U. S. Department
of Transportation

**Federal Aviation
Administration**

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

2300 E Devon Avenue
Des Plaines, Illinois 60018

August 6, 2003

Mr. Chris Arman
Deputy Commissioner
O'Hare Modernization Program
Department of Aviation
Post Office Box 66142
Chicago, Illinois 60666

Dear Mr. Arman:

O'Hare International Airport (ORD)
Airspace Case No. 2003-AGL-0848-NRA
Review of Draft Airport Layout Plan

We have completed the Federal Aviation Administration's (FAA) Great Lakes Region review of the Chicago O'Hare International Airport Draft Airport Layout Plan (ALP) submitted to the FAA on December 23, 2002, including the ALP-related documentation submitted to the FAA by the City of Chicago on February 7 and March 6, 2003. As you are aware, we submitted to you our initial ALP comments on May 21, 2003. Enclosed are additional FAA comments that supplement our May 21 submittal.

The enclosed comments focus primarily on utilization of the proposed airfield and surrounding airspace from an operational perspective. The comments are arranged in the following two sections: Draft Project Definition Report comments and Draft Airside Simulation Analysis comments.

We are available to meet with representatives of your office to discuss the items in the attached document and to provide any technical assistance necessary to facilitate the City's further refinement of the ALP. If you have any questions or wish to further discuss the attached comments, please contact my office at (847) 294-7812.

Sincerely,

Barry D. Cooper
Manager, Chicago Area Modernization Program Office

Enclosure

# O'HARE MODERNIZATION PROGRAM

## AERONAUTICAL STUDY 2003-AGL-0848-NRA

**FEDERAL AVIATION ADMINISTRATION AND TRANSPORATION SECURITY ADMINISTRATION**

The draft Airport Layout Plan (ALP), reflecting the City of Chicago's O'Hare Modernization Program (OMP) proposal, offers proposed airfield configuration enhancements necessary to address future aviation demand (capacity, delay reduction, etc.). The City's OMP proposal, however, does not address the ability of the terminal and enroute air traffic control environments to deliver or accept these capacities. Accordingly, the comments offered below endeavor to address air traffic control considerations from both an on-airfield perspective and a farther-reaching terminal and enroute air traffic system perspective.

In order to achieve projected efficiency gains, enhancements to both the physical airfield and the surrounding terminal/enroute air traffic control environment need to occur. It must be noted that the City of Chicago and the Federal Aviation Administration (FAA) bear a shared responsibility to effect changes necessary to realize projected efficiency gains at O'Hare. FAA is currently undertaking a separate initiative known as the National Airspace Redesign (NAR) that will provide enhancements to the terminal/enroute air traffic control environment. While NAR will yield system-wide benefits that extend far beyond O'Hare, implementation of NAR is critical to effecting the terminal/enroute system enhancements necessary to support the OMP proposal.

From an air traffic control "system" perspective, we must examine implications related to both equipment (system infrastructure) and personnel. In regard to equipment (infrastructure), enhancements to Chicago's terminal/enroute airspace defined separately under the NAR initiative (referenced above) must occur. Additionally, two specific phases of the OMP proposal will necessitate additional infrastructure enhancements. These two phases that generate infrastructure requirements solely driven by OMP are the construction/commissioning of proposed Runways 9L-27R (OMP Phase 1A) and 10R/28L (OMP Phase 2C). Some of the infrastructure requirements generated by 9L/27R and 10R/28L are included in the comments below (such as the proposed north and south satellite Airport Traffic Control Towers), while others (not referenced below) are currently undergoing internal FAA evaluation/validation, including determination of the appropriate funding source.

An equally important consideration, as referenced above, is the impact the OMP proposal would have on FAA air traffic control personnel requirements, which would need to be appropriately addressed to assure FAA's ability to manage projected system capacity increases. Experience has shown us that these requirements must be addressed at a very early stage of project planning, given the extensive training needed to support Chicago's complex air traffic control environment. Although personnel considerations are not outlined in the comments below, it is important to understand and acknowledge their interrelationship with the system enhancements that are addressed below. Internal steps are currently being taken within FAA to assess the personnel implications of the OMP proposal and to pursue all necessary actions concerning this issue.

Also of relevance to the comments below is a request made to the City of Chicago by FAA (via letter dated May 2, 2003) to formally undertake "proof of concept" simulation modeling of a proposed alternative Runway 12/30, to be located south of proposed 10C/28C. FAA believes that there may be some operational efficiency gains that could be realized by this alternative runway (with a clearer determination to result from the "proof of concept" work). Consequently, depending on the outcome of this work, some of the issues highlighted in the comments below could be mitigated by the 12/30

proposal. As analysis of the Runway 12/30 proposal is ongoing at this time, no comments related to Runway 12/30 are included in this document.

The comments are arranged in the following order:

- Comments on the Draft Project Definition Report (comments A-1 thru A-31).
- Comments on the Draft Airside Simulation Analysis (comments B-1 thru B-95)

**Project Definition Report, General Comments**

**A-1.** 3.2.1 Text indicates that the plan "...allows for quad approaches during VMC" In actuality, quad approaches capability is only available when visual approach minima are met. The weather must be at least a ceiling of 5500' and visibility of 10 miles. Below these weather minima, triple approaches will be available. Table 1. Indicates that the weather minimums for Runway 4L will be 200 feet and 1/2 mile. These are precision approach minima, and there is no indication that a glide slope is intended for this runway. See comment B-9, B-47.

**A-2.** 3.2.2, Exhibit 9. Taxiway "H" is depicted as an NLA (new large aircraft) taxi route. The taxiway is 400 feet from the runway in the area depicted. This does not meet the runway/taxiway design separation criteria for ADG VI.

**A-3.** 3.2.3, Exhibit 11. The east and west arrival shelves are not correctly depicted.

**A-4.** 3.2.3, Exhibit 12. '"JOT" jet arrivals should be at 11,000 feet. The east and west departure fixes are not correctly aligned. Altitudes for east and west departures should be 15,000 feet.

**A-5.** 3.2.3, Exhibit 13. "BEARZ" jet arrivals should be at 11,000 feet. The east and west departure fixes are not properly aligned. The altitudes for east and west departures should be 15,000 feet.

**A-6.** 3.2.3, Exhibit 14. "JOT" jet arrivals should be at 11,000 feet. The east and west departure fixes are not properly aligned. The altitudes for east and west departures should be 15,000 feet.

**A-7.** 3.2.3, Exhibit 15. "BEARZ" jet arrivals should be at 11,000 feet. The east and west departure fixes are not properly aligned. The altitudes for east and west departures should be 15,000 feet.

**A-8.** 4.3. Depending on traffic level and the phasing of the construction project, the addition of the west terminal ramp may cause as many as 1000 runway crossings per day while Runway 14R is still in operation. Effective project phasing may mitigate much of this issue.

**A-9.** Runways 9L-27R (400'-500'), 10R-28L (400'), 9R-27L (365'-400'), and 10L-28R (400'-500'): For ILS Category II and III operations, runway to taxiway centerline

separation of 500 feet is required for aircraft design group V and 600 feet is required for design group VI. Constructing any portion of the taxiway less than 500 feet will restrict design group V aircraft and/or require the minimums to be raised. See comment A-13, A-22. (See Review of Draft Airport Layout Plan Letter dated May 21, 2003, comment A-48.)

