle penetrates proposed RWY 27C Departure Surface by 33 feet	Proposed RWY 9C Approach Surface by 47	711 feet	Proposed obstacle penetrates the proposed RWY 27C Departure Surface by 19 feet and proposed RWY 9C Approach Surface. ILS or LOC RWY 9C, raises DA by 50 feet, CAT II/III NA.	Proposed RWY 9C Approach Surface by 32
Q5-PT1	41° 58' 53.441" N	87° 56' 28.663" W	659.4641	681.5458	681.5458	25	17	706.5458	698.5458	NA	None	None	NA	None	None

EOWB Tier Two Preliminary Engineering Phase Feasibility Study - South

Point #	Latitude	Longitude	Ex Ground El	Prop. El	Max Ground El	Max Equip Height - Temp	Max Equip Height - Perm	Max El - Temp	Max El - Perm	NEH	IFR Effect - Temp (in feet)	Part 77 Penetrations - Temp (in feet)	NEH - Perm	IFR Effect - Perm (in feet)	Part 77 Penetrations - Perm (in feet)
294 - PT 1	41° 56' 2.740" N	87° 55' 5.140" W	680.833	683.207	683.207	50	35	733.207	718.207	NA	None	None	NA	None	None
294 - PT 2	41° 56' 15.440" N	87° 54' 41.639" W	682.4356	683.6149	683.6149	50	35	733.6149	718.6149	NA	None	None	NA	None	None
294 - PT 3	41° 56' 17.875" N	87° 54' 26.934" W	657.9148	658.9807	658.9807	50	35	708.9807	693.9807	NA	None	None	NA	None	None
294 - PT 4	41° 56' 24.412" N	87° 53' 47.381" W	662.9017	662.9574	662.9574	25	17	687.9574	679.9574	NA	None	None	NA	None	None
294 - PT 5	41° 56' 26.119" N	87° 53' 37.046" W	673.1278	673.04	673.1278	25	17	698.04	690.04	NA	None	None	NA	None	None
EOWB- PT 100	41° 56' 28.362" N	87° 54' 49.585" W	651.5211	686.8961	686.8961	25	17	711.8961	703.8961	NA	None	None	NA	None	None
EOWB- PT 101	41° 56' 44.936" N	87° 54' 50.676" W	651.384	706.3185	706.3185	50	35	756.3185	741.3185	NA	None	None	NA	None	None
EOWB- PT 102	41° 56' 50.373" N	87° 54' 53.132" W	675.8642	718.3686	718.3686	50	35	768.3686	753.3686	NA	None	None	NA	None	None
EOWB- PT 103	41° 57' 2.710" N	87° 55' 13.061" W	663.1838	686.8555	686.8555	30	17	716.8555	703.8555	NA	None	None	NA	None	None
EOWB- PT 104	41° 57' 4.146" N	87° 55' 22.120" W	663.8882	674.6075	674.6075	50	35	724.6075	709.6075	NA	None	None	NA	None	None
EOWB- PT 105	41° 57' 7.404" N	87° 55' 37.374" W	666.7349	667.4811	667.4811	50	35	717.4811	702.4811	NA	None	None	NA	None	None
EOWB- PT 106	41° 57' 10.946" N	87° 55' 48.293" W	672.0804	669.5896	672.0804	50	35	719.5896	704.5896	NA	None	None	NA	None	None
EOWB- PT 107	41° 57' 16.279" N	87° 55' 57.743" W	670.4445	647.7744	670.4445	100	35	747.7744	682.7744	NA	None	Proposed RWY 10R/28L Transitional Surface by 26	NA	None	None
EOWB- PT 108	41° 57' 17.234" N	87° 55' 58.859" W	669.7169	645.012	669.7169	100	35	745.012	680.012	716 feet	Proposed obstacle penetrates the proposed RWY 28L Departure Surface by 54	Proposed RWY 10R/28L Transitional Surface by 38	NA	None	None

Source:
NEH, IFR Effects, Part 77 - FAA
Remaining Information - IDOT
* DENOTES TUNNEL OPTION FOR WEST BYPASS / UNION PACIFIC RAILROAD GRADE SEPARATION

Table 1
Chicago O'Hare International Airport
Elgin O'Hare West Bypass Tier Two Preliminary Engineering Phase Study
Airspace Case #2011-AGL-3913 thru 4424-NRA
Evaluated Points

