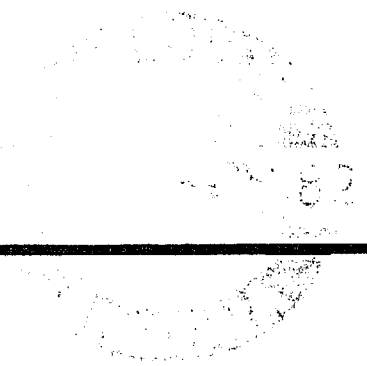
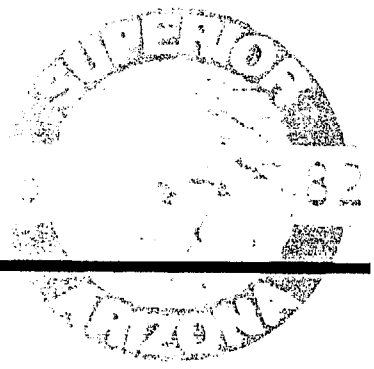
SECTION 3
AIRPORT FACILITY REQUIREMENTS



SECTION 3:
FACILITY REQUIREMENTS

SUPERIOR AIRPORT MASTER PLAN - 2001



INTRODUCTION

Any growth in local aviation related activities or change in existing or anticipated use of an airport facility requires a corresponding program of airport development and implementation. This is necessary in order to assure that the facility remains able to effectively accommodate its demand and to effectively serve its market. In order to provide for the demands on the Superior Airport, a schedule of facility improvements has been developed, based on an inventory of the existing airport facilities and the development of forecast aircraft activity through a twenty-year planning period.

The recommendations for each of the airside and landside facilities were developed accepting the following criteria:

- The dimensional standards and design criteria for all improvements proposed within the planning period shall be as detailed in FAA Advisory Circular AC 150/5300-13, Airport Design and the Arizona Department of Transportation's (ADOT) Transportation Board Policies, 1998 Edition. A printout from the FAA's Airport Design program is included at the end of this section (pages FAA-1 through FAA-2). Excerpts from the ADOT Transportation Board Policies is also included (see pages ADOT-1 through ADOT-3). This includes criteria for both development of an improved airport on the existing constrained site, and an ultimate airport configuration based on maximum potential demand to aid in determining whether or not to relocate the airport to a new site.

- The existing airport only experiences occasional use. The aircraft currently using the airport is a mix of small piston singles such as the Cessna 180, 182 and 206 and the Piper PA-32. Total use does not currently approach 500 annual operations. According to local sources, the use of the existing airfield is limited to possibly 20 to 30 operations per year. The Model 1 forecasts presented in Section 2 indicate that after initial improvements are made to the existing site, the annual operations may increase to as many as 9,900 per year, with 5 based aircraft. After improvements are made (including a paved and lighted runway), a greater range of aircraft types will be able to use the airport. These may include light single and twin engined piston types and possibly very small business jets. The range of aircraft that may be accommodated will, however, be restricted because of the topographic

constraints limiting runway length. The critical aircraft for development on the existing site is a range of ARC A-1, A-II, B-I and B-II aircraft with takeoff weights of less than 12,500 pounds, that could operate from a 3,500' long paved runway.

- If the airport is relocated, it is assumed that it would be developed at a new site that would allow construction of a 5,100' long paved runway along with facilities that would accommodate a greater range of aircraft in the ARC A-1, A-II, B-I and B-II categories. The Model 2 forecasts indicate a significant level of activity as based aircraft migrate to the new facility from other nearby airports. Initially, there may be as many as 27 based aircraft, and annual operations may reach 27,000. A greater range of aircraft would be able to utilize an airport at a new site because it is assumed that runway length development would not be restricted.

The following narrative contains a discussion of each recommended item of development. Figure 3-1, at the end of this section, illustrates the development concept for both the existing site (constrained development) and unconstrained development at a new site.

The discussion of each element includes recommendations for improvements to meet the Short Term (0 to 5 year), and the Ultimate Term (5 to 20 year) demand. The program includes recommendations for both continued development at the "constrained" existing site and development of an "unconstrained" facility at a new location.

Summary tables for the recommended Short Term and Ultimate Term development are included at the end of this section. These general recommendations will be expanded into detailed year-by-year site-specific project recommendations in Section 6, Airport Layout Plan. Development costs will be assigned in Section 7, Financial Plan.

INSTRUMENT APPROACHES AND NAVIGATIONAL AIDS

The existing airport is a Visual Flight Rules (VFR) only facility, with no instrument approaches and no existing navigational aids. Because of rising terrain in all directions, it is highly unlikely that an instrument approach of any kind could be commissioned at the present site.

If a new site is selected and developed, a nonprecision approach procedure could be developed using current Global Positioning System (GPS) technology, which would not require the installation of ground-based navigational aids. This approach could be designed for approach operations to one mile visibility minimums.

Instrument Approaches and Navigational Aids SHORT TERM RECOMMENDATIONS	
Existing Site	New Site
Remain as VFR-only airport.	Initially, airport should be a VFR facility.
ULTIMATE TERM RECOMMENDATIONS	
Existing Site	New Site
Remain as VFR-only airport.	Commission a nonprecision GPS approach.

PRIMARY RUNWAY REQUIREMENTS

The existing primary runway (Runway 4-22) is about 3,500' long and 150' wide. It is an unlighted graded dirt landing strip found to be in generally poor condition.

The existing site is adequate for Visual Flight Rules (VFR) operations only. 1,000' x 250' x 450' FAA Runway Protection Zones (RPZ's) are required for this type of activity. The RPZ's would extend beyond the airport's current property lines. Land use control over the RPZ's may be provided by securing Avigation Easements from adjoining land owners.

