Chapter 8. Recommendations and Investment Needs

8.1. Introduction

The Recommendations and Investment Needs chapter of the Nevada Airport and Heliport System Plan (NAHSP) is the culmination of the study's analysis. The information presented in this chapter is the result of establishing existing conditions, determining NAHSP airport roles or classifications, preparing aviation demand forecasts, analyzing system performance, and establishing future performance targets. It was necessary to conduct all of those steps in order to identify project recommendations and policy considerations that are supported by study analyses and can be used in informed decision making.

Before establishing the path forward in determining project recommendations and policy considerations, an analysis of potential future impacts to the system's needs was prepared which is presented first in this chapter. Potential future impacts include a review of socioeconomic factors and transportation projects that may impact system demand, as well as a review of potential future changes to the National Plan of Integrated Airport Systems (NPIAS) and airport roles, as well as consideration of potential new NPIAS airports. It is important to consider potential future impacts prior to establishing recommendations as the recommendations need to account for these potential impacts.

Following the assessment of potential future impacts, this chapter presents the recommendations and policy considerations organized in the following categories:

- NAHSP-related
  - Performance Measures (PMs)
  - Value Rating Variables (VRVs) and Facility and Service Objectives (FSOs)
- Non-NAHSP-related
  - Airport Capital Improvement Plans/Programs (ACIPs), Master Plans, and Other Studies
  - Large Commercial Service Airport Needs
  - Statewide Programs

Non-NAHSP-related projects and costs have several components and are important to include in the study, as possible, to better reflect the total state aviation investment needs anticipated over the next 20 years. Non-NAHSP projects and costs include those identified by study airports as available from sources such as ACIPs – typically more near term; master plans – typically include short-, mid-, and long-term projects; and other studies such as airport pavement management systems (APMS) conducted by individual airports or airport systems.

The NAHSP also recognizes that the two largest airports in the state, Harry Reid International (LAS) and Reno/Tahoe International (RNO) have significant capital needs, including pavement maintenance, many of which are not addressed through PMs, VRVs, FSOs, or other mechanisms. A separate section that specifically addresses the financial needs of these airports is provided in order to develop a statewide airport investment needs summary.

In addition to individual airport project needs, the NAHSP identifies current and potential statewide programs and their associated costs, including implementation of the Nevada Airport Pavement

Management System Update (APMS) and continuation of the program. All of these costs are summed to determine total system needs, with other recommendations identified including potential policy considerations that could enhance the system over time.

As with most needs-based analyses, the Nevada aviation system has far greater investment needs than historical funding has supported. Prioritization is essential in evaluating what projects should be funded in what order with the limited available funding. A high-level overview of funding sources and considerations for determining project prioritization is also included in this chapter.

See **Appendix A. Individual Airport Reports** for additional information regarding airport-specific investment need estimates.

8.2. Potential Future Impacts

The system evaluation in **Chapter 7. Existing and Future System Performance** focused primarily on the system's existing performance based on the analysis of PMs, VRVs, and FSOs. Beyond changes that will occur as a result of the system's development over time, there are other non-aviation factors that have the potential to impact future aviation demand and the aviation system's future needs. These "outside influences" can include a variety of potential conditions such as changes to population, improvements to the ground transportation network, and economic development opportunities. Additionally, airports themselves may experience changes to their role, which could also impact how the aviation system supports Nevada. These outside influences and potential role changes are discussed below.

8.2.1. Outside Influences

A variety of socioeconomic impacts could influence or impact operations and functionality of Nevada's aviation system. More people moving to the state, or from one part of the state to another, improved roadway connections, and economic development opportunities can influence an airport's activity levels.

Nevada population projections are significant, with a University of Nevada, Las Vegas (UNLV) Center for Business and Economic Research (CBER) report stating that an estimated one million people will relocate to the Southern Nevada region alone by 2060.[1] According to the same report, Southern Nevada has been experiencing a trend of people migrating from all over the country ever since the end of the Great Recession in 2009, with predictions that this trend will continue despite COVID-19 impacts. UNLV CBER states that this migratory trend has the potential to impact businesses not only in Southern Nevada, but also across the state. While population growth is most typical in urban areas, with Clark and Washoe counties being home to 95 percent of the state's overall population, Nye County experienced the fastest population growth of counties in Nevada according to the most recent U.S. Census, with a 17.4 percent increase.[2] These population forecast studies are conducted so that policy and decision-makers can understand future needs related to education, public safety, provision of utilities and services, and the transportation system, including aviation. It is important to monitor population changes in both rural and

[1] https://www.unlv.edu/news/release/unlv-report-forecasts-1m-more-residents-southern-nevada-2060
[2] https://www.usnews.com/news/best-states/nevada/articles/2021-08-12/nevada-becomes-more-populous-and-diverse-but-growth-slows

urban communities in Nevada to support informed decision-making about necessary aviation facility investments. More information regarding county-by-county population projections can be found in **Chapter 4. Aviation Activity and Demand Forecasts**.

Economic development activities impact population levels, and in turn, impact demand for housing, utilities, and transportation services. For example, the extension of Interstate 11 (I-11) into Nevada has the potential to improve connectivity and support economic vitality, attracting more people to the area. The I-11 corridor provides a major north-south corridor that will connect Nevada and the Las Vegas metropolitan area to Phoenix and is anticipated to extend north up to I-80. The I-11 Northern Nevada Alternatives Analysis from May 2018 showed additional options north of I-80 eventually connecting from locations in Mexico through Arizona and Nevada north to Canada. Moreover, significant growth in the northern part of Nevada, specifically Humboldt County, is expected due to recent and ongoing economic development activities, including the Thacker Pass Lithium Mine and large-scale salmon hatchery, West Coast Salmon, development.

Other economic development opportunities supported by the Nevada Governor's Office of Economic Development (GOED) offer additional growth potential. The GOED operates a variety of economic development opportunities that relate to rural and remote community development, incentives for new businesses such as tax abatements, and more. These GOED-supported initiatives complement economic development throughout the state, contributing to population increases and more demand for services. It is important to factor in any major economic development plans when conducting any type of aviation facility planning so that the future aviation facilities are equipped to accommodate changes in demand brought on by these developments.

Most of NDOT's current and planned intermodal improvements are focused on the major metropolitan areas of Las Vegas and Reno where the population growth will likely generate demand for increased capacity and access to the interstate and major arterial highway system, as well as along the interstate and major state highway system. **Table 8-1** shows the projected population growth rate of counties within Nevada that are expected to experience compound annual growth rates (CAGRs) of over one percent and their associated airports in the near term (through 2025). While not shown below, these same counties are projected to have growth above one percent over the long term (through 2040) and represent the highest county growth rates in the state.

Table 8-1: Counties with Projected Population Growth over 1 Percent CAGR

County	CAGR (2020-2025)	Associated City	Publicly Owned Airport
Carson City	1.46%	Carson City	CXP
Churchill	1.92%	Fallon	FLX
Clark	1.67%	Boulder City, Jean, Las Vegas (HND and LAS, Mesquite, North Las Vegas, Overton (Echo Bay and Perkins Field)	BVU, 0L7, HND, LAS, 67L, VGT, 0L9, U08
Elko	1.59%	Elko, Jackpot, North Fork, Owyhee, Wells	EKO, 06U, 08U, 10U, LWL
Eureka	1.90%	Crescent Valley, Eureka	U74, 05U
Humboldt	1.43%	Denio, Winnemucca	E85, WMC
Lincoln	1.26%	Panaca	1L1
Lyon	1.39%	Fernley, Silver Springs, Smith, Yerington	N58, SPZ, N59, O43
Nye	1.32%	Beatty, Currant, Duckwater, Gabbs, Tonopah	BTY, 9U7, 01U, GAB, TPH
Storey	1.70%	None	N/A
Washoe	1.26%	Reno (RTS, RNO, N86)	RNO, RTS, N86

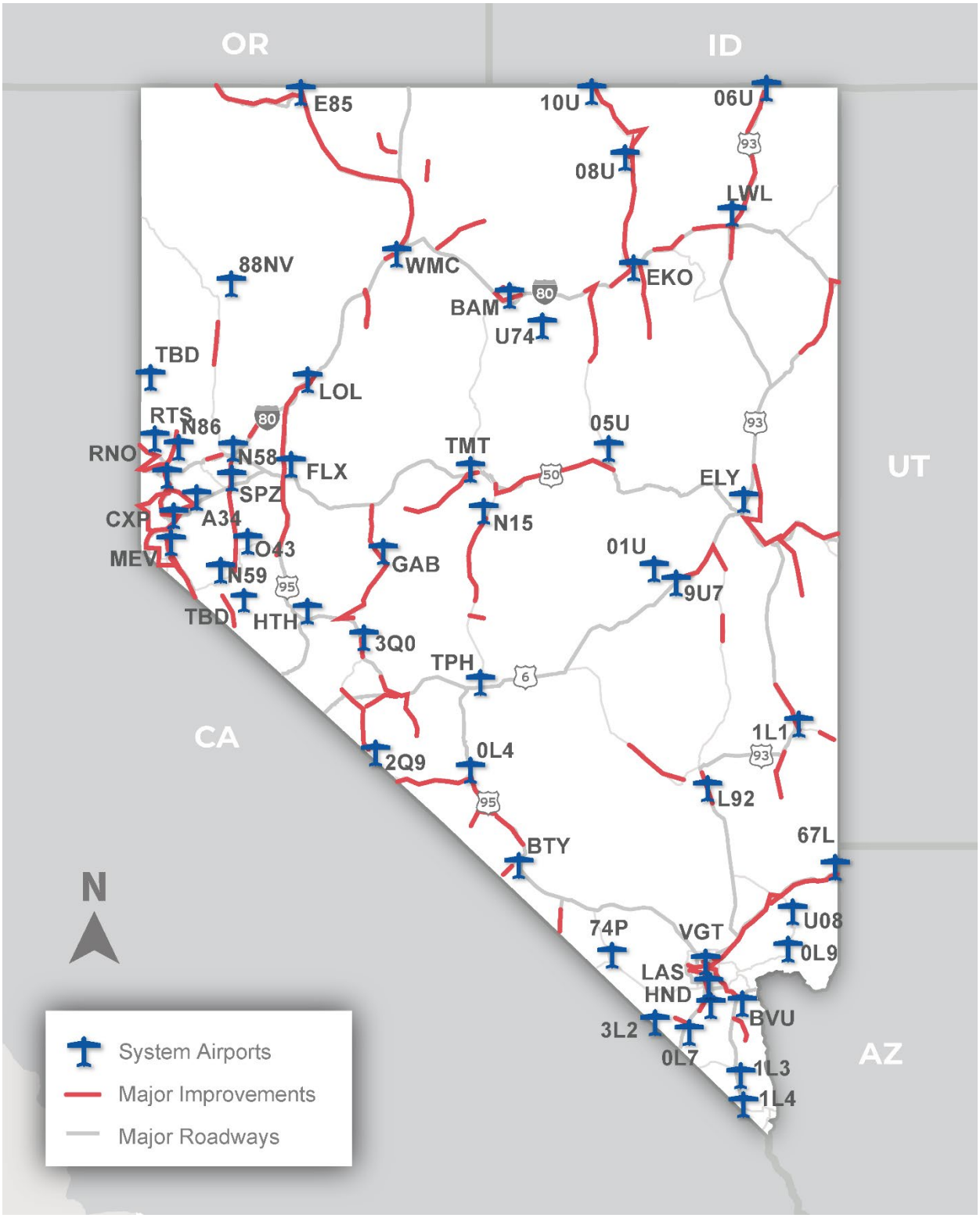
Sources: Woods & Poole Economics, Inc. 2020, Kimley-Horn 2021

Projects identified in the 2021 NDOT Work Program, which includes current fiscal year projects, short-range element projects (defined as two to four years), and long-range element projects that are in the planning stage but expected to be completed five years and beyond. **Figure 8-1** displays the general project areas of the 2021 NDOT Work Program.

As depicted, projects are identified throughout the state, with improvements to roadways including:

- I-15
- I-80
- I-515
- U.S. Route 93
- U.S. Route 95
- U.S. Route 50
- Nevada State Route 140
- Nevada State Route 361
- Nevada State Route 225

Figure 8-1: 2021 NDOT Work Program Map



Source: 2021 NDOT Work Program, Kimley-Horn 2022

There is also a high-speed rail project proposed for development by Brightline (or Brightline West), a privately owned passenger railroad, which is referred to as XpressWest. This project would connect Las Vegas to Los Angeles at final completion. There is currently no estimated timeline for this project.

While population growth is expected and will drive some of the proposed transportation improvements (and vice versa), the existing aviation system appears generally capable of accommodating these changes. The potential exception is in southern Nevada where proposed population growth, as well as associated and likely economic activity, is projected to impact commercial air service needs. Subsequent sections discuss the proposed Southern Nevada Supplemental Airport (SNSA), a long studied new airport site to supplement commercial service needs at LAS.

8.2.2. Evaluation of Potential Changes to the NPIAS

The Federal Aviation Administration's (FAA's) NPIAS is updated every two years, with airport classifications and roles updated based on aviation activity that is evaluated from nine to 12 months prior to the publication. Previous NAHSP chapters have identified the most recent FAA classifications for Nevada's 30 NPIAS airports from the *2021-2025 NPIAS*, as well as identified the NAHSP role of the 21 non-NPIAS airports included in Nevada's aviation system. Using more current data and the NPIAS classification criteria, a re-evaluation of facilities was conducted to identify any airports that may warrant a classification change in the next iteration of the NPIAS, scheduled to be the *2023-2027 NPIAS*. This evaluation of potential changes in NPIAS classification looked only at Nonprimary airports (as opposed to Primary commercial service airports whose hub classifications are examined every year based on enplanements) and non-NPIAS airports within the NAHSP using the criteria outlined in the *2021-2025 NPIAS Appendix C: Statutory and Policy Definitions; Data Sources*. The evaluation was conducted to determine if Nonprimary airports' classifications could possibly change and if non-NPIAS airports may be eligible for inclusion in the next NPIAS iteration.

With the criteria for each classification clearly defined, each airport's data, as gathered from the NAHSP and the FAA's database, was examined against these criteria to see if an airport might be reclassified to a higher or lower role in the next NPIAS iteration. For a reclassification to a higher role, an airport must meet all of the given criteria for the next highest role. For an airport to be reclassified to a lower role, they must fail to meet any one of the given criteria for their current role. **Table 8-2** presents the results of the NPIAS re-evaluation analysis for Nonprimary airports identifying that only one airport, Perkins Field, was found to be possibly eligible for a reclassification. This airport would change from a Basic airport to an Unclassified airport, based on having less than 10 based aircraft. It is important to note that the results of the NPIAS and non-NPIAS reclassification evaluation does not guarantee that the airport will experience any change in the upcoming NPIAS. Coordination between the airport sponsor (Clark County), NDOT, and the FAA is required before any airport will be included or excluded from the NPIAS.

