

Section I System Planning

This is an update of the 2003 California Aviation System Plan (CASP) System Requirements Element. It continues the forecast and planning of projects that aid in the development of safety and mobility enhancements within California's airport community. Now titled 2010 General Aviation System Needs Assessment Element (GASNA), we have changed the name of this document to better reflect its intent to introduce and draw more attention to recommended statewide airport enhancements that could beneficially augment the overall aviation system in California.

Organization of the GA System Needs Assessment Element

The GASNA is organized into three sections: Section I - System Planning, Section II - Primary Commercial Service Hub Airports, and Section III - General Aviation & Reliever Airports.

Section I

Section I outlines the major elements the Division of Aeronautics (Division) takes into consideration when recommending priority projects that would maximize aviation safety and system efficiencies in the near and long-term. It explains the value of the GASNA and explains some of the funding realities and disparities that affect the State aeronautics program (Table 1-A and Figure 1-A). It also introduces trends in aviation such as airport improvements, operational safety enhancements, and changes in aircraft type and demands that may affect system operations. Technological considerations that can assist in forming plans of statewide benefit are included as well as current funding considerations.

We have further expanded Section I to include additional information on how the GASNA is commonly used and valued, and added comments on notable trends in California aviation from the Division's perspective. We also added a New Innovations overview that tracks some of the new technologies that may help improve overall aviation system efficiency, and redescribed how project priorities are established by airport classification. Consistent with previous editions, the GASNA only represents a snapshot in time and continues to be flexible to the needs of airport sponsors as the dynamics affecting airports remain ever in flux.

Section II

Section II discusses the Primary Commercial Service Hub Airports. Although California has approximately 249 public use airports, 30 have FAA approval to conduct commercial service operations. Of these 30, this section focuses on the 13 larger Primary commercial hub facilities. Of particular concern when considering commercial operations at an airport is what happens to the State aviation system when that airport reaches its capacity to accommodate passenger, cargo, and/or General Aviation (GA) activity simultaneously.

Although the State has a limited role in planning and programming projects at the larger Primary Hub airports, GA airports that function as Reliever facilities are directly impacted by commercial airport growth and capacity issues. As such, the State helps facilitate safety and operational enhancements at Reliever and GA airports to help meet anticipated system capacity needs.

Much of the information used to develop this section of the document was obtained from readily available sources, such as the CASP Capital Improvement Plan, Regional Transportation Plans, Metropolitan Transportation Plans, Airport Master Plans, FAA 5010 Inventory Master Records, and Regional Aviation System Plans. The GASNA was developed in consultation with airport staff, Regional Transportation Planning Agencies (RTPAs) and Metropolitan Planning Organizations (MPOs). In December 2008 a notice with supporting data was sent to all GA airports in the State advising of the upcoming GASNA update and requested assistance in verifying data for the subject airport. Planning agency and airport comments on returned information, as well as comments on the draft document, were incorporated as available.

Section III

Section III provides a regional overview of GA airport needs or enhancements. The airports are organized by functional classification and grouped geographically according to their location within one of the 12 Districts that operationally organize Caltrans (Figure 3-A). Consistencies within and between the various Regional Transportation Plans was a key consideration for regrouping the airports as shown in this version of the GASNA. Transportation planning in this sense would include not only the safe and efficient movement of planes, people, and goods at an airport, but also the various modes of transportation that connect an airport to its community.

As introduced above, GA and Reliever airports within the State are classified by function. The functional criteria are identified in the CASP and compliment the Federal Aviation Administration's (FAA) National Plan of Integrated Airport Systems (NPIAS) inventory (see Table 1-C). This section also presents the State airport permit categories, and presents considerations for State airport project funding eligibility. Funding priorities are based, in part, on an airport's ability to meet the minimum standards for its classification (see Tables 1-D and 1-E). A suggested project priority list is compiled by airport for each of the 12 Caltrans Districts along with the respective project costs for that airport. The priority airports and respective projects for each District are rolled up into summary tables in Section III.

Understanding the GA System Needs Assessment Element

The GASNA is one of several Elements that make up the CASP. It is also one of many complementary documents prepared by the Division as required by, and in support of, the State Aeronautics Act (Act), codified in California Public Utilities Code Section 21701, et. seq. Specific to the Act, this document addresses §21702(d) which includes the

consideration of statewide air transportation matters. The GASNA is updated on approximately a five-year cycle with the last report completed in 2003.

A principle purpose of the GASNA is to identify and prioritize/rank potential airport safety and capacity related infrastructure projects. General aviation and Nonprimary airports comprise 95 percent of California's 249 public use airports; GA aircraft account for about 80 percent of all operations. Thus the focus of the GASNA is to identify potential preservation and enhancement projects for GA airports. Airports are ranked Priority 1 or 2 for NPIAS airports, and Priority A or B for non-NPIAS airports. The ranking of Priority A or B is new to this version of the GASNA. The reason for the distinction between NPIAS and non-NPIAS airports is that only NPIAS airports are eligible for FAA Airport Improvement Program (AIP) grants. Yet this funding distinction does not mean non-NPIAS airports are without importance to the State system of airports. On the contrary. Non-NPIAS airports play an important role when one considers the commerce and jobs they bring to their region and the State. To the extent other than State or federal funding is available, the Priority A and B ranking helps guide the planning of those funds. In both cases, highest priority is generally given to those airports for which improvements would likely best support the statewide system of airports. Regional benefits would comprise the next tier of priorities followed by more localized benefits.

As an example of priority considerations, an airport may be operating below capacity because of a specific deficiency, such as runway length, width, weight-bearing capacity, or adequate runway safety area. Yet once the deficiency is addressed, the system of airports should benefit from increased capacity along with the airport itself. Other important projects could be those that assist with the costs of maintaining current safety, engineering and maintenance practices. And not to be dismissed, the economic value of air cargo is of particular interest to the State during the current period of financial recovery. Those airports that could support better air cargo operations with some facility improvements would also be considered for project prioritization. Data from the [10-Year Air Cargo Tonnage Report](#)¹ was used to help evaluate these needs and is noted where appropriate in Section II and III of this report.

