Section 3 - Refinement of the Ultimate Airfield Concept

Using the Base Concept identified in Section 2, IDOT re-examined the ultimate airfield concept to determine if any modifications were feasible and/or desirable. A series of modifications to the Base Concept were proposed to see if the footprint of the airport could be reduced while still preserving the option of a potential future airfield capable of accommodating four simultaneous precision instrument approaches. In addition, a number of alternative concepts were submitted to the FAA through the FAA's Tier 2 Environmental Impact Statement (EIS) scoping process. Scoping Meetings on the proposed construction and operation of Inaugural Airport facilities at SSA were held on December 3, 2003. The public comment period for scoping ran from October 28, 2003 through December 19, 2003.

In 2004, IDOT held a series of Local Advisory Group meetings to present information on the Master Plan process to locally affected municipalities, government agencies and the interested public. These Local Advisory Group meetings have provided a forum for the identification of alternative airport concepts. At the first meeting, the participants were divided into several table groups to interact in discussion of the Ultimate Airport Plan as depicted in the 1998 Phase 1 Engineering Study, including focused discussion on two subjects: (1) Transportation - to and around the new airport; and, (2) Land use around the airport. During the Local Advisory Group meeting a number of ultimate airfield alternatives were discussed. Consequently, IDOT identified several alternatives to the Base Concept for the ultimate airfield, based on alternative concepts submitted to FAA during scoping, comments received during the Local Advisory Group meetings, and internal development of alternative airfield concepts. Two of the alternatives submitted by the Local Advisory Group were judged as being materially different than the alternatives identified by the project team to date. These alternatives were included in the following ultimate airfield alternatives analysis as Alternatives 6.7 and 6.8. Results of the Local Advisory Group meetings are summarized in a separate report to be made available with the final Master Plan Report.

3.1 Base Concept Ultimate Airfield Alternatives

Eight ultimate airfield concept alternatives were identified that were derived from the recommended concept in the *Phase I Engineering Study*. While the Base Concept included a crosswind runway for general aviation and commuter aircraft, subsequent analyses by IDOT have determined that a short crosswind runway will not be needed at SSA if it develops into an ultimate configuration. This determination was made based on changes in the projected fleet mix, where commuter aircraft are expected to consist of regional jets that do not require a crosswind runway. In addition, if activity levels at SSA require four independent parallel runways, general aviation (GA) activity will be minimal as evidenced at major U.S. airports such as Chicago O'Hare International Airport. Thus, while the Base Concept continues to include a small commuter crosswind runway, none of the other alternatives considered in this section include one. For reference purposes, all alternative concepts show the ultimate acquisition boundary as determined in the Tier 1 Environmental Impact Statement (EIS).[1] Following is a brief description of the eight airfield concept alternatives:

- ***Alternative 6.0 (Base Concept)*** is the recommended airfield concept from the *Phase 1 Engineering Study*: six parallel runways in an east-west direction and one crosswind runway in a northwest-southeast orientation

[1] FAA, *Final Environmental Impact Statement, Tier 1: FAA Site Approval and Land Acquisition by the State of Illinois, Proposed South Suburban Airport,* April 2002.

(see **Exhibit 3-1**). This concept would have a north and south airfield, both with three parallel runways; 7,400 feet would separate the inner runways to provide space for terminal and gate facilities. The inner and the outer runways on both the north and south airfield would have a 5,000-foot separation with a departures only runway located in between.

- ***Alternative 6.1*** is a derivation of the base concept. The space for terminal and gate facilities was reduced to the minimum (5,000 feet) by shifting the north airfield south and the crosswind runway was eliminated. (see **Exhibit 3-2**).

- ***Alternative 6.2*** is an additional reduction of Alternative 6.1, where the distance between the inner and outer runways for both the north and south airfield was reduced to 4,300 feet, the absolute minimum separation for independent parallel runways. (see **Exhibit 3-3**).

- ***Alternative 6.3*** proposes relocating (shifting) the entire airfield southward by approximately 3,000 feet. The runway separation would remain the same as the base concept. This shifting was done to determine if there would be any benefits to a more southerly location of the airfield. (see **Exhibit 3-4**).

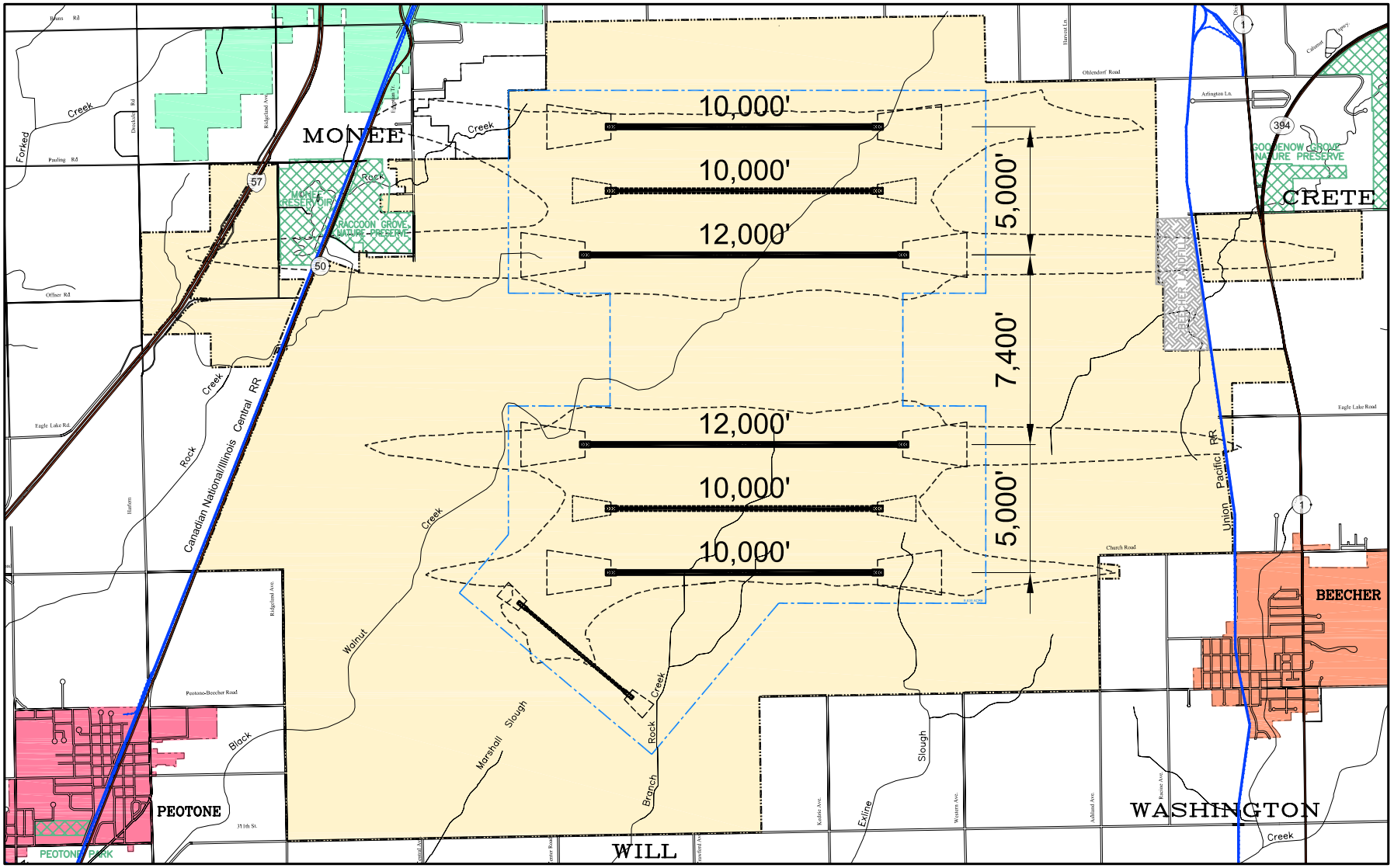
- ***Alternative 6.4*** shifts the three northern runways approximately 1-mile to the east. The runway separation distances would remain the same as the Base Concept. This alternative tests if there would be any benefits to a more easterly location for those runways. (see **Exhibit 3-5**).