Table 8-2: NPIAS Re-evaluation Results for NPIAS Airports in the NAHSP

Associated City	Airport Name	FAA ID	Existing NPIAS Classification	Potential Future NPIAS Classification	Justification*
Overton	Perkins Field	U08	Basic	Unclassified	Publicly owned: Yes Existing based aircraft: 1** Minimum required based aircraft: 10

*Notes: *FAA's Criterion 1 for Basic airports must meet both requirements: publicly owned; and 10 or more validated based aircraft for an airport. **While 1 based aircraft was reported through the NAHSP inventory effort, FAA's National Based Aircraft Inventory Program notes that 7 based aircraft were validated as of 11/13/2019. This is still less than the 10 required for the Basic classification. Sources: 2021-2025 NPIAS, NAHSP Data Collection Form 2021, Kimley-Horn 2022*

For non-NPIAS airports, each was evaluated based on the initial screening requirements outlined by the FAA in FAA Order 5090.5, *Formulation of the NPIAS and ACIP*. The 21 non-NPIAS airports included in the NAHSP were each evaluated for the following five criteria from this FAA Order:

- Public use and operated by a sponsor eligible to receive federal funds and meet obligations (likely publicly owned)
- Used by 10 or more operational and airworthy aircraft based on the airport
- At least 30 miles from the nearest NPIAS airport
- Included in a state or territory aviation system plan
- No significant airfield design standard deficiencies

In order to be considered for inclusion in the next iteration of the NPIAS, a non-NPIAS airport must generally meet all five of these given criteria or fulfill a unique role in the national system as defined by the FAA. While all 21 airports meet the state or territory aviation system plan inclusion, since they are all included in the NAHSP, the performance for the remaining four criteria is mixed, with none of the airports meeting all five criteria. The results of this evaluation indicate that none of the non-NPIAS airports will likely be considered for NPIAS inclusion in the next NPIAS iteration.

8.2.3. Potential Future Airport System

As mentioned in **Chapter 3. Airport Roles and Classification Analysis**, the airports that make up the NAHSP provide a unique array of facilities and services that together contribute to an aviation system that meets the needs of its users. Each NAHSP role is distinct and the airports within those roles serve diverse purposes, while also working together as a dynamic system that provides access to all parts of the state. The airports' individual and cumulative functions impact how well the system can serve community, regional, and state needs.

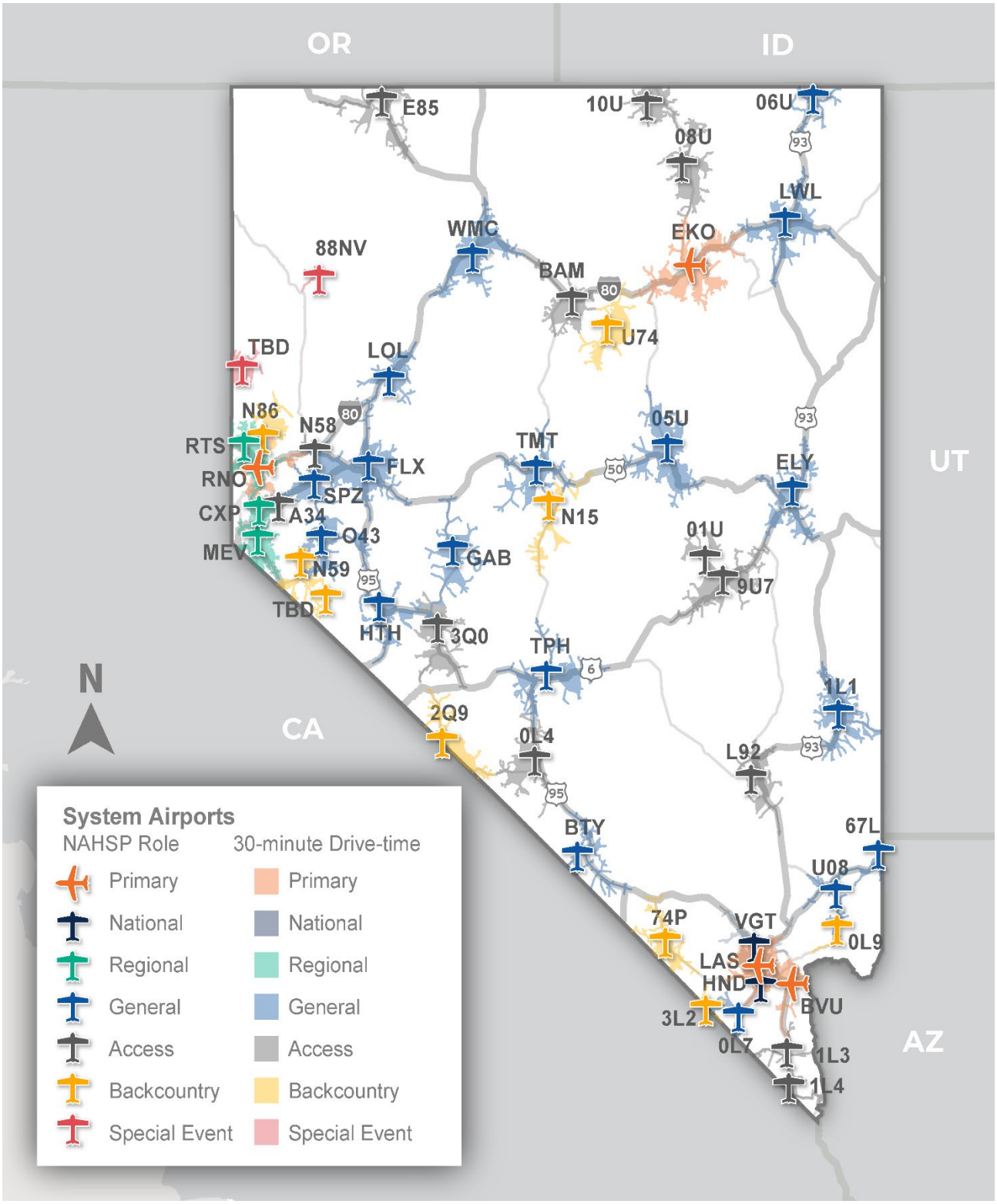
In order to better understand the level of service the NAHSP facilities provide, an analysis was conducted that identifies the percent of the population and land covered by airports that comprise each NAHSP role using 30-minute drive times for each airport. In instances when an airport's drive time extended into a bordering state, only Nevada population was counted. The results of this analysis are presented in **Table 8-3** and depicted in **Figure 8-2**. The four Primary airports in the system provide adequate access for 81 percent of the state's total population coverage and approximately one percent of the state's total land area. The 18 General airports and associated 30-minute drive time service areas account for the highest percentage of land area compared to the other six NAHSP roles, covering approximately three percent of the state's land area.

Table 8-3: Percent of State Population and Land Coverage Within 30 Minutes' Drive Time of Each NAHSP Role*

Roles	Population Served	Percent of Population	Land Coverage (sq miles)	Percent of Land Coverage
Primary (4)	2,520,800	81%	1,070	1%
National (2)	2,211,410	71%	490	0%
Regional (3)	535,300	17%	460	0%
General (18)	507,530	16%	3,420	3%
Access (13)	119,720	4%	1,910	2%
Backcountry (9)	450,660	14%	1,090	1%
Special Event (2)	30	< 0%	80	< 0%

*Notes: *Population and land coverage rounded to the nearest ten. Totals may not sum due to rounding.*
Sources: ESRI Business Analyst 2021, ArcMap 2021, Kimley-Horn 2021

Figure 8-2: Nevada Airport System Population and Land Area Coverage



Sources: ArcMap 2021, Kimley-Horn 2022

To build off of this analysis and further understand how NAHSP roles work together to contribute to a dynamic state aviation system, an analysis was conducted that shows the progression of population and land coverage as the NAHSP roles are merged, one by one, starting with the largest airports in the system until all of the roles are considered as one system. This analysis showcases how each airport classification's contribution to coverage is an integral component to the overall strength of the system. The results of this analysis, including an indication of the number of airports depicted in each combined analysis, are shown in **Table 8-4**.

Table 8-4: Progression of Population and Land Coverage Based on Merged NAHSP Roles*

Roles	Population Served	Percent of Population	Land Coverage (sq miles)	Percent of Land Coverage
Primary & National (6)	2,738,930	88%	1,140	1%
Primary, National, & Regional (9)	2,841,670	91%	1,400	1%
Primary, National, Regional, & General (27)	2,977,470	95%	4,710	4%
Primary, National, Regional, General, & Access (40)	2,997,770	96%	6,470	6%
Primary, National, Regional, General, Access, & Backcountry (49)	3,048,510	97%	7,310	7%
Primary, National, Regional, General, Access, Backcountry, & Special Event (51)	3,048,540	97%	7,390	7%

*Notes: *Population and land coverage rounded to the nearest ten. Totals may not sum due to rounding.*
Sources: ESRI Business Analyst 2021, ArcMap 2021, Kimley-Horn 2021

As shown, the 30-minute drive time service areas for Primary and National airports alone account for almost 90 percent of Nevada's total population, even though these airports' service areas only account for one percent of the total land area. Once all other airport roles' coverage is added, almost all of Nevada's population is within 30-minutes' drive of a system airport, as 97 percent of the population is within one of the service areas. Even with almost all of Nevada's population being 30 minutes from a system airport, these airports' service areas only account for seven percent of the state's total land area. A significant portion of the state's land area does not have adequate access to a public use airport.

As noted in **Chapter 4. State, Regional, and Local Airport Issues**, the federal government currently owns and maintains almost 82 percent of the land in Nevada through various departments such as the U.S. Forest Service (USFS), U.S. National Park Service (NPS), U.S. Fish and Wildlife Service (USFWS), U.S. Bureau of Land Management (BLM), and the Department of Defense (DOD). In terms of access, there are also many privately owned airports and heliports in the state that were not studied in the NAHSP but were identified in Table 2-2 and Figure 2-2, as well as heliports identified in Table 2-3 (all contained in **Chapter 2. Inventory of Aviation System Conditions**). Given the high percentage of coverage to the population, including to low-density areas of the state, this coverage suggests that no additional airports are needed from purely a geographic coverage perspective. Also identified in **Chapter 2. Inventory of Aviation System Conditions** were five airports that are located in four adjacent states but serve Nevada aviation needs due to proximity including:

- McDermitt State Airport, McDermitt, OR (26U)
- Wendover Airport, Wendover, UT (ENV)
- Lake Tahoe Airport, South Lake Tahoe, CA (TVL)
- Truckee-Tahoe Airport, Truckee, CA (TRK)
- Laughlin/Bullhead International Airport, Bullhead City, AZ (IFP)

These five airports provide additional coverage to Nevada residents and visitors and the coverage is mostly duplicative of what other Nevada airports provide except for 26U, ENV, and TRK, all of which provide additional access and coverage to the state's residents and visitors.

In addition to considering coverage based on the Nevada system airports and their existing NAHSP classifications, it is important to consider how proposed airports and airport ownership could impact system service area coverage in the future. Based on needs identified over the past 10 to 20 years, two new airports have been studied and even included in prior publications of the NPIAS. These include Pahrump and an additional commercial service airport for Las Vegas. The current 2021-2025 NPIAS does not include any new airports, but previous NPIAS reports have. A new airport in Pahrump was included in the 2009-2013 NPIAS, 2011-2015 NPIAS, and 2015-2019 NPIAS (but not the 2013-2017). A new airport for Las Vegas was identified in both the 2009-2013 NPIAS and 2011-2015 NPIAS.

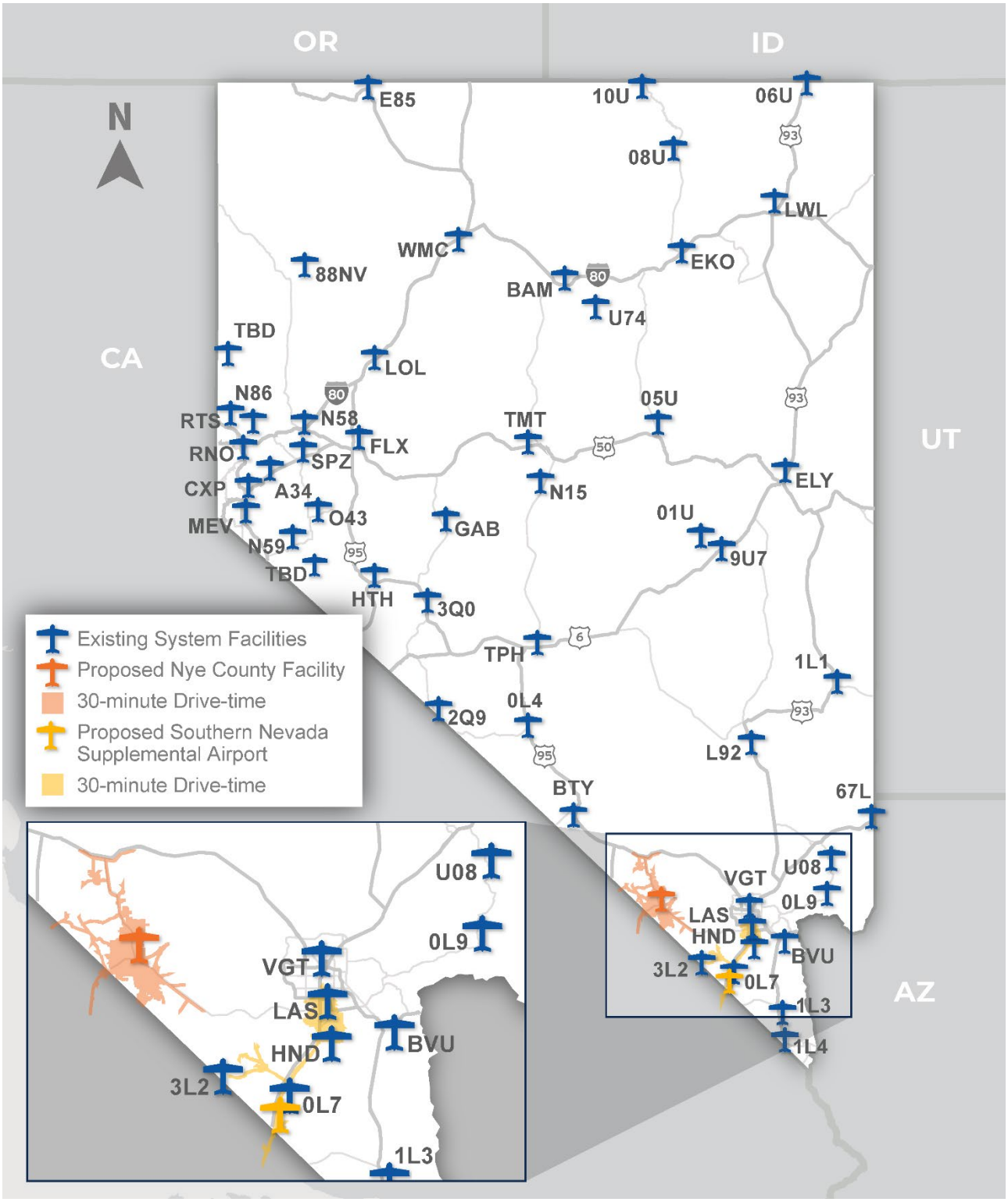
An existing privately owned public-use airport in Pahrump, Calvada Meadows (74P) serves general aviation (GA) activity, primarily the residences at this private residential airpark community. Studied off and on since 1987, a new airport in Pahrump has been evaluated starting with a Preliminary Airport Feasibility Study, through a Master Plan and Environmental Baseline Study, a Financial Feasibility Study, and initiation of an Environmental Impact Statement. FAA has not been involved since 2014, although there is local and state discussion of reconsidering a site selection study for a new publicly owned, public-use airport in Nye County, possibly near Pahrump and/or Pahrump Valley.

A new or supplemental Las Vegas metropolitan area airport was previously evaluated starting in 1997 and various efforts were undertaken through 2010 after the economic downturn and Great Recession from 2007-2009. While dropped from the FAA NPIAS starting with the publications in 2013, study of the needs in the area restarted in 2018, given the increase in aviation traffic, general population, and economic growth, as well as forecast for the Las Vegas area in the future and the inability to sufficiently expand LAS due to the densely developed areas surrounding the airport. The proposed commercial service airport is now referred to as Southern Nevada Supplemental Airport (SNSA), with a proposed location about 30 miles southwest of LAS, in the Ivanpah Valley.

