General Aviation and Heliport Activity Forecasting – Evolutions

White Paper (#1) prepared for the NCTCOG Regional General Aviation and Heliport System Plan

General Aviation and Heliport Activity Forecasting – Evolutions

White Paper prepared for the NCTCOG Regional General Aviation and Heliport System Plan

Purpose

This paper serves to document the forecasting methods and approach that will be developed to guide the North Central Texas Council of Governments (NCTCOG) Regional General Aviation and Heliport System Plan. The Federal Aviation Administration (FAA) and the NCTCOG have both expressed a desire to develop a new forecasting methodology for general aviation and heliport activity. This white paper serves to address the issues involved in forecasting general aviation and heliport activity and to review the end uses, methodologies, data needs, and purposes of the activity forecasts.

The type of forecasts and the level of effort needed to produce the forecast depend on the purpose for which the forecast is being made. Typically forecasts are not a final objective in and of themselves. Short term forecasts support operational planning and personnel requirements at an airport. Intermediate and long term forecasts are used to plan major capital investments. Forecasts beyond a 20 year timeframe can be used to assess the need for additional airports or other regional aviation facilities. Forecasts are usually meant to reflect the demand for aviation services so that planners can provide the appropriate supply in terms of infrastructure to meet the demand. It is important to realize, however that actual activity is driven not just by demand but by the interaction between the supply and demand of aviation services.

The intent is that a series of forecasting products will be generated to document the development of a new general aviation and heliport forecasting model. The interim products will include:

- White Paper #1 - General Aviation and Heliport Forecasting – Evolutions. Present background information on current general aviation forecasting methods, assumptions, and issues.
- White Paper #2 - General Aviation and Heliport Forecasting – Modeling. Present, test, and evaluate any new modeling with sample forecasting for the NCTCOG regional airport system.
- Technical Report #1 – General Aviation and Heliport Forecasting Technical Report – Recommended Parameters. Provide a complete set of specific regional model parameters, specific calibration recommendations and related specific coefficients, specific base year inputs, specific calculations, specific control totals, specific growth factors, long-term maintenance factors and a link to the data management system.
- Technical Report #2 – General Aviation and Heliport Forecasting Technical Report – How to Manual. Instructions for using the model including preparing inputs, running the model, organizing files and generating reports.
- Electronic Model of General Aviation and Heliport Forecasting. CHA will deliver the electronic model by September 30, 2008. It is currently planned to be in Microsoft Excel format. Numerical model results will not be available until FY 2009.

Background

The need for a new general aviation activity forecasting model/method is predicated on the realization of the inherent difficulties there have been in:
(1) Gathering accurate baseline information to be used as the foundation for the forecast,
(2) The resultant variations in the forecast and the actual realized numbers over time,
(3) The increasing importance of the general aviation activity forecast results to the investment and development decisions made by both airport sponsors and by airport communities, and
(4) Enhancing the accuracy of general aviation forecasts in light of the above and other challenges faced in the forecasting methodologies.

As detailed further in this paper, the traditional variables typically used in general aviation activity forecasting are regionally segregated population and employment numbers. These numbers are used by the regional planning agency to guide capital improvement investment decisions on transportation. Other agencies and local governments also use this information to guide decisions related to housing, commercial, and industrial developments. These decisions are also supported with locally-adopted zoning ordinances and subdivision regulations that provide the direction and timing for these investments.

The forecasting of general aviation activity cannot be validated until the passage of time reveals the accuracy of the forecast and ultimately the accuracy and validity of the original numbers and assumptions used to generate a forecast. The 1991 Regional General Aviation System Plan provided forecasts that guided development of aviation and its communities over the last 16 years. A review of these previous forecasts and their realizations will be part of the development process of the new forecasting model. Understanding the developments from 1990 to the present will highlight new (and likely stronger) interrelationships between the activities and the developments that have occurred.