- ***Alternative 6.5*** is a variation of Alternative 6.4; it shifts *only* the northernmost runway eastward by approximately 3,000 feet and reduces its length from 10,000 feet to 7,500 feet (see **Exhibit 3-6**). The rest of the airfield remains unmodified.

- ***Alternative 6.6*** decreases the length of the northernmost runway from 10,000 to 7,500 feet, but keeps the eastern end fixed (see **Exhibit 3-7**). ALNAC's ultimate airfield proposal prefers Alternative 6.6 primarily due to the flexibility provided by two 12,000-foot runways and two 10,000-foot runways with significant separation (7,400 feet) and a flexible infield.

- ***Alternative 6.7*** was proposed by the Village of Crete and includes four parallel runways with an east-west orientation (see **Exhibit 3-8**). The south inner runway would be 10,000 feet long and shifted approximately ¼-mile north of Eagle Lake Road, ending west of Kedzie Avenue. The north inner runway would be staggered to the east (the east end of the runway would end ¼-mile west of Western Avenue). The separation distance between the inner runways would be 5,000 feet and the distance between the outer and the inner runways would be 2,500 feet. This alternative represents the most compact airfield alternative.

- ***Alternative 6.8*** was proposed by the Village of Beecher and consists of six parallel runways in an east-west direction (see **Exhibit 3-9**). This alternative shifts the entire airfield approximately 3,000 feet to the north. The alignment of the inner south runway would be shifted 2,500 feet north of Eagle Lake Road and 2,500 feet west of the original east end point. The separation between the inner runways would be 5,000 feet. The outer runways would also have a 5,000-foot separation from the inner runways.



TAMS an Earth Tech Company

N

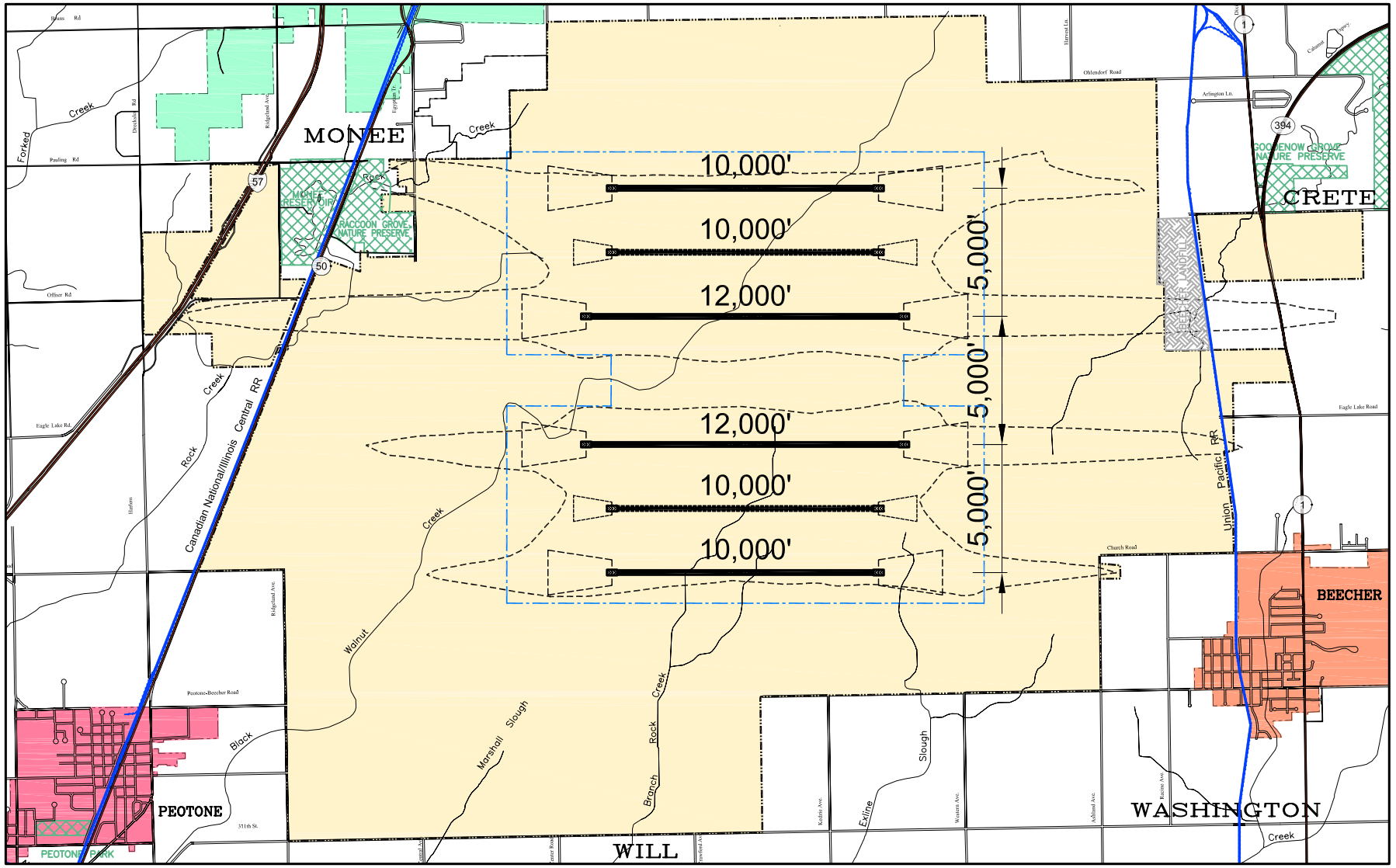
0 3000 6000 ft

Legend

- PROPOSED AIRPORT BOUNDARY
- PROPOSED AIRPORT RUNWAY
- 65 DNL NOISE CONTOUR
- AIR OPERATION AREA (AOA)
- PARK LAND
- LANDFILL (CLOSED)

Refinement of the Ultimate Airfield Concept Alternative 6.0 (Base Concept)