If development at a new site occurs, with a nonprecision GPS instrument approach to not lower than one mile visibility, the RPZ's would need to be 1,000' x 500' x 700'.

According to FAA Advisory Circular AC 150/5300-13 Airport Design, a runway's "Declared Distances" are the distances that the airport owner declares available for an aircraft's takeoff and landing operations. The current Takeoff Distance Available (TODA), Landing Distance Available (LDA), and the Accelerate-Stop Distance Available (ASDA) for the existing Runway 4-22 are 3,500 feet, the total graded runway length. This would be the maximum length that could be developed on the present site because of existing topographic and property constraints.

The previous section (Section 2. Forecasts of Aviation Activity) indicated that the available runway length of 3,500' is adequate to accommodate many single and twin engined piston aircraft and some small jets with takeoff weights of up to 12,500 pounds, assuming that the runway is paved.

The analysis included in Section 2 suggests that a reasonable mix of 12,500 pound-or-

less aircraft through ARC B-II could be accommodated by a 5,100' long runway, and that many of these could be accommodated by a 4,500' long runway.

The FAA's AC 150/5325-4A, Runway Length Requirements for Airport Design recommends the following runway lengths for an airport at an altitude of 2,000' MSL, with a mean daily maximum temperature of 97° Fahrenheit (as calculated using the FAA's Airport Design computer software):

FAA AC 150/5325-4A
Primary Runway Length Recommendations for Superior Airport

Small airplanes (12,500 pounds or less):	
with approach speeds of less than 30 knots	360 feet
with approach speeds of less than 50 knots	960 feet
Small airplanes (12,500 pounds or less) with less than 10 passenger seats:	
75 percent of these small airplanes	3,280 feet
95 percent of these small airplanes	3,930 feet
100 percent of these small airplanes	4,570 feet
Small airplanes with 10 or more passenger seats	4,780 feet
Large airplanes of 60,000 pounds or less:	
75 percent of these large airplanes at 60% useful load	5,140 feet
75 percent of these large airplanes at 90% useful load	7,370 feet
100 percent of these large airplanes at 60% useful load	6,510 feet
100 percent of these large airplanes at 90% useful load	9,750 feet

Examination of the above table suggests that the Section 2 analysis of critical aircraft mix is supported by the FAA criteria. According to the FAA, 100% of small aircraft with less than 10 passenger seats (those that are 12,500 pounds or less) would be accommodated by a 4,570' runway. This utilization would be increased to also accommodate many aircraft with takeoff weights of up to 60,000 pounds with the addition of a runway extension to just over 5,100'.

FAA criteria recommends a 75' pavement width for ARC B-II runways.

Primary Runway SHORT TERM RECOMMENDATIONS	
Existing Site	**New Site**
Construct paved 3,500' x 75' runway, marked for visual operations. (12,500 pound SWG design) Provide 1,000' x 250' x 450' Runway Protection Zones (RPZ's)	Construct paved 4,500' x 75' runway, marked for visual operations (12,500 pound SWG design). Provide 1,000' x 250' x 450' Runway Protection Zones (RPZ's)
ULTIMATE TERM RECOMMENDATIONS	
Existing Site	**New Site**
	Extend runway to an ultimate length of 5,100', marked for nonprecision instrument operations. Strengthen runway pavement to 60,000 pound SWG design. Provide 1,000' x 500' x 700' Runway Protection Zones (RPZ's)

CROSSWIND RUNWAY REQUIREMENTS

The FAA recommends that a secondary (crosswind) runway be developed if the wind coverage on the primary runway is less than 95% (see FAA AC 150/5300-13, Change 4, paragraph 203. b.). A crosswind runway may also be justified based on specific local conditions.

The analysis of available wind record data for the existing site, contained in Section 1, indicated that the present runway alignment provides adequate crosswind coverage without the need for a second (crosswind runway. Wind coverage of 95.0% at 10.5 knots and 96.7% at 13 knots is indicated.

Wind data for the Phoenix metropolitan area will probably be more representative of conditions at the Superior Airport if the airport is relocated to a new site west of the present site. The resulting wind coverages for this scenario were computed with reference to data from the NOAA National Climatic Data Center collected at the

Phoenix-Sky Harbor International Airport for the 1982-1991 period, using the FAA's Airport Design Wind Analysis software. The results of the computations indicate that Runway 4-22's crosswind coverage is 98.2% at 10.5 knots and 99.2% at 13 knots.

The results of the wind data analysis indicate that a crosswind runway is not required.

TAXIWAY DEVELOPMENT

There are no taxiways at the existing Superior Airport at the present time.

For new taxiway development, FAA criteria recommends a 35' pavement width for ARC B-II taxiways. A parallel taxiway is generally not recommended unless total annual operations approach 20,000. The forecasts for development at the existing site predict that this may occur beyond the 20-year planning period of this study. The alternate forecast for development at a new site closer to the Phoenix metro area suggest that annual operations will exceed 20,000 early in the forecast period.

Each runway end should also have a paved area suitable for aircraft to perform runups. For runways with no parallel taxiway, these areas must also function as turnarounds.

Taxiway Development SHORT TERM RECOMMENDATIONS	
Existing Site	**New Site**
Construct paved 35' wide connector taxiway to the parking apron, and turnaround/runup taxiways at each runway end.	Construct a full 35' wide parallel taxiway to serve the initial 4,500' long runway, as well as connector taxiways to the apron and runup areas at each runway end.
ULTIMATE TERM RECOMMENDATIONS	
Existing Site	**New Site**
Construct a full 35' wide parallel taxiway to serve the 3,500' long runway, if justified by actual demand.	Extend the parallel taxiway concurrent with runway extension.

