



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

September 26, 2005

Ms. Rosemarie Andolino
Executive Director, O'Hare Modernization Program
City of Chicago, Department of Aviation
8755 West Higgins Road
Chicago, Illinois 60631

Re: Chicago O'Hare International Airport
Airspace Case No. 2003-AGL-0878-NRA

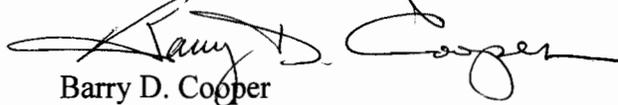
The Federal Aviation Administration (FAA) has completed a comprehensive review of the City of Chicago's proposed Airport Layout Plan (ALP) for Chicago O'Hare International Airport. This review was performed under Airspace Case No. 2003-AGL-0878-NRA. As part of our review process, we have distributed the materials to our Headquarters, Regional, and Field offices within the FAA as well as to the Transportation Security Administration office responsible for ORD. Each of these offices contributed to this review focusing on compliance with FAA Advisory Circulars, Regulations, Orders and Policy Guidance.

The FAA submitted two sets of comments (July 22, 2004 and February 14, 2005) to the City of Chicago on the October 2003 draft ALP. In both of those letters the FAA indicated the need to address various technical issues. Since February, the FAA has met with representatives of the City of Chicago and reviewed revisions to various sheets of the ALP specifically addressing the technical issues of the ALP document. Based on this review, we believe the technical issues have been satisfactorily addressed subject to the City's adherence to the attached conditions. We also have attached advisory comments for your consideration.

As you are aware, approval of the ALP by the FAA cannot occur until the FAA issues a favorable Record of Decision on the Environmental Impact Statement.

If you have any questions please do not hesitate to contact either Richard Kula at (847) 294-7507 or myself at (847) 294-7812.

Sincerely,

A handwritten signature in black ink, appearing to read "Barry D. Cooper". The signature is fluid and cursive, with a large initial "B" and "C".

Barry D. Cooper
Manager, Chicago Area Modernization Program Office

cc: Illinois Division of Aeronautics
FAA Air Traffic Division
FAA Airport Division
FAA Airway Facilities
FAA Logistics Division
FAA National Implementation Center
FAA Runway Safety Office
FAA Flight Procedures Office
FAA Flight Standards Division
FAA Security & Hazardous Materials Division
Transportation Security Administration

ATTACHMENT A

CONDITIONS OF ALP APPROVAL

CONDITIONAL AIRPORT LAYOUT PLAN REQUIREMENTS

- 1) The Airport Layout Plan (ALP) approval is not to be considered a commitment of Federal funding for the proposed development. The Federal Aviation Administration (FAA) concurs with the proposed development for planning purposes only based on current safety, utility, and efficiency standards. Federal funding is being considered in a separate and apart process through the FAA's review of the City of Chicago's Letter of Intent Application submitted to the FAA in February 2005.
- 2) Actual development should comply with approved standards applicable (for the justified critical design group aircraft) at the time of construction. Design standard modifications, listed below, are being evaluated by the FAA:
 - a. Future Runway 9L/27R Category (CAT) II Runway to Taxiway Separation
 - b. Future Runway 9R/27L CAT II Runway to Taxiway Separation
 - c. Future Runway 10L/28R CAT II Runway to Taxiway Separation
 - d. Taxiway A to Service Road Separation – Concourses C, E, F, G, H
 - e. Taxiways A and H to Service Road Separation – Concourses K, L, and B
 - f. Taxiway A to Taxiway B Separation
- 3) If any of the critical design aircraft (Boeing 747-400 for the existing and portions of the proposed airfield and the Airbus 380 for portions of the future airfield) of aircraft group changes, this ALP must be reevaluated by the FAA. The approval does not include the current Runway Safety Area for Runway 4R, Runway 22L, and Runway 4L. The disposition of these airport design standards will be addressed in a forthcoming Runway Safety Area determination that will take into account information and data from the Runway Safety Area (RSA) study and Airport Layout Plan review.
- 4) Our approval does not infer or imply that the land in the airport vicinity is considered compatible with airport operations. Federal requirements stipulate:
 - a. All development programs should be reasonably consistent with the plans of local and state planning agencies for the development in the airport vicinity.
 - b. That fair consideration has been given to the interest of communities in or near the airport.
 - c. That development programs provide for the protection and enhancement of the environment, with a FAA recommendation for acquisition (in fee or in easement) of the full Runway Protection Zone (RPZ).
- 5) The FAA offers no objections to the proposed ultimate airspace utilization as depicted on the ALP based on consideration of safe and efficient use of airspace.

The ALP has the status of "Plan on File" for the purpose of 14 Code of Federal Regulations (CFR) 77, Obstruction Evaluations, and 14 CFR 152, Airport Aid Program. A review of the airside landing area development was conducted according to the following 14 CFRs: -77, -152, -157, Notice of Construction, Alteration, Activation, and Deactivation of Airports (Aeronautical Study No. 2003-AGL-878-NRA). It should be noted that FAA cannot prevent the erection of any structure near an airport. Airport environs can only be protected through state and local zoning ordinances, building regulations, and like requirements.

- 6) To avoid conflicts with future development, we recommend you utilize the ALP when preparing leases. We further recommend you provide copies to the local and state planning zoning boards and county and city officials and encourage them to adopt compatible land use criteria in and around the airport. Copies should also be distributed to Fixed Base Operators (FBO) and airport users.
- 7) The Airport and Airway Improvement Act (49 USC 47107 (a) (16) (D)) requires the Sponsor to eliminate any adverse effects on Federal facilities, or bear all costs to relocate those facilities that are a result of an airport change. However, if Airport Improvement Program (AIP) eligible construction/development items adversely affect FAA facilities, then the cost of relocating the facilities may be eligible under AIP.
- 8) This approval does not include a detailed evaluation of actual construction. Prior to construction any development on the airport, notice (FAA Form 7460-1) consistent with 14 CFR 77 and 14 CFR 157 must be filed with this office. This approval does not include approval for temporary construction equipment that may be used during actual construction, e.g. cranes, equipment staging areas, site access routes, etc. A separate construction safety/phasing plan for any project should be submitted to the FAA for review no less than 60 days prior to beginning any project.
- 9) Airport development that will change the status or geometrics of runways, taxiways, aprons, or other operating surfaces, an updated ALP or notice (FAA Form 7460-1) must be filed with this office consistent with 14 CFR 77, dependent upon the project scope. A pen and ink change would have to be attached to the ALP drawing.
- 10) Excessive snow or any other change in grade in front of a Glide Slope (GS) facility could significantly change the glideslope (GS) signal. To facilitate snow removal, GS snow removal areas are required. FAA Order 6750.49A, Maintenance of Instrument Landing System (ILS) Facilities, requires that snow deeper than 18 inches be removed in front of a GS to prevent signal distortion, or, if the snow is not removed the approach minima will be raised to localizer (LOC) only minima for category "D" aircraft and CAT II/III service will be unavailable. To facilitate snow removal, the FAA and the sponsor have agreed to hard-surfaced snow removal areas, constructed in front of each GS facility. The snow

removal areas depicted on the proposed ALP meet the FAA criteria. Before construction, each snow removal area must be reviewed by the FAA.