EOWB- PT 109	41° 57' 18.967" N	87° 56' 0.618" W	666.4702	642.9138	666.4702	100	35	742.9138	677.9138	718 feet	Proposed obstacle penetrates the proposed RWY 28L Departure Surface by 49	Proposed RWY 10R Approach Surface by 61	NA	None	None
EOWB- PT 110	41° 57' 25.878" N	87° 56' 6.182" W	661.3325	659.3804	661.3325	50	35	709.3804	694.3804	NA	None	None	NA	None	None
EOWB- PT 111	41° 57' 29.696" N	87° 56' 8.829" W	659.9615	671.5455	671.5455	50	35	721.5455	706.5455	NA	None	Proposed RWY 10R Approach Surface by 3	NA	None	None
EOWB- PT 112	41° 57' 33.989" N	87° 56' 11.384" W	659.8711	684.6166	684.6166	50	35	734.6166	719.6166	NA	None	Proposed RWY 10R/28L Transitional Surface by 12	NA	None	None
EOWB- PT 113	41° 57' 37.334" N	87° 56' 12.982" W	660.7368	690.1819	690.1819	30	17	720.1819	707.1819	NA	None	None	NA	None	None
EOWB- PT 114	41° 57' 38.891" N	87° 56' 13.616" W	662.8765	690.8103	690.8103	30	17	720.8103	707.8103	NA	None	None	NA	None	None
EOWB- PT 115	41° 57' 47.061" N	87° 56' 15.871" W	657.7704	676.1222	676.1222	50	35	726.1222	711.1222	NA	None	None	NA	None	None
EOWB- PT 116	41° 57' 49.291" N	87° 56' 16.234" W	658.9219	669.8325	669.8325	50	35	719.8325	704.8325	701 feet	Proposed obstacle penetrates the proposed RWY 28C Departure Surface by 19	Proposed RWY 10C/28C Transitional Surface by 21	NA	None	Proposed RWY 10C/28C Transitional Surface by 6
EOWB- PT 117	41° 57' 56.483" N	87° 56' 17.071" W	685.3815	662.7937	685.3815	50	35	712.7937	697.7937	713 feet	Proposed obstacle penetrates the proposed RWY 28C Departure Surface by 23 feet and proposed RWY 10C Approach Surface by 21 feet. Raises S-ILS DA by 50 feet, CAT II/III NA.	Proposed RWY 10C Approach Surface by 36	713 feet	Proposed obstacle penetrates the proposed RWY 28C Departure Surface by 4	Proposed RWY 10C Approach Surface by 21
EOWB- PT 118	41° 57' 58.651" N	87° 56' 17.224" W	682.8156	663.8923	682.8156	50	35	713.8923	698.8923	714 feet	Proposed obstacle penetrates the proposed RWY 28C Departure Surface by 19 feet and proposed RWY 10C Approach Surface by 17 feet. Raises S-ILS DA by 50 feet, CAT II/III NA.	Proposed RWY 10C Approach Surface by 32	713 feet	Proposed obstacle penetrates the proposed RWY 28C Departure Surface by 8	Proposed RWY 10C Approach Surface by 17
EOWB- PT 119	41° 58' 1.025" N	87° 56' 17.339" W	690.1481	665.0946	690.1481	50	35	715.0946	700.0946	716 feet	Proposed obstacle penetrates proposed RWY 10C Approach Surface by 25 feet. Raises S-ILS DA by 50 feet, CAT II/III NA.	RWY 10 Approach Surface by 37 Proposed RWY 10C Approach Surface by 40	714 feet	Proposed obstacle penetrates the proposed RWY 28C Departure Surface by 12 feet and RWY 28 Departure Surface by 9 feet. Penetrates RWY 10 Approach Surface. ILS or LOC RWY 10, raises DA by 50 feet, CAT II/III NA.	RWY 10 Approach Surface by 22 Proposed RWY 10C Approach Surface by 25
EOWB- PT 120	41° 58' 3.802" N	87° 56' 17.404" W	690.232	666.5003	690.232	50	35	716.5003	701.5003	NA	None	RWY 10 Approach Surface by 37 Proposed RWY 10C Approach Surface by 40 Proposed RWY 10C/28C Transitional Surface by 40	714 feet	Proposed obstacle penetrates the proposed RWY 28C Departure Surface by 12 feet and RWY 28 Departure Surface by 9 feet. Penetrates RWY 10 Approach surface. ILS or LOC RWY 10, raises DA by 50 feet, CAT II/III NA.	RWY 10 Approach Surface by 22 Proposed RWY 10C Approach Surface by 25