AIRCRAFT PARKING AND STORAGE REQUIREMENTS

The existing airport has a graded aircraft parking area with several old tiedown anchors. There are no based aircraft at the present time, and use by transient aircraft is limited to a few operations per year.

The number of required tiedown spaces for based and transient aircraft use for initial and ultimate development at either the existing or a new site was determined by applying the following assumptions.

- Approximately 75% of the total peak daily operations are assumed to be by transient aircraft.
- Most visiting aircraft will arrive and depart on the same day. The actual number of peak transient aircraft is assumed to be one-half the peak transient daily operations.
- Seventy-five percent of the transient aircraft will be parked on the apron at the same time during the peak period.
- Ten percent of the based aircraft may also be parked on the apron temporarily or seasonally.

The calculations on the following page were made to derive the recommended number of tiedown spaces to be provided on the parking apron in the present and ultimate scenarios, for each of the development site options.

Where: D = Average Daily Peak Operations.
T = Total daily peak transient operations.
N = Number of required tiedowns for transients.
B = Number of based aircraft.

...and

S = Total number of recommended tiedowns.

Tiedown Spaces Required
Existing Airport Site Development

For base year (2002) condition:

T = D (0.75) = 31(0.75) = 23.25
N = (T/2) 0.75 = (23.25/2)0.75 = 8.72
N = 9
S = (0.10 (B))+N = (0.10 (5))+9 = 9.5 = 10

For Ultimate (2022) condition:

T = D (0.75) = 60(0.75) = 45.00
N = (T/2)0.75 = (45.00/2)0.75 = 16.88
N = 17
S = (0.10 (B))+N = (0.10(12))+17 = 18.2 = 18

Tiedown Spaces Required
New (Relocated) Airport Site Development

For base year (2005) condition:

T = D (0.75) = 84(0.75) = 63.00
N = (T/2) 0.75 = (63.00/2)0.75 = 23.63
N = 24
S = (0.10 (B))+N = (0.10 (27))+24 = 26.7 = 27

For Ultimate (2025) condition:

T = D (0.75) = 110(0.75) = 82.50
N = (T/2)0.75 = (82.50/2)0.75 = 30.94
N = 34
S = (0.10 (B))+N = (0.10(44))+34 = 38.4 = 38

The aircraft parking apron should be equipped with security floodlighting.

In the above estimates, it is assumed that most based aircraft owners will prefer to park their aircraft within a hangar or T-Shade, if available at a reasonable cost. For this reason, adequate land area for hangar and/or shade construction should be provided for all forecast based aircraft through the planning period. These may be constructed as required by private interests upon leased land, or by the Town to provide a revenue-producing rental base.

Aircraft Parking and Storage Requirements SHORT TERM RECOMMENDATIONS	
Existing Site	**New Site**
Construct a paved and lighted aircraft parking apron to accommodate 10 aircraft. Set aside land area for development of 12 aircraft storage hangars.	Construct a paved and lighted aircraft parking apron to accommodate 27 aircraft. Set aside land area for development of 44 aircraft storage hangars.
ULTIMATE TERM RECOMMENDATIONS	
Existing Site	**New Site**
Expand the aircraft parking apron to accommodate a total of 18 aircraft. Construct hangars as dictated by actual demand.	Expand the aircraft parking apron to accommodate a total of 38 aircraft. Construct hangars as dictated by actual demand.

TERMINAL BUILDING REQUIREMENTS AND RECOMMENDATIONS

The Estimated Peak Hourly Demand, as established in Section 2, was used to arrive at an estimate of the required Terminal Building area for the anticipated general aviation demands through the planning period. A basic criteria of 50 square feet of building space per peak hour passenger or pilot was applied to the assumed rate of 2.5 occupants per peak hour aircraft.

Using this criteria, the estimated minimum recommended Terminal Building space is as follows:

Recommended Minimum Terminal Building Area
Superior Airport

	Year	Peak Hour Demand	Building Area (S.F.)	Year	Peak Hour Demand	Building Area (S.F.)
Existing Airport Site Development	2002	3	375	2022	7	875
New (Relocated) Airport Site Development	2005	9	1125	2025	12	1500

The 375 square foot Terminal Building would be a very basic structure, to include only restrooms and a small office/pilot waiting room. The larger buildings may include restrooms and a larger pilot waiting and briefing room, as well as a separate airport management office and storage room.

Terminal Building Requirements SHORT TERM RECOMMENDATIONS	
Existing Site	New Site
Construct a 375 square foot basic Terminal Building, expandable to 875 square feet.	Construct an 1,125 square foot Terminal Building, expandable to 1,500 square feet.
ULTIMATE TERM RECOMMENDATIONS	
Existing Site	New Site
Expand the basic Terminal Building to 875 square feet.	Expand the Terminal Building to 1,500 square feet.

AUTOMOBILE PARKING AND ACCESS REQUIREMENTS

The Estimated Peak Hourly Demand was also used as a basis to estimate the projected requirements for automobile parking. The criteria used is a factor of 3.25 automobiles per peak hour operation. This factor allows for 2.5 occupants per aircraft operation during the peak hour, plus allowance for airport employees and visitors.

The estimated automobile parking requirements are as follows:

Recommended Minimum Automobile Parking
Superior Airport

	Year	Peak Hour Demand	Auto Parking Spaces	Year	Peak Hour Demand	Auto Parking Spaces
Existing Airport Site Development	2002	3	10	2022	7	23
New (Relocated) Airport Site Development	2005	9	29	2025	12	39

The existing airport is accessed via a graded dirt access road from U.S. Highway 60. This road also serves the Town's wastewater treatment plant and is a penetration of the 20:1 F.A.R. Part 77 Approach Surface to Runway 22. If the existing site is improved, it is recommended that the apron and terminal area be located near the runway midpoint, with new paved access from the highway. The existing dirt road would then only serve the treatment plant, but would require relocation such that a minimum of 15 feet of vertical clearance is provided from the road surface to the 20:1 Approach Surface.

