Chapter 6. Continuous Aviation Planning

6.1. Introduction

The 2022 Minnesota State Aviation System Plan (MnSASP or 2022 MnSASP) collected a wide variety of aviation data points pertaining to the Minnesota state aviation system (or system). This comprehensive data collection effort was guided by a detailed data acquisition plan approved by the Minnesota Department of Transportation, Office of Aeronautics (MnDOT Aeronautics) Airport Planning Staff to complete a comprehensive evaluation of the system's ability to meet current and potential future aviation demands.[1] The findings from this evaluation are used to identify and prioritize airport improvement projects that align with MnDOT's objectives for the state aviation system.[2]

The MnSASP data also includes other aviation information that provides MnDOT Aeronautics staff with the full scope of aviation activities, facilities, and services occurring at or supported by the state aviation system. However, these data will quickly become outdated if without focused attention and ongoing maintenance. As such, it is imperative that MnDOT Aeronautics keep the data collected through the MnSASP (or MnSASP data) up-to-date to engage in continuous system planning using accurate data.

The MnSASP data are maintained in an ArcGIS-based Hub application referred to as the MnSASP Hub (or Hub), which serves as an intuitive user-friendly interface for interacting with the data through several Dashboards, StoryMaps, and Web Map applications. A screenshot of the Hub's landing page and a link to access the Hub is provided on the right. To support the continuous nature of system planning, this data management plan (or plan) was developed to document how all the MnSASP data can be kept current. The first section of this plan provides an overview of all the data sources referenced during the MnSASP, followed by more detailed information about the specific data points obtained from those sources and their application in the MnSASP.

This information is organized in the following sections:

- Data Sources (Section 6.2)
- Data Points Assessment (Section 6.3)

[1] *The data acquisition plan is documented in* ***Chapter 2. Phase I Validation*** *of the 2022 MnSASP Technical Report.*
[2] *MnDOT's objectives are defined in the Minnesota GO, a comprehensive multimodal study providing a 50-year vision for the state's transportation network. More information on the Minnesota GO can be found at the following website: https://minnesotago.org/*

- Supplemental Data Points and Manipulation Details (Section 6.4)

Appendix D. MnSASP Hub Data Matrix consolidates the information included in this chapter. Additionally, the MnSASP Hub User's Guide was prepared for MnDOT Aeronautics as a compendium to this document. The MnSASP Hub User's Guide provides detailed instructions on how to update the MnSASP data within the Hub. This document is for internal MnDOT Aeronautics purposes only and not distributed in conjunction with other 2022 MnSASP documents, although is referenced here for MnDOT Aeronautics staff responsible for ensuring the Hub remains current over time.

6.2. Data Sources

The MnSASP data originate from several different sources. Much of the data originated from a comprehensive airport data collection effort completed within the 2022 MnSASP across the entire system. However, several data points were pulled from publicly available data repositories maintained by MnDOT, the Federal Aviation Administration (FAA), and other data providers. Table 6.1 details each distinct data repository that was queried to obtain MnSASP data.