The uses and applications of forecast data can be multifaceted. For a metropolitan area such as North Central Texas, forecast information will assist in the evaluation of the need for additional NPIAS/public airports in the region. It will also present opportunities to consider the need to increase the service level of existing airports from their current identification as GA to Reliever along with associated additional amenties.

Aviation data sources and issues in data collection. There are innate inaccuracies built into existing general aviation forecasting models. These will be examined in this developmental process and include the following considerations:

- Operational counts at towered and non-towered airports. Towered airports provide relatively accurate accounting of aviation activity at that airport. There can be a small margin of missed activity depending on the hours of tower operation, as most towers at general aviation airports do not operate 24 hours per day. Reporting of activity at non-towered airports relies on the varied reporting of airport management who sometimes uses previous years estimates as a basis for the current or coming year. There is currently not a sound method for validating the operational activity estimates other than the installation of an activity counter at the ends of each runway for a period of time. While counters can provide more accuracy, the numbers are still just estimates with varying degrees of accuracy depending on the data collection methods.

- Accuracy and availability of historical aviation data. The accuracy and availability of historical general aviation data is also suspicious primarily due to the previously mentioned method of estimating that has been used in the recording of "historical" activity. Historical aviation data consists of operations and based aircraft. The operations data is then grouped by activity and aircraft typed.

  The current effort by the FAA to document aircraft tail numbers by airport will greatly assist the validation of based aircraft data. This will assist in the confirmation of other activity numbers and forecasts in the future. The development of the new general aviation forecasting model will need to study the use of this new data and its application toward improved general aviation activity forecasting.

Forecasts are used to plan for potential future facilities and infrastructure. The forecasts assist in determining the quantity and timing of investment decisions, hence the importance of ensuring the validity, accuracy and applicability of the numbers and the factors generated in the forecasting process.

Forecasting is based on a baseline set of numbers and assumptions. The validity of these baseline figures and relationships is critical to the accuracy and validity of the forecast. Understanding and testing these baseline figures is a substantial element of the development of a new model. The development of the forecasting model will assess these relationships and the applicability to general aviation activity forecasting.

Some of the uses and applications of the forecasting efforts include the following:

- **Airside Development Planning.** The forecasts will indicate the future need for airside infrastructure. The length and strength of the runways and taxiways reflect the capabilities of an individual airport and strongly influence the ability to support future airport activities. Part of the dilemma in forecasting is the determination of the extent that existing facilities decide the current activity of an airport and to which future facilities and plans drive future activity and migrations to that particular airport. Navigational aids at an airport also impact the safety and ease of access into individual airports. It is postulated that there is a valid forecasting relationship between airport infrastructure and the activity the infrastructure will support and generate.

- **Landside Development Planning**. The basing and operation of aircraft at an airport drives more than just a place to land, resulting in the need to develop ramp space, fueling facilities, maintenance services, and a multitude of other support functions such as a place to eat, refresh, relax, and rent a car. Again, while activity drives facilities, facilities also influence activity which requires further examination in the development of a more true aviation activity forecasting model.

- **Financial Side Planning - Airport Business Planning.** Various measures of aviation activity are directly or indirectly tied to the revenues and costs associated with operating an airport. As construction, operation and expansion of an airport requires substantial investments, it is important for an individual airport to forecast future demands for aviation services and assess the potential level of revenue and the need for future services. On a system wide basis, accurate forecasts are needed for effective airport system planning and for the efficient provision of capacity. Bond

issues and the use of public funds require an understanding and substantiation of the expected return on investments.

The forecast also becomes a predictor for planning operational aspects at an airport to include staffing, equipment purchases, and the provision of services.

One goal in the development of the general aviation activity forecasting will be the potential to better display the relative accuracy of the forecast – establish a risk factor to the validity of the future forecast. The forecasts will most likely be used to make some substantial investment decisions related to the development of an airport and ultimately, the airport community. The ability to calculate an anticipated return on an investment (and test it over time) could become a critical factor in making major airport investment decisions.

