CHAPTER FOUR

FACILITY REQUIREMENTS

4-1 INTRODUCTION

This chapter of the Airport Master Plan Update assesses the relationship between demand and facility needs based on the 20-year forecasts for the planning period presented in Chapter Three, Aviation Demand Projections. Operational areas will be evaluated to determine existing and future facility requirements. The operational areas focus on:

- Airside
- Landside

The capacity of existing airport facilities, runways, taxiways, etc., will be determined based on criteria set forth in FAA Advisory Circular 150/5060-5, "Airport Capacity and Delay." The forecast aviation demand for each planning horizon year will be evaluated against the specific facilities available to determine any additional facilities needed within each planning period. Recommendations for facility improvements will then be developed to alleviate existing or projected deficiencies.

4-2 DEMAND/CAPACITY ANALYSIS

Airport capacity is a function of the number of available runways and the runway/taxiway configuration. Specific capacity is determined using two principal measures, Annual Service Volume and Hourly Capacity, including visual flight rules (VFR) and instrument flight rules (IFR) conditions.

Airfield capacity as presented in Advisory Circular 150/5060-5, "Airport Capacity and Delay," is referred to as Annual Service Volume (ASV). ASV is defined as "a reasonable estimate of an airport's annual capacity."

Airfield capacity determination can involve highly detailed analysis. However, detailed analysis is generally only appropriate at airports experiencing demand levels at, or approaching, an airfield's ASV. Advisory Circular 150/5060-5 provides a more reasonable method of determining if projected demand will approach hourly capacity and annual service volume.

4-2-1 Annual Service Volume

Annual Service Volume takes into consideration a number of parameters to arrive at airfield capacity levels. These include:

- Aircraft mix
- Percentage of runway use

- Percentage of touch & go operations
- Taxiway exit rating
- Ceiling and visibility conditions

Harry Clever Field has a two runway configuration. Runway 14/32, the primary runway, is 3,950 feet long by 100 feet wide and is asphalt. The crosswind runway, Runway 11/29 is 2,050 feet long by 100 feet wide and is a turf runway. The Airport has three instrument approaches, all non-precision. The only straight-in approach is the GPS approach to Runway 14. The other circling approaches are the VOR-A and the VOR/DME or GPS-B approach.

FAA Advisory Circular 150/5060-5 provides various runway configurations and various fleet mixes typical of those at airports throughout the United States. Large aircraft are assigned more weight in this equation since their wake turbulence requires increased separation for subsequent aircraft operations. The increased separation adds delays and hence reduces capacity. The operating fleet at Harry Clever Field is relatively homogenous with well under 20 percent of the operating aircraft weighing more than 12,500 pounds. The ASV for an airport with two runways as identified in FAA Advisory Circular 150/5060-5 is approximately 230,000 operations. Like most general aviation airports, however, there are a number of conditions that prevent Harry Clever Field from achieving this optimum capacity. Despite having two runways, Harry Clever Field essentially operates as a single runway since its second runway is fairly short and has a turf surface, limiting the types of aircraft that can use it. The Airport also does not have an air traffic control tower to optimize operations. Lastly, the Airport does not have an instrument landing system, so there are weather conditions that can close the Airport, reducing its annual capacity. When these factors are taken into account, a practical ASV for Harry Clever Field is 200,000 operations.

Projected demand at Harry Clever Field by 2023 is estimated at 27,600 annual operations. These projected operations represent approximately 14 percent of the estimated airfield capacity of 200,000 operations. Therefore, existing airfield capacity will readily accommodate projected demand throughout the planning period.

FAA guidelines suggest that facility improvements should be considered to increase capacity when annual operations reach 60 percent of the ASV. Since demand at the Airport will not reach this threshold level within the 20-year planning period, runway development for capacity purposes is not anticipated.

4-3 FACILITY REQUIREMENTS – AIRSIDE

Airside facilities are those portions of the Airport that directly facilitate the landing and departure of aircraft.

4-3-1 Runway Length

Harry Clever Field serves Category B aircraft on a regular basis. Category B aircraft are those with approach speeds of 91 knots or more, but less than 121 knots. The Airport also serves aircraft in Airplane Design Group I (aircraft with wingspans up to but not including 49 feet). However, because of the presence of a Learjet 31 and indications of additional jet demand, the Airport should ultimately be developed to accommodate C-II design standards. However, site

constraints need to be considered before determining if such a plan is feasible. The next chapter will address these issues in more detail.

The Airport's role and critical aircraft are essential in determining the required runway length at Harry Clever Field. Required runway length is a function of many variables, including airport elevation, air temperature, aircraft take-off weight and engine performance, runway gradient, and runway surface condition, among others. All of these variables affect the performance of a departing aircraft. Required runway length can be determined using the manufacturer's performance curves or by using the procedures outlined in the FAA Advisory Circulars. **Table 4-1** shows the recommended runway lengths using the FAA's Airport Design for Microcomputers program. At the time of any runway extension request, justification for the extension must be submitted to the FAA.

Table 4-1
RECOMMENDED RUNWAY LENGTHS FOR HARRY CLEVER FIELD

Airport Data		
Airport elevation (feet)	894	894
Maximum difference in runway centerline elevation (feet)	8	8
Temperature (°F)	85°	85°
Runway Condition	Dry	Wet
Runway Lengths Recommended for Airport Design		
Small airplanes with approach speeds of less than 30 knots	330	330
Small airplanes with approach speeds of less than 50 knots	870	870
Small airplanes with less than 10 passenger seats		
75 percent of these small airplanes	2,760	2,760
95 percent of these small airplanes	3,290	3,290
100 percent of these small airplanes	3,900	3,900
Small airplanes with 10 or more passenger seats	4,350	4,350
Large airplanes of 60,000 pounds or less		
75 percent of these large airplanes at 60 percent useful load	4,830	5,470
75 percent of these large airplanes at 90 percent useful load	6,510	7,000
100 percent of these large airplanes at 60 percent useful load	5,550	5,550
100 percent of these large airplanes at 90 percent useful load	8,330	8,330

Source: Airport Design V4.2

The table shows that all small airplanes (defined as having a maximum take off weight of less than 12,500 lbs.) could operate with a 4,350-foot runway on days as hot as 85 °F. On cooler days, less runway is required.

