Chapter 10: Air Transportation

Air transportation provides a national and global reach for the fast movement of people and time-sensitive freight, offering significant advantages for long-distance travel and transport. Therefore it is somewhat different from other metro systems since its users are primarily going to, or coming from, destinations outside the metropolitan area. Each mode of transportation best serves a specific trip distance and air transportation provides its own unique characteristics and values for interstate and international mobility.

Airspace is the key resource for aviation. To use global airspace air transportation requires three basic types of infrastructure: airports, an air-traffic control system, and ground access system. Airports are locally sponsored but must meet federal development and operational certification. Air traffic control is a federally operated service provided in federally-controlled airspace. Aviation user funds are used to support both of these functions. To connect air transportation users with the air passenger and air cargo terminals requires overall connectivity with the multi-modal transportation system. These connections are accomplished through shared funding efforts.

Existing Conditions

The Twin Cities region is served by one commercial airport and ten general aviation airports for various business and recreational users, as depicted in Figure 10-1. Airports are classified according to their system role as a Major, Intermediate, Minor or Special Purpose facility. Most of these facilities are owned and operated by the Metropolitan Airports Commission (MAC). The system focus until 2010 has been to complete a $3.1B expansion of Minneapolis-St. Paul International Airport (MSP), and to make improvements to several of the reliever airports for business jet flying. Most of the system airports are part of the National Plan of Integrated Airports (NPIAS), eligible for federal and state funding. In 2009 MSP airport, as a hub serving the Upper Midwest, handled over 32 million passengers, 432,000 aircraft operations and 190,000 metric tons of cargo. The general aviation airports handled approximately 440,000 aircraft operations. In 2008 the value of air transportation to the metro region was estimated at over $10B, supporting 150,000 jobs. The regional airports are working reasonably well; however, substantial changes are occurring at all levels of the aviation industry, including federal government actions, that are likely to have major effects on the system and traveling public.

Economic and security issues since the year 2000 have caused turmoil in both the national and local airline industry. Threats of terrorism, rising fuel costs and other problems have led to deep operational losses, airline bankruptcies, mergers and the disappearance of some locally based carriers.

The impacts are far-reaching; less aircraft activity, an increase in the cost of tickets, a reduction in air passenger and cargo traffic, a hold on terminal expansion at MSP, continued aircraft maintenance outsourcing, a new airline agreement at MSP, return of aviation bond refinancing proceeds to tenant airlines,

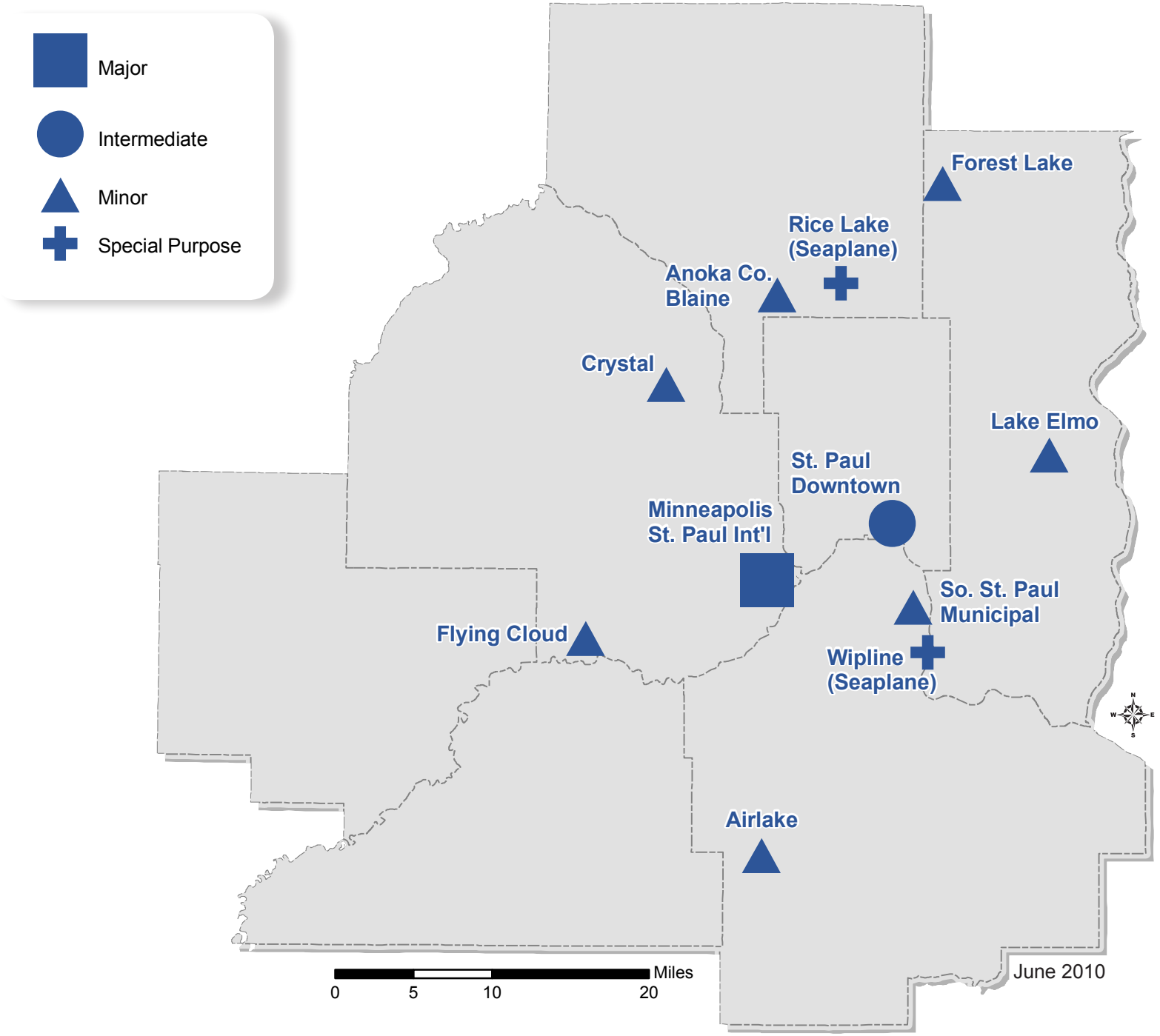


Figure 10-1: Regional Aviation System

Figure 10-2: Air service provider at MSP

a sharing of concession revenues with the airlines, and a revision to the MAC operating philosophy for managing its reliever airports. Maintaining air service and the airport system infrastructure will be a continuing challenge for the community. Impacts and opportunities at individual airports have been assessed in recent updates of each airport's long-term comprehensive plan (LTCP) that extends their planning horizons. The system is basically performing well operationally, but faces financial and air-service uncertainties. Growth in flight activity for both commercial and general aviation is essentially flat as depicted in Table 10-3.

Table 10-3: Summary of Regional System Based Aircraft and Forecasted 2030 Activity

Activity	2008	2015	2020	2030	Average Annual Growth
Total G.A. Based Aircraft	1,913	2,046	2,007	1,993	0.2%
Total G.A. Operations	641,550	612,680	639,540	663,940	0.1%
MSP Enplaned Passengers (Base Case Forecast)	25,936,600	31,229,600	35,998,600	47,896,300	2.8%
MSP Aircraft Operations	450,000	507,000	546,900	630,800	1.5%

Airside capacity of the regional system has recently been improved with a new runway at MSP Airport, a runway extension at Anoka County-Blaine Airport, flood protection of the St. Paul Downtown Airport airfield, and extension of the parallel runways at Flying Cloud Airport. Landside capacity is somewhat constrained at all the reliever airports and new hangar areas are being developed as public and private funding becomes available. Improvements contained in the MSP 2010 development plan are completed, except for noise mitigation, which extends to 2014. Table 10-5 provides an overview on the status of each airport, including planning activities at the system airports, information on individual characteristics of each facility, number of current users and the annual level of aircraft operational activity. A Glossary of aviation terms is included in Appendix O.

Table 10-4: Summary of Key System Accomplishments

Planning Activities/Actions:
Completion of MSP 2030 LTCP.
Initiated joint Airport/Community zoning boards at St. Paul Downtown and Flying Cloud Airports.
Completion of 2025 LTCP Updates for all MAC reliever airports.
Development/Operations
Implemented flood protection at St. Paul Downtown Airport.
Completed parallel runway extensions at FCM; and initiated development of new south building area.
Completed MSP parallel runway pavement improvements
Completed additions to parking ramps, and initiated LRT passenger-bridge to Terminal 2-Humphrey .
Environmental:
Continued noise mitigation projects in the DNL 60 to 64 noise zones at MSP
Continued upgrades to MSP Airport Noise and Operations Monitoring System (ANOMS)

Progress Since 2008 Adoption of the *Transportation Policy Plan*

Several airport planning, environmental, operational, and development projects and actions have been, or are nearing completion since the last update of the system plan. A few key activities/actions are listed in Table 10-4.

Table 10-5: Airport Facility Status

Airport Name and Identifier	Long Term Comprehensive Plan	Airport Size (Acres)	Total No. And Type Runway's	Primary Runway Length	Crosswind Runway Length	Air Traffic Control	Primary Runway Landing Aids	Based Aircraft 2009	Total Annual Aircraft Operations 2009
Minneapolis-St. Paul International (MSP)	2010 Plan adopted by MAC in 1996. 2030 Plan Update prepared 2010	3,400	Four Paved	Rwy 30L-12R 10,000'	Rwy 4-22 11,003' Rwy 17-35 8,000'	24 Hr. FAA ATCT Customs Service	Precision Instrument, High Intensity Runway Lights	24	432,395
St. Paul Downtown (STP)	2025 Plan Update approved 2010.	540	Three Paved	Rwy 14 -32 6,491'	Rwy 13/31 4115' Rwy 9-27 3,657'	16 Hr. FAA ATCT Customs on-call	Precision Instrument, High Intensity Runway Lights	124	110,846
Anoka Co.-Blaine (ANE)	2025 Plan Update approved 2010.	1,900	Two Paved	Rwy 9–27 5,000'	Rwy 18-36 4,855'	15 Hr. Contract ATCT	Precision Instrument, High Intensity Runway Lights	439	69,406
Flying Cloud (FCM)	2025 Plan Update approved 2010.	760	Three Paved	Rwy 10R-28L 5,000'	Rwy 18-36 2,691'	16 Hr. FAA ATCT	Precision Instrument, High Intensity Runway Lights	413	119,139
Crystal (MIC)	2025 Plan Update approved 2008	436	Three-Paved, one turf	Rwy 14R-32L 3,267'	Rwy 6L-24R 2,500'	16 Hr. FAA ATCT	Non-Precision Instrument, Medium Intensity Runway Lights	238	48,877
So. St. Paul (SGS)	1993 Plan adopted by city 1976; Airport Layout Plan updated 2002; CPU approved 2010	270	One Paved	Rwy 16-34 4,000'	None	Unicom	Non-Precision Instrument, Medium Intensity Runway Lights	217	40,800
Airlake (LVN)	2025 Plan Update approved 2008	425	One Paved	Rwy 12-30 4,098'	None	Unicom	Precision Instrument, High Intensity Runway Lights	158	39,021
Lake Elmo (21D)	2025 Plan Update adopted by MAC in approved 2008	640	Two Paved	Rwy 14-32 2,850'	Rwy 4-22 2,497'	Unicom	Non-Precision Med. Intensity Runway Lights	229	37,600
Forest Lake (25D)	City Feasibility study 1996, Airport Area AUAR in 2000; CPU approved 2009.	330	One Turf	Rwy 13-31 2,575'	None	Unicom	Visual Low Intensity Runway Lights	26	8,000
Rice Lake SPB (8Y4) Private, Public-Use	City of Lino Lakes CPU approved 2009.	20 Land area only	Two Water Lanes	NE/SW 6,500'	N/S 5,500'	Unicom	Visual No Lighting	45	4,100

Source: Airport LTCP's, Airport Master Record, FAA ATCT data.

Issues and Trends

GLOBAL DEVELOPMENTS:

World Air Traffic

Globalization of the airline industry continues in the form of alliances between airlines. This trend is expected to accelerate as economic conditions force consolidation in all parts of the world. Asia recently surpassed North America in total numbers of annual airline passengers, a trend which is expected to continue. U.S. air carriers are expanding international service connections, often through airline alliances involving code-sharing agreements to gain or maintain access to these and other markets. Air service resources are increasingly focused on areas of world-class cities and mega-regions. Historically the Twin Cities region has had strong air connections to Asia (evidenced by the previous airline name, Northwest Orient) and more recently to a limited number of European cities. It is not clear where Minneapolis-St. Paul fits in this changing global context, and how that may impact levels of air service connectivity for the MSP service area. Future state and regional socio-economic and aviation forecasts should further define these evolving economic and geographic connections and conditions in future plan updates.

Open Skies Agreements

Air service has been continually stymied by regulations of various countries and the early practice of support for national flag carriers. The U.S. de-regulated its airlines and has entered into open-sky agreements with other countries to relax regulations and enhance service competition. The overall effect has been an opening up of air access between many countries and continued development of airline alliances. Currently there are three major alliances (One-World, Star, SkyTeam) and a group of non-aligned airlines. At MSP over eighty percent of all air service is provided by the SkyTeam alliance, with Delta Air lines as the main U.S. partner, although MSP is currently served by all three global alliances and some non-aligned carriers.

As U.S. dominance of markets is subsumed into alliance networks it will become important to regional economies which networks serve their airports; maintaining service balance is critical to financial sustainability of the region's major airport.

This new reality is reflected in the 2030 Plan for MSP which proposes to physically separate airlines, with the SkyTeam Alliance located at the Lindbergh Terminal (Terminal 1), and all other airlines located at the Humphrey Terminal (Terminal 2). Southwest Airlines is a non-aligned, low cost carrier that has recently entered the MSP market; since Southwests entry to the MSP market average domestic fares fell 31.9% in the 3rd quarter of 2009 in a year-over-year comparison It is not yet clear how the competitive aspects of the alliances will affect domestic and international air service at MSP. It will be important to constantly reassess how the 2030 MSP Phased Development Plan relates to the air service competition plans for the metro and multi-state region.

Figure 10-6: Fuel farm at MSP

Environmental Issues Emerging in a Global Forum

Reducing aircraft pollution is becoming increasing important at the international and national levels. "Going green" is being incorporated in a programmatic way for everyday airport operations around the country. At MSP the MAC has implemented its STAR program (Stewards of Tomorrow's Airport Resources), the environmental part of their strategic planning for sustainability. Improvements in noise and air pollution are also being realized at the local level from old aircraft being retired and new aircraft entering the fleets. The current MSP Part 150 noise mitigation/residential insulation program for MSP neighborhoods is nearing completion in the next few years. Aviation forecasts for the MSP Plan indicate the noise impact area is likely to expand with increasing operations through 2030 and remain an issue.