- 11) Instrument Landing System (ILS) holding position markings (hold line) at GS critical area. It is necessary to prevent airplanes from entering a GS critical area as they taxi on a parallel taxiway that runs past the GS facility. To define the point at which the airplanes must hold short of the edge of the GS critical area, an ILS hold line is painted across the parallel taxiway. The point at which the ILS hold line is painted across the parallel taxiway is the intersection of the edge of the critical area with the inner edge of the taxiway. The inner edge of the taxiway is the edge closest to the runway that the GS serves. If the new GS are all 1,050 feet from runway threshold, the ILS holds lines will be between 820' and 850' from threshold. Present guidance on use of the ILS hold lines is as follows:
 - a) If weather conditions are less/worse than 800-2, airplanes must hold behind the ILS hold line.
 - b) If weather conditions are 800-2 or better, airplanes may taxi past the ILS hold line.
- 12) The proposed ALP identifies the best location for FAA Navigational Aids (NAVAID)s, given the information currently available. Prior to construction, all FAA National Airspace System (NAS) facilities will undergo extensive siting evaluation by the FAA and the sponsor. The FAA and the sponsor will use more specific and timely information to determine the optimal location, in accordance with applicable FAA Orders, Advisory Circulars (AC) and siting criteria. Specifically, the placement of the Very High Frequency (VHF) Omni-directional Range (VOR), Airport Surveillance Radar (ASR), Air Traffic Control Towers (ATCT)s, components of the ILS as well as surveillance, communication and weather system facilities, etc. will require additional engineering to determine their optimal placement. In addition, each construction activity shall be preceded by a Construction Safety Phasing Plan (CSPP) aeronautical study to be submitted by the Sponsor.
- 13) To accommodate the modifications proposed under the ALP, extensive duct work, infrastructure and fiber optics cable modifications are needed. Proactive, aggressive planning by the sponsor will be necessary to accommodate or support the infrastructure requirements within the periods and phases identified.
- 14) The VOR with Distance Measuring Equipment (DME) critical area has a radius of 1000'. The ASR critical area has a radius of 1500'. The Airport Surface Observing System (ASOS) critical area has a 500' radius. Prior to proposed construction, grade change, massing of vehicles or aircraft within a critical area the plan must be evaluated by the FAA in order to protect the integrity of the navigational aid equipment. The area within the critical area must not be modified without prior approval from the FAA. Approvals will be made when

possible, on a case-by-case basis. In addition, all activities within the ASOS critical Area require approval from the National Weather Service.

- 15) Underground diesel fuel storage tanks will be required at some locations. It is assumed that each of the Localizer (LOC)/Approach Light System with Sequenced Flashing Lights in ILS Category two configuration (ALSF-2) buildings will contain a diesel Engine Generator (EG). Each EG requires a minimum of a 1,000-gallon diesel fuel tank. Because the LOC buildings must be within the RPZ, the tanks must be placed underground. The underground tanks must meet all the applicable local, state, and federal environmental requirements.
- 16) The Precision Approach Path Indicator (PAPI) facilities are, by design, located close to runways and taxiways. It will be necessary to design the area in such a way to promote operability, serviceability and accessibility to the PAPI facilities. To facilitate protection of the PAPIs from grass cutting equipment, it will be necessary to place the PAPIs on an asphalt (or equivalent) pad that will provide a buffer from grass cutting equipment. In addition, service road access to the PAPIs from the connector taxiways will be essential. During snow operations, a plan must be developed by the Sponsor to protect the PAPIs from the discharge of snow removal equipment. The piling and banking of snow cannot be placed in such a way as to interfere with the line of sight for the PAPIs.
- 17) The PAPI pad, access road width and location in relation to the connector taxiways must be evaluated together by the FAA and the sponsor. The pad may be substantially wider and longer than the access road width in order to permit snow removal equipment to circumnavigate the visual aid. This could create the impression of a continued taxiway, potentially creating a hazard. Access roads shall not commence at a taxiway across from another taxiway, possibly creating the impression of a continuation of that taxiway. Each PAPI "Snow Pad" must be reviewed by the FAA, to ensure that all concerns area addressed.
- 18) Numerous existing NAS facilities on the airfield are required for the operation of the ASR-9 and Airport Surface Detection Equipment, Type Three (ASDE-3). These facilities are called Moving Target Indicator (MTI) reflectors and Fixed Target Reflectors (FTR). While the FAA does not require that these FAA NAS facilities appear on the ALP, the FAA is providing the most up to date coordinates for the facilities. Locations for the MTI and FTR reflectors are included in Attachment C. This information must be conveyed to the civil engineers and construction firms so they can understand what these facilities are and protect them.
- 19) The Sponsor must assume their portion of the responsibility for ensuring continuous operation of critical weather, communication, radar and navigational aid devices. All equipment required to support seamless, safe and efficient airport operation shall be protected from construction or airport modification until suitable replacement systems or operational plans are in place.

- 20) There are instances of non-standard FAA NAS facility configurations. Each non-standard configuration may have to be considered separately. Each non-standard configuration may require documented acknowledgement and justification on the part of the sponsor. Achieving the proposed ALP configuration would be contingent on the receipt of a National Change Proposal (NCP) waiver for each non-standard condition. An NCP waiver is not guaranteed.
- 21) In accordance with Advisory Circular (AC) 150/5300.7B, FAA Policy on Facility Relocations Occasioned by Airport Improvements or Changes, Paragraph 5, Accomplishment of Work, the FAA shall have exclusive right to determine how all facets of the relocation of an FAA facility will be accomplished. This includes, but is not limited to, engineering, site selection, and procurement of equipment, construction, installation, testing, flight inspection and re-commissioning of the facility.
- 22) The FAA, Technical Operations, System Management Office (SMO) is responsible for all existing FAA facilities. Work impacting FAA equipment because of the projects depicted in this ALP will require that the sponsor/contractor notify the FAA Air Traffic Organization (ATO), System Management Office (SMO) of the project pre-construction meeting. The sponsor is responsible for establishing a reimbursable agreement to protect, relocate, and/or re-establish FAA equipment that will be disturbed during sponsor's project. Before each construction activity begins, FAA ATO, SMO shall be contacted to provide locations of existing facility cables.
- 23) The Runway Visual Range (RVR) Facilities identified on the proposed ALP meet the standard siting criteria. The RVR siting criteria in AC 150/5300-13 is being updated. When the engineering for the project progresses to a point where RVR siting is necessary, coordination with the FAA must be initiated by the Sponsor's engineering staff.
- 24) The runway depiction on the ALP for Runway 10L and Runway 10C taxiway connectors does not match that of the Engineering Design Review (EDR) Documents. The EDR documents need to be reviewed to ensure consistency with the ALP and the Final Environmental Impact Statement (EIS).