This ongoing planning effort is in line with Department goals of mobility and stewardship towards preserving our existing transportation infrastructure, as well as Division policies regarding safety. Although the GASNA does not grant project approval or funding, the GASNA does identify projects that can assist airport sponsors in identifying needed improvements that can improve statewide system performance as well as increase airport capacity and safety based on each functional classification minimum standards.

Reviewing priority airports and the associated projects has been grouped by District and is rolled up into summary tables in Section II with more detail provided in the tables in Appendix 4. These tables are similar to past versions where standards are indicated along with known actual conditions. The difference between standards and known conditions represents the suggested project. The summary tables also provide two new data

¹ <http://www.dot.ca.gov/hq/planning/aeronaut/documents/AirCargo10-yearActivityReport1999-2008.pdf>

categories from the 2003 version of the SRE. We have added a column for known Runway Safety Area (RSA) status and Airport Layout Plan (ALP) approval dates.

Having RSA's that meet minimum standards for the design aircraft the runway is intended to accommodate is paramount to safe aviation. Both the FAA and the Division are working towards improving the condition of runways and RSA's at all public use airports. More specifically, all Part 139 certificated airports have a congressionally mandated deadline to have all practicable RSA improvements physically completed by December 31, 2015. To assist in meeting this deadline, the State and FAA are strongly encouraging Part 139 airport sponsors to make necessary RSA upgrade projects a high priority in their capital improvement plans. To aid this effort, the airport data tables found in Appendix 4 added RSA status designations noting 'S' for Satisfactory, 'U' for Unsatisfactory if it does not meet design standards, or 'NF' for Not Feasible for those runways and RSA's that cannot be brought up to minimum standards for reasons such as topography, land use, or environmental reasons. The information in the data table is the latest collected by the Division as of February 2010 and will be continually updated as information is made available.

Also important is the regular updating of ALP's so that federal and State officials know how the airfield is designed and planned to operate. From here the airport's permit conditions can be verified to confirm that the facility is operating as authorized. For this reason, the Division will be flagging all ALP's that are five years old or greater, as shown in our database and recorded on the District/Airport needs tables found in Appendix 4. Airport operators are requested to submit their current ALP to update our database if not done so recently, or document their timeline for updating their ALP. As the FAA continues to upgrade their system to accept and catalogue electronic ALP's, the Division will similarly align itself to receive ALP's in the new electronic format. Updating ALP's is a FAA and State grant eligible activity and is of high importance to both federal and State officials and airport operators.

Value of the GA System Needs Assessment Element

One of the most valuable outcomes of the GASNA is identifying statewide priorities for airport safety, operations and mobility enhancements. These priorities are then used to support the CASP Capital Improvement Plan (CIP) Element, a fiscally unconstrained projects list. The projects identified in the CASP CIP are ranked biennially using a matrix approved by the CTC. Once approved, the GASNA's recommended priorities become available for review by airport sponsors who can use the list to help compile their roster of desired projects for federal and State funding.

Projects listed in the GASNA include potential projects needed to optimize airport capacity (e.g. both runway extensions and widenings), safety projects (e.g. runway pavement improvements, 24-hour automated weather systems, precision approaches and visual runway and airfield markings), and operational enhancements (e.g. capacity options at Reliever airports.) Combined, the GASNA and CIP serve to more efficiently guide the consideration and planning of priority projects and the necessary funding from

various governmental entities. It is important to remember that the above improvements at GA airports benefit far more than recreational aviation. To often left out of funding discussions are the vital fire suppression, law enforcement, disaster relief, tourism, and other business and economic activities that originate from GA airports. The monies invested in these airports produce benefits that reach well beyond the airports themselves.

Airport managers have also found the GASNA to be a valuable tool in helping educate decision makers and prioritize the cost of safety and infrastructure improvements within their communities. Moreover, because the GASNA looks at the entire State, operators can see how certain improvements at their facility can lead to systemwide enhancements. Organizations such as the California Transportation Commission, Technical Advisory Committee on Aeronautics (TACA), the National Business Aviation Association (NBAA), and Airport Owners and Pilots Association (AOPA) use the GASNA to help sponsor and introduce other projects that benefit the State.

Funding Considerations

General Aviation airports in California generally rely on two funding programs for maintenance and development projects. The first is the Federal Aviation Administration and the second is the State. Augmenting these programs are the various local funding mechanisms derived from county and city budgets.

All State grant programs for airports are funded from the Aeronautics Account in the State Transportation Fund. The Aeronautics Account is funded from tax revenues that are collected on GA fuel at the rate of 2¢ per gallon for jet fuel and 18¢ per gallon for aviation gasoline (avgas). These taxes typically generate about \$7 million per year, depending on total sales volume. To follow this example, of the approximate \$7m available for State use, about \$3.4m would be used for Division operating expenses leaving only \$4.2m for California Aid to Airports Program (CAAP) Programs including State AIP matching grants, A&D grants, and annual credits grants. The Aeronautics Account would also receive minor revenue from other sources including interest earned on its cash balance and sale of documents such as the State aeronautical chart. This flow of revenue and expenditure is shown in priority order, as required under Revenue and Taxation Code §8352.3, in Table 1-A on the following page. What this all illustrates is how small the reinvestment in California's public aviation system has become.

Table 1-A
Aeronautics Account Funding Sample

\$7.6m Revenue ² (Continuously Appropriated)
\$3.4m Division Operations
\$1.5m Annual Credit Grant
\$1.7m AIP Matching Grants
\$1.0m A&D Grants

On the federal side, the majority of GA airports (192)³ meet the National Plan of Integrated Airport Systems (NPIAS) eligibility requirements for funding under the FAA Airport Improvement Program (AIP). The majority of these airports receive up to ninety-five percent funding from the AIP. Airports not included in the NPIAS are ineligible for FAA AIP funds.