**Phase 1A- Runway 9L-27R**

**A-10.** 3.1.1. Designating this runway as "primarily arrival" is inadvisable. While this may be true under simulations completed for the end state airfield, there are various intermediate phases and wind conditions that dictate this runway be used as a departure runway. Text indicating sole or primary use should be eliminated. See comment B-16.

**A-11.** 9.1.1, 1A-6. At the present time existing structures obstruct the view of what will be the new Runway 9L/27R north of existing Runway 14L/32R. Approximately one third of what will be the new runway is not visible from the current control tower. In order to meet requirements to see this runway, a north auxiliary control tower will need to be constructed. This auxiliary tower must be completed and all associated equipment must be operational two months prior to the commissioning of the proposed north runway 9L/27R. The equipment and personnel issues are being worked through internal FAA channels. See comment A-31.

**Phase 1B- Runway10L-28R Extension**

**A-12.** 3. Indicates that all runways will be designed to at least FAA ADG V standards. Runway 10L will have some form of restriction for Group V aircraft during CAT II/III weather, due to the proximity of parallel taxiway "M". At this time, the extent of the restriction is unknown. The curve in Taxiway "M" to allow for construction of a snow road was originally proposed to permit access to the airfield without crossing runways. In other airport areas, hold pads will be utilized to accommodate snow removal equipment and should also be the case for this phase. There are various hold pads available on the south side of the airport that can be accessed without crossing runways such that a snow road would not force restrictions to aircraft movements during CAT II/III weather. The parallel taxiway to future runway 10L separation should change to allow unrestricted FAA ADG V operations in CAT II/III weather. See comment A-9, A-22.

**A-13.** 3.1.2, fourth paragraph references Landing Distance Available (LDA). If LDA is deemed an acceptable method of conducting future operations, the LDA for Runway 10L should be shortened to permit unrestricted use of Taxiway "Q". Airline users have requested that the overall length of this runway needs to be maintained at 13,000 feet, and utilizing an LDA for this runway would preclude that. Can Runway 10R/28L be extended so as not to impact the Runway 22L operation? A greater number of aircraft/users would be able to depart on a longer runway, which would provide a more balanced operation. (See Review of Draft Airport Layout Plan Letter dated May 21, 2003, comment A-42.)

**A-14.** 9.1.2. New LAHSO points will need to be established at each end of Runway 10L-28R. This will be worked through the ORD LAHSO development team.

**A-15.** 9.1.2. "Taxi Into Position and Hold" (TIPH) waivers will be required for intersection departures between sunset and sunrise on Runway 10L-28R. These waivers would be identical to existing waivers at ORD ATCT, as well as numerous other airports across the country. We will require that these waivers be extended to include periods of time when aircraft are not visible from the tower, such as during CAT II/III weather conditions. These waivers will be requested through normal FAA Air Traffic channels.

**A-16.** 9.1.2. A departure waiver will be required to allow aircraft on parallel runways to depart on runway heading, turning within 5 miles. This is similar to the waiver at Dallas/Fort Worth except that it would apply to runways separated by 5500 feet rather than 6200 feet. This waiver will be requested through normal FAA Air Traffic channels. See comment A-30.

**Phase 1C- Runway 10C-28C**

**A-17.** 3.1.2, Page 8, Runway 10C/28C (Relocated Runway 18/36), first paragraph, states that this runway will be primarily used for departures during VMC conditions, and landings during IMC conditions. These terms need to be changed or clarified. When determining traffic flows for configurations using this runway, four general configurations have been established; IFR East, IFR West, VFR East, and VFR West. These configurations presuppose that when Land and Hold Short Operations (LAHSO) is not available, we would be considered to be in one of the IFR configurations. This includes times of snow, rain, wet runways, etc., even though the airport is in VMC conditions. For example, if 10L was wet, and the airport was in VMC conditions, AT would utilize the IFR East configuration, due to the inability to utilize LAHSO. Runway10L would be used for departures in VMC conditions in this scenario.

**A-18.** This same paragraph states that Runway 10C/28C will be 10,600 feet long. Is this the case, or will there be a LDA for Runway10C? (See Review of Draft Airport Layout Plan Letter dated May 21, 2003, comment A-42.)

**A-19.** 3.1.2, page 8, second and third paragraphs state that some buildings in the Southwest Cargo area penetrate Part 77, but not TERPS. There is no clear indication of which surface will be protected. Do the buildings need to be moved or not? If not, is this runway useable in all conditions? (See Review of Draft Airport Layout Plan Letter dated May 21, 2003, comment D-3.)

**A-20.** 3.1.2, page 8, Runway 10C/28C (Relocated Runway 18/36), first paragraph. Will upgrading Taxiway "S" to Group VI affect the distance from the Runway10C localizer ?

**A-21.** 3.1.2, page 7, fourth paragraph erroneously indicates that Taxiway "Q" is an exit from Runway 22R. It is actually an exit from Runway 4R/22L.

**Phase 2- World Gateway**

**A-22.** 3.1.2, third paragraph indicates that a World Gateway approved taxiway change will be included as a component of this project. The curve in Taxiway M to allow for construction of a snow road was originally proposed to permit access to the airfield without crossing runways. In other airport areas, hold pads will be utilized to accommodate snow removal equipment; this should also be the case for this phase. There are various hold pads available on the south side of the airport that can be accessed without crossing runways such that a snow road would not force restrictions to aircraft movements during CAT II/III weather. The parallel taxiway to future runway 10L must change to 500' separation to allow unrestricted FAA ADG V operations in CAT II/III weather. See comment A-12.

**Phase 2A- Runway 9R-27L Extension**

**A-23.** New LAHSO points will need to be established at each end of Runway 9R-27L. This will be worked through the ORD LAHSO development team.

**A-24.** "Taxi Into Position and Hold" (TIPH) waivers will be required for intersection departures between sunset and sunrise on Runway 9R-27L. These waivers would be identical to existing waivers at ORD ATCT, as well as numerous other airports across the country. We will require that these waivers be extended to include periods of time when aircraft are not visible from the tower, such as during CAT II/III weather conditions. These waivers will be requested through normal FAA Air Traffic channels.

**Phase 2B- Runway 9C-27C**

**A-25.** 3.1.1, Page 6, section on Runway 9C/27C (Relocated Runway 14L/32R), third paragraph, states that the limits of the OFA extension include auto parking areas and the ATS station. Does this create a problem with the runway? Does this create a problem with use of the runway during CAT II/III conditions? (See Review of Draft Airport Layout Plan Letter dated May 21, 2003, comment B-96.)

**A-26.** 3.1.1, Page 6, same section as above, fourth paragraph states that it is not anticipated that concentrations of persons at the ATS station would reach levels of assembly as identified in AC 150/5300-13, and would not have to be protected. Is this true? (See Review of Draft Airport Layout Plan Letter dated May 21, 2003, comment B-96.)

**A-27.** 3.1.1, page 7, second paragraph, there is still an outstanding issue regarding Taxiway "H" and ramp restrictions during CAT II/III approaches to new Runway 27L (current runway 9L-27R). These issues continue to be worked in separate sessions by the City in cooperation with relevant FAA Lines of Business. (See Review of Draft Airport Layout Plan Letter dated May 21, 2003, comment A-48.)