Exhibit 3-1



TAMS an Earth Tech Company

N

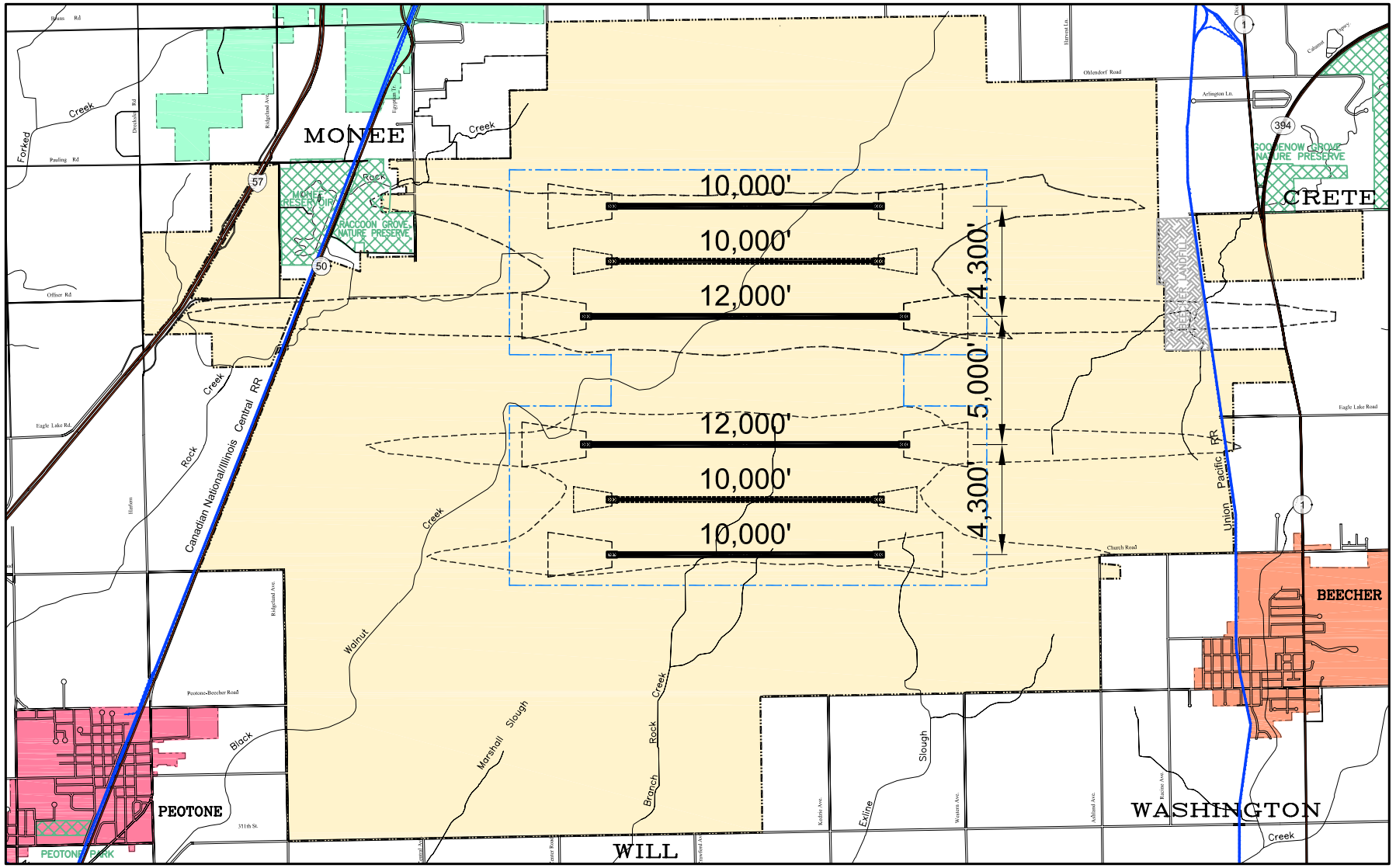
0 3000 6000 ft

Legend

- PROPOSED AIRPORT BOUNDARY
- PROPOSED AIRPORT RUNWAY
- 65 DNL NOISE CONTOUR
- AIR OPERATIONS AREA (AOA)
- PARK LAND
- LANDFILL (CLOSED)

Refinement of the Ultimate Airfield Concept
Alternative 6.1
(Reduce the Inner Runway Separation to 5,000')

Exhibit 3-2



TAMS an Earth Tech Company

N

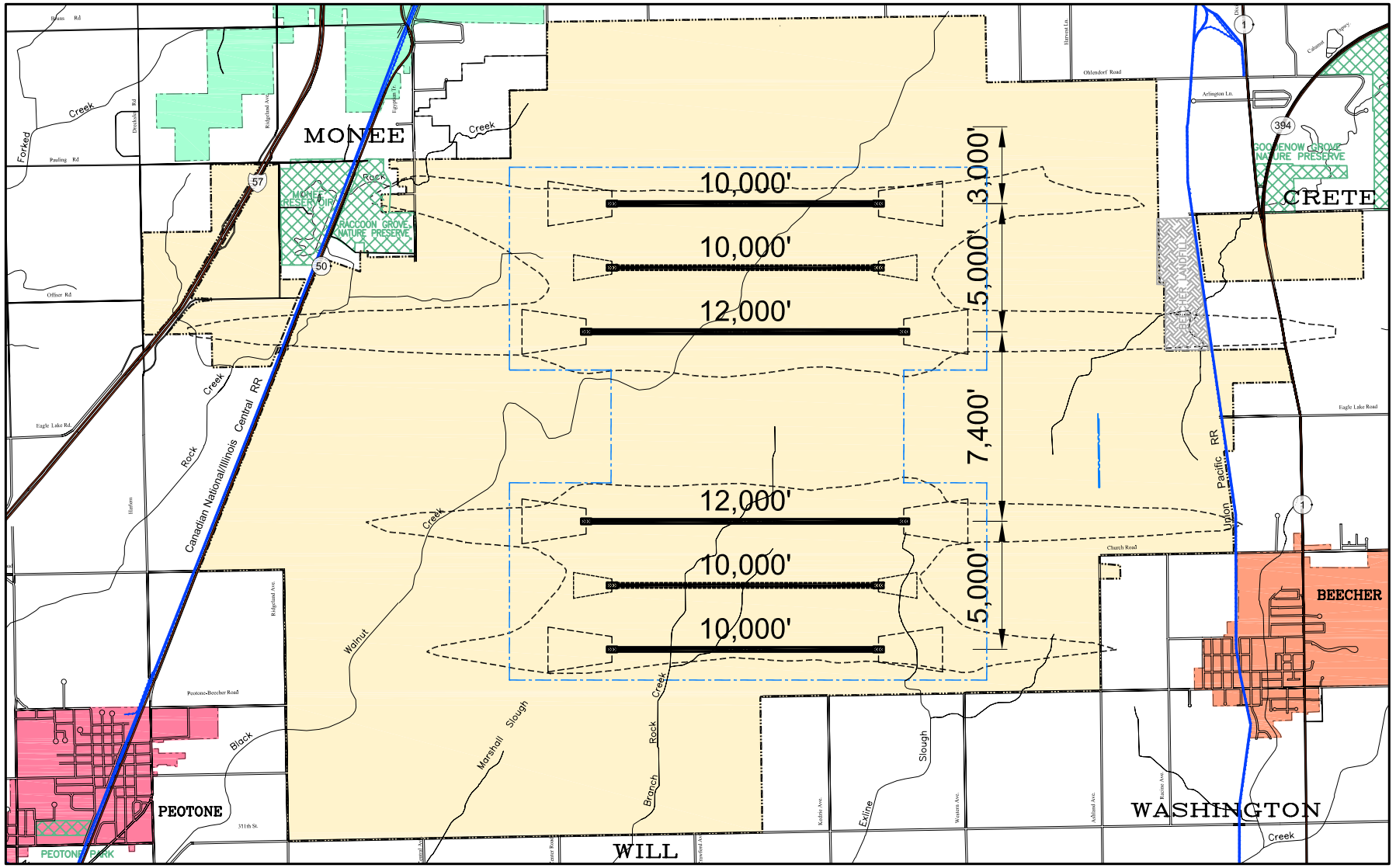
0 3000 6000 ft

Legend

- PROPOSED AIRPORT BOUNDARY
- PROPOSED AIRPORT RUNWAY
- 65 DNL NOISE CONTOUR
- AIR OPERATION AREA (AOA)
- PARK LAND
- LANDFILL (CLOSED)

Refinement of the Ultimate Airfield Concept
Alternative 6.2
(5,000' Separation for Inner R/W's; 4,300' for Outer R/W's)