FUTURE AIRPORT LAYOUT PLAN, SHEET 3:

- 25) The probable Runway 27R Approach Lighting System with Sequenced Flashing Lights for Category II Meteorological Conditions (ALSF-2 approach light plane design elevation from ALSF-2 Station 9+60 to the end of the plane at Station 26+40 is 675.96 feet. All objects between these stations and within 200 feet of extended runway centerline must be removed to an elevation below 675.96 feet. This includes utility U-1 (Top Elevation 681.52 feet), which is shown on ALP

Sheet 20, dated August 2005. Outside the approach light plane, the 50:1 approach surface will govern obstruction removal.

- 26) Obstruction to Runway 22R Runway Alignment Indicator Lights (RAIL) plane complex: The outermost four Runway 27R ALSF-2 bar towers will penetrate the existing Runway 22R Medium-Intensity Approach Lighting System (MALSR) with RAIL plane complex. Therefore, before the Runway 27R ALSF-2 is constructed, the Runway 22R MALSR profile will have to be modified to make the MALSR compatible with the ALSF-2. This can be done by reconstructing the five Runway 22R RAIL flasher towers with:
- a. The Stations 20+00, 21+80, and 24+00 RAIL flasher lamp centerlines at the same elevation as the adjacent Runway 27R ALSF-2 lamp centerlines.
 - b. The Stations 16+00 and 18+00 RAIL flasher lamp centerlines on a straight line between the Station 20+00 RAIL flasher lamp and the Station 14+00 MALSR steady-burning lights."
- 27) The Runway 10R GS is sited 1,070 feet from threshold, to give a 55-foot Threshold Crossing Height (TCH). The GS is shown 407 feet from runway centerline, to place it outside of the runway OFA. Irving Park Road encroaches upon a small segment of the southwest corner of the GS critical area. Technically, this encroachment is a non-standard feature requiring an NCP waiver. The encroachment is indicative of a larger problem, specifically the security fence, the traffic on Irving Park Road, and railroad traffic, as they curve around to the northwest in front of the GS. These items must be math modeled by the sponsor to determine the impact on the GS signal. If there is a predicted degradation of service, the Sponsor will be required to mitigate to rectify the problem.
- 28) The future railroad track route, as shown on the plan views of ALP Sheets 31 through 34, needs to be adjusted slightly. As the track is presently shown, it is unacceptably close to the ALSF-2 outermost light bar at Station 24+50. If the track must be routed as shown, the outermost light bar will very likely have to stand farther from the runway threshold than 2,450 feet, to adequately clear the track. The outermost light bar cannot be sited farther from the runway threshold than 2,450 feet without an NCP waiver.

The solution to this problem is to site the outermost two ALSF-2 bars at Stations 23+40 and 24+50, and to design the railroad tracks to cross the extended runway centerline 2,395 feet from Runway 10R threshold. This design will place each light bar tower between 25' and 30' from the nearest track. If this track route change cannot be made, then there will be a high probability that an NCP waiver will be required for non-standard ALSF-2 stationing.

- 29) The ALSF-2s of future Runways 9L, 9C, 9R, 10L, 10C, and 10R are all shown crossing railroad tracks. Permits for these crossings will be required from the railroad. To facilitate the issuance of permits for construction within the railroad right of way, it is essential that the Sponsor begin planning with the railroad now, if that planning is not already in progress.
- 30) Elements of the ALSF-2s of future Runways 9C, 9R, 10L, and 10C are shown west of York Road on land that is shown off airport property. It is the Sponsor's responsibility to furnish all the interests in real estate required for the establishment of NAVAIDs. For ALSF-2, the interests include land on which to install light bar structures, cable ducts and cables, access roads and walkways, personnel ingress and egress, security, appurtenances, and avigation easements to protect the approach light planes from penetration. These avigation easements will be for airspace below the 14CFR77, 50:1 approach light plane. For the Runways 9C and 10L ALSF-2s, facility elements will have to be constructed on existing buildings off airport property. If these buildings are to remain, then the Sponsor must obtain special real estate interests that will be mutually acceptable to the owner of the ALSF-2 and of the buildings, which are to be depicted on the Future On-Airport Land Use Plan.
- 31) A meteorological study has been conducted to determine the optimal locations for the Low Level Wind Shear Alert System (LLWAS) sensors. The sponsor must furnish interests in real estate required for the establishment of NAVAIDs. For LLWAS, the interests include land on which to install the LLWAS tower and sensor, cable ducts and cables, access roads and walkways, personnel ingress and egress, security, appurtenances, and avigation easements to protect the LLWAS facility from interference.
- 32) The Runway CAT II/III approach facilities include the ILSs, ALSF-2, and RVR, which must be protected from construction, in order to maintain CAT II/III service to runways.
- 33) Runway 10L ALSF-2: a waiver will be required for a non-standard spacing configuration that's results when crossing the railroad and when accommodating existing structures. The Sponsor should acknowledge in writing that they are aware of the non-standard configuration. Written justification for this configuration may be required.
- 34) The railroad tracks on the Runway 10L approach are two sets of two tracks each, separated by a wide median. In that median, there is ample room to install a light bar tower. If a light bar tower is installed in the railroad median, an access road grade crossing would be necessary across the two tracks on which railroad cars would block the crossing for the shortest duration. Even with the light bar in the railroad median, a couple of light bar intervals would deviate from the standard siting criteria. This non-standard spacing requires corrective action or a NCP waiver. With the light bar in the railroad median, an ALSF-2 bridge would not be

required, but a special turnoff on the east side of York Road might be necessary to access the light bar. If a light bar tower is sited between the tracks and York Road, a special turnoff on the east side of York Road would definitely be needed. Alternatively, if an ALSF-2 bridge across York Road and the tracks were constructed, the turnoff on the East Side of York Road would not be necessary.

