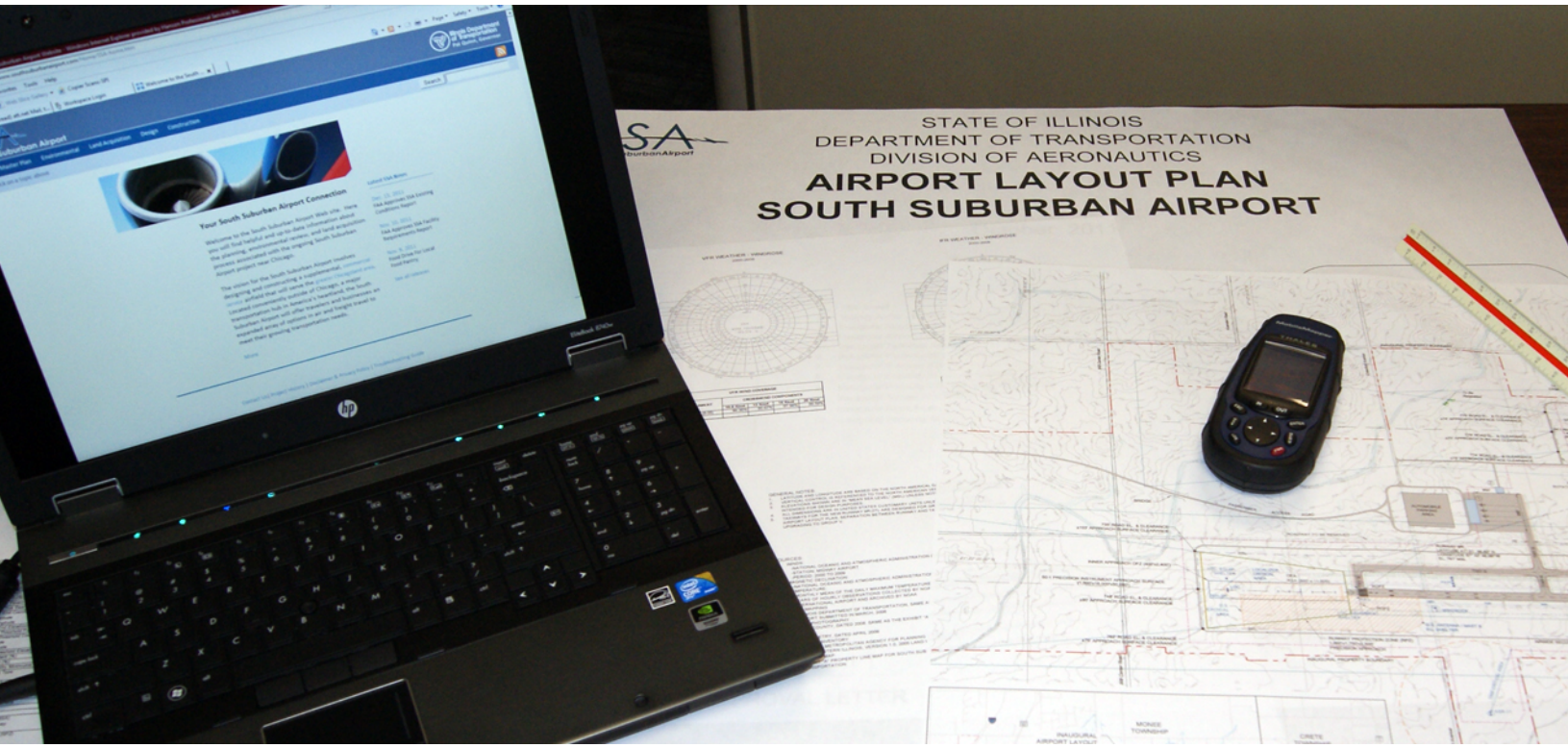

Airport Plans Report

Prepared by:
AECOM

Prepared for:
Illinois Department of Transportation
Division of Aeronautics

September 27, 2012

Table of Contents

List of Tables

List of Appendices

Section 1 – Introduction

The purpose of this report is to document the aeronautical facilities (runways, taxiways, aprons, buildings, roads, Navigational and Visual Aids [NAVAIDS], etc.) that are graphically depicted on the South Suburban Airport (SSA) Layout Plan. An Airport Layout Plan (ALP) is a set of drawings that include detailed illustrations representing the existing and future airfield facilities of an airport. The ALP is usually portrayed in both paper and electronic media. The airfield facilities depicted on the SSA ALP are defined by the aeronautical infrastructure needs listed in the *South Suburban Airport Facilities Requirements Report, October 25, 2011.* The airfield configuration's placement is further defined by the findings of the *South Suburban Airport Alternatives Development and Evaluation Report, June 29, 2012.* The SSA ALP uses applicable Federal Aviation Administration (FAA) guidelines in designing pertinent clearances and airfield dimensions. The primary FAA guidance documents used in the preparation of the SSA ALP are Advisory Circular (AC) 150/5300-13, *Airport Design,*[1] and AC 150/5070-6B, Change 1, *Airport Master Plans.*[2] The SSA ALP also shows physical features and land uses both on and off airport property that may affect navigable airspace.

An ALP is a public document and serves as a record of existing and future aeronautical resources for an airport. The ALP is also a reference document that should be used by local communities in their planning activities. The Illinois Department of Transportation - Division of Aeronautics (IDOT) is submitting the SSA ALP to the FAA for airspace review. Once the ALP is reviewed and found compliant, Federal ALP approval requirements stipulate that:

- all development programs should be reasonably consistent with the plans of local and state planning agencies for the development in the airport vicinity;
- fair consideration has been given to the interest of communities in or near the airport; and
- development programs provide for the protection and enhancement of the environment.

The FAA uses an approved ALP as a planning tool for reviewing requests for federally funded airport development grants. FAA also refers to the ALP during their review of proposed on and off airport construction projects that may affect navigable airspace.

[1] FAA, Advisory Circular 150/5300-13, *Airport Design, through Change 17 Errata* dated December 2, 2011.
[2] FAA, Advisory Circular 150/5070-6B, *Airport Master Plans*, *through Change 1* dated May 1, 2007.

Section 2 – Previous Airport Layout Plan Coordination

Planning for SSA started in the late 1980's with a series of site selection and feasibility studies. The first submittal of an ALP for SSA was made in November 1994. IDOT submitted a six sheet ALP to the FAA and requested the agency conduct an Airspace Feasibility Study (Airspace Case Number 1994-AGL-0115-NRA). FAA responded to IDOT in January 1995 and stated that *"the airport development is feasible and FAA will provide airspace protection and will consider the subject airport layout plan (ALP) as a plan on file."*[3]

Subsequently, IDOT prepared a full ALP set for SSA. This complete sixteen sheet ALP set was submitted to FAA in June, 1995. IDOT requested in this submittal that the FAA conduct a formal Airspace Determination Study (Airspace Case Number 1995-AGL-0062-NRA) on the subject layout. In September 1995, FAA conducted an Airspace Circularization public review of the document. FAA responded with a positive airspace determination in April 1997.[4] In July 1997, IDOT submitted a revised complete ALP set to the FAA for their "conditional approval". At that time, FAA declined to approve the SSA ALP stating a lack of "regional consensus" on airport issues.

After further study and reconciliation of "regional consensus" issues, IDOT submitted a revised ALP in March 2008. This four sheet ALP submittal included a narrative report entitled *Selection of IDOT's Preferred Inaugural Airport Configuration, March 7, 2008* and a companion FAA checklist. FAA declined to review the SSA ALP, stating their desire to see a revalidation of the approved 2004 forecasts of aeronautical operations.

Subsequently, FAA reviewed and approved the *South Suburban Airport Forecasts 2009: Verification of 2004 Forecast, January* 6, 2011. On March 23, 2011, FAA has also accepted for master planning purposes the *South Suburban Airport Existing Conditions Report*, *December 14, 2011*, the *South Suburban Airport Facilities Requirements Report*, *October 25, 2011* and the *South Suburban Airport Alternatives Development and Evaluation Report, June 29, 2012.* The airport plans discussed in this report reflect the FAA approval of the subject forecasts and FAA acceptance of other master planning documents.

[3] Letter from FAA (Louis Yates) to IDOT dated January 30, 1995.
[4] Letter from FAA (Denis Rewerts) to IDOT dated April 3, 1997.

Section 3 – Airport Design Standards and Guidance

3.1 Airport Reference Code

The Airport Reference Code (ARC), as defined in FAA AC 150/5300-13, *Airport Design,*[5] is used to classify an airport and determine the FAA airport planning criteria to which the airport must comply. As stated in the FAA AC, the ARC is a coding system used to relate airport design criteria to the operational and physical characteristics of the aircraft intended to operate at the airport. The ARC is based on two components. The first is an operational characteristic called the Aircraft Approach Category (aircraft arrival air speed in knots), which is depicted by a letter. This classification includes Categories A to E, with "A" corresponding to the slowest speed and "E" to aircraft with the fastest approach speeds.

The second component, depicted by a Roman numeral, is the Airplane Design Group (ADG), which is defined by the aircraft's wingspan. The combination of the two components defines the ARC for the airport. For example, aircraft identified by the moniker C-III or smaller are single-aisle, narrowbody aircraft, whereas aircraft D-IV and larger are generally dual-aisle, widebody aircraft. **Table 3-1: FAA Airport Reference Code System** provides the FAA criteria for the ARC system, relating airport design criteria with the operational and physical characteristics of the most demanding aircraft expected to operate at that airport.

Table 3-1: FAA Airport Reference Code System

Aircraft Approach Category[6]	Aircraft Approach Speed (knots)	Airplane Design Group	Aircraft Wingspan (ft)
A	Less than 91	I	Less than 49
B	91 or more but < 121	II	49 but < 79
C	121 or more but < 141	III	79 < 118
D	141 or more but < 166	IV	118 < 171
E	166 or more	V	171 < 214
		VI	214 < 262

Source: FAA Advisory Circular 150/5300-13, *Airport Design*.

The Inaugural Airport's ARC was formulated in the *South Suburban Airport's Forecasts 2009: Verification of 2004 Forecasts, January 6, 2011* and finalized in the *South Suburban Airport Facility Requirements Report, October 25, 2011*. The Inaugural commercial runway's critical aircraft family is the Boeing 737-800/Airbus A-320 and the ARC is C-III. The ARC for the General Aviation (GA)/Corporate runway is B-I, which includes a broad spectrum of GA aircraft. For planning purposes the future ALP drawing shall use various ARCs that range from Approach Group C to D and Design Group III to VI.

3.2 Federal Guidance Used In Preparing the Inaugural Airport Layout Plan Drawing

Since the SSA ALP is a part of the Airport Master Plan, the primary FAA planning tool used in preparing the ALP is AC 150/5070-6B, Change 1, *Airport Master Plans.*[7] Appendix F of that AC includes guidance on ALP preparation. In addition to the FAA Headquarters guidance, FAA Great Lakes Region-Airports Division has issued a Regional Guidance Letter (RGL) 5070.1, *Preparation and Review of Airport Layout Plans (ALPs), June 28, 2011*. This RGL includes assistance in ALP preparation by providing a regionalized "checklist" for ALPs submitted to Great Lakes Regional and district offices for review. Both of these guidance documents help define the ALP drawing nomenclature and expected data depictions. The SSA ALP Checklist is discussed further in **Section 8 – Airport Layout Plan Checklist** of this report.

[5] FAA, Advisory Circular,150/5300-13, Change 18, *Airport Design*.
[6] Certificated maximum flap setting and maximum landing weight at standard atmospheric conditions.
[7] Ibid.