Exhibit 3-3



TAMS an Earth Tech Company

N

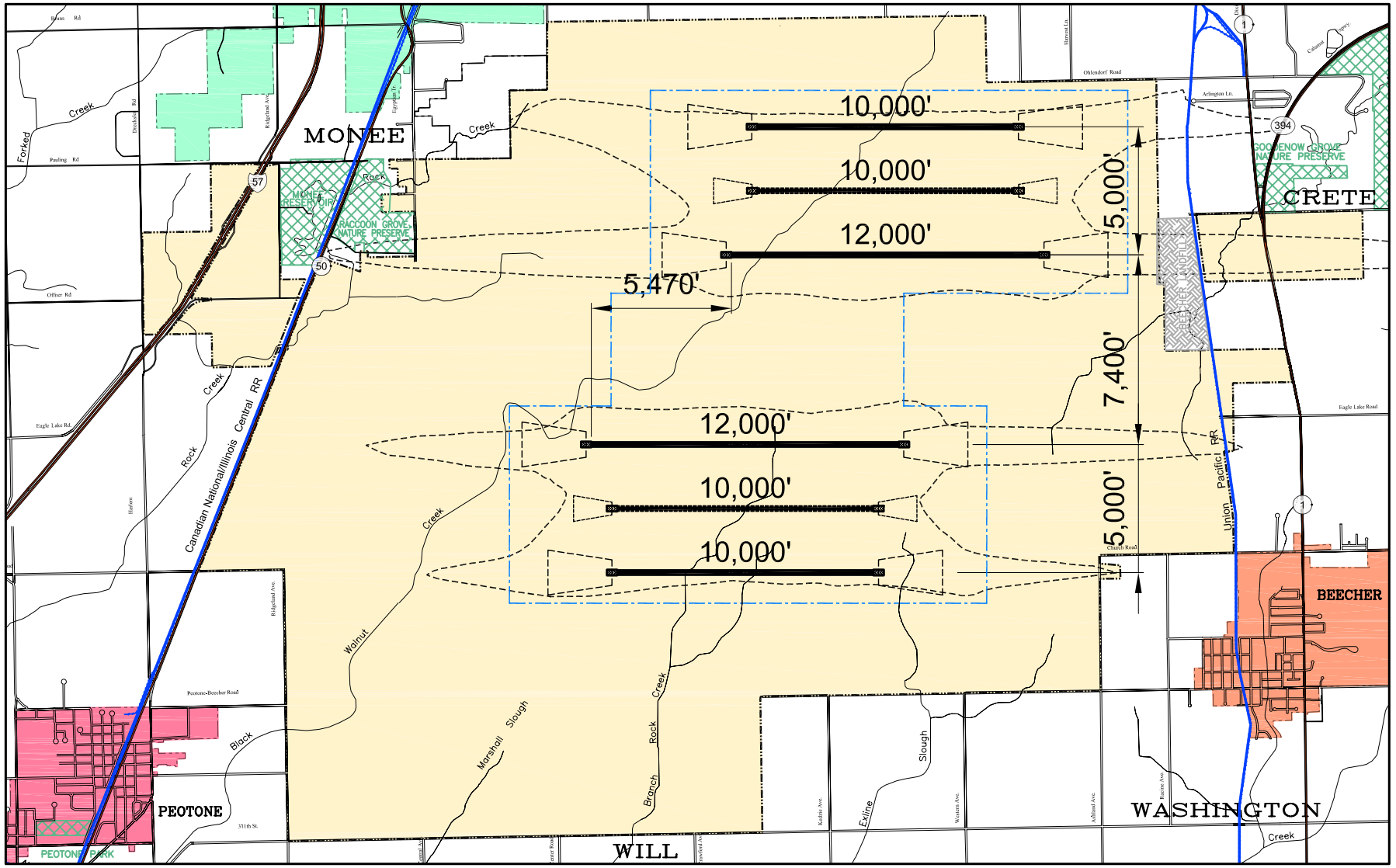
0 3000 6000 ft

Legend

- PROPOSED AIRPORT BOUNDARY
- PROPOSED AIRPORT RUNWAY
- 65 DNL NOISE CONTOUR
- AIR OPERATION AREA (AOA)
- PARK LAND
- LANDFILL (CLOSED)

Refinement of the Ultimate Airfield Concept
Alternative 6.3
(Shift the Entire Airfield to the South)

Exhibit 3-4



TAMS an Earth Tech Company

N

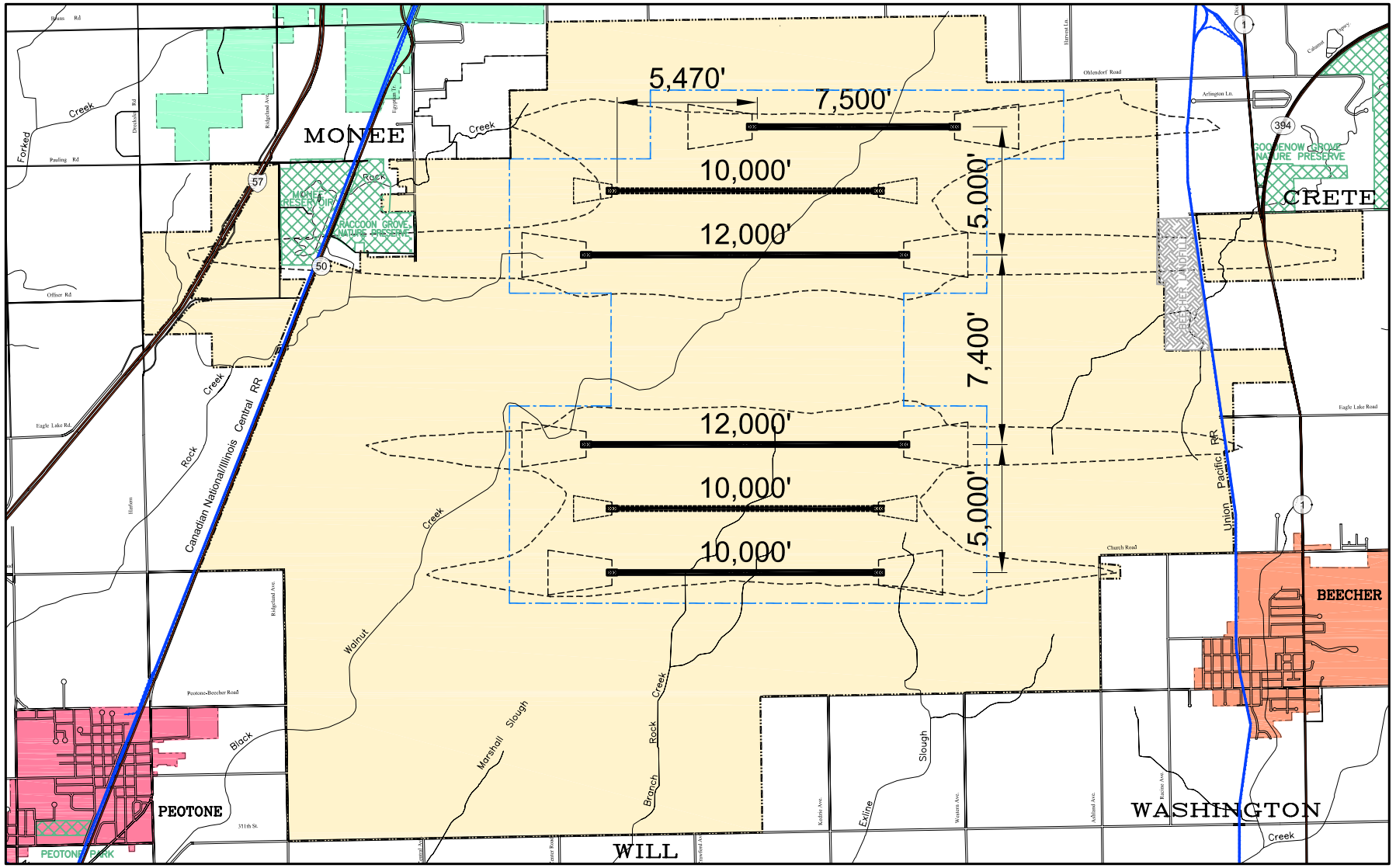
0 3000 6000 ft

Legend

- PROPOSED AIRPORT BOUNDARY
- PROPOSED AIRPORT RUNWAY
- 65 DNL NOISE CONTOUR
- AIR OPERATION AREA (AOA)
- PARK LAND
- LANDFILL (CLOSED)

Refinement of the Ultimate Airfield Concept
Alternative 6.4
(Stagger All North Runways to the East)

