

# CHAPTER 5: AVIATION TRENDS

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## Introduction

In many instances, commercial service and general aviation trends occurring at Washington's airports are reflective of industry-wide developments affecting aviation patterns across the country. It is therefore useful to put statewide trends into a national context.

An overview of national commercial service trends and general aviation trends is presented below, together with a discussion of trends within Washington State.

## Current Commercial Service Trends

*Understanding changes impacting the U.S. airline industry may allow the state to anticipate future changes in the airline services at Washington airports*

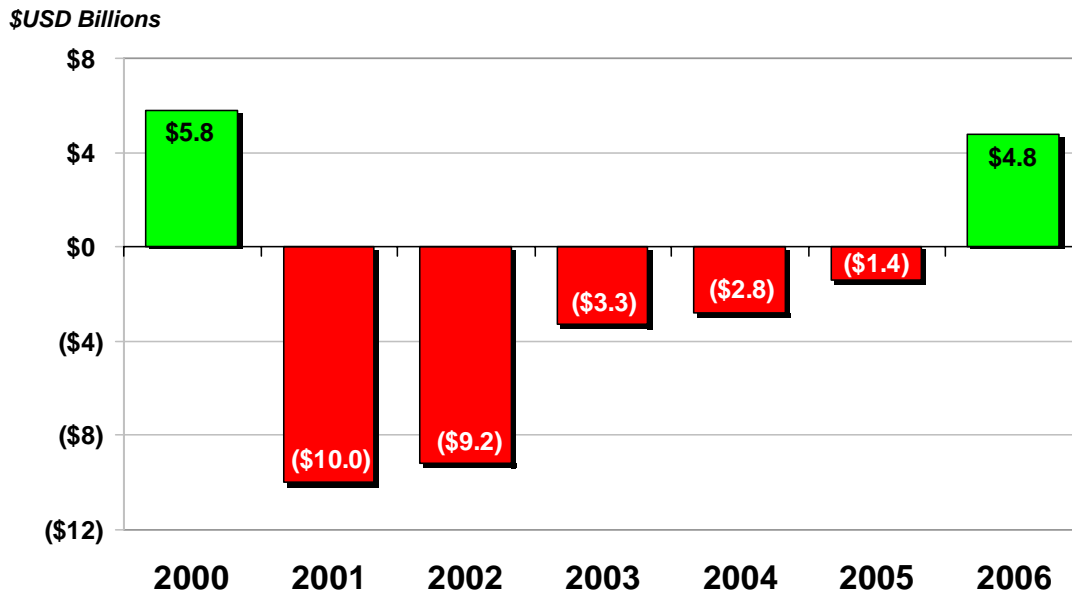
Since 2000, the U.S. airline industry has experienced extreme volatility resulting from factors including dramatic changes in airport security, high and volatile fuel prices, increased competition by low cost carriers, massive financial losses, economic uncertainty, and operational and organizational restructuring in the attempt to restore profitability. Changes that have impacted the national airline industry explain in part recent developments in airline services at the state's commercial airports. An understanding of commercial service trends is important in order for the State to anticipate changes that may affect the future pattern of airline services at Washington airports.

## National Commercial Service Trends

### ***U.S. Airlines Suffer Unprecedented Financial Losses***

U.S. airlines suffered unprecedented financial losses from 2001 through 2005. The major U.S. passenger airlines (those carriers with greater than \$1 billion in annual operating revenue) incurred \$27 billion in cumulative operating losses over the five-year period and have undergone a process of extensive financial and operational restructuring in an effort to restore profitability and achieve long-term viability. U.S. airlines only recently returned to profitability in 2006 (Exhibit 5-1 below). In 2006, U.S. major airlines achieved an operating profit of \$4.8 billion.

### Exhibit 5-1: U.S. Major Airlines /1 Operating Profit, 2000 to 2006



1/ Includes all U.S. airlines with greater than \$1.0 Billion in annual revenue.

Source: US DOT, Form 41, Database Products, Inc.

*June 2007 was the first month in more than five years that one or more of the U.S. major airlines was not in bankruptcy*

It is noteworthy that June 2007 was the first month in more than five years that one or more of the U.S. major airlines was not in bankruptcy.

