

CHAPTER 3: WHAT CHANGES ARE EXPECTED IN GENERAL AVIATION?

Why are General Aviation Trends Important to Washington?

GA provides a wide range of essential services from business transportation to medical evacuation and agricultural support.

General aviation (GA) is defined by the FAA as all aviation other than scheduled commercial aviation and military aviation. GA provides a wide range of essential services such as personal and business transportation, medical evacuation, and agricultural support to communities across the state. Over 8,000 GA aircraft including single-engine piston-powered airplanes, multi-engine turboprops, intercontinental business jets, helicopters, and experimental and light sport aircraft are currently based in Washington State. While GA activity sits often in the shadow of commercial activity, it plays an integral role in fostering the state economy. The large majority of airports in Washington are used for general aviation, and GA aircraft perform the majority of aircraft takeoffs and landings in the state. In addition, GA airports provide the closest access to the national air transportation system in most of the state.

At the end of the 20th century, NASA, the FAA, and other partners began working on the Small Aircraft Transportation System (SATS) with the aim of developing technologies to relieve safety and congestion problems on highways and in the air

Consequently, it is important to identify GA trends that could affect future demand on Washington's aviation system. As stated as a guiding principle for the FAA's National Plan of Integrated Airport Systems (NPIAS), "Airports should be flexible and expandable, able to meet increased demand and to accommodate new aircraft types."

GA is and will continue to be dominated by single and multi-engine piston-powered aircraft, used primarily for personal use, and flown by Visual Flight Rules (VFR). However, high performance aircraft used for business purposes and flown by Instrument Flight Rules (IFR) are a growing portion of GA in Washington and are using more of Washington's airports. Increasingly, they are the most demanding aircraft for the design of airport facilities and services.

What GA Trends Will have the Greatest Effect on Washington's Airports?

In general, growth in the amount of GA activity is associated with underlying socio-economic growth. GA activity is highly cyclical, sensitive to economic conditions and fuel prices. However, the type of GA activity that will occur in the future is also affected by industry trends. It appears that three GA trends could have a significant effect on future demand for Washington's airport facilities and services:

- Continued growth of business jets.
- Introduction of Very Light Jets, including possible air taxi use.
- New instrument approaches, resulting from the FAA's Next Generation Air Transportation System initiatives.

The last two trends relate to the Small Aircraft Transportation System (SATS). At the end of the 20th century, NASA, the FAA, and other partners began working on SATS with the aim of developing technologies to relieve safety and congestion problems on highways and in the air.

SATS would extend air service to the thousands of non-commercial public-use airports in the NPIAS. Approximately 98 percent of Americans live within 30 minutes of a NPIAS airport. The SATS vision is an equitable, distributed, on-demand, point-to-point, near all-weather transportation system using small aircraft to fly into and out of underutilized airports, many without radar or ground control support. In 2005, the SATS project culminated in a demonstration of newly developed technologies in four areas:

- Higher volume operations in non-radar airspace and at non-towered airports.
- Lower landing minimums at minimally equipped landing facilities.
- Increased single-pilot crew safety and mission reliability.
- En route procedures and systems for integrated fleet operations.

The SATS vision may become a reality with the combination of new Very Light Jets and the FAA's Next Generation Air Transportation System.

How Will Continued Growth of the Business Jet Fleet Affect Washington's Airports?

For several years business aviation and turbine aircraft operations have been growing faster than other components of aviation. The FAA's latest forecasts project business use of general aviation will continue to expand more rapidly than personal/sport use.

Business jets are heavier, have greater wingspans, and are faster than piston aircraft. Nearly all the business jets now in use are heavier than 12,500 pounds maximum takeoff weight and have wingspans greater than 40 feet.

Since the terrorist attacks of September 11, 2001, heightened safety/security concerns for business travelers and increased processing times at some airports have made business jets practical alternatives to travel on commercial flights.

Fractional Ownership

With fractional ownership, corporations or individuals purchase an interest in an aircraft and pay a fixed fee for operations and maintenance.