- **Community-Side Planning.** The relationship between an airport and its adjacent communities is an absolutely critical factor in the sustainability of an airport and its services to the community and the region. The ability of the surrounding communities to understand, believe in, and support the planned development of an airport is extremely important in maintaining the sustainability of the airport and in building community support.

  The need to protect the land around a community's airport to ensure its sustainability is unquestioned. However, the extent to which a community needs to protect the land around a planned airport expansion or airport-related development demands the evidence of facts and an endorsement of the forecasts for the future of activity at an airport to support the, many times, hard decisions that a community must make to protect its aviation asset.

Existing Forecasting Models

FAA, State, and airport master plan forecasts are prepared on periodic basis and can be used to understand the historical and anticipated trends in aviation activity on several levels. These forecasts all vary in their uses and in their interrelationship with one another.

- **Federal Forecasts**
  - Terminal Area Forecasts (TAF) –TAF is FAA's official agency forecast for individual airports and is updated annually. The TAF uses a "top down" methodology for general aviation airports and has been traditionally flat-lined for non-towered airports (primarily due to the lack of verifiable data that has been prevalent at these airports). This national forecast identifies general aviation growth. This growth in general aviation is generally higher in urban areas than in rural areas. It is based on historical trends and additional factors for individual airports. The TAF for each airport is based on data of varying accuracies. For general aviation purposes, airports with control towers will have more accurate and detailed data. However forecasts of general aviation activity at non-towered airports are less likely to be useful in identifying real trends driving aviation activity.

  - National Aerospace Forecasts – The FAA's Office of Aviation Policy and Plans annually prepares a national forecast of aviation activity. Based on broad econometric data and activity trends, these forecasts are widely

accepted by industry experts. The forecasts are generally used to assess manpower needs for air traffic control and for other federal initiatives. Of particular interest is the FAA's projected nationwide growth rates for Commercial and General Aviation Active Fleet and Hours Flown. As these forecasts are generally based on towered operations and other official reports as a primary source, the accuracies of these forecasts are more likely to be valid than forecasts which rely on estimates of past activity. The forecasts are useful in identifying the FAA's perspective on national trends in aviation activity which can be correlated with regional activity.

- **State Forecast**
  - These forecasts are developed for the specific state tied to regional population and employment forecasts.
  - There is a direct relationship with population forecasts - as population of service areas grow, so do based aircraft and operations.

- **Master Plan Forecasts**
  - Individual airports that have completed a master plan study (or airport layout plan update) will have detailed forecasting data. As such these forecasts (and the associated methodology used to develop them) will be very useful in identifying specific trends and projections that have been reviewed by FAA and TxDOT. FAA and TxDOT must approve master plan forecast and the forecast must be consistent with TAF. This consistency is weighed with the justifications for forecasts presented in the Master Plans.

There are several accepted methodologies for preparing general aviation activity forecasts.

- **Market Share** – Identifies the relationship between activity at an airport as a percentage of regional activity. Important assumptions to consider that may or may not hold true are that the presumed relationships between an individual airport and the region remain constant over time by default or that strategic planning may indicate a proactive change to that the relationship.

- **Econometric** – This modeling method uses explanatory variables that influence or drive changes in demand or supply of aviation activity. These variables can often include macroeconomic and demographic factors, regulatory environment, infrastructure constraints or improvements, and technological changes. This method of modeling is potentially very sound and powerful but lack of statistical validations and data inaccuracies can cause problems.

- **Times Series** – This approach involves extrapolating existing data into the future and is usually based on current and past trends. The general philosophy is that past trends will identify future trends.

- **Simulation –** This method of modeling provides forecasts based on the relationships between activity patterns within a region or system. Simulation modeling employs rules for flow and the effect of decisions and then develops results. This can then be used to assess the needs of each airport and cumulatively of the system.