EOWB- PT 121	41° 58' 6.200" N	87° 56' 17.401" W	691.8253	667.7141	691.8253	50	35	717.7141	702.7141	NA	None	RWY 10 Approach Surface by 38 Proposed RWY 10C/28C Transitional Surface by 6	715 feet	Proposed obstacle penetrates the proposed RWY 28C Departure Surface by 12 feet and RWY 28 Departure Surface by 10 feet. Penetrates RWY 10 Approach Surface. ILS or LOC RWY 10, raises DA by 50 feet, CAT II/III NA.	RWY 10 Approach Surface by 23
FRAN-PT1	41° 56' 36.990" N	87° 54' 2.590" W	648.57	648.5669	648.57	25	17	673.5669	665.5669	NA	None	None	NA	None	None
FRAN-PT2	41° 56' 40.497" N	87° 54' 11.830" W	651.18	652.1933	652.1933	25	17	677.1933	669.1933	NA	None	None	NA	None	None
FRAN-PT3	41° 56' 42.214" N	87° 54' 16.406" W	651.7	651.7386	651.7386	25	17	676.7386	668.7386	NA	None	None	NA	None	None
FRAN-PT4	41° 56' 46.233" N	87° 54' 28.413" W	654.071	654.4612	654.4612	25	17	679.4612	671.4612	NA	None	None	NA	None	None
FRAN-PT5	41° 56' 50.203" N	87° 54' 42.277" W	658.2565	659.0441	659.0441	50	35	709.0441	694.0441	NA	None	None	NA	None	None
FRAN-PT6	41° 56' 52.217" N	87° 54' 49.466" W	658.8325	659.7645	659.7645	50	35	709.7645	694.7645	NA	None	None	NA	None	None
IPR-PT1	41° 57' 38.498" N	87° 56' 11.509" W	662.7304	663.7298	663.7298	25	17	688.7298	680.7298	NA	None	None	NA	None	None
IPR-PT2	41° 57' 35.750" N	87° 56' 4.984" W	672.4396	-	672.4396	25	17	-	-	NA	None	None	NA	None	None
IPR-PT3	41° 57' 33.105" N	87° 56' 3.361" W	667.2452	-	667.2452	25	17	-	-	NA	None	None	NA	None	None
IPR-PT4	41° 57' 30.609" N	87° 56' 3.083" W	662.9384	-	662.9384	25	17	-	-	NA	None	None	NA	None	None
IPR-PT5	41° 57' 20.954" N	87° 55' 54.762" W	666.5155	-	666.5155	25	17	-	-	NA	None	None	NA	None	None
IPR-PT6	41° 57' 17.968" N	87° 55' 10.051" W	663.0211	-	663.0211	25	17	-	-	NA	None	None	NA	None	None
IPR-PT7	41° 57' 13.052" N	87° 54' 51.903" W	659.4331	-	659.4331	25	17	-	-	NA	None	None	NA	None	None
POW-PT1	41° 56' 18.073" N	87° 54' 38.746" W	652.8479	654.1185	654.1185	25	17	679.1185	671.1185	NA	None	None	NA	None	None
POW-PT2	41° 56' 30.522" N	87° 54' 47.022" W	651.7547	651.0483	651.7547	25	17	676.0483	668.0483	NA	None	None	NA	None	None
POW-PT3	41° 56' 41.288" N	87° 54' 46.428" W	647.7667	647.77	647.77	25	17	672.77	664.77	NA	None	None	NA	None	None
S1-PT1	41° 56' 18.318" N	87° 54' 51.483" W	663.9171	707.2007	707.2007	50	35	757.2007	742.2007	NA	None	None	NA	None	None
S1-PT2	41° 56' 40.935" N	87° 54' 50.735" W	651.07	694.8929	694.8929	50	35	744.8929	729.8929	NA	None	None	NA	None	None
S2-PT1	41° 56' 13.299" N	87° 54' 49.959" W	698.248	731.8647	731.8647	50	35	781.8647	766.8647	NA	None	None	NA	None	None
S2-PT2	41° 56' 18.881" N	87° 54' 47.416" W	651.5465	720.7575	720.7575	50	35	770.7575	755.7575	NA	None	None	NA	None	None
S2-PT3	41° 56' 25.287" N	87° 54' 47.723" W	654.2108	699.6738	699.6738	50	35	749.6738	734.6738	NA	None	None	NA	None	None
S2-PT4	41° 56' 41.763" N	87° 54' 49.275" W	650.42	697.1007	697.1007	50	35	747.1007	732.1007	NA	None	None	NA	None	None
S4-PT1	41° 56' 26.213" N	87° 54' 48.987" W	654.1407	689.3526	689.3526	50	35	739.3526	724.3526	NA	None	None	NA	None	None
TAFT-PT1	41° 57' 4.524" N	87° 54' 53.546" W	677.0822	697.9354	697.9354	50	35	747.9354	732.9354	NA	None	None	NA	None	None
TAFT-PT2	41° 57' 10.331" N	87° 54' 58.117" W	660.435	676.632	676.632	25	17	701.632	693.632	NA	None	None	NA	None	None
TAFT-PT3	41° 57' 11.887" N	87° 54' 59.731" W	661.8673	668.2921	668.2921	25	17	693.2921	685.2921	NA	None	None	NA	None	None