Large aircraft with maximum takeoff weights greater than 12,500 lbs. require longer runways. According to the table, 5,470 feet of runway is recommended to accommodate 75 percent of large airplanes up to 60,000 lbs. at up to a 60 percent useful load.

4-3-2 Primary Runway Length Recommendation

According to **Table 4-1**, aircraft with less than 10 seats only require 3,900 feet of runway. Runway 14/32 is 3,950 feet long, but, in practical terms, the runway does not meet this goal. A

displaced threshold reduces the landing length of Runway 14 (the only runway with a straight-in approach – GPS 14) to 3,630 feet. Additionally, the operator of a Piper Cheyenne III has stated that his aircraft can only operate out of the Airport with 75 percent of its full fuel load and frequently must make a stop in Akron-Canton 30 miles to the north in order to top off on fuel.

NetJets U.S., a company specializing in the fractional ownership of business jets, stated that there are only two aircraft in its inventory that can operate into and out of Harry Clever Field – the Citation Ultra and Citation Encore. Both of these aircraft are restricted to daytime operations when the runway is dry, partly because of the limited instrument approaches at the Airport, but primarily because of the runway length.

Besides these aircraft, records of IFR traffic from February 2003 to December 2003 indicate that a number of jets, most in the B-II category, operated into and out of the Airport. This activity indicates that there is a demand for an airport that can properly accommodate jet operations. Furthermore, a Learjet 31 is based at the Airport and the operator has stated that operations are limited on high temperature days or when the runway surface is contaminated because of the short runway length.

The recommended runway length for Harry Clever Field is largely a function of what role the Airport plans to fill. In order to serve small aircraft (under 12,500 lbs.), a runway of 4,000 feet is recommended. To meet the needs of the most demanding aircraft and other small business jets, including the Learjet 31, an ultimate runway length of 5,000 feet meeting C-II standards can be supported. However, there are a number of constraints. Delaware Avenue crosses just beyond the end of Runway 14. At the closest point, it is approximately 50 feet from the edge of this road to the corner of the runway. On the centerline of the runway, the center of the road is approximately 22 feet away. This road is used to provide access to and from the cemetery, which is located on the opposite side of the road, and cannot be closed or relocated.

On the other side of the cemetery, approximately 700 feet beyond the Runway 14 end, is a drop in elevation of approximately 30 feet. In order to obtain a runway length of 5,000 feet by extending this end of the runway, Delaware Avenue would need to be closed, approximately 1.5 acres of cemetery would need to be closed and the graves in that area relocated, and there would need to be a 30-foot high fill constructed within the last 50 feet of the runway safety area.

On the opposite end of the Airport is located the Schoenbrunn Village, a State of Ohio historical site operated by the Ohio Historic Preservation Office. The City has a long term lease from the State of Ohio over approximately 4.1 acres of land, including the last 130 feet of the runway pavement. There is an old house along East High Extension that once housed a State Highway Patrol facility. The building currently houses the Trumpet in the Land offices. The existing Schoenbrunn Village access road crosses past the end of Runway 32. At its closest point, the road is approximately 260 feet from the end of the runway. If the runway was extended on this end, it would cut through the access road, requiring that another access to the park be provided. However, there is also access to the rear of the park from Delaware Avenue/Route 25 that connects to Route 259.

Just to the east of the park access road is Township Road 1204. The Trumpet in the Land offices are located on this road. There is also a housing development east of this road, as well as some

undeveloped land farther south. The next major road on the east is 21st Street SE, approximately 1,450 feet from the end of Runway 32, as measured along the runway centerline.

Given these constraints, a more reasonable consideration is a 4,500-foot runway that meets B-II standards. However, even a 4,500-foot runway meeting the requirements of a B-II standard will encounter many of the obstacles listed above. The section on alternatives will examine this option, as well as the others. As a compromise, it is recommended that the Airport pursue a 4,500-foot runway that meets B-II standards, but ultimately plan for a 5,000-foot C-II runway.

4-3-3 Crosswind Runway Length

The FAA typically recommends that a crosswind runway provide 80 percent of the primary runway length, or 3,200 feet in the case of Harry Clever Field. The existing crosswind runway is 2,050 feet long, which is less than 80 percent of the length of the primary runway. However, because the crosswind runway has a turf surface and is suitable for serving smaller aircraft and training pilots in soft field techniques, it is deemed adequate for its purposes. It is designed and meets standards for an A-I runway serving small aircraft.

4-3-4 Runway Width

Runway 14/32, the primary runway at Harry Clever Field, is 100 feet wide. The FAA design standard for C-II airports is 100-foot wide runways. The primary runway at Harry Clever Field meets this standard.

4-3-5 Runway Weight Bearing Capacity

The weight limitation of Runway 14/32 is 12,500 lbs. for single wheel, 25,000 lbs. for double wheel, and 40,000 lbs. for double tandem wheels.[1] This weight capacity is more than adequate for the small class of aircraft (under 12,500 lbs.), which make up most of the traffic. The types of larger aircraft that currently use or are projected to use the Airport are unlikely to exceed this weight limit.