The current SNSA location is being studied in terms of planning and environmental impacts. The timing of the construction of the proposed airport has yet to be determined. Of note, SNSA is being proposed as a supplemental airport. SNSA has the potential to provide significant aviation relief to the existing Clark County facilities, particularly LAS. This relief may become incredibly important as Las Vegas and surrounding areas continue to attract new residents, visitors, and economic development opportunities.

Figure 8-3 depicts the potential locations of the two new airport locations under consideration in Nevada.

Figure 8-3: Potential New Nevada System Airports



Sources: Clark County Department of Aviation, 2015-2019 NPIAS, ArcMap 2021, Kimley-Horn 2022

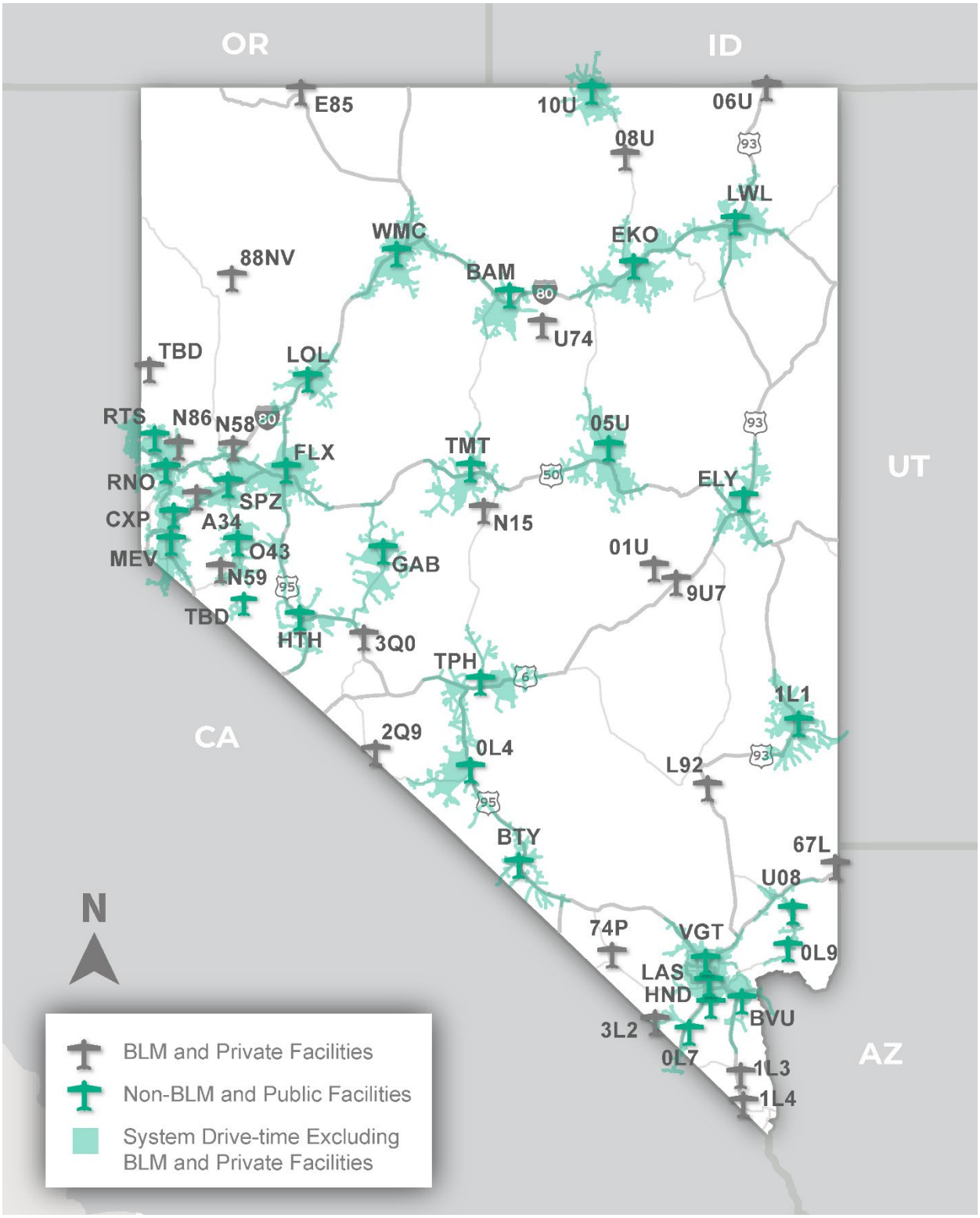
Aviation facility ownership and availability of airports for public use are also factors that could influence the future of Nevada's aviation system and its ability to serve residents and visitors. With 16 airports that are BLM controlled and another five privately owned airports in the system that are public use, there is potential that these airports may be removed from the system due to either BLM not renewing leases or private owners no longer wanting the responsibility of owning and maintaining these facilities. It is important to consider the impacts of this scenario becoming a reality as the impact of 21 airports not being available to public users and being removed from the system would greatly affect accessibility to residents and visitors. Removal of these 21 airports from the system would dramatically impact overall system coverage, both in terms of population and land area throughout the state as depicted in **Figure 8-4**. **Table 8-5** presents the population and total land coverage of facilities located on BLM land and other privately owned airports. Together, these 21 airports provide access for approximately 3 percent of Nevada's population and less than one percent of Nevada's total land area. The overlap between BLM and private facility service areas and other existing system service areas was removed before identifying the percent of population and land area lost if the BLM and private facilities were no longer open. If BLM and other private owners relinquish their lease and ownership of these facilities, there would be considerable impacts across the state for general accessibility and specifically to smaller and more distant areas of the state. **Section 8.3.1.5** provides additional context and policy considerations for the airports on BLM-leased land.

Table 8-5: State Population and Land Coverage of BLM-Owned and Privately Owned Facilities*

Ownership	Number of Facilities	Population Served	Percent of Population	Land Coverage (sq miles)	Percent of Land Coverage
BLM Leased Airports	16	30,700	1%	1,927	<1%
Other Privately Owned Airports	5	57,200	2%	340	<1%

*Notes: *Population and land coverage rounded to the nearest hundred. Totals may not sum due to rounding.*
Sources: ESRI Business Analyst 2021, ArcMap 2021, Kimley-Horn 2021

Figure 8-4: BLM Leased and Other Privately Owned Airports' Impact



Sources: ArcMap 2021, Kimley-Horn 2022

8.3. Investment Needs

Investment needs outlined in the following subsections include costs identified through NAHSP analyses and other individual airport costs obtained through review of available ACIPs, master plans, and airport pavement management analyses conducted by NDOT and others. A separate section is provided specific to LAS and RNO investment needs as these airports have large capital programs and the NAHSP recommendations specific to these two airports did not reflect the tremendous total needs of these two commercial service airports. This section concludes by summarizing needs and costs from each source to present a comprehensive estimate of investment needs for NASHP airports over the 20-year planning horizon. The following subsections present cost estimates from five different categories that are summarized in **Table 8-6**.

Table 8-6: Summary of Recommendations and Investment Needs Sources

Project Source	Description
NAHSP-related	
NAHSP Performance Measures (PMs)	Projects identified through analysis of the delta between existing performance and future performance targets of the PMs. PMs were established for each of the five project goals.
NAHSP Value Rating Variables (VRVs)/Facility and Service Objectives (FSOs)	VRVs and FSOs are mechanisms used to evaluate airports at the airport-level. VRVs include some qualitative information and are reserved for NPIAS airports. FSO focus only on capital improvement projects and are used for non-NPIAS airports only.
Non-NAHSP-related	
ACIPs, Master Plans, and Other Airport-Specific Studies	ACIPs are developed annually by NPIAS airports to determine their facility needs over the short-term. ACIPs were collected from responsive airports and costs were included in the NAHSP. In addition, if airports provided recent master plans, the short-, mid-, and long-term costs of those were also included.
Large Commercial Service Airport Needs	Information from LAS and RNO was obtained to include in the NAHSP to provide a better estimate of total statewide aviation needs, inclusive of projects that address capital needs that were not evaluated in the NAHSP.
Statewide Programs	The NDOT Aviation Program maintains an APMS program as well as an Airport Directory and Pilot's Guide.

Source: Kimley-Horn 2021

Once the NAHSP projects for PMs and VRV/FSOs were identified, it was necessary to establish cost estimates. The costs developed for PM and VRV/FSO projects are considered planning-level estimates, which means the costs are intended for planning purposes only and do not convey a commitment of local, state, or federal funding for a project. These costs should not be used to develop grant applications or for conducting project programming. Proper project justification is still required to support funding requests for these projects. These planning-level unit costs were developed based on general material costs and industry knowledge and were tiered to reflect cost differentials between types and sizes of airports. The NAHSP airport classifications were used for this purpose. For example, a unit cost at a National airport

may be more expensive than at a General airport. The unit costs were then multiplied by the necessary quantities (i.e., area, units, feet, etc.) of the proposed project to develop a cost estimate for that project. This planning-level exercise provides an order of magnitude estimate with some contingencies accounted for in the unit costs. More detailed project costs require additional analyses regarding the specific conditions found at each airport which is outside the scope of the NAHSP. It is important to note that costs for recommended projects that satisfy both a PM and a VRV/FSO are **bolded** in the tables presented in **Section 8.3.1**. Costs for these projects are shown twice, once under the applicable PM and once under the applicable VRV/FSO discussion. However, overlapping costs were not duplicated when presenting total system needs.

The costs related to the non-NAHSP elements such as ACIPs, airport master plans, APMS recommendations, and large commercial service airport projects were obtained directly from these unique sources, primarily provided by the airports and NDOT. In the event that a NAHSP project was included in an ACIP, master plan, APMS, or large commercial airport list, as well as recommended as a result of the NAHSP PM and VRV/FSO analyses, duplicate costs were removed from the total cost estimates presented in **Section 8.3.4**. For more information regarding airport-specific cost estimates, including those from the NAHSP, ACIPs, master plans, and APMS cost estimates, please see **Appendix A. Individual Airport Reports**.

8.3.1. NAHSP Performance Measure Recommendations and Needs

PM project recommendations were identified by comparing each airport's existing performance to the future performance established for the PM, as presented in **Chapter 7. Existing and Future System Performance**. Identifying the difference between how many airports are meeting a PM and how many should meet the PM in the future is the basis for the recommendations. It is important to note that not all PMs result in a capital project recommendation because the PM may not correspond to a physical airport project that NDOT can support. In these instances, policy considerations and recommendations are presented following the cost estimates. Cost estimates and policy considerations are presented by Goal in the following six subsections. Performance measures in bold in the tables indicate that the project recommendation associated with these cost estimates also satisfies a VRV/FSO metric.

8.3.1.1. Enhance Safety Goal

The results of the system performance analysis and future performance target evaluation identified capital project recommendations for all the PMs associated with the Enhance Safety goal. It is important to note that costs were not developed for all projects needed to address FAA design and safety standards as many of these are very airport-specific terrain or other complex issues. Also, costs were not developed at the local airport level for obtaining broadband service, as the state is pursuing development of comprehensive broadband infrastructure through other means. The total cost estimate for projects related to the Enhance Safety goal is $13,419,000. Projects for this goal include installing weather reporting systems, remarking runway hold positions, paving runways, and establishing helicopter landing locations. The cost estimate for each PM is presented in **Table 8-7**.

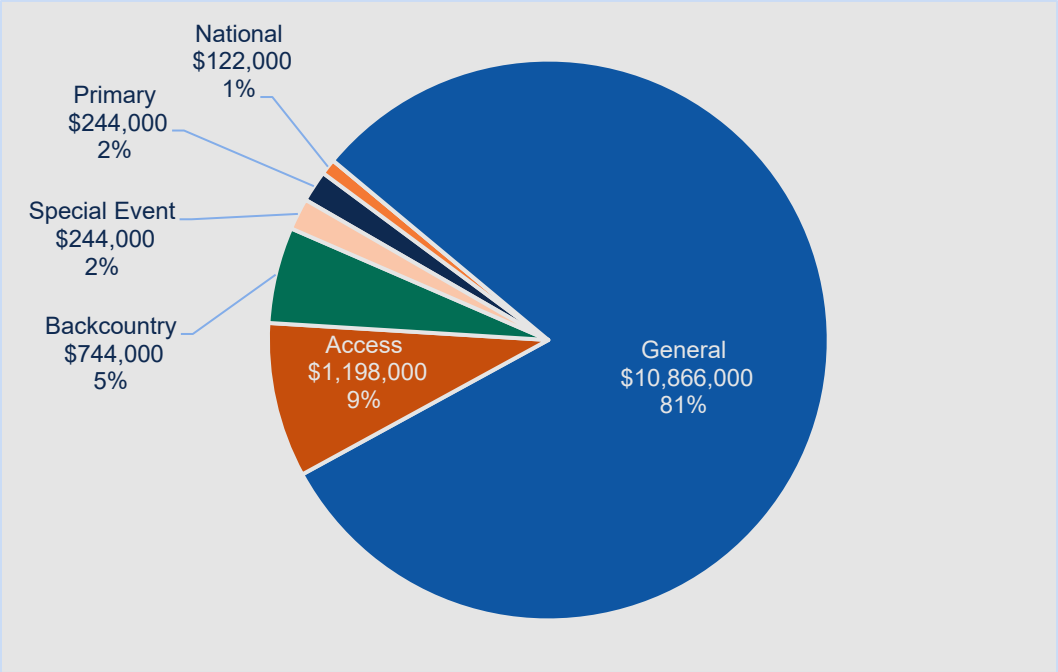
Table 8-7: Enhance Safety Goal: Project Costs by PM

NAHSP Performance Measure	Existing Performance	Future Performance Target	Total Estimated Cost	% of Total
Percent of airports meeting applicable FAA design and safety standards*	67%	100%	$41,000	< 1%
Percent of state land area and population within 30 minutes of airports with weather reporting capabilities	41%	76%	$2,220,000	17%
Percent of state land area and population within 30 minutes of an airport with a paved runway	41%	76%	$7,735,000	58%
Percent of airports that have a designated helicopter landing location	45%	100%	$3,423,000	26%
Percent of Airports that have Broadband Service**	90%	100%	Not Applicable	
Total Enhance Safety Goal PM Costs:			**$13,419,000**	

*Notes: *Due to limited information, costs were only presented as it relates to airfield markings to improve separation standards.*
***Costs were not able to be developed at the airport level for broadband service. Source: Kimley-Horn 2022*

Figure 8-5 presents the cost of Enhance Safety goal's projects by NAHSP role. General airports have the largest portion of costs under this goal, with $10,866,000 (81 percent). After General airports, Access and Backcountry airports have the next largest portion, with almost $1.7 million and $744,000 respectively. It should be noted that Regional airports currently do not have any estimated project costs for this goal and are therefore not shown within the figure.

Figure 8-5: NAHSP Enhance Safety Goal Investment Needs by Role*



*Notes: *Due to limited information, costs were only presented as it relates to airfield markings to improve separation standards. Costs were not able to be developed at the airport level for broadband service. Source: Kimley-Horn 2022*

8.3.1.2. Preserve Infrastructure Goal

The results of the system performance analysis and future performance target evaluation identified capital project recommendations for two of the four PMs associated with the Preserve Infrastructure goal. The cost estimates related to the capital projects of these two PMs are presented in **Table 8-8**. The total cost estimate for the Preserve Infrastructure goal project recommendations is $9,138,000. Projects for this goal including updating ALPs or acquiring a new airport diagram and pavement maintenance projects that improve PCI to the recommended threshold.

