SECTION 4
DEMAND/CAPACITY ANALYSIS AND FACILITY REQUIREMENTS

4.1 INTRODUCTION

This section provides a technical presentation of demand/capacity and facility requirements analysis for Nampa Municipal Airport. The main purpose of the demand/capacity and facility requirements analysis is to compare existing capacities to the aviation-related demand projected in order to determine the timeframe in which capacity constraints could occur. The facility requirements for each horizon year (2013, 2018, and 2028) are based on forecast levels of aviation activity for these years. It should be noted that the timing of the development of any new facilities should depend on the rate of growth that actually occurs at the airport.

The determination of facility requirements for Nampa Municipal Airport focuses on specific issues that are essential to the airport's future growth. The objective of the facility requirements analysis is to determine the adequacy of each of the airport's functional areas (airfield, general aviation facilities, support facilities, non-aviation facilities, and surface transportation) to meet the forecasted demand anticipated over the planning period. Once the existing facilities at Nampa Municipal Airport have been evaluated, and any deficiencies identified, in comparison to anticipated forecast demand, alternative development concepts will be explored in Section 5 to address deficiencies in these functional areas to ensure that Nampa Municipal Airport has long-term flexibility and growth potential that will enable it to respond to changing demand scenarios.

4.2 AIRFIELD REQUIREMENTS

Evaluation of an airport's runways and taxiways with respect to various factors such as capacity, geometrics and strength, plays a key role in the function of an airport within the regional and national system of airports. Thus, operational enhancements and airfield requirements for Nampa Municipal Airport were identified through a review of the existing airspace environment, a determination of existing and future airfield capacity as well as future runway and taxiway requirements.

4.2.1 Airspace Capacity

As presented in Section 2.3, the airspace surrounding Nampa Municipal Airport is defined as Class E. Class E airspace includes the entire airspace that is not classified as either A, B, C, or D, and has no special restrictions with respect to pilot or aircraft equipment rules. However, it is controlled airspace, meaning that aircraft may be provided with air traffic control services from Boise approach control. The proximity of other airports and other factors impact the airspace at Nampa Municipal Airport. The types of constraints that can affect airspace capacity are regulatory, physical, and operational factors. A brief description of these factors is provided in the following paragraphs.

Military Operations Areas (MOAs) and Restricted Areas pose regulatory constraints as they are either restricted to use by military aircraft during certain hours of operation or are limited for use by an enroute air traffic control center during certain hours. There are no MOAs or Restricted Areas within the immediate vicinity of Nampa Municipal. The closest regulated areas are Owyhee MOA, Jarbridge MOA, and Restricted Areas R-3203A&B, and R-3202, located 20-55 nautical miles (NM) south and southeast of Nampa Municipal. Based on their location and extent, it is determined that these MOAs and Restricted Areas do not severely impact the capacity of the airspace in the vicinity of Nampa Municipal Airport.

Physical constraints include tall structures that have the potential to significantly impact operational activity at airports by restricting airspace and reducing capacity by forcing procedures that limit access routings and require higher approach and departure minimum and/or traffic pattern altitudes. There are tall structures located in the general vicinity of Nampa Municipal Airport. As depicted in **Exhibit 2.2,** VFR Sectional Chart, a number of tall structures are located within five NM of the Airport. The top elevations of the existing structures range from 214 feet AGL to 397 feet AGL. These structures are not close to and do not lie in the final approaches to the airfield. Therefore, it is concluded that none of these structures severely impact the operational capacity of Nampa Municipal Airport's airspace. There are no structures or towers that exceed 1,000 feet Above Ground Level (AGL) within the five NM range.

Operational factors pose the most constraints to the airspace surrounding Nampa Municipal Airport. An Alert Area, A-291A, is located approximately seven NM west-northwest of Nampa Municipal Airport. Though not restricted, pilots are advised to exercise caution from 06:00 am to 12:00 midnight as it is an area of concentrated flight training.

Several airports are located within 25 NM of Nampa Municipal Airport as listed in **Table 2.1**. Boise Air Terminal/ Gowen Field is the largest nearby public facility and is located approximately 14 NM east of the Airport.

Due to the level of active air traffic control over the airspace, it is concluded that airspace in the vicinity of Nampa Municipal Airport should be capable of accommodating projected levels of aircraft operations without incurring significant airspace delays.

The immediate airspace structure which applies specifically to Nampa Municipal Airport is that airspace described by FAR Part 77, Subpart C. This airspace is based on the existing and planned runway dimensions, runway end approaches, and type use at the Airport. Airspace described by FAR Part 77 includes the primary, approach, transitional, conical and horizontal surfaces. Objectives of FAR Part 77 are to define objects which affect navigable airspace, provide procedures for notice to the FAA of certain proposed construction or alteration, and to determine their effect on the safe and efficient use of airspace. Specific dimensional depiction of the Part 77 surfaces will be referenced in the airport layout plan drawing set presented in a subsequent section of the Master Plan Technical Report.

The FAA recommends that the Sponsor acquire or obtain control of land encompassed by the extents of all proposed RPZs through fee simple acquisition or avigation easements. Presently, portions of the existing RPZs associated with both runway ends fall beyond airport property. In addition to the RPZs, the Sponsor should make every effort to specifically control the approaches and all surrounding airspace per FAR Part 77, either by way of acquisition, easement, or local zoning. As part of the airport layout plan, recommendations will be delineated for fee simple acquisition of all RPZs as well as adjacent properties which may have an adverse impact on the primary and transitional surfaces (typically denoted by the BRL) associated with each runway complex.

Based upon guidance provided by the FAA for airspace obstruction clearance for existing or planned instrument approaches, a clear 20:1 sloped surface beginning 200 feet beyond the runway threshold and extending outward along the runway centerline, should be maintained. This is applicable for threshold siting and the establishment of nonprecision approaches (in accordance with FAA Order 8260.3B, "Terminal Instrument Procedures (TERPS)") with visibility minimums > ¾ mile. Currently at Nampa Municipal Airport, the approach to Runway 11 provides a 34:1 approach slope beginning 200 feet beyond the runway threshold, and the approach to Runway 29 provides a 20:1 approach slope beginning at the runway threshold. The approach to Runway 29 begins at the runway threshold instead of 200 beyond the runway threshold in order to provide adequate 15' clearance over Happy Valley Road. Runway approach obstructions are detailed in the layout plan set included in Section 8.

4.2.2 Airfield Capacity

The calculations of airfield capacity and delay are the basis for evaluating the adequacy of the runway and taxiway system to meet existing and future airport activity levels. The following analysis was conducted using the FAA's Airport Capacity and Delay Manual (AC 150/5060-5), and FAA's Airport Design Computer Program (version 4.2D).

The capacity of the airfield system is presented in terms of both hourly capacities and Annual Service Volume (ASV). Hourly capacities vary at any given airport based on aircraft fleet mix, runway configuration, runway use strategies, number of exit taxiways available, touch-and-go activity level, incidence of IFR weather conditions, and the level of runway instrumentation and ATC support. The hourly capacity is the number of aircraft departures and arrivals that can physically be accommodated in a one-hour time period, given a specific runway use strategy. The airport ASV represents an approximation of the Airport's annual capacity, taking into consideration weighted hourly capacities and the hourly, daily, and monthly operational patterns at the Airport. It should be noted that ASV approximations may be widely varying, based on observed operational patterns (which may change over time).

4.2.2.1 Capacity Factors

The following factors are fundamental to any airfield demand/capacity analysis:

- Airfield Characteristics – The configuration and number of runways, parallel taxiways, and exit taxiways have a direct influence on an airfield's ability to accommodate various types of aircraft in a given time frame. The type of navigational aids, lighting, radar, and other instrumentation is extremely important to runway capacity, particularly during inclement weather.

