Washington Aviation Economic Impact Calculator

User's Manual

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1. Introduction

The Washington State Department of Transportation (WSDOT) Aviation Division published the 2020 Washington Aviation Economic Impact Study (AEIS) to document the 2018 contributions of Washington's public-use airports to the state's economy. The Aviation Economic Impact Calculator was developed to enable airport administrators and sponsors, policymakers, and members of public to estimate an airport's change in regional and statewide impacts based on potential changes in activity at the airport.

This User's Manual describes the various functions of the Aviation Economic Impact Calculator and provides step-by-step instructions to use the web-based tool. This User's Manual is divided into two major sections and a supplementary appendix:

- **Section 2** provides users with a broad overview of the Aviation Economic Impact Calculator, its intended purposes, and uses.
- **Section 3** gives users a comprehensive description and set of instructions for entering scenario data and viewing scenario results in the Aviation Economic Impact Calculator.
- **Appendix A** provides a glossary of terms that are not already defined in Sections 2 and 3.
- **Appendix B** lists the airports included in the scope of the 2020 Washington AEIS by WSDOT Region and county.
- **Appendix C** includes example projects to help users think through the data input changes potentially associated with various types of scenarios.

Users will also see **green call-out boxes** that include key terms and concepts that are defined or further explained throughout this User's Manual. Additional terms and their definitions are included in Appendix A.

2. Overview of the Aviation Economic Impact Calculator

Purposes of the Aviation Economic Impact Calculator

The primary purpose of the Aviation Economic Impact Calculator (also referred to as the Calculator) is to enable airport administrators and sponsors, policymakers, and members of public to conduct airport economic impact scenario analyses. Some examples of these analyses include evaluating how a surge in visitors, an increase in construction spending, or a growth in tenants would affect regional and state economies.

WSDOT's Aviation Economic Impact Calculator is a web-based tool designed for economic assessment of the state's public-use airport system. This tool can be used to evaluate how changes at a single airport, such as an airport improvement project or policy change, may affect the Washington economy, the regional economy where the airport is located, and the local economy when measuring direct impacts. Economic impacts from this tool are presented either statewide or regionally as changes in business revenue (often referred to as sales or economic output), labor income, and jobs are created. The tool also includes baseline results from the 2020 Washington AEIS, which is based on 2018 data. The Calculator estimates both the short-term economic impacts related to capital projects and the long-term

economic impacts associated with airport operations and tourism from out of state visitor spending in Washington.

What Can be Assessed with the Calculator?

The Calculator is designed to assess a variety of alternative scenarios representing:

- Changes in aviation activity including commercial enplanements and general aviation (GA) operations and passengers
- Changes in freight and cargo operations (excluding access and off-airport logistics)
- Inter-airport shifts, such as shifts in operations and passengers among airports
- Changes in terminal tenants and in-terminal employment
- Changes in airport expenditures, including those for construction, maintenance, and operations

The Calculator can generate impact reports for an individual airport on either its region or the state as a whole. Users will be able to view and download scenario reports as discussed in **Section 3.5.2**. Reports include estimates of:

- Direct and total impacts (with multiplier impacts) by economic sector[1]
- Changes in overall economic activity as measured by business output and jobs at the state and regional levels

Four Elements of the Calculator

The Calculator has four main elements that are described in Section 3. These elements are listed below, along with the main components that make up each element (labeled as "Sections"). The section labels (e.g., Section A, Section B, etc.) are not displayed in the Calculator; they are only used in this User's Manual as a way to organize and clarify the parts covered in the Calculator.

The four elements include:

1. Homepage: Search for an airport name and choose an airport to be evaluated in the Calculator.
2. Spending: Displays the selected airport's baseline and scenario values for airport and visitor spending inputs.
   - Section A: Airport's Annual Budget and Expenditures
   - Section B: Airport's Commercial Enplanements and Visitors
   - Section C: Airport's General Aviation Operations and Visitors
   - Section D: Visitor Spending (Commercial Service and GA)
3. Employment: Displays the selected airport's baseline and scenario values for airport administration and tenant employment inputs.
   - Section A: On-site Transportation Activities

[1] Terms are defined in Appendix A.

- Section B: On-site Supporting Services
- Section C: On-site Freight Activities
- Section D: On-site Passenger Terminal Activities
- Section E: Other Air Services

4. Results: Displays the selected scenario impacts by region or state.

- Section A: Economic Impacts Summary
- Section B: On-Airport Jobs
- Section C: Temporary Construction Jobs
- Section D: Visitor Spending Jobs

Advisory Note: The economic calculator uses 2018 airport data. This data will remain unchanged until the aviation economic impact study or similar activity is conducted that collects new, in depth economic data. The multipliers in the calculator will be updated annually or as new multiplier data becomes available.

3. Aviation Economic Impact Calculator User's Manual

Overview

The Calculator is a multi-tab widget embedded in WSDOT's Aviation webpage. The tool serves as an interface between users and the statewide economic input-output (I/O) model used in the 2019 Washington AEIS. It is supported across most internet browsers (i.e., Chrome, Firefox, Microsoft Edge, and Safari).

> *The Washington Aviation Economic Impact Calculator can be accessed at http://washair.tredis.net/AirportWashington.aspx.*

Through the Calculator, users are able to project potential changes to an airport's baseline economic impact as estimated by the Washington AEIS. Revised economic impacts reflect user-defined impacts generated by entering different/updated scenarios into the Calculator. Any new inputs will not be saved, nor will new inputs influence the data in the original Washington AEIS. Additionally, when the Calculator is reloaded on their browser, users will be redirected to the Homepage and all new inputs will be automatically deleted, resetting scenario values to baseline values. Any changes to the scenario values can be saved by clicking the red "Save" button. Changes that are saved are only stored within an active session. Once users navigate away from the Calculator—either by hitting the back button on their browser or choosing a new airport—their active session and scenario values will be automatically deleted.

Once users have chosen an airport from the homepage, they will be directed to the first modifiable tab in the calculator: "Spending". On this page, users can also see the other modifiable tab ("Employment") and the "Results" tab, as well as the drop-down list of Washington airports on the top-left corner of the widget. These three tabs are used to move between the three key elements of the Calculator and are

further explained in subsequent sections below. Each element is a separate heading, and these headings are further broken into subheadings with details on different components of the element.

It is important to note that there are no buttons within the Calculator widget that will allow users to print the "Spending" and "Employment" screens (i.e., the scenario inputs changed by the user). In both tabs, the easiest option to capture all of the information is to copy and paste the content into a Microsoft Word document using the following steps:

1. For the Employment tab only, click on "Expand All" so all modifiable fields are shown (all modifiable fields are always shown in the Spending tab).
2. Click on the empty white space to the left of the "Save" button.
3. Drag the curser to the bottom of the page and release once all content is selected.
4. Copy the content by right-clicking and selecting "Copy" or using the system shortcut for copy: CTRL + C for Windows users and Command + C for Macintosh users.
5. Open a Microsoft Word document and paste the content. Users should right-click and choose "Keep Source Formatting" under Paste Options. The system shortcut for paste is CTRL + V for Windows uses and Command + V for Macintosh users

Users can also use a print screen option for the Spending tab. However, it is important to note that these options will only capture content on the screen as shown. Content that is below the current screen view (normally accessed by scrolling down) will not be captured. The general options to print a snapshot of the screen are using Print Screen button, using the Snipping Tool, or printing to PDF as follows:

- The system shortcut for the Print Screen option is Ctrl + P for Window users and Command + P for Macintosh users.
- The system shortcut for the Snipping Tool option is Windows icon + Shift + S for Window users and Shift + Command + 4 for Macintosh users.
- To print to PDF, right-click the screen and choose "Print". Depending on the browser, users then chose "Save to PDF" in the Destination drop-down menu or chose "Adobe PDF" in the Select Printer box. Users then click "Print" or "Save" (again depending on the browser), and the screenshot can be saved to the computer for later reference.

These printing options will only print or save the current screen view and ignore any hidden tables (unless the table view option has been expanded and elements of the hidden table are shown on the screen). **It is recommended that users maintain records of what they change to generate new results.**

Users will also see key terms that are defined or further explained in **green call-out boxes** throughout the User's Manual. Additional related terms and their definitions are in Appendix A.

Calculator Homepage

3.1.1 Navigating the Aviation Economic Impact Calculator Homepage

Purpose: Allows users to select a specific airport to review and edit inputs.

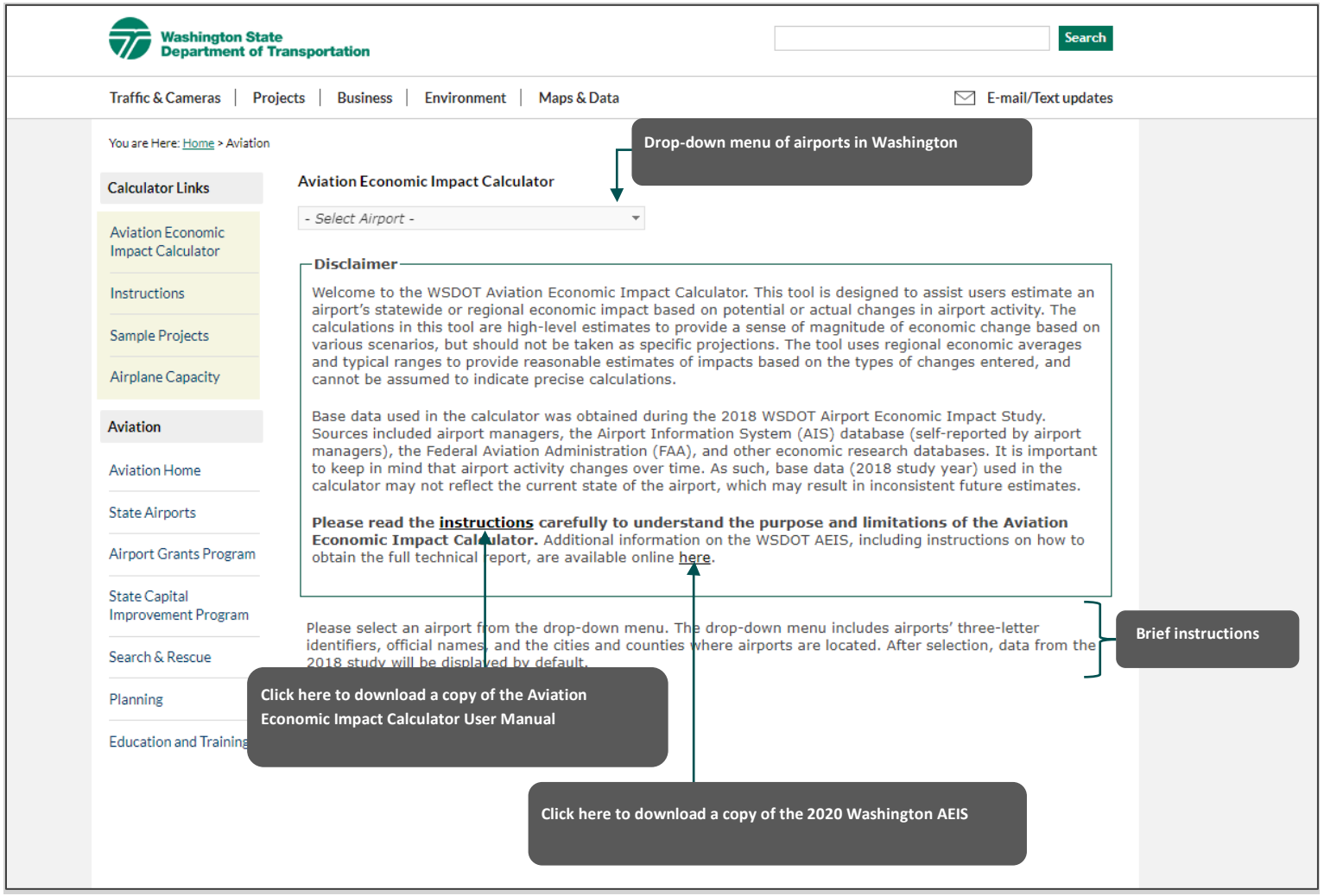
User Input: Select an airport to view by clicking on the drop-down menu and navigating to the desired airport. Once an airport has been selected, the page will direct users to the Calculator.