Table 7-1 - IAP Summary of Facility Requirements for DBO+5 of the *South Suburban Airport Facility Requirements Report, October 25, 2011* lists the inaugural airport facilities that are considered part of the Inaugural Airport Program (IAP). To properly depict those facilities on an ALP, FAA has issued several advisory circulars and orders. The following is a listing and discussion of those ACs and orders that pertain to the SSA ALP.

FAA AC 150/5300-13 – Airport Design[8]

Section 103 of the Federal Aviation Act of 1958 states in part, *"In the exercise and performance of his power and duties under this Act, the Secretary of Transportation shall consider the following, among other things, as being in the public interest: (a) The regulation of air commerce in such manner as to best promote its development and safety and fulfill the requirements of defense; (b) The promotion, encouragement, and development of civil aeronautics…"* This public charge, in effect, requires the development and maintenance of a national system of safe, delay-free, and cost-effective airports. The use of the standards and recommendations contained in FAA AC 150/5300-13 supports this public charge. AC 150/5300-13 provides a majority of the airfield design parameters that are depicted on the SSA ALP. Some of the items include runway and taxiway dimensional safety areas and associated building setback distances. Aircraft parking aprons and critical areas for specific NAVAIDS is also included. Using Table 7-1 - IAP Summary of Facility Requirements for DBO+5 of the *South Suburban Airport Facility Requirements Report, October 25, 2011* as the facilities template, **Table 3-2: AC 150/5300-13 Airport Design Dimensional Standards for the Inaugural ALP Drawing** provides the appropriate dimensional criteria.

Table 3-2: AC 150/5300-13, Airport Design Dimensional Standards for the Inaugural ALP Drawing

Airport Facility	Dimensions (ft)
Primary Commercial Runway 9R-27L Length	9,500 ft
Primary Commercial Runway 9R-27L Width	150 ft
Primary Commercial Runway 9R-27L Paved Shoulder Widths	25 ft
Primary Commercial Runway 9R-27L Blast Pad	150 ft wide x 200 ft long
GA/Corporate Runway 9L-27R Length	5,001 ft (existing)
GA/Corporate Runway 9L-27R Width	75 ft (existing)
Taxiways A, B, B1 and C Width	75 ft
Taxiways A, B, B1 and C Paved Shoulder Widths	25 ft
Taxiway C1, D, D1, D2 and D3 Width	35 ft (D, D1, D2 & D3 existing)
Taxiway C1, D, D1, D2 and D3 Paved Shoulders Width	Not Applicable
Primary Commercial Runway 9R-27L Centerline to Taxiway "B" Centerline	600 ft
GA/Corporate Runway 9L-27R Centerline to Taxiway "D" Centerline	150 ft (existing)
Building Restriction Line	Numerous Criteria[9]
Primary Commercial Runway 9R Runway Object Free Area[10]	800 ft wide x 1,000 ft long
Primary Commercial Runway 27L Runway Object Free Area[11]	800 ft wide x 1,000 ft long
GA/Corporate Runway 9L Runway Object Free Area[12]	400 ft wide x 240 ft long
GA/Corporate Runway 27R Runway Object Free Area[13]	400 ft wide x 240 ft long
Primary Commercial Runway 9R Runway Safety Area[14]	500 ft x 1,000 ft
Primary Commercial Runway 27L Runway Safety Area[15]	500 ft x 1,000 ft
GA/Corporate Runway 9L Runway Safety Area[16]	120 ft x 240 ft
GA/Corporate Runway 27R Runway Safety Area[17]	120 ft x 240 ft
Primary Commercial Runway 9R Runway Safety Area Prior to Runway Threshold[18]	500 ft x 600 ft

[8] Ibid.
[9] BRL encompass the runway protection zones, the runway object free areas, the runway visibility zone, NAVAID critical areas, areas required for terminal instrument procedures and airport traffic control tower clear line of sight.
[10] End dimension listed. ROFA extends entire runway length.
[11] Ibid.
[12] Ibid.
[13] Ibid.
[14] End dimension listed. RSA extends entire runway length.
[15] Ibid.
[16] Ibid.
[17] Ibid.

Table 3-2: AC 150/5300-13, Airport Design Dimensional Standards for the Inaugural ALP Drawing

Airport Facility	Dimensions (ft)
Primary Commercial Runway 27L Runway Safety Area Prior to Runway Threshold[19]	500 ft x 600 ft
GA/Corporate Runway 9L Runway Safety Area Prior to Runway Threshold[20]	120 ft x 240 ft
GA/Corporate Runway 27R Runway Safety Area Prior to Runway Threshold[21]	120 ft x 240 ft
Primary Commercial Runway 9R Displaced Threshold	Not Applicable
Primary Commercial Runway 27L Displaced Threshold	Not Applicable
GA/Corporate Runway 9L Displaced Threshold	Not Applicable
GA/Corporate Runway 27R Displaced Threshold	151 ft
Primary Commercial Runway 9R-27L Runway Obstacle Free Zone[22]	200 ft x 400 ft
GA/Corporate Runway 9L-27R Runway Obstacle Free Zone[23]	200 ft x 250 ft
Primary Commercial Runway 27L Inner-Approach OFZ[24]	400 ft wide x 2,400 ft long
Primary Commercial Runway 27L Inner-Transitional OFZ[25]	H = 48 ft
Primary Commercial Runway 9R Precision Obstacle Free Zone	Not Applicable
Primary Commercial Runway 27L Precision Obstacle Free Zone	200 ft wide x 800 ft long
GA/Corporate Runway 9L Precision Obstacle Free Zone	Not Applicable
GA/Corporate Runway 27R Precision Obstacle Free Zone	Not Applicable
Primary Commercial Runway 9R Runway Protection Zone[26]	1,000 ft x 1,750 ft x 2,500 ft
Primary Commercial Runway 27L Runway Protection Zone[27]	1,000 ft x 1,750 ft x 2,500 ft
GA/Corporate Runway 9L Runway Protection Zone[28]	500 ft x 700 ft x 1,000 ft
GA/Corporate Runway 27R Runway Protection Zone[29]	500 ft x 700 ft x 1,000 ft
Primary Commercial Runway 9R FAR Part 77 Surface[30]	1,000 ft x 1,750 ft x 10,000 ft @ 50:1
Primary Commercial Runway 27L FAR Part 77 Surface[31]	1,000 ft x 1,750 ft x 10,000 ft @ 50:1
GA/Corporate Runway 9L FAR Part 77 Surface[32]	500 ft x 3,500 ft x 10,000 ft @ 34:1
GA/Corporate Runway 27R FAR Part 77 Surfaces[33]	500 ft x 3,500 ft x 10,000 ft @ 34:1
Primary Commercial Runway 9R Threshold Siting Dimensions	Criteria 7[34]
Primary Commercial Runway 27L Threshold Siting Dimensions	Criteria 7[35]
GA/Corporate Runway 9L Threshold Siting Dimensions	Criteria 5[36]
GA/Corporate Runway 27R Threshold Siting Dimensions	Criteria 5[37]
Parallel runway centerline separation[38]	4,300 feet
Parallel Taxiway "A" to Runway 9R-27L Taxiway Safety Area Width	118 ft
Parallel Taxiway "D" to Runway 9L-27R Taxiway Safety Area Width	49 ft
Parallel Taxiway "A" to Runway 9R-27L Taxiway Object Free Area Width	186 ft
Parallel Taxiway "D" to Runway 9L-27R Taxiway Object Free Area Width	89 ft

Source: South Suburban Airport Facility Requirements Report, October 25, 2011.

[18] Ibid.
[19] Ibid.
[20] Ibid.
[21] Ibid.
[22] Defined volume of airspace centered above the runway centerline.
[23] Ibid.
[24] Only applies to runways with approach light systems.
[25] Only applies to runways with approach minimums less that ¾ mile visibility.
[26] Inner width x outer width x length
[27] Ibid.
[28] Ibid.
[29] Ibid.
[30] Additional 40,000 feet @ 40:1 extension beyond stated limits.
[31] Ibid. Assumption that a satellite-based precision instrument approach procedure will be implemented.
[32] Non-precision instrument approach procedure exists to this runway end.
[33] Ibid.
[34] See AC 150/5300-13, Change 18, Appendix 2, Table A2-1.
[35] Ibid.
[36] Ibid.
[37] Ibid.
[38] Simultaneous radar-controlled approaches/departures

FAA Order 6480.4A – Airport Traffic Control Tower Siting Process[39]

Consistent with the FAA's mission to foster a safe, secure, and efficient aviation system is the need for an effective and efficient process to accurately construct new and replacement Airport Traffic Control Towers (ATCT). Determining the optimum height and location of an ATCT is the result of balancing many requirements and considerations, both internal and external to the FAA. FAA Order 6480.4A defines the methods used to complete the ATCT siting process in a consistent manner, and establishes the criteria and procedures for evaluation and approval for the height and location of an ATCT to ensure safety within the National Airspace System (NAS). It prescribes policy, delegates authority and assigns responsibility to ensure that the ultimate goal of providing the shortest possible ATCT meeting all the siting criteria is achieved. It also establishes the criteria and procedures for evaluation and approval for the height and location of an ATCT in an effort to ensure safety within the NAS. See **Section 3.4.1 - Airport Traffic Control Tower Site Analysis**.

FAA Order 6820.10 – VOR, VOR/DME and VORTAC Siting Criteria[40]

FAA Order 6820.10 provides guidance and reference material to be used in certain practical applications of the Very High Frequency Omnidirectional Radio Range (VOR), VOR Distance Measuring Equipment (VOR/DME), and VOR Tactical Air Navigation (VORTAC). The guidance deals with the procedures and techniques that apply to the initial evaluation, selection, and acquisition of sites for these navigational aids. Finally, FAA Order 6820.10 provides direction for the consolidation of buildings and antenna structures when such consolidation involves VOR, VOR/DME, or VORTAC installations. Where the facilities consolidation program requires the relocation, consolidation, or establishment of a new VOR, VOR/DME, or VORTAC installation, this order provides technical guidance for the selection and acquisition of a site for the installation. The guidance provided in this order applies to new establishments, relocated facilities, and consolidated facilities as specified by the FAA's facilities consolidation program. As part of the SSA development, area has been set aside to allow for the possible relocation of the FAA's Peotone VORTAC to the airfield.

FAA AC 150/5340-30F – Design and Installation Details for Airport Visual Aids[41]

Numerous airport visual aids provide information and guidance to pilots maneuvering on or near airports. These aids may consist of single units or complex systems composed of many parts. FAA AC 150/5340-30F provides installation details for all airport visual aids. The SSA ALP includes installation of the following airfield lighting aids: runway and taxiway edge lighting; runway centerline and touchdown zone lighting; runway guard lights; airport rotating beacons; lighted wind cones; Medium Intensity Approach Light System-Runway Alignment Indicator Lights; Runway End Indicator Lights; and Precision Approach Path Indicators.