- Runway-Use Strategies – At airports equipped with one runway, only two strategies are used under normal operating conditions. Inadequate runway instrumentation and poor weather may also necessitate a change in preferential runway end use. Ultimately, the airfield should use a configuration which affords the airport the highest hourly capacity; however, due to varying conditions, this configuration may not be used 100 percent of the time. The Airport's estimated ASV becomes a function of the time period each configuration is used on an average annual basis.

- Meteorological Conditions – Runway capacity is highest during good weather when visibility is at its best and visual flight rules (VFR) are in effect. When visibility and ceiling are below specific minimums (typically 3 miles visibility and/or 1,000 foot ceiling), instrument flight rules (IFR) are imposed, resulting in greater separations between airborne aircraft and longer runway occupancy times. Meteorological factors such as fog, heavy rain, snow, ice, strong crosswinds, or excessive water on the runways have a major impact on runway capacity and may even cause a closure of the airfield at times. Based on the draft 2008 Boise Airport Master Plan Update, VFR weather conditions prevail more than 94 percent of the time, while IFR conditions occur slightly more than 5 percent of the time at Boise Airport. It is assumed that conditions at Nampa Municipal Airport are comparable to those experienced at Boise. Additionally, it has been noted that the absence of localized weather data at Nampa results in significant delays during IFR conditions. The recent installation of an Automated Weather Observation Station (AWOS) on the field should mitigate the remote altimeter penalty incurred during IFR conditions, and allow the maximum use of published minimums.

- Aircraft Fleet Mix – The fleet mix, a composition of aircraft types based on size, weight, and approach speeds, affects airfield capacity because an aircraft's size, weight, approach speed, and breaking ability affect the length of time the aircraft occupies airspace and the runway and the manner in which air traffic control personnel direct activity. Larger aircraft require more airspace separation, thus decreasing capacity to some degree. Variations in aircraft approach speeds and landing distances affect how long an aircraft is on the runway, known as the runway occupancy time, which in turn affects airfield capacity. The aircraft fleet mix is divided into four (4) classes when estimating capacity. These classes are identified by the letters A through D and represent grouping of aircraft by general type and weight. **Table 4.1** summarizes representative aircraft types found in each aircraft class and the estimated percentage of the time each class operates at Nampa Municipal Airport. Class A aircraft make up the bulk of the operational aircraft fleet mix at Nampa

Municipal Airport. The remaining fleet mix consists of aircraft in Class B and Class C. As noted in Table 4.1, the percentage of operations conducted by Class C aircraft is expected to increase slightly throughout the planning period.

Table 4.1
Aircraft Fleet Mix

Class	Fleet Mix % Existing (2008)	Fleet Mix % Future (2028)	Aircraft Type	
Class A	96.0%	92.1%	**Small Single-Engine (Gross Weight: 12,500 pounds or less)**	
Examples			Cessna 172/182	Mooney 201
			Beech, Bonanza	Piper Cherokee/Warrior
Class B	4.0%	5.2%	**Small Twin-Engine (Gross Weight: 12,500 pounds or less)**	
Examples			Beech Baron	Mitsubishi MU-2
			Cessna 402	Piper Navajo
			Lear 25	Cessna Citation I
Class C	0.0%	2.7%	**Large Aircraft (Gross Weight: 12,500 to 300,000 pounds)**	
Examples			Lear 35/55	Gulfstream (I thru V)
			Canadair RJ50	Saab 340
			Embraer Brasilia	Aerospatiale ATR 42/72
			Embraer 135/145	BBJ
Class D	N/A	N/A	**Large Aircraft (Gross Weight: more than 300,000 pounds)**	
			Lockheed L-1011	Airbus A-300/A-310
Examples			Boeing B707	Douglas DC-8-60/70
			Boeing B747	McDonald Douglas MD-11

Source: S67 Tenant Surveys/Operational Counts, 2008.
Kimley-Horn and Associates, Inc., 2009.

From the operational fleet mix, it is possible to establish the Mix Index required in the calculation of an airfield's capacity. The Mix Index calculation is based on the classes of aircraft expected to operate at the airport. The formula for calculating the Mix Index is (C+3D), where C is the percentage of aircraft greater than 12,500 pounds but less than 300,000 pounds and D is the percentage of aircraft greater than 300,000 pounds. Based on this analysis, the existing Mix Index at Nampa Municipal Airport is zero percent. Typically for smaller airports, as Mix Index increases, overall capacity at an airport decreases. The Mix Index at Nampa Municipal Airport is expected to increase over the course of the planning period to 3 percent by the year 2028. Therefore, a negligible degradation in airfield capacity due to an increase in Mix Index is anticipated at the Airport.

- "Touch-and-Go" Operations – Practice landings and takeoffs are normally associated with pilot training and may significantly affect runway capacity. A runway will typically be able to accommodate more of these type operations in a given time period than the normal landing and takeoff activity. Based on limited observations made in September 2008, touch-and-go activity at Nampa Municipal Airport is estimated to represent 15-25 percent of the total current operations.

- Taxiway System – Similar to runways, the absence of well placed taxiways can restrict the level of traffic an airfield may ultimately accommodate. Proper placement of exit taxiways based on the airport's fleet mix can help to reduce runway occupancy times and preserve optimum capacity levels. There are six exit taxiways available for use by aircraft arriving on Runway 11-29; however, based on the estimated mix index (0-3%), and the prescribed exit location range (2000 to 4000 feet), only one taxiway in each direction is useable for determining the exit factor (E) in hourly capacity calculations based on the methodology in FAA Advisory Circular 150/5060-5.

- Arrivals/Departures – The percentage of aircraft arrivals and the sequencing of aircraft departures are two other operational characteristics that affect overall airfield capacity. The percentage of aircraft arrivals is the ratio of landing operations to total airport operations during a given time frame. This percentage is important because arriving aircraft require higher runway occupancy time than departing aircraft. The FAA methodology provides for the use of 40, 50, or 60 percent of aircraft arrivals in the computation of airfield capacity. The 40 and 60 percent figures result in annual capacity figures approximately 11 percent higher and lower, respectively, than the 50 percent figure. For general planning purposes and in the absence of more definitive data, a 50 percent aircraft arrivals figure will be applied in the calculation of airfield capacity.

- Airspace – The location of an airport with respect to other neighboring airports and various natural as well as man-made obstructions (trees, buildings, TV towers, etc.) may restrict the way in which aircraft arrive and depart an airport. Operations at one airport can conflict with operations at another causing the capacity of both airports to suffer. Additionally, the absence of positive control of an airport's airspace will affect the volume of traffic safely accommodated by the airfield. In these cases typical decreases in operational efficiency can result in capacity loses of 10-20 percent. It has been noted that aircraft/pilot communications between departing flights and the Boise ATC Approach & Departure control is a limiting factor that may result in unnecessary delays. Although quantitative data is not available, pilots estimate these delays may be as much as 15 minutes.

4.2.2.2 Annual Service Volume (ASV)

The FAA-designed computer program Airport Design (version 4.2) was used to determine the airport ASV level. The estimated ASV for Nampa is approximately 230,000 operations.

Projected demand at Nampa Municipal Airport by the year 2028 will be approximately 130,000 annual operations, representing 56.5 percent of the estimated ASV. As a result, although existing airfield capacity is anticipated to remain adequate for the 20 year planning horizon, strategies to achieve additional airside capacity will be investigated during the alternatives phase.

4.2.2.3 Hourly Airfield Capacity

Hourly airfield capacity is an estimate of the number of operations an airport can accommodate during a given hour of the day. Hourly capacity determines if an airport can accommodate the projected peak hour operations.