Description: As shown on **Figure 1**, the first page that users will see when accessing the Aviation Economic Impact Calculator widget includes:

- An airport selection drop-down menu on the top-left corner of the page. The drop-down menu includes airports' three-letter identifiers, official names, and the associated cities and counties where located. The airports are listed in alphabetical order by airport name (not code).
- A disclaimer statement about the capabilities of the tool. Within this disclaimer statement, users can also download this User's Manual by clicking on the instructions hyperlink and accessing the WSDOT Aviation AEIS website by clicking on the "here" hyperlink.
- Brief instructions on choosing an airport from the airport selection drop-down menu.

Users can only view one airport at a time and will be redirected to the selected airport's tabs once they have made a selection. Modifiable tabs are Spending and Employment, which include columns that display baseline values and scenario inputs (see **Sections 3.3** and **3.4** for details). Baseline values reflect the airport's data from the Washington AEIS. Scenario inputs is where users can add different values that reflect changes in airport activity. The Results tab is where users can see how their scenario values impact the airport's regional or state economic impacts (see **Section 3.5**).

Figure 1. Washington Aviation Economic Impact Calculator Homepage



Source: EBP US 2020

Spending Tab

3.1.2 Overview of Using the Spending Tab

This tab displays baseline on-airport activity and visitor spending inputs and enables users to modify these inputs to run an updated annual economic impact for the selected airport (i.e., their scenario). The screen is divided into four sections (as shown in Figure 2):

- Section A is used to enter capital and operational budgets and expenditures.
- Sections B and C are used to describe and enter scenario values for the commercial service and GA operations (respectively) at the selected airport.
- Section D is used to describe the visitor spending from travelers who depart the state using commercial service aviation and GA.

This is the first modifiable tab that users see once they choose an airport to evaluate. For each of the three sections on the page, there are two columns: Baseline and Scenario. The baseline values on this page are fixed; users can modify scenario values to build new input values into their scenario report (initially set to the baseline numbers as the default).

When the Washington AEIS was completed, airports may not have had baseline values in some categories. For instance, many airports do not support commercial service visitors and therefore show values of zero under Baseline in the commercial visitor and visitor spending sections.

Users can modify scenario values in this tab as further described below. Once an input has been changed, the save button will turn orange to prompt users to save their work. **Users must click "Save" on the top right to preserve their changes and make sure they are included in the calculation when changing to the Results tab.** Once users hit "Save", the inputs that have been modified will be highlighted in red text so that they can be easily identified (as shown in **Figure 2**). The "Save" button will turn back to a maroon color to let users know that the changes they made have been saved.

HOW ARE THE ELEMENTS WITHIN THE SPENDING TAB DEFINED?

Airport Capital Annual Budget: This is the budget towards the airport's facility and infrastructure.

Airport Operational Annual Budget: This is the budget towards personnel costs and annual facility operating costs.

Other On-Airport Capital Expenditures: This is any additional expenditures made, such as by tenants, to improve or expand the airport's facilities and infrastructure.

Commercial: This group consists of estimated visiting passengers arriving by commercial passenger service.

Enplanements: The number of revenue-paying passengers boarding an aircraft.

Percent Visitors: Percent of visitors who use the airport to travel to Washington from out of state or international locations.

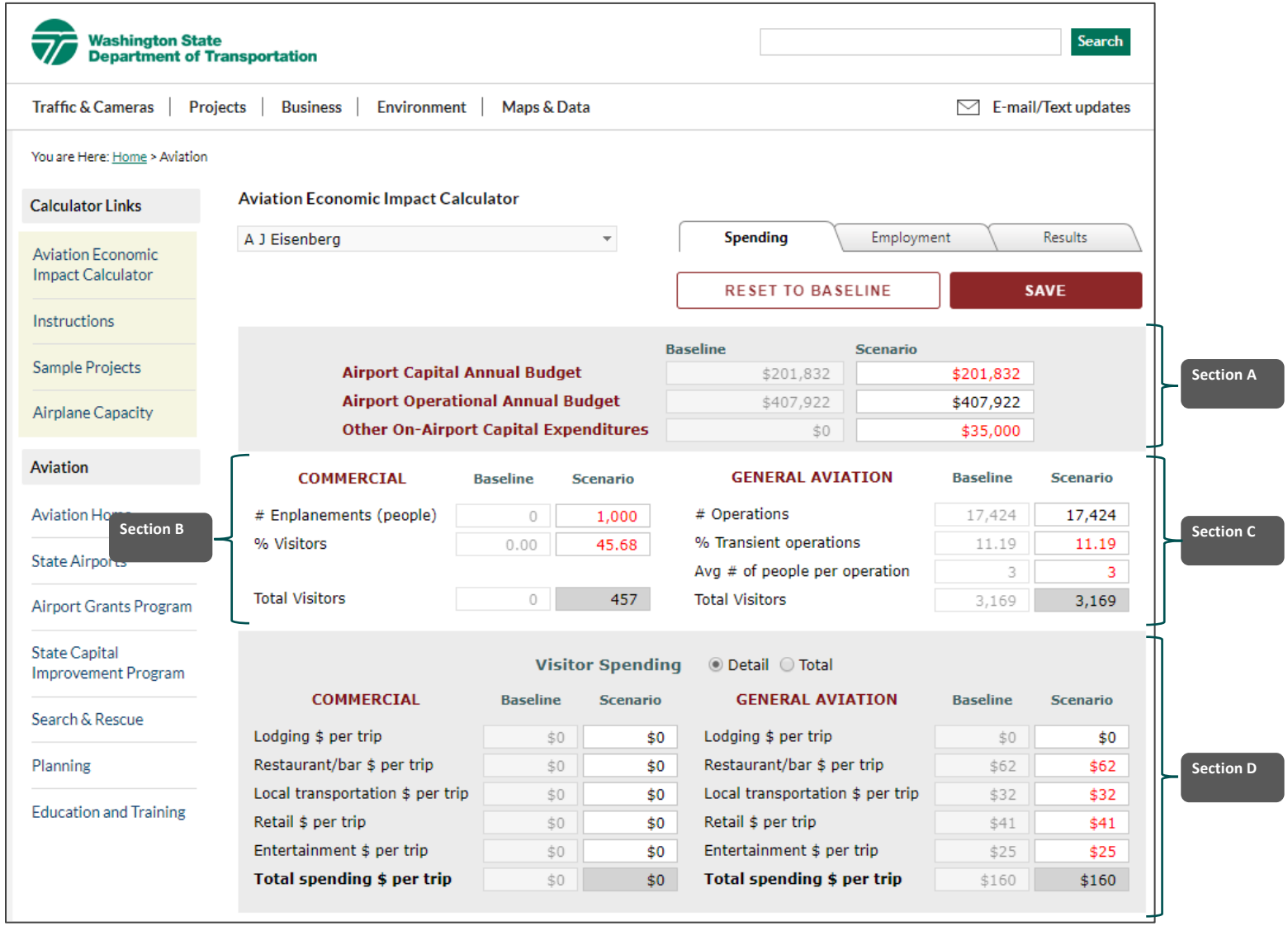
General Aviation (GA): This group consists of estimated passengers arriving by GA.

Transient Operations: GA flights that bring out of state or international visitors to Washington.

In addition, once changes have been saved, there is an option to reset all inputs that have been changed back to the baseline values by clicking on the "Reset to Baseline" button on the top right next to "Save". Once values have been reset to baseline, inputs previously highlighted in red will return to baseline values and will turn back to black. **The "Reset to Baseline" button will reset all values on this page for the selected airport, but it will not impact any saved or unsaved changes in the other modifiable tabs.**

Users will also see a drop-down menu of airports, located at the top left corner of the tab, that will allow users to evaluate another airport. When users navigate to another airport, changes made to existing airports will not be lost within an active session if changes are saved.

Figure 2. Spending Tab



Source: EBP US 2020

3.1.3 Section A: Airport Annual Budget and Expenditures

Purpose: To allow users to change the airport annual budget and capital expenditure baseline values to their scenario values for the selected airport.

User Input: Users can change the dollar values of their selected airport's capital annual budget, operational annual budget, and other on-airport capital expenditures, as applicable, by entering new values in the Scenario column boxes for each category. Once one or a combination of these categories are updated, users should click "Save" to preserve their work.

Description: This section displays the options that users have to change their selected airport's capital annual budget, operational annual budget, and/or other on-airport capital expenditures, based on the scenario under evaluation. The scenario values should be entered in the Scenario column. Changes can be saved or reset to baseline values following the instructions in **Section 3.2.1**.

3.1.4 Section B: Commercial Enplanements and Visitors

Purpose: To allow users to change the number of visitors from the selected airport's baseline values to the user's scenario values.

User Input: Users can update values in their scenario for their selected airport's number of commercial enplanements and the percentage of enplanements that are out of state or international visitors, as applicable. The "Total Visitors" box will calculate the actual number of total commercial visitors based on the enplanements and percentage visitors entered. Once one or a combination of these categories are updated, users should click "Save" to preserve their work.

Description: This section displays the options that users have to change the number of commercial visitors from the airport's baseline values in terms of number of commercial enplanements and percentage of visitors. The number of annual enplanements should be entered as a whole number. For example, 10.75 people would be entered as "11." The percentage of enplanements that are visitors can be entered as a number in decimal form (e.g., 10.75%)

Each time users make a change to either of these inputs, "Total Visitors" will be automatically updated and shown. The updated "Total Visitors" value is generated by multiplying the total number of enplanements (people) by the percentage of visitors**. Users cannot update the "Total Visitors" row; the only way users can update this row is by updating the "# Enplanements" or "% Visitors" row.** Changes can be saved or reset to baseline values following the instructions in **Section 3.2.1**.

3.1.5 Section C: GA Operations and Visitors

Purpose: To allow users to change the number of GA operations, percentage of transient operations, and average number of people per operation for the selected airport.

User Input: Users can update values in the scenario column for the selected airport's GA activity including number of operations, percentage of transient operations (aircraft originating from/departing for destination outside of Washington state), and average number of people per operation. The "Total Visitors" box will calculate the actual number of aviation visitors generated based on the number of operations, percent transient operations, and average number of people per operation. Once one or a combination of these categories are updated, users should click "Save" to preserve their work.

Description: This section displays the options that users have to change the number of GA visitors who rely on their airport from the baseline values. **While the "# Operations" simply represents the total number of GA operations in the selected airport, the "% Transient Operations" represents the percent of GA flights that bring out of state or international visitors to Washington.**

Users can modify the baseline values for their scenario analysis by inputting new values in the scenario column. The "# Operations" and "Avg # of people per operation" rows should be entered as a whole number. For example, 10.75 people would be entered as "11". The percentage of transient operations can be entered as a number in decimal form (e.g., 10.75 percent). Changes should be saved or can be reset to baseline values following the instructions in **Section 3.2.1**.