- 35) Runway 28R ALSF-2: a waiver will be required for a non-standard spacing configuration that results when crossing Runway 22L and Taxiway "Q". Prior to construction, the Sponsor should acknowledge in writing that they are aware of the non-standard Configuration. Written justification for this configuration may be required.
- 36) A waiver will be required for a non-standard equipment type- Semi-flush Steady Burning Lights. The Sponsor may be asked to acknowledge in writing that they are aware of the non-standard configuration. NCP waivers are not guaranteed. Written justification for this configuration may be required.
- 37) The North and South Radars must be operational prior to the construction activity and earthwork for Phase 1 – West Satellite and Phase 2-West Terminal that would impact the operation of the existing Radar.
- 38) The proposed Runway 9R ALSF-2 configuration is non-standard and requires an NCP waiver. The Sponsor may be asked to acknowledge in writing that they are aware of the non-standard configuration. Written justification for this configuration may also be required. NCP waivers are not guaranteed.
- 39) With the Runway 9R light bar in the railroad median, an ALSF-2 bridge would not be required, but a special turnoff on the east side of York Road might be necessary to access the light bar. If a light bar tower is sited between the tracks and York Road, a special turnoff on the east side of York Road would definitely be needed. Alternatively, if an ALSF-2 bridge across York Road and the tracks were constructed, the turnoff on the east side of York Road would not be necessary. The non-standard configuration would be approved by the FAA pending the approval of the NCP waiver. The Sponsor may be asked to acknowledge in writing that they are aware of the non-standard Configuration. Written justification for this configuration may be required. NCP waivers are not guaranteed.
- 40) Runway 10R ALSF-2: the future Bensenville ditch, the airport security fence, future relocation Irving Park Road, and rerouted railroad tracks are all shown crossing through the ALSF-2. These items must be designed to accommodate standard stationing of the ALSF-2 light bars. The previous recommendation was to route the railroad tracks around the end of the Runway 10R ALSF-2 lights. This was not accomplished. If possible, the sponsor should reroute the railroad tracks around the end of, instead of through, the ALSF-2. Ideally, the tracks should amply clear the outermost light bar tower of the ALSF-2. If the tracks

must cross the ALSF-2, the track design must include ALSF-2 ducts under the tracks, and a grade crossing for the access road.

- 41) The proposed ALP illustrates the relocation of the railroad between the last 10R ALSF-2 light bar and the second to last ALSF-2 light bar. This creates additional problems for maintaining a light bar so close to an active rail.
 - a. A grade crossing will be required to access the outermost light bar.
 - b. The Railroad must be relocated to equal-distance between the last and second to last light bars, to accommodate safe facility maintenance.
- 42) The Runway 28L GS critical area runs parallel to a fence for approximately 150'. This configuration could influence the operation of the proposed GS. The sponsor should have the proposed GS signal modeled to ensure that there will be no impacts as a result of the proposed fence configuration. The FAA has no objections provided the sponsor accepts all responsibility to mitigate any impacts associated with such a configuration.

PHASE 1A CONCEPT PLAN, SHEET 10

- 43) All but two or three of the light bars and flashers of the Runway 14L ALSF-2 will have to be semi-flush. Equipment limitations may require the flasher junction boxes and Individual Control Cabinets (ICC) to be less than 200 feet from Runway 14L extended centerline. If so, NCP waivers will be required for the penetration of the approach light plane by these items.

COMMUNICATIONS

- 44) The excavation associated with the people mover may require the relocation of the Remote Transmitter/Receiver (RTR) facility earlier than initially expected. The services provided by Remote Transmitter/Receiver-ORD must be relocated and operational at a new location before the Sponsor can conduct any construction that would potentially impact the operation of the communication services.
- 45) The proposed building located near the Fuel Tank Farm may affect the RTR-P facility. The antennas for the RTR must have a clear line of site to the approach threshold of Runway 9L. A final determination on the building cannot be made until the design of the building is known. As soon as the height, footprint and material of the building are known, the sponsor should begin airspace approval coordination with the FAA through a request for an aeronautical study.
- 46) Impacts to FAA facilities and infrastructure due to the proposed modernization of O'Hare International Airport will require mitigation, the costs of which must be covered by the sponsor through reimbursable agreements with the FAA. A complete evaluation of the communication plan for O'Hare ATCT, Terminal

Radar Approach Control (TRACON) facility and Air Route Traffic Control Center (ARTCC) as it relates to the planned airport development must be completed before the FAA can fully identify the extent of these impacts. Costs may include work both on and off airport property, additional equipment and infrastructure, and phasing the placement of communication facilities on an interim basis. No existing communication or fiber facilities or infrastructure will be removed from service or impacted by airport development without prior coordination with the FAA and new or interim communication services and/or facilities being in place and ready for operation.

- 47) RTR-ORD is presently located in the area identified as the future location of the West Terminal Satellite Concourse (T4) and will require relocation.
- 48) RTR-A will require relocation due to its proximity to the future proposed Runway 10R/28L. An interim and/or final location for the equipment and services provided from this facility must be identified and evaluated.
- 49) RTR-B will require relocation due to its proximity to the future proposed Runway 10C/28C. An interim and/or final location for the equipment and services provided from this facility must be identified and evaluated.
- 50) The future ALP shows a four level rental car facility at the location P3 requiring removal or relocation of RTR-C. The frequencies currently housed in RTR-C must be relocated as a result of planned construction. While it may be possible that communication facilities from RTR-C can be accommodated in other RTR sites, there is no guarantee. The FAA requests additional details on the plans for this parking area for further evaluation. An interim and final location for the equipment and services provided from this facility must be identified and evaluated.
- 51) RTR-D will require relocation due to the construction of Terminal #4. An interim and/or final location for the services provided from this facility must be identified and evaluated.
- 52) The FAA requests details on both the concourse (T4) and parking structure (P3), as they become available for possible incorporation of FAA co-location requirements. Resolution of this item will be required to achieve milestones in implementation of the overall plan. The plans for the parking structure and the terminal building are still unclear. It will be necessary to evaluate the plan in depth before any construction in either of these areas begins. Space, power, utilities, cabling and antenna location may be completed in conjunction with airport work if facilities are acceptable to FAA requirements. Regardless of the final configuration, it will be necessary for the sponsor to accommodate the communications facilities needed to support the proposed airport configuration.

- 53) An integrated FAA and sponsor communication phasing plan will be needed. Detailed integrated scheduling for the construction of all new communication facilities must be developed to ensure services are continued without disruption. The FAA may determine that some work can be consolidated with airport activity. Details of this nature and associated responsibilities will be outlined in the future reimbursable agreement with the airport.