Based on Figure 2-1 in FAA Advisory Circular 150/5060-5, the VFR capacity at Nampa Municipal Airport is approximately 98 operations per hour. The potential IFR capacity would be approximately 59 operations per hour under ideal circumstances, but as noted earlier, may be significantly lower as a result of communications delays with Boise ATC. As shown in **Table 3.19,** peak hour demand at the airport is projected to be 45 operations per hour in 2028. Although hourly airfield capacity is expected to be adequate to accommodate projected demand, further consideration should be given to enhancing communications between Nampa Municipal Airport and Boise ATC in an effort to preserve IFR departure capacity.

4.2.2.3 Aircraft Delay

An analysis of existing and forecast demand versus existing and future airfield capacity is required to determine delay levels incurred by aircraft and to ascertain the need for additional capacity enhancements in the future. Typically, the hourly demand/capacity relationship, rather than ASV, is the key factor in analysis for programming of additional capacity, recognizing the possible fluctuations in ASV due to variations in peaking. Actual capacity enhancements should not be implemented prior to a detailed examination of aircraft delay which normally becomes a factor when the airfield exceeds 80 percent of its estimate peak hour capacity levels under either VFR or IFR weather conditions. When the ratio of peak hour demand to peak hour capacity exceeds 1.0, average delays per aircraft operation at busy general aviation airports begin to surpass the four minute level, with delays per operation increasing exponentially.

Based on the forecast, the ratio of peak hour demand to capacity will increase from 0.38 currently to 0.46 by the year 2028 during VFR conditions. This implies that aircraft delay is not anticipated to be a factor for programming of additional capacity at this time. In cases of a noted loss in capacity due to IFR conditions and the absence of positive control, the demand to capacity ratio may exceed 0.60, but should remain under 0.80.

4.2.2.4 Potential Capacity Improvements

Based on FAA guidelines, facility improvements should be programmed to increase capacity when annual operations reach 60% of ASV.

Based on the previous sections, ASV is not anticipated to reach 60% of ASV within the planning period. Projected 2028 peak hour demand is anticipated to be met with the current airfield configuration. As a result, additional runway capacity improvements are not anticipated in the 20-year planning horizon.

4.2.3 Runway Requirements

Future runway requirements at Nampa Municipal Airport were addressed for the overall runway length, dimensional standards and pavement strength. Runway requirements are planned in accordance with design criteria presented in FAA AC 150/5300-13, Airport Design. The first criterion is the approach speed of critical design aircraft and provides information on the operational capabilities of aircraft using the airport. The airplane design group (ADG), which is the second criterion, is the wingspan range of critical design aircraft using the airport. These two design criteria identifiers are then used together to define the Airport Reference Code (ARC). **Table 4.2** presents the various aircraft approach categories and airplane design groups.

To assist in determining the appropriate spatial requirements and operational capabilities for Nampa Municipal Airport in the future, airport design criteria are based on the critical design aircraft that will regularly use the airport during the planning period. Use of an airport on a regular basis is considered to be 500 or more annual operations conducted by a particular aircraft or aircraft group. A review of aircraft forecast to use Nampa Municipal Airport reveals that aircraft in approach category B will be the most demanding aircraft to regularly use the airport. This would include jet operations by aircraft such as: Cessna Citations, Falcons 20/50/200, and the VLJ fleet.

The largest aircraft from the standpoint of wingspan to regularly use Nampa Municipal Airport currently and in the future fall within ADG II and include the Cessna 441 and the Beech King Air C90. Based on planning guidelines, Nampa Municipal Airport should be designed to accommodate the spatial requirements of ADG II aircraft and have the operational capabilities to accommodate aircraft in approach category B. In combination, this results in an ARC of B-II. Thus, the airport design parameters associated with an ARC of B-II will be used for planning airfield facilities at Nampa Municipal Airport.

Table 4.2
Airport Reference Code Composition

Aircraft Approach Category		Airplane Design Group	
Category	Approach Speed	Group	Wing Span
A	Less than 91 Knots	I	Up to 48 Feet
B	91 to 120 Knots	II	49 to 78 Feet
C	121 to 140 Knots	III	79 to 117 Feet
D	141 to 165 Knots	IV	118 to 170 Feet
E	166 Knots or Greater	V	171 to 213 Feet
		VI	214 Feet or Greater

Source: FAA Advisory Circular 150/5300-13, Airport Design, Change 14.

4.2.3.1 Runway Length Requirements

FAA AC 150/5325-4A, Runway Length Requirements for Airport Design, provides guidance for determining runway length. According to this document, the following criteria are identified:

"The recommended length for the primary runway is determined by considering either the family of airplanes having similar performance characteristics or a specific airplane needing the longest runway. In either case, the choice should be based on airplanes that are forecast to use the runway on a regular basis. A regular basis is considered to be at least 250 takeoffs a year."

The FAA's computer program, Airport Design 4.2D, calculates runway length requirements based on families of airplanes having similar performance characteristics. The program's results are categorized for small aircraft less than 12,500 pounds, large aircraft of 60,000 pounds or less, and large aircraft more than 60,000 pounds. The large aircraft category of 60,000 pounds or less is further subdivided into groups of aircraft at payload capacities of 60 and 90 percent useful load.

Table 4.3 presents the runway length requirements determined using the FAA program. FAA criteria specify that the runway length requirements for an airport such as Nampa Municipal Airport be determined using the category of aircraft less than 60,000 pounds.

As the table indicates, a runway length of approximately 4,810 feet is required to satisfy the requirements for all small aircraft. The current runway length of 5,000 feet exceeds this criterion. Large aircraft with maximum takeoff weights of 60,000 pounds or less would require a runway length between 5,500 and 9,300 feet, depending on payload and fuel loads. Large aircraft with maximum takeoff weights of 60,000 pounds or more are not projected to operate at Nampa Municipal on regular basis.

Table 4.3
Runway Length Analysis

Category	Recommended Minimum Runway Length
Small Aircraft (less than 12,500 Pounds)	
Less than 10 passenger seats	4,690 feet
More than 10 passenger seats	4,810 feet
Large Aircraft (60,000 Pounds or Less)	
75% of these aircraft at:	
60% useful load	5,500 feet
90% useful load	7,640 feet
100% of these aircraft at:	
60% useful load	6,720 feet
90% useful load	9,300 feet
Large Aircraft (more than 60,000 Pounds)	
Approximately	5,900 feet

Notes:

Parameters used in calculations:

- *Airport elevation = 2,537 feet.*
- *Mean daily maximum temperature of the hottest month = 90.5° F.*
- *Maximum difference in runway centerline elevation = 8.0 feet.*
- *Haul length for aircraft over 60,000 pounds = 500 miles.*
- *Assumes wet runway conditions for planning purposes.*

Source: FAA Advisory Circular 150/5325-4A, Airport Design Program 4.2d.
Kimley-Horn and Associates, Inc., 2009

The FAA issued guidance in 2001 concerning runway length requirements for Business Jet Aircraft which typically fall into the "large aircraft with maximum takeoff weights of 60,000 pounds or less" category. This guidance (included in Appendix C) includes runway takeoff distance information for several business jets that have the potential to utilize Nampa Municipal Airport. A selection of these jets is included in **Table 4.4**. The takeoff distances for the selected models were adjusted for elevation and temperature conditions at Nampa Municipal Airport, while reflecting Maximum Gross Takeoff Weight and Maximum Landing Weight performance. As the table indicates, several large aircraft with maximum takeoff weights of 60,000 pounds or less may be accommodated by the existing 5,000 foot runway. Other models, such as the LearJet 23 and Mitsubishi MU-300 Diamond, could be accommodated with takeoff weight restrictions.

At this time, sufficient historical and forecast operational justification in the way of flight department operational requirements or documentation of proposed operations by corporate users, does not exist to support a lengthening of the current runway. In most cases, many of the smaller, more common business jet aircraft may utilize Runway 11-29 either under full or slightly reduced payload conditions. As demand warrants, the City should periodically survey based, transient and potential users of the Airport to assess runway length needs and the estimated economic penalties incurred to operate from the current 5,000-foot runway. At such point that the benefits outweigh the costs associated with extending the runway, the City may choose to re-evaluate this recommendation.