Each time users make changes to the editable rows, such as "# Operations," "% Transient operations," or "Avg # of people per operation," "Total Visitors" will be automatically be updated. Users cannot update the "Total Visitors" row; the only way users can update this row is by updating the GA editable rows. The updated "Total Visitors" value is generated using the following equation:

*Total Visitors = (# Operations) * (50%) * (% of Transient operations) * (Average # of people per operation)*

Note: An operation represents take-offs and landings. The number of operations at an airport is multiplied by 50 percent to account for the fact that each trip includes two operations, but passengers should only be counted once during their visit to Washington.

3.1.6 Section D: Visitor Spending

Purpose: To allow users to change baseline visitor spending dollar amounts for commercial and GA visitors to scenario values.

User Input: Users can update visitor spending for their scenario in terms of total dollars per trip in the following categories:

- Lodging
- Restaurant and bar
- Local transportation
- Retail
- Entertainment

All values are entered as an average per trip dollar amount. Users can update commercial and GA spending separately for each category if the "Detail" radio button is selected. The "Total spending $ per trip" box will be updated to the sum of all spending by category. If the spending by category is unknown, users also have the option to update only the "Total Spending $ per trip" if the "Total" radio button is selected. This option distributes a certain percentage of the total towards the various spending categories according to the statewide analysis. Once one or a combination of these categories are updated, users should click "Save" to preserve their work.

Description: This section displays the options that users have to update commercial and GA visitor spending inputs for their scenario in terms of dollars spent per visitor. Users can either enter specific spending by category, if available, or a total per-visitor spending value that is automatically allocated to the different spending categories based on the 2018 baseline distribution of expenditures for the selected airport. These two options are available by toggling between the "Detail" and "Total" radio buttons.

When the "Detail" radio button is selected, users can change dollar values attributed to the different spending categories, and the sum of all spending categories will be totaled in the "Total spending $ per trip" row. The five spending categories are:

- Lodging $ per trip: Visitor spending on hotels and motels (including casinos, short-term rentals, and other accommodations).
- Restaurant/bar $ per trip: Visitor spending on full-service and limited-service restaurants, as well as other food and drinking places.
- Local transportation $ per trip: Visitor spending on ground transportation including taxis, Transportation Network Companies (TNCs) (e.g., Uber and Lyft), public transportation, and other transportation services. **Note that on-airport car rentals should not be entered here but assumed car rentals off-airport should be included.** On-airport car rentals are captured in airport tenant activity and can be modified in the employment tab under On-site Transportation Activities" (see **Section 3.4.2** for more details).
- Retail $ per trip: Visitor spending on retail establishments, such as stores that sell electronics and appliances, food and beverage, health and personal care items, clothing, general merchandise, sporting goods, musical instruments, and books.
- Entertainment $ per trip: Visitor spending on movies, shows, sporting events, amusements, museum admissions and other similar activities.

Alternatively, when the "Total" radio button is selected, the five spending categories are locked (highlighted in gray) and the only editable box is "Total spending $ per trip" in the scenario column. Users can change the values in the scenario column for either commercial spending per trip, GA spending per trip, or both. The Calculator will then automatically distribute shares of the total spending (reflected in 2018 $USD) among the five spending categories described above.

Total spending across categories is distributed separately for "Commercial" and "General Aviation" visitor spending. How that total spending $ per trip is distributed among the five spending categories is shown in **Table 1**. If users previously edited spending in individual categories while in the "Detail" setting, changes will not be maintained if a new total spending amount is entered while in the "Total" setting.

Table 1. Total Per Trip Spending Distribution by Category

Spending Category ($ per trip)	Commercial	GA
Lodging	48%	30%
Restaurant/bar	29%	34%
Local transportation	3%	11%

Spending Category ($ per trip)	Commercial	GA
Retail	15%	13%
Entertainment	5%	12%
Total spending	100%	100%

Source: EBP US 2020

Any changes to the scenario values should be saved or be reset to baseline values following the instructions in **Section 3.2.1** before continuing to a different tab.

Employment Tab

3.1.7 Overview of Using the Employment Tab

The Employment tab is where users can view the baseline number and modify scenario inputs for on-site jobs (based on headcount) for the following groups:

- On-site Transportation Activities
- On-site Supporting Services
- On-site Freight Activities
- On-site Passenger Terminal Activities
- Other Air Services
- Miscellaneous Activities

Definitions for on-site jobs and these specific categories are available in the **call-out box** on the following page. Users navigate to this tab by clicking on the Employment tab at the top of the Calculator widget once an airport has been selected. The page includes a black header bar for each of the groups. Below each header is a table with a list of specific activities within that group, and columns for each the Baseline and Scenario numbers, as shown in **Figure 3**.

At the top left of the tab, users have the option to "Expand All" to show all job activities for all six groups, or "Collapse All" to hide all of the tables under the group headers. Alternatively, users can choose to expand any of the groups by directly clicking on the black header/title bar labeled with the chosen group's name and "(Show Details)". Individual tables can also be hidden by clicking on the black header/title bar of choice where it now says "(Hide Details)" next to the group's name. If users want to see a short description of each of the employment groups, they can hover over the black header/title bars and a pop-up comment box will appear next to the title bar explaining the group. The first five employment groups pertain specifically to aviation-related activities, while the "miscellaneous" group contains other non-aviation-related activities commonly occurring at Washington airports.

Similar to the Spending tab, each table on this tab includes a column with baseline numbers and a scenario column where numbers can be entered for the user's scenario analysis. The baseline column shows the results of each data field from the Washington AEIS and cannot be changed. The right "Employment" column reflects the number of jobs to be evaluated as part of the scenario analysis.

After making any changes on this screen, the "Save" button will change to orange to indicate inputs need to be saved. Users must click Save before moving on. After changes have been saved, any scenario

numbers that differ from the Baseline number will be red, and the "Reset to Baseline" button will appear next to the "Save" button. To undo any saved changes and reset all jobs numbers to the baseline numbers, users should click the "Reset to Baseline" button.

The drop-down menu of airports located at the top left of the tab allows users to evaluate a different airport. When users navigate to another airport, changes made to existing airports will not be lost within an active session if changes are saved.

DEFINITIONS: ON-SITE JOBS AND EMPLOYMENT GROUPS

On-site Jobs: In this context, "jobs" refers to the sum of full- and part-time workers. Each part-time employee counts as a full head, rather than calculating full-time equivalent hours (commonly referred to as a "headcount"). Jobs include wage and salaried employees as well as proprietors.

On-site Transportation Activities: Employment for terminal, on-site transit, car rental, and other transportation activities.

On-site Supporting Services: Employment for on-site building maintenance, parking, and safety services.

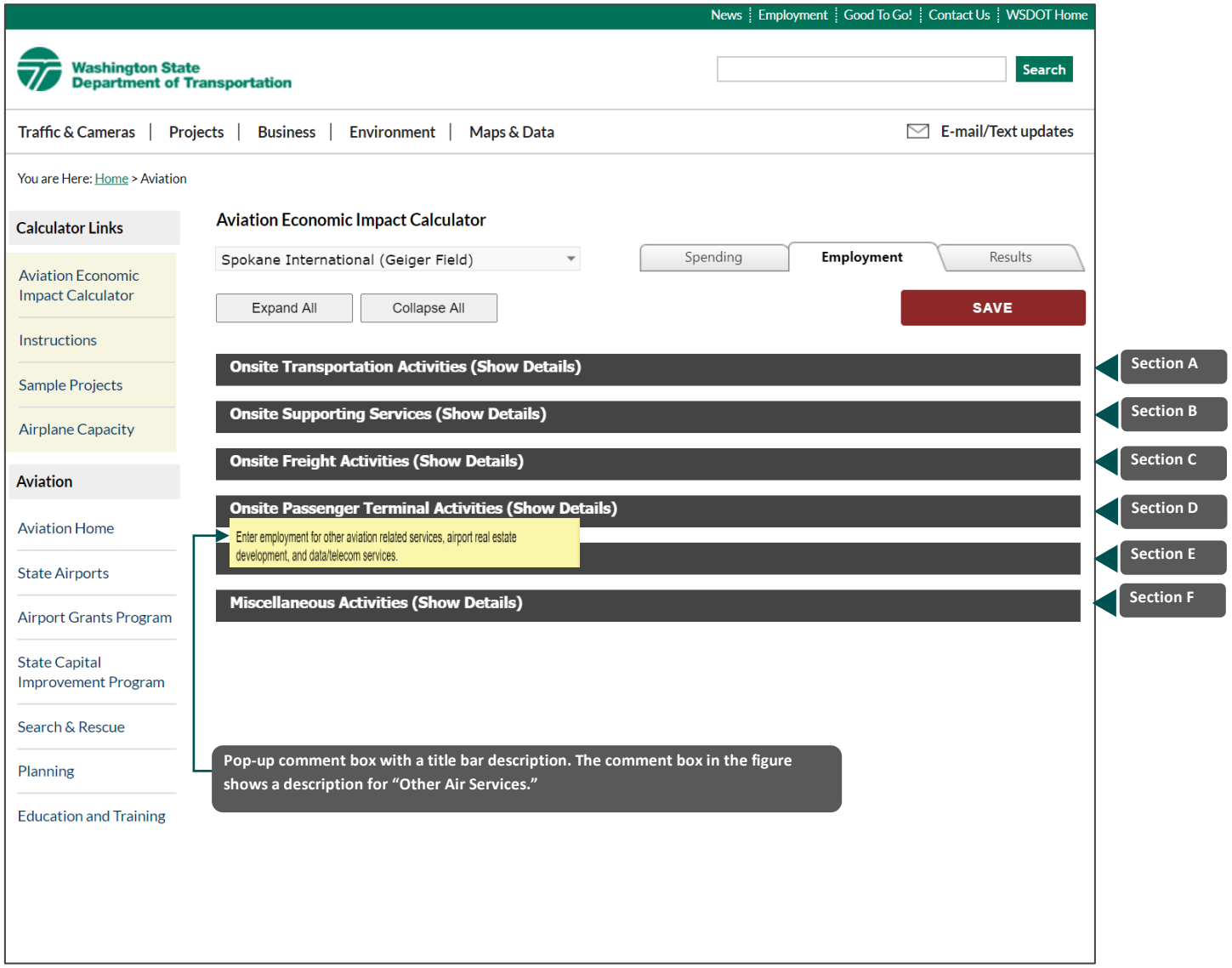
On-site Freight Activities: Employment for on-site freight cargo, warehousing, & postal services.

On-site Passenger Terminal Activities: Employment for on-site retail, restaurant, and entertainment services.

Other Air Services: Employment for on-site air services, such as news/traffic reporting, real estate, and property development, etc.

Miscellaneous Activities: Various types of non-aviation-related industries commonly found at Washington's airports. Examples include agriculture, construction, healthcare, marinas, and non-aviation-related government agencies.

Figure 3. Employment Tab



Source: EBP US 2020

3.1.8 Section A: On-site Transportation Activities

Purpose: To allow users to change the number of employees related to on-site transportation activities.

User Input: Users can change the number of employees in job activities relating to on-site transportation activities. Once scenario values have been updated under Employment, users need to click "Save" to preserve their work.