On the State side, California has four general programs and includes AIP matching grants, Acquisition and Development (A&D) State Funded Grants, Annual Credit grants, and loans. All State grant programs for airports are funded from the Aeronautics Account. The Division's CAAP Matching Grant Program provides approximately 2.5 percent of the federal grant (2.375 of the total five percent matching grant), while the remaining 2.625 percent is made up by a local match. Non-NPIAS airports are ineligible for State AIP matching grants.

The State's Local Airport Loan Program can also be used to fund facility improvements at publicly-owned, public use, airports. Loans are available for revenue generating projects such as hangars and fueling facilities. Loans can also be made for airport development projects. Finally, loans can be made to assist the sponsor with the local match for an AIP project.

Eligibility for State funds, including AIP Matching Grants and A&D Grants, are subject to programming and allocation by the CTC. Information regarding these grants and loans can be found in the California Code of Regulations as Title 21, Division 2.5, Chapter 4, CAAP, which is available on the Division of Aeronautics web site at: (www.dot.ca.gov/hq/planning/aeronaut/documents/Regs_Fiscal.pdf).

Funding Shortfalls

The 2009/2010 State budget suspension of some grant programs delayed numerous airport improvement projects and prohibited the leveraging of millions of federal AIP dollars for airport improvement projects throughout the State. Whereas this was a rare occurrence in the history of the program, it does illustrate the risk of placing too high a

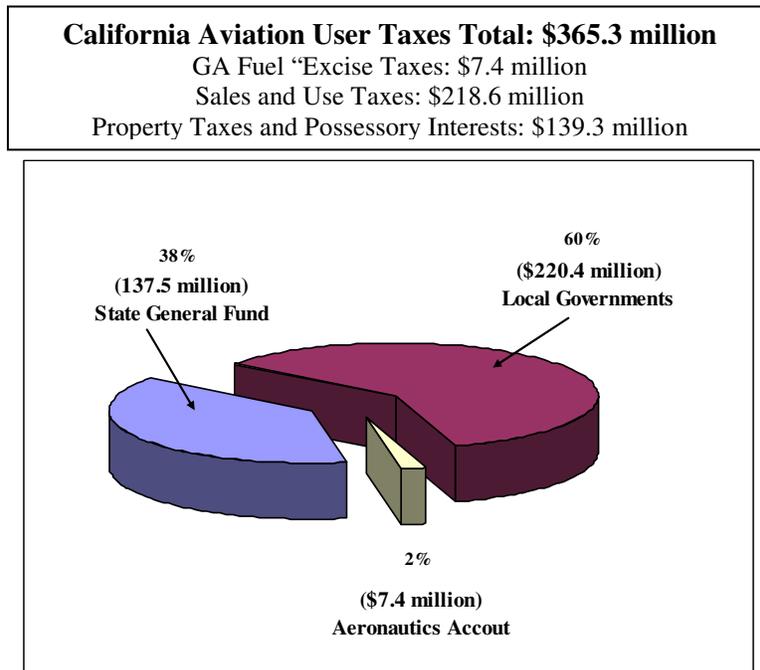
² Figures represent an average over the last ten years and fluctuate based on actual received aviation use taxes. The rate of use tax decline has been approximately 1.3% per year for the period 1999-2009.

³ Federal Aviation Administration. *Report to Congress: National Plan of Integrated Airport Systems (NPIAS), 2009-2013.*

reliance on State resources for airport improvements. This crisis exemplifies the point that airport sponsors should increase the awareness that their airports are ‘economic engines’ and pursue additional improvement opportunities and grants from sources outside the FAA and the State. Beyond atypical funding constraints such as the suspension of grant funds in FY 2009/10, the disproportionate aviation user tax distribution system still exists. With only 2 percent of all aviation user taxes going back into aviation, the State’s ability to adequately fund safety and critical infrastructure improvements will go unmet without legislative changes to that distribution system.

In 2007, aviation’s annual contribution to State and local governments exceeded \$365 million. Approximately \$138 million of aviation user taxes was directed to the State General Fund while approximately \$220 million augmented local government revenues through aviation Sales and Use Taxes, Property Taxes and Possessory Interests that supported transit, public safety, schools and special districts. However, only a small percentage of the aviation revenues, typically around two percent per year, were reinvested in GA statewide. The lack of reinvestment into GA from aviation user taxes is illustrated in Figure 1-A. The two percent allocation back into aviation falls well short of the cost to fund safety, capacity and capability needs identified in the 2010-2019 Capital Improvement Plan or the 2010 General Aviation System Needs Assessment.

Figure 1-A
California Aviation Tax Revenue Sources and Distribution (FY 2007-08)



American Recovery and Reinvestment Act of 2009

Through passage of the American Recovery and Reinvestment Act of 2009 (ARRA), nineteen California airports are currently planned to receive approximately \$84.9 million in funding for twenty-three “ready-to-go” projects, as of February 22, 2010. These federal grants are awarded for a variety of airport improvement projects ranging from infrastructure safety and maintenance to terminal improvements. This federal program is unique in that it is a one-time award, requires no State or local matching dollars, and construction is to be projected for completion by February 16, 2011. Cost overruns will not be handled in the same manner as normal AIP grants in that they are unlikely to be funded. Specific conditions for the use and disbursement of the ARRA funds apply and are found on the FAA’s website (www.faa.gov/airports/aip/) and are beyond the scope of this document to report. However, the system of California airports benefit from this program not only by the direct infusion of federal funds, but also in the projects it helps complete that were not “planned expenditures from airport-generated revenues or from other State and local sources.” It is important to note that the projects and grant awards listed in Table 1-B represent a snapshot in time and may change over time.

