



AVIATION ECONOMIC IMPACT STUDY

Technical Appendix A Project Approach & Methodology

APPENDIX A: PROJECT APPROACH AND METHODOLOGY

INTRODUCTION

Document Purpose

The purpose of this document is to outline and describe BERK's approach to the economic contribution analyses conducted as a part of the Aviation Economic Impact Study for WSDOT's Aviation Division. This document was specifically developed for the Aviation Advisory Committee—as background material that goes into greater detail than we could cover in a meeting. However, we at BERK strive to be as transparent as possible in our analyses and welcome a broader audience.

BERK's Approach to Economic Contribution Analyses

Elements of Economic Contribution. For this project, BERK developed an approach designed to provide a holistic view of the economic contribution that the aviation system brings to Washington and its communities. To achieve that objective, the scope focuses on three key perspectives on economic contribution:

- I. **Airport-level economic impacts.** This is the core of the analysis: identifying the economic impacts—the jobs, wages, and output—of the state's 135 public use airports. These airport-level impacts deal with activity that can be directly associated with an airport, namely: the businesses operating at the airport and the visitors traveling through the airport. From these direct impacts, multiplier effects are also evaluated, as wages and other spending are re-spent in the local economy. Going one step further, this analysis includes how these airport businesses and visitors affect local and state tax revenues.
- II. **Industry-level economic impacts.** While the airport-level analysis focuses on activity that can be directly attributable to specific airports, the industry-level analysis takes a broader perspective and explores how the presence of airports affects the location and distribution of economic activity in the state. A selected number of state industries are examined in relation to airports.
- III. **User-level economic value.** The broadest measure of economic contribution is the user-level value that is derived from access to and use of aviation services in the state. This analysis will take a look at the intrinsic value that users derive from the system by examining a number of aviation-supported services.

Guiding Principles. There are two foundational principles that guide BERK’s analysis:

- **Data-based analyses.** BERK employs existing data for its first cut at the analyses, using existing data sources at the state and federal levels. Data sources included the Washington Department of Revenue, Aviation Division, and the Federal Aviation Administration, among others. These analyses provide the first snapshot of understanding the various aspects of aviation’s economic contribution.
- **Thorough review process.** Review and feedback is a critical part of the analytic process. BERK incorporated review processes throughout the project to obtain feedback from key stakeholders on preliminary analytic findings. This includes airport-level review related to individual airports’ economic impacts and Advisory Committee engagement related to the analysis and draft findings.

Document Guide. This document walks through the key questions, concepts and terms, and approach for the three perspectives on economic contribution.

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I. AIRPORT-LEVEL ECONOMIC IMPACTS

Analysis: Overview and Objectives

The airport-level economic impact analysis examines how each airport affects its local economy. Economic impacts are the jobs, wages, and output associated with the public use airports.

This is the study's core piece of analysis and is the traditional basis for FAA-supported economic impact analyses at the state level. Our goal is to *estimate the full economic impact resulting from the presence of each airport*. This means identifying the level of economic activity that can be reasonably attributed to the presence of an airport and then estimating how that activity generates impacts as it ripples through the local economy.

Key Terms and Concepts

Economic impacts start with expenditures. Expenditures within an economy are passed from hand to hand, creating more economic activity than just the original transaction. This is called a **multiplier effect**: one dollar spent within the community can become more than one dollar of economic activity when passed along several times. Or, on the flip side, if a portion of that money is sent out of the region, one dollar spent becomes less than one dollar of economic activity in the area.

From expenditures come economic impacts. In this analysis, economic impacts come from two places: local expenditures by businesses located at an airport and expenditures from visitors passing through an airport. This study, like many other economic impact studies, measures three types of economic impacts:

- **Direct Impacts.** Direct impacts are not, as many people might think, the amount of money initially spent on a purchase. They are, instead, the amount of that initial purchase that will *remain* within the local economy. As an example, when a visitor pays to rent a car at the airport the rental car company will send some of that money to their headquarters outside of the local region, some of the money will be sent to purchase goods outside of the local region, and the rest will be spent on local employees and purchases from businesses within the region. In this case, the cost of the rental car is not the direct impact. Instead, the direct impact is the amount that the rental car re-spends within in the *local region* because that is the portion of the initial expenditure that affects the local economy.
 - **Airport Businesses.** To measure direct impacts of airport businesses, we use Gross Business Income (GBI) for each business. We include only the amount of GBI that is assumed to be spent on employees and local businesses. Money that is sent out of the study region does not create an economic impact for that region and is therefore not counted in the analysis.
 - **Visitor Spending.** To measure direct impacts of visitors we estimate the number of visits passing through an airport in a given year. We also estimate average spending by visitors, adjusted by location. In the case of visitors, because we cannot know where their final destination is, we consider the state as a whole the local region. In this case, all estimated visitor spending is therefore assumed to be local to the state. However, as described above, the direct impacts are the portion of those initial expenditures that are expected to be re-spent within the state.

- **Indirect Impacts.** Indirect impacts result when an industry makes purchases from another industry. For example, if a person purchases an item from an airport gift shop, the gift shop owner must then make more purchases from their supplier; this is an indirect effect.
- **Induced Impacts.** Induced impacts occur from the expenditures of employee wages. If a person purchases an item from an airport gift shop, the person who sells that item receives a wage for working in the shop. The wages that are then put back into the local economy as that person makes purchases for his or her household is the induced effect of the gift shop expenditure.

Analytic Steps

To estimate economic impacts (direct, indirect, and induced) at the airport level, there are five key analytic steps:

1. Establish airport footprints to define the area of economic activity around the airport.
2. Estimate on-site business activity within the airport footprint.
3. Estimate off-site spending associated with visitors traveling through each airport.
4. Estimate multiplier effects of direct on-site and off-site economic activity for each airport.
5. Estimate fiscal impacts resulting from the airport's economic activity.

Attached to this document are a series of flowcharts that show additional details on the methodology, data sources, inputs, and assumptions.

STEP 1: Establishing Airport Footprints

Establishing airports' geographic footprints is an important first step in determining economic activity tied to airports throughout the state. Airports' boundaries are composed of property owned by each airport's owner – such as a port, city, county, private owner, or the state – and property leased by the same owner that is used for airport operations.