Table 6.1. MnSASP Data Sources

Data Source	Summary	Responsible Author/Agency	Source Data Update Cycle[3]	Website
Aircraft Registration Database	The FAA's Aircraft Registration Database records all civil aircraft in the United States, including detailed records of each aircraft (registration, manufacturer, model), owner information (name and address), and the airworthiness certificates on-file. The complete database can be downloaded as a ZIP folder (including an Excel workbook) for further analysis.	FAA	Daily	https://www.faa.gov/licenses_certificates/aircraft_certification/aircraft_registry/releasable_aircraft_download/
Airmen Certification Database	The FAA maintains a database recording all individuals that have an active airmen certificate including detailed records for each certificate holder including name, address, medical certificate on-file, and airworthiness certificate(s) and rating(s) acquired. The full database can be downloaded as a CSV or text file for further analysis.	FAA	Monthly (on the first day of each month)	https://www.faa.gov/licenses_certificates/airmen_certification/releasable_airmen_download/
Airport Data and Information Portal (ADIP)	The FAA's ADIP is a data repository of airport and aeronautical data. This repository includes airport data collected from the FAA's 5010 Airport Safety Inspection program, FAA-published approach plates, and presents airport map imagery. Airport 5010 inspections collect data on airport facilities, services, activities, and obstructions intruding into the airport's critical safety areas. This data can be downloaded in an Excel format from Airport Data and Information Portal (ADIP) using the advanced facilities search query to select the intended airports for review. This data is organized in four categories: Facility, Runway, Remark, and Schedule Data.[4]	FAA	FAA 5010 inspection cycle (typically every three years for airports without air carrier service and annually for airports with scheduled commercial service)	https://adip.faa.gov/agis/public/#/public
Airport Improvement Program (AIP) Grant Histories	The FAA's AIP directs federal funding to airports included in the National Plan of Integrated Airport Systems (NPIAS). Historical summaries of all grants awarded through the AIP can be downloaded in a PDF or Excel format for further analysis.	FAA	Annually	https://www.faa.gov/airports/aip/grant_histories/
Low Altitude Authorization and Notification Capability (LAANC)	The FAA has introduced the LAANC program to support integrating unmanned aerial vehicles (UAV) activity into the National Airspace System (NAS). The LAANC facilitates communication between UAV users and aviation stakeholders (including airports) for identifying sensitive airspace and gaining visibility into the locations and times of UAV activity.	FAA	Unknown[5]	https://www.faa.gov/uas/programs_partnerships/data_exchange/#:~:text=LAANC%20is%20the%20Low%20Altitude,pilots%20can%20and%20cannot%20fly.
National Based Aircraft Inventory Program	The FAA's National Based Aircraft Inventory Program is a data repository recording all based aircraft at Nonprimary NPIAS airports. These airports are required to submit their based aircraft into the program's website to be validated with the FAA's Aircraft Registration database. Specific details on the based aircraft at each airport is limited to authorized personnel (i.e., airport managers, sponsors). However, summary reports of the total based aircraft at each airport are made publicly available on the program's website.	FAA	Annually to maintain eligibily for federal funding (responsibility of airport sponsors)	https://basedaircraft.com/Default.aspx?ReturnUrl=%2f
NPIAS	The NPIAS reports all existing and proposed airports that are included in the NAS. Appendix A of the report details all NPIAS airports including the roles they currently serve and the amounts and types of airport development eligible for federal funding under the AIP over the next five years. This appendix can be downloaded in a PDF or Excel format for further analysis.	FAA	Biennially	https://www.faa.gov/airports/planning_capacity/npias/current/
Operational Network (OpsNet)	The FAA's OpsNet is a database containing official operations data reflective of FAA air traffic operations recorded across the NAS. This includes operations counts among airports with an air traffic control tower (ATCT), which can be queried and downloaded as an Excel file, Word document, or viewable in HTML for further analysis.	FAA	Monthly	https://aspm.faa.gov/opsnet/sys/main.asp
Traffic Flow Management System Counts (TFMSC)	The FAA's TFMSC is a database that maintains operations data across all airports in the NAS. The operation counts recorded in TFMSC are limited to aircraft operations that fly under instrument flight rules (IFR) and are captured by the FAA's en route computers. Most aircraft operating under visual flight rules (VFR) are not captured by this database.	FAA	Monthly	https://aspm.faa.gov/tfms/sys/main.asp

*[3] This column indicates the frequency that each data source is updated by the responsible author/agency. It is not the intention that the data points pulled from the sources are updated in the same frequency. Refer to **Section 6.3** for the suggested update cycle and trigger point(s) associated with each data point maintained in the Hub.*
[4] The categories are accurate as of 01/18/2022 and are subject to change. Refer to the data dictionary available in the advanced facilities search for the most current organization of ADIP.
[5] As of 01/18/2022, the list of airports participating in the LAANC was last updated in June of 2021.