With fractional ownership, corporations or individuals purchase an interest in an aircraft and pay a fixed fee for operations and maintenance. The concept was introduced in 1986 by NetJets and has grown significantly. The growth trend is expected to continue. The typical candidates for fractional ownership participation are businesses that do not have their own flight departments, wealthy private individuals, and corporate flight departments that need additional lift, but cannot justify acquiring another aircraft. The four major fractional ownership providers are NetJets, Bombardier Flexjet, Flight Options, and CitationShares. Marquis Jet Partners buys fractional shares and sub-leases them, which avoids acquisition costs, monthly maintenance fees, and flight-hour fees associated with the traditional fractional ownership programs.

Effect of Business Jets on Airports

As a business jet becomes the most demanding aircraft regularly using⁶ a GA airport, runway length, width, strength, and other airport design standards will be more demanding, possibly including the spacing between runways and taxiways. If runways aren't long enough and compliant with design standards, an aircraft might be required to limit fuel or passenger loads.

Justification for instrument approaches increases with business jet traffic, since they are equipped for and flown by Instrument Flight Rules (IFR) all the time, and their business traveler occupants need to be assured of landing at the desired location at the desired time.

Compared to visual approaches, instrument approaches require more facilities, such as runway edge and approach lights, automated real-time weather reporting equipment, a full-length parallel taxiway, and compliance with more restrictive design standards, such as cleared areas around runways and taxiways. The requirement for a runway protection zone⁷ at the end of a runway can vary from eight to 79 acres, depending on the instrument approach as well as the aircraft size and speed. Meeting

⁶ Regular use, as defined by the FAA, is at least 500 annual itinerant operations. (An operation is a takeoff or landing.) This is equivalent to the design aircraft landing an average of once per weekday.

⁷ The purpose of the runway protection zone is to protect people and property on the ground; the runway protection zone must be clear of incompatible land uses, such as residences and places of assembly.

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more demanding design standards might necessitate wetlands fill, land/easement acquisition, or relocation of roads, houses, or businesses. Instrument approaches need more airspace clear of obstructions on- and off- airport than visual approaches, which could necessitate the removal or relocation of vegetation, terrain, structures, and roads.

Needs and expectations for the type and quality of aviation services increase along with increases in business jet traffic. While Fixed Base Operators (FBOs) typically provide the services needed for business jets, airport sponsors may need to provide supporting infrastructure, such as bulk jet fuel storage. In addition, the airport sponsor should be prepared for new/expanded FBO service with appropriate land use planning, up-to-date minimum standards for aeronautical service providers, and appropriate rates, charges, and leasing policies.

How Will Very Light Jets Affect Washington's Airports?

Very light jets (VLJs), also called microjets or personal jets, are a new class of airplane that offers performance comparable to high-end business jets at a fraction of the price. They will be capable of operating from shorter runways than commercial airliners and larger business jets.

A VLJ could be an added to a corporate jet fleet, sold to an individual owner, or it could redefine the air taxi industry.

A VLJ costs between \$1 and \$3 million, weighs less than 10,000 pounds, seats up to seven people and can fly 1,000 miles at speeds of 300 to 400 mph. They can fly at altitudes up to 40,000 feet, where it's easier to find a smooth ride than at lower altitudes. VLJs are quieter, less polluting, and more energy efficient than piston and turboprop aircraft of similar size. They are made from lightweight composite materials and have advanced cockpit automation, such as moving map GPS and multi-function displays, automated engine and systems management, and integrated autoflight, autopilot, and flight guidance.

Three air taxi or charter operators have announced their intentions to start operating with VLJs.

Two companies received FAA certification for the jets in 2006—Eclipse Aviation (Eclipse 500) and Cessna Aircraft Company (Mustang). Other companies developing VLJ are Embraer, Honda Motor Company, Piper Aircraft, Adam Aircraft, Diamond Aircraft, Avocet, Epic, and Spectrum Aeronautical. The FAA's latest forecast projects that 350 microjets will join the US fleet in 2008, a number growing to between 400 and 500 additional VLJ per year through 2020.⁸

⁸ FAA Aerospace Forecast Fiscal Years 2007-2020.