Description: This section displays the baseline numbers for jobs in on-site transportation services activities, and users can update the values used for the scenario analysis. The baseline jobs for each activity are shown in the second column of the table, and the scenario values can be edited in the third column labeled "Employment". After making changes, users should either "Save" their changes or "Reset to Baseline Values," using the respective options on the top-right corner of the widget.

The different types of activities within on-site transportation services are as follows:

- Airline Companies: Aviation carriers with scheduled passenger and/or cargo service
- Airport Terminal Facilities & Administration: Jobs associated with the upkeep, maintenance, and operation of the airport terminal as well as airport management/operators. This row may also include jobs associated with hangar rental, parking services, baggage and cargo handling, and runway cleaning/maintenance services.
- Car Rental: Automotive rental service companies that are located on-site
- Charter Services other than Fixed Based Operator (FBO): On-airport charter flight companies, which might include pilot, crew, aircraft maintenance, company administration, and other jobs.
- FBO: On-airport FBOs, which generally includes services such as fueling, hangar rental, tie-down and parking maintenance, aircraft repair, flight instruction, and other related services.
- On-site Transportation Activities:
  - Non-Aviation Vehicle Repair and Maintenance, including repair and maintenance of on-airport ground transportation vehicles
  - Taxi/Limo, including ride-hailing/TNC activities
- Rental of Aviation Equipment: On-airport aircraft rental services
- Repair of Aviation Equipment: Aircraft maintenance and repair service jobs, including testing services (does not include jobs associated with FBOs and charter services)
- Sale of Aviation Equipment: Aircraft dealers' services

3.1.9 Section B: On-site Supporting Services

Purpose: To allow users to change the number of employees relating to on-site supporting services.

User Input: Users can change the number of employees in job activities relating to on-site supporting activities. Once scenario values have been updated under "Employment," users need to click "Save" to preserve their work.

Description: This section displays the baseline numbers for jobs in on-site supporting services activities, and users can update the values used for the scenario analysis. The baseline jobs for each activity are

shown in the Baseline column of the table, and the scenario inputs can be edited in the Employment column. Users should either "Save" their changes or "Reset to Baseline Values," using the respective options on the top-right corner of the widget.

The different activities within On-site Supporting Services are:

- Aerial Firefighting: Use of aircraft to combat wildfires
- Aviation Training and Education: Flight school instruction, education and training, and other educational flight-related activities
- Building Maintenance: Maintenance and repair on on-airport buildings
- Federal Government (non-military): Federal agencies, such as the Federal Aviation Administration (FAA), Customs and Border Protection (CPB), Immigration and Customs Enforcement (ICE), the Drug Enforcement Administration (DEA), and the Federal Bureau of Investigation (FBI). This may also include other agencies such as the Bureau of Land Management (BLM) and the U.S. Forest Service (USFS), but it does not include the Transportation Security Administration (TSA) and other Department of Homeland Security (DHS) agencies.
- Military National Guard: Federal and state Air National Guard personnel
- On-site Supporting Services:
  - Consultants (contracted on-airport staff effectively functioning as employees)
  - Hospitals
  - Hotels
  - Labor & Civic Organizations
  - Legal Services
- Parking: Airport parking services
- Public Safety (Police, Fire): Airport police, fire, and other state and local public safety personnel
- Security/TSA: Federal agencies such as the TSA and other security-oriented positions within DHS

3.1.10 Section C: On-site Freight Services

Purpose: To allow users to change the number of employees relating to on-site freight activities.

User Input: Users can adjust the number of employees in job activities relating to on-site freight activities. Once scenario values have been updated under Employment, users need to click "Save" to preserve their work.

Description: This section displays the baseline numbers for jobs in on-site freight activities, and users can update the scenario input values. For each activity in the table, baseline jobs are shown in the left column, and scenario jobs can be edited in the right column under Employment. Users should either "Save" their changes or "Reset to Baseline Values", using the respective options on the top-right corner of the widget.

The different activities are that are within on-site freight services are as follows:

- Cargo Consolidators & Air Couriers: Integrated air cargo carriers (e.g., FedEx, UPS, and DHL), freight forwarders, express delivery, and other courier services.
- Postal Service: United States Postal Service activities
- Trucking Companies: Freight trucking companies located on-airport or serving airport logistics via through the fence arrangements
- Warehouse & Distribution: On-airport or through-the-fence activities associated with warehousing, logistics, distribution, and shipping and receiving services (including scheduling) on-airport or serving airport logistics via through the fence arrangements

3.1.11 Section D: On-site Passenger Terminal Activities

Purpose: To allow users to change the number of employees relating to on-site passenger terminal activities.

User Input: Users can change the number of employees in job activities relating to on-site passenger terminal activities. Once scenario values have been updated under "Employment," users need to click "Save" to preserve their work.

Description: This section displays the baseline numbers for jobs in on-site passenger terminal activities. Users can also update the inputs for these activities used for the scenario analysis. The baseline jobs for each activity are shown in the Baseline column of the table, while the scenario inputs can be edited in the Employment column. Users should either "Save" their changes or "Reset to Baseline Values" using the respective options on the top-right corner of the widget.

The different activities within On-site Passenger Terminal Activities are:

- On-site Passenger Services: Activities associated with currency exchange, banking, and other personal care services
- On-site Retail: Retail stores in sectors such as electronics, health and personal care, clothing, sporting goods, and general merchandise stores, or other
- On-site Passenger Terminal Activities – Entertainment: On-airport entertainment services such as museums. Note that restaurant, bar, and catering services are counted separately.
- On-site Restaurants/Bars/Catering: Restaurants, other food/drinking establishments, and catering services.

3.1.12 Section E: Other Air Services

Purpose: To allow users to change the number of employees relating to other air services, such as aerial applicators and supply, medical evaluation, news/traffic reporting, and weather reporting and forecasting.

User Input: Users can change the number of employees in job activities relating to other air services. Once scenario values have been updated under "Employment," users need to click "Save" to preserve their work.

Description: This section displays the baseline numbers for jobs in other air services activities, and users can update the values used for analysis. For each activity row, baseline jobs are shown, and the inputs for analysis can be edited in the Employment column of the table. Users should either "Save" their changes or "Reset to Baseline Values" using the respective options on the top-right corner of the widget.

The different activities within other air services include the following:

- Aerial Applicators and Supply: Crop dusting and other agricultural applications
- Medical Evacuation: Air ambulance services or other medical transport activities
- News/Traffic Reporting: Radio and television broadcasting services that rely on aviation
- Other Air Services: The number of jobs associated with the following activities:
  - Data/hosting
  - Telecom
  - On-airport real estate and property development
  - Skydiving
- Sightseeing: Scenic and sightseeing transportation services
- Weather: Meteorological and other weather forecasting and reporting services.

3.1.13 Section F: Miscellaneous Activities

Purpose: To allow users to change the number of employees relating to miscellaneous on-airport activities that do not fall into sections A – E. These include agricultural services (but not aerial applicators), education institutions (but not flight training), and various types of businesses and organizations that are located on an airport, but that are not specifically identified in one of the earlier sections.

User Input: Users can change the number of employees in job activities relating to miscellaneous activities. Once scenario values have been updated under "Employment," users need to click "Save" to preserve their work.

Description: This section displays the baseline numbers for jobs in fifteen categories of miscellaneous activities, and users can update the values used for analysis. For each activity row, baseline jobs are shown, and the inputs for analysis can be edited in the Employment column of the table. Users should either "Save" their changes or "Reset to Baseline Values" using the respective options on the top-right corner of the widget. Miscellaneous activities include the following:

- Agriculture/Agricultural Support Services/Livestock/Farming
- Construction/Restoration/Construction Support Services/Remodeling
- Educational Institutions/High Schools/Colleges/Universities/Departments
- Energy Services/Energy Utilities
- Healthcare/Health Services/Wellness Services
- Marinas, Shipbuilding, and Repairs
- Misc. Commercial Trade & Services
- Misc. Manufacturing

- Misc. Media, Content Production, & Publishing
- Misc. Organizations & Associations
- Misc. Professional Services
- Misc. Services
- Misc. Software & Computer Services
- Misc. Transportation or Services
- State/Local Government Agencies/Departments

Results Tab

3.1.14 Overview of Using the Results Tab

This part of the Calculator will show the economic impact results for a scenario analysis based on the inputs provided in the Spending and Employment tabs. All reports produced in this tab are available as data tables and can be exported as Microsoft Excel files (specifically as a Microsoft Excel 97-2003 Worksheet).

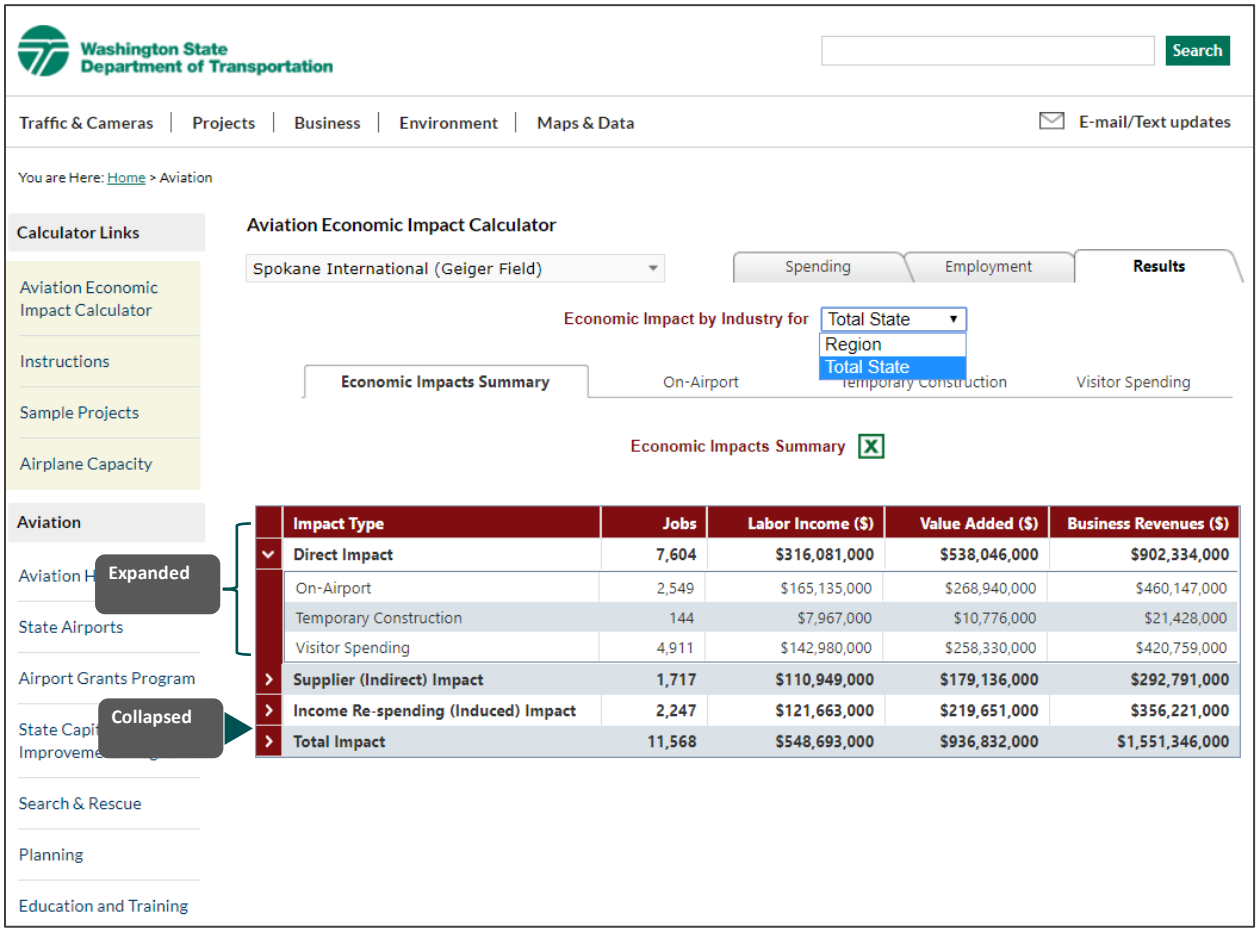
By clicking on the Results tab, users will be redirected to the Economic Impacts Summary section where they will see a summary of the economic impact analysis results for the selected airport. The information shown on this page can be disaggregated by expanding "Direct Impact", "Supplier (Indirect) Impact", "Income Re-spending (Induced) Impact," and "Total Impact" within the Economic Impacts Summary table (see **Figure 4**) to show the effects on each of the three impact types for On-Airport, Temporary Construction, and Visitor Spending activities.