Data Source	Summary	Responsible Author/Agency	Source Data Update Cycle[3]	Website
Airport Layout Plans (ALPs)	ALPs provide a graphical representation of existing/planned facilities and design standards at an airport. MnDOT Aeronautics maintains a repository of ALPs and master plans submitted by airports for review and MnDOT approval.	MnDOT Aeronautics / Airports	Varied	N/A
Airport Pavement Management System (APMS)	MnDOT Aeronautics maintains a comprehensive APMS for paved airports in the system.[6] The airfield pavement at each participating airport is inspected on a three-year cycle and evaluated against the FAA's and MnDOT's pavement design and condition standards to identify current and future airfield pavement maintenance needs. This information helps informs airports and MnDOT Aeronautics on developing the state's Capital Improvement Program (CIP). The data maintained in the APMS is documented in Pavement Condition Reports prepared for each participating airport, which are available as downloadable PDFs. The data are also available in a geospatial format and exportable as an E70 file that can be parsed into shapefiles. The APMS also maintains an interactive web-based map application (AIRView) for viewing the pavement condition data collected across all airports.	MnDOT Aeronautics	Three-year cycle	https://www.dot.state.mn.us/aero/airportdevelopment/pavementmanagement.html
Minnesota Airport Directory and Travel Guide	MnDOT Aeronautics annually publishes an airport directory that includes airport and aeronautical information relevant to pilots operating in Minnesota. Profiles of each airport's points of contact, available facilities, services, nearby attractions, and aerial images are provided within the directory. The directory is available in three versions: a downloadable PDF, a custom content pack for pilots to upload into the Foreflight app, and codified in the web-based AirportFinder app.[7]	MnDOT Aeronautics	Annually	Home page: https://www.dot.state.mn.us/aero/airportdirectory/ Link to the AirportFinder app: https://www.dot.state.mn.us/aero/airportdirectory/airportfinder/index.html
MnSASP Airport Inventory	A comprehensive airport inventory was completed across the system as a part of the MnSASP using an Airport Inventory Form. The Inventory Form collected information about airport facilities, services, and activities, among other topics that was unavailable through federal, state, or other third-party sources.	MnDOT Aeronautics	MnSASP update (typically a 10-year cycle)	N/A
MnSASP Baseline Operations Estimation Tool	The 2022 MnSASP update developed an Excel-based tool for estimating a baseline count of aircraft operations across all general aviation (GA) airports in the system. This tool pulls in operations counts recorded in the FAA's TFMSC database, extrapolates these counts using nationwide ratios of TFMSC vs FAA OpsNet operations stratified by NPIAS hub/role, and adds the airport-reported local operations collected during airport 5010 inspections.[8]	MnDOT Aeronautics	Annually (recommended)	N/A
Statewide Airport Economic Impact Study	MnDOT Aeronautics completes a periodic statewide study to quantify the annually economic impact that the system generates to the Minnesota economy. The findings of this study are summarized and published in a technical report downloadable in a PDF format.	MnDOT Aeronautics	As determined by MnDOT Aeronautics	http://www.dot.state.mn.us/airport-economic-study/
Zoning Information Warehouse	MnDOT Aeronautics maintains a data repository of airport zoning ordinances established by the jurisdictions in which system airports are located. The repository includes ordinance documentation, map visuals, and GIS-compatible map files (Shapefiles) to map into a GIS mapping software (i.e., ArcMap, ArcGIS Pro, ArcGIS Online). The Zoning Information Warehouse also includes an interactive map application for viewing all airport zoning across the system (Statewide Airport Zoning Tool).	MnDOT Aeronautics	Unknown	https://www.dot.state.mn.us/aero/planning/zoning-warehouse.html
Aviation Safety Reporting System (ASRS)	The National Aeronautics and Space Administration (NASA) maintains a data repository of aviation incidents occurring worldwide. This repository is populated by aviation users (pilots, air traffic controllers, mechanics, flight attendants) that voluntarily report aviation incidents in a confidential manner. The incidents are categorized by several different user and event characteristics (environmental conditions, aircraft, location, event assessment) which are searchable through a public-facing search query to view each recorded incident. The incident data is viewable in HTML and downloadable in three different formats: Excel file, comma-separated values (CSV), and Word.	NASA	Monthly	https://asrs.arc.nasa.gov/search/database.html