Development of a new site will also require a paved access road, the design of which will be site-specific.

The recommended automobile parking and access road improvements are as follows:

Automobile Parking and Access Requirements SHORT TERM RECOMMENDATIONS	
Existing Site	**New Site**
Construct a paved automobile parking area able to accommodate 10 cars. Provide a paved access road from U.S. Highway 60 to the auto parking area. Relocate the existing dirt access road to the wastewater treatment plant to conform with FAR Part 77 requirements.	Construct a paved automobile parking area able to accommodate 29 cars. Provide a paved access road to the auto parking area.
ULTIMATE TERM RECOMMENDATIONS	
Existing Site	**New Site**
Expand the automobile parking area such that it will accommodate a total of 23 cars.	Expand the automobile parking area such that it will accommodate a total of 39 cars.

AIRPORT LIGHTING AND VISUAL AIDS

The existing airport has no visual aids. The existing runway is not lighted.

A typical airport that will adequately serve general aviation ARC B-II demand in 24-hour Visual Flight Rules (VFR) conditions should at least be equipped with Medium Intensity Runway Lights (MIRL), a Rotating Beacon and retroreflective taxiway edge markers. Other desirable improvements for airports expected to include nonprecision instrument approaches and higher levels of activity include installation of Medium Intensity Taxiway Lights (MITL) and Precision Approach Path Indicators (PAPI).

Recommended lighting and visual aids improvements for Superior Airport include the following:

Airport Lighting and Visual Aids SHORT TERM RECOMMENDATIONS	
Existing Site	**New Site**
Install Medium Intensity Runway Lights (MIRL) on the new 3,500' long runway. Provide retroreflective taxiway edge markers on connector and turnaround/runup taxiways. Install Rotating Beacon.	Install Medium Intensity Runway Lights (MIRL) on the new 4,500' long runway. Provide retroreflective taxiway edge markers on parallel, connector and runup taxiways. Install Rotating Beacon.
ULTIMATE TERM RECOMMENDATIONS	
Existing Site	**New Site**
Install Precision Approach Path Indicators (PAPI) on both runway ends. Install Medium Intensity Taxiway Lights (MITL) on all taxiways, including parallel (if constructed), connector and runup taxiways.	Install Precision Approach Path Indicators (PAPI) on both runway ends. Install Medium Intensity Taxiway Lights (MITL) on all taxiways, including parallel, connector and runup taxiways. Extend MIRL and MITL concurrent with runway extension to 5,100'.

AIRCRAFT FUEL SERVICE

The existing airport does not provide aircraft fueling. Development of an improved airport facility, either at the present location or at a new site, should include a fuel delivery and storage system.

For development at the existing site, installation of a self-service above-ground package storage and deliver system that provides 100LL aviation fuel as well as auto fuel for use by aircraft with an autogas Standard Type Certificate (STC) should be considered. 5,000 gallon capacity for each product should be sufficient considering the projected level of activity at this site. Installation of this system could be delayed until actual activity justifies the cost.

If the airport is relocated to a site that will allow development of an airport that will serve larger aircraft, the addition of Jet-A fuel service should be considered. A package system that provides 10,000 gallons of each product should be sufficient. This system could be self-service or service could be provided by a Fixed Base Operator (FBO).

Aircraft Fuel Service SHORT TERM RECOMMENDATIONS	
Existing Site	New Site
	Install an above-ground package storage and deliver system that provides 100LL aviation fuel, Jet-A and auto fuel.
ULTIMATE TERM RECOMMENDATIONS	
Existing Site	New Site
Install a self-service above-ground package storage and deliver system that provides 100LL aviation fuel as well as auto fuel.	

FENCING

The existing airport property is enclosed by a barbed wire fence that was found to be in Fair-Poor condition. If this site is improved, the property line fencing should be upgraded or replaced and the new terminal area should be enclosed with chain link security fencing. Card controlled gate access to aircraft operations and parking areas should also be programmed for installation as part of the security fencing.

Development of a new airport site should include installation of barbed wire property line fencing and chain link terminal area security fencing with card controlled gate access to aircraft operations and parking areas.

Fencing SHORT TERM RECOMMENDATIONS	
Existing Site	New Site
Upgrade or replace the existing barbed wire property line fencing. Construct terminal area chain link security fencing with card controlled gate access to aircraft operations and parking areas.	Construct barbed wire property line fencing. Construct terminal area chain link security fencing with card controlled gate access to aircraft operations and parking areas.

ULTIMATE TERM RECOMMENDATIONS	
Existing Site	New Site
Expand terminal area security fencing as required to accommodate future airport development.	Expand terminal area security fencing as required to accommodate future airport development.

RECREATIONAL AIRPORT FACILITIES

In 1992, the ADOT - Aeronautics Division developed the Arizona Recreational Airport Master Plan, which selected 18 possible airport sites that would be good locations for use as recreational sites. The intent was that the owners of the 18 airfields listed in the plan could apply to the state for grants for development of eligible recreational improvements. The Superior Airport was not included on the plan.

Since the Recreational Airport Master Plan was published, only one airport has taken advantage of the funding for development of recreational facilities (Payson Airport, in north central Arizona). In order to generate more interest in the recreational airport program, ADOT plans to open the program up to other airport owners who express interest in this type of development.