Users can also view the economic impact of their scenario by total state or region. Additionally, if users would like to revise any scenario inputs after running a scenario report, they can navigate back to either the Spending tab or the Employment tab, make the desired revision, click "Save," and then return to the Results tab page regenerate their report.

WHAT IS THE DIFFERENCE BETWEEN TOTAL STATE AND REGION?

Users have the option to toggle between Total State and Region within the Results tab. If users want to see the cumulative impacts of their scenario for the whole state of Washington, they should click on Total State. If users just want to see the impact of their scenario to the WSDOT transportation region that their selected airport is in, they should choose Region.

Figure 4. Economic Impact Summary Tab



Source: EBP US 2020

At the top-left side of the Results tab, users will see a drop-down menu of airports. This drop-down menu is visible throughout this tab and among the subtabs so users can quickly evaluate another airport after they have viewed their results for their current selected airport.

3.1.15 Viewing and Downloading Scenario Reports

Purpose: To allow users to view and download scenario reports by the selected airport.

User Input: Users can view different scenario report results for different geographical levels (total state or region). The results are presented as tables, and also sometimes as pie charts and bar charts (as described below).

Description: Once users have modified the Spending and Employment tabs, they can then view their scenario analysis results using the Results tab. At the top-left side of the Results tab, users will see a drop-down menu of airports. Under the drop-down menu titled, "Economic Impact by Industry for," users can analyze their scenario results by two geographical levels: total state and region. The values in the scenario report will change according to the geography selected.

Below the "Economic Impact by Industry for" drop-down menu, users will find four summary tabs. Users can navigate between the tabs by clicking on the tab names. Within each summary tab, users will find tables and charts summarizing the results of the scenario analysis run by the Calculator. The four summary tabs that users will see are:

- Economic Impact Summary
- On-Airport Jobs
- Temporary Construction Jobs
- Visitor Spending Jobs

KEY DEFINITIONS USED IN THE RESULTS TAB

On-Airport: Employment and activity at the airport (both working directly for the airport and tenants). These activities broadly include airside activities, terminal services to passengers (including concessions), air-related services by government agencies (such as TSA), construction, airport administration, and all on-airport tenants with employees working on airport property.

Temporary Construction: Employment and activity due specifically to capital-investment projects conducted by airport administration and tenants.

Visitor Spending: Off-airport spending by visitors who depart via the airport.

Total State: The entire state of Washington.

Region: The WSDOT transportation region in which the selected airport is located. Additional information about WSDOT transportation regions is available in the Introduction of the Washington AEIS Technical Report.

Users are also able to export the results of each particular tab as a Microsoft Excel 1997-2003 file by clicking on the green Excel icon next to the table name in the center of the page just below the tabs. **Users are also able to view the summaries as pie charts and bar charts under the On-Airport Jobs, Temporary Construction Jobs, and Visitor Spending Jobs subtabs.** Detailed descriptions of the four summary sub-tabs are provided below.

The Calculator does not have an option for users to directly export the pie and bar charts. If users want to print these charts, one option is to print a snapshot using the Print Screen button. The system shortcut for the Print Screen option is Ctrl + P for Window users and Command + P for Macintosh users. Users can also use the Snipping tool. The system shortcut for the Snipping tool option is Windows icon + Shift + S for Window users and Shift + Command + 4 for Macintosh users. Users operating Microsoft Edge or Explorer can also right-click on the image, click "Save picture as" (select .png as the file type), and then save the image to their computer. The saved image can then be inserted into another compatible software program such as Microsoft Word or PowerPoint. Users operating Google Chrome can save as a PDF by right-clicking on the image, choosing "Print," selecting "Save as PDF" under the Destination drop-down list, and clicking "Save." PDFs must be exported to an image file (such as .jpg or .png) prior to being inserted in a Microsoft Word or PowerPoint file. This can be done using a PDF to

image converter application (such as Adobe Acrobat Pro) or the Snipping tool described above. Free PDF to image converter applications are also readily available online.

3.1.16 Section A: Economic Impact Summary Sub-tab

Purpose: To allow users to view and download the Economic Impacts Summary for the selected airport.

User Input: Users can view a summary of the selected airport's economic impact results presented as a table.

Description: The table shown in this sub-tab summarizes the overall economic impact of the selected airport(s), shown as four types of impacts:

- Direct Impact: Direct impact represent the economic impact of on-airport and visitor-related activities and temporary construction on the Washington economy
- Supplier (Indirect) Impact: Supplier sales impact is generated from the purchases of goods and services made by airport-based businesses, on-airport public sector agencies, and businesses in the state's hospitality industries. These purchases are effectively business sales earned by supplier companies located across the state or in the airport's region.
- Income Re-spending (Induced) Impact: The income re-spending impact is derived from direct and supplier businesses that hire additional workers to meet the demand for airport and visitor services. Payroll earned by workers in businesses that benefit from direct or supplier business revenues leads to further spending by households. Additional business revenues, payroll, and jobs are supported as this income re-spending circulates within Washington or within a specific region.
- Total Impact: Total economic impacts represent the sum of direct, supplier sales, and income re-spending impacts.

An image of this tab is shown in Figure 4 above.

The default Economic Impact Summary sub-tab screen is a table that provides the four types of impacts in terms of:

- Jobs
- Labor Income ($)
- Value Added ($): Synonymous with contributions to Gross Regional Product, Gross State Product, or Gross Domestic Product
- Business Revenues ($): Often referred to as sales or output

Additionally, users can view a breakdown of the four impact types by clicking on the ">" in the red bar next to the impact rows. The breakdown will include values for one or a combination of On-Airport, Temporary Construction, and Visitor Spending.

The values shown in the On-Airport, Temporary Construction, and Visitor Spending rows will match the values in each of the disaggregated summary sub-tabs of the same name. In some cases, the numbers may be slightly different due to rounding.

3.1.17 Section B: On-Airport Jobs (Sub-tab)

Purpose: To allow users to view and download the job impacts of their scenario from on-airport activities.

User Input: Users can view a summary of the economic impact of the selected airport's scenario on jobs from on-airport activities, which are presented as either a table (i.e., "data"), pie, or chart.

Description: As shown in **Figure 5**, the On-Airports sub-tab shows the total jobs by sector as classified by the North American Industry Classification System (NAICS) codes. These jobs stem from employment and activity at the airport (both working directly for the airport and for tenants). This information is generated based on the values users input on the Employment tab. The NAICS sectors that are included in the table are:

- Agricultural & Extraction (NAICS codes 111-115, 211-213)
- Utilities (NAICS code 221)
- Construction (NAICS code 230)
- Manufacturing (NAICS codes 311-339)
- Wholesale Trade (NAICS code 420)
- Retail Trade (NAICS codes 441-454)
- Transportation (NAICS codes 481-488)
- Postal & Warehousing (NAICS codes 491-493)
- Media and Information (NAICS codes 511-519)
- Financial Activities (NAICS codes 521-525, 531-533)
- Professional & Business Services (NAICS codes 541, 551, 561-562)
- Education & Health Services (NAICS codes 611, 621-624)
- Other Services (NAICS codes 711-713, 721-722, 811-814)
- Government (NAICS code 920)

Users can view the On-Airport jobs data in three ways: as a data table (Data), as a pie chart (Pie), or as a bar chart (Chart). To change the data view, users can click on the drop-down menu above the sub-tabs to the left of the "Economic Impact by Industry for" menu. To see how results of On-Airport compare to Temporary Construction and Visitor Spending, users can navigate to the "Economic Impacts Summary" sub-tab.

The Data view presents the information as a data table. From this view, users can evaluate the direct and multiplier impacts of each job sector. These direct and multiplier impacts are broken out in the columns of the table and include:

- Direct impact (on-airport, temporary construction, and visitor spending)
- Supplier Sales (multiplier impact)
- Income Re-spending (multiplier impact)
- Total

These direct and multiplier impacts are further explained under the Economic Impact Summary subsection of this User's Manual (see **Section 3.5.3**). Users can export the data table as a Microsoft Excel 1997-2003 file by clicking on the green Excel icon located above the table.

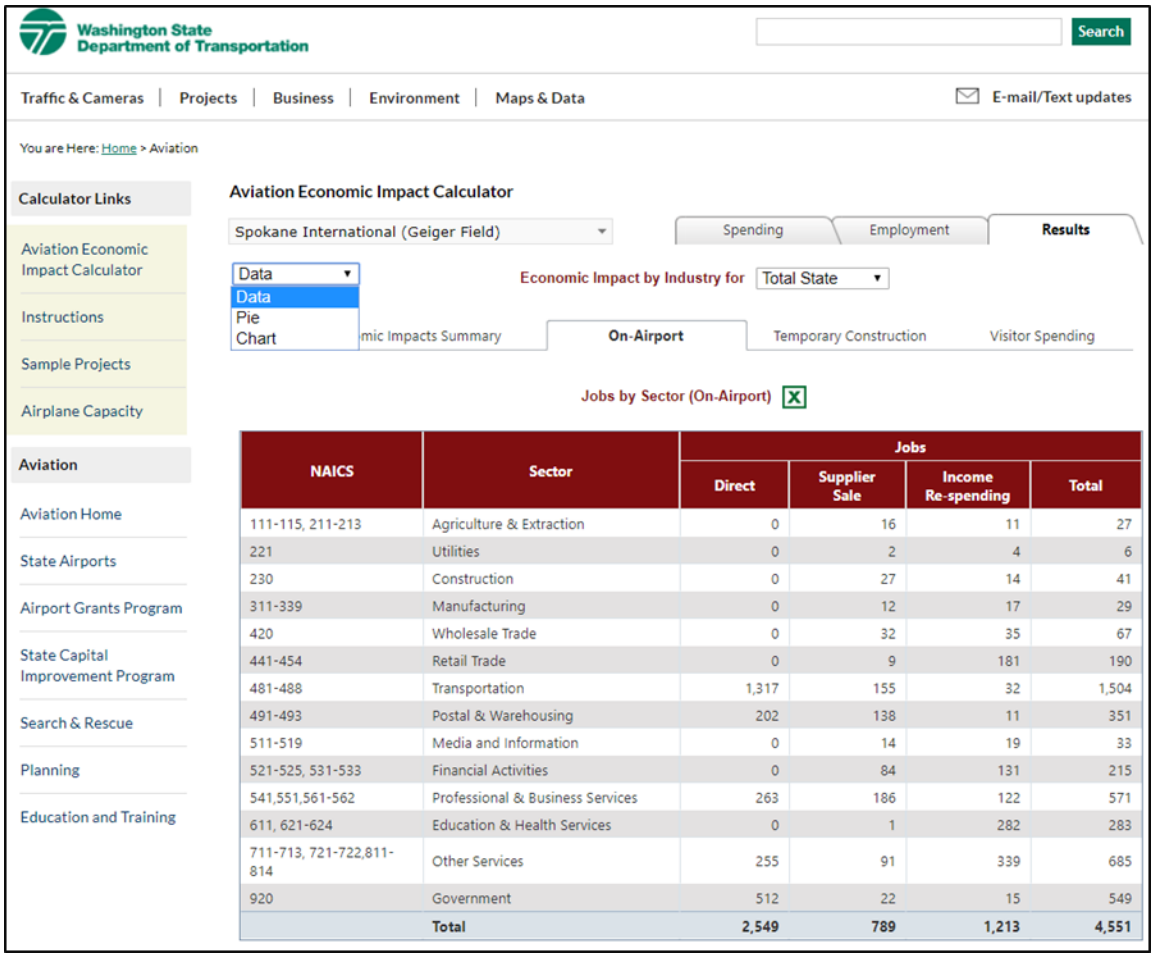
The Pie view shows a pie chart with the total impact numbers and percent of total impact for each sector. Users can see the values associated with any sector by hovering over that piece of the chart or the associated label. Sectors that result in less than one percent in the analysis will be grouped into a "Rest of Sectors" category. The Chart view displays the same data as a bar graph with the total impact numbers for each sector, categorized in terms of the following impact types:

- Direct (blue bar)
- Indirect (i.e., Supplier Impact, green bar)
- Induced (i.e., Income Re-spending Impact, yellow bar)

Users can see the number of jobs associated with any sector by hovering over that piece of the Chart.

If users want to print either the Data, Pie, or Chart within this sub-tab, a general option is to print a snapshot of the screen with the Print Screen button. The system shortcut for the Print Screen option is Ctrl + P for Window users and Command + P for Macintosh users. Users can also use the Snipping tool. The system shortcut for the Snipping tool option is Windows icon + Shift + S for Window users and Shift + Command + 4 for Macintosh users.

Figure 5. On-Airport Jobs Tab - Data View



NAICS	Sector	Jobs			
		Direct	Supplier Sale	Income Re-spending	Total
111-115, 211-213	Agriculture & Extraction	0	16	11	27
221	Utilities	0	2	4	6
230	Construction	0	27	14	41
311-339	Manufacturing	0	12	17	29
420	Wholesale Trade	0	32	35	67
441-454	Retail Trade	0	9	181	190
481-488	Transportation	1,317	155	32	1,504
491-493	Postal & Warehousing	202	138	11	351
511-519	Media and Information	0	14	19	33
521-525, 531-533	Financial Activities	0	84	131	215
541,551,561-562	Professional & Business Services	263	186	122	571
611, 621-624	Education & Health Services	0	1	282	283
711-713, 721-722,811-814	Other Services	255	91	339	685
920	Government	512	22	15	549
	Total	**2,549**	**789**	**1,213**	**4,551**

Source: EBP US 2020

3.1.18 Section C: Temporary Construction Jobs Sub-tab

Purpose: To allow users to view and download the economic impact of the selected airport's scenario on jobs from temporary construction activities.

User Input: Users can view a summary of the economic impact of the selected airport's scenario on jobs from temporary construction activities, which are presented as either a table (i.e., "data"), pie, or chart.

Description: As shown in **Figure 6**, the Temporary Construction sub-tab summarizes the effects of temporary construction spending in the same 14 NAICS job sectors used on the On-Airport Jobs sub-tab. These effects are generated by changes to the Airport Capital Budget and Other On-Airport Capital Expenditures entered on the Spending tab. To see how results of Temporary Construction compare to On-Airport and Visitor Spending, users can navigate to the "Economic Impacts Summary" sub-tab.

Users have the option to view the Temporary Construction jobs data in three ways: Data, Pie, and Chart. To change the data view, users can click on the drop-down menu above the sub-tabs to the left of the "Economic Impact by Industry for" menu. In the Data view, users can evaluate the direct, multiplier, and total impacts of each job sector. Direct and multiplier impacts are briefly explained under the Economic

Impact Summary subsection of this User's Manual (see **Section 3.5.3**). Users can export the data as a Microsoft Excel 1997-2003 file by clicking on the green Excel icon located above the table.

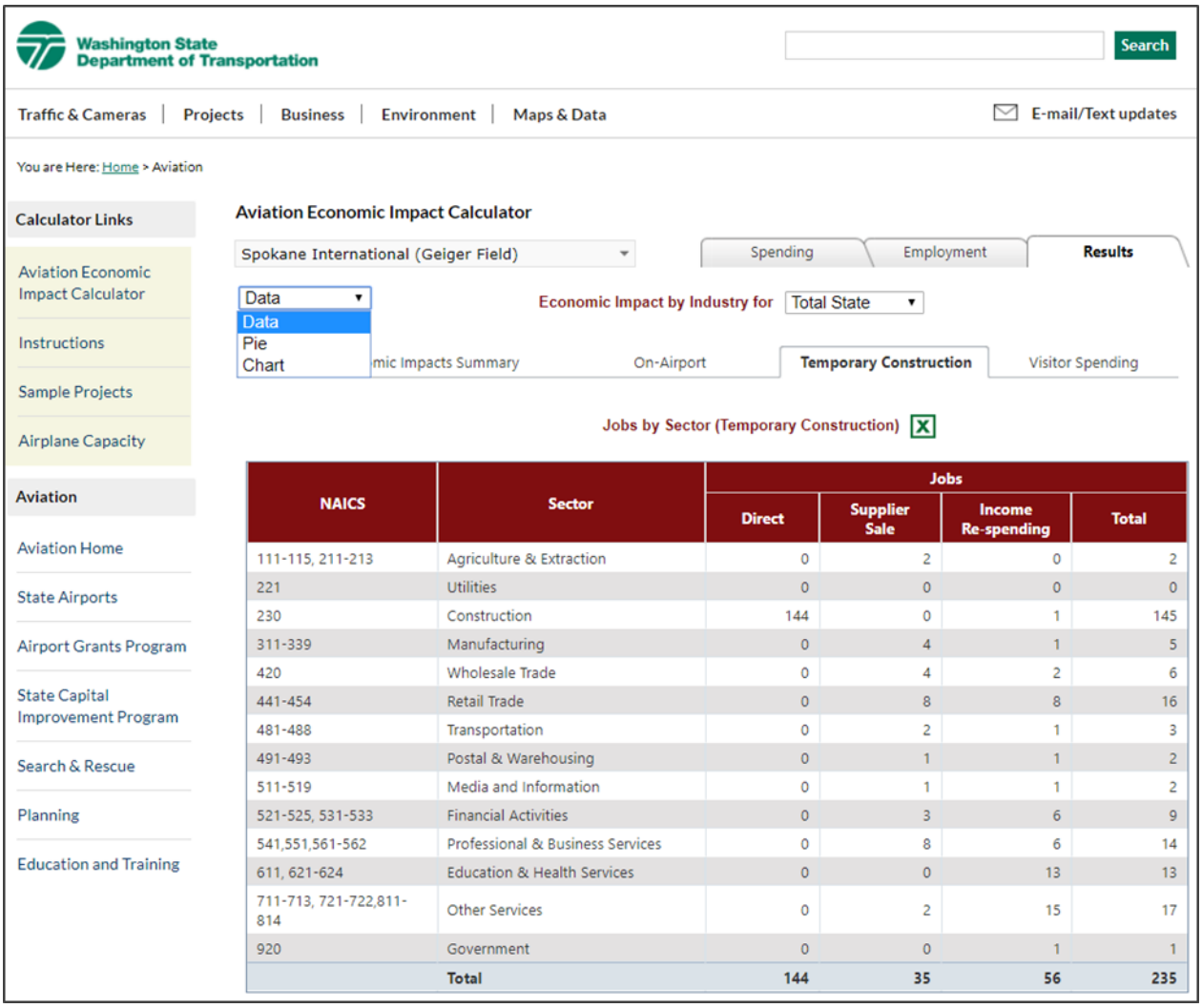
The Pie view shows a pie chart with the total impact numbers and percent of total impact for each sector. Users can see the values associated with any sector by hovering over that piece of the chart or the associated label. Sectors that result in less than one percent job impact will be grouped into a "Rest of Sectors" category. The Chart view displays the same data as a bar graph with the total impact numbers for each sector, categorized as either of the following three impacts:

- Direct (blue bar)
- Indirect (i.e., Supplier Impact, green bar)
- Induced (i.e., Income Re-spending Impact, yellow bar)

Users can see the number of jobs associated with any sector by hovering over that piece of the Chart.

If users want to print these charts, a general option is to print a snapshot of the screen with the Print Screen button. The system shortcut for the Print Screen option is Ctrl + P for Window users and Command + P for Macintosh users. Users can also use the Snipping tool. The system shortcut for the Snipping tool option is Windows icon + Shift + S for Window users and Shift + Command + 4 for Macintosh users.

Figure 6. Temporary Construction Jobs Tab - Data View



NAICS	Sector	Jobs			
		Direct	Supplier Sale	Income Re-spending	Total
111-115, 211-213	Agriculture & Extraction	0	2	0	2
221	Utilities	0	0	0	0
230	Construction	144	0	1	145
311-339	Manufacturing	0	4	1	5
420	Wholesale Trade	0	4	2	6
441-454	Retail Trade	0	8	8	16
481-488	Transportation	0	2	1	3
491-493	Postal & Warehousing	0	1	1	2
511-519	Media and Information	0	1	1	2
521-525, 531-533	Financial Activities	0	3	6	9
541,551,561-562	Professional & Business Services	0	8	6	14
611, 621-624	Education & Health Services	0	0	13	13
711-713, 721-722,811-814	Other Services	0	2	15	17
920	Government	0	0	1	1
	Total	**144**	**35**	**56**	**235**

Source: EBP US 2020

3.1.19 Section D: Visitor Spending Jobs Sub-tab

Purpose: To allow users to view and download the economic impact of the selected airport's scenario on jobs from visitor spending activities.

User Input: Users can view a summary of the economic impact of the selected airport's scenario on jobs from visitor spending activities, which are presented as either a table (i.e., "data"), pie, or chart.

Description: As shown in **Figure 7**, the Visitor Spending sub-tab summarizes the effect of visitor spending on 14 NAICS job sectors identified in the On-Airport Jobs sub-tab. Users can evaluate the direct and multiplier impacts of each job sector; these direct and multiplier impacts include Direct impact (on-airport, temporary construction, and visitor spending), Supplier Sale (multiplier impact), and Income Re-spending (multiplier impact). To see how results of Visitor Spending compare to On-Airport and Temporary Construction, users can navigate to the "Economic Impacts Summary" sub-tab.

Users have the option to view the results in Visitor Spending in three ways: Data, Pie, and Chart. To change the data view, users can click on the drop-down menu above the sub-tabs to the left of the "Economic Impact by Industry for" menu. In Data view, users can evaluate the direct, multiplier, and total impacts of each job sector.