Capturing “Through-the-Fence” Connections. In addition to properties directly owned or leased by an airport, the study also includes properties adjacent to the airport that are tied to the presence of the airport but not owned or leased by the airport's owner. This second type of property is considered a through-the-fence (TTF) connection. There are two main types of TTF connections:

- **Aviation-Dependent Business Activity.** This includes offsite private business activity that is dependent on the airport to function. For example, the Boeing facility next to Paine Field in Snohomish County is not owned or leased by Snohomish County, but the property is directly dependent on the presence of the airport and would not be at that location if the airport and the appropriate runway were not there.
- **Rural Airparks.** A second type of TTF connection includes rural airparks where private homes with hangars are next to the airport-owned property. Any adjacent property with a hanger or airplane is included in the airport footprint. These types of properties are primarily identified through aerial photos.

Non-Aviation Uses on the Footprint. Not all property owned by an airport's owner is used for aviation operations or related uses. For example, Olympia Municipal airport is owned by the Port of Olympia, which owns a large amount of property that extends well beyond the runway, taxiways, and airport hangars on the property. A number of the Port's properties are leased by businesses and the State of Washington for commercial, industrial, or general office uses that do not have any aviation purpose.

The study errs on the side of inclusion and includes all properties owned or leased by the airport's owner in the footprint, even if these properties house non-aviation related businesses and uses. Any non-

aviation related businesses and economic activities are excluded later when estimating gross business income and jobs for each airport.

STEP 2: Estimating On-site Economic Activity by Airport

The objective of this task is to estimate employment and gross business income (GBI) for aviation-related businesses located on each airport footprint. These estimates serve as inputs for the direct, indirect, and induced impact analysis as well as the individual airport profiles.

Data Availability Issues. The original scope of work called for heavy reliance on Washington Employment Security Department (ESD) ES202 employment data in developing job estimates for each airport footprint. Due to unexpected confidentiality restrictions, BERK was not given access to ESD employment data, so alternative data sources were identified and a revised methodology was developed. The final methodology uses taxable retail sales (TRS) data in combination with several other primary and secondary data sources to estimate GBI and jobs on each airport footprint.

Selecting Aviation-dependent Businesses. Many Washington airports, particularly those located in urban areas, are home to non-aviation related businesses that do not depend on the airport for their operations. For the economic impact analysis, it is important to screen these businesses out and only consider those businesses that are aviation-dependent.

Put simply, the screening process is designed to select only businesses that *rely on the presence of the airport to exist*.

Industry classification codes, internet research, and input from airports are used to select aviation-dependent businesses in each airport footprint. Listed below are a few notable examples of business categories and how they were handled.

Businesses Included

- **Aircraft and aerospace manufacturing.** Aerospace businesses located on airport footprints were included in the impact analysis because these operations often depend on the airport for testing and trials of various aircraft products. It is important to note that aerospace businesses outside the footprint were not included in this piece of analysis. The impact of the larger aerospace industry is addressed separately in the industry-level economic analysis.

Businesses Excluded

- **Non-aviation industrial and warehouse businesses.** Some airports, such as the Olympia Regional Airport, have industrial, warehouse, and manufacturing businesses located on the airport footprint that do not rely on the airport for operations. These types of businesses often locate on airport property because the airport provides large-lot industrial land with good transportation access. Wherever possible, these types of businesses are excluded from economic impact calculations.
- **Hotel, restaurant, and rental vehicle businesses.** Accommodation, food service, and rental vehicle businesses located on airport property are excluded from the list of aviation-dependent businesses because the economic impact of these businesses is already being captured in the visitor spending analysis. Some exceptions were made for food service establishments located within terminals.

STEP 3: Estimating Off-site Visitor Spending

The visitor spending analysis captures economic impacts related to visitors entering a community through an airport and spending money in that community and beyond.

Spending Categories. Visitor spending is one lens into examining how airports relate to tourism. This analysis captures the economic impacts associated with airports in the spending categories of:

- **Accommodations** such as hotels, motels, and bed and breakfasts.
- **Food service and food stores**, such as restaurants, cafes, and grocery stores.
- **Arts, entertainment, and recreation** such as museums, spectator sports, and gambling.
- **Retail**, such as clothing and sporting goods.
- **Local transportation**, such as taxi service and rental cars.

To avoid double-counting from the previous section, this analysis captures spending outside of the airport footprint—in the grocery stores, restaurants, hotels, and other businesses in the community. All rental car companies, including those located at airports, are included in visitor spending analysis and are excluded from the on-the-airport footprint calculations.

Reliance on existing data sources. BERK conducted an extensive review of other aviation economic impact studies, from Washington and other state aviation systems. Our analysis is based on existing data related to aviation visitor spending and Washington State county-specific visitor spending data.

The base visitor spending estimate used in our analysis comes from a recent 2009 survey, conducted by Martin Associates, of commercial aviation visitors arriving at Sea-Tac International airport. The majority of the state's visitors arriving via air arrive at Sea-Tac. Given the recent timeframe of this survey and the challenges associated with survey response rates for 135 public use airports around the state, BERK chose not to conduct additional surveys. This baseline number was then adjusted to account for differences across counties. Using Washington county-level data on sales revenue and visitor spending, BERK developed factors to adjust the Sea-Tac estimate to the local economic landscape of individual airports.

Differences in visitors, airports, and local economies. The 135 airports examined in this study and the communities in which they live are different. Visitors and their spending habits are also different. Our approach accounts for these differences by adjusting spending amounts by county and by the type of aviation visitor. Resources and methods used to account for these differences include:

- Washington county-level sales revenue and visitor spending data were used to account for differences between counties. This makes sure that our total visitor spending estimates make sense for each county.
- Aviation economic impact studies from other states were used to develop factors to differentiate commercial service visitor spending and general aviation visitor spending. This reflects that commercial visitors typically spend more than general aviation visitors. General aviation visitor spending was further separated into corporate travel and other general aviation at airports where data was available. This reflects the fact that corporate travelers generally spend more per day than other general aviation travelers. The commercial visitor spending factor was applied to corporate general aviation visitors.
- The 2010 report on Washington State County Travel Impacts (sponsored by the Washington State Department of Commerce and conducted by Dean Runyan Associates) was used to develop factors to adjust the distribution of spending across the spending categories by county. This accounts for the fact that some counties, for example, will have a higher proportion of visitor spending going to accommodations.

At the conclusion of this approach appendix, after the flowchart attachments, a sample calculation of visitor spending is included to clearly show assumptions, adjustment factors, and inputs.

STEP 4: Estimate Multiplier Effects, The use of IMPLAN

IMPLAN software is used to estimate the multiplier effects. IMPLAN (short for IMpact Analysis for PLANning) is an input/output model that uses county-level data to trace the ripple effects of an expenditure that occurs within the economy. The model is used to track how an economic action, such as money spent at an airport business, will ripple through a regional economy creating different levels of revenue, jobs, and income in many different economic sectors.