- **Combinations** – Most accepted forecasts will usually develop a methodology that combines several of the above methods and uses a weighting method to produce the final forecasts of activity.

Forecasting Accuracy – The validation of forecasts can only be accomplished post-forecast. The potential for extreme variation is amplified in longer range forecasts. Testing and evaluation of the various methodologies is useful in identifying specific strengths and weaknesses of their results. In addition, the utility and application of longer range forecasting needs to be improved.

Forecasting Results – Needed Information

What needs to be Forecasted and Why

- Since the use of forecasted activity represents the consensus view of future demand, it is important to gain a foundational understanding of what needs to be projected as a forecast element. The forecasts' accuracy is required for analysis of future needs. These requirements will be examined in terms of meeting accepted uses of forecast information as well as consideration for new uses and values. Typical forecast elements include the following forecast elements and follow FAA issued guidance to ensure the ability to justify FAA funding for specific projects. The FAA Advisory Circular on Airport Master Plans, AC 150/5070-6B recommends specific forecast elements to be included. These are:

    - **Annual Operations** – Itinerant and local operations categorized as air carrier, air taxi and regional commuter, general aviation and military.

    - **Annual Passenger Enplanements** – Air carrier and commuter passengers. These can be further categorized as originating and connecting. (This category will not be addressed in the North Central Texas Regional General Aviation and Heliport System Plan.)

    - **Aircraft Types** – Categorized as based aircraft and aircraft mix (jet, multi-engine, piston, etc), and identification of the design or critical aircraft. This particular forecasting effort will also include a review of available data on Very Light Jets and other new technologies.

    - **Other Elements** – Domestic and. international operations, annual instrument approaches, IFR and VFR operations, air cargo aircraft operations, helicopter operations, training (touch and go) operations, average passenger load factors, fuel volumes, general aviation passengers, and other items such as number of student pilots and hours flown or average seats per aircraft.

The Master Plan Advisory Circular also specifies that forecasts should be prepared for the short term (up to 5 years), the intermediate term (6-10 years) and the long term (beyond ten years). A baseline forecast is expected to identify which method of forecast represents the most likely estimate of activity. The development recommendations included in the master plan for each of the timeframes is justified and warranted by the airport system within the same timelines and these recommended developments are not constrained by financial resources. As such it is not a capital implementation plan and developments may not be realized during the timeframes due to lack of available resources. Different scenarios can also be developed to assess the impacts of higher or lower activity levels on the development plans for the region or the individual airport.

It is anticipated that this forecasting effort will include high, medium, and low forecasts based on various regional scenarios.

A major FAA requirement affecting the ultimate acceptance of proposed forecasts is that baseline forecasts of operations and based aircraft must be compared with the FAA's Terminal Area Forecasts (TAF). The current FAA policy is to review and approve short term and intermediate term forecasts. As a matter of policy, short term forecasts that differ from the FAA TAF by more than 10% or intermediate term forecast that differ more than 15% from the TAF must include clearly justified methodology and input data. System planning forecasts that are used to support AIP projects are also subject to the 10% and 15% variation review from the TAF. Generally, forecasts at GA airports that have fewer than 100,000 annual operations are not subject to percentage conformity to the TAF unless there are specific issues regarding special programs (e.g. establishment/discontinuance of federal contract tower facilities)

Factors Affecting General Aviation and Heliport Activity and Regional Activity Forecasts

There are several factors that affect general aviation activity that will need to be correlated appropriately in the development of new forecasting models. These include:

- **Economics** – Sustained growth in national, regional, and local economies increases demand for business-related activity. The FAA projected economic growth for 2007 is near 3%, a level that has had a historical correlation to strong business jet growth. However, future economic growth may be subject to downturns due to rising oil prices, credit markets, and international currency valuations.