Energy Costs and Alternative Fuels

A major cost of airline operations is aircraft fuel. Recent volatility in the international petroleum fuels market has significantly affected cost and availability. U.S. airlines are particularly affected due to imported supplies and changes in currency exchange. Overall energy supply costs also affect the economy, dampening demand for air service and further reducing revenue for U.S. airlines. Domestic airlines, without funds to replace aging aircraft with more fuel efficient planes, are becoming less competitive with other world airlines. The airline industry (including the U.S. military) is experimenting with mixed bio-fuels, but the ability of these new fuels to be produced in sufficient quantity, and to be environmentally friendly, has not been determined. The cost of fuel has been included as a key scenario in forecasting the 2030 MSP operations and economic dampening effect on discretionary income of potential air passengers.

U.S. DEVELOPMENTS:

Economy Affecting Viability of Domestic Air Transportation

Since 2001 spending for air travel has fallen as a percent of the U.S. economy. Foreign country ownership of America's airlines, and provision of air service in the U.S. is still very high on the list for discussion between the European Union and the U.S. in their recent Open Skies Agreement. At the local level, Northwest Airlines merged with Delta, another U.S. legacy airline. A new airline agreement at MSP provides for increased revenue-sharing of airport concessions with the airlines. Older aircraft are being removed from the fleet, and uneconomical service is being dropped. Many fees and charges are being added by the airlines and some calls for re-regulation or curtailing oil speculation are being sought from Congress by the airline community.

Figure 10-7: Airport security at MSP Lindbergh Terminal

Deteriorating Performance of the National Air Transportation System

The national system of airports has been increasingly congestion prone, with proposals by FAA to limit air traffic levels at constrained hub airports. Problems with runway incursions are improving,

Figure 10-8: Aircraft landing aids

but are still a problem at many commercial and general aviation airports. Implementation of the Next-Gen air navigation and air traffic control systems is years behind schedule and over budget; funding is being included in 2010 Congressional reauthorization legislation. Funding of FAA operations and recommended imposition of a new fee structure has pitted airlines and general aviation against each other. Lack of reauthorization and funding of the Airport Improvement Program (AIP) is delaying needed capacity and safety projects.

Airlines have turned in better on-time records recently with fewer people flying. Safety has been good over the years, but there are increased inspections being required by FAA due to age of aircraft, and runway incursions.

Funding of Airport Projects

Commercial and general aviation airports are under revenue stress due to the poor economy and its effect on system users. In addition, they are under pressure, along with the airlines, to address continuing facility and passenger security costs and operational issues. Security screening of air cargo is an ongoing issue. Projects are being delayed or dropped at many airports due to airline revenue reductions. Locally, the state airport trust fund was used to address state general fund shortfalls, so availability of state matching funds for federal AIP monies will affect immediate and future year capital projects. A new financial model for reliever airports has been put into effect at MAC airports, to improve self-sufficiency. Additional non-aviation revenue opportunities are also being explored at the MAC-owned relievers.

Shortfall in Airport Landside Capacity, Need for Airside Technology Upgrades

While the annual airside capacity at the region's airports is generally adequate, landside issues involve the need for more hangar building areas and services. New passenger gate development at MSP is proposed to be implemented in four phases to 2030 pending airline demand and funding. Continued application of new technology for air-side development is needed to improve capacity and maintain safety/security levels. Funding is a concern for both airside and landside projects. A public/private partnership has assisted in making recent projects at the Anoka County-Blaine airport a reality.

Figure 10-9: Airport and community compatibly
Community athletic fields at Flying Cloud Airport

Airport Compatibility a Continuing Long-Term Effort

Airport safety zoning is underway, and airport development/mitigation plans are being updated. Updated community plans are expected to help address continued safety, land use, environmental, infrastructure and services issues posed by airport and community development. Urban development and development pressures have fully engaged the system airports and it is anticipated that on- and- off airport redevelopment issues will become increasingly noticeable in the future.

Increasing Difficulty in Forecasting Air Travel

Opposing trends in aviation are increasing the difficulties in aviation forecasting. For example, the previously discussed "constraint" issues are offset by continued general optimism expressed in government and industry economic and aviation forecasts of passenger and

Figure 10-10: Passenger terminal improvements at MSP

air-cargo demand. Reductions in congestion, provision of improved air traffic control, additional runway and airport terminal capabilities appear to still be needed, while air travel, as a portion of gross national product (GNP) is down significantly from historical norms. The U.S. is still the largest single air market and foreign competition for an increased share is escalating. Impacts of a new generation of fuel efficient aircraft and associated technology are only beginning to be realized. Questions remain as to the future growth of the very light jet and recreational flying segments of the general aviation fleet. Improved capabilities to survey and monitor specific types and levels of activity at the region's airports are needed.

Policies and Strategies

The following regional policies and strategies will guide the development and operation of the aviation system in the region.

Policy 19: Aviation and the Region's Economy

Availability of adequate air transportation is critical to national and local economies in addressing globalization issues and airline alliances that have increased competition and the need for improved international market connectivity.

Figure 10-11: Air cargo at MSP

Strategy 19a. MSP as a Major Hub: Public and private sector efforts in the region should focus on continued development of MSP as a major international hub.

Strategy 19b. Region as Aviation Industry Center: State and regional agencies, in cooperation with the business community, should define efforts to be a major aviation-industry center in terms of employment and investment, including the ability to compete for corporate headquarters and specialized functions.

Strategy 19c. Air Passenger Service: The MAC should continue to pursue provision of a mix of service by several airlines with frequent passenger flights at competitive prices to all regionally-preferred North American markets and major foreign destinations.

Strategy 19d. Air Cargo Service: The MAC should pursue provision of air cargo infrastructure and air service for the region with direct air freight connections to import/export markets providing trade opportunities for the region's economy.

Figure 10-12: Ground access and parking at MSP

Strategy 19e. Provide State-of-the-Art Facilities: State-of-the-art facilities should be made available by airport sponsors at the region's airports, commensurate with their system role, to induce additional aviation services and provide additional jobs, thereby enhancing the region's economy.

Strategy 19f. Competition and Marketing: Decisions by aviation partners on provision of facilities and services to improve regional economic capabilities, should be based upon periodic updating and refinement of airport economic impact studies and surveys, a MAC commercial air-service competition plan and on-going airport marketing efforts.

Policy 20: Air and Surface Access to Region's Airports

Provision of adequate local access by air service providers and system users to the region's airports is essential to realizing the advantages of air transportation to the region's businesses and citizens.

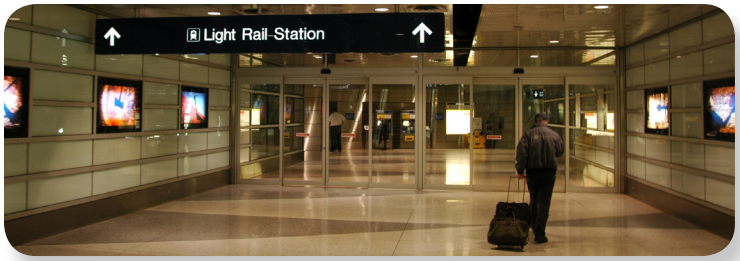


Figure 10-13: Multimodal access at MSP
Signage to LRT station at Lindbergh Terminal

Strategy 20a. Use of Technology: Airport sponsors should provide facilities that are safe and secure, affordable and technologically current for all facets of the aviation industry.

Strategy 20b. User Friendly: Airport sponsors and service providers should make flying convenient and comfortable for everyone using regional aviation facilities.

Strategy 20c. Airport Service Area Access: The Council will work with Mn/DOT, counties and airport sponsors to achieve high-quality multimodal ground accessibility, appropriate to the airport's role and function, to all portions of each airports service area within regionally defined travel times.

Policy 21: Consistency with Federal and State Plans/Programs

The planning, development, operation, maintenance and implementation of the regional aviation system should be consistent with applicable Federal and State aviation plans and programs.

Strategy 21a. Project Eligibility: Project sponsors, to improve chances of successful outcomes, should meet funding eligibility requirements, design standards and operational considerations.

Strategy 21b. Consider Alternatives: Project sponsors need to consider impacts of alternatives, such as telecommunications and other travel modes, in regional aviation planning and development.

Strategy 21c. Responding to National Initiatives: Project sponsors need to include the following in their planning and operational activities;

- Environmental sustainability efforts.
- Security needs as identified by National Homeland Security through the Transportation Security Administration.

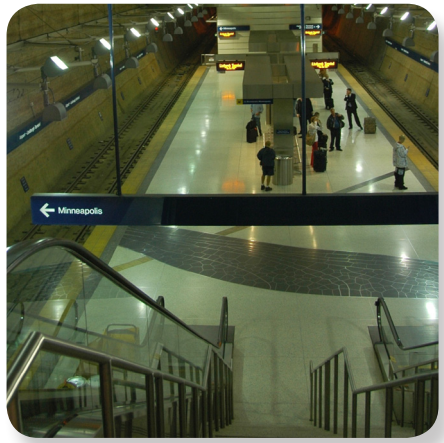


Figure 10-14: Passengers waiting on Lindbergh Terminal LRT station platform

Policy 22: Airport Development Plans

Long-term comprehensive plans (LTCPs) should be prepared by the airport sponsor for each system airport according to an established timetable and with required contents as defined in this policy plan.

Strategy 22a. Preparing LTCPs: Regional aviation facilities are under different types of public and private ownership. Therefore,

Figure 10-15: FAA building

the scope, application and content, for preparation of a LTCP is defined for different sponsors in this Transportation Policy Plan.

Strategy 22b. Updating/Amending LTCPs: The LTCP should be periodically updated according to the timetable established in this TPP. If a substantial change to the approved plan is recommended and cannot be addressed as part of the periodic update it should be amended.

Strategy 22c. Transitioning the Airport: The development of system airports must be carried out in a way that allows for continued growth in operations and uninterrupted services for an overall smooth transition to new, expanded or enhanced facilities. Airport LTCPs should describe how this will be accomplished.

Strategy 22d. Providing Metro Services: Airports straddling the boundary between the rural service area and the MUSA should be included in the MUSA so metropolitan facilities and services can be provided when they are available.

Policy 23: Agency and Public Coordination

The regional aviation planning partners will promote public participation and awareness of aviation issues including involvement of non-traditional populations, system users and individuals.

Strategy 23a. Enhance Public Awareness: The region's aviation partners will utilize a variety of media and technologies to bring aviation planning into the mainstream of public decision-making so all interested persons have an opportunity to participate in the process and become acquainted with major development proposals.

Strategy 23b. Governmental Roles Defined: The region's aviation partners will have a regional aviation management system that clearly defines government roles and responsibilities for planning, development, operations, environmental mitigation and oversight.

Figure 10-16: Shoreview tall tower antenna farm

Policy 24: Protecting Airspace and Operational Safety

Safety is the number one priority in the planning and provision of aviation facilities and services. Local ordinances should control all proposed structures 200 feet or more above ground level at the site to minimize potential general airspace hazards.

Strategy 24a. Notification to FAA: The local governmental unit is required to notify the Federal Aviation Administration (FAA) prior to approving local permits for proposed tall structures.

Strategy 24b. Locating Tall Structures: Structures over 500 feet tall should be clustered, and no new structures over 1,000 feet tall should be built in the region unless they are replacements or provide for a function that cannot otherwise be accommodated.

Strategy 24c. Airport/Community Zoning: Joint Airport/Community Zoning Boards should be established at each of the region's system airports to develop and adopt an airport safety zoning ordinance.

Policy 25: Airports and Land Use Compatibility

Figure 10-17: Environmental compatibility around MSP

In areas around an airport, or other system facilities, land uses should be compatible with the role and function of the facility . The planning, development and operation of the region's aviation facilities must be conducted to minimize impacts upon the cultural and natural environment, regional systems and airport communities.

Strategy 25a. Surface-Water Management: Airport LTCPs should include a plan for surface-water management that contains provisions to protect surface and groundwater. The LTCP must be consistent with plans of watershed management organizations and the state wetland regulations. The water management plan should also include provisions to mitigate impacts from construction and include the pretreatment of runoff prior to being discharged to surface waters.

Strategy 25b. Protecting Groundwater Quality: Airport LTCPs should include a management strategy to protect groundwater quality that indicates proposed policies, criteria and procedures for preventing, detecting and responding to the spill or release of contaminants on the site. The plans should identify the location, design and age of individual/group/central sewer systems on-site and all well location sites, and evaluate system deficiencies and pollution problems.

Strategy 25c. Providing Sanitary Sewer: Airport LTCPs should include detailed proposals for providing sanitary sewer services. Reliever airports should be connected to the sewer system when service is available near the airport. Whenever connecting is not practical, the airport owner and the local governmental units must adopt and implement ordinances and administrative and enforcement procedures that will adequately meet the need for trouble-free on-site sewage disposal in accordance with the Council's guidelines in its water resources management policy plan.

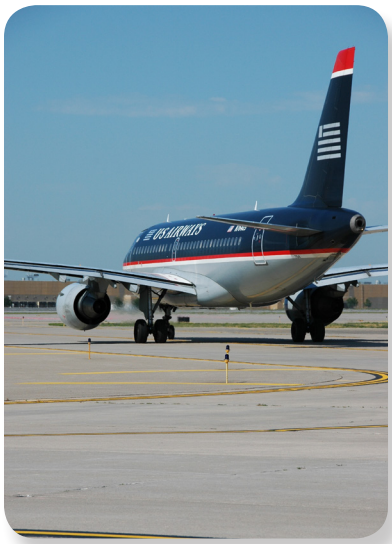


Figure 10-18: Plane on taxiway at MSP

Strategy 25d. Monitoring Air Quality: The MAC should periodically evaluate the air quality impacts of MSP operations and report to the Council on air quality problems or issues through the MAC annual environmental review of the capital improvement program.

Strategy 25e. Aircraft Noise Abatement and Mitigation: Communities and aviation interests should work together on noise abatement and mitigation. Local comprehensive plans and ordinances for communities affected by aircraft noise should incorporate the Land Use Compatibility Guidelines for Aircraft Noise.

Policy 26: Adequate Aviation Resources

Public investments in air transportation facilities should respond to forecast needs and to the region's ability to support the investments over time.

Strategy 26a. Maximize Existing Investments: Airport sponsors should maintain and enhance existing facilities to their maximum capability, consistent with the *Development Framework*, prior to investing in new facilities.

Strategy 26b. Quality, Affordable Services: Airport sponsors and air-service providers should establish airport business plans and agreements in order to deliver high-quality services at affordable prices to users.

Strategy 26c. Long-Term Financial Plan: Airport sponsors should operate within a long-term financial plan that stresses maximizing non-regional funding sources, avoiding or minimizing financial impacts on regional taxpayers and maintaining a high bond rating for aviation improvements.