Determining a local region. We determined the appropriate “local region” for spending by airport businesses by considering each airport’s location, proximity to other counties, and likelihood of drawing on those counties for employees, goods, and/or services. Neighboring counties that have commercial or residential centers where people or goods are within easy reach were included as part of the local region as they are likely to be affected by airport activity.

For each region, an IMPLAN model was created to produce the appropriate multipliers for direct, indirect, and induced impacts unique to that region.

Calculating the Impacts. Next, economic impacts were calculated for the airport footprint and visitor spending:

- **Footprint analysis.** For each airport, all estimated Gross Business Income by type of economic activity located on the airport’s footprint was multiplied by the appropriate multipliers (created in IMPLAN) to estimate the total direct, indirect, and induced impacts of the economic activity from businesses on airport footprints.
- **Visitor spending.** Since it is not known exactly where visitors are spending money in the state, only which airports they are using to arrive, it does not make sense to use the local economic area definitions developed for the footprint analysis. Instead, statewide multipliers were developed to estimate the total economic impacts (direct, indirect, and induced) resulting from visitor spending.

STEP 5: Estimate Fiscal Impacts

In addition to the economic impacts generated, we looked at how the airport-related activity generates tax revenue. The goal of the fiscal contribution analysis is to acknowledge and describe the contributions received by state and local governments from the aviation system.

BERK identified a list of key revenue-generating activities located on or directly associated with airports and estimated the tax streams associated with those activities. Taxes analyzed include those unambiguously linked to the operation of the aviation system, as well as additional taxes that generate significant revenues for the state from general business operations.

The fiscal contribution identified in this analysis only takes into account the direct impacts on airport footprints and direct spending by airport visitors – tax revenues generated from induced and indirect impacts are not estimated. For each tax, the contribution is estimated at the state, county, city, and special purpose district level, where applicable. To account for variations in taxable base definitions, such as exclusions, exemptions or differential tax rates for different types of activity, effective tax rates are used to estimate tax revenues associated with underlying economic activity.

Calculating Impacts on the Airport Footprint. This study analyzes the following tax streams related to operations and economic activity within the airport footprint:

- Sales Tax
- Property Tax
- Utility Tax
- Business & Occupation Tax
- Leasehold Excise Tax
- Aircraft Excise Tax
- Aviation Fuel Tax

Calculating Impacts from Visitor Spending. Tax revenues from visitor spending are based on the direct visitor spending numbers estimated for each airport. The benefits associated with each airport are not necessarily received by the county or city where the airport is located, because travelers flying into an airport may take additional ground transportation to their final destination. This study analyzes the following tax streams generated from visitor spending:

- Sales Tax
- Business & Occupation Tax
- Rental Car Tax
- Hotel/Motel Tax

To estimate each tax, BERK's estimate of statewide visitor spending was apportioned to local jurisdictions based on Department of Commerce's *Washington State County Travel Impacts 1991-2009*. Applicable state and local tax rates were applied to the relevant spending categories to reach statewide tax revenue estimates. These revenues were distributed among individual airports based on the airport's initial portion of statewide visitor spending, as estimated by BERK.

Results

This analysis results in the identification of total economic impacts (direct, indirect, and induced) for each of the state's 135 airports. The economic impacts—dollars and jobs—are reported in the airport's individual Airport Profile—a standalone document that will be accessible via WSDOT Aviation's website, as well as in the final report's technical appendix.

II. INDUSTRY-LEVEL ECONOMIC IMPACTS

Analysis: Overview and Objectives

The airport-level economic impact analysis described above is limited to businesses and activities located on airport footprints and spending by visitors passing through the airport. The industry-level economic impact analysis takes a different perspective and focuses on how aviation facilities and services support the broader economy in general and specific industries in particular, whether they are located on an airport footprint or not. The analysis will include two elements:

1. **Economic activity near airports.** The first part of the industry-level analysis looks at businesses located near airports to determine the magnitude of business activity and whether

certain industry clusters are particularly concentrated around airports. This analysis looks at business concentrations around different types of airports as well as how business activity is distributed differently within sub-regions of the state.

This airport-based approach looks at all businesses within five- and ten-mile buffers around airports and identifies industries that are more or less concentrated than one would expect based on statewide averages. The airport buffer analysis provides insights on:

- The level of total economic activity that is located near airports
 - How industry concentrations around different airport types vary
2. **Distribution patterns of selected industries in Washington.** The second part of the industry-level analysis goes into greater detail analyzing factors of production and business locations for five selected industries that rely on the aviation system in different ways. The five industries selected are: Business & Professional Services, Agriculture & Resources, Tourism, Manufacturing, and Aerospace. These industries were selected because of their strong relationships with the aviation system, their importance to the state economy, and strong interest from stakeholders and the Advisory Committee.

For each selected industry, the analysis describes:

- a. The size of the industry (in terms of jobs and GBI) and its relative importance to the state economy.
- b. The spatial distribution of industry activity across the state (represented visually through a series of 3-D maps).
- c. How each industry and subsectors of each industry use aviation services.
- d. How important aviation services and facilities are to businesses in these industries when making location decisions.

Key Questions

The industry-level economic analysis seeks to explore the relationship between the location of economic activity and the location of aviation facilities and services. A few important questions the analysis seeks to answer include:

1. What industries either exhibit a strong reliance on the aviation system, or might provide insight into the role of aviation in the distribution of economic activity in the state?
2. Are certain aviation services (e.g. commercial service, cargo services) particularly important to selected industries?
3. How do airport size and class relate to the locations or distribution of business activity in selected industries?

Analytic Steps

The following steps were followed in the industry-level analysis:

PART 1: Economic Activity Near Airports

STEP 1: Establish five- and ten-mile buffers around each public use airport

GIS software is used to automatically generate five- and ten-mile buffers around the centroid of each public use airport in Washington. Buffers were also created around Portland International Airport in

Oregon because a significant amount of economic activity in southwest Washington is located within the market area for Portland International Airport.

STEP 2: Estimate total GBI within each buffer

The Washington Department of Revenue maintains a statewide geographic database of business locations and the taxable retail sales (TRS) attributed to these locations. Using statewide ratios between TRS and GBI for specific industries, we estimated GBI for each business location statewide. Using GIS software, the GBI at each business location is assigned to the five- and ten-mile buffers for each airport.