FAA Order 6750.16D – Siting Criteria for Instrument Landing Systems[42]

Presently the aviation industry's standard for providing precision instrument approaches to a commercial runway end is through the use of an Instrument Landing System (ILS). The ILS, available since the middle of the 20th century, provides guidance to a pilot in inclement weather to almost zero cloud height and zero visibility minima. The ILS is composed of two parts: Localizer Antenna Array and the Glide Slope Antenna. These two instruments give the pilot a spatial vertical and horizontal reference to the runway threshold. These instruments are also aided by an appropriate approach light system that provides a visibility reference. FAA Order 6750.1D was used as a reference in depicting an ILS for Runway 27L. It must be noted that the FAA is moving away from ground based instrument approach systems, such as the ILS, and toward satellite based technology known as NextGEN.[43] Under NextGEN, the FAA has developed and approved both Wide Area Augmentation Systems (WAAS) and Local Area Augmentation Systems (LAAS) systems. These systems have been installed and tested as prototype systems at numerous airports. The FAA has adopted the International Civil Aviation Organization terminology of Satellite Based Augmentation System for WAAS and Ground Based Augmentation System (GBAS) for LAAS systems. Prototype systems have been installed and tested at Memphis, Atlantic City, Cedar Rapids, Minneapolis, Chicago,

[39] http://www.faa.gov/documentLibrary/media/Order/ND/6480_4A.pdf
[40] http://www.faa.gov/documentLibrary/media/Order/6820.10.pdf
[41] http://www.faa.gov/documentLibrary/media/Advisory_Circular/150_5340_30F.pdf
[42] http://www.faa.gov/documentLibrary/media/Order/ND/6750_16D.pdf
[43] http://www.faa.gov/nextgen/

Seattle, Moses Lake and Guam. The Honeywell, SmartPath Precision Landing System, a Category I non-federal GBAS system received FAA approval on September 3, 2009. The Port Authority of New York and New Jersey has installed a CAT I GBAS system at Newark Liberty Airport and FAA has published Category I approach procedures at Newark. For planning purposes, the SSA ALP includes ILS based precision approaches for Runway 27L. IDOT would be prepared to implement NextGEN systems should they become available for SSA.

FAA Advisory Circular 150/5340-5C – Segmented Circle Airport Marker System[44]

The segmented circle performs two functions: it aids the pilot in locating an airport; and it provides a centralized location for such indicators and signal devices as may be required for a particular airport. "L" shaped indicators, formed by using the landing strip and traffic pattern indicators, are required for compliance with Title 14 CFR part 91, *General Operating and Flight Rules*. Segmented Circles are only used on runways implementing right-hand traffic patterns. SSA requires the installation of a segmented circle to depict to pilots the expected right pattern traffic for Runways 9R and 27R. Since it is not anticipated that SSA would have a 24-hour ATCT through Date of Beneficial Occupancy (Fifth Year After Opening Day) (DBO+5), the segmented circle notification shall be necessary for aircraft operating at SSA outside of normal ATCT hours.

FAA Order 6560.21A – Siting Guidelines for Low Level Windshear Alert System Remote Facilities[45]

Low Level Windshear Alert Systems (LLWAS) are monitors designed to detect the existence of horizontal windshear conditions on an airport and around its perimeter and to alert controllers/pilots when conditions may become hazardous. This order provides the siting guidelines for locating and determining the tower heights for remote anemometer stations. A review of potential LLWAS locations was conducted for both the Inaugural and Future airport configurations. LLWAS siting is discussed further in **Section 3.4.2 – Low Level Windshear Alert System**.

FAA Order 6560.20B – Siting Criteria For Automated Weather Observing Systems[46]

Automated Weather Observation Stations and their companion Automated Surface Observation Stations (owned and operated by the National Oceanic and Atmospheric Administration), collect and report weather conditions on airport facilities. These automated units collect data such as: wind direction and speed, atmospheric pressure, ambient and dew point temperatures, visibility, sky conditions, precipitate by type and amount, snowfall depths and lightning detection. This FAA Order provides guidance on location for the sensors and their proximity to other facilities on an airfield.

FAA Order 6310.6 – Primary/Secondary Terminal Radar Siting Handbook[47]

Airport Surveillance Radar (ASR) is an approach control radar system that is used to detect and display an aircraft's position in a terminal area, such as the Chicago airspace system. ASR provides range and azimuth information and coverage can extend up to 60 nautical miles from the antenna site. ASR interfaces with both legacy and digital automation systems and provides six-level national weather service calibrated weather capability. An ASR system consists of two integrated electronic subsystems: primary surveillance radar and secondary surveillance radar. The primary surveillance radar uses a continually rotating antenna mounted on a tower to transmit electromagnetic waves that reflect, or backscatter, from the surface of aircraft up to 60 miles from the radar. The radar system measures the time required for a radar echo to return and the direction of the signal. From this, the system can then measure the distance of the aircraft from the radar antenna and the azimuth, or direction, of the aircraft in relation to the antenna. The secondary radar uses a second radar antenna attached to the top of the primary radar antenna to transmit and receive area aircraft data for barometric altitude, identification code, and emergency conditions. Military, commercial, and GA aircraft, operating in Class B airspace, have transponders that automatically respond to a signal from the secondary radar by reporting an identification code and altitude. The air traffic control uses this system to verify the location of aircraft within a 60-mile radius of the radar site. The beacon radar also provides rapid identification of aircraft in distress. As part of the SSA development, area east of the runway configuration has been set aside for installation of an ASR.

[44] http://www.faa.gov/documentLibrary/media/advisory_circular/150-5340-5C/150_5340_5c.pdf
[45] http://www.faa.gov/documentLibrary/media/Order/6560.21A.pdf
[46] http://www.faa.gov/documentLibrary/media/directives/ND/ND6560-20b.PDF
[47] http://www.faa.gov/documentLibrary/media/Order/6310.6.pdf

FAA Advisory Circular 97-1A – Runway Visual Range[48]

A Runway Visual Range (RVR) is visual device that supports precision landing and takeoff operations at an airport. The system measures visibility, background luminance, and runway light intensity to determine the distance a pilot should be able to see down the runway. RVRs are needed to support increased landing capacity at existing airports and new airport construction. Each RVR system consists of the following elements: Visibility Sensor, Ambient Light Sensor, Runway Light Intensity Monitor, Data Processing Unit and Controller Display(s). The RVR interfaces with the Automated Surface Observing System, Enhanced Traffic Management System, and Maintenance Processing System. These interfaces enhance safety, increase system capacity, and improve maintenance within the NAS.

3.3 Federal Guidance Used In Preparing the Future Airport Layout Plan Drawing

Table 8-10: Summary of Facility Requirements – Ultimate Airport of the *South Suburban Airport Facility Requirements Report, October 25, 2011* lists the airfield facilities identified for inclusion on the Future ALP Drawing. It is anticipated that planning for the construction of a second commercial runway would be initiated within the future forecast horizon (prior to DBO+20). Also, it is expected that the planning for a second commercial runway would include the review of the potential decommissioning of the existing GA/Corporate aviation runway. The airport master plan anticipates that all future runway ends have precision instrument approach procedures. Most of the previous guidance listed in **Section 3.2 - Federal Guidance Used In Preparing the Inaugural Airport Layout Plan Drawing** is also applicable for use in preparing the Future ALP Drawing. Additional guidance needed for the Future ALP Drawing is discussed below. **Table 3-3: AC 150/5300-13 Airport Design Dimensional Standards for the Future ALP Drawing** lists the various criteria dimensions for planning purposes.

Table 3-3: AC 150/5300-13 Airport Design Dimensional Standards for the Future ALP Drawing

Airport Facility	Dimensions
Runway 9L-27R Length (Former Runway 9R-27L)	12,000 ft[49]
Runway 9L-27R Width (Former Runway 9R-27L)	200 ft[50]
Former Runway 9L-27R Length (GA/Corporate)	Decommissioned
Former Runway 9L-27R Width (GA/Corporate)	Decommissioned
Runway 8R-26L Length	12,000 ft[51]
Runway 8R-26L Width	200 ft[52]
Runway Paved Runway Shoulder Widths (variable)	25-40 ft
Runway Blast Pads Widths (variable)	200-280 ft
Runway Blast Pads Lengths (variable)	200-400 ft
Taxiway Widths (variable)	75-82 ft
Taxiway Shoulder Widths	25-40 ft
Runway Centerlines to Taxiway Centerlines	600 ft
Building Restriction Line (variable)	Numerous Criteria[53]
Runway Object Free Areas[54]	800 ft wide x 1,000 ft long
Runway Safety Areas[55]	500 ft x 1,000 ft
Runway Safety Areas Prior to Runway Threshold[56]	500 ft x 600 ft

[48] http://rgl.faa.gov/Regulatory_and_Guidance_Library/rgAdvisoryCircular.nsf/list/AC%2097-1A/$FILE/ac97-1a.pdf
[49] Used for planning purposes.
[50] Ibid.
[51] Ibid.
[52] Ibid.
[53] Building Restriction Line encompasses all runway protection zones, runway object free areas, runway visibility zone, NAVAID critical areas, areas required for terminal instrument procedures and ATCT clear line of sight.
[54] End dimension listed. ROFA extends entire runway length.
[55] End dimension listed. RSA extends entire runway length.
[56] Ibid.

Table 3-3: AC 150/5300-13 Airport Design Dimensional Standards for the Future ALP Drawing	
Airport Facility	**Dimensions**
Runway Displaced Thresholds	Not Applicable
Runway Obstacle Free Zones[57]	200 ft x 400 ft
Runway Inner-Approach OFZs[58]	H = variable
Runway Precision Obstacle Free Zones	200 ft wide x 800 ft long
Future Runway Protection Zones[59]	1,000 ft x 1750 ft x 2,500 ft
Future Runway FAR Part 77 Surfaces[60]	1,000 ft x 1,750 ft x 10,000 ft @ 50:1
Future Runway Threshold Siting Dimensions	Criteria 7[61]
Parallel runway centerline separations[62]	Variable (5,000 ft minimum)
Parallel Taxiway Safety Area Widths (variable)	171-262 ft
Parallel Taxiway Object Free Area Widths (variable)	259-386 ft

FAA Order 6850.35 – High Intensity Approach Lighting System With Sequenced Flashing Lights Project Implementation Plan[63]

Approach Lighting Systems (ALS) provides the basic means to transition from instrument flight to visual flight for landing. Operational requirements dictate the sophistication and configuration of the approach light system for a particular runway. The High Intensity Approach Lighting System With Sequenced Flashing Lights (ALSF-II) is an ALS that provides visual information on runway alignment, height perception, roll guidance, and horizontal references for Category II/III instrument approaches. ALS are a configuration of signal lights starting at the landing threshold and extending into the approach area a distance of 2,400 feet for precision instrument runways. A typical ALSF-II system consists of 247 steady burning lights: including green threshold lights (49 lights), red side row-bar lamps (9 rows, 54 lamps), and high intensity steady burning white lights (144), plus an additional 15 flashing lights commonly referred to as strobes. The strobes flash in sequence starting with the strobe farthest from the runway and ending with the strobe closest to the runway threshold. The lights are spaced at 100 feet intervals from the runway threshold outward to 2,400 feet. For planning purposes ALSF-II systems shall be depicted on all future runway ends.[64]

3.4 Terminal Facilities and NAVAID Site Analysis

Separate and specific siting analysis was conducted for the following terminal facilities: ATCT and the LLWAS. Both facilities require further analysis by the FAA prior to final location siting. These facilities are discussed herein.