The Superior Airport PAC has expressed interest in the potential development of the Superior Airport as a recreational airport. The development would consist of a prepared, secure campsite area adjacent to the terminal area, with potable water available and restroom facilities. This type of use is probably only viable at the existing site, since a new site (probably much closer to the Phoenix metro area) would function more as a metropolitan/commercial development center.

Recreational Airport Facilities SHORT TERM RECOMMENDATIONS	
Existing Site	New Site
Set aside adequate airport land to allow future development of a fenced camping area.	

ULTIMATE TERM RECOMMENDATIONS	
Existing Site	New Site
Initially, a fenced camping area should be developed that could accommodate three camp sites. An adjacent restroom/shower building should be provided with potable water available and security lighting. Depending upon the actual demand for camping on the airport, the facilities may need to be expanded.	

UTILITIES: ELECTRICITY, TELEPHONE, SEWER AND WATER

The existing airport does not have electricity, telephone service, potable water or a sanitary sewer system. Electric and telephone service is available along Highway 60. Water service would require an extension from a main near the wastewater plant, and sewer disposal would require either a sanitary sewer extension or installation of an onsite disposal system.

Development at either the existing site or a new site should include installation of 3-phase power service, telephone, sanitary sewer and potable water.

Utilities SHORT TERM RECOMMENDATIONS	
Existing Site	New Site
Install new 3-phase electric service, telephone service, sanitary sewer and water service.	Install new 3-phase electric service, telephone service, sanitary sewer and water service.

ULTIMATE TERM RECOMMENDATIONS	
Existing Site	New Site
Extend utilities as necessary to accommodate future airport development.	Extend utilities as necessary to accommodate future airport development.

GENERAL DEVELOPMENT PHASING PLAN SUMMARY

The tables on the following pages are a summary of the general recommendations for facility improvements to be constructed within the Short Term and the Ultimate Term time frames, as presented in the above narrative. The summary is presented such that a comparison of the relative level of effort can be made between development at the existing site (constrained development) and development at a new site.

Alternate methods for execution of the recommended major improvements are presented in Section 4, Site Selection and Alternatives.

The general development plan as presented in this section will be refined and presented in greater detail in Section 6: Airport Layout Plan.

Estimated costs for the recommended development will be presented in Section 7: Financial Plan.

Superior Airport
SHORT TERM RECOMMENDATIONS
(2002-2007)
Existing Site Development

Construct paved 3,500' x 75' runway, marked for visual operations. (12,500 pound SWG design)

Provide 1,000' x 250' x 450' Runway Protection Zones (RPZ's)

Construct paved 35' wide connector taxiway to the parking apron, and turnaround/runup taxiways at each runway end.

Construct a paved and lighted aircraft parking apron to accommodate 10 aircraft.

Set aside land area for development of 12 aircraft storage hangars.

Construct a 375 square foot basic Terminal Building, expandable to 875 square feet.

Construct a paved automobile parking area able to accommodate 10 cars.

Provide a paved access road from U.S. Highway 60 to the auto parking area.

Relocate the existing dirt access road to the wastewater treatment plant to conform with FAR Part 77 requirements.

Install Medium Intensity Runway Lights (MIRL) on the new 3,500' long runway.

Provide retroreflective taxiway edge markers on connector and turnaround/runup taxiways.

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Superior Airport
SHORT TERM RECOMMENDATIONS
(2005-2010)
New Site Development

Construct paved 4,500' x 75' runway, marked for visual operations (12,500 pound SWG design).

Provide 1,000' x 250' x 450' Runway Protection Zones (RPZ's)

Construct a full 35' wide parallel taxiway to serve the initial 4,500' long runway, as well as connector taxiways to the apron and runup areas at each runway end.

Construct a paved and lighted aircraft parking apron to accommodate 27 aircraft.

Set aside land area for development of 44 aircraft storage hangars.

Construct an 1,125 square foot Terminal Building, expandable to 1,500 square feet.

Construct a paved automobile parking area able to accommodate 29 cars.

Provide a paved access road to the auto parking area.

Install Medium Intensity Runway Lights (MIRL) on the new 4,500' long runway.

Provide retroreflective taxiway edge markers on parallel, connector and runup taxiways.

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Short Term Recommendations Continued Existing Site Development	Short Term Recommendations Continued New Site Development
Install Rotating Beacon.	Install Rotating Beacon.
	Install an above-ground package storage and deliver system that provides 100LL aviation fuel, Jet-A and auto fuel.
Upgrade or replace the existing barbed wire property line fencing.	Construct barbed wire property line fencing.
Construct terminal area chain link security fencing with card controlled gate access to aircraft operations and parking areas.	Construct terminal area chain link security fencing with card controlled gate access to aircraft operations and parking areas.
Set aside adequate airport land to allow future development of a fenced camping area.	
Install new 3-phase electric service, telephone service, sanitary sewer and water service.	Install new 3-phase electric service, telephone service, sanitary sewer and water service.

Superior Airport
ULTIMATE TERM RECOMMENDATIONS
(2008-2022)
Existing Site Development

Construct a full 35' wide parallel taxiway to serve the 3,500' long runway, if justified by actual demand.

Expand the aircraft parking apron to accommodate a total of 18 aircraft.

Construct hangars as dictated by actual demand.

Expand the basic Terminal Building to 875 square feet.

Expand the automobile parking area such that it will accommodate a total of 23 cars.

Install Precision Approach Path Indicators (PAPI) on both runway ends.

Install Medium Intensity Taxiway Lights (MITL) on all taxiways, including parallel (if constructed), connector and runup taxiways.

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Superior Airport
ULTIMATE TERM RECOMMENDATIONS
(2011-2025)
New Site Development

Commission a nonprecision GPS instrument approach.