Exhibit 3-5



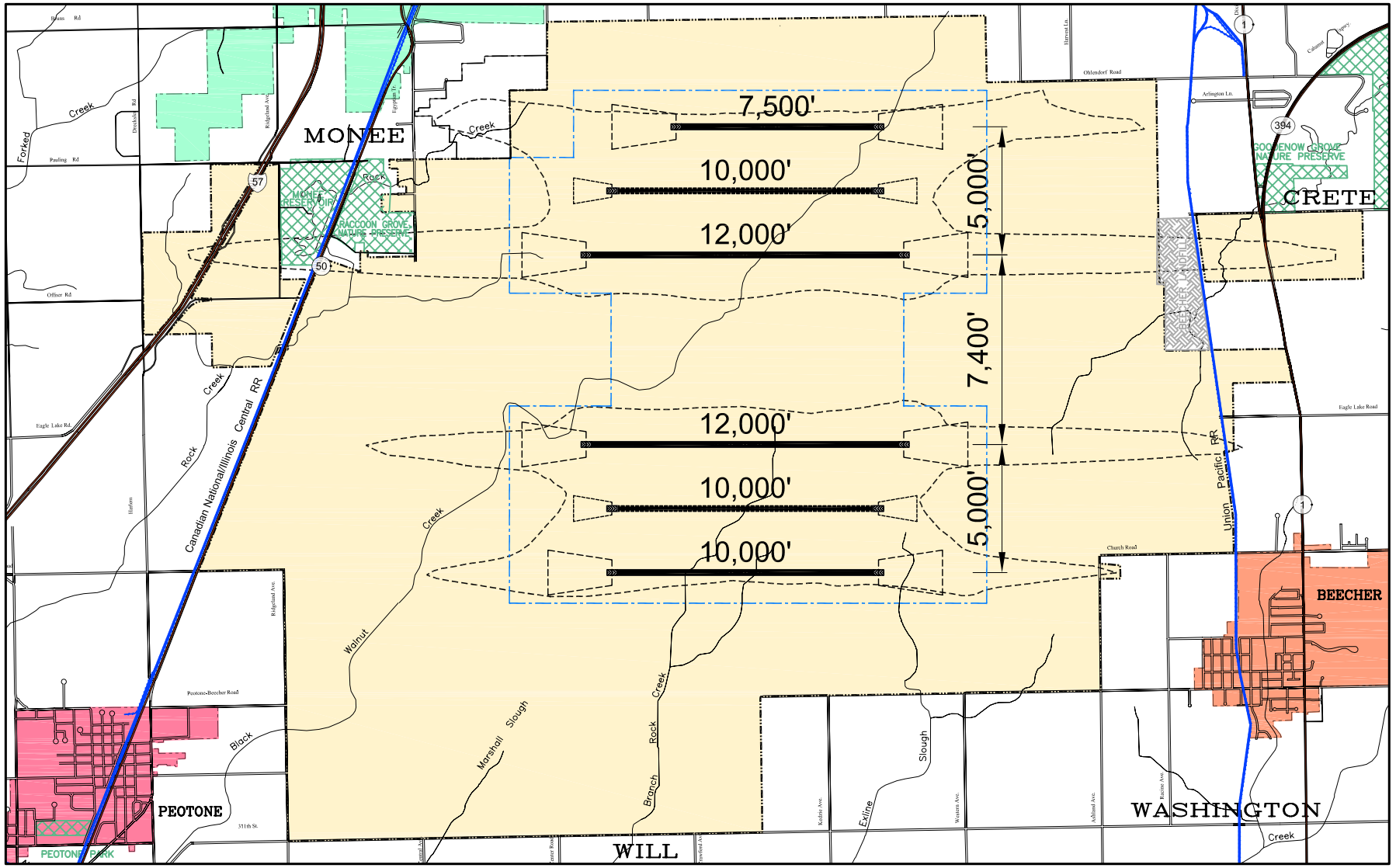
TAMS an Earth Tech Company

Legend

- PROPOSED AIRPORT BOUNDARY
- PROPOSED AIRPORT RUNWAY
- 65 DNL NOISE CONTOUR
- AIR OPERATION AREA (AOA)
- PARK LAND
- LANDFILL (CLOSED)

Refinement of the Ultimate Airfield Concept
Alternative 6.5
(Stagger and Shorten the Northernmost R/W to the East)

Exhibit 3-6



TAMS an Earth Tech Company

N

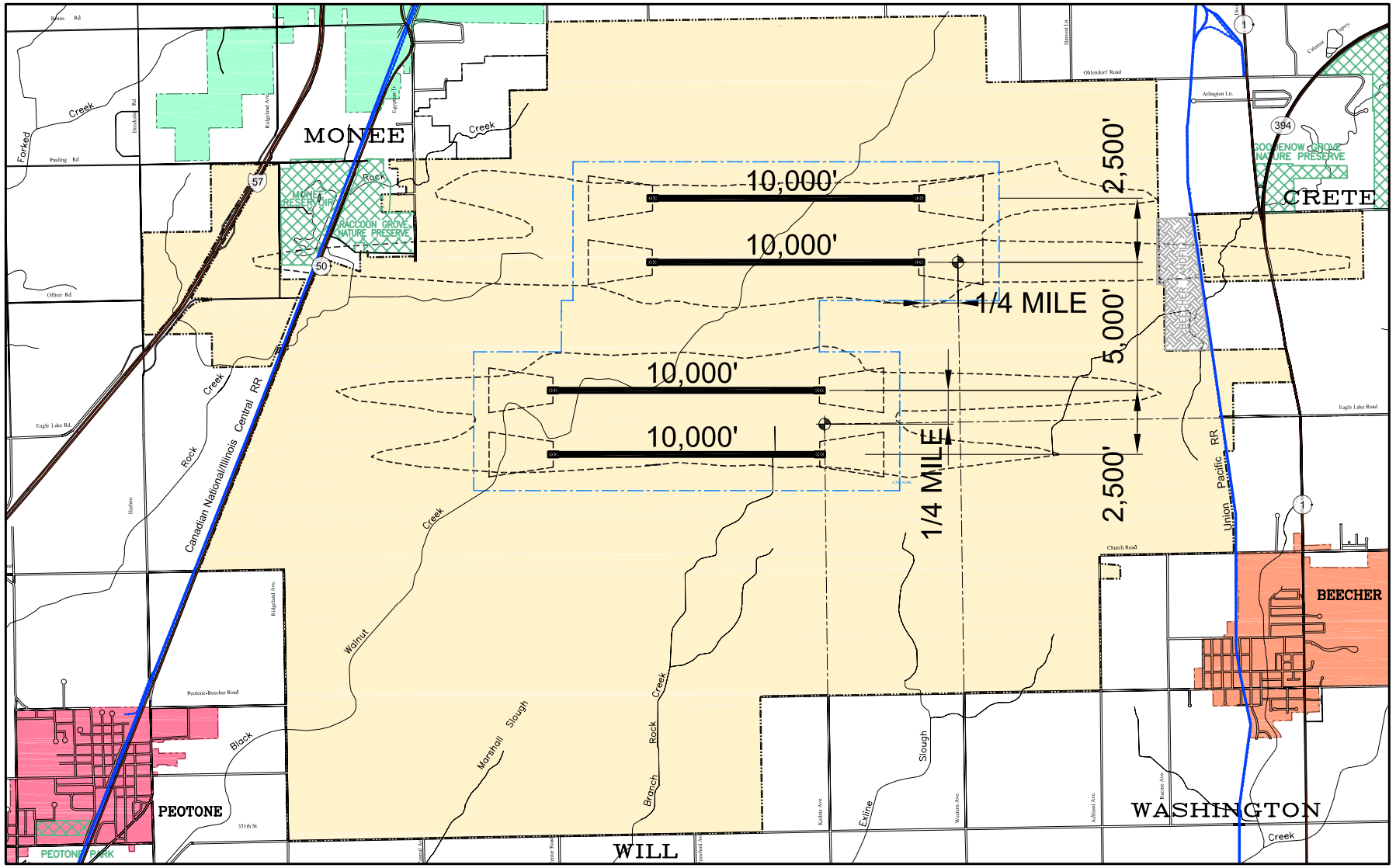
0 3000 6000 ft

Legend

- PROPOSED AIRPORT BOUNDARY
- PROPOSED AIRPORT RUNWAY
- 65 DNL NOISE CONTOUR
- AIR OPERATION AREA (AOA)
- PARK LAND
- LANDFILL (CLOSED)