A series of factors contributed to the recent financial turmoil facing the U.S. airlines. The economic downturn that began in 2000 and the immediate and dramatic consequences of the terrorist attacks of September 11, 2001 caused a substantial and immediate reduction in the underlying demand for passenger air travel. While demand levels as measured by enplaned passengers and revenue passenger miles (RPMs) have recovered to their pre-9/11 levels, industry fares, airline yields and overall revenues have remained depressed.

*The cost of jet fuel has risen from \$0.84 to \$1.93 since 2003*

The financial condition of the U.S. airlines was further stressed by the rapid rise and continued volatility in fuel prices that has occurred over the past four years. The average jet fuel price per gallon for U.S. airlines has risen from \$0.84 in 2003 to \$1.93 in 2006. Fuel costs in 2006 represented 32 percent of U.S. airline passenger revenues, compared to just 13.5 percent in 2003.

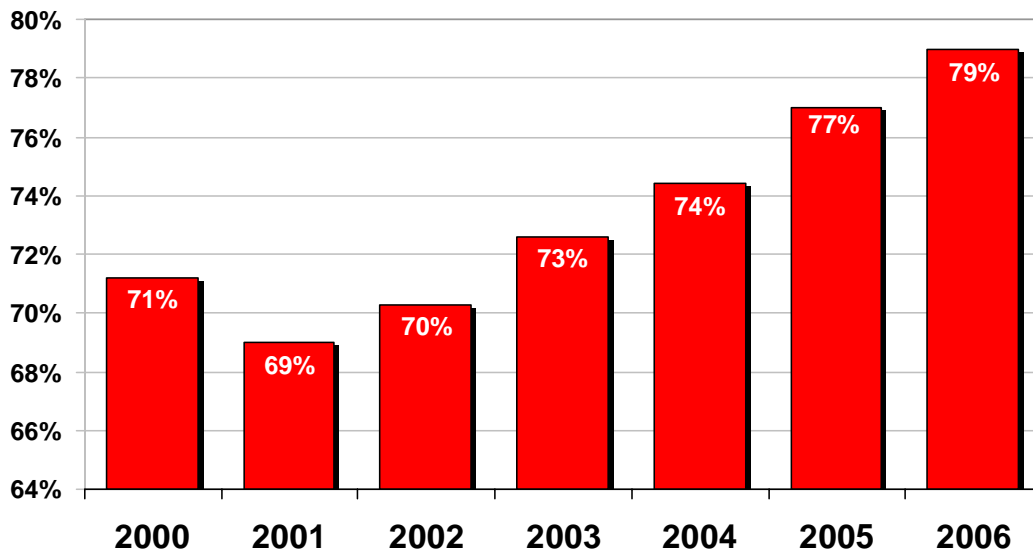
### **Network Carriers Undergo Restructuring**

The network or legacy carriers—generally defined through their hub-oriented route networks—responded to their financial distress and growing domestic competition by:

- Reducing domestic capacity, refocusing activity on their primary hub markets.
- Increasing their reliance on regional airline affiliates.
- Aggressively restructuring costs including labor, pensions, and aircraft lease rates, either inside or outside of bankruptcy court.

Capacity reductions have led to a significant rise in domestic load factors (i.e., the percent of seats occupied by passengers), as shown in Exhibit 5-2.

**Exhibit 5-2: Average Domestic Passenger Load Factors for U.S. Airlines**



Source: Air Transport Association

While some industry observers have predicted the demise of the legacy carriers<sup>16</sup>, these airlines still maintain a revenue advantage over low cost competitors. This is due to their network structure, ability to participate in a greater number of city-pair markets, frequent flyer programs, a dominant presence in U.S.-international markets, and ability to access worldwide markets through international alliances. Their survival has certainly been aided by the continued willingness of investors and stakeholders to

<sup>16</sup> Legacy carriers include airlines such as American, Delta, Northwest, United, and Continental that are generally characterized by their long history and hub-oriented route networks.