3.4.1 – Airport Traffic Control Tower

The ATCT is the focal point for controlling flight operations within an airport's designated airspace, as well as all aircraft and vehicle movement on the Aircraft Operations Area (AOA). To allow for commercial service activity it is anticipated an ATCT be constructed and operational on Opening Day, also known as Date of Beneficial Occupancy (DBO). Any future ATCT facility must meet FAA's planning and design standards and should be located equal distance from all planned operational areas, particularly the runway ends. The elevation of the tower should be adequate to ensure unobstructed views to all runway approaches, airside and terminal facilities that are under ATCT control. Convenient access by the ATCT personnel and maintenance staff is also important in locating the ATCT facility. The tower structure design follows the guidelines described in FAA Order 6480.7D, *Airport Traffic Control Tower and Terminal Radar Approach Control Facility Design Guidelines*.[65] The ATCT elevation would be determined in accordance with FAA Order

[57] Defined volume of airspace centered above the runway centerline.
[58] Only applies to runways with approach light systems.
[59] Inner width x outer width x length
[60] Additional 40,000 feet @ 40:1 extension beyond stated limits.
[61] See AC 150/5300-13, Change 18, Appendix 2, Table A2-1.
[62] Simultaneous radar-controlled approaches/departures
[63] http://www.faa.gov/documentLibrary/media/Order/6850_35.pdf
[64] http://www.faa.gov/about/office_org/headquarters_offices/ato/service_units/techops/navservices/lsg/als/
[65] http://www.faa.gov/documentLibrary/media/Order/6480.7D.pdf

6480.4, *Airport Traffic Control Tower Siting Criteria*. Line of Sight from the ATCT to all appropriate SSA facilities would be depicted on the Inaugural and Future ALP Drawings.

Taking into consideration the location of the air passenger terminal complex, the inaugural and future runway ends, visual depth of field and any shadowing, several potential ATCT sites were considered along with other evaluation criteria. The sponsor-selected ATCT site is on an east-west line through the centroid of the airfield and is near the midpoint of the inaugural commercial runway. This location is based on appropriate tower height and provides proper sight distances to all runway thresholds, taxiways and the passenger and cargo parking aprons. The central location also provides adequate security setbacks for the tower and base buildings and discrete landside access for tower personnel. It should be noted that the proposed ATCT site is defined herein for airport planning purposes. The FAA would conduct its own ATCT siting study to determine the final location and cab height elevation.

3.4.2 – Low Level Windshear Alert System

A LLWAS measures wind speed and direction at remote sensor station sites situated around an airport. Each equipped airport has several remote anemometer stations that transmit sensor data to a master station, which then generates warnings when windshear or microburst conditions are detected. Current wind speed, direction data and warnings are provided to approach controllers in the Terminal Radar Approach Control Facility and to ATCT ground controllers. Air Traffic Controllers relay the LLWAS runway specific alerts to pilots via voice radio/data communication links. LLWAS alerts assist pilots during critical portions of flight when they must determine whether to attempt to land or take off in hazardous weather conditions.

FAA Order 6560.21A – Siting Guidelines For Low Level Windshear Alert System Remote Facilities[66] was used in siting LLWAS facilities at SSA. It is anticipated that the Inaugural ALP would have 11 anemometers covering the runways' protected regions. Aircraft on either runway, whether landing or taking off, would be able to be warned about problematic wind shear and microbursts. See **Exhibit 3-1 - Inaugural Low Level Wind Shear Alert System**. Assumptions used in this analysis include:

- Sheltering from three-dimensional objects, such as trees, buildings or billboards, of the candidate sites should be less than 20 percent.
- Logistical constraints such as Federal Aviation Regulations (FAR) Part 77 Surfaces, proximity to high voltage powerlines, access to AC power are not an issue. The height of the anemometers would be determined during the in-depth validation study.
- It is assumed the airport could provide the property necessary to site the LLWAS locations.

LLWAS identified on the Future ALP would remove three anemometers from the Inaugural proposal to allow for future airfield improvements. After new facilities are constructed, approximately eight new anemometers would be added. Other sensors installed during the inaugural phase of the project would remain in place. **Exhibit 3-2 – Future Low Level Wind Shear Alert System** depicts the locations for the future phasing of the airport.

The proposed LLWAS layouts do not have any "blind spots" that affect the vulnerable areas of aircraft operations. Inaugural and future runways would be protected and coverage for future airfield improvements can be easily assimilated. The geographic siting contained herein only determines proposed locations of the LLWAS equipment. An in-depth study shall be conducted to determine the optimal performance of the system and validate the candidate site locations.

[66] Ibid.

Section 4 – Airport Layout Plan

The ALP for SSA depicts the inaugural and future airport plans which were generated from the *South Suburban Airport Facilities Requirements Report, October 25, 2011* and the *South Suburban Airport Alternatives Development and Evaluation Report, June 29, 2012.* The SSA ALP set consists of the following sheets:

- Sheet 1 – Title Sheet
- Sheet 2 – Vicinity Aerial – Existing Land Use Drawing
- Sheet 3 – Inaugural Airport Layout Plan Drawing
- Sheet 4 – Inaugural Airport Data Sheet
- Sheet 5 – Inaugural Terminal Area Drawing
- Sheet 6 – Inaugural Airport Airspace Drawing
- Sheet 7 – Inaugural Runway 9R Inner Portion of the Approach Surface Drawing
- Sheet 8 – Inaugural Runway 27L Inner Portion of the Approach Surface Drawing
- Sheet 9 – Inaugural Runway 9L Inner Portion of the Approach Surface Drawing
- Sheet 10 – Inaugural Runway 27R Inner Portion of the Approach Surface Drawing
- Sheet 11 – Inaugural Airport Land Use Drawing
- Sheet 12 – Inaugural Airport Property Map
- Sheet 13 – Inaugural Airport Property Map Data Tables
- Sheet 14 – Future Airport Layout Plan Drawing
- Sheet 15 – Future Airport Data Sheet
- Sheet 16 – Future Terminal Area Drawing
- Sheet 17 – Future Airport Airspace Drawing
- Sheet 18 – Future Runway 9L Inner Portion of the Approach Surface Drawing
- Sheet 19 – Future Runway 27R Inner Portion of the Approach Surface Drawing
- Sheet 20 – Future Runway 8R Inner Portion of the Approach Surface Drawing
- Sheet 21 – Future Runway 26L Inner Portion of the Approach Surface Drawing
- Sheet 22 – Future Airport Land Use Drawing
- Sheet 23 – Future Airport Property Map

4.1 Sheet 1 – Title Sheet

The Title Sheet is the first page of the ALP and contains the airport name, date of the ALP, designated space for the FAA approval letter and signature blocks for IDOT and AECOM. Sheet 1 also includes a location map, vicinity map, index to sheets and the required FAA Airport Layout Plan Review Statement. **Exhibit 4-1 – Title Sheet** depicts the Title Sheet for SSA's ALP.

4.2 Sheet 2 – Vicinity Aerial – Existing Land Use Drawing

The Vicinity Aerial – Existing Land Use Plan provides an aerial view of the airfield and its environs. This sheet depicts land uses, both natural and manmade, on and in the area around the airport and contains all lands within the expected 65 Day-Night noise contour. On-airport land uses depicted include the air passenger terminal area, airfield (runway, taxiway, aircraft parking aprons) pavements, support facilities, air cargo facilities, GA/Corporate aviation facilities, auto access and parking, airfield maintenance facilities, streams, wetlands, ATCT, airport property line and AOA. Off-airport features depicted include boundaries of local communities, other transportation infrastructure such as interstate highways, arterial roadways and local roads. Passenger and freight railroads and a local privately-owned private-use airfield are also shown. **Exhibit 4.2 – Vicinity Aerial – Existing Land Use Plan Drawing** depicts the Vicinity Aerial – Existing Land Use Plan for SSA's ALP.

4.3 Sheet 3 – Inaugural Airport Layout Plan Drawing

The Inaugural ALP is a drawing that represents airfield facilities expected to either be in operation on DBO and/or before DBO+5. The drawing includes inaugural airfield pavements, buildings, safety areas, clearances, critical areas, support facilities, NAVAIDS and service roads. Key elements of the Inaugural ALP include:

- *Airfield* – The inaugural airfield consists of a parallel runway configuration Runways 9L-27R and 9R-27L. Runway 9L-27R is an existing GA/Corporate runway that is 5,001 feet long and 75 feet wide. Runway 9L-27R's ADG is Group I and the Aircraft Approach Category is B. Runway 9R-27L is a commercial service runway that will be 9,500 feet long and 150 feet wide. The ADG for Runway 9R-27L is Group III and the Aircraft Approach Category is C. Both runways have complete parallel taxiways serving all runway thresholds. A precision instrument approach is identified for Runway 27L and all other runway thresholds have non-precision instrument approaches. Visual and electronic NAVAIDS are illustrated for each runway end and an approach light system is shown to the threshold of Runway 27L. Appropriate safety areas, AOA and land boundary limits are shown on this sheet.

- *Terminal Facilities* – The inaugural airfield includes the development of an air passenger terminal and air cargo facilities. These structures include aircraft parking aprons adjacent to the terminals. At DBO, air cargo aircraft parking would be co-located on the air passenger ramp. By DBO+5 a new air cargo terminal would be constructed in the airfield's eastern quadrant. Existing GA/Corporate aviation hangars shall remain adjacent to Runway 9L-27R.

- *Support/Ancillary Facilities* – Support facilities are depicted between the parallel runways. The airport maintenance area and the Aircraft Rescue and Fire Fighting (ARFF) facilities are centrally located between the air passenger terminal and the DBO+5 air cargo terminal. The ATCT and the airport rotating beacon are also located in this area. The airport fuel farm is located north of the DBO+5 air cargo terminal.

Ground Access Facilities – An airport entrance road from Interstate 57 and Illinois Route 50 (Governors Highway) to the air passenger terminal is depicted. The drawing identifies those roadways that would be severed to allow for construction of Runway 9R-27L. Local access to the Inaugural airport would be provided via the local county road system. Ashland Avenue and Eagle Lake Road would be reconstructed to offset the severed roads on the east side of the airport and provide a connection to Illinois Route 394 and Illinois Route 1. Public parking in the inaugural air passenger terminal area shall be provided using surface lots. Portions of the surface parking shall be available for rental car and employee parking. **Exhibit 4-3 – Inaugural Airport Layout Plan Drawing** depicts the Inaugural Airport Layout Plan for SSA's ALP.

4.4 Sheet 4 – Inaugural Airport Data Sheet

The Inaugural Data Sheet includes pertinent information on key airport facilities depicted on the Inaugural ALP. Information contained on the sheet includes wind rose and wind coverage tables, airport and runway data tables, declared distances table, general notes, data sources and document abbreviations. Key elements of the Inaugural Data Sheet include:

- *Wind Rose and Wind Coverage Tables* – The Inaugural Data Sheet depicts an All Weather Wind Rose, VFR Weather Wind Rose and an IFR Wind Rose. Wind coverage for each wind rose is documented in an associated table. Historical wind data was obtained for Chicago Midway International Airport (MDW) for ten years from 2000 to 2009.

- *Airport Data Table* – The Airport Data Table includes a summary of geographic (Inaugural Airport Reference Point (ARP) and airfield elevation), meteorological (Mean Maximum Temperature) and operational (critical aircraft) data for the Inaugural ALP. The local magnetic variation and inaugural NAVAIDS are also listed.

- *Runway Data Table* – The Runway Data Table defines specific physical, geometric and operational information for each runway end contained on the Inaugural ALP. The table includes approach category and design group parameters, physical runway lengths and widths, pavement strengths, and runway end coordinates and elevations. The table also contains dimensions for Runway Safety Areas (RSA), ROFA, Runway Protection Zones (RPZ) and Precision Obstacle Free Zones (POFZ). Taxiway Safety Areas and dimensions are also listed in the table.

Declared Distances Table – Appendix 14 of the FAA's AC 150/5300-13, *Airport Design* defines the use of Declared Distances for airfield development. Declared Distances use an aircraft's runway performance to independently check: Takeoff-Run Available (TORA), Takeoff Distance Available (TODA), Accelerated-Stop Distance Available (ASDA) and Landing Distance Available (LDA). Declared Distances are implemented at "constrained" airfields where RSAs are comprised. SSA is designed not to be a "constrained" airport and would meet current RSA criteria. FAA guidelines require analysis of Declared Distances at all facilities. Runway 9L-27R was designed to meet IDOT safety standards for a privately-owned, public use airport and not FAA design standards. Specific improvements are depicted on the plans to bring that runway into RSA compliance. Declared Distances for the Inaugural ALP are included in a table on this sheet and discussed further in **Section 7 – Declared Distances**. **Exhibit 4-4 - Inaugural Airport Data Sheet** depicts the Inaugural Airport Data Sheet for SSA's ALP.