Table 4.4
Runway Length Analysis (Large Aircraft only)

Aircraft	ARC	Maximum Takeoff Weight (lbs)	Takeoff Distance[1] (feet)	Adjusted Takeoff Distance (feet)
Cessna 500 Citation	B-I	11,850	2,930	3,919
Cessna 550 Citation Bravo	B-II	14,800	3,600	4,815
Cessna 560 Citation V Ultra	B-II	16,300	3,180	4,254
Dassault Falcon 2000	B-II	35,800	5,240	7,009
Dassault Falcon 50	B-II	37,480	4,715	6,307
LearJet 23	C-I	12,500	4,000	5,350
Mitsubishi MU-300 Diamond	B-I	14,630	4,300	5,752
Sabreliner 40	B-I	18,650	4,900	6,554

Notes:
1) Takeoff Distance is based on maximum takeoff weight, no effective gradient, conditions at sea level at 59° F

Source: FAA Southern Region, Regional Guidance Letter RGL 01-2, August 2001

4.2.3.2 Runway Widths and Dimensional Standards

Runway width requirements are determined by the ARC, in particular the ADG standards. In accordance with ADG II standards, it is recommended that Runway 11-29 be maintained at its current width of 75 feet.

Dimensional standards pertaining to runways and runway-related separations are essential to provide clearances from potential hazards affecting routine aircraft movements taking place on the runways. These standards relate to separations for parallel runways, hold lines, parallel taxiways, aircraft parking, obstacle free areas, and safety areas. Also addressed are dimensional criteria for shoulders and blast pads.

Runway 11-29 dimensional standards are determined based on an ARC B-II because this is the critical approach category and design group of the family of airplanes that are anticipated to use the runway on a regular basis. **Table 4.5** presents the existing runway-related separations at Nampa Municipal Airport and compares them to the dimensional standards required in the future.

Table 4.5

Runway Dimensional Standards

Item	Runway 11-29 Existing	B-II[1] Standard
Runway:		
Width	75′	75′
Shoulder Width	10′	10′
Blast Pad Width	N/A	95′
Blast Pad Length	N/A	150′
Safety Area Width	150′	150′
Safety Area Prior to Landing Threshold	300′	300′
Safety Area Length Beyond R/W End	300′	300′
OFA Width	>500′	500′
OFA Length Beyond R/W End	>300′	300′
Runway Centerline to:		
Parallel Runway Centerline	N/A	700′
Hold Line	N/A	200′
Taxiway/ Taxilane Centerline	240′	240′
Aircraft Parking Area	>250′	250′

Note:

[1]*Runway design standards for runways with not lower than ¾-statute mile visibility minimum.*

Source: FAA Advisory Circular 150/5300-13, Change 14.
Kimley-Horn and Associates, Inc. analysis, 2009

4.2.4 Taxiway Requirements

Taxiway requirements are addressed to maintain and/or improve existing and future airfield capacity levels previously identified in subsection 4.2.2.2, and to provide more efficient and safe ground traffic movements. Taxiways, which provide vital links between independent airport elements, should optimize airport utility by providing free movement to and from the runway, general aviation terminal areas, and aircraft parking areas. The desirability of maintaining a uniform flow, with a minimum number of points necessitating a change in aircraft taxiing speed, is of paramount concern. Requirements for the taxiway systems at Nampa Municipal Airport in terms of orientation/ placement and dimensional standards are presented in the following subsections.

4.2.4.1 Taxiway Configuration

Several types of taxiways comprise the taxiway system at any airport. These types may include: entrance and exit taxiways, bypass taxiways, crossfield/ crossover/ transverse taxiways, parallel and dual parallel taxiways, and apron taxiways and taxilanes. In accordance with FAA guidelines for airport design, taxiway placement and design should strive to meet the following key principles:

- provide each runway with a full-length parallel taxiway or the capability thereof,
- build taxiways as direct as possible,
- provide bypass capability or multiple access to runway ends,
- minimize crossing runways,
- provide ample curve and fillet radii, and
- avoid traffic bottlenecks.

The existing taxiway system at Nampa Municipal Airport was examined to determine existing or potential deficiencies based on the design principles previously listed. FBO and other tenants were also consulted to facilitate the identification of bottlenecks and other problem areas. Taxiway improvements recommended for the existing airfield as well as any future runway complexes are described as follows.

- Equip the runway complex with bypass taxiways or hold pads at each runway end.
- Provide adequate exit taxiways located strategically to preserve capacity.
- Eliminate or minimize runway crossings where possible.
- Reserve the capability to provide a partial or full-length parallel taxiway on the south side of Runway 11-29 to service basing facilities in the future, thereby minimizing runway crossings.
- Maintain adequate lateral separations from the runway and taxiways whenever the presence of enhanced instrument navigational aids is anticipated.

4.2.4.2 Taxiway Dimensional Standards

Dimensional standards pertaining to taxiways/taxilanes and taxiway/taxilane-related separations are necessary to ensure FAA recommended clearances between taxiing aircraft and fixed or movable objects during routine operations. These standards relate to separations for parallel taxiways/taxilanes, aircraft parking, service roads, object free areas, wingtip clearances, safety areas, and shoulders. Also addressed are recommended taxiway widths.

All dimensional standards are determined based on the ARC established for the Airport. **Table 4.6** presents all taxiway dimensional standards to be applied at Nampa Municipal Airport, relative to the separations currently in existence.

Table 4.6
Taxiway Dimensional Standards

Item	Existing Dimensions	Standard ADG II
Width	≥35′	35′
Safety Area Width	79′	79′
Taxiway OFA Width	≥131′	131′
Taxilane OFA Width	60′-115′+	115′
Taxiway Centerline to:		
Parallel Taxiway/Taxilane Centerline	N/A	105′
Fixed or Movable Object	65.5′	65.5′
Taxilane Centerline to:		
Parallel Taxiway/Taxilane Centerline	>97′	97′
Fixed or Movable Object	30′ (min)	57.5′
Taxiway Fillet Dimensions:		
Radius of Taxiway Turn	75′	75′
Fillet Radius for Tracking Centerline	varies	55′

Source: FAA Advisory Circular 150/5300-13, Airport Design, Change 14.
Kimley-Horn and Associates, Inc., 2009.

4.2.5 Pavement Strength Requirements

Pavement capacity requirements are related to three primary factors:

- The operating weight of aircraft anticipated to use the Airport;
- The landing gear type and geometry; and
- The volume of annual aircraft operations, by type.

The airfield pavement strength ratings identified in subsection 2.5.1 indicate that Runway 11-29 will adequately serve the projected fleet mix including the critical aircraft identified as the Beech King Air C90 at the Airport.

Conventional FAA pavement designs are based on a 20-year life under normal operating conditions. During this time, pavement maintenance in the way of overlays for bituminous pavement may be required due to excessive activity, inadequate construction, or unforeseen subsurface conditions. Major pavement rehabilitations should be planned at the end of the 20-year life or as localized conditions dictate. Many of the current pavements will reach the end of their life during the planning period, and should therefore be targeted for major maintenance. These include the northwest and triangle ramp areas (see **Exhibit 7.1,** Areas 16 & 17) that will require an overlay in the 2010-2015 timeframe, the apron hangar area surrounding buildings 210-250 and 310-350 (Area 19) that will require reconstruction in the 2010-2015 timeframe, and Runway 11-29 (Area 13) that will require an overlay in the 2016-2020 timeframe. As a maintenance measure, annual (or more frequent) visual inspections should be conducted biannually and pavement condition index inspections every three years.