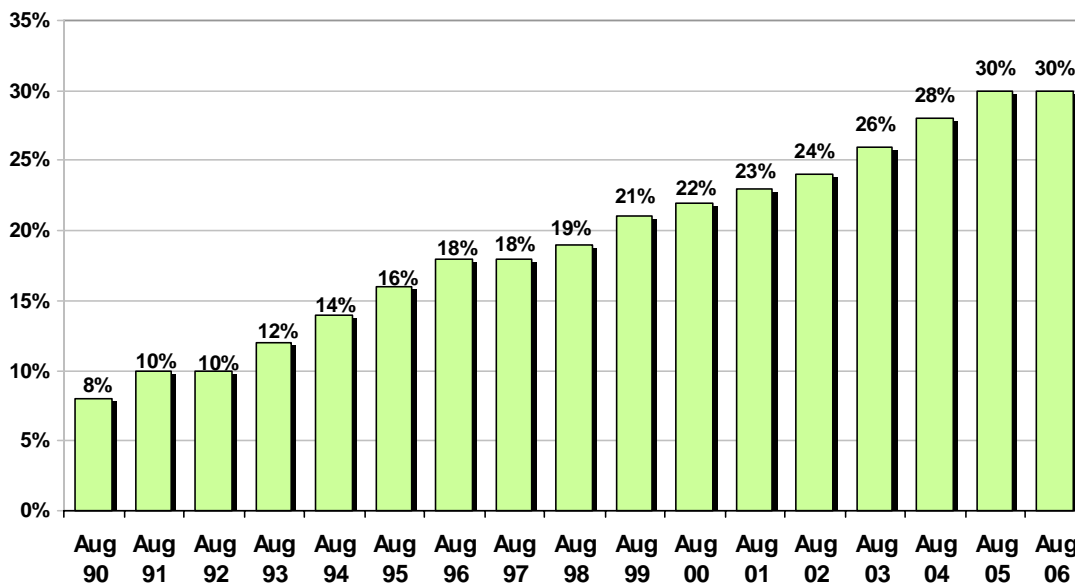
provide new capital despite the industry's exceptionally poor financial performance.

The recent wave of bankruptcy and network restructuring has led several legacy carriers to renew their focus on international markets. However, nearly all of the long-haul international routes targeted for new service by U.S. airlines involve their primary U.S. hub cities and second tier cities outside the U.S.

### ***Growth of Low Cost Carriers***

On another front, the U.S. aviation market has seen strong growth in the presence of low cost carriers (LCCs) including Southwest, jetBlue, AirTran, Frontier, Virgin America, Spirit, and others. The share of domestic seat capacity operated by low cost carriers has risen from 16 percent to 30 percent since 1995 (Exhibit 5-3). As these low cost carriers have added aircraft and expanded their route networks, a growing portion of the overall U.S. domestic air travel market has become subject to low fare competition. In general, pricing in the airline industry is directly related to competition and most specifically, competition from low cost carriers. The growth in low cost airlines has caused downward pressure on ticket prices, and caused air fares and yields to fall.

**Exhibit 5-3: U.S. Low-Fare Carrier Share of Total Domestic Nonstop Seats, 1990–2006**



Source: Official Airline Guide

These pressures will continue, as LCCs continue to expand their aircraft fleet and overall presence in the U.S. market. In fact, while the legacy airlines have reduced domestic seat capacity, LCCs continue to expand their aircraft fleets. For example, LCCs will receive 80 percent of the total aircraft deliveries to U.S. mainline jet carriers in 2007.

### ***Changes in Regional Aircraft Fleet***

Regional airlines that operate aircraft with fewer than 60 seats provide the bulk of services to smaller communities in the national commercial air transportation system. For many years, regional carriers have operated with code-sharing affiliations with major U.S. airlines. In these agreements, regional airline services link smaller air service markets into carrier hubs, where passengers can connect to mainline jet services to their final destination.

The regional carrier industry historically operated turboprop aircraft in the 19 to 50-seat range, but in the early 1990's began introducing regional jet (RJ) aircraft with 30 to 50 seats into their fleets. While RJ's accounted for only 3 percent of regional airline departures in 1995, that share has steadily increased and RJ's now represent nearly 80 percent of total regional carrier flights in 2006. Concurrently, turboprop aircraft with 19 or fewer seats accounted for more than 40 percent of regional airline departures in 1995, but now represent only 5 percent of total flights.