Source:
NEH, IFR Effects, Part 77 - FAA
Remaining Information - IDOT
* DENOTES TUNNEL OPTION FOR WEST BYPASS / UNION PACIFIC RAILROAD GRADE SEPARATION

Table 1
Chicago O'Hare International Airport
Elgin O'Hare West Bypass Tier Two Preliminary Engineering Phase Study
Airspace Case #2011-AGL-3913 thru 4424-NRA
Evaluated Points

TAFT-PT4	41° 57' 15.723" N	87° 55' 0.568" W	664.5523	667.2921	667.2921	50	35	717.2921	702.2921	NA	None	None	NA	None	
T2-PT1	41° 56' 29.913" N	87° 54' 47.748" W	651.8924	684.3383	684.3383	50	35	734.3383	719.3383	NA	None	None	NA	None	
T2-PT2	41° 56' 45.983" N	87° 54' 48.759" W	652.1043	653.6085	653.6085	25	17	678.6085	670.6085	NA	None	None	NA	None	
T3-PT1	41° 57' 5.369" N	87° 55' 21.571" W	664.0127	670.2944	670.2944	25	17	695.2944	687.2944	NA	None	None	NA	None	
T3-PT2	41° 57' 7.464" N	87° 55' 34.489" W	665.6949	664.1762	665.6949	50	35	714.1762	699.1762	NA	None	None	NA	None	
U1-PT1	41° 57' 25.875" N	87° 56' 7.448" W	660.5096	662.0185	662.0185	50	35	712.0185	697.0185	NA	None	None	NA	None	
U1-PT2	41° 57' 30.567" N	87° 56' 10.883" W	659.8697	673.2369	673.2369	50	35	723.2369	708.2369	NA	None	Proposed RWY 1R Approach Surface by 2	NA	None	
U2-PT1	41° 57' 25.880" N	87° 56' 4.918" W	662.54	656.9624	662.54	50	35	706.9624	691.9624	NA	None	None	NA	None	
U2-PT2	41° 57' 31.603" N	87° 56' 8.357" W	660.5068	668.1842	668.1842	25	17	693.1842	685.1842	NA	None	None	NA	None	
U3-PT1	41° 57' 49.454" N	87° 56' 14.809" W	659.425	666.4592	666.4592	50	35	716.4592	701.4592	709 feet	Proposed obstacle penetrates the proposed RWY 28C Departure Surface by 8	Proposed RWY 10C/28C Transitional Surface by 20	NA	None	Proposed RWY 10C/28C Transitional Surface by 5
U3-PT2	41° 57' 56.485" N	87° 56' 16.017" W	684.9279	661.4818	684.9279	50	35	711.4818	696.4818	711 feet	Proposed obstacle penetrates the proposed RWY 28C Departure Surface by 24 feet and proposed RWY 10C Approach Surface by 22 feet. Raises S-ILS DA by 50 feet, CAT II/III NA.	Proposed RWY 10C Approach Surface by 36	NA	None	Proposed RWY 10C Approach Surface by 21
U3-PT3	41° 58' 0.351" N	87° 56' 16.318" W	675.8117	663.7664	675.8117	50	35	713.7664	698.7664	712 feet	Proposed obstacle penetrates the proposed RWY 28C Departure Surface by 14 feet and proposed RWY 10C Approach Surface by 12 feet. Raises S-ILS DA by 50 feet, CAT II/III NA.	RWY 10/28 Transitional Surface by 12 Proposed RWY 10C Approach Surface by 27	NA	None	Proposed RWY 10C Approach Surface by 12
U4-PT1	41° 57' 49.130" N	87° 56' 17.649" W	660.8696	668.0542	668.0542	50	35	718.0542	703.0542	715 feet	Proposed obstacle penetrates the proposed RWY 28C Departure Surface by 4	Proposed RWY 10C/28C Transitional Surface by 18	NA	None	Proposed RWY 10C/28C Transitional Surface by 3
U7-PT1	41° 57' 38.888" N	87° 56' 9.771" W	663.5257	664.4218	664.4218	50	35	714.4218	699.4218	NA	None	None	NA	None	
U7-PT2	41° 57' 43.750" N	87° 56' 13.196" W	660.6168	663.52	663.52	25	17	688.52	680.52	NA	None	None	NA	None	
WOLF- PT 1	41° 56' 19.661" N	87° 54' 16.128" W	653.7505	674.9005	674.9005	30	17	704.9005	691.9005	NA	None	None	NA	None	