4.3 GENERAL AVIATION FACILITY REQUIREMENTS

The purpose of this evaluation is to determine the aggregate capacity of existing general aviation facilities and their ability to meet forecast levels of demand during the planning period. In this analysis, the following facilities were evaluated:

- General Aviation Terminal Facilities
- Aircraft Storage Hangars (including shade hangars)
- Based, Transient and Aircraft Maintenance Apron Areas
- General Aviation Automobile Parking Facilities

4.3.1 General Aviation Terminal Facilities

General aviation terminal space is required to meet the needs of pilots, passengers and visitors using the Airport. Additional space is also required for administrative and operational functions. General aviation terminal area requirements are based on peak hour factors at general aviation airports. Historically, the FAA recommends using a basic minimum criterion of providing 49 square feet of administrative/ lobby space per design hour passenger. However, this guidance has become outdated as increased focus has been put on pilot and passenger amenities. More recent general aviation terminal facilities incorporate additional space into their design to accommodate specialized services such as flight training, charter operations, food catering and rental car services. For this purpose, it is recommended that 80 square feet of space be provided per design hour passenger at Nampa Municipal Airport. **Table 4.7** provides a breakdown of the previous FAA minimum and current recommended areas required per operational use.

Based on typical peaking activity at similar general aviation airports, the design hour itinerant passengers were calculated at a rate of 3 passengers per design hour itinerant operation. Design hour itinerant operations were calculated as a percentage of peak hour operations using the local/itinerant split determined in the activity forecasts.

Table 4.8 presents the general aviation terminal space requirements for Nampa Municipal Airport. The requirements for terminal building space reflect aggregate totals for terminal, administrative, and public spaces, some of which are provided by the FBOs and other key tenants at Nampa. The terminal space at the Airport provides approximately 3,900 square feet of general aviation administrative/ lobby facilities. This facility in and of itself does not fulfill the demand for terminal facilities throughout the planning period. By year 2028, it is estimated that a shortfall of approximately 2,000 square feet of terminal space will exist. This shortfall should be made up through the expansion of existing facilities or the construction of new facilities at the Airport.

Table 4.7
Generic Area Requirements for the General Aviation Terminal Building

Operational Use	Minimum Required (SF/passenger)	Recommended (SF/passenger)
Pilot's Lounge	15.0	15.0
Public Space	--	15.0
Management Operations/FBO Employees	3.0	3.0
Public Conveniences	1.5	2.0
Concessions/Dining	5.0	10.0
Specialized Services	--	10.0
Circulation, Mechanical, Maintenance	24.5	25.0
Total	**49.0**	**80.0**

Source: "Aviation Demand and Airport Facility Requirement Forecast for Medium Air Transportation Hubs through 1980" Federal Aviation Administration, January 1969.
Kimley-Horn and Associates, Inc., 2009.

Table 4.8
General Aviation Terminal Facilities
Recommended Space Requirements – Nampa Municipal Airport

Description	2008	2013	2018	2028
Design hour Itinerant Operations	20	21	21	25
Design hour Passengers	61	63	64	74
Pilot's Lounge (SF)	916	940	966	1,114
Public Space (SF)	916	940	966	1,114
FBO Employees (SF)	183	188	193	223
Public Conveniences (SF)	122	125	129	149
Concessions / Dining (SF)	611	627	644	743
FBO Services (SF)	611	627	644	743
Circulation, Mechanical, Maintenance (SF)	1,526	1,567	1,611	1,856
Total Area Required (SF)	**4,884**	**5,013**	**5,154**	**5,940**
Existing Capacity (SF)	3,900	3,900	3,900	3,900
Net Surplus/(Deficiency) (SF)	**(984)**	**(1,113)**	**(1,254)**	**(2,040)**

Source: Tables 3.17 & 3.19
Kimley-Horn and Associates, Inc., 2009.

4.3.2 Aircraft Storage Hangars

The demand for storage hangars is dependent upon the number and types of aircraft based at the Airport, as well as local climate conditions, airport security, availability, rates and charges, and owner preferences. The percentage of based aircraft that are stored in hangars varies from state to state, but is usually greatest in regions that are subject to extreme weather conditions. Currently, about 95% percent of based aircraft owners store their aircraft in hangars at Nampa Municipal Airport. This practice is expected to continue.

The future demand for both large conventional aircraft hangars and T-hangars was estimated. Most often, the principal users of conventional hangars are owners of larger, more expensive aircraft, who desire convenient access to maintenance and related services, while the primary users of T-hangars are owners of single-engine and some small multi-engine aircraft. T-hangars are popular with the latter group because they provide individual privacy, security, and easy access for aircraft owners.

In the future, the demand for storage hangars at the Airport will vary according to aircraft type and owner preference. It is estimated that up to 30 percent of single-engine aircraft, 65 percent of multi-engine piston and turboprop aircraft, 100 percent of turbojet and 100 percent of rotorcraft will desire conventional hangar space.

At present, there are a total of 198 T-hangar and shade hangar units at Nampa Municipal Airport. It is estimated that 60 percent of single-engine aircraft owners use T-hangar storage and will continue to do so in the future. Some small multi-engine aircraft are also stored in T-hangars, but typically, the majority of owner's of these aircraft types desire conventional hangar aircraft storage. It is anticipated that 30 percent of the multi-engine aircraft will use T-hangars at the Airport. The remaining aircraft types, turboprops, jet and rotorcraft, typically prefer and require conventional hangar space.

However, accommodations should be provided for open ramp tie-down space as well. For planning purposes, it is recommended that aircraft apron tie-down space be provided for up to 10 percent of the single-engine aircraft and 5 percent of the multi-engine aircraft anticipated to be based at the Airport. For ease of reference, **Table 4.9** presents the existing and future distribution of based aircraft within storage facilities at Nampa Municipal Airport.

Planning criteria were applied to forecast levels of based aircraft to determine the conventional hangar facilities required during the planning period. Based on industry standards, planning criteria of 1,250 square feet per single-engine aircraft; 1,850 square feet per multi-engine aircraft; 2,250 square feet per turboprop, 3,000 turbojet and 1,500 square feet per rotor aircraft were used. Often several aircraft are located in one conventional hangar depending on the aircraft types and hangar size. Therefore, only the total area required for conventional hangars is presented.

Table 4.10 summarizes the demand/capacity analysis and resulting future facility requirements for aircraft storage hangars. By the end of the planning period 120 additional T-hangar units will be required at the Airport. A surplus of approximately 7,700 SF of conventional hangar space is anticipated at the end of the planning period.

Kimley-Horn and Associates, Inc.

Table 4.9
General Aviation Based Aircraft Storage Distribution

Description	2008 (Actual)	2013	2018	2028
Single Engine				
T-Hangars	58.00%	60.00%	60.00%	60.00%
Conventional Hangars	36.00%	34.00%	32.00%	30.00%
Tie-Down	6.00%	6.00%	8.00%	10.00%
Total Single Engine	**100.00%**	**100.00%**	**100.00%**	**100.00%**
Multi-Engine Piston				
T-Hangars	58.00%	50.00%	40.00%	30.00%
Conventional Hangars	33.00%	43.00%	55.00%	65.00%
Tie-Down	9.00%	7.00%	5.00%	5.00%
Total Multi-Engine Piston	**100.00%**	**100.00%**	**100.00%**	**100.00%**
Turboprop				
T-Hangars	0.00%	0.00%	0.00%	0.00%
Conventional Hangars	100.00%	100.00%	100.00%	100.00%
Tie-Down	0.00%	0.00%	0.00%	0.00%
Total Turboprop	**100.00%**	**100.00%**	**100.00%**	**100.00%**
Turbojet				
T-Hangars	0.00%	0.00%	0.00%	0.00%
Conventional Hangars	100.00%	100.00%	100.00%	100.00%
Tie-Down	0.00%	0.00%	0.00%	0.00%
Total Turbojet	**100.00%**	**100.00%**	**100.00%**	**100.00%**
Rotorcraft				
T-Hangars	0.00%	0.00%	0.00%	0.00%
Conventional Hangars	100.00%	100.00%	100.00%	100.00%
Tie-Down	0.00%	0.00%	0.00%	0.00%
Total Rotorcraft	**100.0%**	**100.0%**	**100.0%**	**100.0%**

Source: Kimley-Horn and Associates, Inc., 2009.