FIBER OPTICS

- 54) The intent is for existing O'Hare Fiber Optics Transmission System (FOTS) cable loops to remain intact throughout construction. Due to construction activities, some existing fiber cable segments will have to be rerouted because the existing service will be destroyed. Prior to construction activities that will destroy an existing fiber cable segment, and in lieu of splicing working segments after cutting, a new fiber cable will be installed between fiber patch panels and a transition to the new cable must occur. The cost of this must be borne by the Sponsor.
- 55) During Phases 1A and 1B, construction on the new fiber duct system and new FOTS loops may begin. Instead of creating linear point-to-point FOTS configurations (i.e., establishing a two terminal system) a third hub node may have to be established at the O'Hare International Airport ATCT until RTR locations have been established. It is possible that when ready, the hub nodes will be relocated to the new RTR building, and connected back on the loop (will permit the node to be programmed at installation as if it were already at the new RTR location). If instead, linear point-to-point configurations were established, an entire fiber loop would have to be turned down, deprogrammed, and re-established as a multi-node ring configuration (this will take days to reconfigure).

This requires the simultaneous purchase of all FOTS equipment necessary to establish each complete ring. Therefore, a FOTS plan will be needed to minimize the risk associated with conducting construction activities on an operational airport. It will be imperative that the sponsor coordinate each phase with the FAA prior to beginning construction.

- 56) Fiber optic cables, ductwork, conduit and equipment requirements must be included/planned for connecting all new communication facilities to the existing ATCT and two future ATCTs. It will be necessary for the Sponsor and the FAA to work together to define the work and reimbursable agreement responsibilities.
- 57) Further planning will be required within the FAA and with the Sponsor to determine specific plans and timing of when new fiber network requirements need to be in place. The FAA will determine where and when new fiber optic capabilities must be established prior to any impact to the existing FOTS infrastructure.

- 58) Two separate manholes must be provided for physical diversity of power, control, and communication cables, etc. for each new communication facility. Design responsibilities still need to be discussed and agreed to between the FAA and the Sponsor, then documented in a reimbursable agreement.
- 59) In addition, any runway or site relocation (e.g., LOC, GS, ALSF, MALSR, ASR-9, and RTR) presently connected via a FOTS system, will need to be established at the new location before disconnection occurs at the current location. The duct or conduit will be traceable back to the ORD ATCT. Fiber Optic Cable and FOTS equipment will be used for all FAA on airport operational services between the ORD ATCT and FAA sites. Detailed discussions will be required to address the plans to minimize impacts to existing facilities while preparing future infrastructure needed for new facilities.

JET BLAST

- 60) In accordance with FAA Airport Design AC 150/5300-13, Airport Design, paragraph 600. D. Jet Blast/Exhaust, NAVAIDs, monitoring devices and equipment shelters should be located at least 300' behind the source of jet blast to minimize the accumulation of exhaust deposits on antennas. See AC 150/5300-13, Chapter 8, The Effects and Treatment of Jet Blast. The Sponsor shall conduct the jet blast study work scope as identified in the June 9, 2004 letter from the Chicago Area Modernization Program Office to the Sponsor.
- 61) The Runway 14R LOC antenna array will stand outside the runway and taxiway safety areas, but inside the Runway 10L/28R Object Free Area (OFA). The array may be in the path of jet blast from airplanes turning from the north parallel taxiway of Runway 10L onto the north parallel taxiway of Runway 32L. The array would be expected to receive repeated 70-mph breakaway thrust jet blasts from B-747's during the facility life. Consideration must be given to mitigate these blast effects.
- 62) The temporary displacement of the Runway 32L approach places the Runway 14R localizer shelter in an area that may be subjected to higher than acceptable levels of jet blast. The Sponsor should provide jet blast studies for the localizer. The S-turn configuration where an aircraft heading east on Taxiway M turns onto Taxiway T heading in a northwest direction, and then turns east onto the taxiway that currently has no identifying letter but merges into Taxiway B. It is predicted that the LOC shelter will be subjected to high jet blast. The potential to turn from Taxiway M north onto Taxiway T exists, but it is not likely. If jet blast in the area exceeds acceptable levels, steps will have to be taken by the Sponsor and the FAA to ensure that personnel and equipment are not subjected to damaging levels of jet blast.

In addition, the temporary displacement of the Runway 32L approach places the Runway 14R Localizer antenna in an area that may be subjected to higher than acceptable levels of jet blast.

PROPOSED AIR TRAFFIC CONTROL TOWER

- 63) The Sponsor is responsible for providing a line of sight evaluation for all proposed construction that would be located between any existing and future ATCT and any movement area under its control.
- 64) The proposed new ATCT site must meet FAA Order 6480.4, Air Traffic Control Tower Siting Criteria.
- 65) The proposed new ATCT sites must be large enough to accommodate for employee parking, Government Owned Vehicle (GOV) parking, a base building and support equipment.
- 66) The new ATCT site must meet FAA Order 6480.4, Air Traffic Control Siting Criteria. The Sponsor must submit an ATCT Siting report indicating the following information:
 1. Distance and depth perception to runway ends.
 2. Maximum to Avoid (MTA) elevations at each site.
 3. Shadow studies at each site.
 4. Look down angle radius at each site.
 5. A narrative for each site addressing sunrise and sunset impacts, glare and light reflection impacts and employee access.
 6. The new site must be large enough (2+ acres) for employee parking, GOV parking a base building and support equipment.
- 67) The proposed Terminal 4 (Labeled "T2") and existing (Heating & Refrigeration) H&R Building, number 450, must be evaluated to determine if the proposed building would affect the line of sight from the existing ATCT to the airport movement area.
- 68) Proposed building R22, future-cooling towers must be evaluated to determine if it, or plume from it, would have any effect on the line of sight from the existing and future ATCT to airport movement areas.
- 69) Building numbers 437 and 438 are identified on the key as exhaust room #1 and exhaust room #2. Prior to construction, these proposed buildings as well as the

predicted plumage must be evaluated to determine if it would have any effect on the line of site from the existing ATCT to airport movement areas.

RUNWAY/PARALLEL TAXIWAY SEPARATION

70) Runway/Parallel taxiway separation issues: Follow the guidance in the FAA letter on this subject dated April 8, 2004, from Mr. Barry D. Cooper, the FAA Manager, Chicago Area Modernization Program Office, to Mr. Michael Boland, the City of Chicago, First Deputy Director, O'Hare Modernization Program

a. Taxiway to runway centerline distance restrictions per Temporary Instruction Letter (TIL) 00-005A (effects of Height Above Touchdown (HAT) values) are as follows: Minimum HAT value for CAT II operations is 100 ft when runway centerline to taxiway centerline separation is 600 feet or greater. This value may also be achieved with:

- (1) Runway taxiway centerline separation of 500 feet at elevations of 4,000 feet and below, provided taxi operation are restricted to aircraft with wingspans less than 214 feet and tail heights less than 66 feet.
- (2) Runway taxiway centerline separation of 400 feet at elevations of 4,000 feet and below, provided taxi operation are restricted to aircraft with wingspans less than 171 feet and tail heights less than 55 feet.
- (3) Larger aircraft flying the approach or taxiing on parallel taxiways, or taxiway/runway separation less than stated above require a collision risk analysis to determine the minimum HAT values.