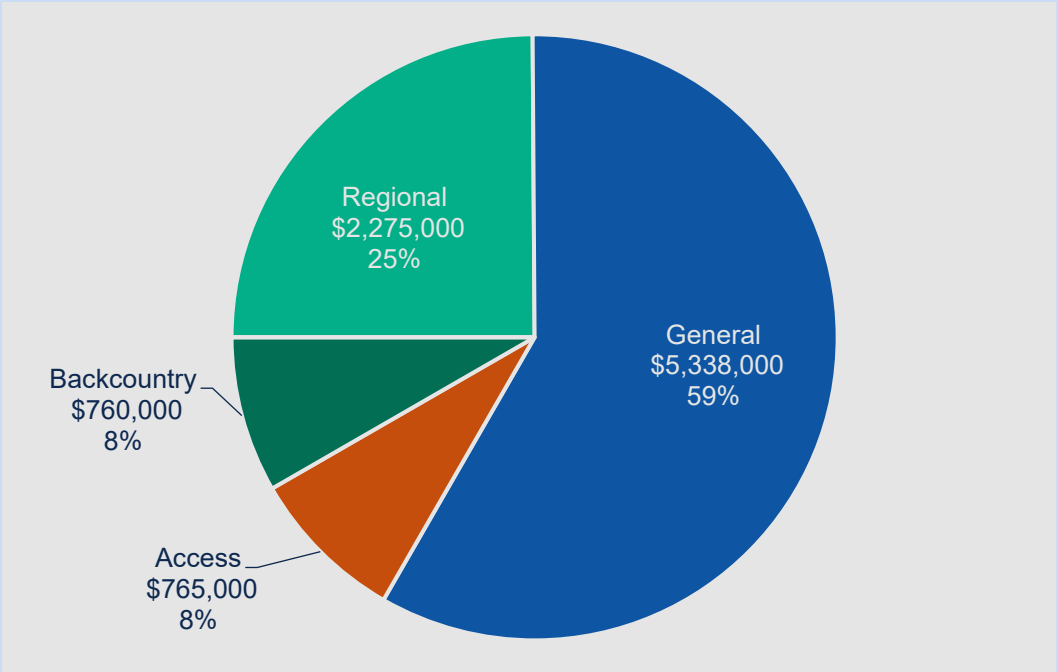
Table 8-8: Preserve Infrastructure Goal: Project Costs by PM

NAHSP Performance Measure	Existing Performance	Future Performance Target	Total Estimated Cost	% of Total
Percent of airports that have an approved airport planning document that was completed after 2013*	ALP: 53%	ALP: 63%	$1,800,000	14%
	Diagram: 27%	Diagram: 37%	$40,000	< 1%
Percent of airports' primary runway meeting pavement condition index (PCI) of acceptable or good (G)**	59%	73%	$7,298,000	85%
Total Preserve Infrastructure Goal PM Costs:				**$9,138,000**

*Notes: *The ALP costs only account for airports that require an ALP update to meet the PM. Costs related to ALP updates for all NPIAS airports over the 20-year planning horizon are presented in Section 2.6. **The pavement maintenance costs only account for rehabilitation costs required to meet the PM future performance target. Comprehensive costs related to pavement reconstruction to account for the 20-year planning horizon are presented in Section 8.3.2.2 and pavement maintenance costs outlined in the Nevada Airport Pavement Management System Update (2019 APMS) are presented in Section 8.3.3.1. Source: Kimley-Horn 2022*

Figure 8-6 presents the cost of Preserve Infrastructure projects by NAHSP role. General airports have the largest portion of costs under this goal, with $5,338,000 (59 percent). After General airports, Regional, Backcountry, and Access airports make up the remaining $3,800,000 of the total cost estimates for capital projects related to the two PMs for Preserving Infrastructure. There are no reported capital projects for Primary, National, or Special Events airports related to this goal.[3]

Figure 8-6: NAHSP Preserve Infrastructure Goal Investment Needs by Goal



Source: Kimley-Horn 2022

There are two PMs in the Preserve Infrastructure goal that did not result in capital project recommendations or cost estimates; however, the following recommendations have been developed to assist the NDOT Aviation Program in supporting infrastructure preservation at Nevada airports:

Percent of Airports with Appropriate Adopted Land Use Controls

Establishing appropriate land use controls requires individual airport representatives to work with their local zoning authority to establish ordinances and/or zoning to reflect protection of the airport as well as people and property near the airport. While NDOT cannot enforce or directly influence these actions, NDOT can support airports in these efforts in a number of ways. NDOT can provide verbal support of these needs in statewide communications and coordinate with airport representatives on their land use ordinance and/or zoning needs, available resources, and general guidance during airport 5010 data updates. Moreover, NDOT can prepare a Land Use Zoning template that outlines the types of land and height controls that would contribute to compatible development near the airport environment. Other

[3] As previously identified in the chapter, separate costs for reconstructions of all primary runways one time during the 20-year planning period are accounted for in Section 8.3.2.2 and projects included in the 2019 APMS are accounted for in Section 8.3.3.1.

states have developed such templates so that airport representatives can easily download the template from an online source and fill out the airport specific information before presenting it to their local zoning authority. NDOT can also develop additional guidance for airports and communities that will promote and improve land use compatibility around airports.

Percent of Airports Under a Military Operations Area (MOA)

There is little that NDOT or an airport representative can do to remedy the circumstances of being underneath an MOA; however, NDOT can continue its work with federal and state elected officials to gain support to limit the expansion of MOAs in the future, further impacting airports and their ability to develop. In addition, NDOT and airports can coordinate with FAA military liaisons to communicate challenges and concerns that Nevada airports have regarding existing and future special use airspace. NDOT can also support airports within MOAs to educate them on future proposed MOA changes and get them assistance to protect their airport's surrounding airspace, such as identifying local elected officials and drafting letters to those officials about the importance of the local airports and the impact of MOA restrictions on their operation.

8.3.1.3. Transform Economies Goal

The results of the system performance analysis and future performance target evaluation identified capital project recommendations for one of the four PMs associated with the Transform Economies goal. The total cost estimate for projects related to the Transform Economies goal is $750,000, which includes projects related to improving airport approaches to at least a non-precision approach. The cost estimate for this PM is presented in **Table 8-9.**

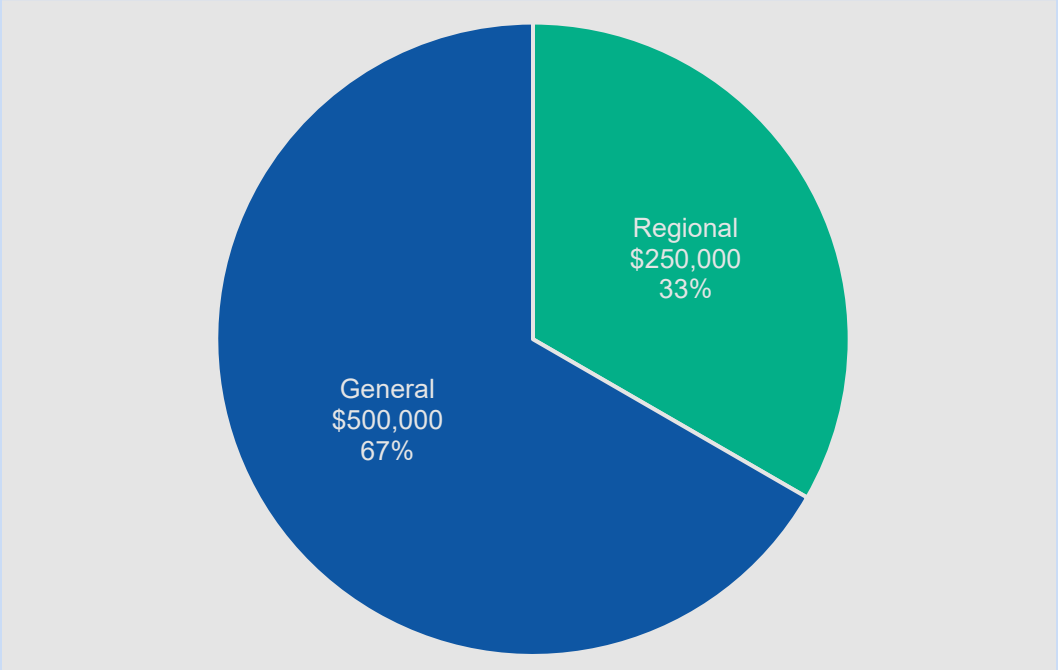
Table 8-9: NAHSP Transform Economies Goal: Project Costs by PM

NAHSP Performance Measure	Existing Performance	Future Performance Target	Total Estimated Cost	% of Total
Percent of airports that can support regular business aircraft activities	33%	39%	$750,000	100%
Total Transform Economies Goal PM Costs				**$750,000**

Source: Kimley-Horn 2022

Figure 8-7 presents the cost of Transform Economy projects by NAHSP role. General airports have the largest portion of costs under this goal, with $500,000 (67 percent). The only other category of NAHSP airports which have capital projects related to Transforming Economies PMs is Regional airports, with $250,000 in estimated costs. It should be noted that Primary, National, Access, Backcountry, and Special Event airports currently do not have any estimated project costs for this goal and therefore are not shown within the figure.

Figure 8-7: NAHSP Transform Economies Goal Investment Needs by Role



Source: Kimley-Horn 2022

There are three PMs in the Transform Economies goal that did not result in capital project recommendations or cost estimates; however, the following recommendations have been developed to assist the NDOT Aviation Program in supporting transforming economies at Nevada airports:

Percent of Airports with Active Development Partnerships

While NDOT cannot force any airport to participate in partnerships with local development organizations, NDOT can support these efforts in a number of ways. NDOT could opt to host a webinar or produce a flyer that could be distributed to all system airports detailing why these types of development partnerships are critical for continued aviation economic sustainability. In addition, NDOT could provide each airport with a list of local chambers of commerce, tourism agencies, and other development organizations that airport representatives could engage with. To support this engagement, NDOT could develop a template email or letter that airports could access and send to the groups identified in their local area. Providing airports with information on local agencies and providing them with a communication template could reduce some of the limitations in establishing these partnerships. Moreover, airports and NDOT can look to the Nevada Aviation Association (NVAA) for support and strategies to establish and maintain relationships with development organizations.

Percent of Airports with Expansion/Development Potential

Expansion and development potential can increase opportunities for aeronautical and non-aeronautical development that could produce revenue-generating opportunities to the airport and/or attract new airport users. The level of expansion and development potential will vary across system airports, but airports should work to evaluate if there is potential for expansion and determine strategies for attracting development to that area. NDOT can support these efforts by promoting these development opportunities in statewide communications and with local and regional economic development organizations.

Percent of Airports with Tour Operators, Specifically Utilizing Helicopters

Nevada is home to a strong tourism industry, with Las Vegas, Reno, and Lake Tahoe attracting visitors, as well as the dynamic desert landscape attracting outdoor enthusiasts from across the country and the globe. While airports play a critical role in supporting this industry by providing air transportation for visitors, airports can also support this industry by hosting tour operator tenants, particularly helicopter tourism operators. NDOT can be supportive of these efforts by spreading general awareness of these operators, partnering with local development organization to promote this business, and by supporting requests to provide the necessary facilities for these operators, either from FAA or other appropriate sources.

8.3.1.4. Foster Sustainability Goal

None of the PMs associated with the Foster Sustainability goal produced capital project recommendations; therefore, no cost estimates are associated with this project goal. Instead, the following recommendations and considerations were developed that relate to the Foster Sustainability goal PMs.

Percent of Airports That Have Established Public Outreach Protocols

Airports with established outreach protocols are better positioned to attract new visitors, maintain a high level of user satisfaction, and are better equipped to respond to user needs. NDOT could encourage airports to establish appropriate public outreach controls during airport 5010 data updates. There are a number of outreach protocols that airports can participate in, including establishing an airport website, advertising their airport, hosting open houses or fly-ins, hosting school tours, or even sharing positive media coverage about the airport. NDOT could also contribute to airport awareness and public engagement by sharing positive news about system airports through various social media platforms.

Percent of Airports with or Pursuing an Alternative Energy Source

NDOT will continue consulting with Nevada Department of Conservation and Natural Resources to determine policies that will achieve the required greenhouse gas (GHG) emissions reduction outlined in Nevada Senate Bill 254, passed in June 2019. Senate Bill 254 mandates that policy options must be developed to achieve GHG emissions reductions of 28 percent below 2005 levels by 2025 and 45 percent below 2005 levels by 2030.[4] NDOT can also participate in industry working groups and industry organizations that are working on aviation emerging technologies that aim to reduce the environmental

[4] One Nevada Transportation Plan, Pg. 26, February 2020

footprint of the aviation industry. NDOT can spread this information and educate airports on actions that they can take to work towards the GHG emission reduction goal outlined in Senate Bill 254.

Separately, as electric aircraft, including electric vertical takeoff and landing (eVTOL) aircraft, are certified by the FAA and move into widespread manufacturing and use, these aircraft can assist with reducing some of the emissions. However, these new aircraft also generate additional electricity needs at airports, including installation of new electric aircraft charging stations which are not yet eligible for funding by the FAA and for which a standard is not yet available.

Percent of Airports with an Airport Manager to Operate and Maintain the Airport

While NDOT is not able to fund airport manager positions, NDOT can take actions to encourage an increase in airport managers at system airports. NDOT could check in with airport sponsors during airport 5010 data updates and work with those sponsors who do not have a dedicated airport manager to determine strategies for establishing an airport manager role, even if only part-time. NDOT can also educate sponsors on the airport manager role and the values of different airport manager styles so that the airport sponsor can make informed decisions about the type of management best suited for their airport.

Percent of Airports That Have Received Federal and/or State Funding Within the Last Five Years

Securing funding is critical for the continued preservation and performance of NAHSP airports. Securing funding for NPIAS airports is often much more straightforward than securing funding for non-NPIAS airports. In recent years, additional federal funding has been made available to NPIAS airports through programs such as the Coronavirus Aid, Relief, and Economic Security (CARES) Act, the Coronavirus Response and Relief Supplemental Appropriations (CRRSA) Act, and American Rescue Plan Act (ARPA). Each of these funding sources has different amounts available to airports, unique eligibility rules on how the funds can be spent, and different rules on how long the funds are available for airports to utilize. In addition to these pandemic-relief related programs, the Bipartisan Infrastructure Law (BIL) was passed in late 2021 to provide funding for transportation, including airports. Through the airport infrastructure grants (AIG), each NPIAS airport is eligible to receive funding for up to five years to address capital needs. In Fiscal Year 2022, Nevada's airports will receive $58.6 million in BIL AIG funding, with nearly $44 million going to LAS and almost $7 million to RNO, while nonprimary GA airports are allocated between $110,000 and $763,000.[5] In addition to the AIG, there is an opportunity for airports to compete for additional funding through the Airport Terminal Program (ATP) and to receive funding through the Air Traffic facilities component.

NDOT can contribute to NPIAS airports' ability to secure federal and state funding by participating in the FAA's ACIP meetings to coordinate on behalf of NPIAS system airports. Information provided in the NAHSP can be used to help guide the airports on projects that can benefit the entire airport system, improving the system's performance. NDOT can also collect and review ACIPs and provide feedback that might be beneficial to airports when developing these documents in light of the NAHSP and other recent information. NDOT can also coordinate with elected officials and legislators to educate them on the

[5] www.faa.gov/bil/airport-infrastructure

importance of providing the local and state funding matching for FAA grants and how to leverage additional funding for Nevada.

NDOT also assists NPIAS airports by supporting FAA grants with a partial match. The percentage of local match required in Nevada is 6.25 percent, less than the standard 10 percent, because of the significant federal ownership of 82 percent of land in the state. The NDOT Aviation Program administers the Nevada Fund for Aviation (formerly known as the Nevada Aviation Trust Fund), which provides grants for NPIAS airports to match FAA grants, with $100,000 a year available. This fund "is intended to assist rural general aviation airports" and the maximum grant amount is $50,000 to any one airport.[6] A request was submitted through Nevada's State Treasurer's Office for $5 million of American Rescue Plan Act (ARPA) funding be allocated to the Nevada Fund for Aviation to support matching requirements.