STEP 3: Summarize concentrations of industry activity

Once GBI estimates are assigned to each airport buffer, a variety of analyses of industry concentrations are possible. GBI summaries for different buffer sizes, geographic regions, airport classifications, and sub-industries were generated. The following indicators were considered:

1. Share of statewide GBI included in each buffer distance
2. The concentration of industry GBI within each buffer distance and each airport classification. The “concentration index” measure used in this study is based on the ratio between the concentration of industry within airport buffers compared to the concentration of the same industry statewide. If the index is over 1.0, then the industry is more concentrated around airports than it is statewide.
3. The distribution of industry GBI within different geographic groupings including regional transportation planning organizations (RTPOs) or WSDOT’s planning regions.

PART 2: Distribution patterns of selected industries in Washington

STEP 4: Select focus industries

The five industries to study further were selected using the following criteria:

- Have a strong relationship or dependence on the aviation system.
- Are of interest to particular stakeholder groups.
- Serve more than just local markets.
- Are large enough to be important to local or state economies.

The initial industry selections are informed by location quotient analysis to highlight industries in Washington State that have higher concentrations than the national average. The Advisory Committee was also consulted for potential industry ideas and before final industry selection. Final industry selections were defined using collections of appropriate NAICS industry codes.

STEP 5: Map distributions of industry activity

Using the geographically-located GBI dataset developed in Step 3, a series of maps were created to visually display the distribution patterns of industry activity across the state. 2-D density “heat maps” were created as well as maps with 3-D visualizations of GBI concentrations.

STEP 6: Summarize concentrations of activity in subsectors

Industry subsectors at the 3-digit NAICS industry level were analyzed using the same concentration index described earlier in Step 3. Scatterplot charts showing subsector size and concentration near airports were created.

Results

The final products for this analysis include a series of maps and charts showing the magnitude of economic activity in each industry, where this activity is located, and what, if any, relationship there is between industry activity and airport locations. Final industry profiles will also include qualitative assessments of how industry subsectors use aviation services and how aviation facilities factor into business location decisions.

III. AVIATION SYSTEM USER-LEVEL ECONOMIC VALUE ESTIMATES

Analysis: Overview and Objectives

The broadest measure of economic contribution of the aviation system is the intrinsic value that access to and use of the system generates for all of the individual system users. In contrast to the other two assessments of economic contribution, the economic value analysis is more qualitative and conceptual in nature, because measuring true economic value is nearly impossible—this would require knowing what millions of users would ultimately be willing to pay for a good or service.

While the previous perspectives provide windows into the role of aviation in supporting economic activity at the local and state level, this perspective focuses on how individuals derive value from the use of aviation facilities and services. In some cases, the value derived by individuals is much greater than the economic impact (jobs, wages and output) associated with the provision of the service. The value that is derived by individuals is an important perspective to keep in mind when considering state policy implications of protecting and investing in the aviation system.

Key Questions. To better understand the economic value of the state's aviation system to individual users, 17 aviation-supported services are examined. The analysis asks two questions:

- How does this aviation-supported service create value for the individual user?

Understanding how value is created by airports is the first step in estimating how much value airports create. Once the process of value creation is understood, then quantities and prices can be attached to elements of the process where possible.

- How great is the value that is created?

Measuring economic value would require knowing how much each individual user values a service. Because that is not possible, our assessment is more qualitative in nature. We pose plausible examples and scenarios to highlight the value being created. In some cases, we quantify what we can; using average prices and total users, we can estimate what users actually do pay for these services. This gives us an order-of-magnitude sense of the value created.

Key Concept

Economic value is the intrinsic worth of a good or service at the individual level. In this case, it's the worth of access to and use of the state's aviation system. It's easy to see how the aggregate value created—that is adding together the individuals—is immense.

Analytic Considerations

Selection of the aviation-supported services. We examine 17 aviation-supported services that encompass a wide range of activities, listed below:

- **Moving people and goods.** Commercial passenger service; business and corporate travel; personal transportation; air cargo; and blood, tissue, and organ transportation.
- **Protecting people and resources.** Medical air transport, search and rescue, firefighting, national security, and emergency preparedness and response.
- **Supporting research.** Scientific research and aerial photography.
- **Supporting industry.** Aircraft manufacturing and agriculture.
- **Flying for training.** Pilot training and certification.
- **Flying for recreation.** Aerial sightseeing and skydiving.

These services are not meant to be exhaustive, but rather serve as a representative set of activities to illustrate the many ways aviation-supported services create value to their users.

System-level value creation. Each of the state's public use airports provides a different mix of services. Economic value is not attributed to a particular airport, but rather, is attributed to the aviation system and the services and activities it enables. The services were selected to capture the diversity of activities in airports large and small, in urban and in rural settings.

Results

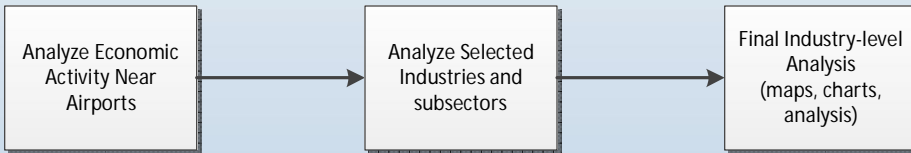
The final product for this analysis is a written assessment of the economic value created by the 17 aviation-supported services in Washington.

Attached are a series of flowcharts that show additional details on the methodology, data sources, inputs, and assumptions described in this approach document.