4.5 Sheet 5 – Inaugural Terminal Area Drawing

The Inaugural Terminal Area Plan is an expanded view drawing of the Inaugural ALP and focuses on the areas where aprons, buildings, hangars, and parking lots are located. Inaugural airport facilities depicted on the terminal plan include the air passenger terminal, air cargo facilities (DBO and DBO+5), existing GA hangars, support facilities and the ATCT. Buildings shown on this sheet are listed in a table that include existing or inaugural top of structure elevations. **Exhibit 4-5 - Inaugural Terminal Area Drawing** depicts the Inaugural Terminal Area Plan for SSA's ALP.

4.6 Sheet 6 – Inaugural Airport Airspace Drawing

Inaugural airspace planning depicted in the ALP is illustrated through two drawing series: the Inaugural Airport Airspace Plan and the individual Inner Portion of the Approach Surface Drawings. Inaugural Airport Airspace Plan is **a holistic airspace view of the** airfield configuration. Inner Portion of the Approach Surface Drawings are localized graphics for each runway end and are discussed in **Section 4.7 - Sheet 7 - Inaugural Runway 9R Inner Portion of the Approach Surface Drawing; Section 4.8 – Sheet 8 – Inaugural Runway 27L Inner Portion of the Approach Surface Drawing; Section 4.9 – Sheet 9 – Inaugural Runway 9L Inner Portion of the Approach Surface Drawing and Section 4.10 – Sheet 10 – Inaugural Runway 27R Inner Portion of the Approach Surface Drawing**. Airspace criteria used by FAA for airspace drawings is contained in CFR Part 77 – *Safe, Efficient Use, And Preservation of the Navigable Airspace*,[67] commonly referred to as Part 77.

The Inaugural Airport Airspace Plan is a drawing that depicts the Part 77 imaginary surfaces, or heights that define navigable airspace surrounding an airport's runway system. Part 77 imaginary surface dimensions are defined by the weight of the aircraft using the runway (utility aircraft $\leq$12,500 pounds; greater than utility aircraft >12,500 pounds) and by the type of standard instrument approach procedures (visual, non-precision, precision) that are expected on each end of that runway. Penetration(s) of Part 77 surfaces by a fixed or moveable object(s) constitutes an obstruction to air navigation.

The airspace plan uses United States Geological Survey topographic sheets as its base map and depicts the entire inaugural airfield configuration. Smaller scaled profile views of inaugural approaches and obstruction data tables are also included. Runway numerals label the location of the airfield configuration and airspace slopes are defined at 50 foot elevation intervals. An extended runway centerline ground profile, based on the highest terrain across the width and along the length of the approach surface, has been depicted. Specific Part 77 surfaces shown on the Inaugural Airport Airspace Plan include:

[67] http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&rgn=div5&view=text&node=14:2.0.1.2.9&idno=14

- *Primary Surface* is a flat plane longitudinally centered on a runway. For runways with specially prepared hard surfaces, the primary surface extends 200 feet beyond each end of that runway; but when the runway has no specially prepared hard surface (turf, water, etc.), the primary surface ends at each end of that runway. The elevation of any point on the primary surface is the same as the elevation of the nearest point on the runway centerline. The width of the primary surface is:

  (1) 250 feet for utility runways having only visual approaches;
  (2) 500 feet for utility runways having non-precision instrument approaches;
  (3) For other than utility runways, the width is:
    (i) 500 feet for visual runways having only visual approaches;
    (ii) 500 feet for non-precision instrument runways having visibility minimums greater than ¾ statue mile;
    (iii) 1,000 feet for a non-precision instrument runway having a non-precision instrument approach with visibility minimums as low as ¾ of a statute mile and for precision instrument runways.

  The width of the primary surface of a runway shall be that width prescribed for the most precise approach existing or planned for either end of that runway.

- *Approach Surfaces* are imaginary planes longitudinally centered on the extended runway centerline and extending outward and upward from each end of the primary surface. An approach surface is applied to each end of each runway based upon the type of approach available or planned for that runway end.

  (1) The inner edge of the approach surface is the same width as the primary surface and it expands uniformly to a width of:
    (i) 1,250 feet for that end of a utility runway with only visual approaches;
    (ii) 1,500 feet for that end of a runway other than a utility runway with only visual approaches;
    (iii) 2,000 feet for that end of a utility runway with a non-precision instrument approach;
    (iv) 3,500 feet for that end of a non-precision instrument runway other than utility, having visibility minimums greater that ¾ of a statute mile;
    (v) 4,000 feet for that end of a non-precision instrument runway, other than utility, having a non-precision instrument approach with visibility minimums as low as ¾ statute mile; and
    (vi) 16,000 feet for precision instrument runways.
  (2) The approach surface extends for a horizontal distance of:
    (i) 5,000 feet at a slope of 20 to 1 for all utility and visual runways;
    (ii) 10,000 feet at a slope of 34 to 1 for all non-precision instrument runways other than utility; and
    (iii) 10,000 feet at a slope of 50 to 1 with an additional 40,000 feet at a slope of 40 to 1 for all precision instrument runways.
  (3) The outer width of an approach surface to an end of a runway shall be that width prescribed in this subsection for the most precise approach existing or planned for that runway end.

- *Transitional Surfaces* are imaginary planes that extend outward and upward at right angles to the runway centerline and the runway centerline extended at a slope of 7 to 1 from the sides of the primary surface and from the sides of the approach surfaces. Transitional surfaces for those portions of the precision approach surface which project through and beyond the limits of the conical surface extend a distance of 5,000 feet measured horizontally from the edge of the approach surface and at right angles to the runway centerline.

- *Horizontal Surface* is a flat plane 150 feet above the established airport elevation, the perimeter of which is constructed by swinging arcs of specified radii from the center of each end of the primary surface of each runway of each airport and connecting the adjacent arcs by lines tangent to those arcs. The radius of each arc is:

  (1) 5,000 feet for all runways designated as utility or visual; and
  (2) 10,000 feet for all other runways.

The radius of the arc specified for each end of a runway shall have the same arithmetical value. That value would be the highest determined for either end of the runway. When a 5,000-foot arc is encompassed by tangents connecting two adjacent 10,000-foot arcs, the 5,000-foot arc shall be disregarded on the construction of the perimeter of the horizontal surface.

- *Conical Surface* is a plane extending outward and upward from the periphery of the horizontal surface at a slope of 20 to 1 for a horizontal distance of 4,000 feet.

Exhibit 4-6 - Inaugural Airport Airspace Drawing depicts the Inaugural Airport Airspace Plan for the SSA's ALP.

4.7 Sheet 7 – Inaugural Runway 9R Inner Portion of the Approach Surface Drawing

The Inaugural Runway 9R Inner Portion of the Approach Surface Drawing is a close up view of the immediate runway end approach area for the commercial runway. Safe aircraft operations require the removal and restriction of obstructions to air navigation. Penetrations to traverse ways (FAR Part 77, Threshold Siting Criteria, Departure Surface-One-Engine Inoperative obstacle identification surface, etc.) are numerically identified in a table with elevations, computed vertical clearances and object disposition. This sheet also depicts safety areas (RPZs, RSAs, ROFAs, POFZs, etc.) and identifies any penetrations to those criteria. The coverage of this drawing is limited to the RPZ area. Additional geographic features include ground contours, roads, railroads and airport boundary limits are also depicted. **Exhibit 4-7 - Inaugural Runway 9R Inner Portion of the Approach Surface Drawing** depicts the Inaugural Runway 9R Inner Portion of the Approach Surface Drawing for SSA's ALP.

4.8 Sheet 8 – Inaugural Runway 27L Inner Portion of the Approach Surface Drawing

The Inaugural Runway 27L Inner Portion of the Approach Surface Drawing is a close up view of the immediate runway end approach area for the commercial runway. Safe aircraft operations require the removal and restriction of obstructions to air navigation. Penetrations to traverse ways (FAR Part 77, Threshold Siting Criteria, Departure Surface-One-Engine Inoperative obstacle identification surface, etc.) are numerically identified in a table with elevations, computed vertical clearances and object disposition. This sheet also depicts safety areas (RPZs, RSAs, ROFAs, POFZs, etc.) and identifies any penetrations to those criteria. The coverage of this drawing is limited to the RPZ area. Additional geographic features include ground contours, roads, railroads and airport boundary limits are also depicted. **Exhibit 4-8 - Inaugural Runway 27L Inner Portion of the Approach Surface Drawing** depicts the Inaugural Runway 27L Inner Portion of the Approach Surface Drawing for the South Suburban Airport's ALP.

4.9 Sheet 9 – Inaugural Runway 9L Inner Portion of the Approach Surface Drawing

The Inaugural Runway 9L Inner Portion of the Approach Surface Drawing is a close up view of the immediate runway end approach area for the GA/Corporate aviation runway. Safe aircraft operations require the removal and restriction of obstructions to air navigation. Penetrations to traverse ways (FAR Part 77, Threshold Siting Criteria, Departure Surface, etc.) are numerically identified in a table with elevations, computed vertical clearances and object disposition. This sheet also depicts safety areas (RPZs, RSAs, ROFAs, POFZs, etc.) and identifies any penetrations to those criteria. The coverage of this drawing is limited to the RPZ area. Additional geographic features include ground contours, roads, railroads and airport boundary limits are also depicted. **Exhibit 4-9 – Inaugural Runway 9L Inner Portion of the Approach Surface Drawing** depicts the Inaugural Runway 9L Inner Portion of the Approach Surface Drawing for SSA's ALP.

4.10 Sheet 10 – Inaugural Runway 27R Inner Portion of the Approach Surface Drawing

The Inaugural Runway 27R Inner Portion of the Approach Surface Drawing is a close up view of the immediate runway end approach area for the GA/Corporate aviation runway. Safe aircraft operations require the removal and restriction of obstructions to air navigation. Penetrations to traverse ways (FAR Part 77, Threshold Siting

Criteria, Departure Surface, etc.) are numerically identified in a table with elevations, computed vertical clearances and object disposition. This sheet also depicts safety areas (RPZs, RSAs, ROFAs, POFZs, etc.) and identifies any penetrations to those criteria. The coverage of this drawing is limited to the RPZ area. Additional geographic features include ground contours, roads, railroads and airport boundary limits are also depicted. **Exhibit 4-10 – Inaugural Runway 27R Inner Portion of the Approach Surface Drawing** depicts the Inaugural Runway 27R Inner Portion of the Approach Surface Drawing for SSA's ALP.

4.11 Sheet 11 – Inaugural Airport Land Use Drawing

The Inaugural Airport Land Use Plan depicts on-airport and off-airport land uses. On-airport land uses include: airfield pavements, terminal areas, ancillary and support facilities, GA/Corporate aviation facilities, property boundaries, aircraft operations areas, etc. Present day off-airport land uses include: airport lands, municipal boundaries, cemeteries, commercial uses, industrial uses, institutional uses, residential uses, recreational uses, vacant/agricultural uses and open water. Public facilities such as schools, parks, forest preserves and other similar developments are shown on the plan. Inaugural airport features (runways, taxiways, aprons, RPZs, buildings, navigational aids, etc.) are graphically included on the plan. **Exhibit 4-11 – Inaugural Airport Land Use Drawing** depicts the Inaugural Airport Land Use Plan for SSA's ALP.