Table 4.10
Aircraft Hangar Storage Requirements

	2008	2013	2018	2028
T-Hangar Unit Requirements*				
Single-engine	180	212	240	313
Multi-engine	6	6	5	5
Total Units	**186**	**218**	**245**	**318**
Existing Units	198	198	198	198
Net Surplus/(Deficiency)	**12**	**(20)**	**(47)**	**(120)**
Conventional Hangar Requirements (SF)				
Single-engine	139,500	150,025	160,000	195,375
Multi-engine	6,716	9,546	13,228	18,038
Turboprop	4,500	6,750	11,250	15,750
Turbojet	0	6,000	15,000	27,000
Rotorcraft	10,500	10,500	12,000	15,000
Total Area Required (SF)	**161,216**	**182,821**	**211,478**	**271,163**
Existing Area (SF) Est.	278,810	278,810	278,810	278,810
Net Surplus/(Deficiency) (SF)	**117,595**	**95,989**	**67,333**	**7,648**

**Includes shade hangars*
Source: Kimley-Horn and Associates, Inc., 2009.

4.3.3 Based, Transient and Aircraft Maneuvering Apron

General aviation apron areas are provided for transient aircraft visiting Nampa Municipal Airport and also for based aircraft that do not desire hangar storage. In addition, apron area is required adjacent to hangars for aircraft maintenance and maneuvering.

Currently, about 20 based aircraft require tie-down apron space. In the future, based aircraft tie-down positions will be composed of 10 percent single-engine and 5 percent multi-engine aircraft. It is anticipated that by 2028, approximately 53 based aircraft tie-down positions will be required. The based aircraft apron area was determined by allocating an average of 350 square yards of pavement per single-engine tie-down position including maneuvering space, and 600 square yards per multi-engine position. By 2028, approximately 27,200 square yards of tie-down apron will be required at Nampa Municipal Airport for based aircraft.

Transient patrons and their aircraft visiting an airport will typically park at an apron area adjacent to the FBO or general aviation terminal because they are most likely to use the terminal facilities and/or FBO services. Transient aircraft parking apron requirements were determined by applying the following assumptions to the itinerant movements performed by transient aircraft on the average day of the peak month:

- The vast majority of transient aircraft will arrive and depart on the same day;
- The number of aircraft utilizing the transient parking apron is 95 percent of the itinerant arrivals on the average day of the peak month;
- 40 percent of the transient aircraft will be on the ground at any given time and will need parking space;
- Transient general aviation operations are currently composed of approximately 90 percent single engine, seven percent multi-engine aircraft, and three percent turboprop/turbojet/rotor aircraft;
- Transient general aviation operations in 2028 will be composed of approximately 80 percent single engine, 15 percent multi-engine aircraft, and five percent turboprop/turbojet/rotor aircraft; and
- The apron space required per transient aircraft for parking and maneuvering area is as follows:
  - Single Engine: 400 SY
  - Multi-Engine: 650 SY
  - Turboprop/Turbojet/Rotor: 850 SY

Based on this analysis, approximately 27,100 square yards of transient apron will be required for visiting aircraft by the year 2028.

Based on industry practices at similarly sized airports, the sizing criteria for determining aircraft maintenance and maneuvering apron areas is largely predicated upon calculated conventional hangar facilities on the Airport. Apron areas immediately adjacent to conventional bay hangars are required to stage, position and maneuver aircraft throughout the day in support of storage activities. Industry experience reveals that a conservative approach provides for a 1:1 ratio of conventional hangar space to maneuvering area. As a result, by 2028, over 77,800 square yards of aircraft maneuvering apron will be required at Nampa Municipal Airport.

Table 4.11 presents the general aviation apron requirements based on the above criteria and the forecast of based and itinerant aircraft activity presented in Section 3. There are approximately 58,800 square yards of apron area available for aircraft parking on the general aviation ramps. Based on the demand/capacity analysis for the average day of the peak month, the existing ramp areas will need to be expanded by approximately 73,600 square yards for aircraft parking and maneuvering space by 2028.

Table 4.11
General Aviation Parking Apron Area Requirements

Aircraft Type	2008	2013	2018	2028
Based Aircraft Tie-down				
Number of Aircraft	20	22	33	53
Single-Engine	6,510	7,413	11,200	18,235
Multi-Engine	6,600	7,200	7,800	9,000
Turboprop/Jet/Rotor	0	0	0	0
Sub-Total (SY)	**13,110**	**14,613**	**19,000**	**27,235**
Transient Aircraft Parking Apron				
Number of Aircraft	33	36	41	52
Single-Engine	11,737	12,791	13,773	16,664
Multi-Engine	1,483	2,126	2,896	5,077
Turboprop/Jet/Rotor	831	927	1,377	2,213
Estimated Number of Pull-Up Service Positions	2	2	3	4
Pull-Up Service Area (SY)	1,700	1,700	2,550	3,400
Sub-Total (SY)	**15,752**	**17,544**	**20,596**	**27,355**
Aircraft Maneuvering Apron				
Sub-Total (SY)	**45,813**	**53,013**	**60,248**	**77,829**
Grand Total (SY)	**74,675**	**85,170**	**99,844**	**132,419**
Existing Capacity (SY) Est.	58,800	58,800	58,800	58,800
Net Surplus/(Deficiency) (SY)	**(15,875)**	**(26,370)**	**(41,044)**	**(73,619)**

Source: Kimley-Horn and Associates, Inc., 2009.

4.3.4 General Aviation Automobile Parking Facilities

Automobile parking facilities for general aviation patrons are provided adjacent to the FBO facility and the terminal building and at surface lots near the storage hangars located east of Municipal Drive. Existing parking facilities provide approximately 220 parking spaces. Typically, two parking spaces are required for each design hour passenger at the general aviation terminal facilities. Of the entire parking space allocation, 50 percent is typically required adjacent to conventional hangars. For planning purposes, 10 percent excess parking capacity was also provided.

By planning 320 square feet per parking space, including maneuvering space, future parking area requirements were determined. **Table 4.12** presents the results of the analysis, which indicates that the existing demand for parking facilities will increase throughout the planning period and by 2028 approximately 210 additional parking spaces, or over 67,000 square feet of additional paved areas, will be required.

Table 4.12
General Aviation Automobile Parking Space Requirements

Description	2008	2013	2018	2028
ADPM Itinerant Operations	172	191	213	274
ADPM Local Operations	140	157	174	224
Design Hour Pilots & Passengers	148	152	156	180
Primary Spaces Required	245	273	304	391
Excess Capacity	24	27	30	39
Total Spaces Required	**269**	**300**	**335**	**430**
Existing Spaces	220	220	220	220
Net Surplus/(Deficiency) (SF)	**(15,812)**	**(25,715)**	**(36,650)**	**(67,299)**

Note: [1] *Does not include parking facilities adjacent to office only and non-aviation related facilities.*
ADPM = Average Day Peak Month

Source: Kimley-Horn and Associates, Inc., 2009.

4.3.5 General Aviation Acreage Requirements

Consolidated acreage requirements for general aviation activity at Nampa Municipal Airport are presented in **Table 4.13.** These gross area projections will serve as a valuable tool during the determination of general aviation land use alternatives in the next section of this report. To provide for adequate site circulation, landscaping elements and utility improvements, a surplus of 30 percent was added to the gross requirements. The total general aviation acreage requirement is expected to increase by approximately 25.7 acres, for a total of approximately 61 acres by the year 2028.