Potential Uses of VLJ

Opinions differ about the jet's market niche, and reality may be different than any opinions. A VLJ could be added to a corporate jet fleet, sold to an individual owner, or it could redefine the air taxi industry. Eclipse's expectations hinge largely on the air taxi industry, with an opportunity to bring business people who normally drive into short-haul jet travel. Cessna doesn't believe the air taxi industry is feasible; the company plans on cornering the market on sales for corporate travel and individual owner/operators.⁹

“Air taxi” and “charter” are terms used interchangeably to describe unscheduled commercial flights, but for the customer, they are not identical. Chartering an airplane involves paying a fixed per hour charge for the full airplane, while air taxi operators usually charge by the seat-mile or have a fixed rate for flights between given locations. Currently, most air taxi operators use piston aircraft with maximum speeds around 200 mph, a service ceiling of about 25,000 feet, and a practical range of about 350 miles. For several years, the trend has been for piston-powered aircraft to be phased out in favor of turbine (turboprop and turbojet) aircraft.

An air charter industry survey shortly after 9/11 found that demand for charter services increased by 30 percent over pre-9/11 levels, and approximately 30 percent of the demand was from first-time users. Business travelers account for 70 percent of the market. The industry's growth trend is projected to continue, and may be strengthened by VLJ air taxi operations. Security processing is just one problem with commercial airports that has spurred the charter industry. Another problem is the reduction in airline service to smaller markets in recent years, leaving some travelers to smaller cities with the choice of a highly inconvenient flight schedule or a long drive, since the community lacks airline service.

VLJ Air Taxi or Charter Operators

Three air taxi or charter operators have announced their intentions to start operating with VLJs--Pogo, Linear Air, and DayJet.

One of DayJet's goals is to restore the ability to conduct day trips to/from small regional markets.

DayJet is competing with the automobile, not major airlines.

Pogo is a startup company headed by former American Airlines Chairman, Robert Crandall. Pogo plans to begin VLJ air taxi flights in 2008, operating in a 500-nautical mile circle around New York City, where there are 800 useable airports. Pogo plans to lure high-income passengers who require point-to-point charter service, competing with the automobile and major airlines for trips to 300-mile destinations that cannot be visited in a single day. The company is planning an average full plane charter price of

⁹ Stephen Majors, Associated Press. “Very Light Jets Poised for Aviation Stardom?” November 6, 2006.

\$2,000 per occupied hour, equating to per-seat prices not more than 30 to 40 percent above full-fare airline fares. Pogo asserts their rates using VLJ will be 40 to 50 percent below current jet charter rates. The company has not yet chosen the VLJ it will use.

Linear Air, based in Massachusetts, has a business plan similar to Pogo's, but is already operating an air taxi service using the eight-seat Cessna Grand Caravan as a proxy for the Eclipse VLJ. Linear Air plans to acquire and operate Eclipse jets in the Northeast soon and quickly expand to Los Angeles, San Francisco, and Washington D.C. Rates are per-plane, not per-passenger, based on the trip's distance and time flown. The per-person cost is typically more than a full fare airline ticket, but the flight time is considerably shorter.

DayJet, based in Florida, plans to operate a true air taxi. One of DayJet's goals is to restore the ability to conduct day trips to/from small regional markets. Like its two VLJ competitors, DayJet expects the majority of its business will come from business travelers who would otherwise drive on regional trips of 100 to 500 miles. However, instead of chartering a full plane, customers will pay an annual membership fee that lets them request a seat with as little as four hours of advance notice. Travelers with flexible schedules, helping DayJet fill its planes, will get discounted rates. DayJet asserts it is competing with the automobile, not major airlines; in fact, the DayJet business model predicts some customers who fly DayJet one way will take a commercial flight the other way.

DayJet has taken delivery of a small number of Eclipse 500 aircraft and plans to begin air taxi service in 2007. The DayJet concept of "per-seat, on-demand" regional air service marries the VLJ with its own real-time, fully automated operations system. DayJet is planning to charge between \$1 and \$3 per seat-mile, a price touted as a modest premium over commercial airlines. DayJet plans to begin service in Florida and quickly expand into six other southeastern states. DayJet has published its facility and service requirements for the three different categories of airports it will serve:

- DayStops, the most basic category, will be an extended pick-up or drop-off point for passenger service, needing:
 - Hard surfaced runway of 3,500 feet or longer
 - Secure perimeter
 - Runway lighting
 - Visible signage from interstate to FBO terminal