- **General Aviation as a Business Tool**. Increasingly, GA aircraft are seen as business and productivity tools. This is especially true as limitations and delays of commercial air travel become more apparent and as the time-value of the corporate/business traveler are recognized. According to the FAA, the number of general aviation hours flown will increase by 3.2% per year through 2017. According to the General Aviation Manufacturers Association (GAMA), U.S. based airplane shipments have been increasing at a rate of about 20% per year. Business jet shipments rose by 18% in 2006.

- **Technology** – The investment of the general aviation industry in research and development of new products will continue to enhance the safety, reliability and efficiency of general aviation, accelerating the industry. New aircraft types such as the Very Light Jets and Light Support Aircraft are new to the industry and do not have any historical records of activity. In-depth research into local vertical flight activity will also influence the documentation and forecast of aviation activity in this sector. The technology improvements in air traffic management and navigational aids will affect regional aviation forecasts and allocations as the Next Generation Air Transportation System (NextGen) is developed and implemented.

- **Airport Locations and Access –** The location and accessibility of an airport in relation to the regional growth and development will contribute to identifying specific drivers of the activity that can be expected at an individual airport. Other factors include:

  - Airspace – Ease of access by air, traffic patterns, controlled airspace, approach instrumentation
  - Adjacencies –The environment surrounding the airport, compatible land use characteristics
- Access Roads – Ease of access through roadway infrastructure in relation to major highways and thoroughfares

- **Airport Characteristics** – The availability and utility of airport facilities are other key factors in the allocation of activity to particular locations within the region. Runway strength and length, approach procedures and minima, fuel service, aircraft storage, et cetera all contribute to the level of activity likely to occur at an individual airport.

- **Service Area Population and Employment –** The local review of population and employment data along with related forecasts within an airport's service area will provide indications of an airport's current and future roles. Demographic and economic characteristics contribute to the support of general aviation and heliport activity. Population growth on one hand can drive aviation activity but on another, residential development can encroach on the airport's ability to grow.

- **Community support and promotion** – The support and promotion of an airport by its host community will influence the ability of the airport to provide adequate services and support the development pace and future development direction. The reverse is likewise true: without community support, airport growth will be stunted and opportunities lost. This support may be demonstrated in a variety of ways, including financial support, obstruction removal, compatible land use controls, et cetera.

- **Fuel Prices**. While fuel is a global influence on aviation activity, fuel costs effect decisions on aviation development on a regional basis primarily through the anticipated effects on aviation activity that supports improvement decisions.

- **Regional Pilot Population**. Where a pilot lives affects where they base their aircraft and fly. The total number of U.S. pilots (both student and private pilots) dropped below 600,000 in 2006 for the first time in several decades.

- **Personal Preferences: Amenities and Service –** As users, pilots and aircraft owners have strong preferences. User surveys can be useful as a data set to identify not only perceived weaknesses in services and lack of facilities but also support for planned airport improvements. Regions that characteristically attract concentrations of pilots and aircraft will continue to grow where adequate facilities and services are provided.

- **Airport Community Value –** A new metric is being created to assess the value of the airport asset to the communities surrounding the airport, to the region and to the pilots who use the individual airport: Airport Community Value. The model will further develop this new metric but will likely include such elements as the value of the airport land (both on airport and the land in the airport service area), the replacement value of facilities and infrastructure, the current economic impact, and the future economic potential of the airport for the community and the region.

- **Threshholding** – An important part of the forecasting process will be the assessment of uncertainty in the forecasts. Forecasting inherently provides a measure of the level of uncertainty (the risks) of forecasts, decision makers should be given the opportunity to plan different strategies based on the ranges of uncertainty and assumptions built into individual forecasts. The development of the new model will explore the opportunities to create and validate the concept of threshholding in the forecasting methodology so that threshold factors can reveal strategic points for further airport investments based on anticipated returns.