4.12 Sheet 12 – Inaugural Airport Property Map

From the start of the land acquisition process, IDOT has maintained an Exhibit "A" Property Line Map of all acquired land and property. That document is the basis of the Inaugural Property Line Map. This sheet, which is the same size and scale as the Inaugural ALP Sheets, includes a map of land parcels overlaid on top of inaugural airport features (runways, taxiways, terminals, roadways, NAVAIDS, safety areas etc.). A title block, revision block and legend are also contained on this sheet. **Exhibit 4-12 – Inaugural Airport Property Map** depicts the Inaugural Airport Property Map for SSA's ALP.

4.13 Sheet 13 – Inaugural Airport Property Map Data Tables

As a companion to Sheet 12, a table listing the date of acquisition and previous land owner is depicted on Sheet 13. A numerical identification system has also been listed in the table to categorize the parcel tracts. At present no Federal funds have been used in the acquisition of airport property and that criteria requirement is not applicable at this time. **Exhibit 4-13 – Inaugural Airport Property Map Data Tables** depicts the Inaugural Property Map Data Tables for SSA's ALP.

4.14 Sheet 14 – Future Airport Layout Plan Drawing

The Future ALP is a drawing that represents airfield facilities expected to either be in operation beyond DBO+5. The drawing includes airfield pavements, structures safety areas, clearances, critical areas and dimensions for passenger and cargo terminal areas, support facilities, aircraft hangars, NAVAIDS and service roads. Key elements of the Inaugural ALP include:

- *Airfield* – The Future ALP continues to fulfill the requirements of FAA's approved Tier I Environmental Impact Statement's Record of Decision by depicting a quadruple simultaneous runway configuration. The airfield shall be divided into a north and south complex centered on the air passenger and cargo core. In the southern complex, the future airfield builds from the inaugural runway by maintaining and extending Runway 9R (future Runway 9L) to 12,000 feet. An additional independent Runway 9R-27L would be constructed 5,000 feet south of the future Runway 9L-27R. A dependent Runway 9C-27C is located between the two main runways to allow for aircraft departure overflow capability. In the northern airfield complex two independent Runways 8L-26R and 8R-26L are depicted and shall be separated by 5,000 feet. A dependent Runway 8C-26C is included for future overflow departure needs. Construction and operation of Runway 8R-26L necessitates the closure of the GA/Corporate aviation runway. Runways 8R-26L and 9L-27R shall be separated by 7,400 feet. All independent runways are planned to accommodate ADG VI aircraft and Aircraft Approach Category

D. Safety areas and taxiway centerline locations are placed to meet D-VI requirements. All independent runways are designed to be capable of handling Category IIIc precision instrument approach procedures. Visual and electronic NAVAIDS are shown for each independent runway end. Appropriate safety areas, AOA and land boundary limits are shown on this sheet. End around taxiways are depicted for aircraft transitioning from the most external independent runway to the terminal core.

- *Terminal Facilities* – The future airfield would continue to develop air passenger terminal and air cargo facilities constructed during the airfield's inaugural phase. These structures include commensurate air passenger terminals, air cargo terminals and aircraft parking aprons. At DBO, air cargo aircraft parking would be co-located on the air passenger ramp. By DBO+5 a new air cargo terminal shall be constructed in the airfield's eastern quadrant. Existing GA/Corporate aviation hangars would remain adjacent to Runway 9L-27R.

- *Support/Ancillary Facilities* – Support facilities are depicted between the parallel runways. The airport maintenance area and the ARFF facilities are centrally located between the air passenger terminal and the DBO+5 air cargo terminal. The siting of the ATCT and the airport rotating beacon are also located in this area. The airfield fuel farm is located north of the DBO+5 air cargo terminal.

- *Ground Access Facilities* – An airport entrance road from Interstate 57/Illinois Route 50 (South Governors Highway) to the air passenger terminal is depicted. Direct access is also slower from Illinois Route 394/Illinois Route 1 to the Future Terminal Area. The drawing also denotes those roadways that have been severed. Local road improvements to support future airport plans would be achieved through the IDOT/CMAP transportation improvement planning and programming process. Public parking in the inaugural air passenger terminal area would be provided using surface lots. Portions of the surface parking shall be available for rental car and employee parking.

Exhibit 4-14 – Future Airport Layout Plan Drawing depicts the Future ALP for SSA's ALP.

4.15 Sheet 15 – Future Airport Data Sheet

The Future Data Sheet includes pertinent information on key airport facilities depicted on the Future ALP. Information contained on the sheet includes wind rose and wind coverage tables, airport and runway data tables, declared distances table, general notes, data sources and document abbreviations. Key elements of the Inaugural Data Sheet include:

- *Wind Rose and Wind Coverage Tables* – The Future Data Sheet depicts an All Weather Wind Rose, VFR Weather Wind Rose and an IFR Wind Rose. Wind coverage for each wind rose is documented in an associated table. Historical wind data was obtained for MDW for ten years from 2000 to 2009.

- *Airport Data Table* – The Airport Data Table includes a summary of geographic (ARP and airfield elevation), meteorological (Mean Maximum Temperature) and operational (critical aircraft) data for the Future ALP. The local magnetic variation and inaugural NAVAIDS are also listed.

- *Runway Data Table* – The Runway Data Table defines specific physical, geometric and operational information for each runway end contained on the Future ALP. The table includes approach category and design group parameters, physical runway lengths and widths, pavement strengths, and runway end coordinates and elevations. The table also contains dimensions for RSA, ROFA, RPZs and POFZ. Taxiway safety areas and dimensions are also listed in the table.

- *Declared Distances Table* – Appendix 14 of the FAA's AC 150/5300-13, *Airport Design* defines the use of Declared Distances for airfield development. Declared Distances use an aircraft's runway performance to independently check: TORA, TODA, ASDA and LDA. Declared Distances are implemented at "constrained" airfields where RSAs are comprised. SSA is designed not to be a "constrained" airport and would meet current RSA criteria. FAA guidelines require analysis of Declared Distances at all facilities. Runway 9L-27R was

designed to meet IDOT's safety standards and not FAA design standards. Specific improvements are depicted on the plans to bring that runway into RSA compliance. Declared Distances for the Future ALP are included in a table on this sheet and discussed further in **Section 7 – Declared Distances**.

Exhibit 4-15 – Future Airport Data Sheet depicts the Future Airport Data Sheet for SSA's ALP.

4.16 Sheet 16 – Future Terminal Area Drawing

The Future Terminal Area Plan is an expanded view drawing of the Future ALP and focuses on the areas where aprons, buildings, hangars, and parking lots are located. Future airport facilities depicted on the terminal plan include the air passenger terminal, air cargo facilities, existing GA hangars, support facilities and the ATCT. Buildings shown on this sheet are also listed in a table that includes existing or future top of structure elevations. **Exhibit 4-16 – Future Terminal Area Drawing** depicts the Future Terminal Area Plan for SSA's ALP.

4.17 Sheet 17 – Future Airport Airspace Drawing

Future airspace planning depicted in the ALP is illustrated through two drawing series: the Future Airport Airspace Plan and the individual Inner Portion of the Approach Surface Drawings. Future Airport Airspace Plan is a holistic airspace view of the airfield configuration. Inner Portion of the Approach Surface Drawings are localized graphics for each runway end and are discussed in **Section 4.17 – Sheet 17 – Future Airport Airspace Drawing; Section 4.18 – Sheet 18 – Future Runway 9L Inner Portion of the Approach Surface Drawing; Section - 4.19 – Sheet 19 – Future Runway 27R Inner Portion of the Approach Surface Drawing and Section 4.20 – Sheet 20 – Future Runway 8R Inner Portion of the Approach Surface Drawing**. Airspace criteria used by FAA for airspace drawings is contained in CFR Part 77 – *Safe, Efficient Use, And Preservation of the Navigable Airspace*,[68] commonly referred to as Part 77.

The Future Airport Airspace Plan is a drawing that depicts the Part 77 imaginary surfaces that define navigable airspace surrounding an airport's runway system. Part 77 imaginary surface dimensions are defined by the weight of the aircraft using the runway (utility aircraft ≤12,500 pounds; greater than utility aircraft >12,500 pounds) and by the type of standard instrument approach procedures (visual, non-precision, precision) that are expected on each end of that runway. Penetration(s) of Part 77 surfaces by a fixed or moveable object(s) constitutes an obstruction to air navigation.

The airspace plan uses United States Geological Survey topographic sheets as its base map and depicts the entire inaugural airfield configuration. Smaller scaled profile views of inaugural approaches and obstruction data tables are also included. Runway numerals label the location of the airfield configuration and airspace slopes are defined at 50 foot elevation intervals. An extended runway centerline ground profile, based on the highest terrain across the width and along the length of the approach surface has been depicted. Specific Part 77 surfaces shown on the Future Airport Airspace Plan include:

- *Primary Surface* is a flat plane longitudinally centered on a runway. For runways with specially prepared hard surfaces, the primary surface extends 200 feet beyond each end of that runway; but when the runway has no specially prepared hard surface (turf, water, etc.), the primary surface ends at each end of that runway. The elevation of any point on the primary surface is the same as the elevation of the nearest point on the runway centerline. The width of the primary surface is:

  (1) 250 feet for utility runways having only visual approaches;
  (2) 500 feet for utility runways having non-precision instrument approaches;
  (3) For other than utility runways, the width is:
      (i) 500 feet for visual runways having only visual approaches;

[68] http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&rgn=div5&view=text&node=14:2.0.1.2.9&idno=14

(ii) 500 feet for non-precision instrument runways having visibility minimums greater than ¾ statue mile; and
(iii) 1,000 feet for a non-precision instrument runway having a non-precision instrument approach with visibility minimums as low as ¾ of a statute mile and for precision instrument runways.

The width of the primary surface of a runway shall be that width prescribed for the most precise approach existing or planned for either end of that runway.

- *Approach Surfaces* are imaginary planes longitudinally centered on the extended runway centerline and extending outward and upward from each end of the primary surface. An approach surface is applied to each end of each runway based upon the type of approach available or planned for that runway end.

(1) The inner edge of the approach surface is the same width as the primary surface and it expands uniformly to a width of:
  (i) 1,250 feet for that end of a utility runway with only visual approaches;
  (ii) 1,500 feet for that end of a runway other than a utility runway with only visual approaches;
  (iii) 2,000 feet for that end of a utility runway with a non-precision instrument approach;
  (iv) 3,500 feet for that end of a non-precision instrument runway other than utility, having visibility minimums greater that ¾ of a statute mile;
  (v) 4,000 feet for that end of a non-precision instrument runway, other than utility, having a non-precision instrument approach with visibility minimums as low as ¾ statute mile;
  (vi) 16,000 feet for precision instrument runways.
(2) The approach surface extends for a horizontal distance of:
  (i) 5,000 feet at a slope of 20 to 1 for all utility and visual runways;
  (ii) 10,000 feet at a slope of 34 to 1 for all non-precision instrument runways other than utility;
  (iii) 10,000 feet at a slope of 50 to 1 with an additional 40,000 feet at a slope of 40 to 1 for all precision instrument runways.
(3) The outer width of an approach surface to an end of a runway would be that width prescribed in this subsection for the most precise approach existing or planned for that runway end.

- *Transitional Surfaces* are imaginary planes that extend outward and upward at right angles to the runway centerline and the runway centerline extended at a slope of 7 to 1 from the sides of the primary surface and from the sides of the approach surfaces. Transitional surfaces for those portions of the precision approach surface which project through and beyond the limits of the conical surface extend a distance of 5,000 feet measured horizontally from the edge of the approach surface and at right angles to the runway centerline.