4-3-6 FAA Airfield Safety Areas

FAA standards for runways and runway-related elements such as runway protection zones (RPZs), runway safety areas (RSAs), obstacle free zones (OFZs), and separation distances are presented in this section. The following paragraphs discuss the standard width, length, and separations for runway-related safety elements. **Table 4-2** summarizes these safety areas and runway/taxiway dimensions.

The Airport is currently designated as a B-II ARC airport. Based upon the forecast of activity, the Airport should ultimately plan on meeting the C-II ARC criteria for its primary runway. The turf runway, Runway 11/29, currently meets the standards for an A-I ARC runway serving small aircraft, which is adequate for its purposes. It should be noted that since Harry Clever Field does not have an approach lighting system, the inner approach OFZ requirements are not applicable.

[1] The weight limitation of Runway 14/32 is reported in the FAA Airport/Facility Directory as 52,500 lbs. for single wheel, 67,500 lbs. for double wheel, and 140,000 lbs. for double tandem wheels.

Table 4-2
AIRPORT DESIGN STANDARDS FOR HARRY CLEVER FIELD

ITEM (all units in feet)	A-I Rwy 11/29 Existing and Ultimate	B-II* Rwy 14/32 Existing	C-II Rwy 14/32 Ultimate
Runway Safety Area (RSA)			
Length beyond runway end (C)	240	300	1,000
Width (P)	120	150	500
Runway Object Free Area (OFA)			
Length beyond runway end (R)	240	300	1,000
Width (Q)	250	500	800
Runway Protection Zones (RPZ) (Not lower than 1 mile visibility)			
Length (L)	1,000	1,000	1,700
Inner width (W1)	250	500	500
Outer Width (W2)	450	700	1,010
Runway Obstacle Free Zone (OFZ)			
Length beyond runway end	200	200	200
Width	120	250	400
Inner-approach OFZ width**	n.a.	250	400
Inner-approach OFZ length beyond approach light system**	n.a.	200	200
Runway and Taxiway Width and Clearance Standard Dimensions			
Runway width	60	75	100
Taxiway width	n.a.	35	35
Runway centerline to parallel taxiway/taxilane centerline	n.a.	240	300
Runway centerline to edge of aircraft parking	n.a.	250	400

*(visibility not lower than ¾ mile)
**Not applicable to PHD
Reference: AC 150/5300-13, Airport Design.
Note: Table depicts FAA standards, not current conditions

4-3-6-1 Runway Safety Area (RSA)

The RSA serves as a safety area if an aircraft overruns or lands short of the paved surface. According to the FAA's definition, the RSA shall be cleared and graded and have no potentially hazardous ruts or surface variations. In addition, the RSA under dry conditions, must be able to support snow removal equipment, emergency equipment, and occasional passage of aircraft without causing structural damage to the aircraft. The general requirement for the grading of this area is a 0 to -3 grade for the first 200 feet from the runway end, with the remaining longitudinal grade ensuring that no part of the RSA penetrates the approach surface or drops below a -5 degree grade level. This area should also be drained by use of grading or storm sewers and objects higher than three inches should be constructed on frangible supports.

The current design standard, B-II, calls for a RSA that is 150 feet wide and extends 300 feet beyond the runway threshold. Harry Clever Field does not meet these criteria because of a

service road providing access to the Schoenbrunn Village, a State of Ohio historical site that passes within 300 feet of the approach end of Runway 32, intruding upon the RSA boundary. Also, there is a road at the other end of the runway, as well as a fence.

The recommended RSA dimensions for Runway 14/32 are those of a C-II ARC runway. Those dimensions are 500 feet in width and 1,000 feet in length beyond the runway end. It would be very difficult to meet this requirement because of the proximity of buildings and trees on the northeast side of Runway 14/32, and because of the cemetery and drop in elevation at the other runway end. C-II is the ultimate ARC objective, while B-II is the interim ARC objective for the Airport.

The recommended RSA dimensions for an A-I ARC runway, which applies to Runway 11/29, are 120 feet in width and 240 feet in length beyond the runway end. The current runway safety area for Runway 11/29 meets these criteria.

4-3-6-2 Runway Protection Zone (RPZ)

RPZs are trapezoidal in shape and centered on the extended runway centerline (see **Exhibit 4-1**). **Table 4-2** displays the RPZ dimensions. The RPZ functions to enhance the protection of people and property on the ground. The RPZ begins 200 feet beyond the end of the runway pavement usable for takeoffs and landings. Displacing the landing or takeoff threshold (as is done with Runway 14's threshold) does not change the beginning point of the RPZ. The location of the RPZ remains at the 200-foot standard if runway pavement is used for either takeoffs or landings. The actual RPZ length and width depends on the size aircraft operating on the runway and type of approach available. Generally, as aircraft size increases and the approach minimums become more precise, the dimensions of the RPZ increase.

Two sub-areas, the runway object free area (OFA) and the controlled activity area, are contained within the RPZ and are discussed in the following sections.

4-3-6-2-1 Runway Object Free Area (OFA)

The runway OFA is a two-dimensional ground area surrounding the runway from which parked aircraft and objects, except NAVAIDS and objects with locations fixed by function, are prohibited. The existing OFA for Runway 14/32 is a 500-foot wide surface extending 300 feet beyond each runway end. However, there are a number of objects within this area that violate the FAA standards for an OFA. Those objects include:

- Aircraft parking – Both tie-down areas are within 250 feet of the runway centerline.
- Road – Delaware Avenue is located close to the approach end of Runway 14, well within the confines of the OFA.
- Service road – A road providing access to the Schoenbrunn Village, a State of Ohio historical site, is located within 300 feet of the approach end of Runway 32, intruding upon the OFA.
- Trees – A number of trees intrude upon the OFA near the Runway 32 threshold on the northeast side of the runway.
- Buildings – Portions of buildings penetrate the OFA on the northeast side of the runway.