Direct, multiplier, and total impacts are briefly explained under the Economic Impact Summary subsection in this User's Manual (see **Section 3.5.3**). Users can export the data as a Microsoft Excel 1997-2003 file by clicking on the green Excel icon located above the table.

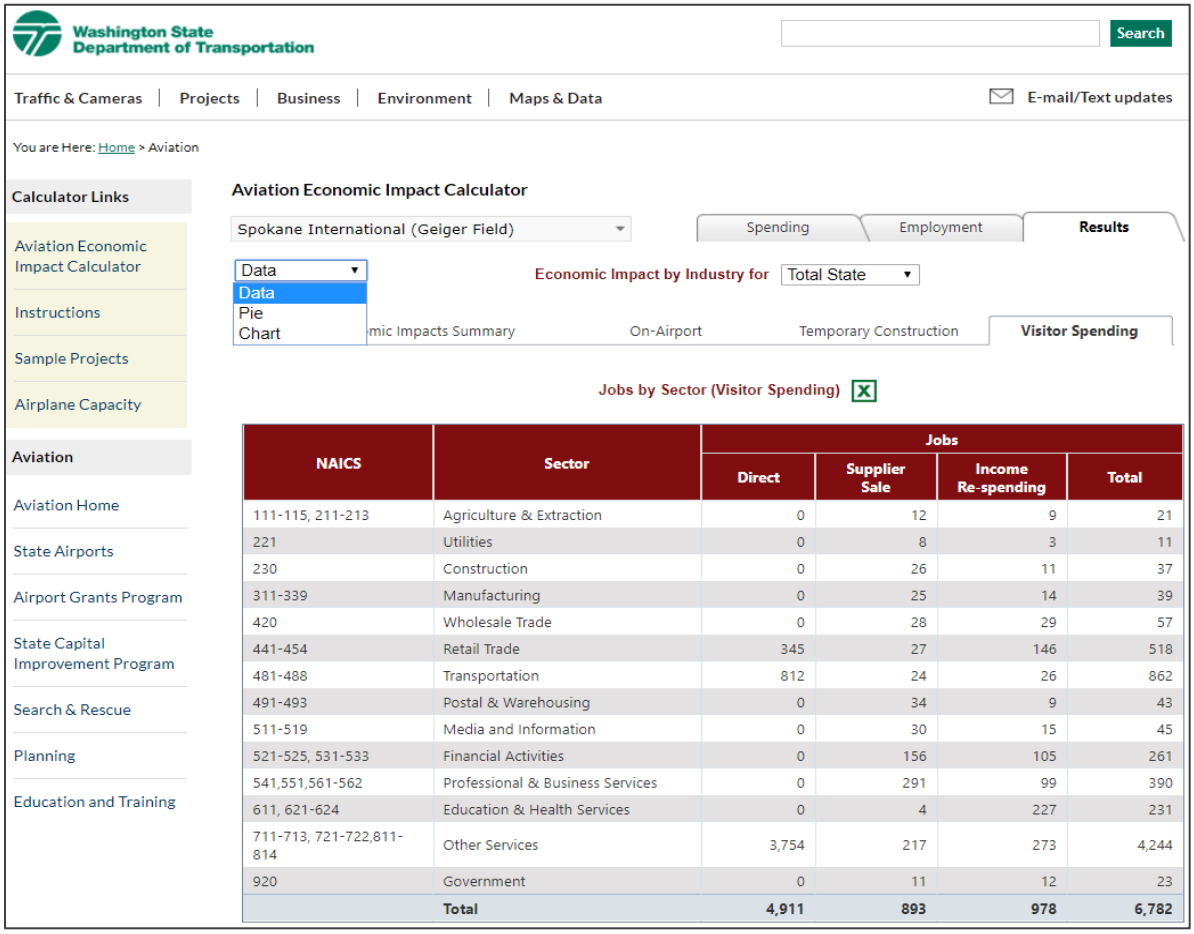
Users have the option to view the Visitor Spending jobs data as a Pie or Chart in addition to Data view. To change the view, users can click on the drop-down menu above the sub-tabs to the left of the "Economic Impact by Industry for" menu. The Pie view shows a pie chart with the total impact numbers and percent of total impact for each sector. Users can see the values associated with any sector by hovering over that piece of the chart or the associated label. Sectors with less than one percent impact will be grouped into a "Rest of Sectors" category. The Chart view displays the same data as a bar graph with the total impact numbers categorized as either:

- Direct (blue bar)
- Indirect (i.e., Supplier Impact, green bar)
- Induced (i.e., Income Re-spending Impact, yellow bar)

Users can see the number of jobs associated with any sector by hovering over that piece of the Chart.

If users want to print these charts, a general option is to print a snapshot of the screen with the Print Screen button. The system shortcut for the Print Screen option is Ctrl + P for Window users and Command + P for Macintosh users. Users can also use the Snipping tool. The system shortcut for the Snipping tool option is Windows icon + Shift + S for Window users and Shift + Command + 4 for Macintosh users. Users operating Microsoft Edge or Explorer can also right-click on the image, click "Save picture as" (select .png as the file type), and then save the image to their computer. The saved image can then be inserted into another compatible software program such as Microsoft Word or PowerPoint. Users operating Google Chrome can save as a PDF by right-clicking on the image, choosing "Print," selecting "Save as PDF" under the Destination drop-down list, and clicking "Save." PDFs must be exported to an image file (such as .jpg or .png) prior to being inserted in a Microsoft Word or PowerPoint file. This can be done using a PDF to image converter application (such as Adobe Acrobat Pro) or the Snipping tool described above. Free PDF to image converter applications are also readily available online.

Figure 7. Visitor Spending Jobs Tab - Data View



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- Airport Grants Program
- State Capital Improvement Program
- Search & Rescue
- Planning
- Education and Training

Aviation Economic Impact Calculator

Spokane International (Geiger Field) | Spending | Employment | Results

Data (Data, Pie, Chart) | Economic Impact by Industry for Total State

mic Impacts Summary | On-Airport | Temporary Construction | Visitor Spending

Jobs by Sector (Visitor Spending)

NAICS	Sector	Jobs			
		Direct	Supplier Sale	Income Re-spending	Total
111-115, 211-213	Agriculture & Extraction	0	12	9	21
221	Utilities	0	8	3	11
230	Construction	0	26	11	37
311-339	Manufacturing	0	25	14	39
420	Wholesale Trade	0	28	29	57
441-454	Retail Trade	345	27	146	518
481-488	Transportation	812	24	26	862
491-493	Postal & Warehousing	0	34	9	43
511-519	Media and Information	0	30	15	45
521-525, 531-533	Financial Activities	0	156	105	261
541,551,561-562	Professional & Business Services	0	291	99	390
611, 621-624	Education & Health Services	0	4	227	231
711-713, 721-722,811-814	Other Services	3,754	217	273	4,244
920	Government	0	11	12	23
	Total	**4,911**	**893**	**978**	**6,782**

Source: EBP US 2020

Appendix A: Glossary of Terms

The following terms are used throughout the Aviation Economic Impact Calculator:

- **Direct Impact:** Direct impact, also known as direct effects, take place in the industry immediately affected, whether it is on- or off-airport. These impacts are a result of on-airport activities, spending by airport visitors off-airport, and the production of air cargo.
- **Income Re-spending (Induced Impacts):** Income re-spending (induced impacts) measures the effects of the changes in household income representing the effects from the spending of wages earned by workers of directly and indirectly affected industries.
- **Multiplier Impact:** Multiplier impacts are made up of indirect and induced impacts, which are labeled as "supplier sales" and "income re-spending" to carry intuitive descriptions of the two streams of effects. These are the impacts of income circulating the regional or statewide economies from new consumer expenditures.
- **North American Industrial Classification System (NAICS):** NAICS is the means used by federal statistical agencies to classify business establishments for the purpose of collecting, analyzing, and publishing statistical data related to the U.S. business economy. NAICS is organized by sectors and each sector is numbered. The specificity of a sector is analogous to the number of "digits" represented by that sector, with more digits representing more specificity. For example, sector 48-49 (considered a two-digit sector) is "Transportation and Warehousing"; sector 481 (three digits) is "Air Transportation"; and sector 4811 (four digits) is "Scheduled Passenger Transportation".
- **Supplier Sales (Indirect Impacts):** Supplier sales (indirect impacts) measure the purchase of supplies and services needed to produce directly supplied products and services.
- **Total Impacts:** Total impacts are the summation of direct and multiplier (supplier sales and income re-spending) impacts.
- **Visitor Spending:** Defined as off-airport spending by out of state and international visitors who arrive by air to Washington. Typical spending categories are retail purchases, food and drink, entertainment, lodging, and off-airport transportation. Spending by visitors on these items are counted as direct impacts, which then trigger additional impacts from supplier sales and income re-spending.

Appendix B: Airport Lists

Table B.1 lists the counties the compose each of the six WSDOT transportation regions. **Table B.2** list the airports in the scope of the 2020 Washington AEIS by WSDOT transportation region and associated city.

B.1 Counties by WSDOT Region

Table B.1 provides the counties the comprise each of WSDOT's six transportation regions.

Table B.1. Counties by WSDOT Region

Region No.	Region Name	Counties
1	Eastern	Adams, Ferry, Lincoln, Pend Oreille, Spokane, Stevens, Whitman
2	North Central	Chelan, Douglas, Grant, Okanogan
3	Northwest	Island, King, San Juan, Skagit, Snohomish, Whatcom
4	Olympic	Clallam, Grays Harbor, Jefferson, Kitsap, Mason, Pierce, Thurston
5	South Central	Asotin, Benton, Columbia, Franklin, Garfield, Kittitas, Walla Walla, Yakima
6	Southwest	Aahkiakum, Clark, Cowlitz, Klickitat, Lewis, Pacific, Skamania

Source: WSDOT Aviation 2019

B.2 Washington Airports by WSDOT Region and Associated City

Table B.2 provides a list of Washington airports by WSDOT transportation region and associated city.