Table 1-B
FAA Airports – Project Listing by Grant Number for Economic Recovery Funds

Work Site Location ID	Grant Number ¹	City Name	Work Site Location Name	Award Date	Project Description	Project Amt ²
Data as of: 02/22/2010						
BFL	3-06-0017-032-2009	Bakersfield	Meadows Field	6/10/2009	Rehabilitate Taxiway	\$2,725,219.00
BUR	3-06-0031-049-2009	Burbank	Bob Hope	5/7/2009	Rehabilitate Taxiway	\$3,985,000.00
CMA	3-06-0339-028-2009	Camarillo	Camarillo	6/11/2009	Rehabilitate Apron	\$986,237.00
CPM	3-06-0049-008-2009	Compton	Compton/Woodley	8/4/2009	Rehabilitate Apron	\$8,000,000.00
LAX	3-06-0139-057-2009	Los Angeles	Los Angeles International	6/12/2009	Construct Aircraft Rescue & Fire Fighting Building	\$10,832,000.00
SAN	3-06-0214-058-2009	San Diego	San Diego International	6/16/2009	Install Guidance Signs	\$4,875,537.00
SEE	3-06-0212-017-2009	El Cajon	Gillespie Field	6/15/2009	Rehabilitate Taxiway	\$1,915,621.00
DWA	3-06-0342-011-2009	Davis	Yolo County	6/15/2009	Rehabilitate Runway	\$1,315,224.00
FAT	3-06-0087-057-2009	Fresno	Fresno Yosemite International	6/11/2009	Rehabilitate Taxiway	\$2,750,000.00
LLR	3-06-0121-007-2009	Littleriver	Little River	6/15/2009	Rehabilitate Runway	\$684,550.00
MER	3-06-0364-010-2009	Atwater	Castle	6/15/2009	Rehabilitate Runway	\$1,000,000.00
MRY	3-06-0159-052-2009	Monterey	Monterey Peninsula	6/12/2009	Rehabilitate Runway	\$4,300,485.00
OAK	3-06-0170-048-2009	Oakland	Metropolitan Oakland International	7/7/2009	Rehabilitate Apron	\$5,000,000.00
OAK	3-06-0170-048-2009	Oakland	Metropolitan Oakland International	7/7/2009	Rehabilitate Apron	\$4,700,000.00
OAK	3-06-0170-051-2009	Oakland	Metropolitan Oakland International	11/17/2009	Rehabilitate Apron	\$5,251,428.00
RDD	3-06-0194-036-2009	Redding	Redding Municipal	6/15/2009	Rehabilitate Runway	\$728,810.00
SFO	3-06-0221-046-2009	San Francisco	San Francisco International	4/15/2009	Rehabilitate Runway	\$5,500,000.00
SFO	3-06-0221-048-2009	San Francisco	San Francisco International	9/25/2009	Rehabilitate Runway	\$9,000,000.00
SJC	3-06-0226-075-2009	San Jose	Norman Y. Mineta San Jose International	8/10/2009	Construct Taxiway	\$5,178,291.00
SNS	3-06-0206-018-2009	Salinas	Salinas Municipal	6/15/2009	Rehabilitate Runway	\$1,365,000.00
SNS	3-06-0206-018-2009	Salinas	Salinas Municipal	6/15/2009	Rehabilitate Taxiway	\$1,200,000.00
STS	3-06-0241-037-2009	Santa Rosa	Charles M. Schulz - Sonoma County	7/2/2009	Rehabilitate Terminal Building	\$1,683,378.00
TRK	3-06-0262-022-2009	Truckee	Truckee-Tahoe	6/12/2009	Rehabilitate Runway	\$1,886,000.00
¹ Some grants have multiple projects						\$84,862,780.00
² Project amounts are subject to change based on final project close-out procedures.						
Source: http://www.faa.gov/airports/aip/grantapportion_data/media/fy09_cumulative_approved_arra_grants.xls						

Improvement Prioritization

The Division's primary considerations for prioritizing airport improvements are meeting minimum facility safety standards and addressing capacity issues that serve the majority of representative aircraft likely to use that facility. Understandably, safety and capacity projects will be as varied as the types of aircraft that use these statewide public facilities. The highest priorities are generally assigned to those facilities that serve the greatest majority of statewide users and return the greatest value to the State aviation system. The benefit of this investment strategy is that the very aviation system that contributes to approximately nine percent of the State's Gross Domestic Product, and approximate nine percent of statewide jobs, is preserved and positioned for planned growth⁴. Additional feedback from air cargo operators would also assist the department with future updates to the GASNA.

The ranking or weighting of priorities is generated primarily by the Division's safety inspections, knowledge and expertise of facilities and regulations, our own database of airport data gathered by staff during State permit compliance inspections, and FAA 5010-1 Inventory Master Record program inspections. Other data reviewed included airport master plans, airport layout plans, published data from airport websites, interviews and comments from staff airport management, and the FAA. The simultaneous consideration of GASNA and CIP priorities creates an ideal opportunity for airport sponsors to evaluate their near and long term facility goals and use this information to better support improvement grant requests, FAA AIP and State AIP matching grants, and the Acquisition and Development (A&D) or CAAP State loan program.

System Trends

Although the GASNA is not the outcome of any forecasting model, there are trends in the GA industry that the Division monitors to help influence priorities that may benefit the efficiencies within the statewide aviation system. Some of the major trends are summarized below.

- According to the Fall 2009 Airport Cooperative Research Program *ACRP Report 17 Vol. 1 and Vol 2: Airports and the Newest Generation of General Aviation Aircraft*, the GA community is preparing for two markets that are driving the demand for newer GA aircraft: 1) the use and demand for personal, business and corporate aircraft (including fractional ownership), and 2) commercial charter or air taxi use. Fractional, or shared-use, ownership is estimated to increase the number of hours flown annually. With increased flight time and ownership types, aircraft variations will also change to meet service demands. Commercial charter and air taxi service is also expected to increase as demand for short haul point-to-point travel increases over the next 5- to 10-year planning horizon. The various aircraft used to meet this demand will require GA facilities to support the advanced avionics these planes will contain if they hope to attract such business opportunities, as well as to optimize NextGen capacity improvements.