2030 System Plan

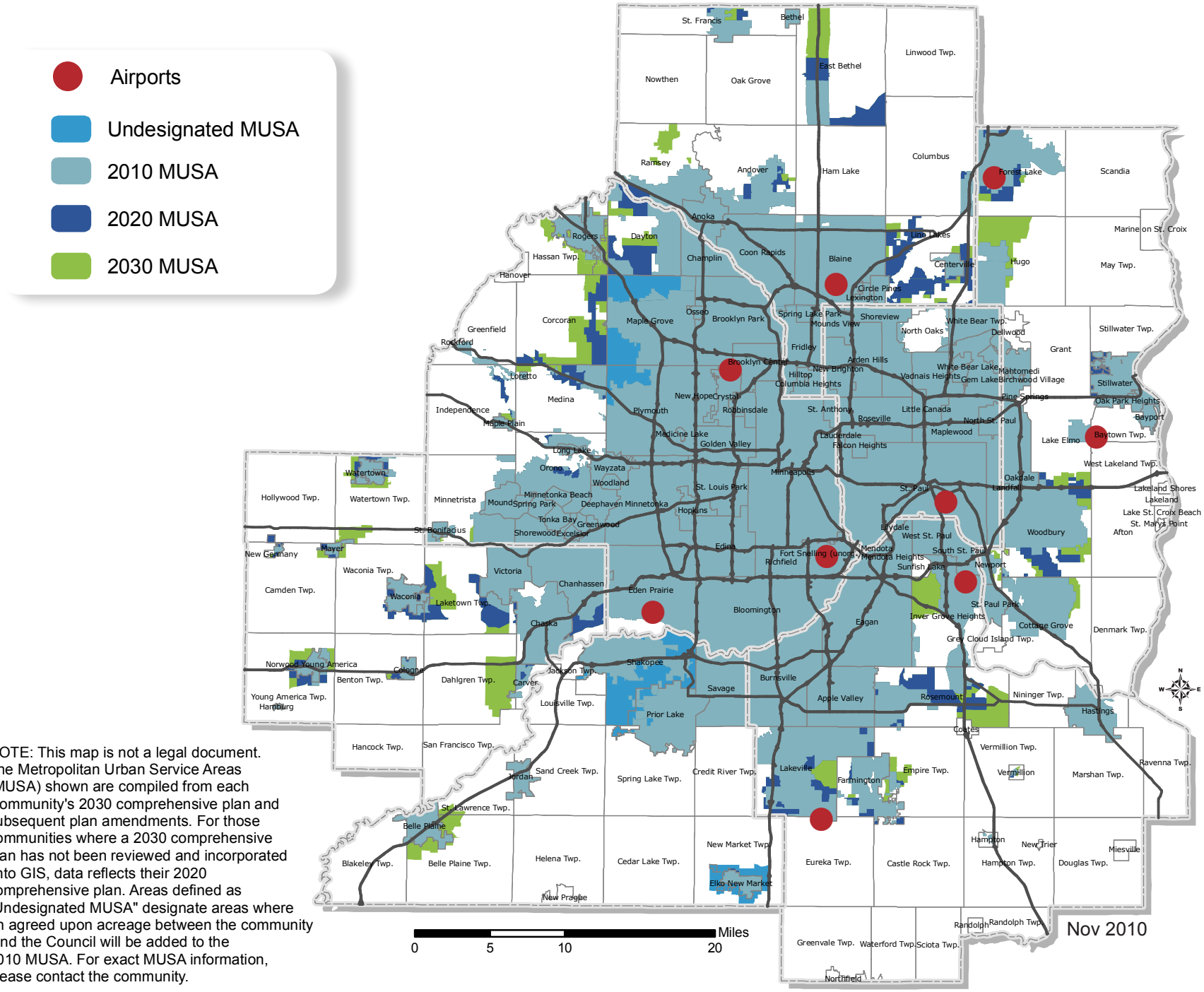
The 2030 system plan as discussed here reflects new information developed through the 2030 System Plan Update Technical Report prepared in 2009, updates of the individual airports' long-term comprehensive plans (shown in Appendix I) , 2008 updates of community comprehensive plans, MAC reports, various FAA documents, and review actions by the Council.

Goals and principles

The key goal of the Twin Cities air transportation system is the efficient and safe movement of people and goods to and from regional, national and international markets, for benefit of the region's citizens; providing services that enhance the economy and provide a sustainable environment.

The Council's *Regional Development Framework* provides policy direction and strategies for coordinating and implementing the orderly and economic development of the seven-county metropolitan area containing many local governmental units and 3 million people. The 2030 metropolitan urban service area, and location of the aviation system in relation to future urban development areas, is depicted in Figure 10-19.

Figure 10-19: Metropolitan Urban Service Area



NOTE: This map is not a legal document. The Metropolitan Urban Service Areas (MUSA) shown are compiled from each community's 2030 comprehensive plan and subsequent plan amendments. For those communities where a 2030 comprehensive plan has not been reviewed and incorporated into GIS, data reflects their 2020 comprehensive plan. Areas defined as "Undesignated MUSA" designate areas where an agreed upon acreage between the community and the Council will be added to the 2010 MUSA. For exact MUSA information, please contact the community.

Regional Development Framework goals have the following meanings for aviation:

- Maximizing the operational effectiveness and value of aviation services, airport infrastructure public and private investments and user incentives,
- Working collaboratively with regional airport and user partners to accommodate aviation growth within the metropolitan service area,
- Enhancing intermodal and multimodal transportation choices and improving the ability of Minnesotans to travel safely and efficiently throughout the region, and
- Preserving and mitigating vital natural areas and resources from adverse aviation operations and development for future generations.

The region's airport system provides the physical access for aircraft connections to other local, state, national and international airports. A major goal of the regional airport system is to reflect the following general principles guiding federal involvement in the *National Plan of Integrated Airports Systems* (NPIAS):

- **Permanent** - with assurance facilities will remain open for aeronautical use over the long-term.
- **Extensive** - with facilities located at optimum sites, and providing as many people as possible with convenient access to air transportation.
- **Flexible and expandable** - able to meet increased demand and accommodate new aircraft types.
- **Safe and efficient** - developed, operated, and maintained to appropriate standards, and developed in concert with improvements to the air traffic control system.
- **Compatible** - with other regional systems and surrounding communities, maintaining a balance between the needs of aviation and the requirements of residents of neighboring areas.
- **Affordable** - to both users and government relying primarily on user fees and placing minimal burden on the general revenues of local, state and federal government.
- **Cost beneficial** - in aviation infrastructure investments.
- **Supportive** - of national objectives for defense, emergency readiness and postal delivery.
- **Contributing** - to a productive national economy and international competitiveness

Partner Roles and Responsibilities

Numerous public and private interests are partners in the aviation planning process Roles of the various partners include:

User Groups

- **Pilots:** Operate and hangar aircraft at system facilities, tenant participation in airport development, maintenance, operations activities and pay various aviation fees.

- **Air Passengers:** Purchase various types of air transportation services, utilize terminals and support concessions, pay ground transportation or parking fees, create business and recreational air travel demands, and pay for support of airport development, operations and environmental mitigation.
- **Businesses:** Purchase air passenger and freight services, support air freight forwarders and consolidators, own/operate corporate aircraft, use the system facilities, and participate in chambers of commerce on air service.
- **Airlines:** Provides various air services to passengers and air cargo users, generates access to travel and business opportunities, pays taxes and fees to develop and support user and airline support facility needs, purchases services, and enter into agreements on use, development projects and operation leaseholds, participates in airport planning, development, operational and funding activities.
- **Aviation Firms:** Provide general services to user groups, provides specialty services and products to users, provides fees for on-airport operations, and participates in airport planning and operation.

Airport Sponsors

Own and operate airports on a daily basis. Responsible for airport certification and security. Provide airside, landside and support facilities and services to meet user needs. Responsible for airport financing, management, and environmental protection. Responsible for airport plans and development. Participates in promotion of aviation, respond to legislation/rules affecting airports. The MAC, City of South Saint Paul, and the City of Forest Lake are system sponsors in the seven county region for public airports.

Regional Systems Planning

The Metropolitan Council prepares regional system plans including air transportation. Responsible for review of community comprehensive plans, MAC airport plans, environmental evaluations, and aviation capital program. Responsible for oversight, coordination, and planning/implementation assistance of airport/community land use compatibility, airspace protection, ground access, environmental mitigation and local infrastructure support. Conducts and participates in aviation planning, coordination, and implementation activities.

Mn/DOT

Agency responsible for statewide promotion and over-sight of airports and aviation. Provides safety, financial, technical and regulatory services for airports in Minnesota. Prepares statewide aviation system plan and provides input to the NPIAS on state needs.

FAA

Prepares the national airports and airspace plan operates navigational aids and air traffic control, manages aviation development funds for airport improvement program (AIP), develops/enforces airport design standards, provides planning assistance, coordinates within U.S. DOT, and participates in local planning, environmental and implementation activities that are federally funded or under federal purview.

Figure 10-20: Minor reliever airport - South St. Paul

Partner Jurisdictional Areas

The partners not only have different aviation roles and responsibilities but also different geographic areas of jurisdiction. Figure 10-22 shows the main jurisdictional areas between MN and WI state airports system plan areas, the Metropolitan Council and MAC areas, and those communities involved in joint airport/city zoning efforts. Areas of county and township permitting of private airports are also identified.

Planning Process

The federal government controls the national airspace for both civil and military use, therefore preempting and proscribing many operational, development, design, funding and planning parameters for airports. Airport systems of the states and metropolitan areas make up the National Plan of Integrated Airports (NPIAS). In Minnesota there is a state airport system plan (SASP), a Twin Cities regional aviation system plan (RASP) defined in the TPP, and individual airport long-term comprehensive plans (LTCPs) that provide the basis for defining airport roles, development, funding and environmental mitigation. Figure 10-21 shows the feedback nature of the process. The metropolitan portion is highlighted. The review process for the capital improvement plan is defined in Appendix P.

This continuous planning process ensures that the system plans provide guidance appropriate to expected needs and implementation priorities. The regional system plan is based upon a 20 year planning horizon and updated every four years; each LTCP is based upon a 20 year planning horizon and periodically updated as defined in Appendix I. Interim updates or special studies are conducted if warranted. State and metro systems plans include aviation facilities of local importance. Entry criteria are established for inclusion in the NPIAS, a prime requisite for federal funding.

Figure 10-21: Aviation Planning Process

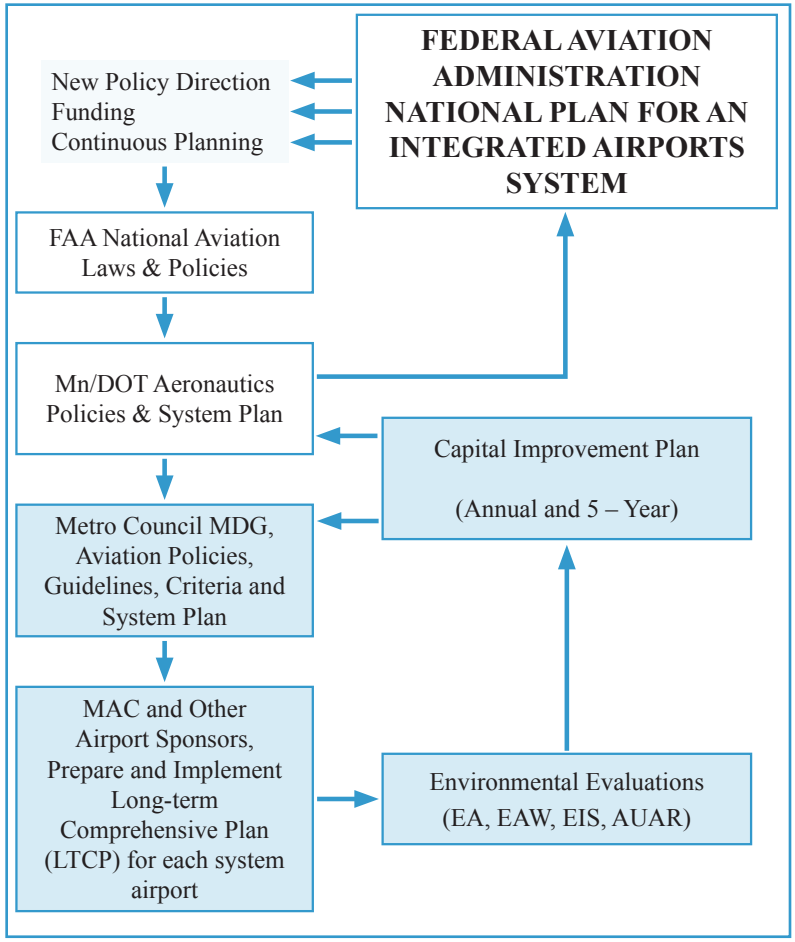
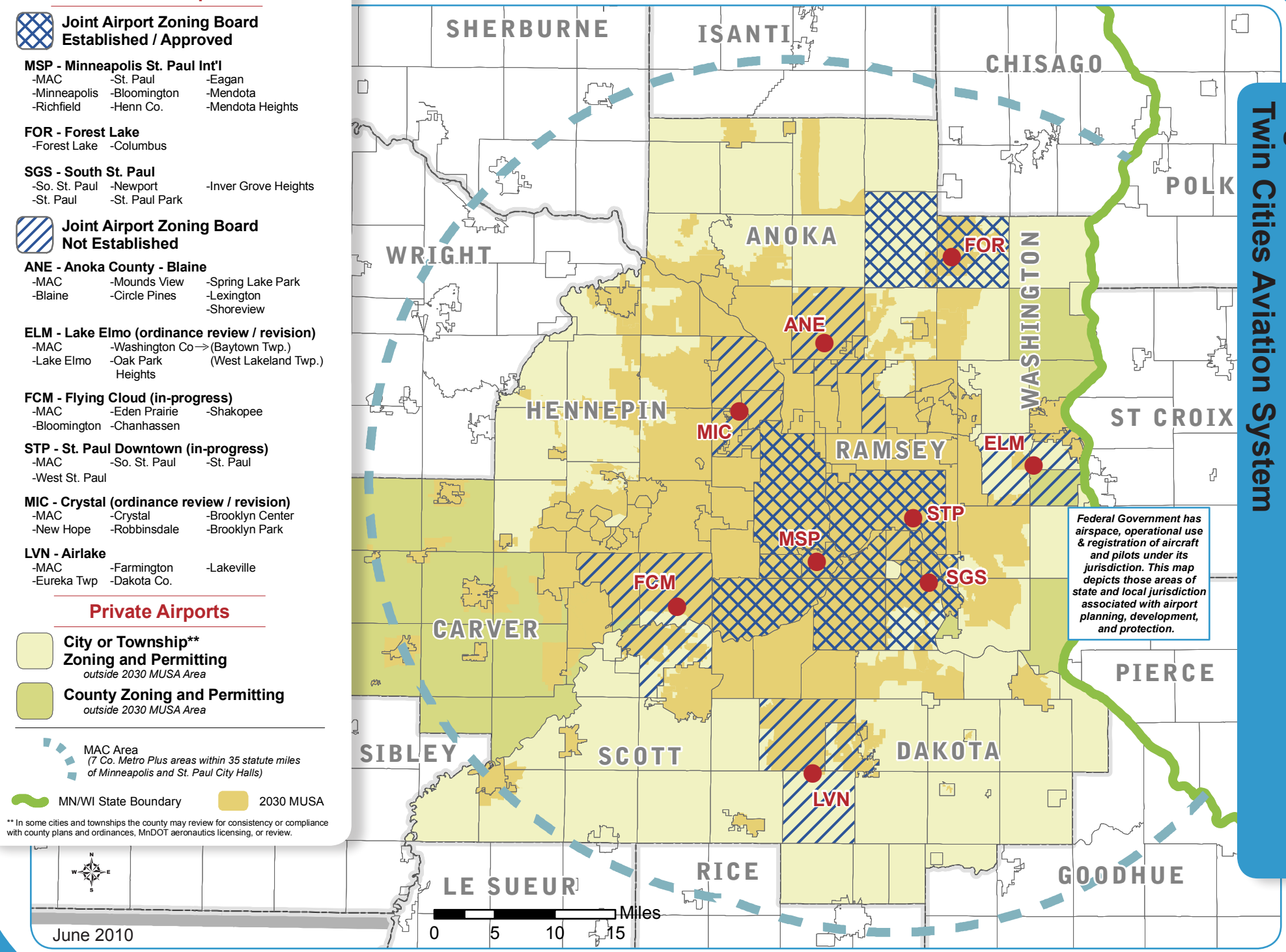


Figure 10-22: Jurisdictional Areas
Twin Cities Aviation System



Aviation *Systems Statements* are prepared by the Council after adoption of each aviation system plan. The statements describe what specific system elements are to be included and considered in updating or amending a local plan. Three types of aviation statements are given to communities:

- Communities with only general airspace protection and notification to FAA for proposed tall structures.
- Communities with general airspace protection considerations, but also directly affected by aircraft and adjacent airport facility operations.
- Communities with general airspace protection, but also an aviation facility located within its corporate limits.