The recommended OFA dimensions for Runway 14/32 are those of a C-II ARC runway. Those dimensions are 800 feet in width and 1,000 feet in length beyond the runway threshold. As with the RSA, meeting this OFA would be extremely difficult because of the large number of buildings to the northeast of Runway 14/32 as well as the lack of space needed to move the runway to the southwest.

The Alternatives Chapter of this study will evaluate options to try to accommodate the recommended runway safety and object free areas for Runway 14/32.

The existing OFA for Runway 11/29 is 250 feet wide and extends 240 feet beyond each runway end. This meets the criteria for an A-I runway limited to small aircraft.

4-3-6-2-2 Controlled Activity Area

The controlled activity area is the portion of the RPZ beyond and to the sides of the runway OFA. The Airport should maintain control of this area through fee simple ownership. The controlled activity area should be free of land uses that create glare and smoke. Construction of residences, fuel-handling facilities, churches, schools, and offices are not recommended in the RPZ's controlled activity area. Roads are also not typically recommended within the RPZ.

The existing B-II ARC RPZs are not completely within the property line of Harry Clever Field. The RPZ for a B-II runway begins 200 feet beyond the runway end and extends 1,000 feet. The inner width of the trapezoid shaped area is 500 feet and it expands to 700 feet at the outer width. As stated earlier, there are numerous obstacles in these RPZs at Harry Clever Field, including roads and a number of homes off of each runway end.

The recommended dimensions of the Runway 14/32 RPZ are those for a C-II runway. The RPZ for a C-II runway is 1,700 feet in length and inner and outer widths of 500 and 1,010 feet, respectively. This larger area would be even more difficult to bring up to necessary standards. Wherever possible, the future airport development plans will depict unowned property within the Airport's existing and future RPZs as "to be acquired."

4-3-6-3 Obstacle Free Zone (OFZ)

The OFZ is a three-dimensional volume of airspace centered on the runway that supports the transition of ground to airborne operations (or vice versa). The OFZ clearing standards prohibit taxiing and parked aircraft and other objects, except frangible NAVAIDS or fixed-function objects, from penetrating this zone.

The requirements for the current B-II OFZ are 200 feet beyond each runway end and 250 feet in width. A number of buildings on the northeast side of Runway 14/32 penetrate this boundary.

The recommended dimensions for the Runway 14/32 OFZ are those for C-II runways. The OFZ for a C-II runway extends 200 feet beyond each runway end and measures 400 feet wide. The proximity of buildings to the northeast of Runway 14/32 makes it very difficult to meet this requirement. While currently not applicable, more restrictive OFZ standards for inner-approach and inner transitional surfaces are established for runways with an approach lighting system.

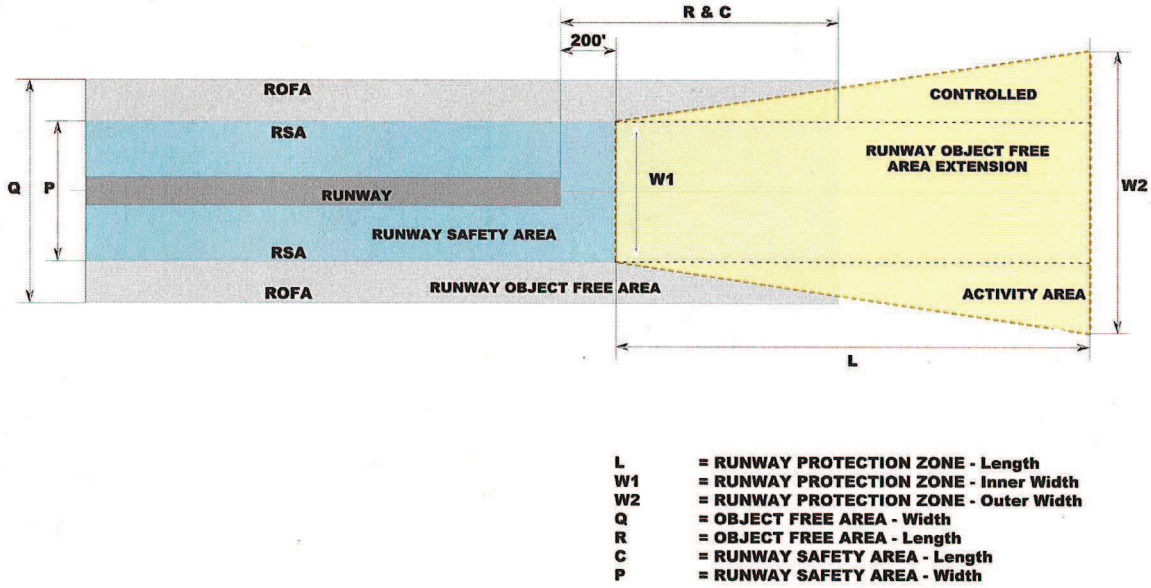


Exhibit 4-1

4-3-6-4 Part 77 Surfaces

Federal Aviation Regulation (FAR) Part 77 – Objects Affecting Navigable Airspace, establishes standards for determining which structures pose potential obstructions to air navigation by defining specific airspace areas around an airport that should not contain any protruding objects. These airspace areas are referred to as "Imaginary Surfaces." Objects affected include existing or proposed objects of natural growth, terrain, or permanent or temporary construction, including equipment that is permanent or temporary in nature. The imaginary surfaces outlined in FAR Part 77 include the following:

- Primary surface
- Transitional surface
- Horizontal surface
- Conical surface
- Approach surface

Dimensions of FAR Part 77 surfaces vary depending on the type of approach. For purposes of Part 77, Runway 11/29 is considered a visual, utility runway. Runway 14 is considered a non-precision instrument runway with visibility minimums greater than ¾ mile (because of the GPS 14 approach). Runway 32, which does not have a straight-in approach, is considered a visual, larger than utility runway.