[6] The latest update to the APMS included 103 paved airports in the system, not including the airports managed by the Metropolitan Airports Commissions (MAC).
[7] The AirportFinder app is linked and presented as a Dashboard in the MnSASP Hub (in the Airport Dashboards page).
[8] Additional information about the GA operations counting methodology can be obtained in Chapter 3. Operations Counting and Forecasting of the 2022 MnSASP Technical Report.

Data Source	Summary	Responsible Author/Agency	Source Data Update Cycle[3]	Website
Aviation Weather Center (AWC)	The National Oceanic and Atmospheric Administration (NOAA) maintains the AWC as live data repository for aviation weather information. Real-time weather information is published by AWC through meteorological aerodrome reports (METAR) reported for each airport in the system. The METAR reports are viewable directly in the website as text and can be copy/pasted into another application for further analysis.	NOAA	Live updates	https://www.aviationweather.gov/
Case Analysis and Reporting Online (CAROL)	The National Transportation Safety Board (NTSB) maintains a comprehensive database of all transportation-related accidents in the United States (U.S.). As a public-facing platform for this data, CAROL is a query tool for finding information on all transportation-related investigations completed and ongoing by the NTSB. This includes aviation accident cases started after 2008. The accident data is viewable directly in the query tool and the NTSB reports are downlodable in a PDF format.	NTSB	Daily	https://data.ntsb.gov/carol-main-public/landing-page

Sources: Kimley-Horn, 2022; Various state and federal databases, 2022

6.3. Data Points Assessment

This section provides a comprehensive review of all the data points MnDOT Aeronautics has selected to maintain in the MnSASP Hub. Additional data were collected during the MnSASP airport inventory conducted in 2021. Many of these data were used in the analyses of the MnSASP but will not be included in the Hub (e.g., airport rates and charges, certain types of aviation activities). All MnSASP data are available in static Excel format. For simplicity and ease of use, the assessment consolidates and organizes the data points into categories. Each data category is evaluated across 11 different criteria (described in Table 6.2) providing a complete summary of all the data points, including guidance on updating all the data points.

Table 6.2. Data Points Assessment Criteria

Assessment Criteria	Description
Data Point(s)	Lists out all the data points associated with the assigned category
Data Type	Format of the data points (all data points are in a tabular format, but may have associated spatial data [polygons, points, lines])
Description	Summary of all the data points
Source(s) (and Details)	Identifies and describes the source of the data points (if applicable, a link to access the source is included)
Date of Initial Data Collection	Date that the data points were initially collected for the 2022 MnSASP
Update Cycle	Recurring cycle that the data points should be updated to remain current for MnDOT's continuous system planning efforts
Trigger Point(s) for Evaluation Outside of Update Cycle	Events outside of the normal update cycle that the data should be evaluated and updated to reflect new conditions
Hub Presentation/Use	Identifies the page(s) and applications in the Hub where the data points are presented
MnSASP Hub Layer/Table	Denotes the feature layer (and table where applicable) that the data points are stored in the Hub's backend data[9]
MnDOT Aeronautics Responsibility	Identifies the individual/group within MnDOT Aeronautics recommended to be responsible for updating the data points
Data Manipulation Plan from Raw State (if applicable)	Details how the raw data needs to be manipulated to conform with the parameters of the MnSASP data

Source: Kimley-Horn, 2022

This evaluation completed across all 11 data categories are codified into tables and included in the following subsections.

[9] *Refer to the MnSASP Hub User's Guide for more information on the construct of the Hub's backend data. The MnSASP Hub User's Guide is a compendium document prepared for MnDOT Aeronautics to provide detailed instructions on how to update the MnSASP Hub. This document is for internal MnDOT Aeronautics purposes only and not distributed in conjunction with other 2022 MnSASP documents.*

6.3.1. AIRPORT BACKGROUND

Airport background information identifies the airports in the system and provides relevant information for MnDOT Aeronautics to engage in airport planning and development efforts. Table 6.3 through Table 6.10 document all the data points providing airport background information maintained in the MnSASP data.