The planning process and local plan requirements are further defined in the *Local Planning Handbook*. Figure 10-24 depicts the regional aviation system and identifies those communities and geographical areas affected by one or more types of air transportation planning and development considerations. The *Airport Compatibility Area* identifies where aviation planning considerations are likely to apply, and is a tool used by the Council in its initial assessment of whether public and private projects referred for review are going to require additional coordination or information.

Table 10-23: Airport Classifications

Airport	Federal NPIAS	State	Regional
MSP International	Commercial Service - Primary	Key	Major
(None in metro system)	Commercial Service - Other	Key	N/A
(e.g. St. Cloud)	Commercial Service - Reliever	Key	N/A
St. Paul Downtown	Reliever	Key	Intermediate
Flying Cloud	Reliever	Key	Minor
Anoka County-Blaine	Reliever	Key	Minor
Crystal	Reliever	Intermediate	Minor
Lake Elmo	Reliever	Intermediate	Minor
Airlake	Reliever	Intermediate	Minor
South St. Paul	Reliever	Intermediate	Minor
(e.g. Red Wing)	General Aviation (G.A.)	Key	N/A
Forest Lake	N/A	Landing Strip	Minor

System Plan Elements

Classification of Airports

All airports are subject to the rules of airspace sovereignty and national governmental controls. Most airports in the metropolitan and state system are part of the national plan of integrated airport systems. These systems classify airports as to their role and function in the particular system. Each level of system planning categorizes the airports in different ways to address the agency purpose and goals for their particular system. Policy, design, operations, facility use, and funding are tied to these facility designations. A comparison of the federal, state and regional nomenclature and classification is depicted in Table 10-23.

Table 10-25 gives a summary overview of airport functional and operational characteristics and regional airport facility classification, including application of the airport influence area. The existing regional airport system plan for the metropolitan area (RASP) depicted in Appendix J includes a figure identifying the metro airports system including the hub airport, reliever airports, and special purpose facilities. No publicly-owned airports exist in either Scott or Carver Counties. Also included in this appendix are figures depicting the NPIAS airports and the state airport system plan (SASP) airports.

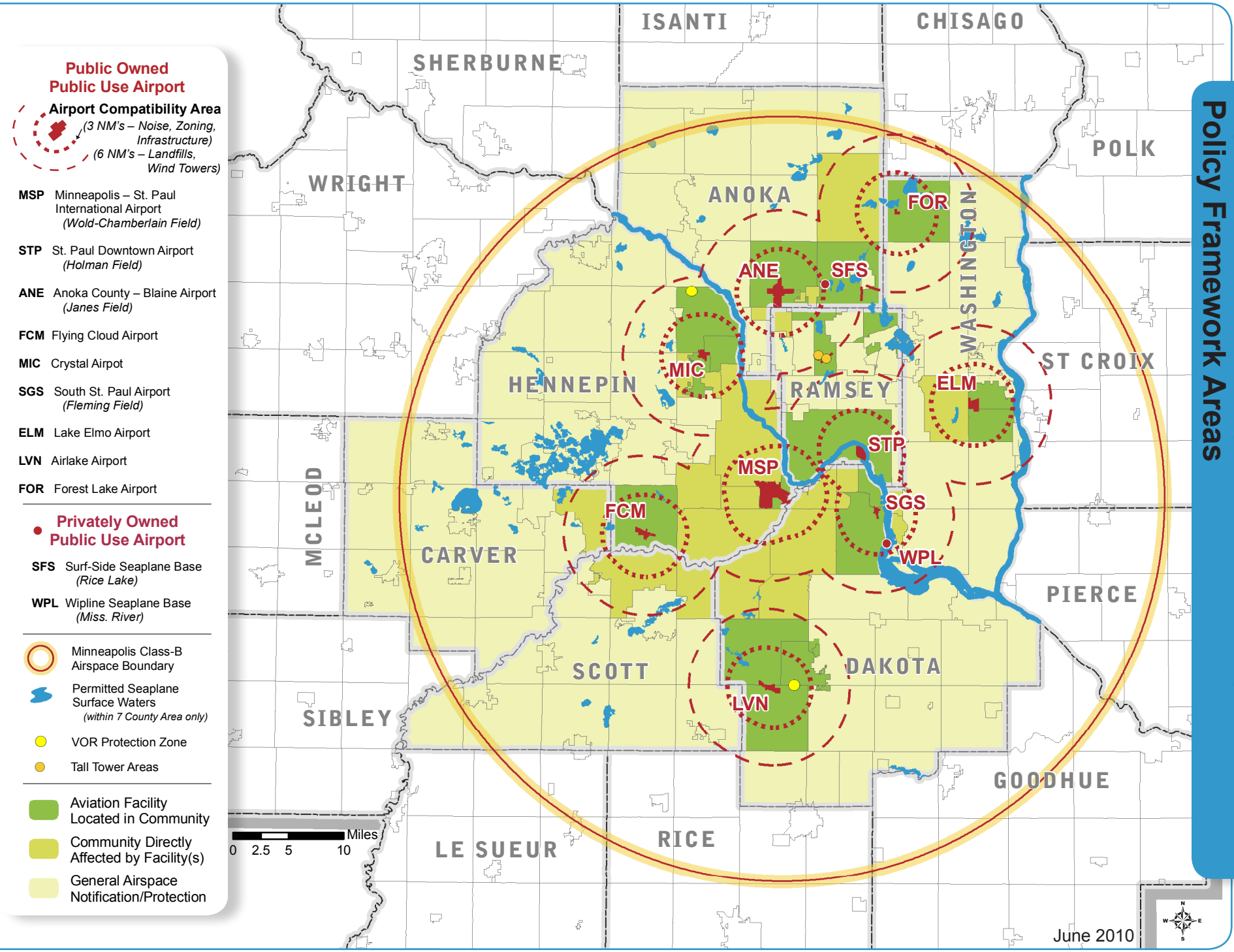


Figure 10-24: 7 Co. Regional Aviation System Policy Framework Areas

Table 10-25: Airport Functional and Operational Characteristics / Classification of Metro Region Airport System Facilities

Facility Classification	Functional Characteristics			Operational Characteristics		Airport Compatibility Area *
	System Role	Users Accommodated	Air - Service Access Provided	Primary Runway Length	Instrumentation Capability	Compatibility Considerations
Major Airport						
MSP International	Commercial Air Service Hub	Scheduled Passenger & Cargo, Charter, Air Taxi, Corporate G.A., Military	International, National, Multi-State, Regional	8,001 - 12,000 ft, Paved	Precision	Airport Compatibility Area requirements for airport system functioning: • Regional Airspace Protection • Airport Airspace and land use safety zoning • Land Use Guidelines for Aircraft Noise • Local Infrastructure and Services ▫ Sewer Service ▫ Water Service ▫ Storm Water ▫ Road Access ▫ Police-Fire ▫ Non-Aviation Uses
Tier 2 Airport (SASP) ** St.Cloud	Commercial Hub Reliever	Scheduled Passenger & Cargo, Charter, Air Taxi, Corporate G.A., Military	International, National, Multi-State, Regional	8,001 - 10,000 ft, Paved	Precision	
Intermediate Airport						
St. Paul Downtown	Corporate Jet Reliever	Air Charter, Air Taxi, Corporate Jet, Military, G.A.	International, National, Multi-State, Regional	5,001 - 8,000 ft, Paved	Precision	
Minor Airport						
Anoka Co. -Blaine	Business Jet Reliever	Air Taxi, Business Jet	Nat'l./Multi-State	5,000 ft, Paved	Precision	
Flying Cloud	Business Jet Reliever	Air Taxi, Business Jet	Nat'l./Multi-State	5,000 ft, Paved	Precision	
Airlake	G.A. Reliever	Rec./Training/Business	Multi-State/State	4,098 ft, Paved	Precision	
So. St. Paul	G.A. Reliever	Rec./Training/Business	Multi-State/State	4,001 ft, Paved	Non-Precision	
Crystal	G.A. Reliever	Rec./Training/Business	Multi-State/State	3,263 ft, Paved	Non-Precision	
Lake Elmo	G.A. Reliever	Rec./Training/Business	Multi-State/State	2,850 ft, Paved	Non-Precision	
Forest Lake Airport	Recreational/Business	Recreation/Training	State, Region	2,650 ft Turf	Visual	
Special Purpose						
Surfside Seaplane Base	Recreational/Business	Rec./Training/Per. Bus.	Multi-State/State	6,500 ft Water	Visual	Variable by Facility
Wipline Seaplane Base	Recreational/Business	Training/Business	Nat'l/Multi-State	8,000 ft Water	Visual	
Public Heliports	General Aviation	Business/Air Taxi	State, Regional	Variable by facility	Visual	
Private Heliports	Business	Bus./Training	State, Regional	Variable by facility	Variable by facility	
Hospital Heliports	Emergency Services	Business	State, Regional	Variable by facility	Variable by facility	

*Airport Compatibility Area is defined as a radius area 3 nm and 6 nm off the ends of the existing and planned runways of the nearest system airport; within 3 nm it addresses general land use compatibility issues, and out to 6nm it also addresses sanitary landfills, and wind-generation facilities.
compatibility issues and out to 6 nm it also addresses sanitary landfills, and wind-generation facilities.

** The St. Cloud Airport is not part of the metro airports, but is included here for comparison purposes since it is designated in the 2006 State Airport System Plan (SASP) and airport master plan as a commercial service reliever to MSP International Airport.

System Role and Function

Defining an airport's function and role in the overall system is an important policy and technical step in the aviation planning process. Periodic re-evaluation is necessary to see if the system has the right type of airports, in locations providing the right type and level of services, in a cost-effective and compatible manner. The need for potential changes in designations or terminology were examined in the *2030 System Plan Update Technical Report,* and no changes in airport classification were recommended**.** The technical report also examined the following considerations:

SASP Air-Service Initiative

Mn/DOT Aeronautics, in cooperation with the affected agencies and airports recommended an inter-regional approach as a strategic method to meet future air-service needs in its *Tier 2 Air Service Study, June 2003* . MSP was defined as the Tier 1 airport in the state system and the Tier 2 group of airports consists of Rochester, St. Cloud and Duluth. A number of roles were identified for these facilities [such as] being gateways to mainline carrier networks and reliever airports to MSP. The St. Cloud airport was designated as a future Commercial Reliever since it is the closest Tier 2 airport to MSP and the metro area, although St Cloud does not currently have scheduled commercial air service. An update to the SASP is being initiated in 2010.

Light Sport Aircraft

The FAA has implemented a new category of general aviation aircraft, *Light Sport Aircraft* (LSA), and an associated *Sport Pilot certificate* that necessitated looking at the existing airport classification scheme. Initial expectations were that these aircraft would be based and operated at the reliever airports. A special study on sport aviation was conducted by the Council to assess potential effects on the system. The study survey indicated that this new user group is likely not to use reliever airports due to costs and apparent preference for uncontrolled airports with turf runways. Therefore the regional system

Figure 10-26: Special purpose airport - Forest Lake

classification accommodates this aircraft group in the Special Purpose airport role until proven otherwise. Growth and development of this aircraft category should be closely monitored.

Small Business Jets

The FAA has encouraged general aviation airports to be business-jet ready. The advent of the very light business jet (VLJ), the growth of the larger-scale corporate business aircraft fleet, and increasing fractional ownership of planes are expected to be the growth segments for general aviation. Recognizing this demand, the Council has approved airport plans for St. Paul Downtown, Anoka County-Blaine, and Flying Cloud airports that upgrade capabilities for the business users. Continued emphasis on business jet aircraft at these three Minor airports is recognized in each airport's designated role.

Airport Financial Sustainability

Reliever rates and charges have been reassessed by the MAC in response to an airline lawsuit that maintained the rates were too low in relation to comparable facilities, that the reliever airports should become more self-sufficient, and that they not be "subsidized" from revenues generated at MSP. FAA policy is that there cannot be revenue diversion from MSP, and all airports should enhance their revenue streams and be as self-sufficient as feasible. The Commission has implemented a new fee structure and options that cover all or part of airport costs of maintenance, operation, depreciation and capital investment *MAC Reliever Task Force Report July 2006* The end result is that rates-and-charges increased over previous levels and a financial model was implemented to monitor longer term financial performance. During the recent LTCP updates for the minor airports, non-aviation land use development was identified as a new revenue source to be implemented at each airport to the extent feasible. The process for review of non-aviation land use changes is included in Appendix I.

Service Areas and Access

Accessibility, both by air and ground access to the airport, is important to efficient use of air-transportation. While the region has only one major commercial airport, development of the regional system of minor airports reflects the geographic trends in urban development, population and employment patterns to maximize economic benefits. The relationship of the various airport service areas to the MUSA and economic development is shown in Appendix K.