ECONOMIC VALUE ASSESSMENT



INDUSTRY-LEVEL ECONOMIC ANALYSIS



INTRODUCTION

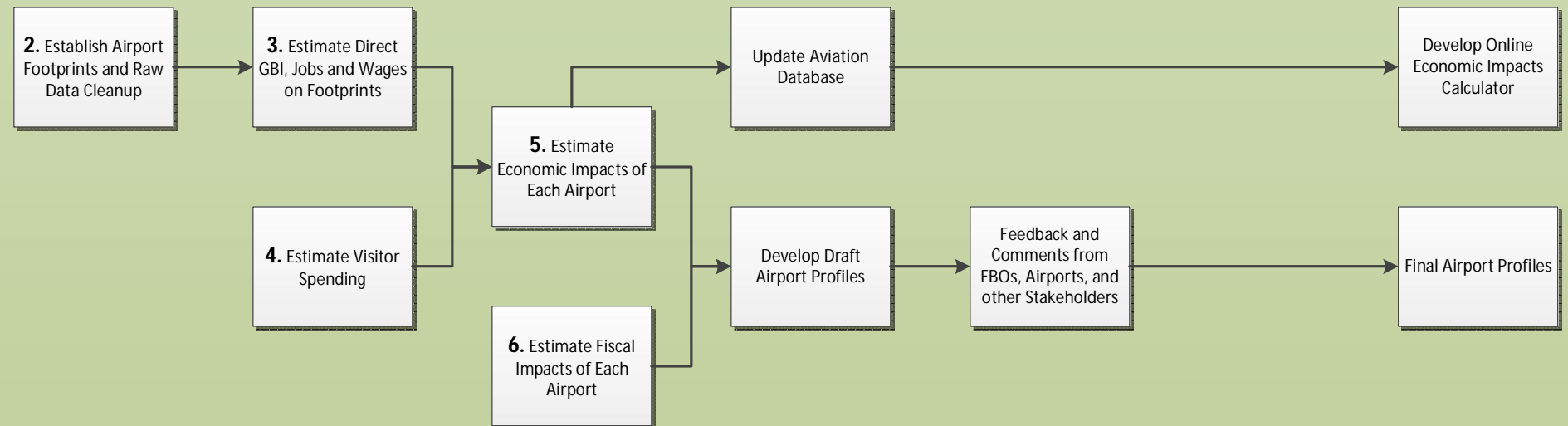
This collection of flowcharts describes the methodology used in estimating economic value and economic impacts for the Washington aviation system. This flowchart shows the overall methodology and how analyses are linked. The numbers in the upper left of some process boxes on this page correspond to the numbered detailed flowcharts that follow.

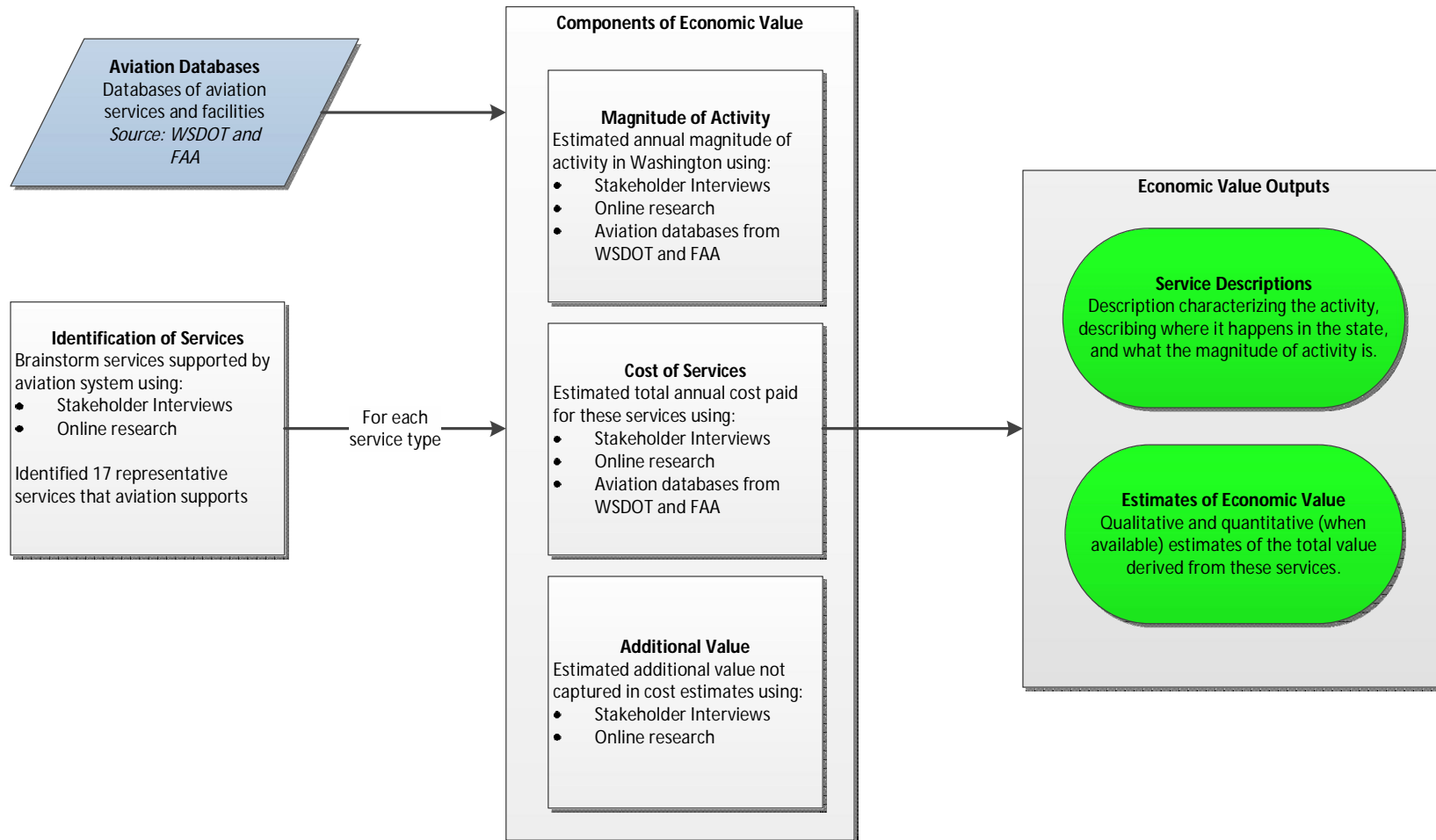
LEGEND

The following symbols are used in the detailed methodology flowcharts. Each represents a specific type of input, output, or process.