SIMULTANEOUS ILS OPERATIONS

71) Proposed Simultaneous ILS operations must meet the requirements of 8260.3B, Change 19, Volume 3, Appendix 2. Proposed simultaneous ILS operations have not been submitted, and would be required, to supplement instrument procedure development (This was previously identified in the ALP Review by the FAA.)

VORTAC RELOCATION

72) VORTAC relocation will require revisions of 27 Standard Instrument Approach Procedures (SIAPS), 5 Standard Terminal Arrival routes (STARs), and 3 Departure procedures (DPs). In addition, the Enroute structure will be impacted, as the VORTAC makes up the Enroute structure, V116, and V217/V228. All of these procedures/products will require amendments/re-work. To support this project, with this many projects, the FAA would require at least 18-24 months, advance notice to work all of these procedures into the production schedule and to assign resources to work on these amendments.

DEPARTURE SURFACE (40:1) SLOPE

- 73) This surface dimension, and the Obstruction Clearance Surface (OCS), is contained in FAA Order 8260.3, Vol 4, Chapter 1. These surfaces are not depicted on this ALP, and when drawn out, it appears that the departure surface may not have been considered in evaluation of obstructions on the airport.
1. Departure Surfaces are described in FAA Order 8260.3, Volume 4, Chapter 1. Due to the absence of obstruction survey data within the departure surfaces, a full evaluation of the relocated runway thresholds was not thoroughly evaluated. Obstructions must be considered and survey data provided, to fully evaluate the Instrument Flight Rules (IFR) effects of moving/relocating the departure end of the runways, as this is the origination point of the 40:1 slope, and the beginning of the Obstruction Clearance Surface (OCS).
 2. Survey Data. While this data would not be immediately required to approve the ALP, it is noted that this obstruction data must be obtained/provided during the scheduled obstructions surveys to support instrument procedures.
 3. IFR Effects. Future evaluation of obstruction data may result in a requirement to develop/publish departures procedures for the 40:1 obstruction penetrations. Once survey data is provided, a thorough IFR effect can be assessed and provided to the Sponsor. Possible actions that may be considered by the Sponsor, is removal or reduction of height of 40:1 penetrations, etc. If not removed or reduced in height, a departure procedure will be required to be developed and published.

NOTIFICATION REQUIREMENTS

- 74) The Chicago Flight Procedures Office (CHI FPO) must be notified at (847) 294-7255 at least 5 days prior to any temporary displacement and/or relocation of the thresholds. Sponsor must provide the latitude/longitude and elevation of the displaced threshold location. (Notification time necessary for issuance of Notices to Airmen (NOTAMS).
- 75) Letter Required. A letter must be submitted, to CHI FPO, by the Sponsor, requesting amendments to Instrument Approach Procedures (IAP). Review of this ALP does not constitute an automatic request to amend procedures.
- 76) Timeline. To meet publication cutoff dates, a minimum of 12 months or up to 1 ½ years, based on complexity and current workload, may be required, to revise existing procedures and develop new SIAPS. Any new runway pavement will have to flight checked for day/night operations: reference United States Standard

Flight Inspection Manual (OAP 8200.1, Chap 100, sect 104, types and priorities of flight inspections).

- 77) Survey Data. Any extended runway pavement will result in survey data, which IAW AC 150/5300-13 – Airport Design, must meet the specifications outlined in FAA No. 405. This data must be provided to CHI FPO, before development/amendments to procedures can begin. (NOTE: Obstruction Survey data is sent through CHI FPO; however, the proposed engineering design data is provided directly to AVN-210).
- 78) Submit Proposed Runway Data. Sponsor must provide proposed runway data for all runway construction projects directly to AVN-210 (405-954-5930) for procedure development. After the construction completion date is determined, notify ATA-100 (202-267-5917).
- 79) Equipment Relocation Data: Sponsor must provide proposed relocation/information of any equipment that will be relocated or added: Lighting, Localizer, etc. AVN-210 (405-954-5930) and ATA-100 (202-267-5917). NOTE: Electronic PAPI Datasheet is required for any PAPI and/or VASI information. This sheet available electronically from CHI FPO (847-294-7223).
- 80) Publication. Publication of Instrument Approach Procedures (IAP) could take from 12 months, up to 1 ½ yrs, after runway data and relocated/proposed installation of equipment/facilities is submitted to the FAA.
- 81) FAA FORM 5010-1. The Sponsor must update the airport FAA Form 5010-1 to reflect new runway data and updated runway changes.
- 82) Adding Obstruction Data. Review of this ALP does not result in newly identified obstructions being added or removed from the obstruction database. Obstructions must be surveyed In Accordance With (IAW) FAA No. 405 specifications and submitted through the CHI FPO for inclusion in the obstruction database.
- 83) Removing and/or Reducing Height of Obstruction Data. Removal of obstructions and reduction of obstruction height is identified on this ALP. These reductions in height and/or removal of penetrating obstructions is not automatic. This must be addressed, separately, via letter, from the surveyor and/or airport Sponsor to remove obstructions. Change of heights must be identified by a surveyor and an official survey letter submitted; identifying what obstruction action has been taken (i.e. tree cut, tower dismantled, etc.).
- 84) Recommendation: Reduce and/or remove obstructions, before the obstruction survey IAW FAA No. 405 specifications is accomplished. This would confirm that the surfaces were cleared, and no additional action would be required, unless new penetrations were identified. If this is not possible, then, it is very important that all removals are tracked, if in fact, obstructions are identified as requiring

removal. (This is important to ensure the FAA obstruction database is accurate when amending or developing new procedures).

TRANSPORTATION SECURITY ADMINISTRATION

85) O'Hare International Airport is required to comply with all federal regulations governing civil aviation security (as found within Title 49 of the Code of Federal Regulations and all relevant corresponding documents) throughout the development process, inclusive of all points identified below. All comments associated with the October 2003 document remain valid, as do the Sponsor's responses.

1. All new facilities must have an adequate infrastructure to accommodate an access control system as well as personal screening facilities since all new construction will either be contained within, or provide access to, the secured area of O'Hare International Airport.
2. Terminal and cargo buildings must be designed with sufficient space to handle screening equipment for passengers, employees, baggage and cargo.
3. Relocation and modification of perimeter gates must be designed to accommodate an area where screening of vehicles and occupants can take place.
4. The increase in the number of employees will necessitate additional capacity in the access control and identification badge computer system.

SECURITY & HAZARDOUS MATERIALS DIVISION

86) Any modification to existing FAA facilities, or construction of new FAA facilities, are to be coordinated with the Manager, Security and Hazardous Materials Division, AGL-700. AGL-700 will review and provide guidance to ensure that appropriate physical security standards are met for the designated Security Level of the specific Federal Facility. Coordination is to be made with this office to assist with site selection, facility location, hardware schedule, and product specifications for security related items of FAA facilities.