**A-28.** 9.2.3. New LAHSO points will need to be established at each end of Runway 9C-27C. This will be worked through the ORD LAHSO development team.

**A-29.** 9.2.3. "Taxi Into Position and Hold" (TIPH) waivers will be required for intersection departures between sunset and sunrise on Runway 9C-27C. These waivers would be identical to existing waivers at ORD ATCT, as well as numerous other airports across the country. We will require that these waivers be extended to include periods of time when aircraft are not visible from the tower, such as during CAT II/III weather conditions. These waivers will be requested through normal FAA Air Traffic channels.

**Phase 2C- Runway 10R-28L**

**A-30.** 3.2.1. The plan as presented does not provide for balanced arrival and departure capacities during all weather conditions. There remains no acceptable method for moving aircraft from the terminal area to Runway 10R for departure. Access to 10R during weather conditions below 800/2 is limited by the Glide Slope Critical area of Runway 10C, and the Localizer Critical Area of Runway 10C. The necessity of protecting these two areas precludes a workable taxi route in the plan as submitted. This issue is the subject of ongoing work with the City and the Air Traffic team(s). Subsequent refinements may mitigate or alleviate these issues. These refinements also would raise issues requiring a waiver from FAAO7110.65 to accommodate 3 parallel arrival and 3 parallel departure runways. See comment A-16.

**A-31.** 9.2.4, 2C-5. Approximately one third of what will be the new runway is not visible from the current control tower. In order to meet requirements to see this runway, a south auxiliary control tower will need to be constructed. This auxiliary tower must be open and all associated equipment must be operational two months prior to the commissioning of the proposed south runway 10R-28L. The equipment and personnel issues are being worked through internal FAA channels. See comment A-11.

**Airside Simulation Analysis**

**B-1.** Introduction, page I-1, 4th paragraph. Indicates that there are six existing runway configurations. Text should indicate that only six configurations were studied; there are actually more available, but the ones studied are the most often used configurations.

**B-2.** Introduction, page I-2, 2nd full paragraph. Plan B modified is no longer a preferred configuration due to LAHSO restrictions. Recent changes to LAHSO procedures have rendered this configuration less viable than previously anticipated. Non-participating aircraft are no longer authorized to operate on the full-length runway while another aircraft is utilizing the hold-short runway. While efforts are underway to mitigate some of the issues with this configuration, Plan B modified is not a preferred configuration

**B-3.** Introduction, page I-3, 3rd paragraph. Indicates that all runways except 9C and 10C are designed to ADG V standards. While under most weather conditions this may be operationally correct, during CAT II/III weather, all other runways will have an aircraft size constraint for unrestricted operations. See comment A-9.

**B-4.** Introduction, page I-3, 5th paragraph. Air Traffic team member names must be removed.

**B-5.** II, Data Collection and Model Inputs. TRACON staff provided verification of inputs and assumptions for baseline only.

**B-6.** 2.1.2, page II-5, Table II-4. Data suggests that 2002 traffic is projected only. Actual numbers are available, and text should change to reflect current data.

**B-7.** 2.1.3, and Tables II-1 and II-2. Tables should be updated to reflect current data.

B-8. 2.1.4, page II-8, 3rd paragraph. "GA activity is expected to decrease..." Request a re-evaluation and clarification of GA traffic numbers.

**B-9.** 2.3, page II-15, 2nd paragraph. Indicates that VFR and IFR operating configurations are determined solely by ceilings and visibility. In fact, the operating configurations are also determined by runway contamination (rain, snow, etc.); even when the weather is VMC an IFR operating configuration may be in use. Runway crossings at the approach ends would be required under this scenario, as LAHSO procedures would not be available and increased arrival spacing would be required. The ability to utilize quadruple approaches is limited to ceiling and visibility minima of at least ceiling 5500' and visibility 10 miles, as outlined in Table 2, page 16 of the Project Definition Report. Below these minima only triple approaches are achievable. Table II-10 (and possibly others) may need to be changed to reflect this information. See comment A-1, B-47.

**B-10.** 2.3, page II-16, 4th paragraph. "...assumptions attained from ATCT on their preferred usage of these configurations..." text should be changed to " weather data and operating assumptions ".

**B-11.** 2.3, page II-16, table II-8. Plan B Modified is no longer a preferred configuration. See comment B-2.

**B-12.** 2.5, page II-18, 1st paragraph. "....heavier aircraft result..." should be changed to "produce", "... during any operation..." should be "...phase of flight...".

**B-13.** 2.5, page II-18, 2nd paragraph. "...wait up to 2 minutes..."; 2 minutes wake turbulence delay is only applicable to departures.

**B-14.** 2.5, pg. II-19, first line. Text should be changed to "...separation requirements are met at touchdown...".

**B-15.** III. Model Calibration and Validation, 4th paragraph. Modeling results are ongoing, as several current operating configurations have not been modeled successfully.

**B-16.** 4.1.1.1. Text indicates that this will operate primarily as an arrival runway. While this may be true under simulations completed for the end state airfield, there are various intermediate phases and wind conditions that dictate this runway be used as a departure runway. Text indicating sole or primary use should be eliminated. See comment A-10.

**B-17.** 4.1.1.1, 2nd paragraph. Flight Standards is conducting a collision risk model analysis of the impact to operations of the runway/taxiway separation. See comment A-9, A-12, A-22.

**B-18.** 4.1.1.1, 2nd paragraph. Text is inconsistent with Table II-12. In CATII/III conditions, arrivals would have to be spaced at a greater interval to accommodate ADG V operations. Aircraft would have to clear the runway on arrival and proceed to a point at least 500' from the runway centerline. Table text needs to reflect these larger arrival intervals.

**B-19.** 4.1.1.2. A LAHSO hold short point will have to be established. Solely lengthening Rwy 14L does not ensure that LAHSO will be available. Current LAHSO Order N110.118 requires that a Rejected Landing Procedure (RLP) be developed for this configuration, as the distance from the landing threshold of Rwy 22R to Rwy 14L is less than the required 3000' (distance is 2800'). The RLP would have to be developed and risk assessment modeling successfully completed to approve this configuration for LAHSO. To date, no successful RLP's have been developed. This issue will be worked through the ORD LAHSO development team.

**B-20.** 4.1.1.4. The issue of perimeter taxiways will have to be addressed by Flight Standards, reference the August 22, 2002 memo. Text needs to be added clarifying that this option was eliminated for further consideration based on the Flight Standards memo. Also attached for reference is the follow-up memo from Flight Standards clarifying issues raised by the August 22, 2002. memo.

**B-21.** 4.1.2.1, top of page. The taxiway separation was predicated on the necessity of a snow road, see comment A-12, A-21. The perimeter taxiway issue will have to be addressed by Flight Standards, see comment B-20.

**B-22.** 4.1.2.2 , 2nd paragraph. The perimeter taxiway issue will have to be addressed by Flight Standards, see comment B-20.

**B-23.** 4.3, page IV-6. Text indicates that the new runway ends would need to be located to satisfy clearance requirements for CAT II/III operations. When the runway ends are located thus, does this enforce limitations on the use of the parallel taxiways? Current issues have arisen indicating that the entire length of taxiway "H" would be restricted, as well as the portion of taxiway "M" between "M5" and "M7". Final determination is being sought from Flight Standards.