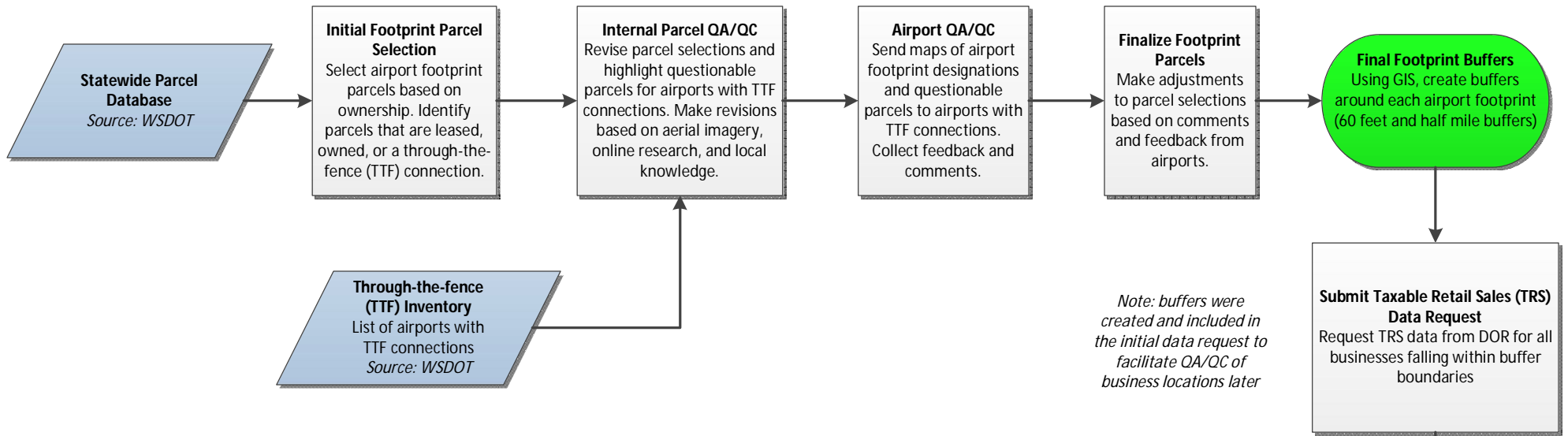


ECONOMIC IMPACT ASSESSMENT

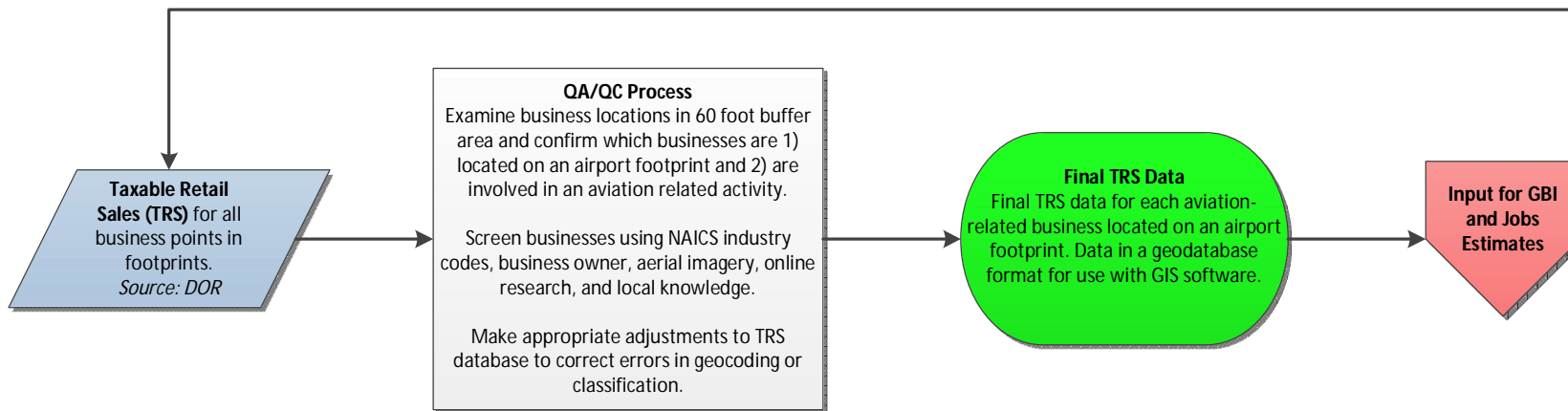


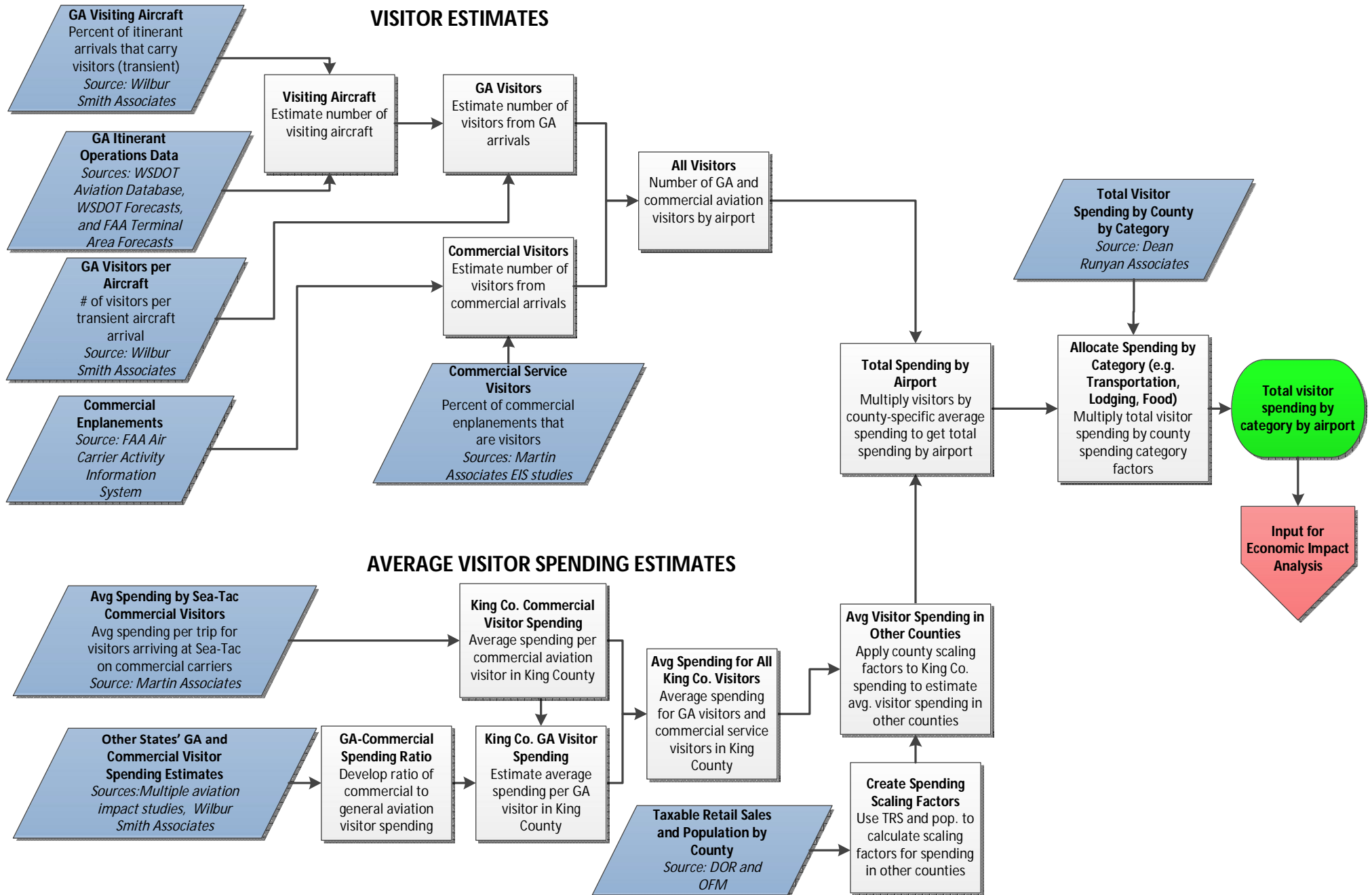


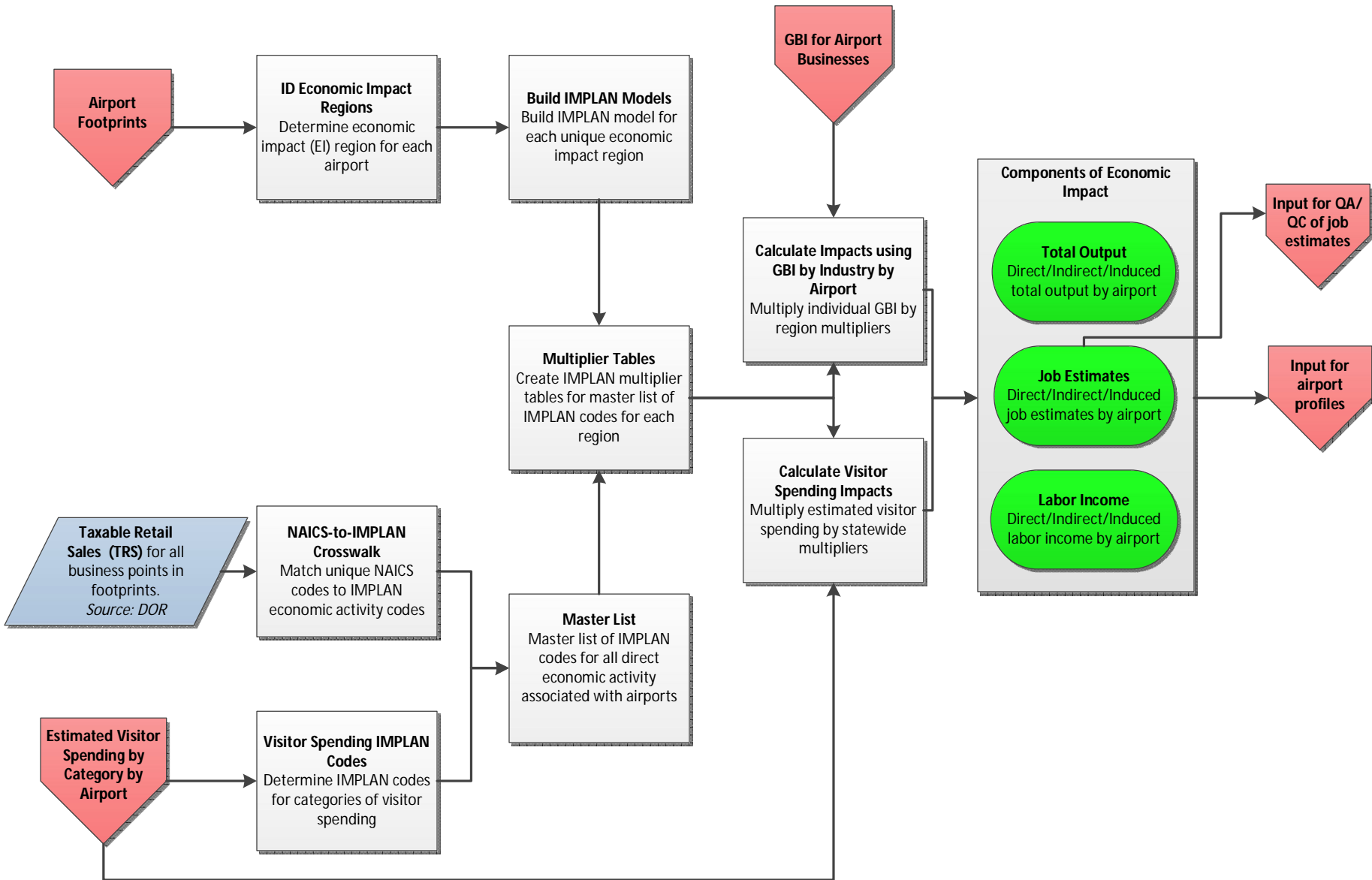
ESTABLISHING AIRPORT FOOTPRINTS

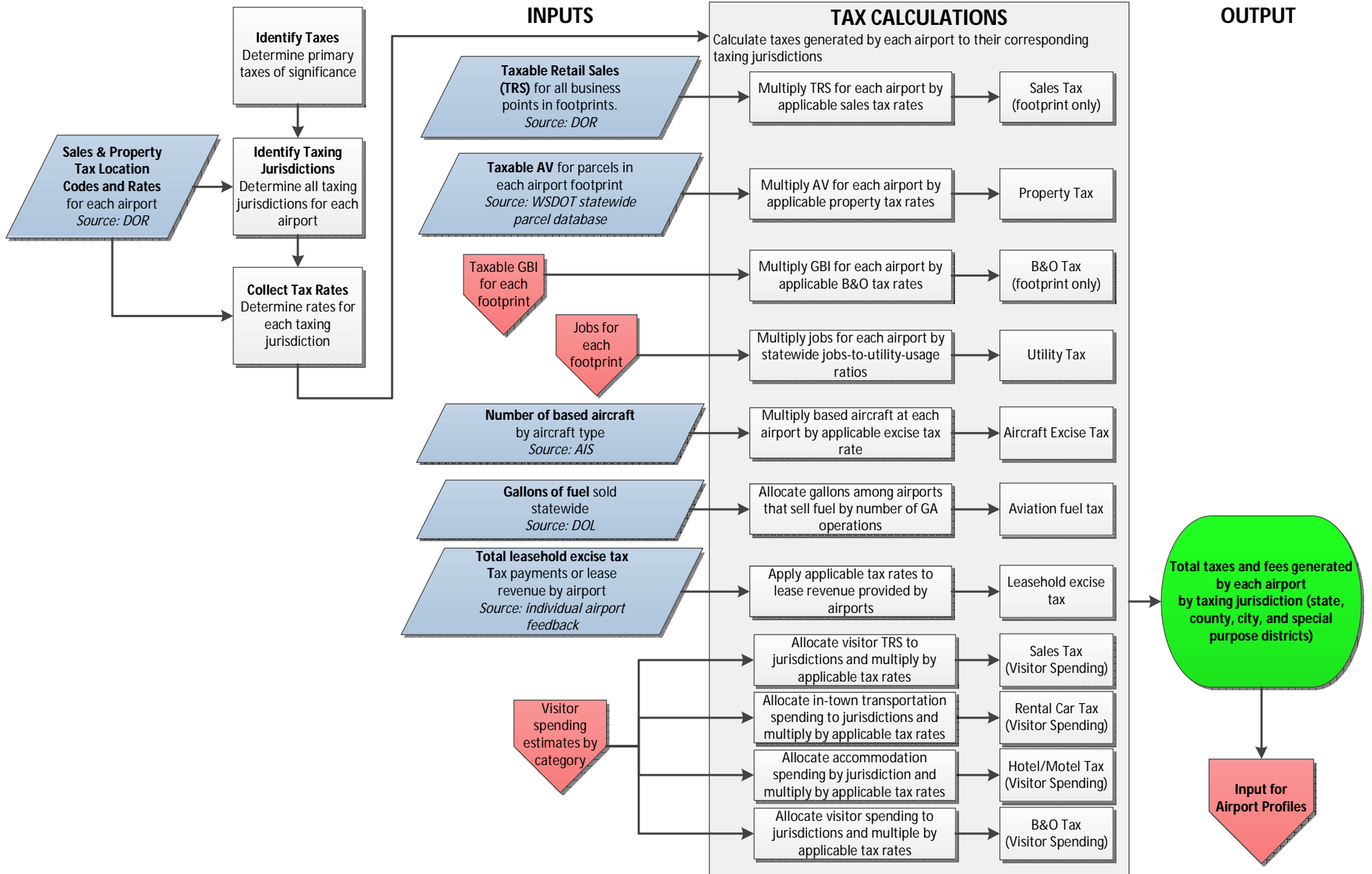


CLEANUP OF RAW TRS DATA









Example Airport Visitor Spending

Visitor Spending (listed on profile) = \$120,499,249 = Number of Visits x Average Visitor Spending per Trip
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Visitor spending captures the economic impacts related to visitors entering a community through an airport and spending money in that community and beyond. This is one of two sources of economic impacts presented in the airport profile.

Visitor spending was calculated by:

- (1) Estimating the number of visits to an airport
- (2) Estimating the average spending of each visit
- (3) Multiplying the number of visits by the average spending per visit
- (4) Dividing total spending into spending categories (see below) to determine economic impacts

(1) ESTIMATING THE NUMBER OF VISITS

Commercial Visits		General Aviation Visits	
Commercial Enplanements ^{1C}	500,000	GA Itinerant Operations ^{1GA}	15,000
Percent of enplanements that are visits (SeaTac) ^{2C}	48%	Percent of operations that are arrivals	50%
Percent of enplanements that are visits (all other airports) ^{3C}	40%	Percent of arrivals that are visiting ^{2GA}	33%
		Number of visits per visiting arrival ^{3GA}	2.35
Total Commercial Visits	200,000	Total General Aviation Visits	5,816
Sources:		Sources:	