Refinement of the Ultimate Airfield Concept
Alternative 6.6
(Shorten Northernmost R/W to 7,500')

Exhibit 3-7



TAMS an Earth Tech Company

N

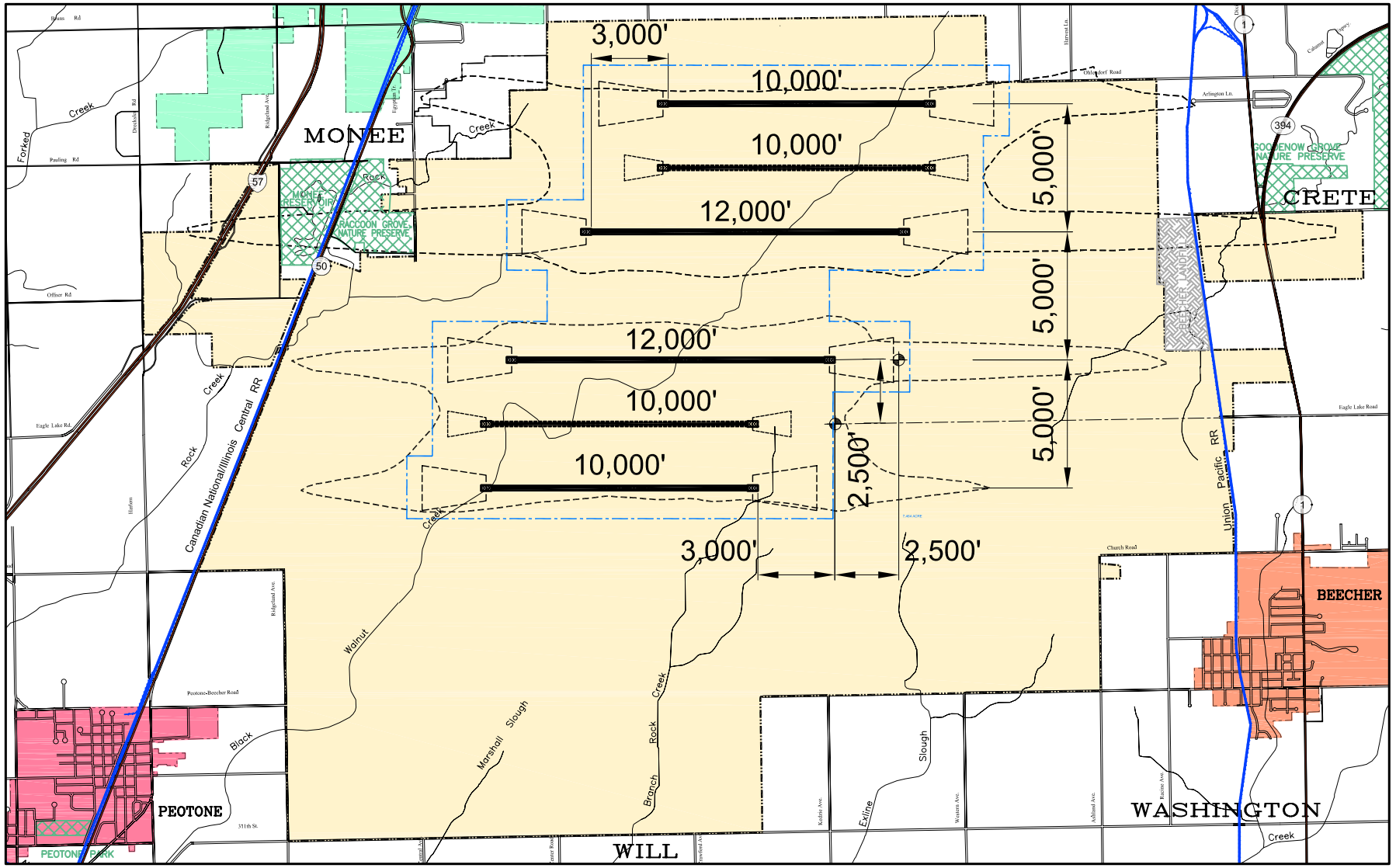
0 3000 6000 ft

Legend

- PROPOSED AIRPORT BOUNDARY
- PROPOSED AIRPORT RUNWAY
- 65 DNL NOISE CONTOUR
- AIR OPERATION AREA (AOA)
- PARK LAND
- LANDFILL (CLOSED)

Refinement of the Ultimate Airfield Concept
Alternative 6.7 - Proposed by Village of Crete
(Stagger and Shorten all Runways)

Exhibit 3-8



TAMS an Earth Tech Company

N

0 3000 6000 ft

Legend

- PROPOSED AIRPORT BOUNDARY
- PROPOSED AIRPORT RUNWAY
- 65 DNL NOISE CONTOUR
- AIR OPERATION AREA (AOA)
- PARK LAND
- LANDFILL (CLOSED)

Refinement of the Ultimate Airfield Concept
Alternative 6.8 - Proposed by Village of Beecher
(Shift Airfield to the North)

Exhibit 3-9

3.2 Evaluation of the Base Concept Ultimate Airfield Alternatives

3.2.1 Ultimate Airfield Evaluation Criteria

The criteria used in the *Phase 1 Engineering Study,* presented in **Table 2-1**, were reviewed and used as the basis for developing the Base Concept Ultimate Airfield Alternatives evaluation criteria. Additional criteria relevant to the current planning process were also identified and used to evaluate the Base Concept Ultimate Airfield Alternatives. **Table 3-1** lists the criteria developed to evaluate the concept refinements for the Ultimate Airfield. A short description of how each evaluation criteria was used to evaluate the alternatives is also provided.

Table 3-1
Ultimate Airfield Concept Alternatives
Evaluation Criteria

No.	Criteria	Definition
1	Ability to accommodate potential long-term future aviation demand (beyond DBO+20)	• An airfield concept that would be able to efficiently handle potential future aviation traffic demand.
2	Preserve the option to provide an airfield capable of accommodating up to four simultaneous inde-pendent approaches under CAT III conditions	• Develop a runway concept that could accommodate four parallel runways with a minimum 5,000-foot separation distance between runways.
3	Ability to avoid runway incursions	• Develop an airfield concept that minimizes incursions into critical areas by ground based vehicles and aircraft (i.e., a proposed perimeter taxiway system).
4	Ability to provide for future landside and terminal expansion in balance with the airfield	• Provide adequate runway separation to allow unconstrained expansion of the landside and terminal facilities under a range of future terminal concepts.
5	Ability to provide for flexible and balanced airfield operations	• Develop a runway system concept that would ultimately be able to serve all types of aircraft operations expeditiously, including: 1. Hub and non-hub type operation, 2. International operation, 3. Cargo hub type operation, and 4. A point-to point operation. • Develop a runway system that would balance taxiing operations for both east and west air traffic flow configurations
6	Ability to meet security criteria	• Develop an airfield concept that would meet Transportation Security Administration (TSA) security criteria and minimize the airfield area required to be secured.
7	Ability to avoid and/or minimize adverse land use impacts and community disruption	• Develop an airfield concept that would minimize conflicts with land use plans of the neighboring communities. • Contain all significant aircraft-generated noise, as defined by FAA, on airport property or compatible land uses. • Define the future airport boundary to encompass the optimal land area needed for airport-related uses, but no more land than is necessary, and minimizes impacts to surrounding land uses. • Population displacement. • Local traffic disruption and permanent closure of existing local roads. • Impacts to emergency vehicle and school bus routes.
8	Ability to avoid and/or minimize impacts on natural resources	• Impacts to wetlands. • Impacts to floodplains. • Impacts to water resources. • Impacts to Section 303(c) Lands (parklands). • Impacts to prime farmlands.
9	Comparison of relative costs	• Compare relative costs of each airfield concept

Source: TAMS, an Earth Tech Company, 2004.