**B-24.** 4.3, page IV-8, 1st paragraph. Indicates that all other runways would meet ADG V standards. See comment B-3.

**B-25.** 4.3.1.2. "It is envisioned by ORD ATCT...", text should be changed to "It has been modeled/simulated with input from the ORD AT team...". Indicates that this will operate primarily as an arrival runway, see comment A-10, B-16.

**B-26.** 4.3.1.3, 4th paragraph. Text indicates that taxiway "H" would be restricted to aircraft of a certain size. See comment B-23.

**B-27.** 4.3.1.3, last paragraph. Indicates that this will operate primarily as an arrival runway. See comment A-10, B-16.

**B-28.** 4.3.2.1. Indicates that taxiway "M" is being moved to within 400' of the runway centerline to accommodate three taxiways between existing Rwy 27L and the international taxilane. Discussions indicate that this taxiway is being moved to accommodate a snow road located between the taxiways. Removal of the snow road would allow unrestricted movement of aircraft during CAT II/III weather. See comment A-12, A-22.

**B-29.** 4.3.2.2, 1st paragraph. Indicates that this runway will operate primarily as a departure runway. During recent simulations this runway has been utilized as an arrival runway. See comment A-10, B-16.

**B-30.** 5.1, 2nd paragraph. Text states "...enter the TRACON airspace with five miles in-trail separation at speeds of approximately 250 knots." Text should change to reflect that the spacing and speeds assigned are dynamically altered to maintain an efficient traffic flow, i.e. five-to-ten miles spacing at assigned speeds of 210 kts. to 300 kts.

**B-31.** 5.1, page V-4, 2nd full paragraph, last sentence. Propeller aircraft will be assigned 10,000' and handed off to SBN approach until clear of the High & Wide traffic. When clear, traffic will be handed off to ZAU for climb to requested altitude.

**B-32.** 5.1, page V4, 3rd full paragraph, last sentence. Jet traffic will climb to 15,000', not 23,000' as stated in the text.

**B-33.** 5.1, page V-4, 4th full paragraph. Jet traffic will climb to 15,000'. Propeller aircraft will climb to 10,000' until clear of the High & Wide traffic and then climb to requested altitude.

**B-34.** 5.1.1. Text indicates that this configuration will be used with winds ranging from 330 degrees to 130 degrees. The directions encompassed are correct, but a reference needs to be included referencing wind velocity. Winds exceeding a certain velocity (and therefore crosswind component) will preclude use of this configuration.

**B-35.** 5.1.1.2, 2nd paragraph, re: Exhibit V-5. Secondary departure routes not accurately depicted. Arrival traffic from MKE should be at 8000', regardless of type aircraft.

**B-36.** 5.1.2.1, re: exhibit V-7. Either the depiction of the arrival routings is not accurate, or the description is inaccurate. Tower enroute arrivals from MKE and SBN are not depicted.

**B-37.** 5.1.1.2, 2nd paragraph. Remove "simultaneous" reference departures, as it is a dependent operation. 3rd sentence, Rwy 22R should be the third arrival runway, not Rwy 27R. End of paragraph, LAHSO procedures should be referenced in terms of "operational requirements" or all of the particulars should be spelled out. The 8000' restriction is not the only issue.

**B-38.** 5.1.1.2, 3rd paragraph. "KRENA" offload should be "22R" rather than "27R".

**B-39.** 5.1.2.2, Exhibit V-7. "EON", "RBS" and "GUIDO" departures seem to depict a Rwy 32 departure rather than Rwy 22L.

**B-40.** 5.1.3.1, Exhibit V-9. Tower enroute arrivals from MKE and SBN are not depicted.

**B-41.** 5.1.4. Plan B Modified is no longer a preferred configuration due to LAHSO constraints. See comment B-2.

**B-42.** 5.1.5. Explain the use of 4.1% usage for simulation rather than 5% historic.

**B-43.** 5.1.5.1, Exhibit V-13. Tower enroute arrivals from MKE and SBN are not depicted.

**B-44.** 5.1.5.3. Exhibit V-14 indicates that taxiway "H" can be used between taxiway "C" and "P" to queue departures for Rwy 32R. In weather conditions where existing Rwy 27R is not visible from the tower, use of this taxiway for taxiing aircraft is precluded.

**B-45.** 5.1.6. Explain the use of 5.2% usage for simulation rather than 4.6% historic.

**B-46.** 5.1.6.1, Exhibit V-15. Tower enroute arrivals from MKE and SBN are not depicted.

**B-47.** 5.2. Text states "With the provision of three or four parallel approaches in an east-west configuration..."; this refers to an operational concept developed to accommodate triple and quadruple arrival runways. This concept is called "High & Wide", and is depicted on Exhibits V-18, V-20, V-22, V-24, V-26, V-28, V-30, V-32, V-34, and V-36, and would be utilized from all four cornerposts depending on the configuration. Arrival traffic from the near fix(es) on a given configuration would be routed to the inboard runway(s); keeping aircraft "higher" and "wider" than the traffic to the outer arrival runways. Quadruple approaches would only be available with weather minima of at least ceiling 5500' and visibility of 10 miles. An additional procedure currently in use to a limited extent called CAP's (Compressed Arrival Procedures), is envisioned to continue and possibly be utilized more extensively when operationally advantageous. These concepts have been discussed during the ongoing coordination efforts between the City and the Air Traffic Team(s). Text changes need to be made to incorporate this information. See comment A-1, B-9.

**B-48.** 5.2, Page V-28, 1st paragraph. Text states "... five miles in-trail at speeds of...". Text should be changed to reflect the dynamic nature of the spacing and speeds. See comment B-30.

**B-49.** 5.2, Page V-28, 2nd paragraph, last two sentences. Text should read jet traffic over PAYTN intersection at 10,000' MSL and prop traffic at 8,000' regardless of the arrival flow.

**B-50.** 5.2, Page V-28, 4th paragraph 2nd sentence. BEARZ jet arrivals will cross BEARZ at 11,000', descending to 9,000'. Turboprop will cross BEARZ at 8,000'. These changes are a result of ongoing coordination efforts between the City and the Air Traffic team(s).

**B-51.** 5.2, page V-28, 7th paragraph. Text indicates that the arrival fix has changed from "KRENA" to "TEDDY" on all configurations; this is not the case. When on an east flow, arrival traffic arrives over "KRENA" direct the airport or over "TEDDY" and then heading

180 degrees. When on a west flow, all arrivals remain over "KRENA". See comment B-77, B-82.

**B-53.** 5.2, page V-28, last paragraph. Text incorrectly indicates that High & Wide will be used with traffic from the northwest fix. This is being modeled for future consideration but is not proposed by Air Traffic at this time. Arrival traffic from the southwest will be the primary fix from which High & Wide will be run on this configuration.

**B-54.** 5.2. Page V-28, last paragraph, last sentence. Should be "...40 to 50 miles west of airport."

**B-55.** 5.2, page V-29, 2nd paragraph. Here and reference exhibit V-17, the naming and depiction of the eastbound routes (ORDEA, ORDEB, ORDEC, ORDED ) are in the process of being re-evaluated. Usage of departure tracks will be determined at the outcome of modeling conducted by the AT team(s). The FAA has been coordinating with the City on the modeling expectations. Jet departures would climb to 15,000', not 13,000'.