EVALUATION OF FUTURE HOLD PAD

87) The FAA requests that the Sponsor evaluate the placement of a hold pad on the north side of proposed Runway 9R between the third and fourth proposed north/south connector taxiways north of the building restriction line of proposed Runway 9R and south of the building restriction line of the parallel taxiway north of proposed Runway 9R.

ESTABLISHMENT OF ABANDONED PAVEMENT REMOVAL PROGRAM

- 88) A significant amount of pavement including runways and taxiways will be abandoned during various phases of construction. To prevent any potential confusion with usable pavement, the Sponsor must establish a pavement removal program that illustrates what pavement will be removed and when.

FUTURE EVALUATION OF TUNNELED SERVICE ROAD

- 89) The runway/parallel taxiway separation for future proposed Runway 10L/28R (Existing Runway 9R/27L) with extension can be shown as depicted on the ALP drawing. Due to the presence of a second parallel taxiway, aircraft can be routed on this taxiway during CAT II/III conditions. However, due to the potential for a heavy volume of traffic, both aircraft and service vehicles, the Sponsor must evaluate the need for a tunnel for the service road north of Taxiway M between Taxiway ZT and Taxiway ZV through north of Taxiway LL between Taxiway ZZ and Taxiway S. If the tunnel is warranted a north/south service road should be maintained at the exit of the east side of the tunnel.

ATTACHMENT B

ADVISORY

ADVISORY AIRPORT LAYOUT PLAN COMMENTS

- 1) In February 2005, the FAA published a new siting order for Instrument Landing Systems. The Sponsor has been asked to show all localizer critical areas in accordance with this new guidance. When applying the previous siting criteria, the FAA required that the Runway 32R Localizer critical area be controlled by AT enforcement of critical area protection and ILS signage. Under the new criteria, the ILS critical area has been reduced slightly. The 32R Localizer critical area no longer requires AT enforced protection or signage. The relocation of the service road to the north as seen on the Airport Layout Plan (ALP) provides sufficient critical area protection.
- 2) The ALSF-2s of future Runways 9C, 9R, 10L, 10C, 10R, 27C, and 27R, are all shown crossing public roadways.
 - a. Permits for these crossings will be required from the government bodies administering these roadways.
 - b. To facilitate the issuance of permits for construction within the right of way of these roadways, it is essential that the Sponsor begin planning with the responsible entities now, if that planning is not already in progress.
- 3) The Runway 9R ALSF-2 light lane must cross the railroad tracks at a right angle where the tracks are set widely apart. The railroad tracks on the approach to Runway 9R are two sets of two tracks each, separated by a wide median. In that median, there is ample room to install a light bar tower. If a light bar tower is installed in the railroad median, an access road grade crossing would be necessary across the two tracks on which railroad cars would block the crossing for the shortest duration. Even with the light bar in the railroad median, a couple of light bar intervals would deviate from the standard siting criteria. The Sponsor may be asked to acknowledge in writing that they are aware of the non-standard Configuration. Written justification for this configuration may be required.
- 4) The proposed Runway 28C and Runway 28L ALSF-2 configuration results in a penetration of the Approach Light Plane, which will require an NCP waiver.
- 5) The Runway 14L Inner Marker (IM) is shown as requested by the FAA and represents the best possible location for the IM, given this complex configuration. The IM will be placed 210' northeast of the Runway 14L Extended centerline. An NCP waiver will be required to site the IM in this nonstandard offset location.

FUTURE RUNWAY 27R INNER APPROACH SURFACE, SHEET 20

- 6) Access Road to O'Hare Express North. Construction of the access road from Lee Street to the O'Hare Express North buildings is either complete or near completion.

Lee Street, the O'Hare Express North access road, and the future service road will all cross the Runway 27R extended centerline. The distances between these roads require nonstandard light bar spacing for which an NCP waiver is required.

- 7) In order to support the expanded communications requirements that result from the proposed ALP, it may become necessary to add RTR facilities to the overall FAA communications plan. If additional RTR facilities become necessary, it will be the Sponsor's responsibility to provide a suitable location, as well as funding necessary to establish the facilities.
- 8) The FAA has documented that the ORD Remote Communication Air/Ground (RCAG) does not penetrate TERPS.
- 9) No automatic assumptions should be made regarding the ability of existing facilities to accommodate equipment and services from communication facilities targeted for removal from the airport. Further evaluation and planning will be required, as staging plans become more specific for airport development.
- 10) The proposed site for RTR-U has been shown within the footprint to the West Terminal Satellite Concourse (Building T4 on the future ALP). The FAA will require additional information as the concourse is engineered, to determine if co-locating RTR-U with the concourse is feasible. Close coordination, regarding this facility, will be necessary to ensure all structural, space, access and infrastructure requirements are met. The FAA requires 24-hour, un-impeded access to this facility.
- 11) Four new RTRs are depicted to the northwest (RTR-P), the northeast (RTR-Q), the southwest (RTR-R) and the southeast (RTR-S). The proposed runway configuration supports the requirement for two additional RTRs in the area of the West Terminal Concourse (RTR-U) and the existing ATCT (RTR-Z). Space and funding should be reserved for the construction of RTR-U associated towers and infrastructure in the event that a co-location with other buildings such as the concourse or the tower cannot be accommodated. The ALP should be modified to include RTR access roads. There is a heightened regard for the movement of vehicles on and around the Airport Operations Area.
- 12) The Sponsor must construct access roads, grading and subsurface work to and from each facility, including each communication facility. This will require additional coordination with the FAA both on responsibilities and schedule integration. While the FAA is concerned about the plans for access roads and access procedures to each facility, RTR-R and RTR-U are of particular concern. Access to all facilities must meet or exceed the SMO expectations. RTR-U, which is proposed on top of the new West Terminal, will pose unique access complications and new procedures. Concerns for secured and exclusive access, parking, movement of heavy or oversized equipment to and from the facility, will have to be addressed, negotiated and resolved.