Figure 10-27: Corporate business aircraft

There are two types of criteria used in this plan to define airport service areas. One reflects air access to local destinations from the particular airport for itinerant aircraft users, and the other reflects local ground access by based-aircraft users from their home or work locations to airports where their plane is based. The service areas are defined by travel times on the 2030 highway system. Airport service areas for MSP and other metro reliever airports, metro collar county airport service areas, and special purpose airport service areas are discussed and depicted in Appendix K. Figure K-1 depicts airport service areas for the metro area system. Figure K-2 depicts service areas for the collar county public airports. Figure K-3 depicts selected metro and collar county turf and seaplane facilities.

Figure 10-28 depicts the general accessibility provided by different types of aircraft based upon an estimated one-hour of flight in one direction from the metro area. Most of the aircraft types listed have a much further total range capability. For example, the new category of very- light- jets (VLJs) have an average range of about 1,100 miles allowing access to a large part of the domestic airport system from the Twin Cities. The larger corporate business jets can fly to all portions of the continental U.S. and non-stop to Europe.

The region is well served by a geographically dispersed pattern of minor airports. No new general aviation airports are proposed in this plan. General aviation search area (A), defined in previous regional plans is no longer needed and has been eliminated from the plan. The plan envisions that public airports in the collar counties would provide future capacity for growing areas on the edge of the seven county region. For example, no new airports are envisioned in Carver or Scott Counties since they are provided with service from Flying Cloud, Airlake, Le Sueur, Glencoe and Winsted airports.

Airspace and Airport Safety Protection

Protection of the region's airspace and airport safety is accomplished by focusing on four areas that need to be addressed in land use planning:

- Notification (concerning proposals for potential obstructions)
- General airspace
- Airport airspace and land use zoning
- Aviation facilities located off-airport

Notification

All metro area communities are required to include a "Notification" element (using FAA form 7460) in their comprehensive plans as defined in the *Local Planning Handbook*. (www.metrocouncil.org/planning/LPH/handbook.htm)

This notification is for structures over 200 feet above ground level at the site. It is used by the FAA for review of structure height and structure transmitting frequency and power, in coordination with the FCC. Notification is also used by Mn/DOT Aeronautics for permits for height of non-transmitting structures, including wind generators as defined in their *Tall Towers web section*, and to coordinate with the Minnesota Pollution Control Agency. The metro area is one of the less productive wind resource locations in the state; however, due to energy costs and promotion of renewable energy sources, a number of communities and institutions in the metro area are establishing wind generators and related local zoning ordinances. The Airport Compatibility Area, along with the other policy framework areas, is used for review and monitoring of proposals affecting the region's airspace.

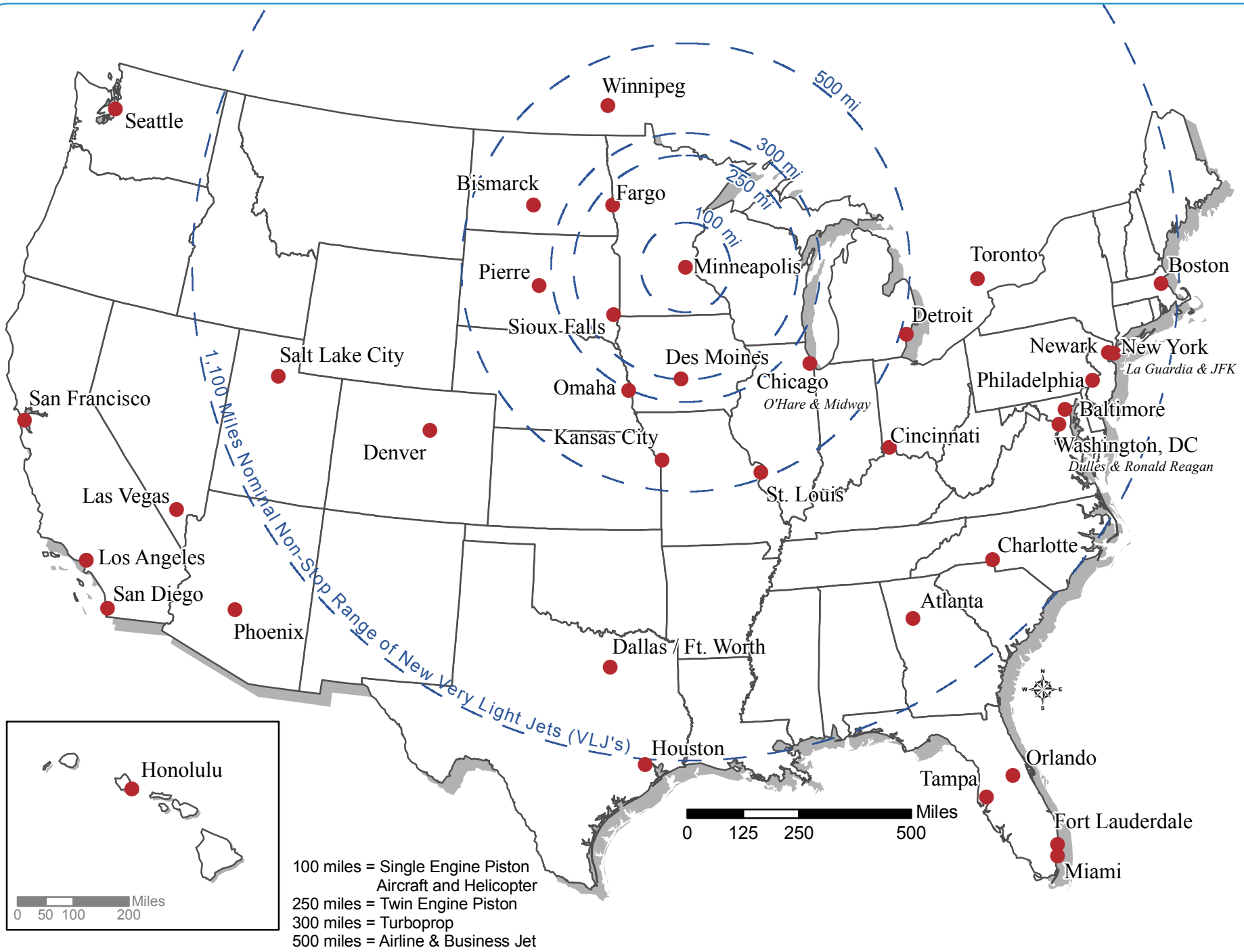


Figure 10-28: Typical Aircraft One-Hour Flight Access

June 2010

Figure 10-30: FAA air traffic control tower - MSP

Airport Airspace

This airspace is defined as including the FAA FAR Part 77 imaginary surfaces, state law Chapter 360, state Rules 8800, and Mn/DOT land use safety zones as defined in their *Land Use Compatibility Manual*. It is the airport zoning district and ordinance as adopted by a Joint Airport/Community Zoning Board. The airport airspace basically covers all potential obstructions from ground level to about 200 foot above ground level.

Facilities Off-Airport

Airspace for off-airport aviation facilities are to be reflected in local community plans and protected from physical or electronic interference (receiving or transmitting) from near ground surface at the site and within certain distances and heights. This includes navigation aids, landing aids, and radar facilities.

General Airspace

All airspace in the seven-county area that is not within an airport airspace zoning ordinance area is considered to be "general airspace" as concerns potential and existing hazards to air navigation. Protection of this airspace is concerned primarily with potential airspace structures that could cause channeling or compression of low altitude operations occurring under the MSP Class B airspace, affect existing or potential extended approach surfaces for ILS runways, affect airport published approach procedures, or generally increase the complexity of the airspace structure or inter–airport flight operations. Structures 500 feet or more in height should be clustered in a way to take advantage of shadowing effects of existing structures where feasible; structures over 1,000 feet above ground level should either be co-located with similar existing structures or located outside the of Class B airspace as depicted in Figure K-2 .

Airport Capacity and Delay

Capacity of the regional aviation system is usually determined by several interrelated components: the airspace itself and related facilities, airport airside facilities, airport landside facilities and aircraft mix.

Figure 10-29: Aircraft at the gates - MSP

Airspace Capacity

At MSP the FAA has in place a Class - B airspace that expands outward 30 nautical miles from MSP and includes airspace in the collar counties of Minnesota and Wisconsin, as depicted in Appendix L. The region's Class - B airspace was expanded in February 2006 (minor adjustments by FAA in 2010-2011) and has adequate capability to handle air traffic generated by the MSP hub airport.

Airport Airside Capacity

Airside facilities include runways, taxiways, and aprons for the movement and parking of aircraft. Airside capacity is determined by various factors including orientation of runways to prevailing winds and to each other if multiple runways, number and type of taxiways, mix of aircraft using the air-

port, operational characteristics of the based aircraft, and weather conditions. The FAA has established a definition of general airport capacity called the annual service volume (ASV) that takes these variables into account for each particular airport. The ASV for a given airport is the annual level of aircraft operations that can be accommodated with minimal delay. For airports with operations below the ASV delay is minimal, usually less than four minutes per operation. Delay levels above four minutes can result in rapidly increased congestion, operating costs and operational complexities.

When an airport is projected to reach 60% of ASV the FAA recommends that planning for improvements begin; when an airport's operations reach about 80% of ASV project programming and implementation should be initiated. These criteria are usually applied at facilities where physical expansion is feasible, for consideration of constrained airports further discussion on capacity thresholds is included in Appendix Q. In addition, these thresholds assume continuing growth in airport operations.

However, at MSP the new north/south runway and downturn in traffic has substantially reduced pressure on runway capacity needs in the short-term; the mid-to-long term effects are further discussed under the 2030 system plan section. This decline was recognized by the Council in its review of the 2030 LTCP which stated that MAC should begin a capacity study when operations approach 540,000.

Recent updates of the reliever airport LTCPs indicate airside capacity is adequate, and at Crystal airport two runways are approved for closure . Airside development capacity additions are likely to come from a combination of runway, air-traffic management procedures/equipment and aircraft on-board technology improvements under the FAA NextGen airport capacity program.

Delay

A four minute average annual delay per aircraft operation is a threshold used by FAA to define an acceptable level of delay. The Metro Development Framework benchmark for the aviation system adopted a 2030 target of 7.1 minutes of delay for the Major airport, using a 2002 baseline of 6.9 minutes average delay, at a time when MSP was near its historical high operating level. This delay level appeared to be an economically acceptable level for MSP operating within the large hub airport category. After the new north/south runway 17/35 opened the average delay dropped to 5.5 minutes. Based upon new 2030 aviation demand forecasts, the delay level is expected to rise to an average annual delay of approximately ten minutes per operation at approximately 640,000 annual operations.

Airport Landside Capacity

The capacity of the airport's landside facilities usually relates to the number of gates and parking aprons at the Major and Intermediate airports, and the number of hangar spaces and transient apron/tie-down spaces at the other Minor airports.

Gate and apron needs for passenger-handling at MSP appear inadequate according to 2030 forecasts. Additional passenger gates, terminal expansion and parking are needed. The changes in aircraft fleet mix due to operating costs, along with a likely shift in fleet mix resulting from the NWA/Delta merger, also impact needs and are addressed in the MSP 2030 LTCP Update. Current MAC policy limits additional GA

hanger development at MSP for general aviation based-aircraft users. General Aviation is encouraged to use the reliever airports, and improvements are aimed to attract these users away from MSP.

Hangar storage at the system's general aviation airports is necessary because of security concerns, aircraft ownership/operational requirements, and effects of the Minnesota weather seasons. Existing hangar spaces are generally adequate and additional space is currently available, especially in T-hangars. New areas for building hangars have been prepared at Anoka Co.-Blaine, Airlake, Flying Cloud, and So.St. Paul Airports. Provision for additional building area development has been included in the LTCP update for Lake Elmo airport, and there is some possibility of building area redevelopment at Crystal airport. The most current estimates of existing hangar spaces and percent of capacity utilized are presented in Table 10-31.

Land Use and Environmental Compatibility

Most of the land surrounding the system airports now consists of built-up areas or land zoned for urban uses. Only Lake Elmo and Airlake airports have adjacent rural land use areas. Anoka County-Blaine and Forest Lake are in rapid transition to being enveloped by urban development.

The Council has implemented land use compatibility guidelines for aircraft noise as a *preventative* measure to help communities control expanded development of sensitive land uses around airports. The airport sponsors use *corrective* land use measures to help mitigate noise in areas with existing development that is incompatible with designated noise levels. The definition and application of the guidelines is found in Appendix M, along with revised noise contours for each airport.

Table 10-31: Estimated Landside Capacity Utilization

Airport	Hangar Spaces	Based Aircraft*	Percent of Capacity
MSP International	no estimate	24**	(policy-limited)
Anoka Co.-Blaine	510	459	90
Crystal	382	251	66
Flying Cloud	450	450	100***
Lake Elmo	256	227	89
So. St. Paul	N/A	241	N/A
Forest Lake	22	26	100+
St. Paul Downtown	159	124	78
Airlake	160	175	100+

** Includes military aircraft at some airports.*

*** G.A. only*

**** Indicates that some aircraft are accommodated using outside storage.*

In addition, the Council reviews the long-term comprehensive plans for each airport to determine whether the airport plan is compatible with land use and environmental evaluation requirements concerning metro systems, and for consistency with regional policies. The Council also reviews community comprehensive plan updates and plan amendments for airport/community compatibility in the areas of height and safety zoning, ground access, sewer and water service, and safety/security services.

A preliminary assessment for year 2010 status of each airport is included in Appendix N and will be used to help identify issues and areas that may need to be further addressed in the future. The compatibility estimate for future years will be predicated on implementation of updated airport long-term comprehensive plans (LTCPs) to meet forecasted demand for short, medium and long-term planning horizons out to 2030.

Air Service

There are generally five different categories of public and private air service providers and users in the Twin Cities. Table 10-32 identifies these providers/users and the type of metro area airports they typically use. Demand for aviation service is primarily a reflection of population and employment in a particular catchment area. The histori-

cal and projected levels of metro area population and employment, in comparison to commercial aviation activity at MSP, are depicted in Table 10-33.