**B-56.** 5.2, Exhibit V-17. Area C should be shown as 15,000' and below.

**B-57.** 5.2, page V-29, 3rd paragraph. Jet departure traffic will climb to 15,000'.

**B-58.** 5.2, page V-29, 4th paragraph. Jet departure traffic will climb to 15,000'.

**B-59.** 5.2, page V-29, 5th paragraph. Jet departure traffic will climb to 15,000'.

**B-60.** 5.3.1.2, and Exhibit V-18. See comment B-55.

**B-61.** 5.3.2, Exhibit V-20. See comment B-55.

**B-62.** 5.4, 2nd paragraph. "issueseveral" needs clarification. 2nd bullet, Subsequent direction has been received from Flight Standards (attached) regarding aircraft operations across the extended centerlines of runways that coincides with current operational requirements.

**B-63.** 5.4.1.2. Here and Exhibit V-22, see comment B-55.

**B-64.** 5.4.2.1, 2nd paragraph. Text states "...maintain an altitude of 7,000 feet MSL or above...", should be "...maintain an altitude of 7,000 feet MSL"

**B-65.** 5.4.2.1. See comment B-55.

**B-66.** 5.4.3.1, 2nd paragraph. Text states "...maintain an altitude of 7,000 feet MSL or above..." should be "...an altitude of 7,000 feet MSL".

**B-67.** 5.4.3.2. Here and Exhibit V-26, see comment B-55. Page V-45, top of page. See comment B-55.

**B-68.** 5.4.4.1, 2nd paragraph. Text states "...maintain an altitude of 7,000 feet MSL or above..." should be "...maintain an altitude of 7,000 feet MSL."

**B-69.** 5.4.4.2. See comment B-55.

**B-70.** 5.5, first paragraph. Text states "...up to four simultaneous arrival streams..." text should be clarified to explain that four arrival streams (quads) are only achievable with weather minima of at least ceiling 5500' and visibility of 10 miles. "Simultaneous" departure streams implies that they are independent, which they are not entirely. Text should be changed. See comment A-1, B-9, B-47.

**B-71.** 5.5, 4th paragraph. Refers to annualized figures for percentage of use of configuration. These numbers have been revised based on new wind criteria and text should be changed to reflect this.

**B-72.** 5.5.1, Exhibit V-30. The southwest arrival area should be referred to as "PLANO", not "JOT." East and west jet departures will climb to 15,000 feet. "PLANO" jet arrivals will be at 11,000' descending to 9,000', propeller aircraft will be at 8,000'. An additional "High & Wide" arrival route from "JVL"(northwest) over "SIMMN" is being studied during coordination between the City and the Air Traffic team(s).

**B-73.** 5.5.1.1, page V-51, 2nd full paragraph. Text states "...maintain an altitude of 7,000 feet MSL or above..." should be "...maintain an altitude of 7,000 feet MSL."

**B-74.** 5.5.1.2, and Exhibit V-30. See comment B-55.

**B-75.** 5.5.1.2, 1st paragraph. Runway 4L departures are referenced. Complexity and workload issues have made the use of Rwy 4L on this configuration undesirable. Subsequent simulations conducted by the City have removed this runway and substituted Rwy 10R as a departure runway in this configuration. See Attachment 1.

**B-76.** 5.5.1.3, Exhibit V-31. Exhibit V-31 should be replaced with Attachment 1.

**B-77.** 5.5.2, Exhibit V-32. East and west jet departures will climb to 15,000'. The southwest arrival area should be "PLANO" not "JOT." The northwest arrival area should be "KRENA" not "TEDDY" for this flow. "BEARZ" arrivals will be on the ORD 139 degree radial with jets at 11,000' descending to 9,000' and props at 8,000'. This has been discussed during the ongoing coordination efforts between the City and the Air Traffic Team(s). See comment B-51, B-82.

**B-78.** 5.5.2.1, 1st paragraph, 4th sentence. High & Wide references need to be clarified. Southeast "High & Wide" arrivals will only be assigned runway 28R. This has been discussed during the ongoing coordination efforts between the City and the Air Traffic Team(s).

**B-79.** 5.5.2.1, 2nd paragraph. Text states "...maintain an altitude of 7,000 feet MSL or above..." should be "...maintain an altitude of 7,000 feet MSL."

**B-80.** 5.5.2.2. See comment B-50. Departure runways are not correctly depicted. They are correctly depicted in Attachment 2.

**B-81.** 5.5.2.3. Exhibit V-33 should be replaced with Attachment 2.

**B-82.** 5.5.3, Exhibit V-34. East and west jet departures will climb to 15,000'. The southwest arrival area should be "PLANO" not "JOT". "PLANO" jet arrivals will be at 11,000' descending to 9,000', propeller aircraft will be at 8,000'. An additional "High & Wide" arrival route from "JVL" (northwest) over "SIMMN" is being studied by the City and the Air Traffic team(s). This has been discussed during coordination between the City and the Air Traffic team(s). The northwest arrival area should show "TEDDY" then heading 180 degrees. See comment B-51, B-77.

**B-83.** 5.5.3.1, 1st paragraph, last sentence. Arrivals from the southwest would normally be assigned to Rwy 9C via the "High & Wide" procedure. Rwy 9C arrivals will be turned on to final at 6,000'. This has been discussed during the ongoing coordination efforts between the City and the Air Traffic Team(s).

**B-84.** 5.5.3.2. See comment B-55.

**B-85.** 5.5.3.3. Exhibit V-35 indicates Rwy 22L as a primary taxi route for Rwy 10R departures. The users and the Office of Runway Safety have voiced concerns about the use of runways as a primary taxi route. To mitigate this, Air Traffic has developed an alternate route, as depicted on Attachment 3. Exhibit V-35 should be replaced with Attachment 3.

**B-86.** 5.5.4. Exhibit number referenced is wrong, should be "V- 36". "BEARZ" jets will be 11,000' descending to 9,000'; props will be at 8,000'. East and west jet departures will climb to 15,000'. The southwest arrival area should be "PLANO" not "JOT". The northwest arrival area should be "KRENA" not "TEDDY" for this flow. This has been discussed during coordination between the City and the Air Traffic team(s). See comment B-51, B-77, B-82.

**B-87.** 5.5.4.1. "High & Wide" references need to be clarified see comment B-47. "High & Wide" arrivals will only be assigned to Rwy 27C. Rwy 27C arrivals will be turned onto final at 6,000', Rwy 28C arrivals will be at 5,000'.

**B-88.** 5.5.4.2. See comment B-55.

**B-89.** 5.5.4.3. Exhibit number referenced is wrong, should be "V-37". Exhibit V-37 should be replaced with Attachment 4.

**B-90.** 6.1, 4th paragraph, last line. Statement reference airspace changes is inaccurate. National Airspace Redesign (NAR) is specifically designed to increase the efficiency of current airspace and maximize the benefits of airport improvements as outlined in the NAR Integrated Design Plan (IDP). Page VI-2, first sentence, as above. OMP airspace and procedural environment are dependent on NAR design initiatives.