Table 6.3. Airport Contact Information

Data Assessment	Contact information
Data Point(s)	On Site Manager Manager Name Manager Title Manager Phone Manager Cell Manager Email Other Contact Name Other Contact Title Other Contact Phone Other Contact Cell Other Contact Email
Data Type	Tabular data
Description	Maintaining an up-to-date directory of airport contact information is critically important for airport users and MnDOT Aeronautics to connect with the airport staff. In many cases, airports have a manager (on- or off-site) employed by the airport sponsor to oversee airport management/administration, operations, and improvement. Some airports have identified an additional point of contact ("Other Contact") as an alternate option for connecting with the airport.
Source(s)	MnSASP Airport Inventory
Source(s) Details	The MnSASP Airport Inventory includes contact information for the airport's designated manager and an alternate point of contact.
Date of Initial Data Collection	06/02/2021 (2022 MnSASP Airport Inventory)
Update Cycle	Annually
Trigger Point(s) for Evaluation Outside of Update Cycle	Airport staffing changes
Hub Presentation/Use	MnSASP Report Card: Airport details element Airport Geodata: Weather Stations & Navigational Aids (NAVAIDs) Dashboard, Airport Pavement Dashboard, Airport Safety Areas Dashboard
MnSASP Hub Layer/Table (if applicable)	MnSASP Hub Airport Data/MN Airport Background
MnDOT Aeronautics Responsibility	Airport planning staff
Data Manipulation Plan from Raw State (if applicable)	None

Source: Kimley-Horn, 2022

Table 6.4. Airport Coordinates

Data Assessment	Airport Coordinates
Data Point(s)	Latitude Longitude Airport Elevation (feet [ft])
Data Type	Spatial data (points)
Description	Airport reference point (ARP) data (maintained as latitude/longitude data in ADIP) refers to the centerpoint of the primary runway and is used to identify the location of each airport facility in the system. The ARP serves as the main reference for plotting each airport point in the "Airport Background" layer.
Source(s)	FAA ADIP: https://adip.faa.gov/agis/public/#/public
Source(s) Details	Coordinate data are included in a downloadable "Facilities" dataset available through ADIP's advanced search query. Refer to the key below for the field names containing the data points: - Latitude: ARP Latitude - Longitude: ARP Longitude - Airport Elevation (ft): Elevation
Date of Initial Data Collection	10/20/2020
Update Cycle	As required based on trigger point for evaluation
Trigger Point(s) for Evaluation Outside of Update Cycle	Major airfield geometry update or airport relocation
Hub Presentation/Use	MnSASP Report Card: Airport details element and map Airport Dashboards: Airport Economic Impact Dashboard (map) Airport Geodata: Weather Stations & NAVAIDs Dashboard, Airport Pavement Dashboard, Airport Safety Areas Dashboard
MnSASP Hub Layer/Table (if applicable)	MnSASP Hub Airport Data/MN Airport Background
MnDOT Aeronautics Responsibility	Airport planning staff
Data Manipulation Plan from Raw State (if applicable)	The coordinate data (latitude, longitude) in ADIP is recorded in DMS format, which is incompatible for the MnSASP data (plotting the points in ArcGIS). See **Section 6.4.1** for instructions on converting DMS to decimal degrees to conform with the Hub data parameters. Refer to the MnSASP Hub User's Guide for guidance on mapping the airport points in the Hub.