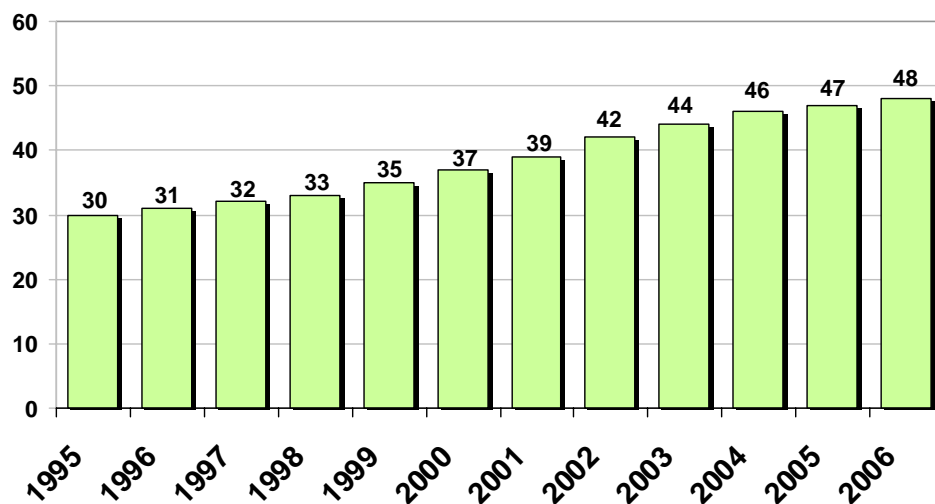
*Since 1995, the average seat size of regional carrier aircraft has increased by 60%*

Regional jets have been deployed not only in former turboprop markets, but also in:

- City-pairs that traditionally have been served by larger, mainline jets.
- New nonstop markets where the RJ's seat capacity and mileage range permit services that were not feasible in either larger mainline jets or with range-limited turboprop aircraft.

These trends have resulted in a significant increase in the average aircraft size operated by U.S. regional airlines. Between 1995 and 2006, the average seats per regional carrier departure has risen from 30 to 48 seats, an increase of 60 percent (Exhibit 5-4).

**Exhibit 5-4: Average Aircraft Seat Size for U.S. Regional Airlines,  
August 1995 - August 2006**



Source: OAG Schedule Tapes

This increase in regional carrier aircraft size has had mixed implications for communities that rely on regional airlines for access to the national air transportation system. Since passengers generally prefer to fly on larger aircraft, the upgauging of aircraft size has had some positive benefits in terms of passenger acceptance and comfort. However, the use of larger capacity aircraft is typically associated with a reduction in flight frequency. At smaller communities with limited passenger demand, the substitution of larger aircraft can reduce flight frequency to a minimum level and have a negative impact on travel time options and connecting opportunities at the hub airport. When this occurs, passenger demand levels may be further reduced, as passengers choose to drive to larger surrounding airports to originate trips.

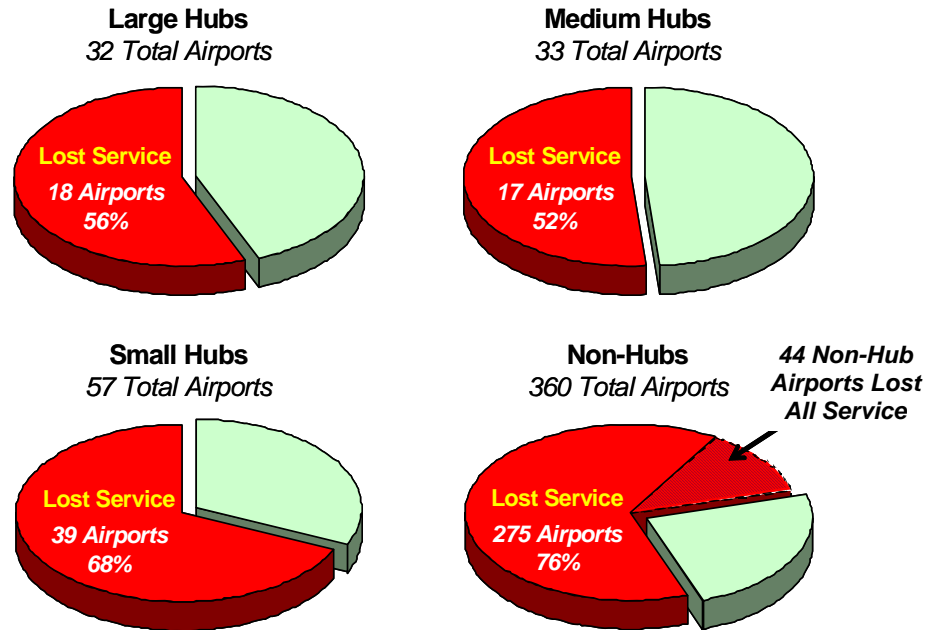
### ***Changes in Service Levels at U.S. Airports***