- DayPorts, primary points of passenger origin/destination and refueling stations, will need:
 - Sufficient paved ramp space
 - Sufficient space for a customer welcome desk
 - Jet A fuel, oxygen and nitrogen
 - Qualified FBO line personnel for fueling and towing, and minimal maintenance capability
 - Fuel truck and power cart (28v)
 - Car rental and taxi service for passengers
 - Sufficient passenger seating, restrooms and parking
 - Cost considerations for fuel, landing fees, facility rental and other services
 - T-1 broadband connection
 - IT backup generator
 - Lockable closet for server hardware
- DayBases, which will be home for maintenance facilities and flight operations personnel, need:
 - Air traffic control tower or high volume operation technology support
 - ILS or WAAS approaches
 - Approach and taxiway lighting
 - 5,000 to 7,000 feet of available leased hangar space
 - Dedicated, secure WiFi Internet connectivity
 - Dedicated terminal (desired)
 - Strong community relationships

Effect of VLJ on Airports

The new Very Light Jets will be capable of using many public-use airports in Washington that see no jet activity now. They will most likely be seen at airports in communities or resort destinations that business travelers or wealthy individuals want to visit, if the airport has a paved runway long enough. If high-volume air taxi operations in VLJ start happening in Washington, they may not occur until the concept has been proven in other parts of the country. Every VLJ air taxi getting ready to initiate

The new Very Light Jets will be capable of using many public-use airports in Washington that see no jet activity now.

service is located in the eastern half of the country. While VLJ operations should not need the same level of airport facilities and services as the current fleet of business jets, jet fuel, instrument approaches, and a higher level of amenities for passengers may be needed. Instrument approaches would be needed for the same reason they are needed for larger business jets. While it would not be fiscally prudent for every small airport to invest in improvements with the expectation of VLJ usage, airports should assess the potential impacts, particularly the impact of instrument approach improvements, which include larger areas on-and off-airport that need to be clear of obstructions.

One premise of VLJ development is that they could operate on the runways lengths existing at most GA airports. VLJs can operate on runways 3,000 to 3,500 feet long, although VLJs used in air taxi service may require longer runways due to Part 135 regulatory requirements. Many of Washington's GA airport runways are shorter than 3,000 feet. In some circumstances, runway lengthening may be required to serve the VLJ, unless another airport in the region can provide the needed runway length.

Even if the average NPIAS airport in Washington had adequate runway length, width, strength, and design standard compliance for the VLJ, new or improved facilities may be needed, such as in the previous DayJet listings of facilities and services needed at DayStops, DayPorts, and DayBases. Upgrading large numbers of GA airports in the state for VLJ needs would be unnecessary. Although the VLJ is intended for non-congested airports, it is not likely that there will be strong VLJ demand at primitive airports in rural areas that lack services. They will more likely use airports that have FBOs who will expand their services for the VLJ.

Possible Adverse Effects

Some people have expressed concern that VLJ traffic will actually increase congestion at busy commercial service airports. A NASA study in 2005 projected that air taxis will want to land at commercial service airports, increasing traffic at some airports, such as Las Vegas, up to 25 percent.¹⁰

Others contend that VLJs will be sharing finite airspace at 40,000 feet with airliners and larger business jets. Since VLJs cruise much slower

¹⁰ Scott McCartney, The Wall Street Journal, "Air-Taxi Services threaten to Jam Airports," March 28, 2006.

than airliners and larger business jets, they could delay traffic, like a Sunday driver on a two-lane country road.¹¹

Will Washington Experience a Large Increase of Instrument Approaches and Other Changes from NexGen?

NexGen encompasses advances in automation information systems, communications, navigation, surveillance, and weather.

The FAA is part of an interagency and private industry effort to develop a concept for 2025 that transitions the current national airspace system into the Next Generation Airport Transportation System (NGATS or NexGen). The vision of NexGen is to modernize aviation to support greater capacity and less congestion. NexGen addresses critical safety and economic needs in civil aviation while integrating national defense and homeland security improvements.

NexGen encompasses advances in automation information systems, communications, navigation, surveillance, and weather. NexGen is dependent on global positioning system (GPS) satellites.

While the impetus for NexGen is to decrease congestion at the nation's busiest commercial service airports, it is not just focused on air carrier aircraft and commercial service airports. Many of the concepts behind NexGen began as a pilot program focused on improving safety for operations in small piston air taxi aircraft in rural Alaska. NexGen anticipates handling a wide range of aircraft types, including VLJs used as air taxis, and aims to more effectively use the largely untapped capabilities of thousands of small airports throughout the nation.