Table 10-32: Air Service Available at Region's Airports*

Types of Air Transportation Services Provided - Primary Function (P) - Secondary Function (S)	MSP Major Commercial Service Airport	St. Paul Downtown Intermediate Service Airport	Minor Airports (relievers)	Special Purpose Airports
Scheduled Air-Carrier and Regional Carrier air services.	P			
Scheduled and non-scheduled air charter services.	P	S		
Scheduled and non-scheduled air-taxi air services	P	P	S	
Corporate/business and emergency medical services	S	P	P	
Personal use business and recreational activities.		S	P	P

**Does not mean pilots cannot legally use a particular airport*

Table 10-33: Comparison of Metro Growth and Commercial Aviation Activity

Year	Population	Employment	MSP Total Annual Passengers	Personal Income*	MSP Total Annual Aircraft Operations	Total Originating Passengers
1990	2,288,721	1,273,000	20,381,314	----------	383,922	4,284,240
2000	2,642,062	1,606,263	36,614,671	$109,183,000	523,170	7,225,020
2007	2,850,000	----------	35,157,322	----------	452,972	7,857,050
2009	----------	----------	32,378,599	----------	432,395	----------
Forecast 2010	3,071,982	1,819,710	41,700,000	$128,830,000	----------	----------
2015	----------	----------	----------	----------	507,700	10,654,300
2020	3,446,863	2,003,920	43,000,000	$164,591,000	546,900	12,333,800
2030	3,716,430	----------	56,863,000	$210,465,000	630,800	16,624,900

*(in millions of 2004 dollars) Woods & Poole Economics, Inc. Oct. 2008

2030 Aviation Forecasts

Forecasts of commercial and general aviation activity estimate the level of activity expected at airports in the seven-county Twin Cities area, and the surrounding fourteen "collar counties". The projections assist in verifying the roles of individual airports and bracket future levels of activity to determine whether there are any outstanding capacity issues that the regional plan should address. The general aviation forecasts include twenty-four airports, and the commercial forecasts are for MSP International Airport. The forecasts were prepared in 2009 with a base-year of 2008 and extend to 2030.

The recent recession of U.S. and world economies has interjected a high level of uncertainty into all public and private business planning. Recent history confirms a high risk environment that might lead to outcomes beyond a traditional forecasting range. For Minnesota, the most critical variables for aviation forecasting are the following:

- The timing and pace of economic recovery from the current recession,
- The price of jet and 100LL fuel,
- The availability of credit, and the degree to which general business and aviation in particular can maintain and/or expand activity,
- Recovery in corporate aviation after recent disinvestment in that sector,
- The expansion of Southwest Airlines service (introduced March, 2009) at MSP, and
- The integration of Northwest's hub at MSP (due to October, 2008 merger) into the Delta Air Lines system.

The high level of uncertainty for these variables is addressed in the commercial forecasts through use of forecast scenarios, examining the impact of Southwest service, and comparison with peer airports. Forecasts for MSP reflect the types of activity that occurs at the airport, including international passengers, domestic passengers, all-cargo, general aviation and military.

Commercial Aviation Forecasts

During the past five years passenger and operational activity at MSP and 20 other large domestic airports has been on a downward trend. To address this loss of demand, airlines have parked older fuel inefficient aircraft, dropped poorly performing routes, reduced seat capacity and increased on-board load factors. Total scheduled seats, in and out of MSP, at the end of 2007 numbered about 11 million; by end of 2008 seat numbers were down to 9.9 million and continuing downward.

Passenger Forecasts

Forecasting passengers and operations at MSP is complicated by the Delta/NWA merger and the entry of Southwest Airlines in MSP market. In addition to these significant airline changes the local market has been affected by the deep recession beginning in the fall of 2008, high volatility in fuel prices, and a global credit crisis. To address this uncertainty the forecasts examined the passenger activity in three groups:

domestic enplaned passengers, international enplaned passengers, and domestic passenger originations. For each group of passengers identified above a base-case and four forecast scenarios were developed, as depicted in Table 10-34.

Table 10-34: Forecast Scenarios

Originations	2008	2015	2020	2030	Average Annual Growth 2008-2030	Difference in Scenarios By 2030	
Base Case	8,287,800	10,654,300	12,333,800	16,624,900	3.2%		
High Fuel Cost	8,287,800	9,904,000	11,280,800	14,707,500	2.6		
Low Fuel Cost	8,287,800	11,114,200	13,054,900	18,256,800	3.7		
High Economic Growth	8,287,800	11,378,000	13,217,200	17,979,100	3.6		
Declining Connections	8,287,800	10,654,300	12,333,800	16,624,900	3.2		
2030 High/Low Difference						3,549,300	24%
Total Enplanements	2008	2015	2020	2030	Average Annual Growth 2008-2030	Difference in Scenarios By 2030	
Base Case	16,384,300	19,102,800	21,818,200	28,431,900	2.5%		
High Fuel Cost	16,384,300	16,651,500	18,068,000	21,401,100	1.2		
Low Fuel Cost	16,384,300	19,921,300	23,063,000	31,111,200	3.0		
High Economic growth	16,384,300	20,421,200	23,378,500	30,656,300	2.9		
Declining Connections	16,384,300	17,869,000	19,601,300	23,708,100	1.7		
2030 High/Low Difference						9,710,000	45%
International [only]	2008	2015	2020	2030	Average Annual Growth 2008-2030	Difference in Scenarios By 2030	
Base Case	1,264,500	1,472,500	1,836,600	2,839,500	3.7%		
High Fuel Cost	1,264,500	1,305,000	1,465,200	1,847,200	1.7		
Low Fuel Cost	1,264,500	1,520,000	1,938,800	3,134,900	4.2		
High Economic Growth	1,264,500	1,536,500	1,974,700	3,241,600	4.4		
Declining Connections	1,264,500	1,423,500	1,699,400	2,422,100	3.0		
2030 High/Low Difference						1,287,700	75%

A number of observations are apparent in reviewing the passenger forecasts:

- Total enplanements will grow over the forecast period at an annual rate of between 1.2 and 3.0 percent.
- High fuel costs results in the lowest number of enplanements and significantly constrains international traffic.
- Low fuel prices and high economic growth are the greatest stimulants of traffic.
- Declining connections is the second most important contributor to lower enplanements.
- Degree of uncertainty is very high and forecasts project a wide band of possible futures. For total enplanements, by 2030, the difference between a prolonged period of high fuel cost or low fuel cost is almost 10 million passengers or a 45 percent difference.
- There is a 75 percent difference or 1.3 million passengers between highest and lowest international passenger forecast.
- The originating passenger forecast exhibits the smallest range of possible outcomes. This scenario effectively sizes the market as a local origin and destination market (no hubbing). In 2030 the local MSP market is forecast to be between 14.2 and 18 million originations.

The existing terminals at MSP are not capable of handling the passenger numbers forecasted. Implementation of the MSP 2030 LTCP will move all non-SkyTeam airlines to Terminal 2 Humphrey and all Delta SkyTeam Alliance member hubbing airlines remain at Terminal 1 Lindbergh. Existing total passenger gate capacity would be increased from 127 gates to a total of 155 gates by 2030. Additional parking is proposed along with the new gates to meet demand and balance airside and landside capacities. No airside improvements, other than some taxiway development, are envisioned in the 2030 concept plan. Most of the large projects are demand-driven and will not be built unless needs warrant implementation.

Figure 10-35: Maintenance and Improvements at MSP, Summer 2010

The MAC is actively involved in attracting new and additional air service to MSP by both incumbent and potential new entrant airlines. The MAC maintains on file with the FAA an approved Airline Competition Plan and completed an update to the Competition Plan in 2008 in accordance with changes to the MAC's Airline Operating Agreement in 2007.

Passenger Operations Forecasts

MSP peak aircraft operations of 541,093 occurred in 2004.

Table 10-36: Traffic Growth

Type of Operation	2008	2015	2020	2030	Average Annual Growth 2008-2030
Domestic Air Carriers	378,300	426,900	461,100	529,600	1.5%
International Air Carriers	24,100	28,800	32,500	47,100	3.1
Charter	500	400	400	200	-4.1
All-Cargo Carriers	14,400	16,100	17,500	18,800	1.2
General Aviation/Air-Taxi	30,700	33,400	33,300	33,000	0.3
Military	2,100	2,100	2,100	2,100	0.0
Total	**450,000**	**507,700**	**546,900**	**630,800**	**1.5**

Scenarios	2008	2015	2020	2030	
Base Case	450,000	507,700	546,900	630,800	1.5%
High Fuel Cost	450,000	449,400	469,500	514,000	0.6
Low Fuel Cost	450,000	543,000	583,900	697,800	2.0
High Economic Growth	450,000	546,600	591,600	688,400	2.0
Declining Connections	450,000	484,700	512,000	571,900	1.1

The aircraft fleet mix is changing at MSP with more operations being performed by regional airlines. In 2009 total operations were 432,395 with 49 percent being main line aircraft and about 42 percent regional carrier type aircraft. Table 10-36 indicates the average annual growth to 2030 ranges between 0.6 percent and 2.0 percent. This "growth" is from a traffic level of 450,044 in 2008 that was the lowest since 1993.

Air Cargo Activity

MSP ranks 22nd in tonnage of air cargo moved in the U.S. The MSP 2030 LTCP Concept Plan has designated space available for additional air cargo operations; but, existing logistics systems usage patterns, and lack of sufficient back-haul cargo, currently hampers growth opportunities. Most freight forwarders/consolidators currently use trucks to move local airfreight , primarily to Chicago. Security requirements for air cargo are still being implemented but involve increased costs for the airlines. The reduction in average size of aircraft in the MSP fleet also reduces (belly-hold) cargo lift capacity in the local market. An initiative to develop a regional [air cargo] distribution center in Rosemount was studied several years ago, but implementation was not supported with commitments from local shippers.

MSP has cargo facility infrastructure available to accommodate additional cargo operations in the near term and land available for development of future cargo operations on a long-term basis.

General Aviation (G.A.) Forecasts

The volatility that has buffeted commercial aviation and the rest of the economy is certainly also visible in the general aviation sectors, as reflected in Figure 10-37.

A weakened economy has dampened business and personal flying demand. The recent economic conditions are recognized in FAA forecast assumptions that incorporate a decline in general aviation activity until 2013 before activity returns to previous levels, similar to what was done concerning airline

Figure 10-37: Total Annual Operations at MAC G.A. Airports

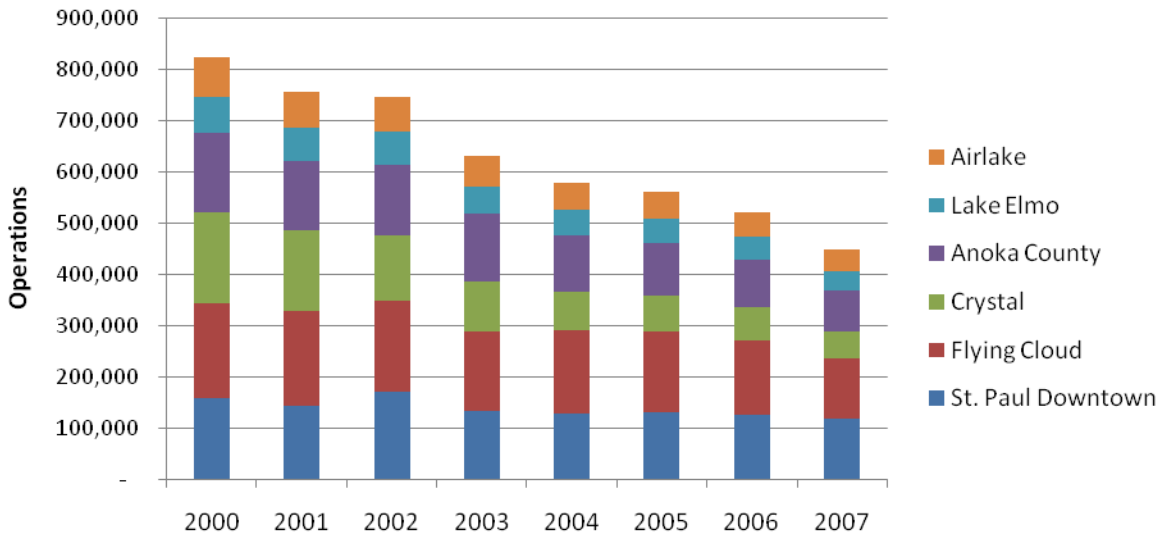


Table 10-38: Based Aircraft Fleet Mix

Region	Single Engine	Multi-Engine	Jet	Helicopter	Sport Aircraft	Total
Metropolitan Region	1,593	145	137	34	4	1,913
Metro Region Distribution	*83.3%*	*7.6%*	*7.2%*	*1.8%*	*0.2%*	*100%*
Collar Counties	693	56	11	32	80	872
Collar County Distribution	*79.5%*	*6.4%*	*1.3%*	*3.7%*	*9.2%*	*100%*
Total Region	2,286	201	148	66	84	2,785
Regional Distribution	*82.1%*	*7.2%*	*5.3%*	*2.4%*	*3.0%*	*100%*
National Distribution	*64.3%*	*8.2%*	*8.5%*	*4.3%*	*5.1%*	*100%*

forecasts. It should be noted that general aviation, operating out of MSP International Airport, is included here under system-wide discussion of general aviation activities. The G.A. forecasts do not include special analysis of Seaplanes, Sailplanes, Ultra-light aircraft or Helicopters.

In 2007 there were an estimated 2,785 G.A. aircraft based in the metro and collar county airports as depicted in Table 10-38.

About 80% of the region's based G.A. aircraft are single-engine piston aircraft with a high proportion being used for personal flying; therefore much of the following discussion focuses on that part of the aircraft fleet. The 2030 forecast of based aircraft and aircraft operations for each system airport and average annual growth is depicted in Table 10-39.

G.A. does tend to run in an extended cycle. In the personal flying sector, aircraft are kept in service for decades. Pilots often take their training at an early age and embark on a lifetime of flying, provided of course they can afford the cost of keeping certifications current, maintaining or renting an aircraft, and paying for fuel. Personal flying patterns can span an entire generation so there is a substantial drag on change. It is possible that recent economic upheavals may convert to long-term trends. On a national basis total hours flown in G.A. has declined and the relative share of these hours flown for personal use has also declined as depicted in Figure 10-40.

Aside from the obvious deterrents of high fuel costs and weak economy, industry data suggests another key reason to expect fewer operations is the age of the G.A. aircraft fleet. Figure 10-41 depicts annual shipments of aircraft manufactured over the past 50 years. About 220,000 were delivered in the peak years from 1965 to 1980 (these numbers do not include kit and homebuilt aircraft).

As can be seen in Figure 10-41, product liability suits decimated manufacturing from about 1982 until the mid-1990's, when a federal government recovery program was instituted and a 20 year limitation on product liability was instituted.