- **Regional Variations** – The NCTCOG region includes characteristics that are both similar and different from other metropolitan regions around the country. The regional variations that may offer some influence in general aviation forecasting include weather, geography, state and local legislation, and commercial and residential development patterns

- **Risk Factoring** – The new general aviation and helicopter activity forecasting model will offer a analysis and model modification method to assess the relative risk inherent in the use of new forecasting results. This risk factor is currently under development and definition and will address the impacts of forecast aviation activity information on planned regional airport developments and on anticipated return on investment decisions.

Directions

The purpose of this white paper is to initiate the development of a forecasting model capable of predicting future general aviation and vertical flight activity within North Central Texas. It is anticipated that in addition to the traditional uses of general aviation activity forecast information, there are additional utilities the forecasts can support to provide strong indicators of future activity and offer the potential to identify key threshold points for generating additional activity at an airport. It is the direction of the CHA Aviation Development Team to generate a methodology that will provide a tool that can offer “return on investment” assessments to guide future airport capital improvement investment decisions.

A timetable for the completion of the development process and validation testing of the new model will be provided with the development of the annual calendar of events that is being prepared for the FY 2008-09 effort on the Regional General Aviation and Heliport System Plan.

Key concepts that will be advanced within the next few weeks include:

- Identification of calculable relationships between based aircraft and operations at an individual airport and between regional airports (particularly those without control towers). At the direction of our funding agency, the Federal Aviation Administration, this will include the use of recently reported based aircraft counts at individual airports when these numbers are released.

- Investigation into the potential forecasting impacts of Next Gen and its effects on airport capacity and future needs

- Investigation of the strengths and weaknesses among the various forecasting methodologies to be used for different classes of aircraft (i.e., jets, multiengine, single engine and helicopter).

- Identification of the correlation among fuels sales and aircraft activity at individual airports and regionally.

- Identification of key development thresholds for airports within the region that will predict substantial increases of certain types of activity.

- Investigation of the FAA's data for based aircraft by airport by tail number and aircraft type to offer an improved foundational basis for general aviation activity forecasting.

- Evaluation of the forecasts of activity as an element in the development of a proposed aviation metric - Airport Community Value (ACV).

- Per capita incomes segregated by airport service areas will be an indicator of aviation activity at an airport.

  Evaluation/comparison of regional data as factors in airport choice and general aviation activity. This includes, but is not limited to: travel time contours to local airports, location of major employers on aviation activity, pilot concentration by zip code, employment by classification/type, and a sampling of VFR flight data for comparison to total activity counts at sample airports.

Data Requirements

The next steps in the development of the system plan's forecasting model will be the collection of key pieces of data to better investigate the relationships among the many factors influencing general aviation activity in the region. All of this data will be logged and accessible in the data management system. Key information includes the following:

- Reassessment of the forecasting baseline numbers and assumptions used in the previous regional general aviation system plan, while evaluating the effect of the proximity of population and employment forecast made in 1990 with actual data from 2000 and 2005.

- Identification of available demographic and economic data and for those portions of North Central Texas that can provide a basis for comparable analysis with previous studies.

- Preparation of a comprehensive history of major general aviation airport improvements. It is anticipated that the following airport improvements will be documented over the last 15-20 years: runway extensions, taxiway additions, ramp expansions, major changes in NAVAIDS, and hangar developments that have occurred in North Central Texas since 1990.

- Development of a list of planned major transportation improvements over the next 10 years for identifying potential factors that may influence aviation forecasts.

- Detailed analysis of the FAA's National Plan of Integrated Airport Systems (NPIAS) for individual airports in North Central Texas.

- Collect and evaluate existing forecasts for airports in the region from the FAA's TAF and master plans for years 2010, 2015, 2020, and 2030.

- Identify the structure of the National Airspace System (NAS) Architecture and understand its influence on North Central Texas

- Consideration for developing subregional airport systems for use in forecasting and in identifying specific areas of activity and influences.

- Evaluate the individual and cumulative economic impacts of North Central Texas' regional airports.