⁴ Aviation in California: Benefits to Our Economy and Way of Life, 2003.

- The modest six percent projected increase in demand for Very Light Jets (VLJ) and other similar segment aircraft by 2017 will create an opportunity for some GA airports to upgrade their systems to be VLJ-ready so as to capture the regional economic benefits of that market segment. This segment can include aircraft such as the Cirrus SR-22, Cessna/Columbia 350 and 400, and Mooney M20 series on one end, and the Eclipse 500, Cessna Citation Mustang, and the Embraer Phenom 100 on the other end of the segment line.
- Air cargo continues to dominate ‘value per ton’ freight shipments by mode. Highlighting the *2007 Commodity Flow Survey Preliminary Data Special Report* produced by the U.S. DOT, Bureau of Transportation Statistics, air transport nationally averaged \$59,464 per ton, followed by truck at \$934 per ton, water at \$253 per ton, and rail at \$201 per ton. In the absence of more refined data specific to the State, the value of air cargo shipments continue to show why aviation is important to the California economy and those airports that can accommodate this business sector. Readers can find current air cargo data on the Division of Aeronautics home page⁵. Also, the [10-Year Air Cargo Tonnage Report](#)⁶ used to compile peak year tonnages in Sections 2 and 3 of this report are likewise found on the Divisions home page.
- OAG Aviation reported in November 2009 that air cargo volumes may not return to 2007 levels until 2013⁷. Nonetheless, some commercial carrier airports are taking advantage of the slow economy by working towards mitigating their growth and capacity issues still forecast to develop by 2015 and 2025. The challenge is balancing where and how growth will be accommodated. For example, if a given commercial airport decides that some passenger, cargo or GA operations are best transferred to a Reliever airport, then that facility will need to be prepared to meet the demand or lose the commerce that comes with those activities. In short, the Division recognizes a sense of urgency to support growth and capacity enhancement strategies that keep commerce in the State rather than lose the economic activity elsewhere.

New Technologies

The introduction of new technologies into the General Aviation (GA) community is never an idle topic. Many of the improvements designed for the largest commercial airports have a positive influence on the way GA facilities can increase their operational safety, efficiency and interregional significance. Some of these new technologies are listed as follows:

⁵ <http://www.dot.ca.gov/hq/planning/aeronaut/>

⁶ <http://www.dot.ca.gov/hq/planning/aeronaut/documents/AirCargo10-yearActivityReport1999-2008.pdf>

⁷ Air Cargo World. *Wait Until 2013 for Pick Up Says OAG*. November 2009.

NextGen

The FAA is rolling out a new national airspace management system known as the Next Generation Air Transportation System, or [NextGen](#)⁸. A clear benefit of the program is its ability to allow aircraft to use satellite-based technology in a more robust way, with enhanced capabilities in the cockpit including better navigation, optimized approaches into busy airports, route planning, and far more comprehensive and accurate knowledge of weather and traffic conditions. Critical to the rollout of the NextGen system are the technological advancements managed through the FAA's Global Navigation Satellite System (GNSS) Program Office. This office provides satellite Global Positioning System (GPS) based positioning, navigation, and timing (PNT) services in the United States to enable performance-based (RNP/RNAV) operations for all phases of flight from en route, terminal, approach, and surface navigation.

According to the FAA's NextGen website, program activities are focused "...on the deployment of [Automatic Dependent Surveillance – Broadcast](#) (ADS-B) around the country to enhance situational awareness and air traffic control surveillance, and the publication of additional fuel- and time-saving precision navigation procedures ([RNAV and RNP](#)) for many busy airports and air routes." The Division is very supportive of the NextGen program and is monitoring activities with the FAA to determine how it can implement NextGen enhancements that support both commercial and GA operations in California. Tailored arrivals are currently being tested at San Francisco International for transpacific flights with encouraging improvements in flight time, fuel use efficiency and improved air quality.

Automated Weather Systems (AWOS/ASOS)

The upgrades and distribution of Automated Weather Observing Systems, as well as Automated Surface Observing Systems (AWOS/ASOS), in California are a critical part of the State aviation system and elements of NextGen. Improvements benefit both commercial and GA operations. The Division is monitoring the expansion and updating of the system with a focus on bringing more of this technology to key airports thereby increasing national and State air safety. Also, as AWOS/ASOS technology improves, the use of the hardware for shared uses, such as monitoring remote highways concurrently with remote airports is seen as an essential safety measure for normal as well as emergency response operations. The State is currently researching a cooperative approach to improving the road and aviation automated weather reporting system to support multimodal safety statewide. The expansion of the system through Public Private Partnerships (P3) is also becoming a topic of increasing interest as data and cost sharing strategies among various users becomes more desired, available and practical.

Airport Classification Categories

Public use airports are classified in varying ways by different agencies. The FAA identifies airports as GA, Reliever, Commercial Service (Primary, NonPrimary or other

⁸ <http://www.faa.gov/about/initiatives/nextgen/>

based on the airport's reported annual enplanements) for differentiation in the NPIAS. California expands on this concept giving greater clarity to the types of GA airports in the State. Table 1-C shows a comparison of categories used in California versus the FAA, and is explained in greater detail following the table. As a point of clarification, the reason the FAA designates some GA airports as 'Reliever' is that these facilities are eligible to receive special funding consideration under the FAA's AIP Entitlement Program. Relievers receive this consideration because they are designated by the FAA as a nearby GA airport intended to help 'relieve' commercial airport's runway pressure.