Criteria 1 – Airfield Capacity - Airfield capacity was evaluated on the basis of the estimated annual capacity of the proposed runway concept, as either stated or interpolated from FAA AC 150/5060-5, Change 2, *Airport Capacity and Delay*. The estimated capacity of the ultimate 6-runway airport that allows for four simultaneous precision instrument approaches is 1.5 million annual operations, which is estimated to be the maximum practical capacity of the airport. Airfield concepts capable of providing the capacity for at least 1.3 million operations were retained for further analysis; those that could not provide the capacity for 1.3 million operations were eliminated from consideration.

Criteria 2 – Simultaneous IFR Operations - The greater the ability of an airfield concept to accommodate peak activity during adverse weather conditions, the greater the ultimate capacity of the airport. The capability of providing four simultaneous independent IFR arrivals during CAT-III weather conditions would provide maximum capacity at SSA, if future demand dictates the need for such capacity. Thus, each alternative was evaluated on its ability to provide the capability of construction and operation of four simultaneous precision instrument approaches. FAA AC 150/5060-5, Change 2, *Airport Capacity and Delay* states that a 5,000-foot separation distance (in systems with more than two parallel runways) must be provided between parallel runways in order to serve simultaneous arriving aircraft during CAT III weather conditions. Those alternatives that could not provide the minimum separation distance to allow for the option of four independent parallel runways were eliminated from further consideration.

Criteria 3 – Runway Incursions – Runway incursions occur primarily at the points of intersection of runways, taxiways and runways and at the intersections of service roads and runways. Each of the eight alternative concepts is based on a parallel runway configuration, which completely eliminates the potential for runway-runway incursions. The airside concept with the fewest taxiway-runway intersections was considered to have the lowest probability of runway incursions. Alternatives that have fewer potential intersections where runway incursions could occur rate higher than those that have more potential intersections for runway incursions. Consideration was also given to perimeter taxiways options.

Criteria 4 – Terminal Expansion – This criterion was rated based on the runway separation distance between the two center parallel runways. Alternatives that provide greater runway separation distance between the two center parallel runways were rated higher than those that provide lesser runway separation distance for the terminal area. The greater the distance provided, the greater the flexibility in allowing the future terminal area to develop in a number of ways.

Criteria 5 – Balanced Airfield Operations - The balance in airfield operations was determined by calculating the range of taxing times for arriving and departing aircraft in both air traffic flow configurations (east and west). The shortest taxiing time to a centrally located terminal area was graded excellent; the longest taxiing time was considered poor.

Criteria 6 – Perimeter Security and Access Control – The length of the perimeter security boundary (including the Air Operations Area) and number of access control points was analyzed as a measure of assessing security exposure and risk. The potential of each alternative to provide a security buffer to the airfield was also considered. The most compact security perimeter with fewest access/egress points and adequate space for a security buffer was regarded as the most secure and received the highest rating.

Criteria 7 – Ability to Avoid and/or Minimize Land Use Impacts and Community Disruption – This criterion was divided into five sub-criteria to rate different impacts that are of concern to the landowners and communities surrounding the site. Each sub-criterion was rated separately and then averaged with ratings from the other sub-criteria for each alternative.

Sub-Criteria 7a – *Conflicts with Local Land Use Plans* – Each alternative was evaluated against the *Land Use Plan for the Eastern Will County Area* (August 1997) to determine if the alternative would conflict with the plan. Conflicts were defined as airport facilities being located outside of the previously defined airport boundary (as depicted on the land use map), on land planned for other uses by the communities within the airport boundary, or if air carrier runways with an 09-27 orientation would be located directly east or west of existing or planned residential land uses.

Sub-Criteria 7b – *Contain Aircraft Noise on Airport Property* – Those alternatives that contain all significant aircraft-generated noise (as defined by FAA) on airport property (as defined by the Tier 1 EIS) were rated higher than those that did not contain all significant aircraft-generated noise on airport property. Those that would result in 65 DNL noise contours over compatible land uses (as defined by FAA Federal Aviation Regulation Part 150) were rated second highest. Other alternatives that result in 65 DNL noise contours over land outside the airport boundary and on other land uses were rated lower.

Sub-Criteria 7c – *Optimal Land Area* – Alternatives that would result in less land required for airport purposes were rated higher than those that would require more land. This criterion examined the land area encompassed within the proposed Air Operations Area (AOA)[2] for each alternative, indicated by the light blue line on the exhibits.

Sub-Criteria 7d – *Population Displacement* – Alternatives that minimize impacts to homes and residents were rated higher than those that had greater impacts.

Sub-Criteria 7e – *Local Traffic Disruption* – Alternatives that would result in less road closures would have fewer impacts on local traffic including emergency vehicle and school bus routes. Closure of roadways that have higher existing traffic volumes were considered to have a greater impact than roads with lower existing traffic volumes. Those alternatives that had less impact on roads were rated higher than alternatives that had higher impact on local roads.

Criteria 8 – Ability to Avoid and/or Minimize Natural Resource Impacts – This criterion was divided into five sub-criteria to rate different impacts that are of concern to the Federal and state natural resource agencies, special interest groups and the general public. Each sub-criterion was rated separately and then averaged with ratings from the other sub-criteria for each alternative.

Sub-Criteria 8a – *Impacts on Wetlands* – Alternatives that would result in fewer impacts to wetlands rated higher than alternatives with greater impacts.

Sub-Criteria 8b – *Impacts on Floodplains* – Alternatives that would result in fewer impacts to floodplains rated higher than alternatives with greater impacts.

[2] The AOA includes land needed for runways, taxiways, potential terminal area and runway protection zones, Part 77 surfaces and TERPS surfaces.

Sub-Criteria 8c – *Impacts on Section 303(c) Lands* – Alternatives that would result in fewer impacts to Section 303(c) Lands (parks, forest preserves, etc.) rated higher than alternatives with greater impacts.

Sub-Criteria 8d – *Impacts on Water Resources* – Alternatives that would result in fewer impacts to water resources (streams, lakes, etc.) rated higher than alternatives with greater impacts to water resources.

Sub-Criteria 8e – *Impacts on Prime Farmland* – Alternatives that would result in fewer impacts to prime farmland rated higher than alternatives with greater impacts to prime farmland.

Criteria 9 – Comparison of Relative Costs – Alternatives were compared against the Base Concept (Alternative 6.0) to determine if they would be relatively more or less expensive than the Base Concept. Those alternatives that are relatively less expensive rated higher than those that are relatively more expensive.

3.2.2 Ultimate Airfield Evaluation Matrix

The next step in the evaluation process was the development of an evaluation matrix to assess the airfield concepts. Each concept was evaluated and ranked by each criteria identified in **Table 3-1**. A rating scale from 1 to 5 was assigned to each criterion to better distinguish differences between each of the alternatives. A score of 5 was considered the best score for a criterion, while a score of 1 was considered the worst.

The first two criterion shown in **Table 3-1** were screening criterion; if an alternative could not meet both of these criterion, it was eliminated from further consideration. Alternatives 6.2 and 6.7 did not meet these two criterion; thus they were eliminated. The remaining alternatives were compared against the remaining seven major criterion developed for this process. **Table 3-2** depicts the results of applying the criterion and rating scale to each of the airfield concepts. The evaluation worksheet with a more detailed explanation of the rating scale is shown in **Table 3-3**.