Non-precision approaches provide only azimuth (left/right) information for alignment on a runway. Precision approaches, in contrast, provide both azimuth alignment information and glide slope (vertical) information to the end of a runway.

The FAA does not regulate tall structures. The FAA can determine those structures that present obstructions to air navigation through an aeronautical study that determines whether a structure in question would be a hazard to air navigation under Part 77. However, there is no specific authorization in any statute that permits the FAA to limit structure heights or determine which structures should be lighted or marked. In fact, in every aeronautical study determination, the FAA acknowledges that state or local authorities have control over the appropriate use of property beneath an airport's airspace.

Definitions of the Part 77 surfaces are as follows (see **Exhibit 4-2**):

Primary Surface – The primary surface is longitudinally centered on a runway. Hard surface runways have primary surfaces that extend 200 feet beyond each runway end. Primary surfaces range in width from 250 feet to 1,000 feet, based on the existing or planned approach for the runway (e.g., visual, non-precision, or precision). The primary surface for Runway 11/29 is 250 feet in width and ends with the runway ends. The primary surface for Runway 14/32 is 500 feet wide and extends 200 feet beyond the runway ends.

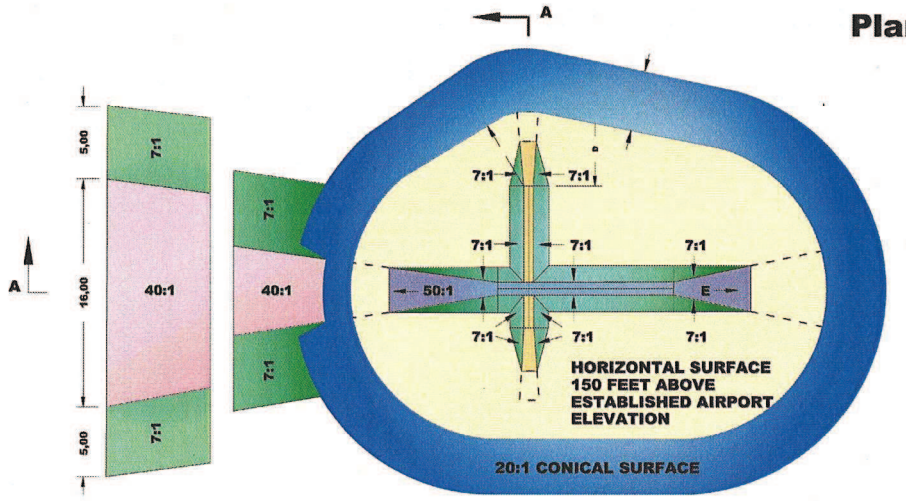
Approach Surface – The approach surface is centered longitudinally on the extended runway centerline and extends outward and upward from the end of the primary surface. Each runway has an approach surface based on the type of approach: 20:1 for visual approaches, 34:1 for non-precision approaches, and 50:1 for precision approaches. The approach slopes for Runway 11, Runway 29, and Runway 32 are 20:1. The approach slope for Runway 14 is 34:1.

Horizontal Surface – The horizontal surface is a horizontal plane located 150 feet above the established airport elevation, covering an area from the transitional surface to the conical surface. The perimeter of the horizontal surface is determined by constructing arcs from the center of each end of the primary surface and connecting the adjacent arcs by lines tangent to those areas. The length of the arc for a given runway must be the same at both ends. For runway ends with different criteria, the longest arc requirement is applied to both ends.

For all approaches to runways supporting large aircraft, the radius of each arc used to construct the horizontal surface is 10,000 feet. For other runways, the arc radius is 5,000 feet. Runway 11/29, a utility runway, has 5,000-foot arcs for the horizontal surface at each runway end. Runway 14/32, because of its GPS 14 approach, has 10,000-foot arcs applied to each runway end to define its horizontal surface.