NDOT can support the funding needs of non-NPIAS system airports by discussing their funding needs and project recommendations to better understand state or local grant programs that may be leveraged to secure funding. At this time there is no aviation funding available to non-NPIAS system airports.

8.3.1.5. Connect Communities Goal

The results of the system performance analysis and future performance target evaluation identified capital project recommendations for two of the four PMs associated with the Connect Communities goal. The total cost estimate for projects related to the Connect Communities goal is $5,956,000, which include costs related to installing Jet A fuel farms, installing credit card readers on aviation fuel pumps, installing Automated Weather Observing System (AWOS)/Automated Surface Observing System (ASOS) equipment, as well as establishing a helicopter landing location and runway extensions to support jet aircraft. The cost estimate for each PM is presented in **Table 8-10**.

Table 8-10: NAHSP Connect Communities Goal: Project Costs by PM

NAHSP Performance Measure	Existing Performance	Future Performance Target	Total Estimated Cost	% of Total
Percent of airports capable of supporting aerial firefighting operations	71%	74%	$4,234,000	71%
Percent of airports capable of supporting emergency (medical/police) operations	65%	72%	$1,722,000	29%
Total Connect Communities Goal PM Total Costs:			**$5,956,000**	

Source: Kimley-Horn 2022

The total cost of $5,956,000 estimated for the Connect Communities related projects are all associated with General airports.

[6] Nevada Fund for Aviation Grant Program Policy and Procedures Manual, 2015.

There are two PMs in the Connect Communities goal that did not result in capital project recommendations; however, the following recommendations have been developed to assist the NDOT Aviation Program in connecting communities to their local NAHSP facility:

Percent of the Population Within 30 Minutes of Any Public-Use Airport

As mentioned in **Section 8.2.3**, there are 16 NAHSP airports that are currently BLM controlled, whether through a lease or ownership, and five other airports that are privately owned. In the event that these facilities close, there could be considerable loss of public-use airport service area coverage. Many of the airports leased by the BLM provide essential access to remote communities and many remote communities are reliant on their local airport. If these airports were closed or transitioned to private use only, the impact to the surrounding communities could be significant as approximately 3 percent of Nevada's population live within these airports' service areas. NDOT can use the findings from this analysis, and representation of other needs, to rally public and political support for public-use aviation facilities in Nevada, particularly those in remote areas.

Percent of Airports Providing Access to Remote Communities

Nevada is home to a number of remote and tribal communities, and it is critical that access to and from these communities remains available. Having adequate access to remote parts of the state is critical for participating in the local and regional economy, accessing emergency and non-emergency services, and more. NDOT could continue supporting airports that provide access to remote communities and encourage those airports to participate in local or regional planning studies that may impact the future of their airport.

8.3.1.6. Optimize Mobility Goal

The results of the system performance analysis and future performance target evaluation identified capital project recommendations for one of the three PMs associated with the Optimize Mobility goal. Existing performance for the "percent of airports that are adequately accessible" measure meets the future performance target, so no capital project recommendations were developed. The total cost estimate for projects related to the Optimize Mobility goal, specifically the "percent of airports that provide off-airport transportation" measure, is $225,000, which relates to the cost of acquiring courtesy cars at system airports that did not report having a courtesy car program. The cost estimate for each PM is presented in **Table 8-11.**

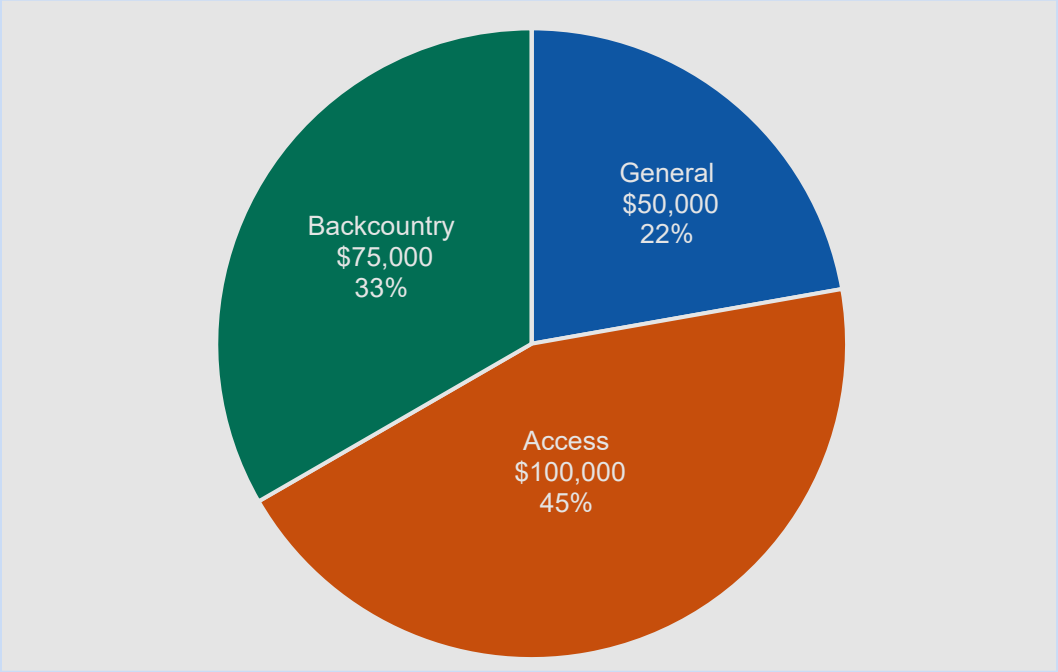
Table 8-11: NAHSP Optimize Mobility Goal: Project Costs by PM

NAHSP Performance Measure	Existing Performance	Future Performance Target	Total Estimated Cost	% of Total
Percent of airports that are adequately accessible	98%	98%	$-	-%
Percent of airports that provide off-airport transportation	80%	100%	$225,000	100%
Total Optimize Mobility Goal PM Total Costs:				**$225,000**

Source: Kimley-Horn 2022

Figure 8-8 presents the cost of Optimize Mobility projects by NAHSP role. Access airports have the largest portion of costs under this goal, with $100,000 (50 percent). General and Backcountry airports make up the remaining cost estimates for the PMs related to Optimizing Mobility. It should be noted that Primary, National, Regional, and Special Event airports currently do not have any estimated project costs for this goal and therefore are not shown within the figure.

Figure 8-8: NAHSP Optimize Mobility Goal Investment Needs



Source: Kimley-Horn 2022

There is one PM in the Optimize Mobility goal that did not result in capital project recommendations; however, the following considerations have been developed to assist the NDOT Aviation Program in preparing NAHSP facilities for unmanned aircraft system (UAS) proliferation:

Percent of Airports That Are Involved in UAS/UAV Activity

As a UAS Test Site established under the FAA Modernization and Reform Act of 2012 (FMRA 2012), it is critical that the state of Nevada continue to support the advancement of UAS activity. NDOT can support these efforts in a number of ways. For example, NDOT could develop a UAS safety awareness flyer that is distributed to all of the airports so that airports are participating in educating airport users about the impacts of UAS on airport safety. NDOT could also host a webinar sharing similar safety information. In addition, NDOT can participate in FAA working groups and other programs that are intended to educate and spread awareness about the functionality and benefits of UAS. NDOT can also work to identify the industries in the state that use or rely on UAS and determine if there are any actions that NDOT or airports can take to support UAS advancement and proliferation in Nevada.

8.3.1.7. Summary of NAHSP PM Investment Needs

The total estimated investment needs specific to project costs for each of the six goals of the NAHSP are shown in **Table 8-12**. As shown, the Enhance Safety goal comprises the largest portion of the total estimated needs, with nearly $14 million, almost half of all estimated project costs. Following this goal, Preserve Infrastructure and Connect Communities goals, respectively, have the next largest portions of the total estimated needs, with over $9 million and almost $6 million respectively. The remaining portions of the total estimated project costs are divided among transforming economies and optimizing mobility, with a total between the goals of just under $1 million.

Table 8-12: Summary of NAHSP PM Investment Needs

Goal	Estimated Project Costs	Percent of Total
Enhance Safety	$13,419,000	46%
Preserve Infrastructure	$9,138,000	30%
Transform Economies	$750,000	3%
Foster Sustainability	$0	0%
Connect Communities	$5,956,000	20%
Optimize Mobility	$225,000	1%
Total NAHSP PM Costs	**$29,487,000**	**100%**

Note: Totals may not sum due to rounding. Source: Kimley-Horn 2022

8.3.2. Value Rating Variable and Facility and Service Objective Recommendations and Investment Needs

The VRV and FSO projects were identified by comparing an airport's existing condition to the objective set for various facilities or services based on that airport's role. If and when the project is completed, the airport would then be considered as meeting that objective. The VRV and FSO evaluations are closely related, with the VRV evaluation focusing on quantitative and qualitative factors at NPIAS airports and the FSO evaluations focusing only on the same quantitative factors at non-NPIAS airports. The following sub-sections present the capital project cost estimates and policy considerations identified through the VRV and FSO evaluations, presented by VRV/FSO category. It is important to note that the investment needs presented include costs for NPIAS and non-NPIAS airports, whereas the qualitative recommendations relate specifically to the VRV evaluations which only include NPIAS airports. Additionally, some of the components of the VRV/FSO evaluations were accounted for in PM investment needs presented in **Section 8.3.1** and details are provided to indicate as such.

8.3.2.1. Regional Significance

The results of the VRV and FSO analysis identified capital project recommendations for four of the Regional Significance variables/objectives. **Table 8-13** presents the cost estimates for these project recommendations. The total cost estimate for projects related to the Regional Significance VRV/FSO is $58,201,000. Projects for this VRV/FSO category include extending runways, constructing more hangars, installing aviation fuel pumps, and improving instrument approaches.

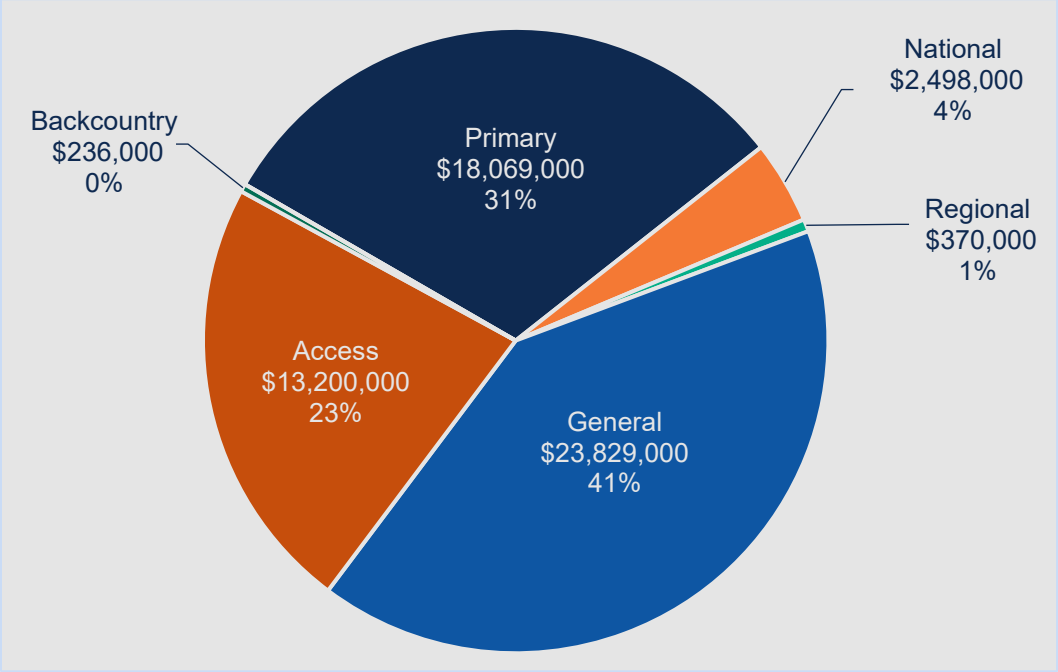
Table 8-13: Investment Needs for the Regional Significance VRV/FSO Category

Regional Significance VRV or FSO	Total Estimated Cost	% of Total
Longest Runway	$19,298,000	33%
T-Hangar Ratio	$4,433,000	8%
Fuel Availability	$15,600,000	27%
Instrument Approach	$18,870,000	32%
Regional Significance Total Costs	**$58,201,000**	**100%**

Source: Kimley-Horn 2022

Figure 8-9 presents the cost of Regional Significance projects by NAHSP role. General airports have the largest portion of costs under this goal, with $23,829,000 (41 percent). After General airports, the two other largest portions of cost estimates are for Primary and Access airports, with over $18 million and $13 million, respectively. It should be noted that Special Event airports currently do not have any estimated project costs related to the Regional Significance VRV/FSO and therefore are not shown within the figure.

Figure 8-9: Regional Significance VRV/FSO Investment Needs



Source: Kimley-Horn 2022

There are four variables/objectives in the Regional Significance category that did not result in capital project recommendations; however, the following recommendations have been developed to assist the NDOT Aviation Program:

Airport Ownership

Recommendations regarding securing an appropriate airport manager were discussed in **Section 8.3.1.4**. Other recommendations regarding airport ownership relate to the 16 airports that are leased from the BLM and the seven airports that are owned privately. As discussed in **Section 8.2.3**, approximately 2 percent of the population and two percent of Nevada's total land area are provided access to the air transportation system by these 23 airports. In the event that BLM or private owners no longer have an interest in leasing or owning these facilities, the system could be at risk of decreasing its overall service area. NDOT could continue to be proactive about coordinating with the BLM and continue discussions with BLM regarding real estate transactions if the BLM is no longer interested in supporting an airport. The same level of coordination could apply to the airports that are privately owned as well. Moreover, NDOT can consider assisting with transfer of these airports to local airport sponsors from BLM or from private owners. In general, NDOT can continue to bring in support from elected officials, when necessary, to secure continuity of the airport system and provide access for Nevada residents and visitors.

Airport Uses

While there is little that NDOT can do to impact the type of activities or uses supported at each NAHSP airport, NDOT can continue to coordinate with NAHSP airports to determine if there are gaps in critical services, such as business activity, emergency medical service (EMS), and aerial firefighting operations. In the event a gap in any of these, or similarly critical services, emerges then NDOT can work with the airport to determine if any necessary projects are eligible for certain funding opportunities, or provide other support to those airports.

Nearest Airport

There are no specific recommendations associated with this VRV; however, NDOT can continue to monitor system needs as it relates to airport locations and distance between airports. In the event that new facilities are suggested or that the two potential new airports in Nye County and at SNSA continue to be considered and evaluated, NDOT could be part of the study of these new facilities to address their potential impact on the overall state airport system.

Aircraft Maintenance

Having an aircraft maintenance provider is an airport asset for many system airports. Not only does providing this service attract and retain airport users, but it can also contribute to an increase in airport revenues. NDOT could continue monitoring the number and location of facilities offering these services. If it is identified that more of these services are required across the state, then NDOT could continue coordinating with these airports and provide any non-monetary support possible.