- Investigate and evaluate based aircraft and operation activity for North Central Texas's airports since 1990.

- Develop description criteria for categorizing airports in the system plan and identify the effect on forecasting activity, allocation of capacity and funding implications.

- Evaluate current master plans for North Central Texas airports concerning their assessments of existing and proposed capacity.

- Identify current and potential initiation of legislative considerations and their impacts on basing aircraft and level of operations at particular airports.

- Development of vertical flight history / market factors moving into the future.

Summary

New forecasting methods and approaches for the North Central Texas Council of Governments (NCTCOG) Regional General Aviation and Heliport System Plan reflect the expressed desire by the Federal Aviation Administration (FAA) and NCTCOG to explore alternative forecasting methodologies for general aviation and vertical flight activity. Evolving interactions between the supply and demand today for aviation services reflect a powerful need for gathering more accurate baseline data to be used as the foundation for the forecast. Our goal is to compare variations in the forecast over time to help focus on the investment and development decisions made by both airport sponsors and by airport communities. The passage of time reveals the accuracy of the previous forecasting efforts and ultimately the accuracy and validity of the original numbers and assumptions used to generate those forecasts.

The intent is that a series of forecasting products will be generated to document the development of a new general aviation and heliport forecasting model. The interim products will include:

- White Paper #1 - General Aviation and Heliport Forecasting – Evolutions. Present background information on current general aviation forecasting methods, assumptions, and issues.

- White Paper #2 - General Aviation and Heliport Forecasting – Modeling. Present, test, and evaluate any new modeling with sample forecasting for the NCTCOG regional airport system.

- Technical Report #1 – General Aviation and Heliport Forecasting Technical Report – Recommended Parameters. Provide a complete set of specific regional model

parameters, specific calibration recommendations and related specific coefficients, specific base year inputs, specific calculations, specific control totals, specific growth factors, long-term maintenance factors and a link to the data management system.

- Technical Report #2 – General Aviation and Heliport Forecasting Technical Report – How to Manual. Instructions for using the model including preparing inputs, running the model, organizing files and generating reports.

- Electronic Model of General Aviation and Heliport Forecasting. CHA will deliver the electronic model by September 30, 2008. It is currently planned to be in Microsoft Excel format.

The recent documentation of based aircraft tail numbers by the FAA is one improvement toward validating some of the foundational data. Forecasts are also employed as a tool to plan for potential future facilities and infrastructure, airside development, navigational aids, and financial/business planning, as well as to identify triggers for construction projects. Data variables such as Terminal Area Forecasts (TAF), state forecasts, market shares, econometric changes, and classical airport record data analysis will be combined to produce a new understanding of current forecasting models. Tested with all of these factors, the team will select an alternative forecasting model(s) with higher accuracy validated by forward and backward testing. The team recognizes that GA airports are not subject to conformity to the TAF but is sensitive to this FAA development tool. A limited number of assumptions based on the economics of sustained growth in national, regional, and local economies are to be utilized such as the following:

- Business-related travel is projected by the FAA for 2007 to be near 3%.
- Aircraft shipments have been increasing at a rate of about 20% per year including Very Light Jets, Light Support Aircraft.
- Business jet shipments rose by 18% in 2006.
- Individual airport characteristics such as runway strength and length, location, ground access, population, employment, fuel flow, pilot populations, amenities, and services validate the concept of threshholding in future airport improvements.

The NCTCOG Team strives to generate a methodology that will provide an improved tool that can offer the “return on investment” assessment long sought after as a guide for future airport capital improvement investment decisions. Exploration of the relationships between based aircraft and operations at individual airports, coupled with their regional airport counterparts, tied with fuels sales, and actual aircraft movements will yield new validated points of departure for general aviation activity forecasting. Basic return on an investment and testing this new valid data are critical factors in making major airport planning and investment decisions. The need for advanced community planning to protect the land around airports to ensure its sustainability is unquestioned.