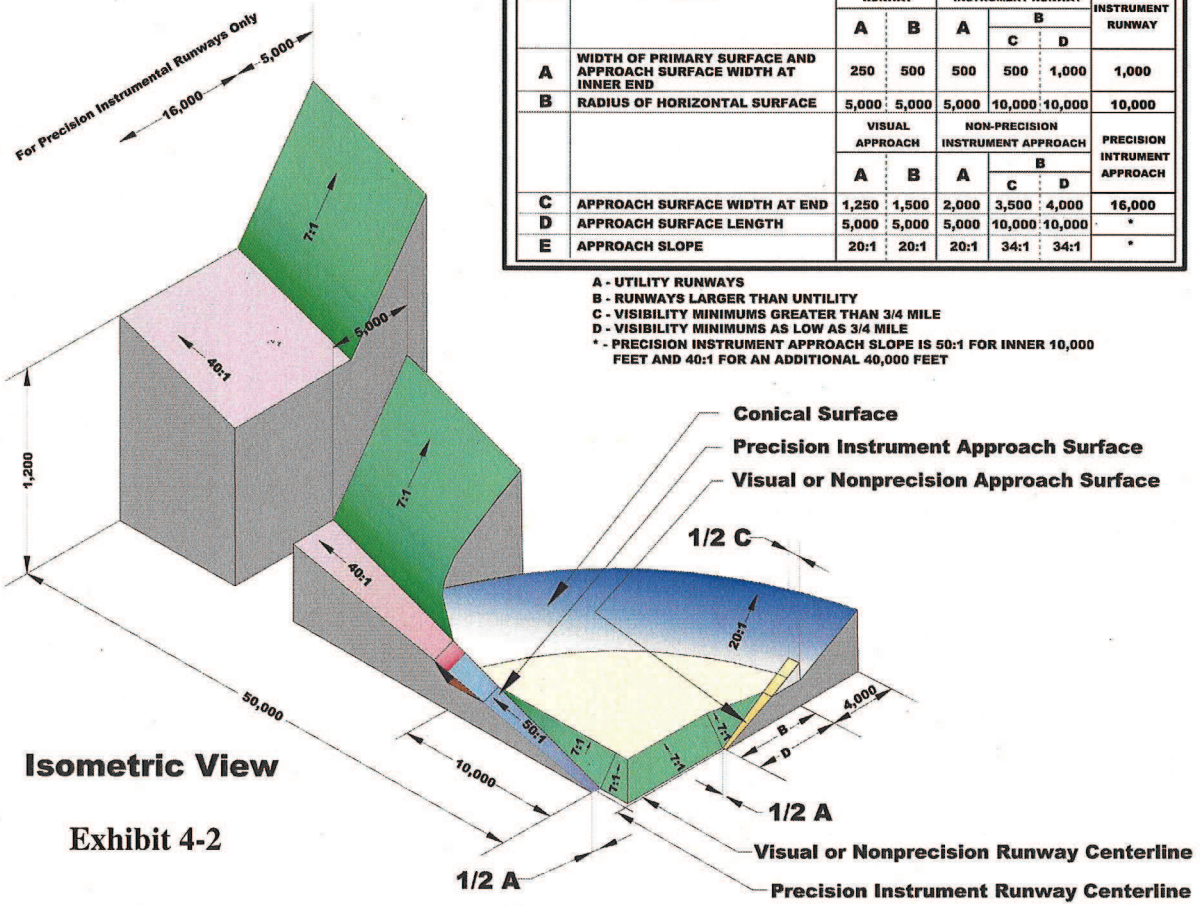
Conical Surface – The conical surface is a surface extending upward and outward from the edges of the horizontal surface at a slope of one foot vertical for every 20 feet horizontal (20:1) for a total distance of 4,000 feet.

Transitional Surface – Transitional surfaces extend outward and upward at right angles to the runway centerline, with the runway centerline extended at a slope of seven feet horizontally for each foot vertically (7:1) from the sides of the primary and approach surfaces. The transitional surfaces extend to the point where they intercept the horizontal surface at a height of 150 feet above the runway elevation. Transitional surfaces for those portions of a precision approach surface that project through and beyond the limits of the conical surfaces, extend a distance of 5,000 feet horizontally from the edge of the approach surface and at right angles to the runway centerline.



DIM	ITEM	DIMENSIONAL STANDARDS (FEET)					
		VISUAL RUNWAY		NON-PRECISION INSTRUMENT RUNWAY			PRECISION INSTRUMENT RUNWAY
		A	B	A	B		
					C	D	
A	WIDTH OF PRIMARY SURFACE AND APPROACH SURFACE WIDTH AT INNER END	250	500	500	500	1,000	1,000
B	RADIUS OF HORIZONTAL SURFACE	5,000	5,000	5,000	10,000	10,000	10,000
		VISUAL APPROACH		NON-PRECISION INSTRUMENT APPROACH			PRECISION INTRUMENT APPROACH
		A	B	A	B		
					C	D	
C	APPROACH SURFACE WIDTH AT END	1,250	1,500	2,000	3,500	4,000	16,000
D	APPROACH SURFACE LENGTH	5,000	5,000	5,000	10,000	10,000	*
E	APPROACH SLOPE	20:1	20:1	20:1	34:1	34:1	*

A - UTILITY RUNWAYS
B - RUNWAYS LARGER THAN UNTILITY
C - VISIBILITY MINIMUMS GREATER THAN 3/4 MILE
D - VISIBILITY MINIMUMS AS LOW AS 3/4 MILE
* - PRECISION INSTRUMENT APPROACH SLOPE IS 50:1 FOR INNER 10,000 FEET AND 40:1 FOR AN ADDITIONAL 40,000 FEET



Isometric View

Exhibit 4-2

4-3-7 Runway/Taxiway Separation

Table 4-2 lists recommended runway and taxiway width and clearance dimensions obtained using the FAA's Airport Design program for an ARC of C-II and B-II.

The recommended separation distance between the centerline of the runway and the parallel taxiway for the current B-II ARC standard is 240 feet. The existing runway and parallel taxiway separation distance is 136 feet and do not meet current standards.

The recommended separation distance between the centerline of the runway and the parallel taxiway for the future C-II ARC standard is 300 feet.

Runway 11/29 does not have a parallel taxiway.

4-3-8 Runway Alignment

FAA criteria recommend a minimum of 95 percent wind coverage for airports accommodating aircraft in approach category C, for a 16-knot crosswind component. Where a single runway cannot provide the recommended 95 percent coverage, consideration of a crosswind runway is recommended. The wind coverages identified in the Inventory Chapter of this study are based on the All Weather Wind Rose for Akron-Canton Regional Airport. These tabulations show that the existing Runway 14/32 alignment provides 98.2 percent coverage for a 16-knot crosswind component, which exceeds the FAA recommended minimums. It should be noted that when the B-II criteria of a 13-knot limiting crosswind is applied, Runway 14/32 provides approximately 94 percent coverage, less than the FAA recommended minimum.

Runway 11/29 provides 85.9 percent coverage for a 10.5-knot crosswind limit.