Table 10-39: Forecast of Based G.A. Aircraft/Operations

Metro Airports	2007	2015	2020	2030	Average Annual Growth
Minneapolis-St. Paul International	24	27	30	30	1.0%
Airlake	162	211	203	204	1.0
Anoka County-Blaine	437	452	433	409	-0.3
Crystal	244	269	254	246	0.0
Flying Cloud	421	411	406	396	-0.3
Forest Lake	26	26	27	30	0.7
Lake Elmo	229	261	247	248	0.3
St. Paul Downtown	83	107	118	127	1.9
South St. Paul	237	235	242	255	0.3
Surfside Seaplane Base	45	42	42	43	-0.2
Wipline Seaplane Base	5	5	5	5	0.0
Total	**1,913**	**2,046**	**2,007**	**1,993**	**0.2**

Figure 10-40: Hours Flown by Use - 1997-2007

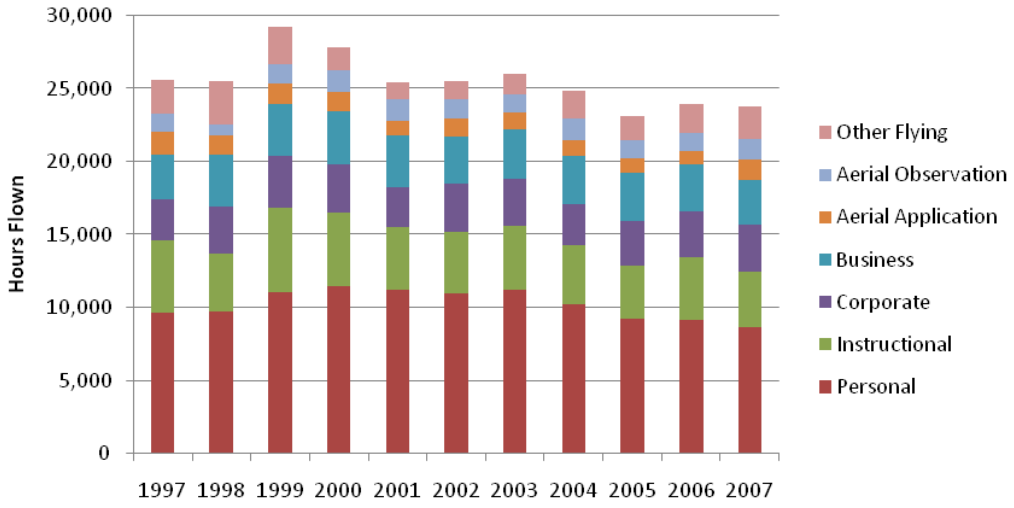


Figure 10-41: Worldwide Total G.A. Shipments 1957-2007

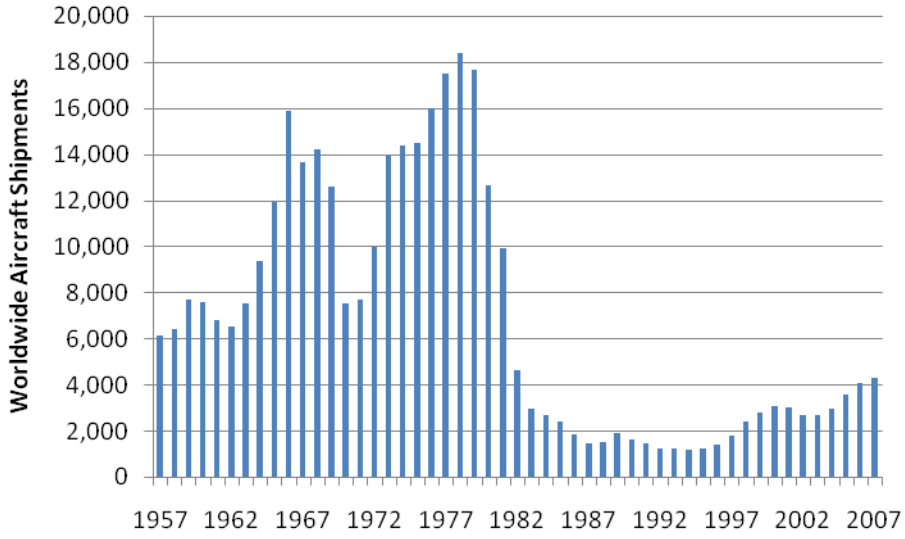


Figure 10-42: Age of Aircraft vs Average Annual Hours Flown

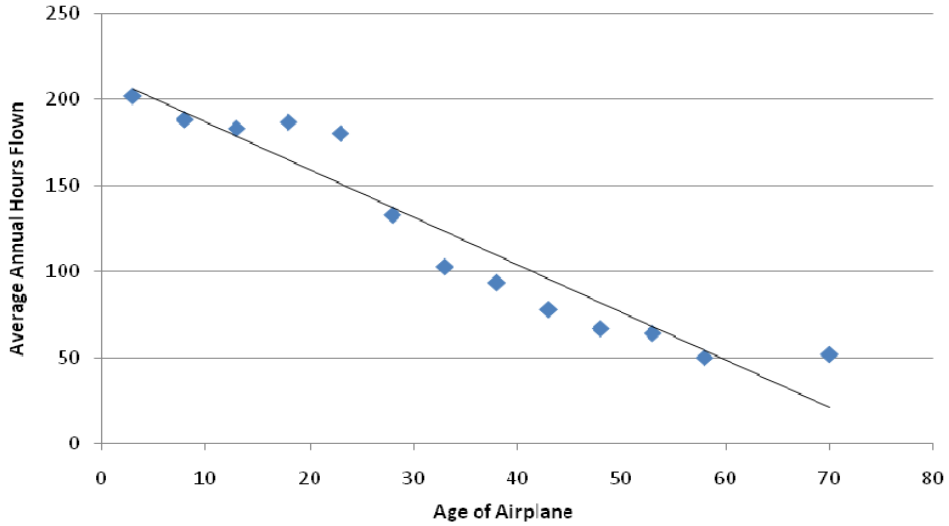
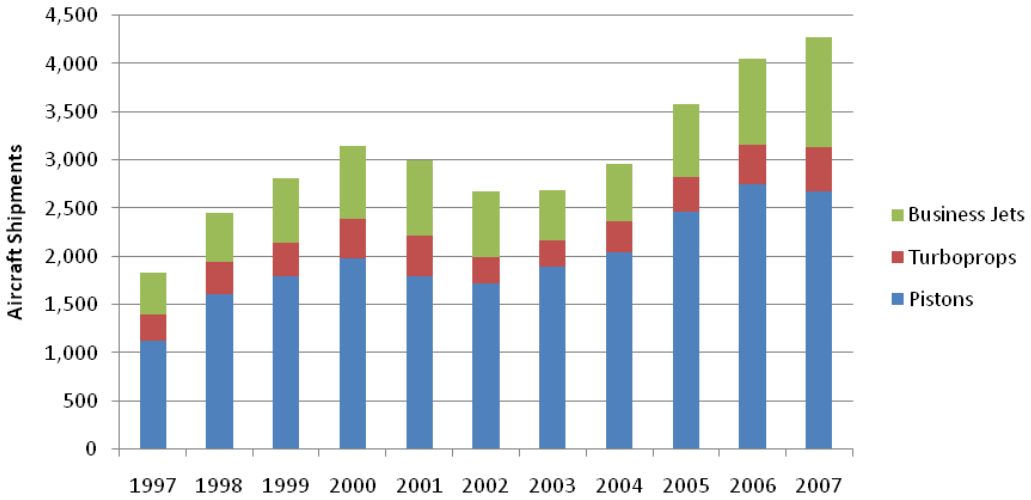


Figure 10-43: Shipments by Type of Aircraft



Many of these aircraft are still active, but are getting older and flown less often. When the number of aircraft are correlated with hours flown it is very apparent that new aircraft fly significantly more hours than older aircraft as shown in Figure 10-42.

Aircraft under 25 years old fly an average of 190 hours a year, between 25 and 40 years of age the average drops to 90 hours a year, and over 40 years old about 90-50 hours a year. A very large portion of aircraft in the U.S. general aviation fleet is approaching the 40 year old mark. The cost of newer, more productive, aircraft is such that a one-for-one replacement of aircraft does not appear to be happening. In addition, the number of student pilots has declined 15% since 2000; new pilots are currently not replacing pilots that become inactive.

A slow recovery has ensued. Figure 10-43 indicates that the aircraft replacement process for aging aircraft has just begun, but the historical demand for primarily single-engine and other piston engine aircraft is changing to business type turboprop and jet powered aircraft.

The implications are for less activity for some time at airports where predominant use is personal use aircraft, and conversely, enhancements will be needed at airports that have the capability of supporting the more sophisticated business users. The system airports in this region reflect these implications in their recently completed updates to their LTCP's through lowered planning and development expectations, reductions in costs, instituting overall rate increases and proposed development of new non-aviation revenue sources. Although the composite activity trend is down throughout the country, at any individual airport the experience is mixed, reflecting the importance of local conditions, services offered, and community support.

SYSTEM PERFORMANCE

The performance of a system or system facility is evaluated in different ways by its managers and users to assess the effectiveness based upon established measures, benchmarks, criterion, guidelines and policies. During the 2030 Plan Update Technical Study the metro aviation system was assessed at the system level compared to other peer-airport systems, commercial hub airports, and individual airport analysis.

Peer Airport Systems

Six peer airport systems were identified for comparison with the Twin Cities regional airport system; they included Atlanta, Charlotte, Denver, Detroit, Philadelphia, and Pittsburg. Their selection was based upon the following factors:

- Only one major hub airport serves the metropolitan area,
- Low cost airline service was present for some time at the hub airport, and;
- The hub airports rank in the top twenty in terms of activity.

Table 10-44 defines the various factors used to do the system comparisons. The comparison indicated that MSP compares favorably in most categories and currently does not have vastly over or under-built capacity. With the recent extension of the runway at Flying Cloud Airport, the region now is more comparable to other systems in the number of relievers with 5,000' or longer runways. From an operations stand point, MSP was second highest in general aviation operations for these hub airports in 2007 at 6.7 percent; this is about half as many operations as it had in 2000. With the improvements at Anoka County-Blaine, Flying Cloud and St. Paul Downtown airports it is expected that the trend toward less General Aviation traffic using MSP will continue.

Table 10-44: Airport System Factor Comparison

City Name	MSA Population (July 2007)	Number of NPIAS Airports In System	Number Reliever Airports in System	No. of GA Based Aircraft in System	Number of GA Based Jets in System	Annual GA Aircraft Operations In System	Number of Airports with 5,000 foot Runways
Atlanta	5,278,904	13	4	1,907	175	868,710	9
Charlotte	1,651,568	5	2	350	30	253,566	3
Denver	2,464,866	4	3	1,509	125	605,315	3
Detroit	4,467,592	10	7	1,474	208	593,555	3
Minneapolis	**3,208,212**	**8**	**7**	**1,913**	**137**	**641,550**	**3**
Philadelphia	5,827,962	18	10	1,656	78	772,550	3
Pittsburgh	2,355,712	10	5	693	93	345,569	3
Average	3,607,831	10	5	1,357	121	582,974	4

Peer Commercial Airports

To help gauge how MSP ranks among its peers the top 20 airports were compared for passenger enplanements, aircraft operations and cargo tonnage. MSP rankings in these various categories in 2007 are depicted in Table 10-45. It has historically ranked higher in all three categories. The top five airport rankings are very consistent over time due primarily to market size and international connections. The rankings vary year-by-year, but occasionally major changes occur, such as when TWA was acquired by American Airlines and the St Louis hub went from a Large hub to a Medium hub status and is no longer in the top 20 large-hub ranking. Atlanta is ranked first in enplanements and operations since it has a system focus on domestic and international connections. Memphis is ranked first as an air cargo hub primarily due to a single operator, FedX, The majority of flights at MSP are provided by Delta Air Lines and its SkyTeam Alliance partners. MSP is now in a different airline system, and although it tracked closely with Detroit when they were in the NWA system, that relationship is likely to change as Delta is defining new international focus hubs. The lowest 2030 MSP forecast is for 16,624,900 annual passenger originations, in the “declining connections” scenario, that would likely lead to a softening in its relative rankings.

Table 10-45: Top 20 U.S. Airports 2007 Activity Comparison

	Enplanements Ranking	Passenger Enplanements (millions)	Operations Ranking	Aircraft Operations (thousands)	Cargo Ranking	Air Cargo (millions metric tons)
1	Atlanta (ATL)	44.8	ATL	994	MEM Memphis	3,840
2	Chicago (ORD)	38.4	ORD	927	ANC Anchorage	2,826
3	Los Angles (LAX)	31.0	DFW	685	SDF Louisville	2,079
4	Dallas/Ft.Worth (DFW)	29.9	LAX	681	MIA	1,923
5	Denver (DEN)	24.9	DEN	614	LAX	1,884
6	New York (JFK)	23.8	LAS	609	JFK	1,607
7	Las Vegas (LAS)	23.5	IAH	604	ORD	1,534
8	Houston (IAH)	21.6	PHX	539	IND Indianapolis	999
9	Phoenix (PHX)	20.9	CLT	523	EWR	964
10	Newark (EWR)	18.2	PHL	500	DFW	724
11	Orlando (MCO)	18.2	DTW	467	ATL	720
12	Detroit (DTW)	18.0	MSP	453	OAK	648
13	San Francisco (SFO)	17.7	JFK	446	SFO	563
14	Minneapolis (MSP)	17.5	EWR	436	PHL	543
15	Miami (MIA)	16.9	SLC Salt Lake City	422	ONT Ontario, CA	483
16	Charlotte (CLT)	16.6	BOS	400	IAH	409
17	Philadelphia (PHL)	16.0	LGA	392	TOL Toledo	362
18	Seattle (SEA)	15.6	MIA	386	IAD	359
19	Boston (BOS)	14.0	IAD Dulles D.C.	383	SEA	319
20	New York (LGA)	12.5	SFO	380	BOS	299
21					DEN	267
22					MSP	257
23					PDX Portland	255
24					PHX	252
25					AFW Ft. Worth	237
26					DTW	233
	US Total	762.4		60,807		29,297

Color Key: MSP Delta SkyTeam Alliance

Facility Criteria/Performance

The role of each airport is reassessed as part of every system plan update. For each airport role a set of service and facility objectives were developed based upon the types of aviation users the airport predominately served. These recommended objectives covered the following airside and landside facilities and services:

- Air Traffic Control Tower
- Airport Reference Code
- Approach Lighting Systems
- Auto Parking
- Fixed Base Operator (FBO)
- Food Services
- Fuel
- Ground transportation
- Instrument Approach
- Other Visual Aids
- Paved Aircraft Parking
- Phone
- Primary Runway Length
- Runway Lighting
- Snow Removal
- Taxiway Type
- Visual Glide Slope Indicators
- Weather Reporting

The system airports met 98% of its individual facility objectives; it is a mature and well developed system with little in the way of unmet facility and service needs in the short-term. For the medium and long-term there are a number of deficiencies identified in individual airport plans for which specific improvements are needed, including maintenance of current infrastructure.

In addition to specific facility objectives, individual airport performance was also examined for having up-to-date airport long-term comprehensive plans (see Table 10-5 Airport Facility Status), a joint airport/community airport zoning board (JZB) and an approved zoning ordinance (refer to Figure 10-22 Jurisdictional Areas in Twin Cities Aviation System). An overall report card on individual airport operational performance is included in Appendix N.