Table B.2. Washington Airports by WSDOT Region and Associated City

Region	Associated City	Airport Name	FAA ID
Eastern	Chewelah	Chewelah Municipal	1S9
	Clayton	Cross Winds	C72
	Colfax	Lower Granite State	00W
	Colfax	Port of Whitman Business Air Center	S94
	Colville	Colville Municipal	63S
	Davenport	Davenport Municipal	68S
	Deer Park	Deer Park Municipal	DEW
	Ione	Ione Municipal	S23
	Laurier	Avey Field	69S
	Lind	Lind Municipal	0S0
	Mead	Mead Flying Service	70S
	Metaline Falls	Sullivan Lake State	09S
	Odessa	Odessa Municipal	43D
	Othello	Othello Municipal	S70
	Pullman	Pullman/Moscow Regional	PUW
	Republic	Ferry County	R49
	Ritzville	Pru Field	33S
	Rosalia	Rosalia Municipal	72S

Region	Associated City	Airport Name	FAA ID
	Spokane	Spokane International (Geiger Field)	GEG
	Spokane	Felts Field	SFF
	Tekoa	Willard Field	73S
	Wilbur	Wilbur Municipal	2S8
North Central	Brewster	Anderson Field	S97
	Cashmere	Cashmere-Dryden	8S2
	Chelan	Lake Chelan	S10
	East Wenatchee	Pangborn Memorial	EAT
	Electric City	Grand Coulee Dam	3W7
	Ephrata	Ephrata Municipal	EPH
	Leavenworth	Lake Wenatchee State	27W
	Mansfield	Mansfield	8W3
	Mattawa	Desert Aire	M94
	Mazama	Lost River	W12
	Moses Lake	Grant County International	MWH
	Moses Lake	Moses Lake Municipal	W20
	Okanogan	Okanogan Legion	S35
	Omak	Omak Municipal	OMK
	Oroville	Dorothy Scott Municipal	0S7
	Quincy	Quincy Municipal	80T
	Stehekin	Stehekin State	6S9
	Tonasket	Tonasket Municipal	W01
	Twisp	Twisp Municipal	2S0
	Warden	Warden	2S4
	Waterville	Waterville	2S5
	Wilson Creek	Wilson Creek	5W1
	Winthrop	Methow Valley State	S52
Northwest	Everett	Snohomish County (Paine Field)	PAE
	Friday Harbor	Friday Harbor	FHR
	Friday Harbor	Friday Harbor SPB	W33
	Kenmore	Kenmore Air Harbor Inc.	S60
	Rosario	Rosario SPB	W49
	Seattle	Kenmore Air Harbor	W55
	Snohomish	Harvey Field	S43
	Anacortes	Skyline SPB	21H
	Anacortes	Anacortes	74S
	Arlington	Arlington Municipal	AWO
	Auburn	Auburn Municipal	S50
	Bandera	Bandera State	4W0
	Bellingham	Floathaven SPB	0W7

Region	Associated City	Airport Name	FAA ID
	Bellingham	Bellingham International	BLI
	Burlington	Skagit Regional	BVS
	Concrete	Mears Field	3W5
	Darrington	Darrington Municipal	1S2
	Eastsound	Orcas Island	ORS
	Kent	Norman Grier Field (Crest Airpark)	S36
	Langley	Whidbey Airpark	W10
	Lester	Lester State	15S
	Lopez	Lopez Island	S31
	Lynden	Lynden Municipal Airport - Jansen Field	38W
	Monroe	First Air Field	W16
	Oak Harbor	A J Eisenberg	OKH
	Point Roberts	Point Roberts Airpark	1RL
	Renton	Renton Municipal	RNT
	Renton	Will Rogers Wiley Post SPB	W36
	Roche Harbor	Roche Harbor SPB	W39
	Seattle	Seattle Seaplanes SPB	0W0
	Seattle	Boeing Field/King County International	BFI
	Skykomish	Skykomish State	S88
	Stanwood	Camano Island Airfield	13W
	Vashon Island	Vashon Municipal	2S1
Olympic	Bremerton	Bremerton National	PWT
	Copalis Beach	Copalis State	S16
	Eatonville	Swanson Field	2W3
	Elma	Elma Municipal	4W8
	Forks	Forks Municipal	S18
	Forks	Quillayute	UIL
	Greenwater	Ranger Creek State	21W
	Hoquiam	Bowerman Field	HQM
	Lakewood	American Lake SPB	W37
	Ocean Shores	Ocean Shores Municipal	W04
	Olympia	Hoskins Field	44T
	Olympia	Olympia Regional	OLM
	Port Angeles	Sekiu	11S
	Port Angeles	William R Fairchild International	CLM
	Port Townsend	Jefferson County International	0S9
	Poulsbo	Port of Poulsbo Marina SPB	83Q
	Puyallup	Pierce County - Thun Field	PLU
	Rochester	R & K Skyranch	8W9
	Sequim	Sequim Valley	W28

Region	Associated City	Airport Name	FAA ID
	Shelton	Sanderson Field	SHN
	Silverdale	Apex Airpark	8W5
	Tacoma	Tacoma Narrows	TIW
	Westport	Westport	14S
South Central	Walla Walla	Walla Walla Regional	ALW
	Anatone	Rogersburg State	D69
	Cle Elum	De Vere Field	2W1
	Cle Elum	Cle Elum Municipal	S93
	College Place	Martin Field	S95
	Easton	Easton State	ESW
	Ellensburg	Bowers Field	ELN
	Kahlotus	Lower Monumental State	W09
	Pasco	Tri-Cities	PSC
	Richland	Richland	RLD
	Richland	Prosser	S40
	Rimrock	Tieton State	4S6
	Starbuck	Little Goose Lock and Dam State	16W
	Sunnyside	Sunnyside Municipal	1S5
	Walla Walla	Page	9W2
	Yakima	Yakima Air Terminal (McAllister Field)	YKM
Southwest	Battle Ground	Goheen Field	W52
	Battle Ground	Cedars North Airpark	W58
	Camas	Grove Field	1W1
	Chehalis	Chehalis-Centralia	CLS
	Dalles, OR	Columbia Gorge Regional/The Dalles Municipal	DLS
	Goldendale	Goldendale Municipal	S20
	Ilwaco	Port of Ilwaco	7W1
	Kelso	Southwest Washington Regional	KLS
	Morton	Strom Field	39P
	Packwood	Packwood	55S
	South Bend	Willapa Harbor	2S9
	Toledo	South Lewis County (Ed Carlson Memorial Field)	TDO
	Vancouver	Pearson Field	VUO
	Vancouver	Fly For Fun	W56
	Woodland	Woodland State	W27

Source: WSDOT Aviation 2019

Appendix C: Example Scenarios

This appendix provides examples of how to enter several sample projects that users could evaluate using the Aviation Economic Impact Calculator. These examples are designed to give users a better idea of the type of scenarios that can be evaluated, as well as the type of inputs that may be affected by various types of scenarios. The examples do not represent a specific planned project or airport goal.

The first section includes an overview of potential implications associated with each type of project that should be considered when developing scenario inputs. **Table C.1** provides example scenario inputs for four types of projects that may be evaluated by the Aviation Economic Impact Calculator.

C.1 Landing Page

Select the airport to be evaluated using the drop-down list.

C.2 Spending Tab

This section includes potential areas of change to reflect the scenario associated with the first modifiable tab: "Spending".

C.2.1 Capital Annual Budget

To modify this section, users should consider if the project would require or have an associated capital expenditure. Note the 2020 Washington AEIS estimated each airport's "average" annual capital expenditure using three years of data (2016 through 2018). The temporary impacts of a specific project can be estimated by inputting the total capital cost, even if that expenditure was made over multiple years. Users can also evaluate the potential economic impacts of a higher average annual expenditure (reflecting average spending over multiple years). Data input into this section should include capital money from local, state, federal, and other sources. Capital investment made by tenants can be input here or in "Other On-airport Capital Expenditures" (expenditures should not be duplicated in both sections).

C.2.2 Operational Annual Budget

This section assesses the scenario's potential impacts to the airport's annual operating budget (note baseline figures reflect 2018 expenditures as reported by during the data collection phase of the 2020 Washington AEIS). This could reflect operating funds provided by the airport sponsor as well as revenue impacts generated by income sources such as:

- Commercial (i.e., business) land leases and rents
- T-hangar lease agreements
- Private hangar land leases
- Agricultural land lease
- Terminal concession rents
- Fuel flowage fees
- Landing and ramp fees

In this section, it is important for users to carefully consider all the implications of a proposed project. The construction of a hangar, for example, may result in revenues generated by lease agreements as well as fuel flowage fees due to a higher number of aircraft based at the facility. The user will have to generate the potential revenue impacts.

C.2.3 Other On-airport Capital Expenditures

Users can enter capital expenditures made by non-government sources, such as tenant improvement projects. A new flight training school, for example, may convert an existing on-airport building to classrooms for ground school or choose to build a new facility. An FBO may complete a pavement improvement project to the apron adjacent to its facility. Also consider that tenant improvements often result in additional associated airport revenues that should be reflected in the "Operational Annual Budget" section above. *These capital expenditures can also be input into the "Airport Capital Annual Budget" box above.*

C.2.4 Airport Operations: Commercial and General Aviation [GA]

For this section, users must consider how this proposed change may impact the number of out of state and international visitors using the airport. For commercial service and GA airports, users should consider if this proposed change could affect:

- Type of aircraft using the facility
- Frequency of operations
- Out of state or international destinations served

Essentially, the user needs to consider how the project may impact the number and/or percent of total non-local passengers and pilots (i.e., visitors) relying on the airport. For example, a runway lengthening project may allow larger and more demanding aircraft to operate. These aircraft generally have longer ranges, which could increase the percent of transient (i.e., out of state/international) operations. Additionally, the average number of people per operation could increase.

For commercial service airports, users need to consider how the change could affect the airport's number of enplanements (revenue-paying passengers boarding an aircraft). If an airline adds one flight per day destined for an out of state airport using an aircraft with 70 seats, this would increase the number of enplanements and potentially the percent of visitors utilizing the facility.

C.2.5 Visitor Spending

In the section above ("Airport Operations"), users are asked to estimate the number of non-local visitors annually relying on the airport. In this section, users are asked to estimate the amount of money each visitor spends during their trip to Washington. The visitor spending section allows users to adjust the "baseline" spending profiles developed as part of the 2020 Washington AEIS. This section should be changed if the user has an indication of the purpose of visitors' trips, as well as the activities they may engage in while in the state. As described in detail in **Section 3.1.6**, users can either provide the total expenditure using the "Total" radio button or spending by sector using the "Detail" radio button.

Business travelers drawn to a specific city for a conference at a newly constructed convention center and hotel may spend a higher amount than baseline on lodging, less on local transportation (since he or she is unlikely to travel beyond the convention center/hotel during a work conference), and more on entertainment (reflective of average conference fees). Note spending profiles reflect total visitor spending per trip and not daily totals.

C.3 Employment Tab

The employment tab provides users with the ability to modify the number of on-airport workers occurring as a result of the scenario under evaluation. Users should carefully consider how a proposed change may impact the support and services provided to aircraft, their pilots, and passengers. This may include additional workers required to support an increase in operations, services to pilots and passengers, or air cargo activities. An airport may choose to update this section with changes in tenant and/or airport administration employment to maintain the accuracy of the airport's economic impact over time.

C.4 Results Tab

The results of the scenario changes made by the users are reflected in the Results tab. There are no modifiable fields in this section.

Table C.1. Aviation Economic Impact Calculator Scenarios

Scenario	Landing Page	Spending Tab					Employment Tab
	Airport	Capital Annual Budget	Operational Annual Budget	Other On-airport Capital Expenditures	Airport Operations (CS/GA)	Visitor Spending	On-airport Business Activity (Employment)
Construct a new T-hangar (+12 units rented to recreational pilots)	Select airport using drop-down menu	+$750,000 (construction cost)	+$50,000 (lease fees and fuel sales)	No change	+8,000 GA operations; No change to % transient operations	+$50/visitor	+1 airport employee
New flight school locating at the airport (3 aircraft conducing 4 one-hour training flights/day with 6 touch and go ops)		No change	+$20,000 (lease fees and fuel sales)	+$25,000 (tenant improvements)	+30,000 GA operations; No change to % transient operations	No change	+3 flight instructors, +1 aircraft mechanic, +2 business administrators
Runway extension (+441 feet)		$3,450,000 (construction cost)	+$15,000 (fuel sales)	No change	+1,000 GA operations; +5% transient operations	No change	+1 FBO employee
Increased commercial passenger enplanements (addition of one CS flight/day from Salt Lake City)		No change	+$50,000 (fees collected from concessionaires, parking, and fuel sales)	No change	+21,000 enplanements; +8% visitors	+$75/visitor	+1 airport administrator, +1 airline staff member, +1 rental car employee, +1 TSA agent, +2 restaurant staff

Source: EBP US 2020