Table 3-2
Ultimate Airfield Concept Alternatives
Evaluation Matrix

No	*Criteria*	Alternative 6.0 (Base Case)	Alternative 6.1	Alternative 6.2	Alternative 6.3	Alternative 6.4	Alternative 6.5	Alternative 6.6	Alternative 6.7	Alternative 6.8
1	**Ability to accommodate potential long-term future aviation demand (beyond DBO+20)**	Yes	Yes	No	Yes	Yes	Yes	Yes	No	Yes
2	**Preserve the option to provide an airfield capable of accommodating up to four simultaneous independent approaches under all-weather conditions**	Yes	Yes	No	Yes	Yes	Yes	Yes	No	Yes
3	**Ability to avoid runway incursions**	5	5		5	4	5	5		5
4	**Ability to provide for future landside and terminal expansion in balance with the airfield**	5	1		5	5	5	5		1
5	**Ability to provide for flexible and balanced airfield operations**	4	5		4	1	2	4		1
6	**Ability to meet security criteria**	1	5		3	2	1	3		3
7	**Ability to avoid and/or minimize adverse land use impacts and community disruption**	2.0	2.8		2.8	2.8	3.6	3.4		2.4
a	*Conflicts with the comprehensive land-use plans of the neighboring communities.*	*4*	*4*		*2*	*3*	*4*	*4*		*4*
b	*Contain all significant aircraft-generated noise, as defined by FAA, on airport property or compatible land uses.*	*1*	*2*		*2*	*2*	*2*	*2*		*1*
c	*Define optimal land area needed for airport-related uses (aeronautical and operational), but requires no more land than is necessary and minimizes impacts to surrounding land uses*	*1*	*4*		*3*	*3*	*3*	*3*		*5*
d	*Population displacement*	*2*	*1*		*2*	*2*	*5*	*4*		*1*
e	*Local traffic disruption and permanent closure of existing local roads, emergency vehicle and school bus routes*	*2*	*3*		*5*	*4*	*4*	*4*		*1*
8	**Ability to avoid and/or minimize impacts on natural resources**	1.2	4.8		3.2	3.6	3.4	3.6		3.6
a	*Wetlands*	*1*	*5*		*3*	*1*	*3*	*4*		*2*
b	*Floodplains*	*1*	*5*		*3*	*5*	*5*	*5*		*5*
c	*Section 303(c) Lands*	*2*	*5*		*5*	*5*	*2*	*2*		*1*
d	*Water Resources*	*1*	*5*		*3*	*5*	*4*	*4*		*5*
e	*Prime Farmland*	*1*	*4*		*2*	*2*	*3*	*3*		*5*
9	**Relative Cost comparison**	1	2.5		2	2	4	4		3
	Total	19.2	26.1		25.0	20.4	24.0	28.0		19.0
	Rating	2.7	3.7		3.6	2.9	3.4	4.0		2.7

Source: TAMS, an Earth Tech Company, 2004.

Table 3-3
Ultimate Airfield Concept Alternatives
Evaluation Worksheet

Numerical Grade	Rating	**Criterion 1** Airfield Capacity (Annual operations)	**Criterion 2** Number of IFR SIAP[1]	**Criterion 3** Runway Incursions (Number of T/W-R/W crossings)	**Criterion 4** Unconstrained Terminal Expansion (R/W separation distance in feet)	**Criterion 5** Balanced Airfield Operations (Taxiing time)	**Criterion 6** Perimeter Security & Access Control (Length in miles)	**Criterion 7a** Conflicts with Local Land Use Plans	**Criteria 7b** Contain Aircraft Noise on Airport Property	**Criteria 7c** Optimal Land Area	**Criterion 7d** Population Displacement	**Criterion 7e** Local Traffic Disruption	**Criterion 8a** Impact on Wetlands	**Criterion 8b** Minimize Impact on Floodplains	**Criterion 8c** Minimize Impact on Sec. 303(c) Lands	**Criteria 8d** Minimize Impact on Water Resources	**Criterion 8e** Minimize Impact on Prime Farmland	**Criterion 9** Comparison of Relative Costs
5	**Excellent**	>1,300,000	4	0	7,400	Shortest taxiing time to outer runways in both flow configurations	Shortest perimeter	No conflicts	65 DNL on airport property	Lowest acreage	Lowest population impacted	Lowest existing traffic volume impacted	Lowest acreage impacted	Lowest acreage impacted	Lowest acreage impacted	Lowest stream length impacted	Lowest acreage impacted	Lowest relative cost (all things being equal)
4	**Good**	N/A	N/A	2	7,000	20 - 40% longer taxiing time	20 - 39% longer	One conflict	65 DNL on airport property or compatible land use	20 - 39% greater acreage	20 - 39% greater impact	20 - 39% greater impact	20 - 39% greater impact	20 - 39% greater impact	20 - 39% greater impact	20 - 39% greater impact	20 - 39% greater impact	20 - 39% greater cost
3	**Average**	N/A	N/A	4	6,500	40 - 60% longer taxing time	40 - 59% longer	Two conflicts	1-150 acres outside airport property	40 - 59% greater acreage	40 - 59% greater impact	40 - 59% greater impact	40 - 59% greater impact	40 - 59% greater impact	40 - 59% greater impact	40 - 59% greater impact	40 - 59% greater impact	40 - 59% greater cost
2	**Fair**	N/A	N/A	8	6,000	60 - 80% longer taxing time	60 - 79% longer	Three conflicts	151-300 acres outside airport property	60 - 79% greater acreage	60 - 79% greater impact	60 - 79% greater impact	60 - 79% greater impact	60 - 79% greater impact	60 - 79% greater impact	60 - 79% greater impact	60 - 79% greater impact	60 - 79% greater cost
1	**Poor**	<1,300,000	<4	>8	5,000 ft)	Longest taxiing time to outer runways in both flow configurations	Longest perimeter	Four or more conflicts	Over 300 acres outside airport property	Highest acreage	Highest population impacted	Highest existing traffic volume impacted	Highest acreage impacted	Highest acreage impacted	Highest acreage impacted	Highest stream length impacted	Highest acreage impacted	Highest relative cost

Source: TAMS, an Earth Tech Company, 2004.
[1]IFR SIAP = Instrument Flight Rules, Simultaneous Independent Approach Procedures
N/A = Not Applicable; T/W = Taxiway; R/W = Runway

3.2.3 Preferred Ultimate Airfield Concept

Based on application of the evaluation criteria, Alternative 6.6 (**Exhibit 3-7**) had the highest rating and was selected as the preferred ultimate airfield concept. The selected ultimate airfield concept rated high in terms of operational efficiency, cost and safety issues and also rated comparably well in terms of minimizing natural resource impacts, land use impacts and community disruption.

The Base Concept, Alternative 6.0, which had the highest environmental and social impacts (primarily due to the commuter/GA crosswind runway) and Alternative 6.8, which also had high social impacts and rated poorly on airfield operational efficiency, ranked the lowest. Alternatives 6.2 and 6.7 do not preserve the option of accommodating four simultaneous precision instrument approaches, and thus were eliminated from consideration. Alternative 6.1 had the least impact to natural resources but constrained future landside and terminal expansion, had more costs and would cause greater population displacement. Alternative 6.3 had greater social impacts since it would position the southern parallel runways directly west of the Village of Beecher. Alternative 6.4 also had greater social impacts and ranked poorly on airfield operational efficiency and security criteria, as did Alternative 6.5.

Alternative 6.6, six parallel east-west runways, is essentially the same as the Base Concept, with the exception of the northernmost runway, which was shortened to 7,500 feet in order to minimize potential impacts on the Heatherbrook Estates neighborhood, and the elimination of the crosswind runway. If the SSA airfield develops into six east-west parallel runways, it will obviate the need for a small commuter/general aviation runway. According to the forecasts[3] and facility requirements[4], a crosswind runway is only needed for general aviation (GA) aircraft. As SSA develops, it is expected that commercial passenger and cargo operations will increase while GA operations decrease. Thus, provisions for a separate GA crosswind runway was eliminated from the ultimate airfield.

Alternative 6.6 preserves the option of accommodating four simultaneous precision instrument approaches, and maintains the flexibility for future terminal and landside expansion, while ranking comparatively well in terms of natural resource and social impacts. Thus, this concept alternative was selected as the preferred ultimate airfield concept and used in subsequent analyses to determine compatibility with an ultimate plan for SSA.

[3] Draft *Projections of Aeronautical Activity for the Inaugural Airport Program, South Suburban Airport,* prepared for the Illinois Department of Transportation, May 2004.

[4] Draft *Demand/Capacity Analysis & Facility Requirements for the Inaugural Airport Program, South Suburban Airport,* prepared for the Illinois Department of Transportation, March 2005.