**B-91.** 6.1.2, page VI-3. Flight Standards has determined that current operational procedures adequately protect the required surfaces, but have not specifically investigated the issue of perimeter taxiways at ORD. Based on FAA guidance and other potential operational impacts, the City of Chicago DOA has chosen not to pursue perimeter taxiway alternative as the airfield plan. See comment B-20.

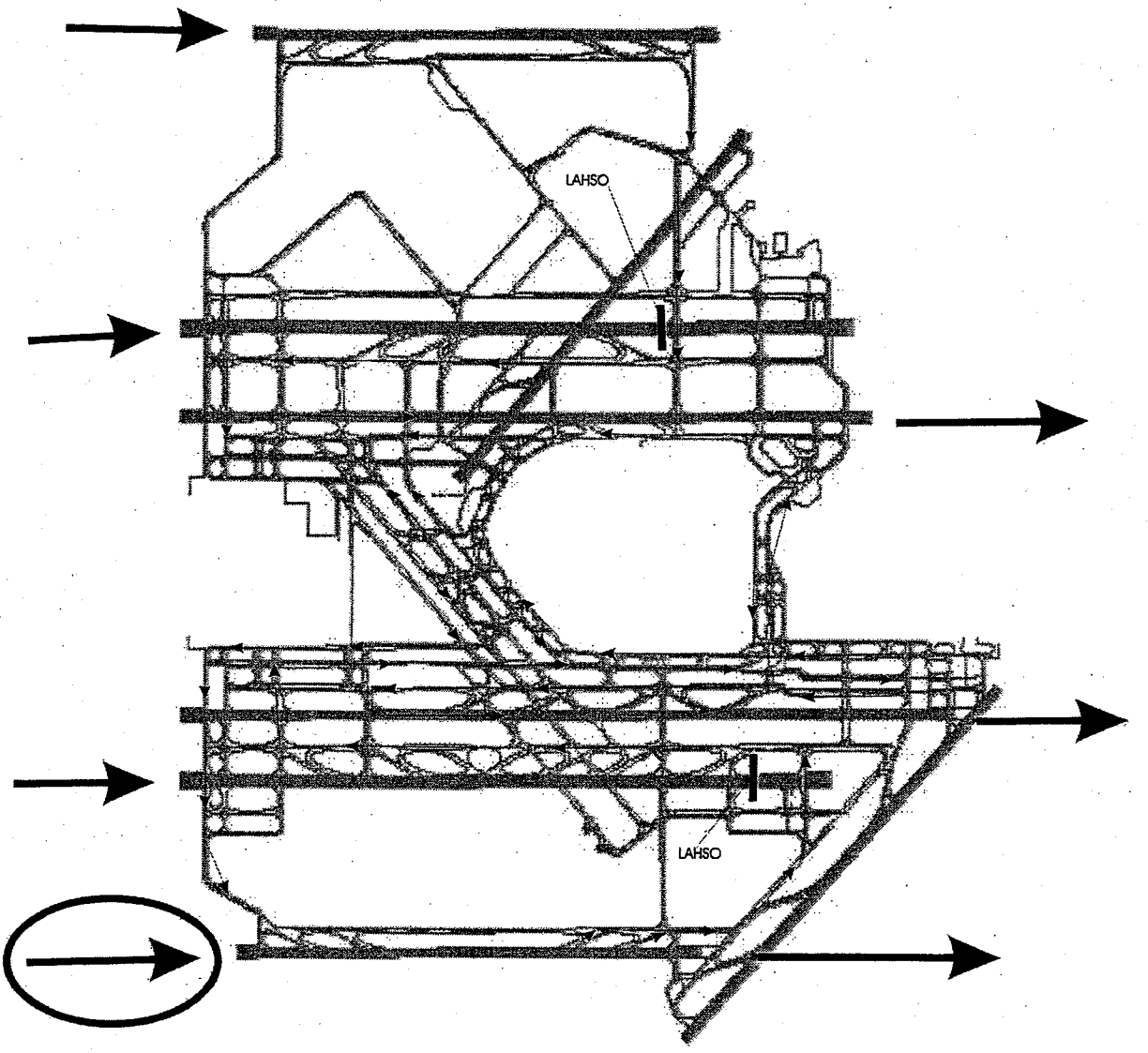
**B-92.** 6.1.3, 1st paragraph. Text states "...balanced departure and arrival capacity under all weather conditions...", but requirements to protect critical surfaces prevent this

under the IFR east configuration. An operationally "balanced" airfield is not presented, with 3 arrival and 3 departure runways when utilizing the IFR east configuration with the current taxiway structure. This issue is the subject of ongoing work with the City and the Air Traffic team(s). Subsequent refinements may mitigate or alleviate these issues. Additionally, quadruple approaches would only be available with weather minima of at least ceiling 5500' and visibility of 10 miles. See comment A-1, B-9, B-47.

**B-93.** 6.1.3, 1st paragraph. Quadruple IFR approaches (Quad IFR) from either direction would have to be examined for operational feasibility, and the concurrent restrictions and equipment requirements determined. This has not been explored as an Air Traffic procedure at this time, although ATP-1 (Air Traffic Planning and Procedures) has committed to the required functionality being incorporated into Chicago TRACON radar monitoring equipment.