^{1C} WSDOT AIS Database, 2010		^{1GA} WSDOT AIS Database, 2010	
^{2C} The 2007 Economic Impact of the Port of Seattle, Martin Associates, 2009		^{2GA} Wilbur Smith & Associates, state economic impact studies	
^{3C} Washington Aviation Economic Impact Study, 2001		^{3GA} Other state aviation economic impact studies	

(2) ESTIMATING AVERAGE SPENDING PER VISIT

<p>Commercial Visit: Base Spending Estimate^{3C} \$729</p> <p>The base number for average spending per visit comes from a 2008 survey of passengers at Sea-Tac airport. The majority of aviation visitors enter the state via Sea-Tac airport, making this a reasonable approximation for average state visitor spending estimates. However, your airport is not like Sea-Tac, and adjustments are made to this base amount to better reflect your community.</p>	<p>General Aviation Visit: Base spending estimate \$167</p> <p>Visitors traveling via commercial service flights do not have the same spending patterns as visitors arriving via general aviation (GA). Using benchmarks from other states' aviation economic impact studies, we adjust the base commercial visit spending downward to better reflect the spending habits of GA visitors. If airports provided us with the percent of GA visitors that were corporate travelers, we applied the Commercial Spending Estimate to those visitors, as they spend more than other GA visitors on average.</p>
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Airport County: Thurston

We adjust the baseline estimate to reflect county differences by using Taxable Retail Sales per capita. This approach leads to a conservative estimate of per visit spending.