SYSTEM CHANGES AND IMPROVEMENTS

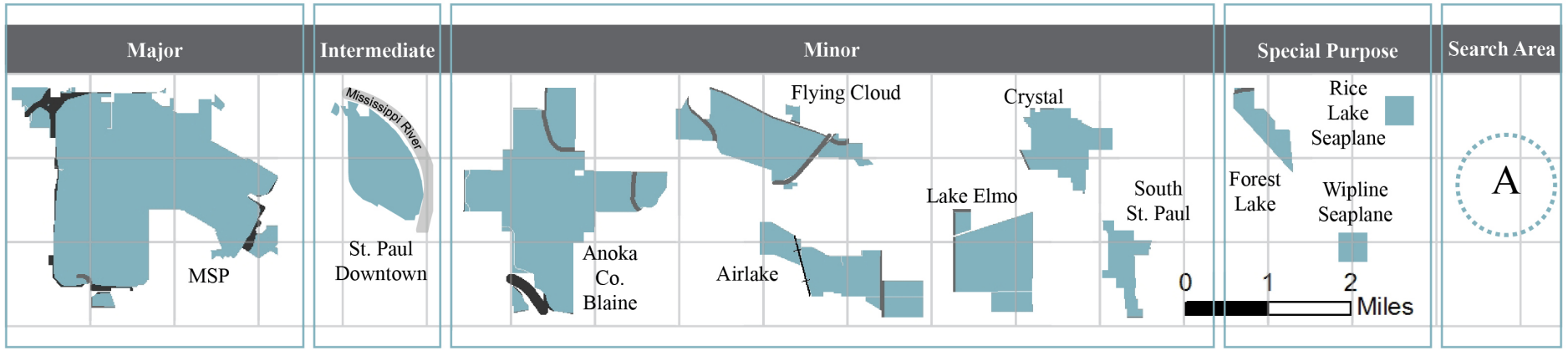
The continued protection and maintenance of the regional aviation system is an important aspect of the Twin Cities transportation infrastructure. A number of recommendations were made in the system update technical report to further enhance the regional system and are included in the 2030 plan:

- Retain the existing regional airport classification system,
- Fulfill Long-term comprehensive airport plan (LTCP) objectives,
- Eliminate General Aviation search area (A) from the system plan,
- Change Forest Lake Airport role from Special Purpose to a Minor airport,
- Install runway end identifier lights (REILS) at So. St. Paul Airport, and
- Examine feasibility of intermodal connectivity options to system airports.

The following illustration, Figure 10-46, indicates how these recommendations relate to the airport classification system.

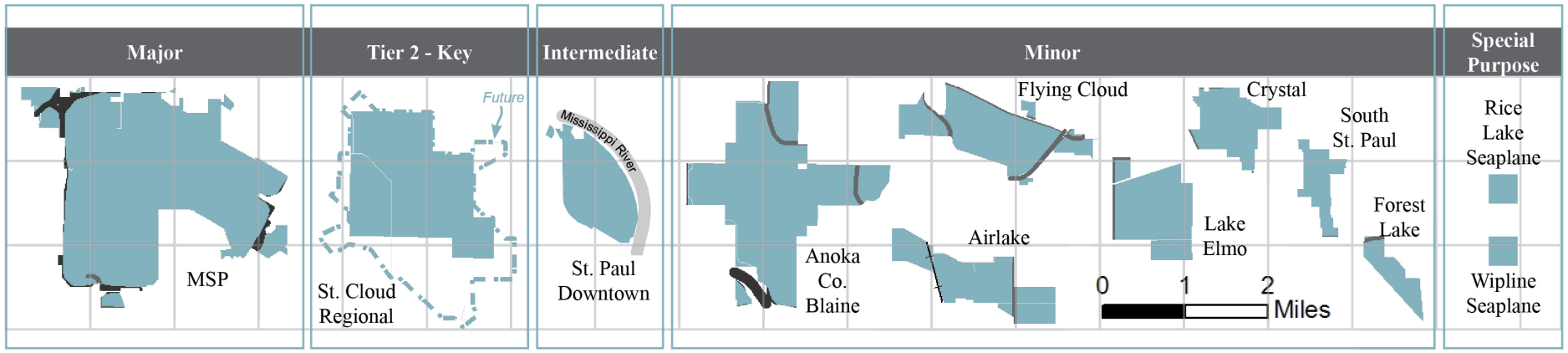
Figure 10-46: Twin Cities Regional Airports Role and Classification

Previous



Changes in the various system facilities, as recommended in the Twin Cities 2030 System Update *Technical Report,* are identified under the current 2010 airport role and classification as compared to the revised 2030 role changes. The general aviation search area (A) located in Hennepin County is removed from the system. The Forest Lake Airport is designated a Minor airport. Rice Lake and Wipline seaplane bases retain their Special Purpose roles. The St. Cloud Airport, although not a part of the metro airport system, is identified in the current state airport system plan as a Tier 2 commercial reliever for the metro area and is included for comparison purposes. The 2030 role for St. Cloud is depicted by the planned land acquisition. The facilities are shown to scale and indicate areas where roads or major physical barriers segregate the airport property.

Revised



SYSTEM IMPROVEMENT COSTS

In order for metro area airports to meet their facility and service objectives, and for the system to maintain its performance and function, continued investments will be needed over the 20-year planning period as depicted in Table 10-47. The first five years reflects the CIP estimates (except for MSP, which also includes LTCP estimates); the 10, 15, and 20 year estimates reflect order-of-magnitude cost derived from the updated airport LTCP's. Overall high cost range is estimated at $ 2.6 Billion, based upon 2009 U.S. dollars. Environmental evaluation and potential noise mitigation costs for the MSP 2030 LTCP are not included in Table 7-47.

Table 10-47: Cost Estimates for Capital Projects

(in millions)

Airport	2010-2015	2016-2020	2021-2025	2026-2030
MSP International				
CIP	$112			
LTCP (cost range)	$377 - $444	$819 - $964	$666 - $783	$191 - $224
St. Paul Downtown	$10	$5		
Anoka County-Blaine	$7	$1		
Flying Cloud	$6	$2		
Crystal	$3	negligible		
Lake Elmo	$4	$3	$1	
Airlake	$5	$1	$7	$0.9
So. St. Paul	$4	negligible		
Forest Lake	$6	Short-term funding needs likely to shift into out years unless federal funding under NPIAS		

FUNDING RESOURCES

Airports rely on a variety of public and private funding sources to finance their capital development, including airport bonds, federal and state grants, passenger facility charges (PFCs) and airport generated income.

Table 10-48 indicates the various funding sources identified by the MAC for its 2010-2016 capital development projects. The approved 2010 – 2016 CIP and operating budget are used in assessing system development costs and funding needs for short, term projects.

Table 10-48: MAC 2010 – 2016 CAPITAL IMPROVEMENT PROGRAM FUNDING SUMMARY

($ 000's)

FUNDING SOURCES	2010 FUNDING	2011 FUNDING	2012 FUNDING	TOTAL FUNDING	% OF TOTAL 2010 - 2012 CIP
Passenger Facility Charges (PFC's)	**$7,550**	**$31,300**	**$31,210**	**$70,060**	17.41 %
Federal & State Aid	**$34,729**	**$31,200**	**$53,950**	**$119,879**	29.79 %
2010 General Airport Revenue Bonds**	$27,400	$21,020	$45,100	$93,520	23.24 %
MAC Funds	$22,321	$19,410	$16,575	$58,306	14.49 %
Airline Repair & Replacement Fund	$31,250	$6,650	$16,275	$54,175	13.46 %
Other Funding***	$3,000	0	$3,500	$6,500	1.62 %
Total All Funding Sources	$126,250	$109,580	$166,610	$402,440	100.00 %

** Grants from Mn/DOT for this period have been committed to projects from prior years.*

*** Currently Revenue Bonds are anticipated to be issued in May 2010 to cover 2010—2012 projects.*

**** Other funding sources represent facilities built by MAC, tenant, or developer and paid for by the tenant or developer.*

SYSTEM PLANNING AND DEVELOPMENT PRIORITIES

Planning Process Timelines

In planning for air-transportation services and facilities, there are certain timelines and benchmarks that come into consideration. They can be reflective of planning activities and environmental evaluations that have to occur before projects are eligible for funding, they may indicate when a project should be programmed for funding, when a project is in the capital improvement plan, when a plan update is scheduled, or new forecasts prepared, pavement conditions reviewed, or activities needing monitoring.

The 2030 LTCP for MSP was found by the Council to be consistent with the 2030 Transportation Policy Plan (TPP) if, the following issues are addressed in the final plan:

1. The LTCP should note that the MAC will update the plan every five years and that the MAC will budget for this in the appropriate years to ensure that the first update is prepared by 2015.
2. The MAC should initiate a capacity study two years in advance of when MSP is expected to have 540,000 annual operations and incorporate the results of this study into the following LTCP update.
3. The MAC should initiate an FAA Part 150 study update (which includes a comprehensive noise analysis and mitigation program), in consultation with the MSP Noise Oversight Committee (NOC), when the forecast level of operations five years into the future exceeds the levels of mitigation in the Consent Decree (582,366 annual operations). The results of this study should be incorporated into the first subsequent LTCP update.
4. The MAC shall continue to work with all appropriate agencies to implement the Interstate 494/34th

Avenue, Trunk Highway 5/Glumack Drive and Trunk Highway 5/Post Road interchange modifications included in the 2030 Concept Plan, including preliminary environmental scoping and analysis. These highway modifications are not currently included in the region's fiscally-constrained 2030 highway plan.

5. The LTCP needs to acknowledge that storm water from MSP detention ponds discharges to the reaches of the Minnesota and Mississippi Rivers that are identified as water-quality impaired for a number of pollutants and stressors.
6. The LTCP should include a general discussion of financial assumptions and funding mechanisms available to implement the proposed development.

The following planning process timelines have been included for consideration in identifying and assessing project phasing, prioritization, and implementation. Table 10-49 assumes no changes in the regional aviation planning process through the 2030 planning horizon, and assumes a fiscally constrained and demand-driven system.

Development Priorities

The key priorities are to maintain existing facilities, security/safety of operations, and to fulfill the airport development plan objectives as depicted in Table 10-50.

Table 10-49: PLANNING PROCESS TIMELINES

Planning Horizon	NPIAS 2-year Update, 5-yr. horizon	SASP 5-year Update, 20-yr. horizon	SASP 5-Yr. CIP	TPP-RASP 4-year Update, 20-yr. horizon	LTCP 5-year Update, 20-yr. horizon		MAC Strategic Plan 5-year moving	MAC – CIP Annual Update, 7-yr. horizon	AOEE Annual Update	MLPA 10-year Update, 20 yr. horizon
					G.A. Airports	MSP				
2011-2015	2011, 2013, 2015	2011	2013	2010, 2014	2013 Updates MIC, LVN,ELM, FOR and SGS 2015 Updates ANE, FCM, STP	2015	2011, 2012, 2013, 2014, 2015	2011-2017	2011 - 2015	[2008]
2016-2020	2017, 2019,	2016	2018	2018	2018 Updates MIC, LVN, ELM FOR and SGS 2020 Updates ANE, FCM, STP	2020				2018
2021-2025	2021, 2023, 2025	2021	2023	2022	2025 Updates ANE, FCM,STP	2025				
2026-2030	2027, 2029	2026	2028	2026	2028 Updates MIC, LVN, ELM FOR and SGS 2030 Updates ANE,FCM, STP	2030				2028
Post 2030	2031, 2033	2031	2033	2030	2033 Updates MIC, LVN, ELM, FOR, SGS	2035				2038

Table 10-50: System Development Phasing Priorities

Aviation Facility	Short-Term 0 to 5 Years	Mid-Term 6 to 15 years		Long-Term 16 to 30 years	Post 2030
	(2010-2015)	(2016-2020)	2021-2025	2026-2030	
MSP International	Implement projects to Expand Terminal 2 Humphrey (Assumes all non-SkyTeam Alliance airlines are moved to Terminal 2) Implement the MAC annual Capita Improvement Program.	Implement projects to Modernize and Expand Terminal 1 Lindbergh Complex. (Assumes all non-SkyTeam Alliance Airlines are moved to Terminal 2 – Humphrey)	Complete Terminal 2 HHH Expansion, Expand Terminal 1 Lindbergh, Concourse G, Expand Parking, Develop Hotel	Construct Crossover Taxiways and Access Road to Terminal 1	
STP St. Paul Downtown	Pavement maintenance and replacement program, on-going throughout planning period. Terminal sub-drain, electric vault improvements, MAC building maintenance on-going, Non-aeronautical land use development.	Pavement Maintenance Building Maintenance Non-Aeronautical land use Development	Pavement Maintenance Building maintenance	Pavement Maint. Building Maint.	On-going On-going
ANE Anoka County-Blaine	Security Gate Improvements, Taxiway Charlie Extension, Xylite Street Relocation, Pavement Maintenance Program, Non-Aeronautical Land Use Dev.	Pavement Maintenance Non-Aeronautical Dev.	Pavement Maintenance	Pavement Maint.	West Bld. East Bldg. N/S Rwy. E/W Rwy.
FCM Flying Cloud	Extend, shift, reconstruct Rwy. 18/36, Construct North perimeter Rd, Replace 18/36 VASI's, So. Hangar Area Utilities, Pavement Management Program.	Pavement Maintenance Non-Aeronautical Dev.	Pavement Maintenance Clear Taxiway (A) object-free area. Relocate ATCT.	Pavement Maint.	
MIC Crystal	Pavement Rehabilitation Obstruction Removals Runway 14R/32L modifications				

Table 10-50: System Development Phasing Priorities

Aviation Facility	Short-Term 0 to 5 Years	Mid-Term 6 to 15 years		Long-Term 16 to 30 years	Post 2030
	(2010-2015)	(2016-2020)	2021-2025	2026-2030	
ELM Lake Elmo	Rwy 14/32 reconstruction, Pavement rehabilitation, Install AWOS New hangar bldg. area Phase I Pursue agreements for sewer and water service	Rwy 4/22 Extension	Reconstruct crosswind rwy.		East Bldg. East Twy. Relocate Primary Rwy
LVN Airlake	Pursue sanitary sewer and water Agreements, pursue agreements To protect for Cedar Avenue Relocation, complete so. Bldg. area, Including sewer/water service.	Extend Rwy and Twy (A) to 5,000 ft, including ILS relocation and improved minimums.	Reconstruct existing runway.		
SGS So. St. Paul	Obstruction removal, pavement and hangar maintenance, (2) 12 unit T hangars, field equipment.				
FOR Forest Lake	Obstruction removal, land Acquisition, arrival/departure Bldg, Perimeter fencing, Install AWOS, Pave Rwy/Twy, T Hangar Dev.				
Lino Lakes SPB	Unknown projects, Private facility maintained				
Wipline SPB	Unknown projects, Private facility maintained				

NOTE: Projects identified in 0-5 year time period often move into out-years due to funding and other issues. The information is updated every 5 years.

Aviation Appendices

I - Airport Long-term Comprehensive Plans (LTCP)
J - National and State Airport Classification
K - Airport Service Areas
L - Regional Airspace
M - Land Use Compatibility Guidelines for Aircraft Noise
N - 2010 Preliminary System Airport Assessments
O - Glossary of Aviation Terms
P - Capital Investment Review Process
Q - Airport Capacity Criteria