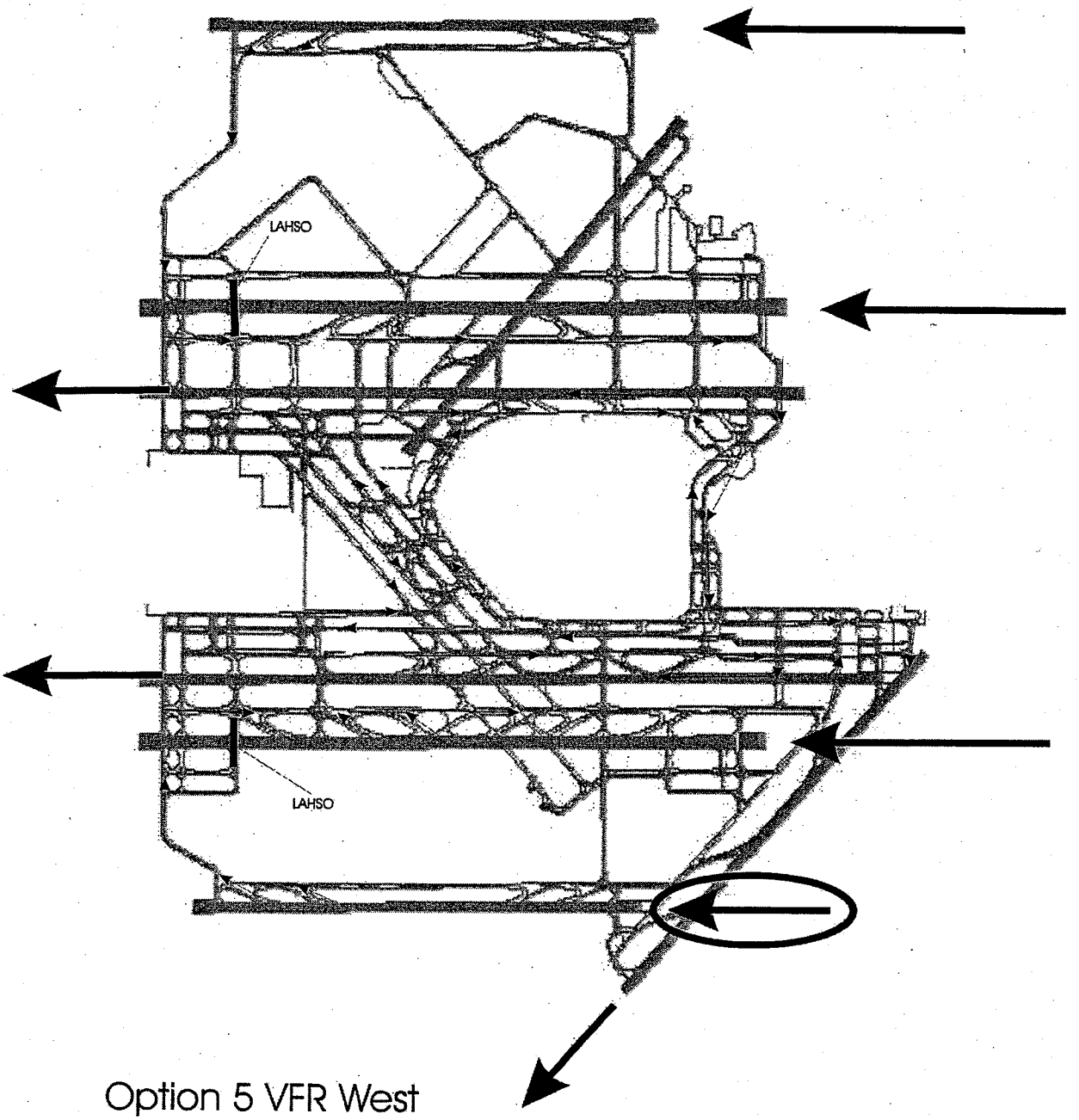
**B-94.** 6.1.3, 2nd paragraph. Text indicates "potential opportunities for improving..." the taxi route necessary to Rwy 10R during IFR weather, but the plan as submitted does not have the structure in place. The taxiway structure around the approach ends of Rwys 10L and 10C would need to be modified; as depicted the ALP does not permit achievable access to Rwy 10R for departures. This continues to be worked by the City in coordination with the Air Traffic team(s).

**B-95.** 6.2. Table VI-1 indicates that under Option 5, IFR East configuration, 117 arrivals and 125 departures are feasible. As submitted, these numbers are not achievable due to requirements for protect of surfaces. The taxiway structure modifications are being worked by the City in cooperation with the Air Traffic Team(s), but a re-evaluation of the arrival and departure numbers will be required with the new configuration.