Automatic Surveillance Monitoring

One element of NexGen is Automatic Dependent Surveillance-Broadcasting (ADS-B). ADS-B provides radar-like surveillance monitoring that lets both the pilot and Air Traffic Control (ATC) know exactly where the airplane is. ADS-B can provide additional traffic routes for aircraft in mountainous terrain and in poor weather. By FY 2010, the FAA plans to operationally implement ADS-B for air traffic services at selected sites.

¹¹ Statement of the Air Transport Association of America, Inc. before the Aviation Subcommittee of the Senate Committee on Commerce, Science & Technology concerning the Impact of new Jet Aircraft on the National Airspace System, September 28, 2006.

Performance Based Navigation

Potentially, thousands of small airports that lack ILS now will be useable during bad weather with WAAS-aided approaches, increasing safety and reducing air traffic delays.

Performance-based navigation (PBN) is another element of NexGen. PBN establishes precise approach, arrival, and departure procedures at airports. It increases efficiency by providing smoother traffic flow, saves fuel, and benefits the environment by reducing the effects of aircraft noise and emissions. Performance based air traffic control systems are in place in part of Alaska and are expanding along the Eastern seaboard and Ohio Valley. The FAA is advancing PBN with continued implementation of Area Navigation (RNAV) routes, standard instrument departures (SIDs), and standard terminal arrivals (STARs). Two key elements of PBN are being accelerated—RNAV and RNP. RNP is RNAV with the addition of an on board performance monitoring and alerting system. RNAV enables aircraft to fly on any desired flight path within the coverage of navigation aids, within the limits of the capability of self-contained systems, or a combination of both capabilities. RNAV aircraft have better access and flexibility for point-to-point operations.

Probably the majority of GA pilots will not rush to upgrade their cockpits with all of NexGen’s “bells and whistles,” and many recreational pilots may choose to stick to unsophisticated visual flight for years to come. However, many GA pilots have been using GPS for navigation for the last decade. GPS instrument approaches to runways have also been available for ten years, although the first GPS approaches “overlaid” existing nonprecision instrument approaches. The overlay GPS approaches increased the navigation aids a pilot could use, but did not enhance their instrument landing with lower cloud ceiling and visibility minimums.

Instrument Approaches Using Wide Area Augmentation System

Since 2003, the Wide Area Augmentation System (WAAS) has been available to provide more exacting navigational guidance than satellites alone. WAAS helps GPS provide vertical guidance to the runway surface and eliminates the need for costly instrument landing systems (ILS). Potentially, thousands of small airports that lack ILS now will be useable during bad weather with WAAS-aided approaches, increasing safety and reducing air traffic delays. The Local Area Augmentation System (LAAS) is another technology that FAA may use in the future, like WAAS, to provide GPS approaches with minimums equivalent to precision ILS approaches. The FAA’s strategy to reduce general aviation accidents includes developing and publishing more WAAS approaches; in FY 2007, the FAA will publish 300.

While instrument approaches can be developed inexpensively using GPS, weather reporting equipment, runway lights, approach lights, parallel taxiways, compliance with more demanding design standards, and other

improvements are needed for instrument runways that are not needed for visual runways.

The 2007-2011 NPIAS Report to Congress acknowledges that the FAA has not fully assessed the infrastructure needs to implement approaches, such as Localizer Precision with Vertical Guidance (LPV) approaches using WAAS. Aerial surveys are underway to assess obstacles that may impact approach minimums. Master plans are underway to consider the airport infrastructure, like a parallel taxiway, that may be needed to accommodate an LPV approach.

With more instrument approaches to more airports, there is a greater chance of overlapping and conflicting approach and departure surfaces. Instrument approach improvements should be analyzed in terms of their impact on other airports, as well as on the airport and its immediate surroundings.

More instrument approaches could complicate busy airspace and increase ATC workload, since IFR aircraft depend on ATC more than VFR aircraft. On the other hand, ADS-B and other NexGen programs are intended to lessen ATC workload and congestion.

Will Other GA Trends Affect Washington's Airports?

Other trends in the GA industry are not projected to have the widespread significance to Washington's airport system over the next 25 years as the three discussed above. The trends described in this section may affect a few individual airports significantly. Or, as is sometimes the case with new technology and ideas, they may have unforeseen consequences and significance to Washington's public use airports.