Extend runway to an ultimate length of 5,100', marked for nonprecision instrument operations.

Strengthen runway pavement to 60,000 pound SWG design.

Provide 1,000' x 500' x 700' Runway Protection Zones (RPZ's)

Extend the parallel taxiway concurrent with runway extension.

Expand the aircraft parking apron to accommodate a total of 38 aircraft.

Construct hangars as dictated by actual demand.

Expand the Terminal Building to 1,500 square feet.

Expand the automobile parking area such that it will accommodate a total of 39 cars.

Install Precision Approach Path Indicators (PAPI) on both runway ends.

Install Medium Intensity Taxiway Lights (MITL) on all taxiways, including parallel, connector and runup taxiways.

Extend MIRL and MITL concurrent with runway extension to 5,100'.

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Ultimate Term Recommendations Continued Existing Site Development

Install a self-service above-ground package storage and deliver system that provides 100LL aviation fuel as well as auto fuel.

Expand terminal area security fencing as required to accommodate future airport development.

Initially, a fenced camping area should be developed that could accommodate three camp sites. An adjacent restroom/shower building should be provided with potable water available and security lighting. Depending upon the actual demand for camping on the airport, the facilities may need to be expanded.

Extend utilities as necessary to accommodate future airport development.

Ultimate Term Recommendations Continued New Site Development

Expand terminal area security fencing as required to accommodate future airport development.

Extend utilities as necessary to accommodate future airport development.

APPROXIMATE COMPARISON OF DEVELOPMENT COSTS

The costs associated with the two development models presented above will vary significantly. Development at the existing site will be constrained to the present airport property, with a 3,500' VFR runway to be used by only light aircraft (those with takeoff weights that do not exceed 12,500 pounds). As was determined in Section 2, activity at the existing site would be much less than that which would occur at a new site that is closer to the metropolitan population center. It has been assumed that a new site would allow unconstrained development of facilities required to accommodate greater projected demand, including a 5,100' long runway that would ultimately serve 60,000 pound aircraft in instrument weather conditions. The new site development would also require land acquisition, which is assumed to total approximately 400 acres.

For the sake of initial comparison, approximate costs have been assigned to each of the two development models. These are tabulated on the following page. Note that the purpose of this estimate is to provide a basis of comparison of relative costs, and only considers selected major development features - those that will probably cost the most. ***The estimates do not represent total development costs***. Additional costs will be incurred with either of the models, including terminal building construction, utilities, fuel systems, and hangar site preparation. Engineering and administrative costs will add about 20% to the total development costs for either model.

Cost estimates will be refined in following sections of this study, where site-specific conditions will be considered. Actual site-specific costs will be affected by such variables as quantities of earthwork required, soils conditions, actual land area required for development, length of access road, and major site drainage features.

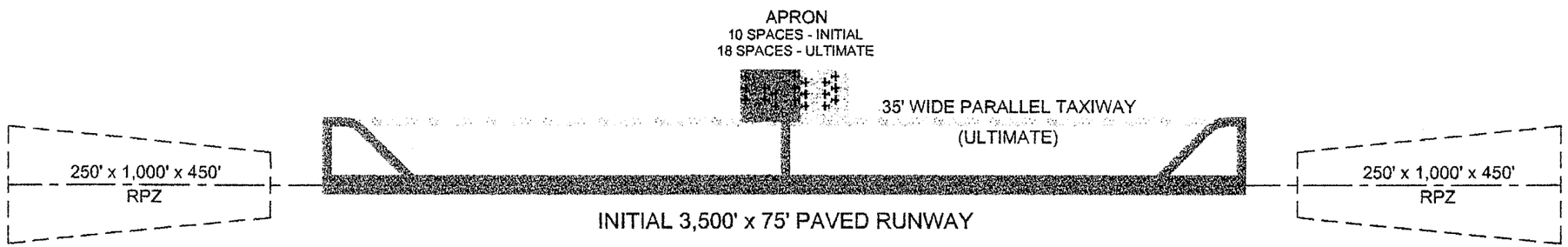
In general terms, the initial estimate indicates that development at a new site may cost five times as much as development at the existing site.

The Town must decide whether this level of investment aligns with the community's vision for the future. The decision at this point is between development of a small community airport with primarily a local tourism/recreational role and a minor local business development role, or development of a new general aviation airfield with a more regional commercial/business development role.

Either of these options appear to be feasible, depending on the ability and willingness of the Town, ADOT and the FAA to provide adequate funding.

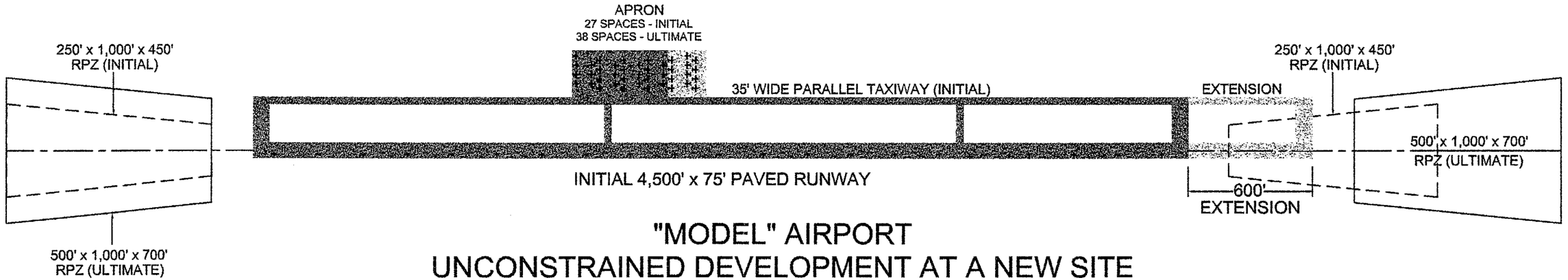
Approximate Comparison of Development Costs
(Major Features)
Superior Airport
Existing Site Development - versus - Development at a New Site