**Table 1-C
FAA and CASP Airport Functional Classification Categories and Subcategories**

FAA NPIAS ⁹ Classifications	CASP ¹⁰ General Aviation Classifications
GENERAL AVIATION & RELEIVER	<p>Limited Use Subcategory is added if the Limited Use Airport supports a special service.</p> <p>Agriculture Firefighting Recreational Access Medical Emergency</p>
	<p>Community Subcategory is added if the Community Airport supports a special service.</p> <p>Agriculture Firefighting Recreational</p>
	<p>Regional Metropolitan Subcategory is added if the Metropolitan Airport supports a special service.</p> <p>Business / Corporate Recreation Cargo</p>
COMMERCIAL-PRIMARY & NONPRIMARY	<p>Nonprimary – Regional Nonprimary – Metropolitan Primary - (Hub-Size) – Regional Primary - (Hub-Size) – Metropolitan Subcategory is added if one of the above category airports support a special service.</p> <p>Business / Corporate Recreation Cargo</p>

⁹ NPIAS = National Plan of Integrated Airport Systems. Airports included in the NPIAS can be found on the FAA’s website at: http://www.faa.gov/airports_airtraffic/airports/planning_capacity/npias/

¹⁰ CASP = California Aviation System Plan

There are four general categories used by the FAA to classify airports in the 2009-2013 National Plan of Integrated Airport System (NPIAS), Primary, Nonprimary, General Aviation (GA) or Reliever. General Aviation airports are basically defined as those that do not receive scheduled passenger service, have at least 10 based aircraft and are at least 20 miles from the nearest NPIAS airport. Because of their relative proximity to Primary airports, a few GA airports have been designated by the FAA as Reliever Airports based on the role they play to alleviate congestion at Primary airports. Depending on the population base served, these Reliever airports are identified as either Metropolitan or Regional by the Division and must be public use facilities. In addition, if an airport enplanes more than 10,000 passengers, the FAA considers them Primary and further breaks them down by hub size – small, medium or large. Airports having more than 2,500 but less than 10,001 enplanements are considered Nonprimary.

To better distinguish airports for State planning purposes, in 1997 the Division, through an involved collaborative process with our partners, created functional classifications to help distinguish GA airport types. These classifications were shown earlier in Table 1-C. Categories and sub-categories used to classify airports in California are based on unique factors including access the airport provides; population size or geographic location of region the airport serves; type of flying activities that occur; aircraft accommodated; and services provided. Services provided are important when defining an airport's function as well as its role in the broader statewide aviation system. The Division, via the California Aviation System Plan, identifies GA airports as Limited Use, Community, Regional, Metropolitan, as well as the FAA's categories such as Primary or Nonprimary, and then uses subcategories to further delineate major operational activities.

In California, the two FAA general aviation classifications are more clearly defined by function. Below, the General Aviation airports are classified in one of the following four (4) categories as they are depicted in the GASNA District maps preceding each regional discussion.

Limited Use Airports – Airports that provide limited access; usually located in non-urban areas; may be used for a single purpose; have a few or no based aircraft; and provide no services.

Community Airports – Airports that provide access to other regions and states; located near small communities or in remote locations; serve, but are not limited to, recreational flying, training, and local emergencies; accommodate predominantly single engine aircraft under 12,500 pounds gross vehicle weight; provide basic or limited services for pilots or aircraft.

Regional Airports – Airports that provide the same access as Community airports but may provide international access; located in an area with a larger population base than Community airports, while serving a number of cities or counties; serve the same activities as Community airports with a higher concentration of business and corporate flying; accommodate most business, multi-engine and jet aircraft; provide most services for pilots and aircraft

including aviation fuel; has a published instrument approach and may have a tower.

Metropolitan Airports – Airports that serve the same activities as Regional airports; are located in urbanized areas; provide for the same flying activities as Regional airports with an emphasis on business, charter and corporate flying; accommodate all business jet services for pilots and aircraft, including jet fuel; has a published instrument approach and a control tower; provides flight planning facilities.

Subcategories used for Primary airports are intended to classify the general aviation activity that occurs there. The following subcategories are intended to emphasize prominent operational activities occurring at airports in a particular category further associating airports by function:

Agriculture – The use of an airport by aircraft for fertilizer application, seed dispersal, pest control and crop-dusting. *Used as a subcategory to designate: (1) a service provided at a Limited Use Airport, or (2) a prevalent activity at a Community Airport.*

Firefighting – The use of an airport by aircraft for aerial firefighting operations. *Used as a subcategory to designate: (1) a service provided at a Limited Use Airport, or (2) a prevalent activity at a Community Airport.*

Recreational Access – The use of an airport by pilots for recreational destination access. *Used as a subcategory to designate a service provided at a Limited Use Airport.*

Medical Emergency – The use of an airport by fixed-wing air ambulance aircraft to transport medical patients, accident victims, transplant organs and vital supplies to hospitals; serves remote regions not practical to be served by helicopters. *Used as a subcategory to designate a service provided at a Limited Use Airport.*

Recreational – The use of an airport by pilots not engaged in corporate or business flying or formal instruction; includes recreational and tourist destination access. *Used as a subcategory to designate the prevalent service provided at a Community, Regional or Metropolitan Airport.*

Business/Corporate – The use of an airport by an individual for transportation required by a business in which the individual is engaged (the pilot is not compensated); or the use of an airport by aircraft owned or leased by a company to transport its employees and/or property (professional pilot is compensated). *Used to designate the prevalent service provided at a Regional or Metropolitan Airport.*

Cargo – The use of an airport for transporting freight, mail and/or packages over a specified route by air. *Used as a category to designate the prevalent service provided at a Regional or Metropolitan airport.*

This GASNA only addresses public use airports since Special Use and Private Use airports (privately-owned, private-use) are not publicly funded. Military airports have also been excluded due to limited State involvement. However, March Air Force Reserve Base and Palmdale Plant 42 have the potential to increase capacity in the future as Joint Use facilities, providing limited, nonmilitary air carrier operations.