Source: Kimley-Horn, 2022

Table 6.5. Airport Identification

Data Assessment	Airport Identification
Data Point(s)	FAA ID Airport Name
Data Type	Tabular data
Description	Airports are commonly identified using a unique name and three-character identified assigned by the FAA
Source	FAA ADIP: https://adip.faa.gov/agis/public/#/public
Source(s) Details	The data points are included in a downloadable "Facilities" dataset available through the ADIP advanced search query. Refer to the key below for the field names containing the data points: - FAA ID: LocationID - Airport Name: FacilityName
Date of Initial Data Collection	11/01/2020
Update Cycle	As required based on trigger point for evaluation
Trigger Point(s) for Evaluation Outside of Update Cycle	Airport name or FAA ID change
Hub Presentation/Use	System Performance: Dashboard filters, metric/indicator data cards Airport Performance: Dashboard filter, metric/indicator data cards MnSASP Report Card: Airport selection list, airport details element Airport Dashboards: Airport Directory Dashboard, Airport Economic Impact Dashboard, FAA-Filed Flight Plans Dashboard Airport Geodata: Weather Stations & NAVAIDs Dashboard, Airport Pavement Dashboard, Airport Safety Areas Dashboard
MnSASP Hub Layer/Table (if applicable)	MnSASP Hub Airport Data (The FAA ID is used as the common key for all tables and layers in the MnSASP Hub Airport Data feature layer)
MnDOT Aeronautics Responsibility	Airport planning staff
Data Manipulation Plan from Raw State (if applicable)	None

Source: Kimley-Horn, 2022

Table 6.6. Airport Physical/Mailing Address

Data Assessment	Airport Physical/Mailing Address
Data Point(s)	Physical Address Owner/Mailing Address
Data Type	Tabular data
Description	Each airport maintains a physical address and a mailing address (assigned as the owner's address) to indicate how the airport can be reached via ground transportation and contacted via mail.
Source(s)	- MnDOT Airport Directory - FAA ADIP: https://adip.faa.gov/agis/public/#/public
Source(s) Details	The physical address is published in the MnDOT Airport Directory for each airport. Owner/mailing address is included in a downloadable "Facility" dataset available through ADIP's advanced search query under the field name "Owner Address."
Date of Initial Data Collection	10/20/2020
Update Cycle	As required based on trigger point for evaluation
Trigger Point(s) for Evaluation Outside of Update Cycle	Airport relocation
Hub Presentation/Use	MnSASP Report Card: Airport details element Airport Geodata: Weather Stations & NAVAIDs Dashboard, Airport Pavement Dashboard, Airport Safety Areas Dashboard
MnSASP Hub Layer/Table (if applicable)	MnSASP Hub Airport Data/MN Airport Background
MnDOT Aeronautics Responsibility	Airport planning staff
Data Manipulation Plan from Raw State (if applicable)	None

Source: Kimley-Horn, 2022

Table 6.7. Airport Planning Jurisdiction

Data Assessment	Airport Planning Jurisdiction
Data Point(s)	MnDOT District Aeronautics Planning Region Congressional District
Data Type	Tabular data
Description	Airports can be categorized into various planning jurisidctions including (but not limited to) Aeronautics Planning Regions, MnDOT Districts, and Congressional Districts.
Source(s)	MnDOT Aeronautics
Source(s) Details	None

Data Assessment	Airport Planning Jurisdiction
Date of Initial Data Collection	MnDOT District: 12/16/2020 Aeronautics Planning Region: 12/16/2020 Congressional District: 06/18/2021
Update Cycle	As required based on trigger point for evaluation
Trigger Point(s) for Evaluation Outside of Update Cycle	Jurisdictional boundary changes
Hub Presentation/Use	System Performance: Dashboard filters, metric/indicator data cards MnSASP Report Card: Airport details element Airport Dashboards: Airport Economic Impact Dashboard Airport Geodata: Weather Stations & NAVAIDs Dashboard, Airport Pavement Dashboard, Airport Safety Areas Dashboard
MnSASP Hub Layer/Table (if applicable)	MnSASP Hub Airport Data/MN Airport Background
MnDOT Aeronautics Responsibility	Airport planning staff
Data Manipulation Plan from Raw State (if applicable)	None