8.3.2.2. Airport Facilities

The results of the VRV and FSO analysis identified capital project recommendations for nine of the Airport Facilities variables/objectives. **Table 8-14** presents the cost estimates for these project recommendations. The total cost estimate for projects related to the Airport Facilities VRV/FSO is $603,118,000. It is important to note that the costs related to the runway surface/type condition VRV/FSO not only include routine maintenance needs based on the PCI deficiency identified during the VRV/FSO analysis, but also include the necessary cost estimates for one complete pavement reconstruction per primary runway at each airport with a paved runway over the 20-year planning horizon. Other projects in this VRV/FSO category include remarking runway hold positions and installing appropriate runway lighting, weather reporting systems, and other visual aids. This category also accounts for recommendations related to establishing or improving utility connections and making terminal improvements. It is important to note that the Weather Reporting VRV/FSO also evaluated the need for an Air Traffic Control Tower (ATCT), which accounts for $14,000,000 of the Weather Reporting costs presented in **Table 8.14**.

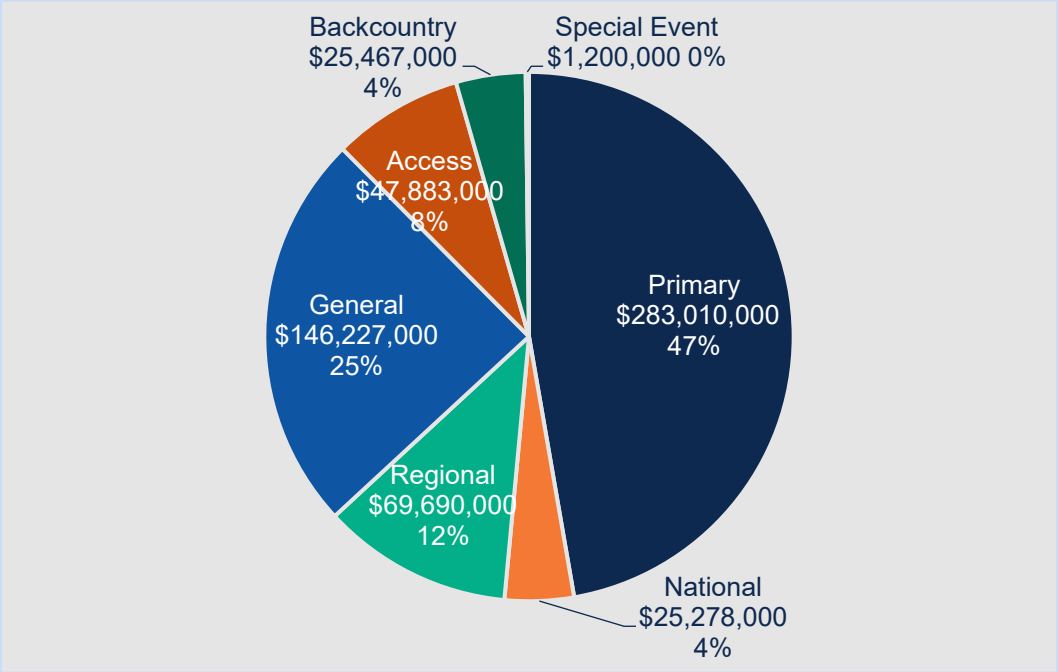
Table 8-14: Investment Needs for the Airport Facilities VRV/FSO Category

Airport Facilities VRV or FSO	Total Estimated Cost	% of Total
FAA Design Standards	$41,000	<1%
Runway Surface/Type Condition*	$552,687,323	92%
Runway Lighting	$2,732,000	<1%
Taxiways	$16,362,000	2%
Visual Aids	$560,000	<1%
Weather Reporting	$16,220,000	2%
GA Terminal	$7,915,000	1%
Utilities	$6,600,000	1%
Security/Wildlife Fencing**	$-	0%
Communications Connectivity	$-	0%
Airport Facilities Total Costs	**$603,118,000**	**100%**

*Notes: *The runway surface/type condition costs here only account for rehabilitation and reconstruction costs identified through NAHSP analyses. Pavement maintenance costs relating to the 2019 APMS are presented in Section 8.3.3.1. **Fencing needs at the individual airport level were not evaluated for project recommendations or cost estimates. Fencing needs should be identified at the airport level during future facility planning. Source: Kimley-Horn 2022*

Figure 8-10 presents the cost of Airport Facilities VRV/FSO projects by NAHSP role. Primary and General airports have the largest portions of costs under this goal, with $283 million (47%) and $146 million (25%), respectively. Beyond those classifications, Access and Regional airports each have over $47 million in estimated costs, with National and Backcountry airports having over $25 million.

Figure 8-10: Airport Facilities VRV/FSO Investment Needs



Source: Kimley-Horn 2022

8.3.2.3. Airport Protection

None of the VRV factors in the Airport Protection category resulted in capital project recommendations. Instead, the following considerations have been developed for NDOT:

Height Hazard

Considerations related to height hazard concerns and height zoning ordinances are presented in **Section 8.3.1.2**.

Obstruction Mitigation

Airports should be aware of the specific details relating to any controlling obstructions present in their airport's airspace. Being aware of these details will help in mitigating the issues, where possible. Mitigation may require lighting and marking permanent obstructions or remove less-permanent obstructions. Mitigation may be difficult for obstructions that are off airport property so airports should work with local landowners, when needed, to mitigate or eliminate obstructions. NDOT can support these efforts by assisting with local landowner coordination on behalf of, or with, the airport sponsors.

Airspace Restrictions

While there is little an airport or NDOT can do about existing airspace restrictions, it is important for airports to identify the limitations imposed by these restrictions to understand the complexity that users face when approaching or departing from the airport that is impacted. NDOT could continue to coordinate with the FAA and other stakeholders regarding new airspace restrictions that may occur in the future so that proactive steps can be taken where possible and so appropriate communication to impacted airports can be made.

Runway Protection Zone

Runway protection zones (RPZ) are critical for maintaining a safe environment at any system airport. Airports should strive for complete control of RPZs through fee-simple ownership or easement acquisition. In the event that an RPZ expands onto privately owned property, then airport sponsors should actively engage with those property owners and use tools such as right of first refusal so that the airport is better positioned to acquire that property if the opportunity arises in the future. If acquisition is not possible, airport sponsors should strive for open communication with the controlling entity in order to advocate for airport needs. NDOT can assist airport sponsors with RPZ acquisition by providing general support to airports, whether that is getting them in contact with the state or local agency that owns the land where the RPZ is located or drafting a letter to a property owner on behalf of NDOT informing them on the situation, or other potential options.

Land Use Compatibility

Recommendations and considerations related to land use compatibility are presented in **Section 8.3.1.2**.

8.3.2.4. Airport Access

The results of the VRV and FSO analysis identified capital project recommendations for one of the Airport Access variables/objectives. **Table 8-15** presents the cost estimates for these project recommendations. The total cost estimate for projects related to the Airport Access VRV/FSO is $225,000, which include acquiring courtesy cars at system airports that did not report having a courtesy car program.

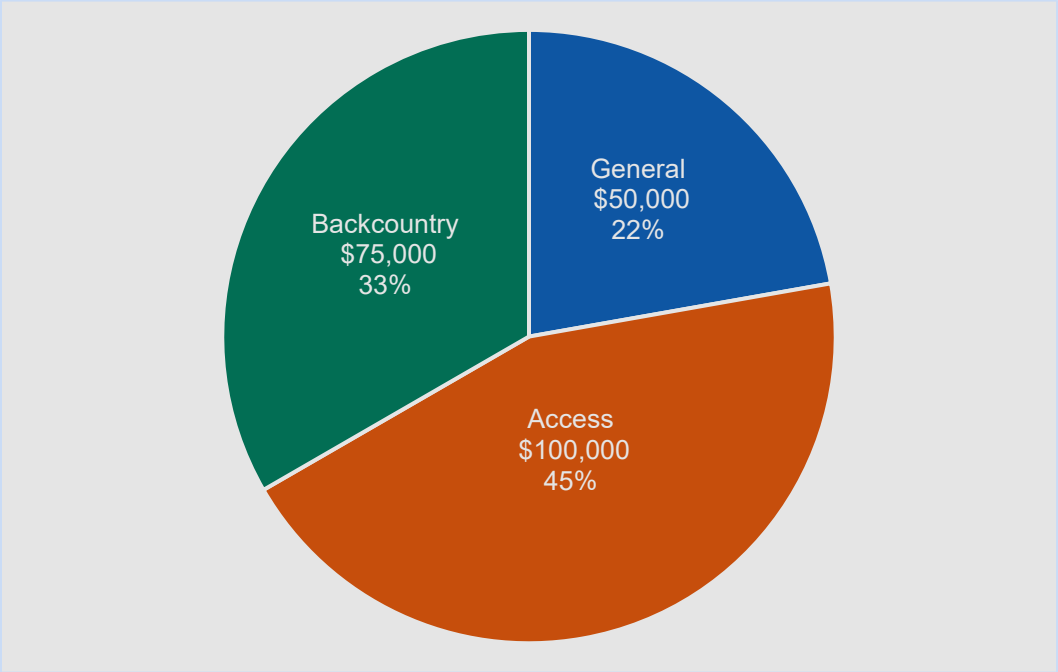
Table 8-15: Investment Needs for the Airport Access VRV/FSO Category

Airport Access VRV or FSO	Total Estimated Cost	% of Total
Ground Transportation	$225,000	100%

Source: Kimley-Horn 2022

Figure 8-11 presents the cost of Airport Facilities projects by NAHSP role, which corresponds directly to **Figure 8-8** presented in **Section 8.3.1.6**. It should be noted that Primary National, Regional, and Special Event airports currently do not have any estimated project costs related to the Airport Access VRV/FSO and therefore are not shown within the figure.

Figure 8-11: Airport Access VRV/FSO Investment Needs



Source: Kimley-Horn 2022

There are four variables/objectives in the Airport Access category that did not result in capital project recommendations; however, the following recommendations have been developed to assist the NDOT Aviation Program:

Community Access

The analysis related to this VRV is based on the distance (in miles) between the airport and the community that the airport serves; therefore, no recommendations can be made that would result in an airport becoming closer to its community. However, airports that scored low in this category can still work to actively engage with the community and educate their community on the services that the airport provides. NDOT can support this engagement by communicating with the airport sponsor on how to develop engagement strategies to educate the community on what the airport offers to them.

Regional Access

The analysis related to this VRV is based on the distance (in miles) between the airport and the interchange of the closest principal arterial highway; therefore, no recommendations can be made that would result in an airport becoming closer to this interchange unless there is a roadway change that might bring access closer to the existing airport site.

Local Access

Airports that are not receiving the maximum number of points for this VRV do not have an access road with the appropriate functional classification. The busier the airport the more robust the local roadway needs to be. Airports should work with NDOT to determine the possibility of improving access roads as part of the larger NDOT roadway needs.

8.3.2.5. Airport Expandability

There are four variables/objectives in the Airport Expandability category that did not result in capital project recommendations; however, the following recommendations have been developed to assist the NDOT Aviation Program:

Total Acreage/Based Aircraft Ratio

Cost estimates were not produced for this VRV because recommendations may include acquiring more property for apron and/or hangar expansion and the numerous factors involved in property acquisition specific to each airport's unique circumstances is difficult to determine for the statewide scope of the NAHSP. Instead, airports are encouraged to work with NDOT and their local planning and development organizations to determine the potential for expansion to construct aircraft parking areas, as needed. NDOT can support these efforts by continuing to coordinate with airports during airport 5010 data updates to better understand their expansion needs.

Airfield and Aeronautical Property

Establishing and maintaining the appropriate amount of space required for supporting airport activity occurring on the airfield and related aeronautical property is critical for airport performance; however, it is also important that the airport property is able to support non-aeronautical uses in order to increase the airport's ability to generate revenue and contribute to the local economy. This VRV is related to a PM within the Transform Economies project goal and recommendations are outlined in **Section 8.3.1.3**.

Surplus Property

The Surplus Property VRV is closely related to the Airfield and Aeronautical Property VRV as it evaluates an airport's ability to expand, either for aeronautical or non-aeronautical purposes. No cost estimates were produced for this VRV because it is not possible to identify costs for development that has not been planned by the airport. Airports should continue to conduct facility planning efforts to determine their future needs and identify if excess property is best suited for aeronautical or non-aeronautical uses. NDOT could continue coordinating with airports during airport 5010 data updates and as needed to provide support for airports interested in or undergoing new developments at their facility.

Airfield Expandability

The Airfield Expandability VRV focuses specifically on an airport's ability to expand its airfield facilities, specifically for runway extension purposes. Airfield expandability may be limited or impossible due to an airport's existing property boundaries and the circumstances of the property adjacent to the airport. No cost estimates were established for this VRV because it is not possible to develop planning-level estimates at the systemwide level for the unique circumstances of an individual airport. Airport sponsors are encouraged to stay proactive about future facility planning efforts and routinely coordinate with NDOT on these needs.

8.3.2.6. Community Commitment

The results of the VRV and FSO analysis identified capital project recommendations for one of the Community Commitment variables/objectives. **Table 8-16** presents the cost estimates for these project recommendations. The total cost estimate for projects related to the Community Commitment VRV/FSO is $23,240,000. It is important to note that the cost presented for ALP updates in **Table 8-16** includes the assumption that each NPIAS airport will likely require two ALP updates over the 20-year planning horizon, regardless of the date of their last update.

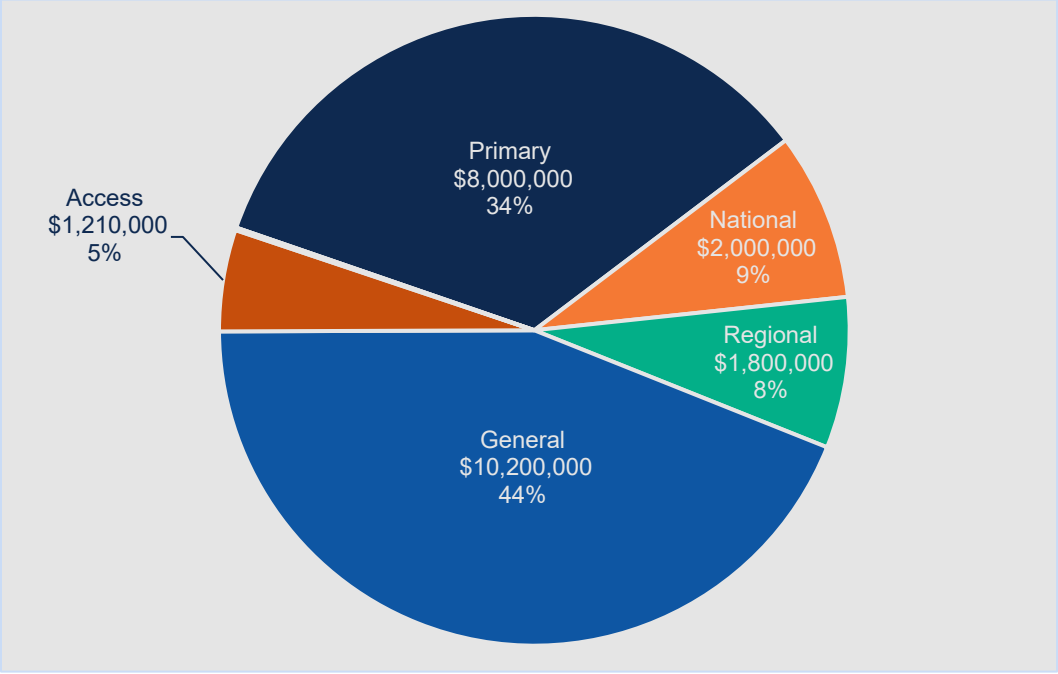
Table 8-16: Investment Needs for Community Commitment VRV/FSO Category

Community Commitment VRV or FSO	Total Estimated Cost	% of Total
Last ALP Update	$23,240,000	100%

Notes: Cost estimate includes projects for airport diagrams and ALPs dependent on the airport's role. ALP costs presented here assume that each NPIAS airport will likely require at least two ALP updates over a 20-year horizon, regardless of date of their last update. Source: Kimley-Horn 2022

Figure 8-12 presents the cost of Community Commitment projects by NAHSP role. General and Primary airports have the largest portions of costs under this goal, with over $10 million and $8 million respectively. National, Regional, and Access airports are the only other airports with projects related to the Community Commitment VRV/FSO, with between $1 million and $2 million of estimated investment needs. It should be noted that Backcountry and Special Event airports currently do not have any estimated needs for the Community Commitment VRV/FSO and therefore are not shown within the figure.