- 13) RTR-Q is very close to Runway 14L/32R. The facility tower plans and phasing should be closely monitored to ensure that communication tower locations and phases are not detrimental to the operation of Runway 14L/32R.
- 14) The proposed location of RTR-S must be evaluated with respect to the timing of RTR-A and RTR-B removals, and shortening of Runway 14R/32L. Placement and timing will be important with respect to the removal of Runway 14R/32L.
- 15) Additional equipment and materials may need to be obtained to support the new or transitional communication or fiber requirements associated with the airport development and in the mitigation of any operational impacts.
- 16) FOTS presence at O'Hare. The established FOTS systems provide operational service communications between on airport FAA sites and the ORD ATCT. Further, it is important to establish awareness as soon as possible, that construction activities must consider first the existing FOTS infrastructure, then new and/or revised runway and site transitions. Listed below are some items to keep in mind prior to construction:
 - a. All FAA operational on airport services, between the ORD ATCT and NAVAIDs, radio transmitter, or radar site locations are provided over a FOTS system.
 - b. There is a future FOTS plan, in association with the OMP and any runway construction activities should consider associated FOTS requirements (e.g., conduit, duct, and fiber optic cable and equipment requirements).
- 17) Construction activities, especially from Runway 9L/27R and south, may put fiber optic cable at risk. Damage to cable will result in loss of service.

FREQUENCY ANALYSIS

- 18) The O'Hare Modernization Program, as proposed, requires additional communication channels (frequencies). The additional air/ground communication channels must be found within the present FAA air/ground spectrum. The FAA is conducting a spectrum analysis to determine the scope of the spectrum requirements. Once this is completed, the Sponsor may be asked to participate in an effort to obtain the necessary frequencies.

ACCESS ROADWAYS

- 19) As FAA and the Sponsor work together to further refine the locations of service and access roads. The FAA cautions against making connections where the parallel taxiway turns into the first or last connector taxiway, due to runway safety concerns.

PROPOSED AIR TRAFFIC CONTROL TOWER

- 20) In the previous evaluation it was identified that buildings R11 and R10 obscured the line of sight from the existing ATCT to existing or proposed movement areas. To mitigate this item as well as numerous other concerns, additional ATCTs have been proposed. If all line of sight impacts are mitigated, the FAA would have no objections from a line of sight perspective. Construction of the proposed North ATCT will remove this particular objectionable condition.
- 21) The FAA offers the following guidance for the proposed South ATCT: The requirements for two additional ATCT facilities (a north and south tower) are valid from a line of sight perspective. The Air Traffic Division, AGL-510 and the Chicago NAS Implementation Center, ANI-400 will determine and approve the appropriate locations.

RUNWAY/PARALLEL TAXIWAY SEPARATION

- 22) Runway/Parallel taxiway separation issues: Follow the guidance in the FAA letter on this subject dated April 8, 2004, from Mr. Barry D. Cooper, the FAA Manager, Chicago Area Modernization Program Office, to Mr. Michael Boland, the City of Chicago, First Deputy Director, O'Hare Modernization Program
1. Taxiway to runway centerline distance restrictions per TIL 00-005A (effects of Height Above Touchdown (HAT) values) are as follows: Minimum HAT value for CAT II operations is 100 ft when runway centerline to taxiway centerline separation is 600 feet or greater. This value may also be achieved with:
 - a. Runway taxiway centerline separation of 500 feet at elevations of 4,000 feet and below, provided taxi operation are restricted to aircraft with wingspans less than 214 feet and tail heights less than 66 feet.
 - b. Runway taxiway centerline separation of 400 feet at elevations of 4,000 feet and below, provided taxi operation are restricted to aircraft with wingspans less than 171 feet and tail heights less than 55 feet.
 - c. Larger aircraft flying the approach or taxiing on parallel taxiways, or taxiway/runway separation less than stated above require a collision risk analysis to determine the minimum HAT values.

HOLD LINES

- 23) HOLD Lines: Because hold lines were not indicated on this ALP, aircraft tail height, and location was not considered in the evaluation of IFR Effect of the taxiways depicted on this ALP.

MAGNETIC VARIATION (MV) CHANGE

- 24) In previous ALP review, 2004, a MV change was recommended. In review of this ALP, and the possibility of the VORTAC relocation, it is recommended that a new MV be assigned to Chicago O'Hare (ORD). Currently, the assigned MV is 0 Degrees, and the projected MV value for Epoch Year 2010 is 3 West. See reference, FAA Order 8260.19C, Chap 2, Sect 5 for Implementing Epoch Year MV. This change would be important, when deciding which MV to assign the new VORTAC. This would require amendments to all instrument procedures at Chicago O'Hare Intl (ORD).
- 25) On the ALP, the shelters housing the localizer (LOC) equipment, ALSF-2 (ALS) equipment, ALSF-2 engine generator (EG), and in some places DME, are labeled FUTURE LOC/ALS/DME BLDG. On the ALP, the term BLDG for building is acceptable, although the term SHELTER is preferred. The FAA calls unattended buildings shelters, to emphasize that they are unattended.

ATTACHMENT C

MTI and FTR LOCATIONS

**APPENDIX C
MTI and FTR Locations**

Facility Identifier	Facility Type	Auxiliary Device	Facility Numeric Identifier	Runway Association or Location	Latitude	Longitude
ORD	ASR-9	N/A	N/A	N/A	N 41° 58' 48.5769"	W 87° 55' 39.9536"
ORD	ASR-9	MTI Reflector	1	Runway 14R	N 41° 59' 35.3337"	W 87° 56' 10.5156"
ORD	ASR-9	MTI Reflector	2	Runway 27R	N 41° 59' 2.0449"	W 87° 53' 15.0956"
ORD	ASR-9	MTI Reflector	3	Runway 22R	N 41° 59' 54.4755"	W 87° 53' 43.2595"
ORD	ASR-9	MTI Reflector	4	Runway 32L	N 41° 57' 21.3"	W 87° 53' 39.1"
ORD	ASR-9	CPME	1	ORD ATCT	N 41° 58' 33.3"	W 87° 54' 11.2"
ORD	ASR-9	CPME	2	Downers Grove	N 41° 44' 58.2856"	W 88° 1' 57.6288"
ORD	ASDE	N/A	N/A	ORD ATCT	N 41° 58' 33.3"	W 87° 54' 11.2"
ORD	ASDE	FTR	1	N/A	N 41° 59' 5.9"	W 87° 53' 39.6"
ORD	ASDE	FTR	2	N/A	N 41° 57' 58.5"	W 87° 52' 56.1"
ORD	ASDE	FTR	3	N/A	N 41° 57' 23.2"	W 87° 53' 36.8"
ORD	ASDE	FTR	4	N/A	N 41° 57' 55.0"	W 87° 54' 22.4"
ORD	ASDE	FTR	5	N/A	N 41° 57' 13.8"	W 87° 55' 55.3"
ORD	ASDE	FTR	6	N/A	N 42° 00' 1.7"	W 87° 54' 41.5"

FTR- Fixed Target Reflector
 MTI- Moving Target Indicator
 ASR- Airport Surveillance Radar
 CPME- Calibration Performance Monitoring Equipment
 ORD- O'Hare International Airport
 ASDE- Airport Surface Detection Equipment
 ATCT- Air Traffic Control Tower
 N/A- Not Applicable
 N- North R- Right
 W- West L- Left