Reductions in domestic capacity, which has enabled U.S. airlines to improve financial performance, have been felt at airports across the country. Overall, domestic airline capacity has declined by approximately 9.5 percent from 2000 levels. The impacts of capacity reductions have been felt unevenly by airports in different size categories.

The FAA groups U.S. airports into four hub classes—Large Hubs, Medium Hubs, Small Hubs and Non-Hubs—based on their level of

passenger enplanements.<sup>17</sup> Overall, 18 of 32, or 56 percent of Large Hub U.S. airports experienced a drop in airline seat capacity between CY 2000 and 2007. For the 33 Medium Hubs, 52 percent lost seat capacity over this period. The proportion of airports experiencing service declines was greater in the Small Hub and Non-Hub categories, where 68 percent and 76 percent of airports lost service, respectively. Among the 360 Non-Hub airports, 44 have lost all scheduled airline service.

**Exhibit 5-5: Lost Service by Airport Hub Type, 2000 vs. 2007**



Source: Official Airline Guide (OAG) Schedules, February 2000 and 2007

### ***Small Communities Lose Passenger Services***

*High fares and reduced flight frequencies are depressing passenger traffic at small communities*

The economics that historically supported the provision of regional carrier feeder services from numerous small communities into major carrier hubs have been greatly stressed not only by the regional airline industry's transition to larger capacity aircraft, but also by fare competition at both the hub airport and, often, at surrounding in-state or out-of-state airports.

As low cost airlines have increased their competitive presence at nearly all major U.S. airports, local fares at hub airports have generally been reduced to levels that approach carrier costs. As a result, there is no longer the ability to price small community services through the hub

<sup>17</sup> Airports classified as Large Hubs enplane at least 1 percent of total U.S. passengers; Medium Hubs enplane 0.25% to 1% of total U.S. passenger enplanements; Small Hubs enplane between 0.05% and 0.25% of total passengers; and Non-Hubs enplane less than 0.25% of total U.S. passengers.

airports at the same fare, or only slightly above the fare level paid by passengers originating trips from the hub city. Instead, the additional costs associated with the regional carrier feed service into the hub are now being fully reflected within the fare structure offered to small community passengers. In some cases, the fare premiums charged at smaller markets can significantly exceed the added cost of the feeder service, as these airports represent one of the few remaining markets sheltered from low fare competition<sup>18</sup>.

As a result, small airports across the country have experienced traffic losses, and some have lost all commercial services, as area passengers elect to drive greater distances to larger, surrounding airports in order to avoid growing fare premiums. When low fare services are available at surrounding airports within driving distance of the community, the rate of diversion – also called *leakage* – can be magnified.

## Washington Commercial Service Trends

Washington State's commercial airline traffic is highly concentrated at Seattle and Spokane, which together account for 96% of total statewide passenger traffic. Both of these airports exhibit a substantial base of local passenger demand, are served by multiple airlines, and have solid representation by Low Cost Carriers and Alaska Airlines. While both airports experienced a decline in scheduled airline seat capacity between CY 2000 and 2007, the declines were generally consistent with those experienced by other airports of comparable size. For these reasons, we consider both Seattle and Spokane to be stable markets that are well-positioned to experience future growth in airline services and passenger traffic.

At Sea-Tac, the eventual introduction of the Boeing 787 aircraft, which offers long-range in a relatively small 225-seat capacity class may be perfectly suited to facilitate continued development of long-haul international services for medium size markets like Seattle.