Sport Aviation

In 2004 the FAA created a new rule for the manufacture, certification, operation, and maintenance of light-sport aircraft and a new sport pilot certificate. Light-sport aircraft are low-performance aircraft weighing less than 660 pounds (if lighter-than-air), 1,320 pounds (if not intended for use on water), or 1,430 pounds (if intended for water use). They are heavier than ultralight vehicles and include airplanes, gliders, balloons, powered parachutes, weight-shift-control aircraft, and gyroplanes. A person with a valid driver's license can operate a light-sport aircraft. Sport aviation is likely to boost general aviation by providing a safe, relatively inexpensive way to introduce people to flying. Many light-sport aircraft are not appreciably different from other piston-powered aircraft that are now

using GA airports. While conflicts between lower-performance and higher-performance aircraft can arise at busier airports, as they have in the past, most can be mitigated with voluntary procedures.

FBO Trends

Fixed Base Operators are the primary providers of aviation services such as fueling, aircraft maintenance, aircraft repair, aircraft rentals, flight training, and pilot amenities. Since the number of FBOs peaked about 25 years ago, many small FBOs have gone out of business, a trend aided in recent years by flight school restrictions, soaring insurance costs, and other fallout from 9/11. Historically, many FBOs were more aviation enthusiasts than business operators. Increasingly complex government regulations and business requirements have made it harder for small FBOs to stay in business. Succession for family owned businesses is another problem for many small FBOs. Several airports in Washington that once had FBO service no longer have an FBO.

At the other end of the spectrum, large FBOs at large airports have benefited from the growth in business jets. A wave of FBO mergers and acquisition began around 2000. Consolidation was due to the owners' long-term investment strategies rather than the economic downturn. FBO franchises have become prominent and are preferred by some corporate aviation departments and fractional ownership groups because they serve multiple airports.

The National Air Transportation Association reports that FBOs will continue moving more toward a supporting role for business aviation, and be less dependent on the recreational pilot. To maintain the economic viability of small airports lacking a FBO, it may be necessary for airport sponsors to consider providing some FBO facilities or services, or take other actions to make the airport more attractive to a FBO. Some sponsors contract with a FBO for airport management and operation, which increases the FBO's revenue sources. At larger airports, sponsors may need to focus on maintaining a level playing field for qualified competing FBOs and aviation service providers.

Security

The terrorist attacks of 9/11 had many repercussions on general aviation, such as "no fly zones" and restrictions on flights schools, aircraft rentals, and agricultural sprayers. The Transportation Security Administration (TSA) requires security screening for charter aircraft over 12,500 pounds, which occurs at some GA airports. However, the TSA has not imposed facility requirements on GA airports, working instead with the GA Industry to develop security recommendations. Many airports on their

own have instituted new access controls, surveillance, and watch programs since 9/11. Security measures recommended by the TSA for GA airports are tailored to the level of risk associated with various airport characteristics, such as number of based aircraft and location relative to populated areas. Access control is recommended for almost any size or type of GA airport. Fencing and gates have safety benefits, such as controlling wildlife, reducing the potential for runway incursions, and protecting the general public from the dangers of aircraft operating areas. Increased levels of security at GA airports are warranted to protect high value airplanes and avionics from theft and vandalism, as well as from terrorist actions. For GA airports, 9/11 raised the funding priority of airport security improvements that were warranted for other reasons. As long as GA airport sponsors continue being proactive about security, further TSA regulation may be unwarranted.

Other New Aircraft

Many new types of aircraft, in addition to the VLJ, are under development and could someday affect GA airport facility and service requirements in Washington:

- New amphibious aircraft are particularly interesting to a state with seaplane bases like Washington. The Centaur, developed by Warrior Aero-Marine, is a six- or seven-seat flying boat with wings that can be folded to enable access to marina docks and yacht berths. A composite-hull replacement for the Grumman Goose is under development in Renton. The Goose could hold more passengers than seaplanes in use now, and could taxi in and out of the water.
- Various ideas for “flyable” cars and “roadable” airplanes are being developed, which could drastically change the nature of airports if they were to enter the marketplace extensively.
- The V-22 Osprey tiltrotor lands and departs like a helicopter but flies like a fixed-wing turboprop. It was once thought to have the potential to be used as a city center to city center commuter aircraft. High operating costs, noise, and difficulties in defining landing sites have hindered that vision. The military has missions appropriate for the aircraft and plans to deploy it in Iraq in 2007.
- Unmanned Aerial Vehicles (UAV) are being rapidly deployed across the country, not just in military applications, but also in a variety of non-military surveillance roles. This proliferation of UAV, some launched from general aviation airports, has created concerns about aviation safety and airspace congestion, which NexGen plans to address.