Option 5 VFR East

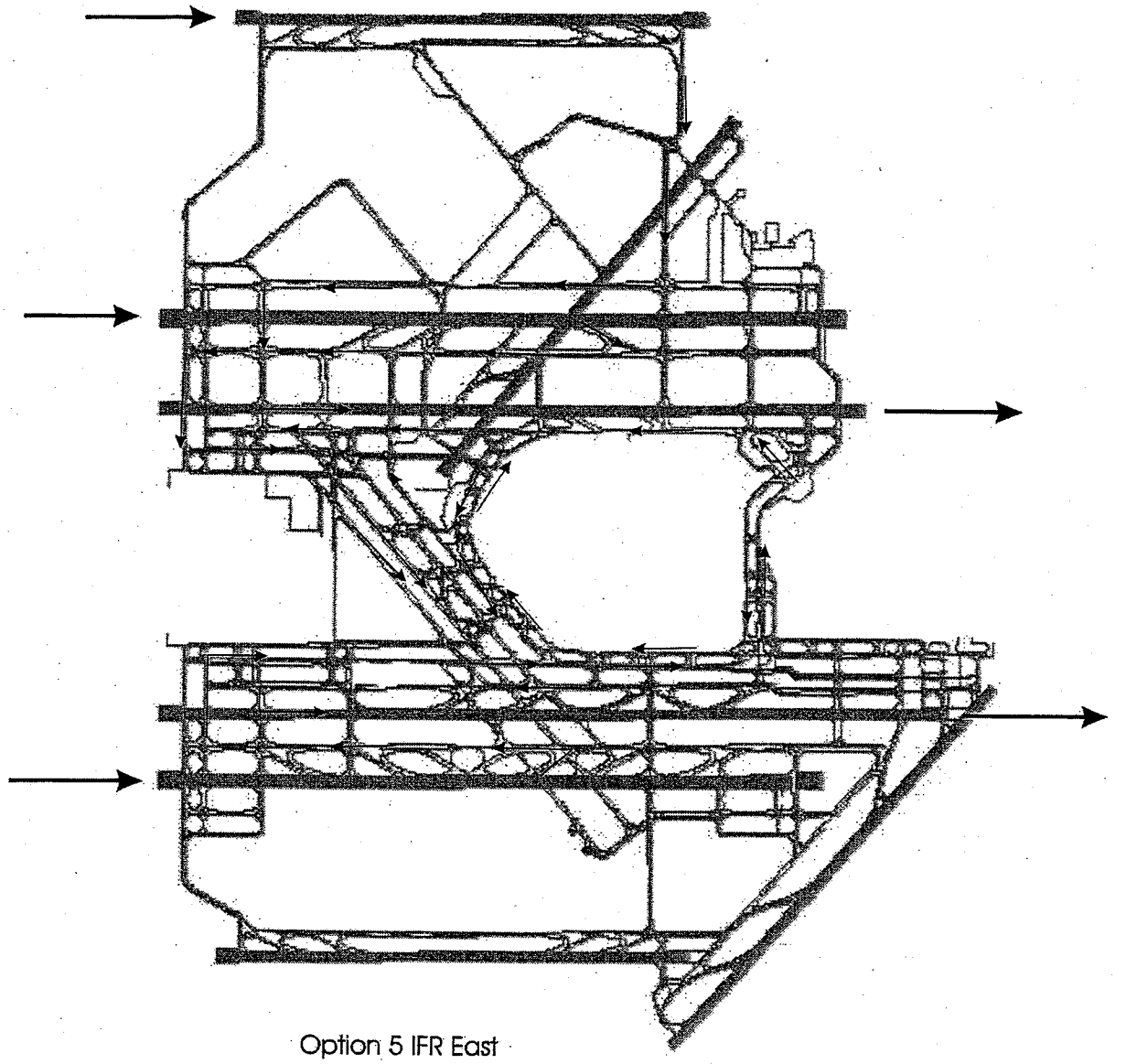
Attachment 1




Option 5 VFR West

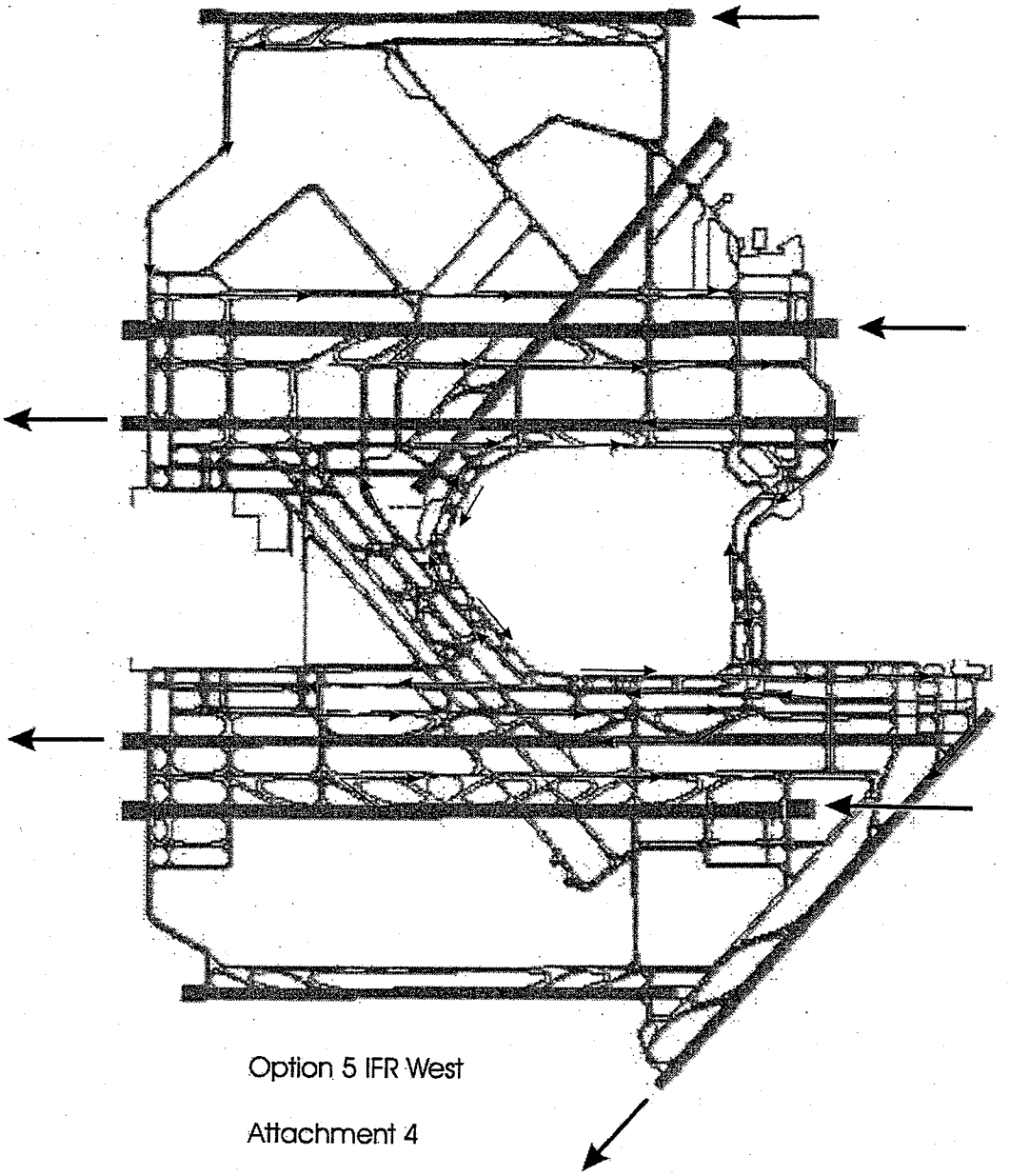
Attachment 2

Exhibit



Option 5 IFR East

Attachment 3



Option 5 IFR West

Attachment 4

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

# Memorandum

Subject: **INFORMATION**: Forwarding Assessment of the Proposed ORD Airport Layout Plan (ALP) dated December 2002

Date JUL 25 2003

From: Director, Flight Standards Service, AFS-1

Reply to
Attn. of:

To: Office of the Regional Administrator, AGL-1

We completed our assessment of the proposed ORD Airport Layout Plan (ALP), prepared by Ricondo & Associates, Inc, dated December 2002 (as shown on sheet 3 of 38), Air Traffic Operations, and concur with this proposal. The attached document outlines the technical considerations of this evaluation and explains the conditions of our concurrence with the ALP.

Any change in the planned airport construction or concept of operations supporting this ALP constitutes an AFS nonconcurrence and requires reevaluations of the new ALP before issuance of an AFS concurrence.

If you have questions regarding this evaluation report summary please contact Howard Swancy at (202) 267-7656.

for John M. Allen

James J. Ballough

# FEDERAL AVIATION ADMINISTRATION
# MEMORANDUM TO THE ADMINISTRATOR

**From:** John McGraw, Manager, AFS-400, 202-385-4589

**Prepared by:** Donald P. Pate, Manager, AFS-420, 405-954-4165

**Date:** Monday, June 2, 2003

**Re:** Review of O'Hare Modernization Program (OMP) and Air Traffic Operations Plan.

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## Overview:

Provide information briefing for Robert Sturgell, Deputy Administrator (ADA-1)

## Background:

In December 2002, the City of Chicago submitted to the FAA a draft Airport Layout Plan (ALP) that depicts the OMP proposal, featuring six east-west parallel runways and two parallel northeast-southwest runways. Following receipt of the ALP and associated narrative documentation from the City, FAA initiated an in-depth technical review of the ALP. This technical review, involving multiple FAA lines of Business, has proceeded throughout 2003 and is ongoing at this time.

Flight Standards' evaluation is based on information provided in the draft ALP and the proposed Air Traffic Operation Plan (ATCOP).

## Purpose/Goal:

**Purpose:** The draft ALP proposes a new terminal building on the west side of the airport. The ATCOP proposed limiting the use of runway 4 left to departures only and runway 22 right to arrivals only.

**Results:** Flight Standards concurs with this plan. This operation will not present any operational problems.

This runway was also evaluated for runway 4 left arrivals and runway 22 right arrival and departures.

Runway 4 Left Arrivals: It is presently unknown what group of aircraft the West Terminal will be supporting. For this evaluation Groups IV, V, and VI are used, from a U.S. Standard for Terminal Instrument Procedures (TERPS) standpoint only. If Group VI aircraft is parked at the West Terminal, it will present an 11 foot missed approach penetration of a Barometric vertical navigation procedure.

Runway 22 Right Departure: The location of the new terminal building was provided to AFS-420 from measurement off the ALP. The City has not determined what height the terminal building will be. AFS-420 used 50 feet for terminal height and evaluated Group IV, V, and VI parked at the gates. Tail heights uses are Group IV 55 feet, V 65 feet, and VI 80 feet. Results as follows:

TERMINAL: 40:1 penetration 13.00 feet
Group IV: 40:1 penetration 18.00 feet
Group V: 40:1 penetration 28.00 feet
Group VI: 40:1 penetration 43.00 feet

Runway 22 Right Arrival: The missed approach surface is not penetrated. The surface clears the terminal by 438 feet.

An evaluation was completed for Category II operation based on the runway/taxiway separation distances. TERPS evaluations where not performed. The Great Lakes region provided the runway/taxiway separation distance from the new ALP. The following runways will support unrestricted Category II operations by aircraft groups.

Group IV, V, VI: Runways 4R, 22L, 9C, 10C.
Group IV, V: Runways 9C, 10L, 10C, 28C, 28R, 27C
Group IV: Runways 9L, 9C, 10L, 10C, 10R, 28L, 28C, 28R, 27C, 27R

## Key Attendees/ Individuals of Interest

ADA-1/AFS-1/AFS-400