- *Horizontal Surface* is a flat plane 150 feet above the established airport elevation, the perimeter of which is constructed by swinging arcs of specified radii from the center of each end of the primary surface of each runway of each airport and connecting the adjacent arcs by lines tangent to those arcs. The radius of each arc is:

(1) 5,000 feet for all runways designated as utility or visual; and
(2) 10,000 feet for all other runways.

The radius of the arc specified for each end of a runway would have the same arithmetical value. That value shall be the highest determined for either end of the runway. When a 5,000-foot arc is encompassed by tangents connecting two adjacent 10,000-foot arcs, the 5,000-foot arc shall be disregarded on the construction of the perimeter of the horizontal surface.

- *Conical Surface* is a plane extending outward and upward from the periphery of the horizontal surface at a slope of 20 to 1 for a horizontal distance of 4,000 feet.

Exhibit 4-17 – Future Airport Airspace Drawing depicts the Future Airport Airspace Plan for SSA's ALP.

4.18 Sheet 18 – Future Runway 9L Inner Portion of the Approach Surface Drawing

The Future Runway 9L Inner Portion of the Approach Surface Drawing is a close up view of the immediate runway end approach area. Safe aircraft operations require the removal and restriction of obstructions to air navigation. One of the most critical parts of a flight is on approach to a runway end. Penetrations to traverse ways (FAR Part 77, Threshold Siting Criteria, Departure Surface-One-Engine Inoperative obstacle identification surface, etc.) are numerically identified in a table with elevations, computed vertical clearances and object disposition. This sheet also depicts safety areas (RPZs, RSAs, ROFAs, POFZs, etc.) and identifies any penetrations to those criteria. The coverage of this drawing is limited to the RPZ area. Additional geographic features include ground contours, roads, railroads and airport boundary limits are also depicted. **Exhibit 4-18 – Future Runway 9L Inner Portion of the Approach Surface Drawing** depicts the Future Runway 9L Inner Portion of the Approach Surface Drawing for SSA's ALP.

4.19 Sheet 19 – Future Runway 27R Inner Portion of the Approach Surface Drawing

The Future Runway 27R Inner Portion of the Approach Surface Drawing is a close up view of the immediate runway end approach area. Safe aircraft operations require the removal and restriction of obstructions to air navigation. One of the most critical parts of a flight is on approach to a runway end. Penetrations to traverse ways (FAR Part 77, Threshold Siting Criteria, Departure Surface-One-Engine Inoperative obstacle identification surface, etc.) are numerically identified in a table with elevations, computed vertical clearances and object disposition. This sheet also depicts safety areas (RPZs, RSAs, ROFAs, POFZs, etc.) and identifies any penetrations to those criteria. The coverage of this drawing is limited to the RPZ area. Additional geographic features include ground contours, roads, railroads and airport boundary limits are also depicted. **Exhibit 4-19 – Future Runway 27R Inner Portion of the Approach Surface Drawing** depicts the Future Runway 27R Inner Portion of the Approach Surface Drawing for SSA's ALP.

4.20 Sheet 20 – Future Runway 8R Inner Portion of the Approach Surface Drawing

The Future Runway 8R Inner Portion of the Approach Surface Drawing is a close up view of the immediate runway end approach area. Safe aircraft operations require the removal and restriction of obstructions to air navigation. One of the most critical parts of a flight is on approach to a runway end. Penetrations to traverse ways (FAR Part 77, Threshold Siting Criteria, Departure Surface, etc.) are numerically identified in a table with elevations, computed vertical clearances and object disposition. This sheet also depicts safety areas (RPZs, RSAs, ROFAs, POFZs, etc.) and identifies any penetrations to those criteria. The coverage of this drawing is limited to the RPZ area. Additional geographic features include ground contours, roads, railroads and airport boundary limits are also depicted. **Exhibit 4-20 – Future Runway 8R Inner Portion of the Approach Surface Drawing** depicts the Future Runway 8R Inner Portion of the Approach Surface Drawing for SSA's ALP.

4.21 Sheet 21 – Future Runway 26L Inner Portion of the Approach Surface Drawing

The Future Runway 26L Inner Portion of the Approach Surface Drawing is a close up view of the immediate runway end approach area. Safe aircraft operations require the removal and restriction of obstructions to air navigation. One of the critical parts of a flight is on approach to a runway end. Penetrations to traverse ways (FAR Part 77, Threshold Siting Criteria, Departure Surface, etc.) are numerically identified in a table with elevations, computed vertical clearances and object disposition. This sheet also depicts safety areas (RPZs, RSAs, ROFAs, POFZs, etc.) and identifies any penetrations to those criteria. The coverage of this drawing is limited to the RPZ area. Additional geographic features include ground contours, roads, railroads and airport boundary limits are also depicted. **Exhibit 4-21 – Future Runway 26L Inner Portion of the Approach Surface Drawing** depicts the Future Runway 26L Inner Portion of the Approach Surface Drawing for SSA's ALP.

4.22 Sheet 22 – Future Airport Land Use Drawing

The Future Airport Land Use Plan depicts on-airport and off-airport land uses. On-airport land uses include: airfield pavements, terminal areas, ancillary and support facilities, GA/Corporate aviation facilities, property boundaries, aircraft operations areas, etc. Future off-airport land uses include: airport lands, municipal boundaries, cemeteries, commercial uses, industrial uses, institutional uses, residential uses, recreational uses, vacant/agricultural uses and open water. Public facilities such as schools, parks, forest preserves and other similar developments are shown on the plan. Future airport features (runways, taxiways, aprons, RPZs, buildings, NAVAIDS, etc.) are graphically included on the plan. **Exhibit 4-22 – Future Airport Land Use Drawing** depicts the Future Airport Land Use Plan for SSA's ALP.

4.23 Sheet 23 – Future Airport Property Map

From the start of the land acquisition process, IDOT has maintained an Exhibit "A" Property Line Map of all acquired land and property. That document is the basis of the Future Property Line Map. This sheet includes a map of land parcels overlaid on top of inaugural airport features (runways, taxiways, terminals, roadways, NAVAIDS, safety areas etc.). **Exhibit 4-23 – Future Airport Property Map** depicts the Future Airport Property Map for SSA's ALP.

Section 5 – Runway Safety Area Determination

FAA describes a RSA as *"A defined surface surrounding the runway prepared or suitable for reducing the risk of damage to airplanes in the event of an undershoot, overshoot or excursion from the runway"*.[69] RSA dimensions are defined in FAA's AC 150/5300-13, *Airport Design* and are based on the runway's Approach Category and ADG. FAA has instituted a national RSA monitoring plan that is defined in FAA's Order 5200.8, *Runway Safety Area Program*.[70] The objective of the Runway Safety Area Program is that all RSAs at federally obligated airports and at airports certificated under 14 Code of Federal Regulations Part 139 shall conform to the standards contained in AC 150/5300-13, *Airport Design*, to the extent practicable.

Inaugural Runway 9R-27L RSA[71] is designed to be 500 feet, 250 feet on either side of the runway centerline and extends the full runway length to a point 1,000 feet beyond both runway ends. Runway 9R-27L would be constructed to be compliant with FAA RSA design criterion. The existing GA/Corporate Inaugural Runway 9L-27R RSA[72] is 120 feet wide, 60 feet either side of the runway centerline, and extends the full runway length to a point 240 feet beyond both ends. Presently Kedzie Avenue penetrates Inaugural Runway 9L RSA by 141 feet and Western Avenue penetrates Inaugural 27R RSA by 137 feet. The Inaugural ALP depicts relocation of Kedzie Avenue outside of the RSA and the closure of Western Avenue. These actions provide compliant RSAs for Inaugural Runway 9L-27R.

A Runway Safety Area Determination request is normally submitted to FAA during an airport master plan or ALP review. As part of the ALP airspace determination study and to fulfill the requirements of the RSA Program, a draft RSA Determination for Inaugural Runway 9L-27R is included in this report. See **Exhibit 5-1 – Draft Runway Safety Area Determination for Inaugural Runway 9L-27R**.

[69] FAA Advisory Circular 150/5300-13, "Airport Design".
[70] http://www.faa.gov/airports/resources/publications/orders/media/Construction_5200_8.pdf
[71] FAA Advisory Circular 150/5300-13, "Airport Design", Table 3-3. Runway design standards for aircraft approach categories C & D.
[72] FAA Advisory Circular 150/5300-13, "Airport Design", Table 3-1 Runway design standards for aircraft approach category A & B visual runways and runways with not lower than 3/4-statute mile (1,200 m) approach visibility minimums.

Section 6 – Modification to Standards

FAA Great Lakes Region issued a **Policy and Procedures Memorandum 5320.1G** on February 13, 2001 entitled *General Processing of Modifications to Agency Airport Design and Construction Standards*.[73] This guidance document provides a framework for FAA review and action regarding the issuance of Modification to Standards. A Modification to Standards request is normally submitted to FAA during an airport master plan or ALP review.

The proposed airfield facilities for the SSA ALP are designed to meet and/or exceed FAA design criteria and thereby no modification to standards for those improvements is required. However, there are specific safety areas, associated with the existing GA/Corporate aviation runway, which do not meet FAA criteria. From inspection of the Inaugural ALP Drawing (**Exhibit 4-3 – Inaugural Airport Layout Drawing**), the ROFA and the RPZ for Inaugural Runway 9L-27R are traversed by existing roadways.

FAA describes an Object Free Area as "*An area on the ground centered on a runway, taxiway, or taxilane centerline provided to enhance the safety of aircraft operations by having the area free of objects, except for objects that need to be located in the OFA for air navigation or aircraft ground maneuvering purposes*."[74] As noted previously, the ROFA beyond both thresholds of Inaugural Runway 9L-27R are crossed by existing roadways. Specifically, the Inaugural Runway 9L ROFA is penetrated 99 feet by Kedzie Avenue and Runway 27R ROFA is penetrated 103 feet by Western Avenue. **Exhibit 6-1 – Inaugural Runway 9L-27R Object Free Area Penetrations Map** includes an expanded view that depicts the ROFA surface penetrations. A modification to standards action is required for this safety issue. **Exhibit 6-2 – Draft Modification to Standards for Runway 9L-27R** provides a draft Modification to Standards request to FAA for the ROFA penetrations.

FAA describes an RPZ as "*An area off the runway end to enhance the protection of people and property on the ground.*" Adherence to these criteria is normally achieved through airport ownership and control of the RPZ. Such controls include clearing RPZ areas and maintain them clear of incompatible objects and activities. Paragraph 212(a)(2)(b) of FAA AC 150/5300-13, *Airport Design* states those land uses that are not compatible with a RPZ are:

> *"Land uses prohibited from the RPZ are residences and places of public assembly. (Churches, schools, hospitals, office buildings, shopping centers, and other uses with similar concentrations of persons typify places of public assembly.) Fuel storage facilities may not be located in the RPZ."*

The location of the roadways through the Runway 9L-27R RPZ's, while not desirable, are not a specific prohibited activity and as such a modification to standards is not required.

To resolve these safety issues, the Inaugural ALP Drawing depicts the relocation of Kedzie Avenue outside of the ROFA and RPZ and the closure of Western Avenue. These combined actions include proper grading and provides compliant ROFA's for Inaugural Runway 9L-27R.