Minimum Standards

Part of the process of prioritizing improvements is to examine which airports need help maintaining current standards, which need help bringing their facility up to minimum standards, and which of these improvements will benefit the greater aviation community. Tables 1-C and 1-D are used to identify minimum standards for the type of use occurring at a facility, or the type of use desired to upgrade a facility to provide commercial relief to the regional system. Table 1-F suggests the minimum standards for airports desiring to maintain or accommodate business aircraft, as recommended by the National Business Aviation Association (NBAA). In cases where a runway would need to be extended by less than 100 feet to meet that airport's calculated minimum longest runway length, the runway would be generally considered to meet minimum standards without the extension. Whereas this is not a hard rule, it is a formula for promoting sound benefit cost discussions with individual airports.

Table 1-D
Minimum Standards by Functional Classification:
Primary Hub and Nonprimary Airports

Project Description (in priority order)	Minimum Standards by FAA Functional Classification	
	Primary Hub	Nonprimary
Runway Length/ Extension	8,000 feet or as provided in Airport Master Plan	7,000 feet if below 3,000 feet MSL or 8,000 feet if above 3,000 feet MSL; or as provided in Airport Master Plan
Runway Width	150 feet	150 Feet
Runway Weight Limit	60,000/single wheel; 200,000/dual wheel; or 300,000/dual tandem wheel	50k/single wheel or 100k/dual wheel
Runway/Approach Lighting	MALS to runway with precision IFR approach	MALS to runway with precision IFR approach
24-hour On-field Automated Weather Observation System	24-hour On-field Automated Weather Observation System	24-hour On-field Automated Weather Observation System
Landing Aids	VASI/PAPI to lighted runway if no approach lights; REIL for IFR runway without approach lights	VASI/PAPI to lighted runway if no approach lights; REIL for IFR runway without approach lights
Fuel Available	Jet A and Avgas	Jet A and Avgas
Runway Safety Area (RSA)	Formula determined per AC 150/5300-13, Chapter 1 #2, Chapter 3	Formula determined per AC 150/5300-13, Chapter 1 #2, Chapter 3

**Table 1-E
Minimum Standards by Functional Classification**

Project Description (in order of priority)	Primary Commercial Service Non-Hub or Commercial Service	Metropolitan	Regional	Community	Limited Use
Runway Length/ Extension¹	7,000' if below 3,000' MSL or 8,000' if above 3,000' MSL; or as provided in Airport Master Plan	5,000' if below 3,000' MSL; 6,000' if above 3,000' MSL; or as provided in Airport Master Plan	Sufficient to accommodate 100% of the aircraft fleet at 60% useful load per FAA AC 150/5325-4B Figure 3-2	Sufficient to accommodate 100% of the aircraft fleet having 10 passenger seats or less per FAA AC 150/5325-4B Figure 2-1	Sufficient to accommodate 95% of the aircraft fleet having 10 passenger seats or less per FAA AC 150/5325-4B Figure 2-1
Runway Width	150'	100'	75'	75'	60'
Runway Weight Limit (lbs.)	50k single wheel or 100k dual wheel	25,000 single wheel	12,500 single wheel	12,500 single wheel	12,500 single wheel
Runway Safety Area (RSA)	Formula determined per AC 150/5300-13, Chapter 1, Sect. 2; & Chapter 3	Formula determined per AC 150/5300-13, Chapter 1, Sect. 2; & Chapter 3	Formula determined per AC 150/5300-13, Chapter 1, Sect. 2; & Chapter 3	Formula determined per AC 150/5300-13, Chapter 1, Sect. 2; & Chapter 3	Formula determined per AC 150/5300-13, Chapter 1, Sect. 2; & Chapter 3
Visual Aids	VASI/PAPI to lighted runway if no approach lights; REIL for IFR runway w/o approach lights	VASI/PAPI to lighted runway if no approach lights; REIL for IFR runway w/o approach lights	VASI/PAPI to lighted runway if no approach lights; REIL for IFR runway w/o approach lights	VASI/PAPI to lighted runway if no approach lights; REIL for IFR runway w/o approach lights	None
Approach Procedure	ILS	GPS/VOR	GPS/VOR	GPS/VOR	None
Runway/Appch Lighting	MALS to runway with Precision IFR approach	MALS to runway with Precision IFR approach	None	None	None
24-Hour On-Field Automated Weather (AWOS/ASOS)	24 hour on-field weather observation	24 hour on-field weather observation	24 hour on-field weather observation	24-hour on-field weather observation if IFR approach, Part 135 or air ambulance operator on field.	None
Fuel Available	Jet A and Avgas	Jet A and Avgas	Jet A & Avgas	Avgas	None
Airport Layout Plan	Approval Date Fewer than 5-years old (Month/Year)	Approval Date Fewer than 5-years old (Month/Year)	Approval Date Fewer than 5-years old (Month/Year)	Approval Date Fewer than 5-years old (Month/Year)	Approval Date Fewer than 5-years old (Month/Year)
MSL: Mean Sea Level AMP: Airport Master Plan SWL: Single Wheel Loading (Landing gear with a single wheel on each strut) MALS: Medium-Intensity Approach Lighting System IFR: Instrument Flight Rules			VASI: Visual Approach Slope Indicator PAPI: Precision Approach Slope Indicator ASOS: Automated Surface Observing System AWOS: Automated Weather Observing System		
¹ The minimum standard length is calculated based on the airport elevation and daily mean maximum temperature. The airport elevation is obtained from the FAA 5010 airport master record.					