County Adjustment Factor (King = 100%) ^{4C} 82%	County Adjustment Factor (King = 100%) ^{4GA} 82%
Commercial service per visit spending \$599	General aviation per visit spending \$137
Sources: ^{3C} Martin Associates, <i>The 2007 Economic Impact of the Port of Seattle</i> , 2009	Sources: ^{4GA} Based on TRS per capita, WA Department of Revenue, 2010
^{4C} Based on TRS per capita, WA Department of Revenue, 2010	

(3) ESTIMATING TOTAL VISITOR SPENDING

To get to a total, we multiply the number of visits by average spending per visit. This estimate is of the total amount of spent statewide by visitors arriving at your airport. We don't know exactly where in Washington State these visitors are spending their money.

Total- Commercial Visitor Spending	Total- General Aviation Visitor Spending
(without rounding) \$119,701,800	(without rounding) \$797,449

(4) ESTIMATING SPENDING BY CATEGORY

To calculate economic impacts, we divide total spending into spending categories. Visitors will spend their money differently, depending on where they are visiting. To account for differences across the state, we developed visitor spending county factors based on the *Washington State Travel Impacts 2010 Report*, conducted by Dean Runyan Associates for the WA State Department of Commerce.

Accommodations	\$13,836,907	11%
Food Service & Food Stores	\$40,949,563	34%
Local Transportation & Gas	\$30,862,735	26%
Arts, Entertainment & Recreation	\$16,318,611	14%
Retail Sales	\$18,526,759	15%
Total Estimated Visitor Spending (rounded)	\$120,499,249	100%