[73] http://www.faa.gov/airports/great_lakes/airports_resources/ppms/media/5320-1G.pdf
[74] http://www.faa.gov/documentLibrary/media/Advisory_Circular/150_5300_13_chg18_consolidated.pdf

Section 7 – Declared Distances

Appendix 14 of the FAA's AC 150/5300-13, defines the use of Declared Distances for airfield development. Declared Distances use an aircraft's runway performance to independently check: TORA, TODA, ASDA and LDA. Declared Distances are implemented at "constrained" airfields where RSAs are comprised. SSA is designed to not be a "constrained" airport and shall meet or exceed current RSA criteria. The FAA's ALP Checklist discussed in **Section 8 – Airport Layout Plan Checklist** of this report requires the inclusion of Declared Distances for all runways.

Inaugural Runway 9L-27R was originally designed and constructed to meet IDOT safety standards and not FAA design standards. Inclusion of this runway into the SSA airfield configuration requires specific improvements depicted on the Inaugural ALP that bring Runway 9L-27R into complete RSA compliance. Declared Distances for both Inaugural runways are listed in **Table 7-1: Inaugural Runways Declared Distance Analysis**. For a graphically portrayal of the declared distances criteria see **Exhibit 7-1 – Inaugural Runway 9R-27L Declared Distances Map** and **Exhibit 7-2 - Inaugural Runway 9L-27R Declared Distances Map**.

Table 7-1: Inaugural Runways Declared Distance Analysis

Airport Facility	TORA	TODA	ASDA	LDA
Runway 9L-27R	5,001 ft	5,001 ft	5,001 ft	5,001 ft/4,850 ft
Runway 9R-27L	9,500 ft	9,500 ft	9,500 ft	9,500 ft

For planning purposes, the declared distances for the runways depicted on the Future ALP drawing are contained in **Table 7-2: Future Runways Declared Distance Analysis**. The Declared Distances for these runways are depicted in the following exhibits:

Table 7-2: Future Runways Declared Distance Analysis

Airport Facility	TORA	TODA	ASDA	LDA
Runway 8L-26R	7,500 ft	7,500 ft	7,500 ft	7,500 ft
Runway 8C-26R	10,000 ft	10,000 ft	10,000 ft	10,000 ft
Runway 8R-26L	12,000 ft	12,000 ft	12,000 ft	12,000 ft
Runway 9L-27R	12,000 ft	12,000 ft	12,000 ft	12,000 ft
Runway 9C-27C	10,000 ft	10,000 ft	10,000 ft	10,000 ft
Runway 9R-27L	10,000 ft	10,000 ft	10,000 ft	10,000 ft

Section 8 – Airport Layout Plan Checklist

All Federally obligated airports are required as part of their grant assurances to "keep up to date at all times an airport layout plan of the airport showing:

- boundaries of the airport and all proposed additions thereto, together with the boundaries of all offsite areas owned or controlled by the sponsor for airport purposes and proposed additions thereto;
- the location and nature of all existing and proposed airport facilities and structures (such as runways, taxiways, aprons, terminal buildings, hangars and roads), including all proposed extensions and reductions of existing airport facilities; and
- the location of all existing and proposed non-aviation areas and of all existing improvements thereon".[75]

The FAA's Great Lakes Regional Guidance Letter 5070.1[76] further states that: *"Such airport layout plans and each amendment, revision, or modification thereof, shall be subject to the approval of the Secretary by the signature of a duly authorized representative of the Secretary on the face of the airport layout plan. The sponsor will not make or permit any changes or alterations in the airport or any of its facilities which are not in conformity with the airport layout plan as approved by the Secretary and which might, in the opinion of the Secretary, adversely affect the safety, utility, or efficiency of the airport."*

FAA AC 150/5070-6B, Change 1, *Airport Master Plans*[77] provides guidance on the preparation of ALPs. In order to maximize clarity, minimize costs and optimize the process of FAA review and approval of ALPs, the FAA Great Lakes Region has developed a supplemental RGL 5070-1 to provide a standardized checklist to be used for all ALPs prepared in the Great Lakes Region. SSA's ALP Checklist is contained in **Exhibit 8-1 – South Suburban Airport Layout Plan Checklist.**

This Airport Plans Report, as a companion document to the full-size ALP set, is being submitted to the FAA-Chicago Airports District Office for their review. IDOT, as a part of this ALP submittal, has requested that the FAA conduct an Airspace Determination Study (airside landing area development per 14 CFR Part 77, Part 152 and Part 157) on the subject ALP. IDOT has also requested that the FAA accept the SSA ALP as a "Plan on File" for the purposes of 14 CFR Part 77, *Obstruction Evaluations* and potentially 14 CFR Part 152, *Airport Aid Program,* subject to appropriate NEPA approvals.

[75] http://www.faa.gov/airports/great_lakes/airports_resources/ppms/media/5070-1.pdf
[76] Ibid.
[77] http://www.faa.gov/documentLibrary/media/advisory_circular/150-5070-6B/150_5070_6b_chg1.pdf

Section 9 –Non-Design Related Airport Classifications

The *South Suburban Airport Forecasts 2009: Verification of 2004 Forecasts,*[78] approved by the FAA, estimated approximately 471,000 annual passenger enplanements in DBO+5. To uniformly compare public-use, aeronautical facilities in the United States that may be eligible for federal funding, several airport categories have been created. Most categories are dependent on the type and amount of passengers and air cargo served at a specific location. Federal funding, commonly referred to as Airport Improvement Program funds, is for civil use only.

9.1 Airport Classifications Based on Passenger Boardings

Airports who enplane (board) 10,001 or more passengers in a single year are classified as Primary Airports. Airports who enplane 2,500 passengers, up to 10,000 passengers are called Commercial Service Airports.[79] Smaller airfields that have no commercial service (or less that 2,500 passengers annually) are normally identified as GA and/or corporate aviation airports. Certain GA/Corporate aviation airports in large metropolitan areas such as Chicago, that provide alternative GA access to an existing commercial airport and thereby relieve congestion at that facility, are called GA Reliever Airports. Based on the approved Forecast Report it is anticipated that SSA would become a Primary Airport (19,575 enplanements) after its first year of operation. SSA also provides a convenient regional entry point for GA/Corporate aviation users desiring to access the southern Chicago metropolitan area. It is expected that SSA would also have an added dual classification as a GA Reliever Airport to MDW.

To classify airports by the magnitude of passenger levels, FAA has created the definitions of Large Hub, Medium Hub, Small Hub, Non-Hub (Primary) and Non-Hub Commercial Service Airports. A Large Hub Airport is defined as having 1% or more of all national passenger boardings. Examples of a large hub airport include Chicago O'Hare International Airport and MDW. A Medium Hub Airport is defined of having at least 0.25% of the national boarding but less than 1%. Two examples of Medium Hub Airports include Indianapolis International Airport and Nashville International Airport. Small Hub Airports are defined as having at least 0.05% of the national boardings but less that 0.25%. Examples of Small Hub Airports include Quad City International Airport in Moline, Illinois and Santa Barbara Airport in California. The Non-Hub Airport category has been subdivided into two sections: Non-Hub Primary Airport and Non-Hub Commercial Service Airport. Airports that enplane less that 0.05% of the national passenger levels but greater than 10,000 in a single year are called Non-Hub Primary Airports. Examples of Non Hub Primary Airports include Central Illinois Regional Airport in Bloomington, Peoria International Airport and Abraham Lincoln Capital Airport in Springfield. Airports that enplane at least 2,500 passengers, but less than 10,000 on annual basis, are called Non Hub Commercial Service Airports. Examples of Non Hub Commercial Service Airports include Decatur Airport in Decatur, Illinois and the Quincy Regional Airport in Quincy, Illinois. The forecast report anticipates that SSA would be placed in the Small Hub Airport category by DBO+5.

9.2 Airport Classifications Based on Air Cargo Landed Weight

Cargo Service Airports are those facilities that are served by aircraft providing air cargo transportation flights that have an annual total landed weight of more than 100 million pounds. "Landed Weight" is defined as the weight of an aircraft transporting only cargo in intrastate, interstate or foreign air transportation. An airport may be both a commercial service and cargo service airport. Examples of Cargo Service Airports that are also commercial service facilities include Chicago O'Hare International Airport and Chicago Rockford International Airport. Based on the *South Suburban Airport Forecasts 2009: Verification of 2004 Forecasts* it is anticipated that SSA will not be eligible for consideration as a Cargo Service Airport through DBO+20.

[78] Ibid.
[79] http://www.faa.gov/airports/planning_capacity/passenger_allcargo_stats/categories/

Section 10 – AGIS/eALP Preparation

The FAA has begun a new initiative to streamline the airport survey process and centralize airport data storage into one integrated web-based Geographic Information System (GIS) called "Airports-GIS (AGIS)." The AGIS program defines the FAA process for the collection and maintenance of airport and aeronautical data. This new process was developed in large part to meet the demands of the FAA's *"next generation"* NAS which requires accurate survey data. The AGIS system is designed to be a complete "*one-stop-shopping*" site for obtaining and maintaining airport data. FAA's initiative to centralize data storage through AGIS, combined with new AC requirements for geospatial and aeronautical data formulation, has created a change in the way survey data is gathered and processed.

Specifically FAA has issued three AC's that help guide the AGIS process. **AC 150/5300-16A, *General Guidance Specifications for Aeronautical Surveys Establishment of Geodetic Control and Submission of the National Geodetic Survey***[80] defines the geodetic control necessary in surveys conducted on or near an airport. **AC 150/5300-17C, *Standards For Using Remote Sensing Technologies in Airport Surveys.***[81] as the title states, provides specifications for the imagery used to support the aeronautical information and surveys outlined in AC 16A. **AC 150/5300-18B, *General Guidance And Specifications For Submission Of Aeronautical Surveys To NGS: Field Data Collection And Geographic Information System (GIS) Standards***[82] is the final piece that provides the specifications for the collection of airport data and explains how to submit data to the FAA.

FAA Great Lakes Region issued a **RGL 5300.4, *Airports GIS Data Collection Implementation Policy***[83] on August 11, 2010 regarding implementation of AGIS and specifically ACs -16, -17 and -18. **RGL 5300.4** states that: "*Airport Master Plans and ALP's using ACs -16, -17, and -18 should be limited to Large and Medium Hub airports, pilot program airports, and those airports desiring to fully implement Airports GIS by FY-2012". In addition FAA Great Lakes also issued RGL 5070.1 "Preparation and Review of Airport Layout Plans*". This RGL also requires airports who desire new or modified instrumental approach procedures to conduct surveys that comply with ACs -16, -17, and -18.

As noted in **Section 9 – Non-Design Related Airport Classifications** of this report, SSA is anticipated to be listed in the Small Hub Airport category by DBO+5. Also, the GA/Corporate aviation runway (Inaugural Runway 9L-27R) presently has standard instrument approach procedures already in place to both runway ends. These two items in themselves do not require additional survey actions to meet the requirements of RGL 5300.4. However, creation of new standard instrument approach procedures to both ends of the new Inaugural Runway 9R-27L require appropriate surveys and data collection compliant with the requirements of RGL 5300.4. Since Runway 9R-27L has not yet been constructed and due to the limited shelf-life of the survey data to be used for creating the new instrument approach procedures, it is anticipated that as the Runway 9R-27L is built, RGL-5300.4 survey and data collection shall be accomplished.

[80] http://www.faa.gov/documentlibrary/media/advisory_circular/150-5300-16a/150_5300_16a.pdf
[81] http://www.faa.gov/documentLibrary/media/Advisory_Circular/150_5300_17c.pdf
[82] http://www.faa.gov/documentLibrary/media/Advisory_Circular/150_5300_18b.pdf
[83] http://www.faa.gov/airports/great_lakes/airports_resources/ppms/media/5300-4.pdf