The next tier of Washington commercial airports includes Tri-Cities/Pasco, Bellingham and Yakima. Tri-Cities/Pasco and Bellingham both enplaned well over 100,000 passengers in 2006, receive service by multiple carriers, and have one or more low cost carriers. Bellingham was recently selected by the new entrant carrier Skybus to serve the Seattle-Vancouver region into the airlines Columbus OH base<sup>19</sup>. Both of these markets are well-established and expected to exhibit solid growth in passenger traffic in coming years.

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<sup>18</sup> This is expected to change as LCCs begin to serve larger airports, looking for revenue opportunities.

<sup>19</sup> Bellingham lost Skybus service in 2008.



Yakima was until recently served by a single airline—Horizon—with services feeding Alaska Airlines’ hub at Sea-Tac. However, Yakima has successfully attracted a second carrier—SkyWest—to provide services to Delta Airlines’ Salt Lake City hub<sup>20</sup>. The addition of this second carrier will enhance competition and travel options for area passengers, and should secure Yakima’s position as a solid and developing air travel market.

The remaining commercial service airports in Washington—Wenatchee, Walla Walla, Port Angeles, Anacortes, East Sound, and Pullman/Moscow—are the smallest commercial airline markets in the State. Each of these cities is dependent on a single carrier for all or nearly all of their scheduled airline services and each enplaned fewer than 40,000 passengers in 2006. For the same reasons that small communities nationwide have experienced difficulties maintaining passenger traffic and services over the past 5 to 10 years, including increases in regional carrier aircraft size and the frequent presence of significant fare premiums compared to larger surrounding airports, these three smallest Washington commercial airports could have a difficult time in maintaining existing levels of passenger traffic and scheduled airline services over the forecast period.

## **Current General Aviation Trends**

General aviation has historically been 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) account for a growing portion of GA in the U.S. Increasingly, airports across the country are called to accommodate more demanding aircraft and more diverse types of GA activity.

Three GA trends in particular have a significant effect on future demand for Washington’s airport facilities and services.

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<sup>20</sup> Yakima lost SkyWest service in 2008.

## National General Aviation Trends

### ***Continued Growth in Business Jet Fleet***

For several years business aviation and turbine aircraft operations have been growing faster than other components of aviation. The FAA's 2007 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 programs, which allow corporations or individuals to purchase an interest in an aircraft and pay a fixed fee for operations and maintenance, have further fuelled business jet growth. The fractional ownership concept was introduced in 1986 by NetJets and continues to see significant popularity.

### ***Entry of Very Light Jets into the Market***

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 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.

*VLJs could be added to a corporate jet fleet or sold to an individual owner, and could even potentially redefine the air taxi industry.*

Not only could VLJs be added to a corporate jet fleet or sold to an individual owner, but VLJs could also potentially redefine the air taxi industry. As of 2007, three air taxi operators had announced their intentions to start operating with VLJs. 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<sup>21</sup> plans to operate a “per seat, on-demand” air taxi service in the Southeast, starting in 2007.

### ***Technological Advances with the Next Generation Airport Transportation System***

*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, its impact will extend beyond air carrier aircraft and commercial service airports. 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. For example, the Wide Area Augmentation System (WAAS), which has been available since 2003, augments GPS to provide more exacting navigational guidance to the runway surface and eliminates the need for costly instrument landing systems (ILS) at small airports.

### **Washington General Aviation Trends**

The continued strong business jet growth has many potential impacts on the Washington State aviation system, including the following:

- As a business jet becomes the most demanding aircraft regularly using a GA airport, runway length, width and strength, as well as other airport design standards possibly including the spacing between runways and taxiways, will be more demanding. 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

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<sup>21</sup> DayJet launched operations in Florida in October 2007, and grew to add 50 destinations across five states. Difficulties in securing financing and delays in Eclipse 500 jet deliveries, however, pushed the carrier into bankruptcy in November 2008.

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.

The entry of VLJs into the market could impact Washington in the following ways:

- 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 unlikely 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 development of new instrument approaches and other technological advances with NextGen may impact the Washington aviation system in the following ways:

- Potentially, many small Washington airports that lack ILS now will be useable during bad weather with WAAS-aided approaches, increasing safety, reducing air traffic delays, and stimulating economic development through increased access.
- 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.