Key Findings

Strong growth in the business jet fleet will continue in the next 25 years.

- Business jet growth is fuelled by fractional ownership programs, security processing time and effort at commercial airports, and loss of commercial airline service to smaller cities.
- Business jets are heavier, have greater wingspans, and are faster than piston aircraft, so are more demanding on airport facilities.
- As the business jet becomes the most demanding aircraft regularly using a GA airport, runway length, width, strength, and other airport design standards will be more demanding, possibly including the spacing between runways and taxiways. If runways aren't long enough and compliant with design standards, an aircraft might be required to limit fuel or passenger loads.
- Business jets need instrument approaches. Additional facilities are required for instrument approaches and FAA airport design standards are more demanding for instrument runways than visual runways.
- The type and quality of aviation services needed increases along with increases in business jet traffic.

New Very Light Jets are entering the market and could redefine the air taxi industry.

- Very light jets (VLJs) are a new class of airplane that offers performance comparable to high-end business jets at a fraction of the price.
- Two were certified in 2006, the Eclipse 500 and Cessna's Mustang. Several other VLJ are in development.
- A VLJ could be added to a corporate jet fleet, sold to an individual owner, or it could redefine the air taxi industry.
- Pogo and Linear Air plan to use the VLJ for air charters in the Northeast, charging customers a fixed per hour charge for the full airplane.
- DayJet plans to operate a "per seat, on-demand" air taxi service in the Southeast, starting in 2007.
- DayJet has set out minimum airport facility and service requirements. For the most basic pick-up or drop-off point for passenger service, the requirements are:
 - Hard surfaced runway of 3,500 feet or longer

- Secure perimeter
 - Runway lighting
 - Visible signage from interstate to FBO terminal
- The VLJ will be capable of using many public-use airports in Washington that see no jet activity now.
 - While VLJ operations should not need the same level of airport facilities and services as the current fleet of business jets, jet fuel, instrument approaches, and a higher level of amenities for passengers may be needed.
 - VLJs can operate on runways 3,000 to 3,500 feet long, although VLJs used in air taxi service may require longer runways due to Part 135 regulatory requirements.
 - Although the VLJ is intended for non-congested airports, it is not likely that there will be strong VLJ demand at primitive airports in rural areas that lack services. They will more likely use airports that have FBOs who will expand their services for the VLJ.
 - Instead of reducing congestion at the nation's business airports and airspace, VLJs may increase congestion. A NASA study projected that air taxis will want to land at commercial service airports, increasing traffic up to 25 percent. VLJs will be sharing finite airspace at 40,000 feet with much faster-cruising airliners and larger business jets, which some people fear will clog airspace.

The FAA is developing many new instrument approaches and other technological advances with the Next Generation Air Transportation System (NGATS).

- The FAA is part of an interagency and private industry effort to develop a concept for 2025 that transitions the current national airspace system into the Next Generation Airport Transportation System (NGATS or NexGen).
- NexGen encompasses advances in automation information systems, communications, navigation, surveillance, and weather. NexGen is dependent on global positioning system (GPS) satellites.
- Since 2003, the Wide Area Augmentation System (WAAS) has been available to provide more exacting navigational guidance than GPS alone. WAAS helps GPS provide vertical guidance to the runway surface and eliminates the need for costly instrument landing systems (ILS). Potentially, thousands of small airports that lack ILS now will be useable during bad weather with WAAS-aided approaches, increasing safety and reducing air traffic delays.
- The FAA is developing and publishing more WAAS approaches; in FY2007, the FAA will publish 300 nationwide.

While instrument approaches can be developed inexpensively using GPS, weather reporting equipment, runway lights, approach lights, parallel taxiways, compliance with more demanding design standards, and other improvements are needed for instrument runways that are not needed for visual runways