EOWB Tier Two Preliminary Engineering Phase Feasibility Study - North

Point #	Latitude	Longitude	Ex Ground El	Prop. El	Max Ground El	Max Equip Height - Temp	Max Equip Height - Perm	Max El - Temp	Max El - Perm	NEH	IFR Effect - Temp (in feet)	Part 77 Penetrations - Temp (in feet)	NEH - Perm	IFR Effect - Perm (in feet)	Part 77 Penetrations - Perm (in feet)
ELM-PT1	42° 1' 7.250" N	87° 56' 24.299" W	668.6561	685.6916	685.6916	50	35	735.6916	720.6916	NA	None	None	NA	None	None
ELM-PT2	42° 1' 1.440" N	87° 56' 24.591" W	667.3429	686.7367	686.7367	50	35	736.7367	721.7367	NA	None	None	NA	None	None
ELM-PT3	42° 0' 24.887" N	87° 56' 24.863" W	668.5074	668.7986	668.7986	25	17	693.7986	685.7986	NA	None	None	NA	None	None
ELM-PT4	42° 0' 0.150" N	87° 56' 24.260" W	670.5485	670.5485	670.5485	25	17	695.5485	687.5485	NA	None	None	NA	None	None
ELM-PT5	41° 59' 55.631" N	87° 56' 24.155" W	671.5924	671.5924	671.5924	50	35	721.5924	706.5924	NA	None	None	NA	None	None
ELM-PT6	41° 59' 47.468" N	87° 56' 23.966" W	673.5556	673.5556	673.5556	25	17	698.5556	690.5556	NA	None	None	NA	None	None
ELM-PT7	41° 59' 35.506" N	87° 56' 23.699" W	672.4113	672.4113	672.4113	50	35	722.4113	707.4113	714 feet	Proposed obstacle penetrates the RWY 32L Departure Surface by 9 feet	RWY 14R/32L Transitional Surface by 22	NA	None	RWY 14R/32L Transitional Surface by 7
ELM-PT8	41° 59' 32.449" N	87° 56' 23.654" W	672.4159	672.4159	672.4159	25	17	697.4159	689.4159	NA	None	None	NA	None	None
EOWB- PT 135	41° 59' 27.447" N	87° 56' 16.782" W	668.0521	681.7187	681.7187	25	17	706.7187	698.7187	NA	None	None	NA	None	None
EOWB- PT 136	41° 59' 28.825" N	87° 56' 16.708" W	665.0069	684.7901	684.7901	25	17	709.7901	701.7901	NA	None	RWY 14R/32L Transitional Surface by 4	NA	None	None
EOWB- PT 137	41° 59' 31.030" N	87° 56' 16.868" W	665.1374	689.7109	689.7109	25	17	714.7109	706.7109	697 feet	Proposed obstacle penetrates the RWY 32L Departure Surface by 18	RWY 14R/32L Transitional Surface by 28	697 feet	Proposed obstacle penetrates the RWY 32L Departure Surface by 10	RWY 14R/32L Transitional Surface by 20
EOWB- PT 138	41° 59' 38.036" N	87° 56' 19.430" W	667.7779	705.9147	705.9147	50	35	755.9147	740.9147	714 feet	Proposed obstacle penetrates the RWY 32L Departure Surface by 42 feet and RWY 14R ILS by 40 feet. Raises S-ILS DA by 50 feet, CAT II/III NA.	RWY 14R Approach Surface by 56	714 feet	Proposed obstacle penetrates the RWY 32L Departure Surface by 27 feet and RWY 14R GQS surface. ILS or LOC RWY 14, S-ILS NA, CAT II/III NA.	RWY 14R Approach Surface by 41
EOWB- PT 139	41° 59' 43.763" N	87° 56' 21.404" W	675.2256	713.6187	713.6187	25	17	738.6187	730.6187	727 feet	Proposed obstacle penetrates the RWY 32L Departure Surface by 12 feet and RWY 14R ILS by 7 feet. Raises S-ILS DA by 50 feet, CAT II/III NA.	RWY 14R Approach Surface by 28	730 feet	Proposed obstacle penetrates the RWY 32L Departure Surface by 1	RWY 14R Approach Surface by 20
EOWB- PT 140	41° 59' 45.241" N	87° 56' 21.544" W	673.7854	713.1237	713.1237	25	17	738.1237	730.1237	730 feet	Proposed obstacle penetrates the RWY 32L Departure Surface by 9 feet and RWY 14R ILS by 3 feet. Raises S-ILS DA by 50 feet, CAT II/III NA.	RWY 14R Approach Surface by 26	NA	None	RWY 14R Approach Surface by 18
EOWB- PT 141	41° 59' 56.261" N	87° 56' 17.302" W	678.3098	689.8708	689.8708	50	35	739.8708	724.8708	NA	None	RWY 14R Approach Surface by 14	NA	None	None
EOWB- PT 142	41° 59' 57.229" N	87° 56' 16.372" W	682.1686	687.2186	687.2186	50	35	737.2186	722.2186	NA	None	None	NA	None	None
EOWB- PT 143	41° 59' 59.593" N	87° 56' 13.582" W	668.2662	680.2029	680.2029	50	35	730.2029	715.2029	NA	None	None	NA	None	None
EOWB- PT 144	42° 0' 1.626" N	87° 56' 11.046" W	668.6452	674.435	674.435	50	35	724.435	709.435	NA	None	RWY 9L/27R Transitional Surface by 9	NA	None	None
EOWB- PT 145	42° 0' 10.193" N	87° 56' 0.357" W	674.3416	664.749	674.3416	50	35	714.749	699.749	714 feet	Proposed obstacle penetrates the RWY 27R Departure Surface by 11 feet and RWY 9L ILS by 9 feet. Raises S-ILS DA by 50 feet, CAT II/III NA.	RWY 9L Approach Surface by 25	NA	None	RWY 9L Approach Surface by 10
EOWB- PT 146	42° 0' 16.656" N	87° 55' 52.293" W	671.6117	658.8912	671.6117	50	35	708.8912	693.8912	699 feet	Proposed obstacle penetrates the RWY 27R Departure Surface by 23	RWY 9L/27R Transitional Surface by 34	699 feet	Proposed obstacle penetrates the RWY 27R Departure Surface by 8	RWY 9L/27R Transitional Surface by 19
EOWB- PT 147	42° 0' 18.039" N	87° 55' 50.569" W	668.3193	660.0114	668.3193	50	35	710.0114	695.0114	696 feet	Proposed obstacle penetrates the RWY 27R Departure Surface by 23	RWY 9L/27R Transitional Surface by 11	696 feet	Proposed obstacle penetrates the RWY 27R Departure Surface by 8	None
EOWB- PT 148	42° 0' 20.187" N	87° 55' 48.227" W	662.6351	661.4687	662.6351	50	35	711.4687	696.4687	NA	None	None	NA	None	None