Table 1-F
NBAA Business Aircraft Airport Guidelines¹¹

	Acceptable Minimums	
Runways¹²	Dimensions-ft	Weight capacity-lbs
Heavy Jet (>50,000 lbs.)	5,500 x 100	75,000
Medium Jet (up to 50,000 lbs.)	5,000 x 100	50,000
Light Jet (up to 25,000 lbs.)	4,000 x 75	20,000
Very Light Jet/Turboprop (up to 12,500 lbs.)	3,000 x 60	15,000
Airside Configuration	Adequate ramp area for maneuvering/parking	
ATC Tower	None	
Lighting	<ul style="list-style-type: none"> • REIL or ODALS • Medium intensity runway lights • Visual glide scope on instrument runway • Pilot controlled lights 	
Instrument Procedures	<ul style="list-style-type: none"> • RNAV SIDs/STARs 	
Weather Reporting	AWOS	
Communications	ATC Remote Controlled Outlet	
Services	<ul style="list-style-type: none"> • Enclosed passenger waiting area • Fuel/tie-downs • Elementary security • Telephone 	
Maintenance	Minimal maintenance (tire/battery service, etc.)	
Amenities	<ul style="list-style-type: none"> • Distant hotel/motel • Vending machines 	

Future Considerations

From regulatory updates, to economic changes, to aircraft improvements, airports are always adapting to the dynamics affecting the larger aviation system. The Future Airport Capacity Task (FACT) 2 Report¹³, a federal study of airport expansion needs, examined which of the nations busiest airports are expected to require additional capacity by 2025. In the federal system, capacity is largely a measure of how safely controlled the nations airspace operates, and thus the reason for NextGen improvements. In the State system, flying and moving aircraft around an airfield, managing goods movement (cargo), and facilitating passenger travel to and from the airport is a State and local transportation and airport affair. Although Section III of this report expands on what the Primary airports are facing, it is appropriate to mention that the Fact 2 report identified Nine Primary Hub

¹¹ National Business Aviation Association. *Airports Handbook*. 2009. For airport design purposes only. Actual selection based on aircraft performance requirements. Not intended to replace actual FAA design standards.

¹² Sea level requirements. Note: FAA approved runway performance data determines individual aircraft runway length requirements.

¹³ The FAA's FACT 2 Report can be found on their website at:
http://www.faa.gov/airports/resources/publications/reports/media/fact_2.pdf

airports in California needing capacity enhancements. Five Primary airports were considered whether they will need additional capacity even after planned the improvements. These include those listed in Table 1-G.

Table 1-G

Capacity Needs in the National Airspace System (2015-2025):

An Analysis of California Airports and Metropolitan Area Demand and Operational Capacity in the Future (FAA FACT 2)

California Commercial Service Airports by Metropolitan Region	Year Additional Capacity is Needed <i>without</i> Planned Improvements (FACT 2)		Year Additional Capacity is Needed <i>after</i> Planned Improvements (FACT 2)	
	2015	2025	2015	2025
Los Angeles Metropolitan Area¹	X	X	X	X
Long Beach – Daugherty Field ²	X	X	X	X
Los Angeles International		X		
Ontario International				
Palm Springs International				
John Wayne – Orange County ²	X	X	X	X
Bob Hope - Burbank				
San Diego Metropolitan Area³		X		X
San Diego International		X		X
San Francisco Metropolitan Area¹	X	X	X	X
Metro. Oakland International ⁴	X	X	X	X
San Francisco International		X		X
Mineta San Jose International				

Table 1-G Notes:

¹Based on the six airports identified in the 2015 mid-term planning period, the metropolitan areas surrounding these airports were assessed. The analysis found that four metropolitan areas did not have sufficient capacity to meet the anticipated demand in 2015 and include **Los Angeles**, New York, Philadelphia, and **San Francisco**.

²Long Beach (LGB) and John Wayne (SNA): both airports have legally-enforceable operational and noise restrictions that limit the number of operations at each facility. These enforcements pre-date ANCA and enjoy strong local support. It is assumed these restrictions will remain in place with the operational levels forecasted for these airports in 2015 not likely to be reached. Thus, the actual future delays will likely be less than the criteria established for this analysis. However, this may mean that significant demand will go unsatisfied.

³San Diego Metropolitan Area added based on new FACT 2 criteria.

⁴Oakland (OAK): Geographic, terrain, and airspace issues continue to constrain airports like OAK. These issues may limit an airport's ability to add additional runway or airside capacity.

Capacity Needs Observations by 2025:

- A. Even after planned capacity improvements, four airports (LGB, SNA, SAN, and SFO) will need additional capacity.
- B. All three California metropolitan areas will need further capacity enhancements after planned improvements are completed.

As planned growth, capacity constraints, or weather conditions dictate, large, medium and small hub Commercial Service airports look to nearby Metropolitan and Regional GA airports to provide Reliever service. Metropolitan and Regional GA facilities located around the State are being asked to consider accommodations for the growth in GA and commercial air service, as well as to anticipate an increased share of Commercial Service and GA aircraft operations as capacity is reached. Capacity relief projects can take several forms including, but not limited to, accommodating overflow flight operations or weather diversions, accommodating displaced GA aircraft from commercial hubs due to expansion, providing additional hangar and tie-down space, and expanding maintenance opportunities. The growing needs of commercial service airports are briefly indicated in Section III for consideration by GA facility sponsors. Again, this document attempts to identify airports best suited to generally serve in significant roles at the statewide, regional and local levels, and the enhancements needed to optimize their functionality to the State aviation system within their classifications.

When considering changes in the types of aircraft using GA facilities, jet aircraft, including very light jets (VLJs), are forecast to account for most of the increase, expanding at an average annual rate of around six percent through 2017.¹⁴ The increases in jet hours result from the introduction of VLJs, increases in fractional (shared) ownership of aircraft, and the associated activity levels. Fractional ownership aircraft fly about 1,200 hours annually compared to approximately 350 hours for all business jets in all applications. While there is still a good deal of uncertainty about the utilization rates of the new microjets or VLJs, their application and importance in the State's overall economic health appears positive.

¹⁴ Airport Cooperative Research Program, Report 17, 2009. *Airports and the Newest Generation of General Aviation Aircraft*, pg. 25.