A few of the new data requirements identified will understandably pivot away from baseline numbers and assumptions used in the previous regional general aviation system plan. Demographic comparisons for portions of the region may be found inconsistent and improvements since 1990 and planned major improvements over the next ten years will certainly influence the forecasting paths forward. Side by side comparisons between master plans and TAF’s need to be identified, analyzed, and cataloged. Structural changes in the National Airspace System (NAS) architecture have developed a system of subregional airport and heliport systems when compared to other regions in the state and the state as a whole.

Growth and decline in reported based aircraft and operations for the region's airports examined with individual airport master plans may reflect or imply future changes in regional capacity. In some circumstances legislative considerations for potential impacts on basing and operations at particular airports may also become obvious when viewed over the next 20 years.

References and Resources

- ACRP Synthesis 2, Airport Aviation Activity Forecasting, 2007
- 1991 NCTCOG General Aviation System Plan
- 1988 NCTCOG Heliport System Plan
- GAMA Annual Industry Review & 2007 Market Outlook
- FAA Advisory Circular AC 150/5070-6B, 2005, Airport Master Plans
- FAA Forecasting Aviation Activity by Airport (2001) and Revision to Guidance on Review and Approval of Aviation Forecasts (2004)
- Advisory Circular on Airport System Planning Process
- FAA Terminal Area Forecasts Summary Reports (1997-2006)
- FAA Terminal Forecast (current 2007-2025)
- FAA Aerospace Forecasts (2007-2020)
- FAA Long Range Aerospace Forecasts (2020-2030)
- Model for Estimating Activity at Non-Towered Airports using Towered and Non-Towered Airports, July 2001
- ACRP Synthesis 4, Counting Aircraft Operations at Non-towered Airports, 2007

Appendix A – Anticipated Data Fields for New Forecasting Model

The following data fields represent the initial plans for the new general aviation and heliport activity forecasting model. The data will be collected as available for both current and historical data.

- Based Aircraft by type (to include helicopters)
- Aircraft Operations by type – Local and Itinerant
- Fuel sales by Fuel type by month from available airports
- Population by counties (and further subdivision as needed)
- Employment by counties (and further subdivision as needed)
- Disposable income or similar factor by subdivision areas (yet to be defined)
- Travel time corridors for selected airports (primarily reliever airports)
- Location factors for pilots and businesses supporting based aircraft
- Landside access factor (to be defined)
- Airside Access factor (to be defined)
- Airport Facilities Factors
    - Runway lengths
    - Taxiways
    - Apron size
    - Number of hangar spaces by type
    - Navaids
- Airport community support factor (likely a derivation of airport community value)

Additional factors will likely be identified as development of the new forecasting model progresses. This list of data types will be presented as an update in the second white paper.

Appendix B – Regional Forecasting Comparisons

The following chart will be completed for the second white paper to assist in the analysis and development of the new general aviation and helicopter activity forecasting model.

Operations

Source of Forecast	1985-90	1990-94	1995-99	2000-04	2005 +	Current (2007 or 2008)
Federal						
State						
Reliever Master Plans						
▪ Arlington						
▪ Grand Prairie						
▪ Mesquite						
▪ Alliance						
▪ Spinks						
▪ Meacham						
▪ Denton						
▪ Collin County						
▪ Addison						
▪ Dallas Executive						
▪ Lancaster						
Other Key Airports						

Based Aircraft

Source of Forecast	1985-90	1990-94	1995-99	2000-04	2005 +	Current (2007 or 2008)
Federal						
State						
Reliever Master Plans						
▪ Arlington						
▪ Grand Prairie						
▪ Mesquite						
▪ Alliance						
▪ Spinks						
▪ Meacham						
▪ Denton						
▪ Collin County						
▪ Addison						
▪ Dallas Executive						
▪ Lancaster						
Other Key Airports						