Source:
NEH, IFR Effects, Part 77 - FAA
Remaining Information - IDOT
* DENOTES TUNNEL OPTION FOR WEST BYPASS / UNION PACIFIC RAILROAD GRADE SEPARATION

Table 1
Chicago O'Hare International Airport
Elgin O'Hare West Bypass Tier Two Preliminary Engineering Phase Study
Airspace Case #2011-AGL-3913 thru 4424-NRA
Evaluated Points

EOWB- PT 149	42° 0' 28.083" N	87° 55' 43.445" W	654.6616	657.4464	657.4464	25	17	682.4464	674.4464	NA	None	None	NA	None	
EOWB- PT 135A*	41° 59' 27.447" N	87° 56' 16.782" W	668.0521	661.9387	668.0521	25	17	693.0521	678.9387	NA	None	None	NA	None	
EOWB- PT 136A*	41° 59' 28.825" N	87° 56' 16.708" W	665.0069	658.4764	665.0069	25	17	690.0069	675.4764	NA	None	None	NA	None	
EOWB- PT 137A*	41° 59' 31.030" N	87° 56' 16.868" W	665.1374	652.9293	665.1374	25	17	690.1374	669.9293	NA	None	RWY 14R/32L Transitional Surface by 4	NA	None	
EOWB- PT 138A*	41° 59' 38.036" N	87° 56' 19.430" W	667.7779	634.6633	667.7779	100	35	767.7779	669.6633	714 feet	Proposed obstacle penetrates the RWY 32L Departure Surface by 54 feet and RWY 14R ILS by 52 feet. ILS or LOC RWY 14R NA. CAT II/III NA. GQS penetration.	RWY 14R Approach Surface by 68	NA	None	RWY 14R Approach Surface by 3
EOWB- PT 139A*	41° 59' 43.763" N	87° 56' 21.404" W	675.2256	631.2087	675.2256	100	35	775.2256	666.2087	727 feet	Proposed obstacle penetrates the RWY 32L Departure Surface by 49 feet and RWY 14R ILS by 44 feet. ILS or LOC RWY 14R NA. CAT II/III NA. GQS penetration.	RWY 14R Approach Surface by 65	NA	None	None
EOWB- PT 140A*	41° 59' 45.241" N	87° 56' 21.544" W	673.7854	633.9182	673.7854	100	35	773.7854	668.9182	730 feet	Proposed obstacle penetrates the RWY 32L Departure Surface by 44 feet and RWY 14R ILS by 38 feet. ILS or LOC RWY 14R NA. CAT II/III NA. GQS penetration.	RWY 14R Approach Surface by 61	NA	None	None
EOWB- PT 141A*	41° 59' 56.261" N	87° 56' 17.302" W	678.3098	664.5044	678.3098	50	35	728.3098	699.5044	NA	None	RWY 14R Approach Surface by 3	NA	None	None
EOWB- PT 142A*	41° 59' 57.229" N	87° 56' 16.372" W	682.1686	667.6389	682.1686	50	35	732.1686	702.6389	NA	None	None	NA	None	None
EOWB- PT 143A*	41° 59' 59.593" N	87° 56' 13.582" W	668.2662	673.447	673.447	50	35	723.447	708.447	NA	None	None	NA	None	None
EOWB- PT 144A*	42° 0' 1.626" N	87° 56' 11.046" W	668.6452	673.2787	673.2787	50	35	723.2787	708.2787	NA	None	RWY 9L/27R Transitional Surface by 8	NA	None	None
JANE-PT 1	42° 1' 4.777" N	87° 56' 22.879" W	661.7554	661.7554	661.7554	50	35	711.7554	696.7554	NA	None	None	NA	None	None
JANE-PT 2	42° 0' 57.500" N	87° 55' 50.183" W	658.8852	661.3069	661.3069	50	35	711.3069	696.3069	NA	None	None	NA	None	None
JANE-PT 3	42° 0' 49.979" N	87° 55' 21.942" W	671.5844	672.3142	672.3142	50	35	722.3142	707.3142	NA	None	None	NA	None	None
JANE-PT 4	42° 0' 47.463" N	87° 55' 12.499" W	679.4676	681.8918	681.8918	50	35	731.8918	716.8918	NA	None	None	NA	None	None
JANE-PT 5	42° 0' 46.125" N	87° 55' 7.476" W	653.5284	683.7168	683.7168	50	35	733.7168	718.7168	NA	None	None	NA	None	None
JANE-PT 6	42° 0' 41.139" N	87° 54' 48.764" W	653.8632	-	653.8632	30	17	683.8632	670.8632	NA	None	None	NA	None	None
JANE-PT 7	42° 0' 27.414" N	87° 53' 57.278" W	656.221	-	656.221	25	17	681.221	673.221	NA	None	None	NA	None	None
MPR - PT 1	42° 0' 24.930" N	87° 55' 28.109" W	661.1267	661.1267	661.1267	25	17	686.1267	678.1267	NA	None	None	NA	None	None
MPR - PT 2	42° 0' 27.120" N	87° 55' 15.981" W	651.6301	654.7628	654.7628	25	17	679.7628	671.7628	NA	None	None	NA	None	None
MPR - PT 3	42° 0' 39.862" N	87° 55' 14.487" W	655.3	655.3	655.3	25	17	680.3	672.3	NA	None	None	NA	None	None
PRATT-PT 1	41° 59' 54.816" N	87° 56' 29.203" W	669.6723	669.6723	669.6723	25	17	694.6723	686.6723	NA	None	None	NA	None	None
TOUHY - PT 1	42° 0' 29.752" N	87° 55' 43.242" W	654.1277	683.2724	683.2724	50	35	733.2724	718.2724	NA	None	None	NA	None	None
TOUHY - PT 2	42° 0' 29.910" N	87° 55' 36.716" W	652.2435	689.1874	689.1874	50	35	739.1874	724.1874	NA	None	RWY 14L/32R Transitional Surface by 18	NA	None	RWY 14L/32R Transitional Surface by 3
TOUHY - PT 3	42° 0' 30.072" N	87° 55' 30.003" W	656.8581	691.5818	691.5818	30	17	721.5818	708.5818	NA	None	RWY 14L Approach Surface by 7	NA	None	None
TOUHY - PT 4	42° 0' 30.325" N	87° 55' 19.589" W	652.2026	667.1415	667.1415	25	17	692.1415	684.1415	NA	None	None	NA	None	None
TOUHY - PT 5	42° 0' 30.726" N	87° 55' 6.177" W	648.1129	650.4724	650.4724	25	17	675.4724	667.4724	NA	None	None	NA	None	None
V3-PT1	41° 59' 36.698" N	87° 56' 21.816" W	671.1179	670.0029	671.1179	25	17	695.0029	687.0029	NA	None	None	NA	None	None
V3-PT2	41° 59' 43.401" N	87° 56' 19.386" W	673.2533	689.0935	689.0935	25	17	714.0935	706.0935	NA	None	RWY 14R Approach Surface by 7	NA	None	None
V3-PT3	41° 59' 49.716" N	87° 56' 18.839" W	669.439	702.8688	702.8688	30	17	732.8688	719.8688	NA	None	RWY 14R Approach Surface by 16	NA	None	RWY 14R Approach Surface by 3
V3-PT4	41° 59' 55.279" N	87° 56' 16.494" W	673.7203	686.7303	686.7303	50	35	736.7303	721.7303	NA	None	RWY 14R Approach Surface by 13	NA	None	None
V3-PT5	41° 59' 57.600" N	87° 56' 14.316" W	681.9609	680.6073	681.9609	50	35	730.6073	715.6073	NA	None	None	NA	None	None
V3-PT6	42° 0' 1.830" N	87° 56' 9.271" W	666.2902	672.1459	672.1459	50	35	722.1459	707.1459	NA	None	RWY 9L/27R Transitional Surface by 9	NA	None	None
V3-PT7	42° 0' 5.148" N	87° 56' 5.295" W	675.6491	668.7415	675.6491	50	35	718.7415	703.7415	723 feet	Proposed obstacle penetrates the RWY 27R Departure Surface by 3	RWY 9L Approach Surface by 18	NA	None	RWY 9L Approach Surface by 3
V3-PT1A*	41° 59' 36.698" N	87° 56' 21.816" W	671.1179	670.6263	671.1179	25	17	696.1179	687.6263	NA	None	None	NA	None	None
V3-PT2A*	41° 59' 43.401" N	87° 56' 19.386" W	673.2533	666.2876	673.2533	25	17	698.2533	683.2876	NA	None	None	NA	None	None
V3-PT3A*	41° 59' 49.716" N	87° 56' 18.839" W	669.439	646.9572	669.439	100	35	769.439	681.9572	735 feet	Proposed obstacle penetrates the RWY 32L Departure Surface by 35 feet and RWY 14R ILS by 28 feet. Raises S-ILS DA 50 feet, CAT II/III NA.	RWY 14R Approach Surface by 53	NA	None	None
V3-PT4A*	41° 59' 55.279" N	87° 56' 16.494" W	673.7203	658.4384	673.7203	50	35	723.7203	693.4384	NA	None	None	NA	None	None

Table 1
Chicago O'Hare International Airport
Elgin O'Hare West Bypass Tier Two Preliminary Engineering Phase Study
Airspace Case #2011-AGL-3913 thru 4424-NRA
Evaluated Points