The ideal alignment for the primary runway appears to be a northeast/southwest orientation. However, physical constraints make it unlikely that such an alignment could be obtained.

4-3-9 Taxiways

Additions or improvements to an airport taxiway system are generally undertaken to increase airfield capacity and improve safety. An efficient runway/taxiway system increases an airport's ability to handle arriving and departing aircraft. An efficient taxiway system will also expedite aircraft ground movements between the runway system and the terminal area. FAA criteria recommend a minimum 35-foot width for taxiways serving aircraft in the B-II or C-II ARC.

The existing taxiway system at Harry Clever Field is only 27 feet wide. It is recommended that the taxiway be widened to 35 feet to meet the requirements of a C-II taxiway. Other future changes to the taxiway system would focus on providing adequate access to new or expanded landside facilities.

4-3-10 Airfield Lighting

Runway 14/32 is equipped with medium intensity runway lights, which are preset to low but can be adjusted by pilots using their radio on frequency 123.3. These lights were installed in 2003. Both ends of Runway 14/32 had runway end identifier lights installed in 2003.

Runway 11/29 is not equipped with any lights.

The taxiway system is equipped with medium intensity taxiway edge lights, which were installed in the 1990s. These lights are regarded as adequate for the planning period.

4-3-11 Visual Approach Aids

Runway 14/32 is equipped with a precision approach path indicator (PAPI) on each runway end. Both are located on the southwest side of the runway (opposite side of the FBO). Both provide a visual indication to pilots on approach to the runway for vertical guidance purposes and were installed in 2003.

The Airport's rotating beacon is located on a hill northeast of the Airport, off of airport property. It is within the recommended distance of 5,000 feet from a runway. Most airport beacons are located on airport property. When they are located off of airport property, there needs to be sufficient property interest to permit maintenance and operation of the beacon, as well as the right to keep the beacon visible to approaching aircraft.

4-3-12 Wind Indicators

The Airport is equipped with two lighted wind indicators. One indicator is a lighted wind tee. The other indicator is a lighted wind sock.

4-3-13 NAVAIDS

Runway 14/32 has three published instrument approaches. The GPS 14 approach has the lowest minimums, with requirements of a 666-foot ceiling and one mile of visibility. It is also the only straight-in approach for the Airport. The other two approaches, the VOR-A, and the VOR/DME or GPS-B, are circling approaches with slightly higher minimums. The VOR-A approach requires a 726-foot ceiling and one mile of visibility, while the VOR/DME or GPS-B approach requires an 845-foot ceiling with one mile of visibility. None of these approaches are dependent upon Airport NAVAIDS. The VOR-A approach functions off of the Briggs VOR, approximately 16 nautical miles to the north of Harry Clever Field. The VOR/DME or GPS-B approach uses the Newcomerstown VOR 14.5 nautical miles to the south of the Airport.

4-4 FACILITY REQUIREMENTS - LANDSIDE

Landside facilities are typically associated with areas on the airport other than aircraft operational areas. These areas are associated with airfield support services and facilities.

4-4-1 General Aviation Terminal Building

General aviation terminal buildings are usually designed to accommodate normal peak activity periods. Terminal buildings typically provide pilot briefing and flight planning areas, pilot/passenger lounge(s), vending areas, public restrooms and telephones, storage areas, and rooms for mechanical equipment. The existing Airport terminal building is in very good condition and provides all of these facilities. It is not anticipated that additional terminal building expansion would be required during the course of the planning period. However, the requirements of the FBO may warrant a reconfiguration and/or rehabilitation of the terminal building.

4-4-2 Aircraft Storage

Storage needs for general aviation aircraft reflect local climatic conditions and the size and sophistication of the Airport's based aircraft fleet. Typically, the more valuable the aircraft, the more likely it is to be stored in large, more secure facilities. There are two primary types of aircraft storage in use at Harry Clever Field: hangar storage and tie-downs.

Aircraft storage on the field consists of a mix of T-hangars and conventional hangars. There are two T-hangars, one with 14 units and the other with 10. There are six conventional hangars with the capacity to store approximately 23 aircraft. **Table 4-3** summarizes the aircraft storage facilities at Harry Clever Field.

Table 4-3
AIRCRAFT STORAGE

Covered Storage	Number of Aircraft
T-hangars	10
T-hangars	14
60x60 hangar	3
60x60 hangar	4
Schwab hangar	3
Giles hangar	2
Large hangar	9
Maintenance hangar	2
Total Covered Storage	47
Tie-downs	
Tie-downs, paved	9
Tie-downs, grass	18
Total Tie-downs	27
Total Aircraft Storage	74

Source: WSA

The FBO uses four spaces in the large hangar and all of the space in the maintenance hangar for maintenance purposes, leaving 41 covered spaces for aircraft storage. The airport manager reports that there is a waiting list for hangar space, with a demand for five T-hangars, with three of those coming from off airport.

The forecast of based aircraft estimates an increase of 18 based aircraft during the planning period. An increase of 18 aircraft storage spaces would increase the current inventory of spaces from 41 to 59. It is recommended that this be accomplished as demand warrants, so that users will determine if T-hangars or conventional hangar space is what is needed.

4-4-2-1 Aircraft Apron Area

Aircraft parking apron requirements are typically divided into two categories - transient aircraft parking requirements and based aircraft parking requirements. There are two designated aircraft parking areas on the northeast side of Runway 14/32. The primary aircraft parking area has a hard surface, accommodates nine aircraft, and is located across from the fueling area. Another area has a grass surface, accommodates 18 aircraft, and is located southeast of the fueling area. Both areas are within the confines of the runway OFA which conflicts with the FAA's recommendation to avoid parking aircraft in the OFA.