Table 4.13
General Aviation Acreage Requirements

Functional Areas	2008	2013	2018	2028
Terminal Facilities (Acres)	0.11	0.12	0.12	0.14
Hangar Storage (Acres)	9.47	10.95	12.45	16.08
Aircraft Apron (Acres)	15.43	17.60	20.63	27.36
Automobile Parking (Acres)	1.98	2.21	2.46	3.16
Subtotal	**26.99**	**30.87**	**35.65**	**46.74**
Planning Allocation (30%)	8.10	9.26	10.70	14.02
Grand Total	**35.08**	**40.13**	**46.35**	**60.76**

Source: Tables 4.8 to 4.12
Kimley-Horn and Associates, Inc., 2009.

4.4 SUPPORT FACILITY REQUIREMENTS

This subsection examines the remaining ancillary facilities at Nampa Municipal Airport. Included in this analysis are aviation-related and airport specific support facilities essential to the daily operation of the Airport. Specific support functions analyzed include: fire fighting, airport security, and fuel storage.

4.4.1 Fire Fighting Facilities

Nampa Municipal Airport is a general aviation airport and as such does not have an FAA requirement for a specified level of ARFF equipment. However, the City of Nampa does operate Fire Station No. 5, located on airport property along Happy Valley Road. This fire station is capable of responding to structural fires and other emergencies at the Airport.

4.4.2 Airport Administration

The airport administration building at Nampa Municipal Airport provides sufficient space for the current needs. No expansion requirements are anticipated in the short to intermediate term; however, for planning purposes, it is recommended that up to one half acre of space be reserved adjacent to the existing facility for future growth.

4.4.3 Airport Security

Security Guidelines for General Aviation Airports, published by the TSA in May 2004, provides a security assessment tool for general aviation airports. Various characteristics are considered including location, primary runway length, number of based aircraft, and number and types of operations at the airport. Each of the characteristics is assigned a point ranking based on how much the characteristic is seen to affect airport security in relation to the others.

As determined in **Table 4.14,** Nampa Municipal Airport ranks in the second highest level of security threat with a score of 39. **Appendix D** provides a list of the suggested security enhancements based on the assessment using the airport characteristics measurement tool. Some of the suggested security enhancements from this list include:

- Access Controls
- Lighting Systems
- Personnel & Vehicle ID Systems
- Law Enforcement Officer (LEO) Support
- Security Committee
- Positive Passenger/Cargo/Baggage ID
- Community Watch Program

The list provided in Appendix D should not be considered exhaustive or the only methods available for improving security. The City of Nampa should give consideration to what may be physically and financially feasible at the Airport, but at a minimum the City should consider implementing all of the enhancements listed here with the exception of the "positive passenger/cargo/baggage ID".

4.4.4 Fuel Storage Facilities

As reported in the Inventory section, the current fuel storage capacity includes 12,000 gallons of Jet-A fuel and 32,000 gallons of AVGAS. During the period 2003 to 2007, on average approximately 30,700 gallons of Jet-A fuel and 143,500 gallons of AVGAS were dispensed to aircraft operators annually. This represents an average daily flowage rate of approximately 84 gallons of Jet-A fuel and 393 gallons of AVGAS.

By analyzing the forecast of aircraft operations, fleet mix, departure stage lengths, and estimated fuel consumption rates, current and forecast fuel storage needs were calculated as follows:

- Average Daily Flow = Daily Departures x Average Flow Per Departure
- Storage Requirement for 30-Day Supply = Average Daily Flow x Number of Days
- Net Storage Requirement for 30-Day Supply = Storage Requirement for Number Day Supply – Existing Capacity

As a general planning factor, 30-day storage criteria were applied to Jet-A and AVGAS storage. Longer durations in storage criteria translate in larger storage capacities being required, and are typically not cost justified. **Tables 4.15 and 4.16** present the results of the analysis.

Table 4.14
TSA Airport Characteristics Measurement Tool
Nampa Municipal Airport

Security Characteristics	Assessment Score		
	Public Use	Private use	Nampa
Location			
Within 30nm of mass population areas	5	3	5
Within 30nm of a sensitive site	4	2	4
Falls within outer perimeter of Class B airspace	3	1	NA
Falls within boundaries of restricted airspace	3	1	NA
Based Aircraft			
Greater than 101 based aircraft	3	1	3
26-100 based aircraft	2	-	NA
11-25 based aircraft	1	-	NA
10 or fewer based aircraft	-	-	NA
Based aircraft over 12,500lbs	3	1	3
Runways			
Runway length equal to or greater than 5,000 feet	5	3	5
Runway length less than 5,000 feet, greater than 2001 feet	4	2	NA
Runway length 2,000 feet or less	2	-	NA
Asphalt or concrete runway	1	-	1
Operations			
Over 50,000 annual aircraft operations	4	2	4
Part 135 operations	3	1	3
Part 137 operations	3	1	NA
Part 125 operations	3	1	NA
Flight training	3	1	3
Flight training in aircraft over 12,500 lbs	4	2	NA
Rental aircraft	4	2	4
Maintenance, Repair, and Overhaul facilities conducting long term storage of aircraft over 12,500lbs	4	2	4
		Total Score	**39**

Source: TSA, Security Guidelines for General Aviation Airports, IP A-001, May 2004
Kimley-Horn and Associates, Inc. analysis, 2009

Table 4.15
Jet-A Fuel Storage Requirements

	2008	2013	2018	2028
Daily Turbine Departures	2.66	4.12	7.29	14.25
Average Flow Per Departure (Gallons)	31.54	32	32.5	33.5
Average Daily Flow (Gallons)	84	132	237	477
Storage Requirement for 30-Day Supply (Gallons)	**2,520**	**3,953**	**7,111**	**14,318**
Existing Capacity (Gallons)	12,000	12,000	12,000	12,000
Net Surplus/(Deficiency) for 30-Day Supply (Gallons)	**9,480**	**8,047**	**4,889**	**(2,318)**

Source: Kimley-Horn and Associates, Inc., 2009.

Table 4.16
AVGAS Storage Requirements

	2008	2013	2018	2028
Daily Piston Departures	95.97	110.27	125.31	163.84
Average Flow Per Departure (Gallons)	4.10	5.2	5.5	6.9
Average Daily Flow (Gallons)	393	573	689	1,130
Storage Requirement for 30-Day Supply (Gallons)	**11,790**	**17,201**	**20,676**	**33,914**
Existing Capacity (Gallons)	32,000	32,000	32,000	32,000
Net Surplus/(Deficiency) for 30-Day Supply (Gallons)	**20,210**	**14,799**	**11,324**	**(1,914)**

Source: Kimley-Horn and Associates, Inc., 2009.

Based on the storage requirement for a 30-day fuel supply, the Jet-A storage capacity is currently sufficient. By 2028, it estimated that 2,300 gallons of additional fuel capacity are needed to satisfy the 30-day requirement. Alternatively, adjusting delivery schedules in the future to every 21 days, or a close equivalent, will eliminate this deficiency and permit continued operations without a tank sizing shortfall. It is recommended that the need for additional JET-A fuel storage facilities be reassessed annually, or if available runway length changes, to determine long range fuel storage needs.

Based on the storage requirement for a 30-day fuel supply, the AVGAS storage capacity is currently sufficient. By 2028, it estimated that 1,900 gallons of additional fuel capacity are needed to satisfy the 30-day requirement. Alternatively, adjusting delivery schedules in the future to every 21 days, or a close equivalent, will eliminate this deficiency and permit continued operations without a tank sizing shortfall.

4.5 NON-AVIATION FACILITY REQUIREMENTS

The remaining on-airport facilities are non-aviation properties utilized for a variety of purposes. Currently, there are no known deficiencies in the amount of space required for these non-aviation facilities. The next section will address and develop land use alternatives for these non-aviation related properties. It is generally recommended that land not ultimately needed for aviation-related facilities be reserved for revenue-generating commercial use as a way of optimizing the amount of revenue generated from surplus property.