V3-PT5A*	41° 59' 57.600" N	87° 56' 14.316" W	681.9609	666.477	681.9609	50	35	731.9609	701.477	NA	None	None	NA	None	None
V3-PT6A*	42° 0' 1.830" N	87° 56' 9.271" W	666.2902	671.8399	671.8399	50	35	721.8399	706.8399	NA	None	RWY 9L/27R Transitional Surface by 8	NA	None	None
V3-PT7A*	42° 0' 5.148" N	87° 56' 5.295" W	675.6491	668.7415	675.6491	50	35	725.6491	703.7415	723 feet	Proposed obstacle penetrates the RWY 27R Departure Surface by 3	RWY 9L Approach Surface by 18	NA	None	RWY 9L Approach Surface by 3
V4-PT1	41° 59' 55.783" N	87° 56' 20.108" W	672.3318	670.2734	672.3318	25	17	695.2734	687.2734	NA	None	None	NA	None	None
V4-PT2	41° 59' 59.841" N	87° 56' 15.258" W	667.5523	679.2471	679.2471	25	17	704.2471	696.2471	NA	None	None	NA	None	None
V4-PT1A*	41° 59' 55.783" N	87° 56' 20.108" W	672.3318	667.1645	672.3318	25	17	697.3318	684.1645	NA	None	None	NA	None	None
V4-PT2A*	41° 59' 59.841" N	87° 56' 15.258" W	667.5523	670.9469	670.9469	25	17	695.9469	687.9469	NA	None	None	NA	None	None
W1-PT1	42° 0' 18.311" N	87° 55' 51.933" W	669.2786	656.9462	669.2786	50	35	706.9462	691.9462	699 feet	Proposed obstacle penetrates the RWY 27R Departure Surface by 21	RWY 9L/27R Transitional Surface by 8	699 feet	Proposed obstacle penetrates the RWY 27R Departure Surface by 6	None
W1-PT2	42° 0' 28.017" N	87° 55' 47.579" W	655.0429	673.0072	673.0072	25	17	698.0072	690.0072	NA	None	None	NA	None	None
W2-PT1	42° 0' 13.577" N	87° 55' 54.778" W	672.1117	660.3105	672.1117	50	35	710.3105	695.3105	703 feet	Proposed obstacle penetrates the RWY 27R Departure Surface by 20 feet and RWY 9L ILS by 20 feet. Raises S-ILS DA by 50 feet, CAT II/III NA.	RWY 9L Approach Surface by 31	703 feet	Proposed obstacle penetrates the RWY 27R Departure Surface by 5 feet and RWY 9L ILS, raises S-ILS DA 50 feet, ILS 9L CAT II/III NA.	RWY 9L Approach Surface by 16
W2-PT2	42° 0' 16.486" N	87° 55' 50.767" W	670.7799	660.3817	670.7799	50	35	710.3817	695.3817	696 feet	Proposed obstacle penetrates the RWY 27R Departure Surface by 25	RWY 9L/27R Transitional Surface by 35	703 feet	Proposed obstacle penetrates the RWY 27R Departure Surface by 3 feet and RWY 9L ILS, raises S-ILS DA 50 feet, ILS 9L CAT II/III NA.	RWY 9L/27R Transitional Surface by 20
W2-PT3	42° 0' 17.735" N	87° 55' 49.046" W	664.5651	663.0263	664.5651	50	35	713.0263	698.0263	NA	None	RWY 9L/27R Transitional Surface by 11	NA	None	None
W2-PT4	42° 0' 23.601" N	87° 55' 41.509" W	655.7627	675.2383	675.2383	25	17	700.2383	692.2383	NA	None	None	NA	None	None
W2-PT5	42° 0' 26.153" N	87° 55' 39.747" W	653.9714	680.7587	680.7587	25	17	705.7587	697.7587	NA	None	None	NA	None	None
X1-PT1	42° 0' 35.667" N	87° 55' 43.690" W	654.3775	666.6427	666.6427	50	35	716.6427	701.6427	NA	None	None	NA	None	None
X1-PT2	42° 0' 49.059" N	87° 55' 45.488" W	592.2336	693.815	693.815	50	35	743.815	728.815	NA	None	None	NA	None	None
X2-PT1	42° 0' 36.777" N	87° 55' 41.372" W	652.2405	669.2769	669.2769	50	35	719.2769	704.2769	NA	None	None	NA	None	None
X2-PT2	42° 0' 45.274" N	87° 55' 39.500" W	646.9106	681.5644	681.5644	50	35	731.5644	716.5644	NA	None	None	NA	None	None
X2-PT3	42° 0' 48.828" N	87° 55' 21.196" W	666.0886	672.2274	672.2274	50	35	722.2274	707.2274	NA	None	None	NA	None	None
X5 - PT 1	42° 0' 52.579" N	87° 55' 40.683" W	673.0528	710.9436	710.9436	50	35	760.9436	745.9436	NA	None	RWY 14L Approach Surface by 1	NA	None	None
X5 - PT 2	42° 0' 51.996" N	87° 55' 23.599" W	654.9281	670.9086	670.9086	25	17	695.9086	687.9086	NA	None	None	NA	None	None
X8 - PT 1	42° 0' 48.855" N	87° 55' 40.449" W	648.7681	682.8013	682.8013	50	35	732.8013	717.8013	NA	None	None	NA	None	None
Y3-PT 1	42° 1' 0.969" N	87° 56' 13.293" W	657.4467	682.3022	682.3022	30	17	712.3022	699.3022	NA	None	None	NA	None	None
Y5-PT 1	42° 1' 1.032" N	87° 56' 19.393" W	657.0179	684.71	684.71	25	17	709.71	701.71	NA	None	None	NA	None	None
Y9-PT 1	42° 1' 1.049" N	87° 56' 21.904" W	659.8987	686.0521	686.0521	50	35	736.0521	721.0521	NA	None	None	NA	None	None