Major Development Feature	Existing Site (constrained)	New Site (unconstrained)
Land Acquisition		$2,000,000
Initial Lighted Runway Development	$490,000	$630,000
Initial Lighted Taxiway Development	$59,376	$386,100
Initial Apron Development	$63,324	$142,110
Initial Access Road & Auto Parking	$37,516	$47,046
Total - Initial Development Cost Comparison	$650,216	$3,205,256
Lighted Runway Extension		$84,000
Taxiway Development/Extension	$227,500	$41,189
Apron Expansion	$49,200	$50,550
Auto Parking Expansion	$6,521	$5,016
Runway Strength Upgrade		$255,000
Taxiway Strength Upgrade		$166,932
Apron Strength Upgrade		$108,000
Total - Future Development Cost Comparison	$283,221	$710,687
Total Approximate Costs of Selected Major Features (Over the 20-Year Planning Period)	$933,437	$3,915,943



"MODEL" AIRPORT
CONSTRAINED DEVELOPMENT AT EXISTING SITE

SCALE: 1" = 500'



"MODEL" AIRPORT
UNCONSTRAINED DEVELOPMENT AT A NEW SITE

SCALE: 1" = 500'

FIGURE 3-1
SUPERIOR AIRPORT
DEVELOPMENT CONCEPT
COMPARISON

FAA AIRPORT DESIGN CRITERIA FOR SUPERIOR AIRPORT

AIRPORT DESIGN AIRPLANE AND AIRPORT DATA

Aircraft Approach Category B	
Airplane Design Group II	
Airplane wingspan	78.99 feet
Primary runway end approach visibility minimums are not lower than 1 mile	
Other runway end approach visibility minimums are not lower than 1 mile	
Airplane undercarriage width (1.15 x main gear track)	13.57 feet
Airport elevation	2000 feet

RUNWAY AND TAXIWAY WIDTH AND CLEARANCE STANDARD DIMENSIONS

Runway centerline to parallel runway centerline simultaneous operations when wake turbulence is not treated as a factor:

VFR operations with no intervening taxiway	700 feet
VFR operations with one intervening taxiway	700 feet
VFR operations with two intervening taxiways	700 feet
IFR approach and departure with approach to near threshold	2500 feet less 100 ft for each 500 ft of threshold stagger to a minimum of 1000 feet.

Runway centerline to parallel runway centerline simultaneous operations when wake turbulence is treated as a factor:

VFR operations	2500 feet
IFR departures	2500 feet
IFR approach and departure with approach to near threshold	2500 feet
IFR approach and departure with approach to far threshold	2500 feet plus 100 feet for each 500 feet of threshold stagger.
IFR approaches	3400 feet

Runway centerline to parallel taxiway/taxilane centerline	239.5	240 feet
Runway centerline to edge of aircraft parking	250.0	250 feet
Runway width		75 feet
Runway shoulder width		10 feet
Runway blast pad width		95 feet
Runway blast pad length		150 feet
Runway safety area width		150 feet
Runway safety area length beyond each runway end or stopway end, whichever is greater		300 feet
Runway object free area width		500 feet
Runway object free area length beyond each runway end or stopway end, whichever is greater		300 feet
Clearway width		500 feet
Stopway width		75 feet

Obstacle free zone (OFZ):

Runway OFZ width	400 feet
Runway OFZ length beyond each runway end	200 feet
Inner-approach OFZ width	400 feet
Inner-approach OFZ length beyond approach light system	200 feet
Inner-approach OFZ slope from 200 feet beyond threshold	50:1
Inner-transitional OFZ slope	0:1

Runway protection zone at the primary runway end:

Width 200 feet from runway end	500 feet
Width 1200 feet from runway end	700 feet
Length	1000 feet

Runway protection zone at other runway end:

Width 200 feet from runway end	500 feet
Width 1200 feet from runway end	700 feet
Length	1000 feet

Departure runway protection zone:

Width 200 feet from the far end of TORA	500 feet
Width 1200 feet from the far end of TORA	700 feet
Length	1000 feet

Threshold surface at primary runway end:

Distance out from threshold to start of surface	0 feet
Width of surface at start of trapezoidal section	400 feet
Width of surface at end of trapezoidal section	1000 feet
Length of trapezoidal section	1500 feet
Length of rectangular section	8500 feet
Slope of surface	20:1

Threshold surface at other runway end:

Distance out from threshold to start of surface	0 feet
Width of surface at start of trapezoidal section	400 feet
Width of surface at end of trapezoidal section	1000 feet
Length of trapezoidal section	1500 feet
Length of rectangular section	8500 feet
Slope of surface	20:1

Taxiway centerline to parallel taxiway/taxilane centerline	104.8	105 feet
Taxiway centerline to fixed or movable object	65.3	65.5 feet
Taxilane centerline to parallel taxilane centerline	96.9	97 feet
Taxilane centerline to fixed or movable object	57.4	57.5 feet
Taxiway width	28.6	35 feet
Taxiway shoulder width		10 feet
Taxiway safety area width	79.0	79 feet
Taxiway object free area width	130.6	131 feet
Taxilane object free area width	114.8	115 feet
Taxiway edge safety margin		7.5 feet
Taxiway wingtip clearance	25.8	26 feet
Taxilane wingtip clearance	17.9	18 feet

REFERENCE: AC 150/5300-13, Airport Design, including Changes 1 through 4.