4.6 SURFACE TRANSPORTATION REQUIREMENTS

4.6.1 Current Conditions

Access to the terminal building, parking area, and other landside areas at the Nampa Municipal Airport is currently provided by Municipal Drive, which connects to Airport Road and the adjacent street network at 39th Street to the north. The Airport is currently surrounded by four minor arterial roadways. Each arterial is a two-lane road, one travel lane in each direction. To the north and south of the airport are Airport Road and Victory Road, respectively. To the west and east of the airport are Kings Road and Happy Valley Road, respectively. These four minor arterial roadways complete a grid around the Airport and form four major intersections. The traffic control at these intersections is as follows:

- The intersection of Kings Road and Airport Road is a T-intersection which is stop-controlled in the westbound direction;
- The intersection of Happy Valley Road and Airport Road is stop-controlled in the eastbound and westbound direction;
- The intersection of Happy Valley Road and Victory Road is stop-controlled in the eastbound and westbound direction; and
- The intersection of Kings Road and Victory Road is stop-controlled in all directions.

Traffic volumes for the roadways around the airport were provided by the Community Planning Association of Southwest Idaho (COMPASS), based on most recent counts conducted in 2006 and 2007. Based on these counts, bi-directional average daily traffic (ADT) volumes on Airport Road range from 4,200 vehicles per day (vpd) just east of Kings Road to 1,900 just east of Happy Valley Road. Bi-direction ADT volumes on Victory Road range from 8,500 vpd just east of Kings Road to 3,600 vpd just east of Happy Valley Road. Bi-directional ADT volumes on Kings Road and Happy Valley Road are 12,000 and 9,000 vpd, respectively, in the vicinity of the Airport.

Primary access to the regional transportation network is provided from the north via Garrity Boulevard to Interstate 84. Generally, the existing surface transportation network appears to be adequate to provide suitable access to the Airport and connectivity to the regional transportation system.

4.6.2 Future Conditions

The City of Nampa is currently updating their Transportation Master Plan, with an initial draft scheduled for completion in January or February 2010. According to interim results of this planning effort as provided by the City, all four arterial streets, including Airport Road, Victory Road, Kings Road, and Happy Valley Road, are expected to remain minor arterials. Traffic volumes for these roadways are forecasted to increase over the next 15 years and it is anticipated that some changes to geometry and traffic control will be needed to accommodate growth in vehicular traffic volumes, including conversion of some stop-controlled intersection to traffic signal-controlled.

Based on discussions with City of Nampa transportation planning staff, Happy Valley Road is expected to remain a minor collector. Substantial modifications to the intersection of Happy Valley Road and Victory Road are expected to be included as part of the master plan. This intersection may be relocated to the south along the existing Happy Valley Road alignment and the profile may be lowered for the north leg of the relocated intersection, so that vehicles on Happy Valley Road north of the new Victory Road intersection will not impact the airport's FAR Part 77 approach surfaces such that the vertical profile of these vehicles will remain below the obstacle clearance surface.

The City of Nampa, in partnership with the Nampa Highway District and the Ada County Highway District, is also initiating a corridor study for Airport Road. This study is expected to be completed in early 2011 and will evaluate alternatives for providing connectivity from the Nampa Airport to the east along the Airport Road alignment. This study will also evaluate alternatives for reconfiguration of the Airport Road/Kings Road and Kings Road/Garrity Boulevard intersections. Currently, drivers on Garrity Boulevard west of Kings Road cannot access the Nampa Airport via Airport Road, due to turning restrictions in place at the Garrity Boulevard/Kings Road intersection necessitated by the close proximity of the Kings Road/Airport Road intersection. To access the airport from Garrity Boulevard to the west, vehicles must instead proceed northeast past Kings Road and turn on 39th Street to reach the Nampa Airport.

The Airport Road corridor study will evaluate alternatives for connecting Airport Road directly into Garrity Boulevard. If this connection can be completed, it is expected that Airport Road would be expanded to a four-lane cross section with a raised median, and would provide primary access between I-84 and the airport. If this is accomplished, Airport Road would serve as the primary "front-door" entrance into the airport, and would provide a key connection to the regional transportation network. It is expected that reconfiguration of the Airport Road/Kings/Road/Garrity Boulevard intersections would require acquisition of some property currently owned by the airport as well as some additional private property. If it is determined that Airport Road cannot be connected to Garrity Boulevard, it is expected that Airport Road would remain a two-lane cross section, functioning as a minor arterial or collector roadway.

4.6.3 Changes to Airport Access

According to the City of Nampa Comprehensive Plan, the ongoing Transportation Master Plan, and discussions with Nampa staff, some changes to the surface transportation network are expected in the future. These changes include the following:

- Intersections of Kings Road and Airport Road and Kings Road and Garrity Boulevard will be evaluated in an effort to develop alternatives for reconfiguring these two intersections into a single intersection, due to their close proximity, tying Airport Road directly into Garrity Boulevard;
- Airport Road cross-section is planned to be expanded from a two-lane cross-section to a three-lane cross-section from Kings Road to Happy Valley Road, with potential expansion of Airport Road to a four-lane cross-section with a raised median if reconfiguration of the Airport Road/Kings Road/Garrity Boulevard intersections can be accomplished, thereby providing "front-door" access to the airport and improved connectivity to I-84; and
- Preliminary concepts have been explored for modifications to the Happy Valley Road and Victory Road intersection that would include relocation of this intersection south along the Happy Valley alignment away from its current location and lowering of the roadway profile within the airport's RPZ.

Of these planned and potential improvements, modifications to the Kings Road/Airport Road and Happy Valley Road/Victory Road intersections are expected to most substantially affect access to the Airport. At the Kings Road/Airport Road intersection, the City of Nampa is seeking to reconfigure this intersection along with the adjacent intersection of Kings Road and Garrity Boulevard because these two intersections are separated by approximately 100 feet. This creates both operational and safety concerns at this location, and limits traffic movements, as traffic on Garrity Boulevard approaching from the west cannot access the airport via Airport Road but must instead travel to 39th Street to reach the airport. According to City of Nampa staff, reconstruction of these two intersections could require acquisition of some property near the Kings Road/Airport Road intersection. Some of this property is currently owned by the airport, while some of it is privately-owned by third parties.

If Airport Road can be connected directly into Garrity Boulevard, access to the airport will be substantially improved. Garrity Boulevard provides access to I-84 and the interstate freeway system via the existing interchange. It is expected that Garrity Boulevard and Airport Road would become the primary roadway access to and from the Nampa Airport, serving as the "front door" to the airport. While the City has also evaluated options for widening 39th Street to serve as the primary access to the airport, existing building setbacks along 39th Street are limited. Substantial widening of 39th Street could therefore be difficult and expensive, requiring significant right-of-way and building acquisition. Improvements to the Airport Road/Kings Road/Garrity Boulevard intersection have therefore been identified by city transportation planners as a key element to promote airport expansion and protect the long-term viability of the Nampa Airport.

At Happy Valley and Victory Road, reconstruction of this intersection was proposed a couple of years ago but was restricted due to airport glide path constraints. According to City of Nampa Staff relocation of this intersection is being considered in part to mitigate an existing conflict and potential future impacts that vehicular traffic operations may have on airport airspace and safety if additional funding were to become available. Although no definitive plans have been developed, according to City of Nampa staff, relocation of this intersection south of its current location and a lowering of the roadway grade could be considered if there was interest in this concept and partial funding on the part of the Airport. The new intersection could then be reconstructed with traffic signal control or as a modern roundabout intersection. It is likely that modifications of this nature would require land acquisition. No specific plans have been defined at this time.