EOWB Tier Two Preliminary Engineering Phase Feasibility Study - Far West

Point #	Latitude	Longitude	Ex Ground El	Prop. El	Max Ground El	Max Equip Height - Temp	Max Equip Height - Perm	Max El - Temp	Max El - Perm	NEH	IFR Effect - Temp (in feet)	Part 77 Penetrations - Temp (in feet)	NEH - Perm	IFR Effect - Perm (in feet)	Part 77 Penetrations - Perm (in feet)
A2 - PT 1	41° 59' 35.805" N	88° 7' 14.723" W	804.9175	804.6828	804.9175	25	17	829.6828	821.6828	NA	None	None	NA	None	None
A3 - PT 1	41° 59' 47.252" N	88° 6' 43.966" W	817.284	819.2502	819.2502	50	35	869.2502	854.2502	NA	None	None	NA	None	None
A3 - PT 2	41° 59' 48.153" N	88° 6' 34.095" W	801.188	822.1001	822.1001	50	35	872.1001	857.1001	NA	None	None	NA	None	None
A3 - PT 3	41° 59' 48.839" N	88° 6' 22.281" W	817.0405	817.9071	817.9071	50	35	867.9071	852.9071	NA	None	None	NA	None	None
B1 - PT 1	41° 59' 36.830" N	88° 7' 19.802" W	830.5173	837.6836	837.6836	30	17	867.6836	854.6836	NA	None	None	NA	None	None
B1 - PT 2	41° 59' 45.396" N	88° 7' 5.198" W	840.5608	841.4003	841.4003	25	17	866.4003	858.4003	NA	None	None	NA	None	None
B2 - PT 1	41° 59' 19.087" N	88° 7' 19.647" W	830.2524	830.2524	830.2524	25	17	855.2524	847.2524	NA	None	None	NA	None	None
B2 - PT 2	41° 59' 32.800" N	88° 7' 18.055" W	820.9691	827.1496	827.1496	30	17	857.1496	844.1496	NA	None	None	NA	None	None
B2 - PT 3	41° 59' 36.036" N	88° 7' 15.866" W	806.5205	822.6412	822.6412	50	35	872.6412	857.6412	NA	None	None	NA	None	None
B2 - PT 4	41° 59' 41.025" N	88° 7' 9.479" W	810.171	831.074	831.074	50	35	881.074	866.074	NA	None	None	NA	None	None
B2 - PT 5	41° 59' 44.892" N	88° 7' 1.461" W	835.0124	835.8242	835.8242	50	35	885.8242	870.8242	NA	None	None	NA	None	None
C3 - PT 1	41° 59' 50.897" N	88° 5' 30.234" W	800.2098	819.431	819.431	50	35	869.431	854.431	NA	None	None	NA	None	None
D2 - PT 1	41° 59' 45.278" N	88° 5' 6.023" W	801.1833	801.6318	801.6318	50	35	851.6318	836.6318	NA	None	None	NA	None	None
D2 - PT 2	41° 59' 40.316" N	88° 4' 56.153" W	789.4418	788.8803	788.8803	50	35	838.8803	823.8803	NA	None	None	NA	None	None
D2 - PT 3	41° 59' 38.426" N	88° 4' 51.503" W	792.7772	793.2223	793.2223	50	35	843.2223	828.2223	NA	None	None	NA	None	None
D3 - PT 1	41° 59' 32.557" N	88° 4' 34.056" W	763.6577	765.2623	765.2623	50	35	815.2623	800.2623	NA	None	None	NA	None	None
D3 - PT 2	41° 59' 29.648" N	88° 4' 18.381" W	752.8735	756.7132	756.7132	50	35	806.7132	791.7132	NA	None	None	NA	None	None
EOWB - PT 200	41° 59' 37.387" N	88° 7' 16.520" W	815.7486	820.2256	820.2256	50	35	870.2256	855.2256	NA	None	None	NA	None	None
EOWB - PT 201	41° 59' 44.259" N	88° 7' 5.306" W	835.7129	838.4277	838.4277	50	35	888.4277	873.4277	NA	None	None	NA	None	None
EOWB - PT 202	41° 59' 46.448" N	88° 6' 55.456" W	810.1726	833.2624	833.2624	30	17	863.2624	850.2624	NA	None	None	NA	None	None
EOWB - PT 203	41° 59' 49.102" N	88° 6' 34.095" W	801.8205	822.4392	822.4392	50	35	872.4392	857.4392	NA	None	None	NA	None	None
EOWB - PT 204	41° 59' 49.528" N	88° 6' 6.286" W	803.1959	824.4985	824.4985	50	35	874.4985	859.4985	NA	None	None	NA	None	None
EOWB - PT 205	41° 59' 51.692" N	88° 5' 30.224" W	800.3135	820.8032	820.8032	50	35	870.8032	855.8032	NA	None	None	NA	None	None
EOWB - PT 206	41° 59' 50.357" N	88° 5' 24.107" W	798.505	827.371	827.371	30	17	857.371	844.371	NA	None	None	NA	None	None
FRONT- PT 100	41° 59' 46.690" N	88° 6' 44.170" W	812.0372	814.8511	814.8511	25	17	839.8511	831.8511	NA	None	None	NA	None	None
IPR - PT 100	41° 59' 41.811" N	88° 6' 40.652" W	796.2045	796.2045	796.2045	25	17	821.2045	813.2045	NA	None	None	NA	None	None
RODEN - PT 1	41° 59' 43.336" N	88° 6' 34.365" W	798.2671	798.2427	798.2671	25	17	823.2427	815.2427	NA	None	None	NA	None	None
ROSE - PT 1	41° 59' 33.628" N	88° 4' 48.783" W	793.3865	793.3865	793.3865	25	17	818.3865	810.3865	NA	None	None	NA	None	None
ROSE - PT 2	41° 59' 38.368" N	88° 4' 48.731" W	795.9852	796.357	796.357	25	17	821.357	813.357	NA	None	None	NA	None	None
SPRING - PT 1	41° 59' 36.102" N	88° 7' 9.253" W	816.1694	816.2066	816.2066	25	17	841.2066	833.2066	NA	None	None	NA	None	None
WRIGHT - PT 1	41° 59' 46.656" N	88° 6' 6.329" W	802.8688	801.6362	802.8688	25	17	826.6362	818.6362	NA	None	None	NA	None	None

Source:
NEH, IFR Effects, Part 77 - FAA
Remaining Information - IDOT
* DENOTES TUNNEL OPTION FOR WEST BYPASS / UNION PACIFIC RAILROAD GRADE SEPARATION