Figure 8-12: Community Commitment VRV/FSO Investment Needs



Source: Kimley-Horn 2022

There are five variables/objectives in the Community Commitment category that did not result in capital project recommendations; however, the following recommendations have been developed to assist the NDOT Aviation Program:

Airport Management

There are no physical project recommendations associated with this VRV, so no cost estimates were established. See **Section 8.3.1.4** for more information on recommendations made regarding airport management at NAHSP facilities.

Historical Capital Improvements and Airport Capital Improvement Plans/Programs (ACIP)

This section includes considerations for both the Historical Capital Improvements and ACIP VRVs. There are no physical project recommendations associated with this VRV, so no cost estimates were established. See **Section 8.3.1.4** for more information on recommendations made regarding ACIPs at NAHSP facilities.

Financial Subsidies

There are no physical project recommendations associated with this VRV, so no cost estimates were established. Capital improvement and operations subsidies are often necessary for airports to support their development needs and maintain an operational level that meets user needs. Airports should continue to monitor their financial needs to determine the types of subsidies they need to rely on to remain operational. Airports are encouraged to coordinate with NDOT on a routine basis to identify if there are any policies or programs that an airport could leverage to become less reliant on operational subsidies. These policies or programs could be related to non-aeronautical development or other aeronautical development that generates revenue for the airport.

Goodwill

There are no physical project recommendations associated with this VRV, so no cost estimates were established. Establishing goodwill with the airport community is closely tied to the recommendations related to establishing public outreach protocols, which are presented in more detail in **Section 8.3.1.5**.

8.3.2.7. Total VRV/FSO Investment Needs

The total VRV and FSO investment needs for each category of NAHSP airports are shown in **Table 8-17**. As shown in the table, the Airport Facilities VRV/FSO category comprises the most significant portion of the total VRV/FSO needs, accounting for 88 percent. Regional Significance costs account for 8 percent of total VRV/FSO needs, while Airport Access costs account for approximately 1 percent and Community Commitment accounts for approximately 3 percent. There are no investment needs associated with Airport Protection or Airport Expandability, resulting in zero percent for these categories.

Table 8-17: Total VRV/FSO Investment Needs

Category	Estimated Project Costs	Percent of Total
Regional Significance	$58,201,000	8%
Airport Facilities	$603,118,000	88%
Airport Protection	$0	0%
Airport Access	$225,000	1%
Airport Expandability	$0	0%

Category	Estimated Project Costs	Percent of Total
Community Commitment	$23,240,000	3%
Total	**$684,784,000**	**100%**

Source: Kimley-Horn 2022

8.3.3. Non-NAHSP Needs

In addition to presenting investment needs associated with NAHSP recommendations that were identified through PM analysis and VRV/FSO evaluations, this chapter presents the costs of other needs for three other areas of airport development:

- ACIPs, master plans, and other airport-specific projects and costs
- Large commercial airport projects and costs
- Statewide programs

8.3.3.1. ACIPs, Master Plans, and Other Airport-Specific Investment Needs

To calculate a 20-year development needs estimate for the state's airport system, information from NDOT and airports was obtained through ACIPs, master plans, and other airport-specific information that identifies projects and costs. ACIP costs are near-term with typically five to seven years of projects identified specifically to coordinate with the FAA on an airport's plans for utilizing FAA funding including entitlement and potentially discretionary. ACIPs can be prepared for non-NPIAS airports but are not required since the responsibility for project implementation and funding rests with the sponsor. Master plans were utilized to obtain mid- and long-term projects and costs to complement the short-term ACIP costs, as available. It was important to supplement short-term ACIP costs with mid- and long-term costs from recent master plans in order to align with NAHSP cost estimates, which did not correlate to a specific year but are intended to reflect needs over 20 years.

ACIPs were collected for 17 of the 31 NPIAS airports in the NAHSP, master plans were collected from nine NPIAS airports, and a recent Runway Incursion Mitigation (RIM) Study was also collected for inclusion. In order to incorporate only relevant cost estimates from airport documentation, master plans earlier than 2015 were not considered, resulting in eight master plan project costs not being integrated.[7] There were eight NPIAS airports that did not provide an ACIP, master plan, or other special study, and therefore costs presented in this section cannot be considered inclusive for all NPIAS facilities. Those eight facilities are listed here:

- Beatty Airport (BTY)
- Eureka Airport – Booth Bailey Field (05U)
- Gabbs Airport (GAB)
- Jackpot/Hayden Field (06U)
- Owyhee Airport (10U)
- Tonopah Airport (TPH)
- Wells Municipal Airport/Harriet Field (LWL)

[7] These eight master plans were also not provided by airports during data collection and therefore could not be reviewed for any applicable costs.

- Yerington Municipal Airport (O43)

The primary area where other airport-specific projects and costs were identified are in individual APMS studies, specifically those prepared for Clark County's airport system (excluding LAS) and Reno/Stead Airport (RTS) (as part of a combined effort that includes RNO). APMS costs for LAS and RNO are not presented in this estimate since they are identified in the Large Commercial Airport section, nor are costs from the NDOT APMS which focused on 22 system airports (these costs are presented in **Section 8.3.3.3**).

The projects provided in these three areas (ACIPs, master plans, and other airport-specific information) were sorted into five project categories and reviewed to identify any duplicate recommendations made as part of the NAHSP analyses. The five project categories are presented in **Table 8-18** with example projects provided for additional context. Of note, a separate pavement maintenance category was created to better demonstrate the significant cost related solely to maintaining existing pavement at NAHSP airports. This project category does not include any runway extensions, new taxiways, or other new airfield design projects. Instead, this category is exclusively related to existing pavement rehabilitation and reconstruction costs. Pavement maintenance projects were identified by reviewing ACIPs and master plans, as well as by reviewing the 2019 APMS. The 2019 APMS does not include airports within the Clark County Department of Aviation (CCDOA) or the Reno Tahoe Airport Authority (RTAA).[8] Instead, recent pavement maintenance programs specifically for CCDOA airports (excluding LAS) and RTAA airports (excluding RNO) were reviewed, and cost estimates were developed based on these studies' findings.[9] These project categories are also used in **Section 8.3.4** when presenting total costs.

Table 8-18: Airport Project Need Categories

Project Bucket	Example Projects
Airside	Weather Reporting Stations, Runway and Taxiway Lighting, other NAVAIDs, Airfield Design Projects
Landside	Ground Transportation, Automobile Parking, Aviation Fuel, Hangar Development
Pavement Maintenance	Runway Rehabilitation, Apron Rehabilitation, Taxiway Rehabilitation
Planning	Master Plan, Airport Layout Plan, Environmental and Wildlife Planning, Noise Impact Study
Terminal	Terminal Building Improvement, Passenger Concourse, Terminal Way Finding Signage, Construct FBO

Source: Kimley-Horn 2021

[8] CCDOA airports include Harry Reid International (LAS), Henderson Executive Airport (HND), Jean Airport (0L7), North Las Vegas Airport (VGT), and Perkins Field (U08). RTAA airports include Reno/Stead Airport (RTS) and Reno/Tahoe International Airport (RNO).
[9] LAS and RNO costs were estimated by extrapolating an average annual need, developed by CCDOA and RTAA respectively, over a 20-year planning horizon. Project costs could not be broken into the project categories presented in Table 8.18.

Table 8-19 presents the ACIP, master plan, and other airport-specific costs by project type with additional line items to present the overlap between these three categories and NAHSP costs.

Table 8-19: ACIP, Master Plan, and Other Airport-Specific Needs and Costs by Type

Project Bucket	Total Cost
Airside	$586,030,000
Landside	$268,713,000
Pavement Maintenance	$365,459,000
Planning	$3,936,000
Terminal	$17,493,000
Total Combined Costs	$1,241,630,000
Combined Costs Excluding NAHSP Duplicates	**$1,218,002,000**

Sources: Airport ACIPs, Airport Master Plans, Kimley-Horn 2022

8.3.3.2. Large Commercial Airport Needs and Costs

LAS and RNO each maintain their own maintenance and capital development program focused on maximizing available financial resources and preserving and enhancing their substantial airport assets. These programs are unique based on the existing airside and landside facilities at each airport, financial conditions, and anticipated needs to meet future demand. To develop estimated investment needs for inclusion in the NAHSP, outreach to both airports was undertaken to ensure the appropriateness of information was included. A summary of how each airport's needs were estimated is provided below.

LAS

Harry Reid International is the busiest primary airport in the state and requires considerable continued investment to continue serving the high demand of the Las Vegas metropolitan area. According to CCDOA, it is estimated that LAS, on average, programs $20 million for FAA Airport Improvement Program (AIP)-eligible projects on an annual basis and programs an additional $60-90 million in capital improvement projects that rely on non-federal and/or local funding streams annually. It is important to note that the $20 million and $60-90 million averages represent a typical annual need, and therefore requires extrapolation over 20 years in order to provide a more accurate long-term estimate of the investment need. The high range of $60-90 million is used to determine the 20-year estimate for non-AIP projects.

In addition to the AIP projects and other federally ineligible needs, an estimate for pavement maintenance needs was developed using a recently completed 2020 CCDOA APMS report. Using information presented in this report, a 20-year estimate of pavement maintenance cost of $75,280,000 was established. Another significant cost attributable to LAS is the design and construction cost of the recently completed Terminal 3 building, which was constructed using Passenger Facility Charges (PFCs) that will be collected through 2035. **Table 8-20** presents the 20-year investment need for LAS based on information provided by CCDOA. As shown, the annual estimates for AIP and non-AIP projects extrapolated over 20 years is substantial even before considering the additional 20-year pavement maintenance needs estimated from the CCDOA APMS. All total, the 20-year investment need at LAS sums to over $4 billion.

It is essential to note that this estimate does not reflect any inflationary costs, nor projects to accommodate substantial growth that is likely to be realized requiring even more investment than is depicted. Whether airfield, terminal, access roadways, parking, or other projects, additional passenger growth will generate demand for new facilities that has not yet been determined. The past two years of the COVID-19 pandemic have required CCDOA's focus on near-term needs and the organization's financial strength given the tremendous and immediate negative impact of the pandemic on the airport's revenue.

Table 8-20: Total 20-year LAS Investment Need

Funding Source	Total Cost
Annual AIP-eligible Projects	$20,000,000
Annual Non-federally Funded Projects	$90,000,000
Terminal 3 (PFCs)	$90,000,000
Average Annual LAS Investment	**$200,000,000**
Extrapolated 20-year LAS Investment Need	**$4,000,000,000**
CCDOA APMS 20-year Pavement Maintenance Needs Estimate	$75,280,000
Total 20-year LAS Investment Need	**$4,075,280,000**

Sources: CCDOA, Kimley-Horn 2022

RNO

A master plan for RNO was completed in 2018, with FAA accepting the full plan in 2019. A wide range of short-, mid-, and long-term improvements were identified with total project costs estimated at $1.636 billion over the 20-year period. These included major expansion of the terminal facility including new gates, expansion of other terminal areas, a new consolidated rental car facility, new and expanded automobile parking facilities, airfield improvements, and GA facility improvements as demand warrants.

The airport intends to use a variety of funding sources to pay for the improvements ranging from airport revenue bonds to FAA AIP grants, PFC revenue, customer facility charge (CFC) revenue, airport authority funds, and other third-party sources. As discussed previously, the new BIL funding, which was not available when the RNO master plan was completed, will be a new source of funding that can be used to pay for some of the improvements identified in the study.

While the master plan focuses on improvements to some existing facilities, the plan does not specifically address the airport pavement maintenance needs for RNO. The 2019 Update for RNO Airside Pavements identified an annual maintenance cost of $2,360,000, with separate pavement management plan totaling $174.1 million from 2020 through 2029, an average of approximately $17.4 million per year.

For purposes of the NAHSP, the total needs from the master plan of $1.636 billion and a pavement needs estimate of $348 million (assuming 20 years of projects at an average of $17.4 million per year) are utilized as the total investment needs estimate for RNO. The total investment need for RNO is presented in **Table 8-21**. It is important to point out that the needs of RTS are addressed separately in the prior section.

Table 8-21: Total 20-year RNO Investment Need

Funding Source	Total Cost
2018 Master Plan Identified Needs	$1,636,000,000
2019 RNO Airside Pavement Maintenance (Avg Annual Amount)	$2,360,000
2019 RNO Pavement Management Plan (Avg Annual Amount)	$17,400,000
Annual RNO Pavement Needs	**$19,760,000**
Annual RNO Pavement Needs (Extrapolated for 20-year Estimate)	**$395,200,000**
Total 20-year RNO Investment Need	**$2,031,200,000**

Sources: 2018 RNO Master Plan, 2019 RNO APMS, Kimley-Horn 2022

8.3.3.3. Statewide Programs

The NDOT Aviation Program is responsible for supporting the maintenance and development of system facilities. Throughout the NAHSP, many considerations have been developed to support increased system performance that involve the NDOT Aviation Program activities. These considerations would be in addition to the existing support provided in terms of supporting airports through ACIP processes, conducting 5010 data updates, and working with other local and regional stakeholders. Currently the NDOT Aviation Program has one full-time staff member responsible for all duties of the Program. It is unlikely that significant progress will be made in further supporting airports and the system's enhancement with a single staff member.

The NDOT Aviation Program has two existing programs that support responsible aviation development. NDOT also has a grant program, the Nevada Fund for Aviation, which provides matching monies for FAA grants to NPIAS airports, which is discussed in **Section 8.3.1.4**. Finally, the Nevada Aviation Technical Advisory Committee (NATAC) supports the NDOT Aviation Program by serving as a forum for "discussing planning and programming issues related to the Continuous Statewide Nevada Aviation System Plan (NASP), providing recommendations for the administration of the Nevada Fund for Aviation (formerly the Nevada Aviation Trust Fund), and to fulfill the public participation processes defined under Nevada's open meeting law as defined under Nevada Revised Statutes (NRS) Chapter 241." [10]

One of the existing programs is the Nevada Airport Pavement Management System (APMS) which was first established in 1990 and continues to support proactive planning measures that monitor and preserve airport pavement conditions. Most recently NDOT worked with Applied Pavement Technology, Inc (ApTech) to complete an APMS Update that concluded in 2019. Nevada's APMS program informs individual airports, NDOT, and the FAA on current pavement conditions, pavement-related maintenance and rehabilitation (M&R) needs and allows for the ability to optimize project selection and determine condition impacts of those projects. The APMS also supports multiyear capital improvement program development. The 2019 APMS Update evaluated 22 airports that have over 30 million square feet of pavement, excluding airports including LAS, RNO, and those within the Clark County system as well as RTS and the privately owned airports.

The pavement at the 22 airports is almost 50 percent runways, with the remaining portion composed of taxiways, aprons, T-hangar areas, and helipads. Based on the analysis conducted by ApTech, over half of the airports included in the study would benefit from preventive maintenance or pavement preservation and approximately 20 percent of the study airports need more costly rehabilitation or reconstruction. According to study findings, the average overall area-weighted airport PCI for all airports' pavements was 76.4, with higher PCIs for commercial service airports (85.3) versus other general aviation airports (74.8). If all recommended projects were funded and implemented, the average PCI would increase to 84.5, at a cost of approximately $49.5 million. This cost was developed considering an unconstrained budget scenario, which is not realistic, but provides a basis for understanding the overall airport pavement needs and is a launching point for project prioritization. The NDOT APMS plays a significant role in supporting the maintenance and preservation of aviation assets in Nevada and will continue to do so as it is updated in the future.