AIRPORT PLANNING GUIDELINES

I. BACKGROUND

Airport Planning Guidelines have been established by the State Transportation Board in order for the Aeronautics Division to accurately assess the limitations and deficiencies of airports in the State's Primary and Secondary Airport systems. These guidelines will be applied to airports in the Primary and Secondary system and evaluated periodically to determine the estimated statewide capital improvement costs required to bring the airports into compliance with the planning guidelines.

II. AIRPORT REFERENCE CODE

A. The FAA coding system for airports relates airport design criteria to the operational and physical characteristics of the airplanes intended to operate at an airport. The Airport Reference Code (ARC) consists of two components: Aircraft Approach Category and Airplane Design Group. The planning guidelines for airports in Arizona will be based on the FAA Airport Reference Code.

1. Aircraft Approach Category: The minimum approach speed of an aircraft at its maximum gross landing weight in the landing configuration.

2. Airplane Design Group: A grouping of airplanes based on wingspan.

III. AIRPORT PLANNING GUIDELINES FOR AIRPORTS IN AIRPORT REFERENCE CODE GROUP I:

These airports normally are designed to serve small aircraft, with operating gross weights of less than 12,500 pounds, capable of accommodating aircraft with less than 10 passengers with visual approaches to the runway(s).

A. Runway length and width: The minimum runway length and width will be determined by the predominant type of aircraft that operate at the airport and the approach visibility minimums at the airport. FAA Advisory Circular (AC) 150/5325-4, Runway Length Requirements for Airport Design and AC150/5300-13, Airport Design will be used to determine the appropriate runway dimensions.

B. Taxiways: A minimum of a Turnaround taxiway will be at both runway(s) ends.

C. Runway Safety Area: The runway safety area will be 120 feet wide centered on the runway centerline and a minimum length of 240 feet beyond the actual ends of the runway, in accordance with (IAW) FAA AC 150/5300-13.

D. The airport will have at least one windsock/wind indicator. This windsock should be lighted (if night operations are permitted) and located at/or near the runway midfield.

E. Both paved and unpaved airports should have a graded area for parking the based aircraft as well as at least two transient aircraft. All parking spaces should be equipped with a minimum of one tiedown. The location of the parking apron should be in accordance with FAA AC150/5300-13.

F. The airport should be free of obstructions in the primary, approach and transition surfaces in accordance with FAR Part 77, Objects Affecting Navigable Airspace. The minimum approach slope to the airport should be 20:1.

G. The airport should be equipped with Runway Delineators.

H. The airport should have a continuous access road to a paved city/town/county or state roadway system.

IV. AIRPORT PLANNING GUIDELINES FOR AIRPORTS IN AIRPORT REFERENCE CODE GROUP II:

These airports normally are designed to serve small to medium sized aircraft, with maximum gross weights of less than 25,000 pounds, accommodating less than 35 passengers. These airports will meet all of the minimum design standards of Group I and:

A. The airports with scheduled commercial passenger service will meet the minimum requirements of FAR Part 139.

B. Taxiways: These airports will have a minimum of a partial or full length parallel (mandatory for annual operations in excess of 20,000). If the runway is paved, the parallel taxiway should be paved. Runup areas should be provided at both ends of the runway(s).

C. The airports should be equipped with the following minimum navigational aids:

1. At least one lighted windsock/wind indicator located at/or near the midpoint of the runway.

2. A beacon.

3. Delineators or lighted runway and delineators on all taxiways.

4. An airport approach aid (Visual Approach Slope Indicator, Precision Approach Path Indicator, Generic Visual Glideslope Indicator) at those airports with more than 15,000 annual operations.

5. These airports should have the following Terminal services: a minimum of a telephone, access to weather data, access to FAA Flight Facilities, a waiting area, restroom facilities, portable fire extinguishers, and posted local area procedures/ emergency procedures. In the absence of fuel, eating and sleeping facilities, information should be available on where these accommodations can be obtained. NOTE: Terminal services may be provided by a Fixed Base Operator (FBO) and/or airport sponsor.

D. The airports should have a graded area for parking the based (non-hangared) aircraft as well as at least six transient aircraft at paved or unpaved airports. All apron parking spaces (paved/unpaved) should be equipped with at least three-point tiedowns. The location of the parking apron should be in accordance with FAA AC 150/5300-13.

E. The airports should be fenced.

V. AIRPORT PLANNING GUIDELINES FOR AIRPORTS IN AIRPORT REFERENCE CODE GROUP III, *IV and V*:

A. These airports normally are designed to serve small, medium and large sized aircraft, with maximum gross weights of less than up to 300,000 pounds, capable of accommodating aircraft with more than 35 passengers. These airports will meet all of the minimum design standards of Group I and II and. Airports with scheduled commercial passenger service will meet the minimum requirements of FAR Part 139.

B. All main runway(s), taxiways/taxilanes and apron areas will be paved.

C. All runways and taxiways will be lighted. Transient and local tiedown facilities will be lighted in the main terminal area.

D. Have the following minimum Terminal Facilities: on location weather data terminal; fuel facilities to accommodate both piston and jet aircraft; either commercial eating facilities or vending machines; access to rental car facilities; maintenance facilities for the repair of aircraft, avionics, engine and airframe; and a waiting/lounge area. (NOTE: Some or all of these services may be provided by the FBO's however, the airport sponsor is responsible for monitoring the condition of mandatory facilities.)

E. In addition, the following equipment may be authorized for this type facility: Crash-rescue equipment, Runway sweeper, landscaping tractor, and Snow-plow.

F. Emergency generating equipment for the Beacon, Runway Lights, Visual Approach Aid, ATCT (optional), and emergency equipment.

G. A nonprecision instrument approach to the main runway ends.