The following narrative discusses aircraft parking ramp requirements for transient and based aircraft.

4-4-2-1-1 Transient Aircraft Apron

A number of assumptions were used in determining apron ramp requirements for transient aircraft, listed as follows:

- Itinerant operations comprise 23 percent of total operations.
- Transient operations represent approximately 75 percent of the peak day itinerant operations.
- The number of transient aircraft total 50 percent of peak day transient operations, since each transient aircraft eventually has both a landing and a take off.
- Space should be provided for 80 percent of peak day transient aircraft.

There is a distinction between transient aircraft operations and itinerant aircraft operations. Transient aircraft operations are a subset of itinerant aircraft operations. For example, an aircraft based at Harry Clever Field that is flying to or from Cincinnati would be performing an itinerant operation. In the vast majority of instances, an aircraft based at Harry Clever Field would return to its hangar or tie-down once it returned to the Airport. A transient aircraft would be an aircraft that is based at another airport that is flying to Harry Clever Field. The distinction is that an aircraft based at another field requires transient apron tie-down space when it is parked at Harry Clever Field.

Table 4-4 summarizes the requirements for transient aircraft parking spaces at Harry Clever Field. Transient aircraft parking space requirements at the Airport are projected to increase from six spaces at present to nine spaces by 2023.

Table 4-4
TRANSIENT APRON SPACE REQUIREMENTS

Component	2003	2008	2013	2023
Peak Day Operations	80	90	100	120
Peak Day Itinerant Operations	18	21	23	28
Peak Day Transient Operations	14	16	17	21
Transient Aircraft	7	8	9	11
Transient Spaces	6	6	7	9
Peak Space Demand	6	6	7	9

Source: WSA

Based on this analysis, the need for transient parking spaces will not exceed nine spaces by the end of the planning period. With 27 existing tie-downs, there is adequate space for transient aircraft. There may be times, such as during fly-ins, when peak activity will exceed capacity. However, these occurrences are not expected to occur frequently enough to warrant the additional investment in infrastructure.

4-4-2-1-2 Based Aircraft Apron

According to airport management, the majority of aircraft are stored in hangars. However, there are a small number of aircraft stored on tie-downs and it is reasonable to conclude that there will be a demand for tie-downs since they are less expensive than covered storage. By the end of the planning period, it is projected that 56 of the 69 based aircraft will be in covered storage, leaving 13 using tie-downs. The Airport currently has 27 tie-downs, with nine devoted to transient parking by the end of the planning period. This leaves 18 tie-downs for permanent aircraft storage, indicating that the current ramp space is sufficient for the demand projected through the end of the planning period. However, it is recommended that the grass tie-downs be converted to paved tie-downs at some point during the planning period since this will increase their utility. This paved area may need to be relocated to comply with FAA design criteria.

4-4-3 Automobile Parking

There are two parking lots at Harry Clever Field, one with the capacity for 17 automobiles and the other with a capacity for 38, for a total parking capacity for 55 vehicles. The larger parking lot is located by the on-airport restaurant.

While automobile parking requirements vary greatly for each FBO based on individual needs, the number of employees, the number of customers, and the number of visitors, etc., a general estimate of the total number of spaces an airport requires for general aviation users can be obtained by using a standard methodology. At general aviation airports, a rule-of-thumb is that approximately 2.2 parking stalls per peak hour operation are required to accommodate pilots and passengers. To account for FBO employee, delivery vehicles, guests, and other related parking, this amount is increased by 10 percent. Finally, 15 spaces are assumed necessary for restaurant users. By following these guidelines, Harry Clever Field requires a minimum of 40 parking spaces to meet current demand and 49 spaces at the end of the planning period. In either case, the two parking lots provide adequate capacity.

4-4-4 Fencing

Security fencing surrounds the Airport. However, because of limited land availability, the fencing intrudes on the OFA for Runway 11/29 and Runway 14/32. The fence is on frangible mounts, but it is recommended that the fence be moved beyond the boundaries of the OFA for both runways.

4-4-5 Fuel Storage

Existing fuel storage consists of two underground tanks. Jet-A fuel is stored in a 15,000 gallon tank and 100LL is stored in a 10,000 gallon tank. Fueling is self-service and is accessible 24 hours per day. The FBO operator stated that he used a fueling truck in his first year of operations but decided to eliminate truck fueling since it was not as cost effective as self-service fueling.

4-5 SUMMARY

- The Airport has an annual service volume of 200,000 operations. Future demand is projected to reach 27,600 annual operations, or about 14 percent of the annual capacity. This indicates that the existing facilities are adequate for the planning period.

- The current runway is not long enough to meet the needs of current users and is inadequate for an airport that ultimately intends to meet C-II ARC design standards. However, the recommended short-range goal for the Airport is to extend Runway 14/32 to 4,500 feet with a long-range goal of obtaining a 5,000-foot runway.

- The Airport's existing RSA and OFA do not meet the standards for a B-II airport. It will be even more difficult for the Airport to meet the expanded boundaries of a C-II RSA and OFA. The Airport will need to clear the RSA and OFA of obstructions, obtain a waiver, or find some other method of meeting the requirements of the RSA and OFA.

- The existing taxiway is not wide enough to meet the criteria for B-II or C-II ARC. It is recommended that the taxiway be widened to 35 feet.

- Visibility minimums for the primary runway will remain at one mile.

- A minimum of 18 additional hangar spaces will be needed by the end of the planning period.

- The current apron space is adequate for the demands projected through the end of the planning period. However, it is recommended that the grass tie-downs be paved.

- The automobile parking space is adequate for the demands projected through the end of the planning period.