The NDOT Aviation Program also supports the development of the Nevada Airport Directory and Pilot's Guide which is updated routinely and catalogs important information about airport facilities across the state. The directory is made available online and a web application for Apple iPads was developed so that users can easily download and navigate the directory on the go. The directory is important because it provides airport users access to critical information that supports the safe operations of aircraft into and out of Nevada's public use airports. Information obtained throughout the NAHSP will be considered for integration into the Directory and Pilot's Guide, as applicable.

[10] https://www.dot.nv.gov/mobility/aviation/airport-matching-grants-natac

In addition to these two programs and the Nevada Fund for Aviation and NATAC responsibilities, some potential future programs or considerations are identified that may benefit system airports moving forward. These include opportunities such as statewide aircraft counting programs and considerations for funding FAA AIP-ineligible nonprimary runways.

Effective aviation facility planning relies on an accurate understanding of the number of annual operations an airport experiences. Annual operations are used as an indicator for a variety of facility planning efforts; however, most airports must rely on high-level estimates to identify the number of operations at their airport. Up until recently, only towered airports could provide accurate counts of operations. More recently, other strategies have been implemented, including use of Automatic Dependent Surveillance – Broadcast (ADS-B) counters. An aircraft must be equipped with ADS-B technology, and when equipped, ADS-B allows an aircraft to broadcast their identification, position, altitude, and velocity to other aircraft and air traffic control (ATC). The ability to transmit a signal is referred to as ADS-B Out and being able to receive the signal is called ADS-B In. Currently, 16 Nevada system airports have ADS-B In capabilities, which supports an ADS-B counter program. The ADS-B Counter program allows for potentially more accurate operations counts, but it requires that the aircraft flying into and out of the airport are also equipped with ADS-B Out technology. While an ADS-B Counter Program is an important step in more accurately counting operations at non-towered airports, the NDOT Aviation Program is committed to identifying a more universal solution for aircraft operations counting. Challenges associated with implementing effective counter programs relate directly to the lack of broadband connectivity across the state, and NDOT continues to work with the Nevada Governor's Office to establish critical broadband connections. While challenges remain, NDOT is committed to establishing widespread broadband connections and identifying aircraft operations counting programs that are well suited for all Nevada airports.

Nevada airports with more than one runway may face challenges maintaining their nonprimary runways due to the FAA AIP eligibility guidelines. Per the FAA AIP Handbook, crosswind and secondary runways may be considered ineligible for funding unless the runways meet specific thresholds. For example, a crosswind runway would only be considered eligible for FAA AIP funding if the primary runway's wind coverage is less than 95 percent or if the primary runway has wind coverage less than 95 percent and the existing crosswind runway(s) operates at 60 percent or more of their annual capacity. Similar eligibility requirements are outlined for secondary and additional runways in order to justify a certain level of need for continued FAA funding for maintenance of these crosswind and additional runways. In cases where an airport's crosswind or additional runways do not meet the justification requirements, they face being ineligible for FAA AIP funding support on those runways. In the event that an airport is not able to rely on FAA funding to maintain ineligible runways, NDOT can continue encouraging airports impacted by this issue to look for local or state funding opportunities, while also meeting with FAA and other legislative staff regarding the potential for changing the funding eligibility requirements.

8.3.4. Total Costs

It is critical to identify a comprehensive estimate of total aviation needs to emphasize the importance of continued financial support for Nevada's aviation assets. In addition to the cost estimates associated with the NAHSP and the cost estimates provided by airports (ACIPs, master plans, and other airport-specific studies), as well as costs for the large commercial service airports and statewide programs, there are a few other costs that need to be considered when identifying total financial need. These additional costs are summarized in **Table 8-22**.

Table 8-22: Cost of Other Aviation Needs

Program	Estimated Costs
APMS Study Updates	$2,400,000
NAHSP and AEIS Updates	$600,000
20-year Life Cycle Pavement Reconstruction	$337,230,000
Aircraft Operations Counting Program	$70,000
Pahrump Site Selection Study	$400,000
Pahrump Land Acquisition, Design, and Construction	$10,000,000
Total Cost of Other Aviation Needs	**$350,700,000**

Sources: NDOT Aviation Program, Kimley-Horn 2022

There are also existing and future aviation projects with significant costs that must be considered. These special programs include continuation of Nevada's APMS updates and the Aircraft Operations Counting Program. The APMS Updates are programmed to be conducted every three years, resulting in six updates being considered in the costs presented in **Table 8-22**. More information regarding these two special programs is presented in **Section 8.3.3.3**. As mentioned in **Section 8.2.3** there are currently two proposed public aviation facilities in Nevada, SNSA and Pahrump; however, a cost estimate is only provided for Pahrump at this time.

Table 8-23 provides a summary of total investment needs estimated for NAHSP facilities over the 20-year planning horizon. As shown, the table excludes duplicates costs to avoid double counting and accounts for needs excluding and including the impacts of RNO and LAS.

Table 8-23: Summary of Total Aviation Investment Needs Over 20-year Planning Horizon

Recommendation Category	Cost	% of Total (Excluding LAS & RNO ACIP Cost)	% of Total (Including LAS & RNO ACIP Costs)
NAHSP PM Cost	$29,487,000	N/A	N/A
NAHSP VRV/FSO Cost	$684,784,000	N/A	N/A
Overlapping PM and VRV/FSO Costs	*$23,231,000*	N/A	N/A
Total NAHSP Costs (Duplicates Removed)	**$691,040,000**	**31%**	**8%**
Airport Provided Costs (Exc. LAS and RNO)	$1,241,630,000	54%	15%
LAS Development Costs	$4,075,280,000	N/A	49%
RNO Development Costs	$2,031,200,000	N/A	24%
Overlapping NAHSP and Airport Provided Costs	*$23,628,000*	N/A	N/A
Total Airport Provided Costs (Duplicates Removed)	**$7,324,482,000**	**N/A**	**N/A**
Total Cost of Other Aviation Needs (from above)	$350,700,000	16%	4%
All Costs with Duplicates Removed (*Including* LAS & RNO ACIP Costs)	**$8,366,222,000**	**N/A**	**100%**
All Costs with Duplicates Removed (*Excluding* LAS & RNO ACIP Costs)	**$2,259,742,000**	**100%**	**N/A**

Sources: Clark County Department of Airports, Reno/Tahoe Airport Authority, Kimley-Horn 2022

While not included in **Table 8-23**, it is important to note the significant broadband infrastructure plan for Nevada. As mentioned in earlier policy considerations, not only are there airports in the state without critical broadband connections, but there are also many towns and remote communities that do not have broadband connections. Nevada committed $500 million in federal funding to support increased broadband connectivity throughout the state. The state has established a Broadband Funding Initiative that identifies needs and cost estimates for further developing Nevada's broadband infrastructure. The Initiative proposed over 1,700 miles of cable to be installed throughout the state. It is important to note that, while comprehensive, this Initiative still does not provide connectivity to all NAHSP facilities or to all communities in the state.

8.4. Funding Sources

Funding to support airport capital improvement projects is available from a variety of sources at the federal, state, and local level. An airport's ability to leverage these funds depends on the eligibility requirements included in the various funding sources. An in-depth review of the federal, state, and local funding sources leveraged to support aviation development in Nevada was presented in **Chapter 4. State, Regional, and Local Airports Issues**. **Table 8-24** presents the amount of funding made available to NAHSP airports from 2019 through 2021 through the various federal and state programs. It is important to note that all federal funding programs are only made available to NPIAS airports and the amount of funding available in 2020 was unprecedented considering the numerous relief funding programs established due to the impacts of COVID-19. The CARES Act, CRRSA Act, and ARPA account for 76 percent of the total federal funding available in 2019-2021. If those acts were not established, the total federal funding amount would only be $150,768,295.

Table 8-24: Summary of Federal and State Aviation Funding Opportunities

Source	Eligible Airports	Amount
Federal		
2019 – 2020 FAA AIP Grant Funds	NPIAS Airports	$96,286,071
2020 FAA AIP Supplemental Appropriation Funds	NPIAS Airports	$20,995,231
2020 CARES Act Funds	NPIAS Airports	$228,752,102
2020 CARES Act Local Matching Funds	NPIAS Airports	$7,913,878
2020 CRRSA Act Funds	NPIAS Airports	$49,627,830
2021 ARPA Funds	NPIAS Airports	$191,919,576
2021 FAA AIP Grant Funds	NPIAS Airports	$27,931,437
2021 FAA AIP Supplemental Appropriation Funds	NPIAS Airports	$5,555,556
2019 – 2021 Total Federal Funding		**$628,981,681**

Sources: FAA Map of CARES Funding, 2020; FAA CRRSA Act Funding, 2020; FY 2019-2020 FAA AIP Grants; FY 2020-2022 FAA AIP Supplemental Appropriation; FY 2021 FAA AIP Grants; Kimley-Horn 2022

Starting in Fiscal Year 2022, Nevada's airports will receive $58.6 million in BIL AIG funding, with nearly $44 million going to LAS and almost $7 million to RNO, while nonprimary general aviation airports are allocated between $110,000 and $763,000 each. BIL funding is for five years, with the annual amount for AIG adjusted based on enplanements (depending on the year) for primary airports and the NPIAS role of nonprimary airports as updated every two years. In addition to the AIG, there is an opportunity for airports to compete for additional funding through the Airport Terminal Program (ATP) and to receive funding through the Air Traffic facilities component. This will help Nevada's airports in addressing the significant capital needs identified through the NAHSP and by the airports through planning studies.

Other sources used by many airports to fund projects include the following:

- **Passenger Facility Charges (PFCs):** PFCs are collected on enplaned passengers at commercial airports, with a current cap of $4.50 per flight segment, with a passenger only required to pay a maximum of two PFCs per one-way trip. Currently only LAS, RNO, and Elko Regional (EKO) are collecting PFCs. Of specific note, LAS has committed PFC collections to past projects for up to 20 more years. Without an increase to the PFC cap, LAS will require other funds to meet development needs including terminals, roadway access, and other projects.
- **Bonds:** Many airports utilize general obligation or GO bonds to fund capital improvements. Airports must pay debt service from airport sources on the bonds.
- **Airport Revenue:** Airports generate funds from operation, whether through revenue from fuel sales, hangar leases, ground leases, commercial land leases and rent, landing fees, terminal concession rents, and others.
- **Subsidies:** Many communities provide subsidies to their sponsored airport whether for capital improvements or for operations and maintenance. Subsidies can range dramatically depending on the airport sponsor's financial wellbeing.
- **Private Funding:** Some airports obtain funding from private sources, typically for projects that are developed for the private owner such as hangars or other buildings.

While there are many potential sources of funding, many small NPIAS airports rely heavily on FAA grants for major capital development needs.

The total amount of funding made available to NPIAS airports within the NAHSP between 2019 and 2021 was $628,981,681. Adding BIL funding assuming an average of $59 million per year for AIG will be of great value, however, none of these programs cover any costs related to non-NPIAS airport needs and, in many cases, cannot be distributed to an airport without the airport providing the necessary local funding match. While COVID-19 created a unique funding environment where the CARES Act covered the cost of the local matching funds, those funds are not guaranteed for future years and it would be up to local agencies to allocate the necessary matches. In typical years, nonprimary and primary airports (except for large hub LAS) would be responsible for identifying state and local matches to cover 6.25 percent of total project costs. Even with the additional funding allocated due to COVID relief funding, the estimated costs for ACIP, master plan, airport-specific, and NAHSP project costs presented in **Table 8-23** exceed available funding by approximately $7.7 billion, as shown in **Table 8-25**. In addition, **Table 8-25** breaks down the total funding shortfall to identify the shortfall related specifically to NPIAS and non-NPIAS airports, showing an approximate $7.6 billion and $146.7 million shortfall, respectively.

Table 8-25: Aviation Funding Shortfall

Description	Amount
Estimated ACIP and NAHSP Costs	$8,366,222,000
Estimated Funding Available	$628,981,681
Total Funding Shortfall	**$7,737,240,319**
NPIAS Funding Shortfall	$7,590,540,319
Non-NPIAS Funding Shortfall	$146,700,000

Sources: FAA Map of CARES Funding, 2020; FAA CRRSA Act Funding, 2020; FY 2019-2020 FAA AIP Grants; FY 2020-2022 FAA AIP Supplemental Appropriation; FY 2021 FAA AIP Grants; Kimley-Horn 2022

8.5. Project Prioritization Considerations

The determination of an airport's regional value (ARV), which includes the results of the VRV analysis, an estimate of the economic impact of the airport, and consideration of the replacement value, serves to identify areas where there are opportunities for improvement, whether to mitigate a substandard condition or to transition toward meeting current or future demand. Many of the factors are within the sponsor's control, and their importance relevant to local, regional, state, or federal priorities can be assessed and an appropriate strategy for prioritizing improvement efforts can be identified.

While the ARV can be used as a tool that allows comparison with other similar-sized airports, every situation will have elements that are unique and specific to each airport. The airport sponsor will be the final arbiter of the appropriate response for addressing particular factors, based on their priorities along with the timing and availability of funding resources.

In cases where funds under the FAA AIP are utilized for a project, the priorities may emulate those of the FAA's National Priority Ranking (NPR)[11] system that address issues regarding:

- Safety/Security
- Environment
- Planning
- Pavement Preservation and Reconstruction
- Airfield Capacity
- Design Standards

Improvements that rely on federal funding will be aligned to the FAA's ranked order of priorities in order to compete with other airports for a limited budget. In most cases, improvements using AIP funds will be limited to runways, taxiways, and parking aprons, although with the new BIL AIG there may be opportunities to consider other types of airport development over the next five years.

The priority for other improvements that may not score highly for federal funds may be justified based on separate funding resources. In some cases, public-private partnerships may provide opportunities to generate additional revenue or otherwise expand services for users.

The airport sponsor will generally select the "next best project" based on the availability of funding resources and the impact of implementing the improvement will result in a slight incremental increase in the ARV for a particular VRV metric. However, it will be through a comprehensive and balanced ACIP executed over the short term where the cumulative effect on the airport's ARV will be demonstrated. The intended result is an ARV that quantifies the overall improvement in the airport's capabilities to serve its users and fulfill its existing roles within the federal and state system of airports and in some cases, reaching the threshold for expanding the airport's ability to serve a broader range of users.

[11] "*FAA Order 5090.5, Formulation of the NPIAS and ACIP" includes a formula to establish a score for projects weighted toward achieving federal goals.*

8.6. Summary

The NAHSP was conducted by the NDOT Aviation Program to evaluate the existing airport system's needs, performance, and economic impact, leading to development of an overall plan that provides airports, NDOT, and the FAA with useful information for future decision-making. The costs identified in this chapter provide a comprehensive view of the resources needed to maintain the system over time, recognizing all airports do not have the financial capability to meet the identified needs.

It is essential that the needs of Nevada's airports be considered in the context of the system's economic impact, presented in the final chapter of the NAHSP. The economic impact demonstrates the annual economic contribution the system makes to the local and statewide economies, and will vary based on changes to aviation activities, airport development, and economic conditions.

In addition to development needs, the NAHSP identified numerous considerations to address specific PMs that can assist with preserving and enhancing the state aviation system. These considerations include actions that airport sponsors and NDOT can undertake to support the airport system as the industry evolves and continues to experience change. Nevada's aviation system, including the vast number of privately owned airports and heliports that also support the state's aviation demand, will continue to require support on all levels whether it's financial, legislative, or just community-level respect for the activities that are enjoyed as a result of an airport's operation and the investment in a safe and effective aviation network.