Source: Kimley-Horn, 2022

Table 6.8. Airport Sponsor

Data Assessment	Airport Sponsor
Data Point(s)	Airport Sponsor
Data Type	Tabular data
Description	Airport sponsors are public agencies or tax-supported organizations such as airport authorities or municipal governments authorized to own and operate an airport; obtain property interests; obtain funds; and otherwise be responsible for meeting all applicable legal and financial requirements of current laws, regulations, and other obligations associated with their airport.
Source(s)	FAA ADIP: https://adip.faa.gov/agis/public/#/public
Source(s) Details	Airport sponsor is included in a downloadable "Facility" dataset available through ADIP's advanced search query under the field name "Owner."
Date of Initial Data Collection	11/01/2020
Update Cycle	As required based on trigger point for evaluation
Trigger Point(s) for Evaluation Outside of Update Cycle	Change of airport sponsorship
Hub Presentation/Use	MnSASP Report Card: Airport details element Airport Geodata: Weather Stations & NAVAIDs Dashboard, Airport Pavement Dashboard, Airport Safety Areas Dashboard

Data Assessment	Airport Sponsor
MnSASP Hub Layer/Table (if applicable)	MnSASP Hub Airport Data/MN Airport Background
MnDOT Aeronautics Responsibility	Airport planning staff
Data Manipulation Plan from Raw State (if applicable)	None

Source: Kimley-Horn, 2022

Table 6.9. NPIAS

Data Assessment	NPIAS
Data Point(s)	NPIAS Inclusion NPIAS Primary / Nonprimary NPIAS Category NPIAS Hub NPIAS Role
Data Type	Tabular data
Description	The NPIAS identifies all existing and proposed airports included in the NAS, the roles they currently serve, and the amounts and types of airport development eligible for federal funding under the AIP over the next five years. The FAA publishes the NPIAS every two years.
Source(s)	FAA NPIAS: https://www.faa.gov/airports/planning_capacity/npias/
Source(s) Details	Appendix A lists each airport's NPIAS classification with five-year forecasted activity and development estimates. This can be downloaded as an Excel or PDF file at the following webpage: https://www.faa.gov/airports/planning_capacity/npias/current/. Information on NPIAS airports in Minnesota is in the sheet named "MN."
Date of Initial Data Collection	11/1/2020 (NPIAS 2021 - 2025)
Update Cycle	Biennially (coinciding with the release of a new NPIAS report)
Trigger Point(s) for Evaluation Outside of Update Cycle	None
Hub Presentation/Use	MnSASP Report Card: Airport details element Airport Geodata: Weather Stations & NAVAIDs Dashboard, Airport Pavement Dashboard, Airport Safety Areas Dashboard
MnSASP Hub Layer/Table (if applicable)	MnSASP Hub Airport Data/MN Airport Background
MnDOT Aeronautics Responsibility	Airport planning staff
Data Manipulation Plan from Raw State (if applicable)	None

Source: Kimley-Horn, 2022

Table 6.10. State Classification

Data Assessment	State Classification
Data Point(s)	State Classification
Data Type	Tabular data
Description	Per Minnesota Statute (630.305 Subdivision 2), airports are required to have a state-specific classification designation before the airports can receive state investment into airport projects. These classifications provide an indication of the role that each airport serves in the system.
Source(s)	- FAA ADIP: https://adip.faa.gov/agis/public/#/public - MnSASP
Source(s) Details	Minnesota state airport classifications are determined by runway length, Part 139 certification, and runway surface type (see **Section 6.4.1)**. As such, assigning state classifications to airports requires reviewing airport data maintained in ADIP (see data manipulation plan for details).
Date of Initial Data Collection	11/11/2020
Update Cycle	As required based on trigger points for evaluation
Trigger Point(s) for Evaluation Outside of Update Cycle	Runway extension project, runway paving project, or new Part 139 certification
Hub Presentation/Use[10]	System Performance: Dashboard filters, metric/indicator data cards Airport Performance: Dashboard filter, metric/indicator data cards MnSASP Report Card: Airport details element Airport Dashboards: Airport Economic Impact Dashboard Airport Geodata: Weather Stations & NAVAIDs Dashboard, Airport Pavement Dashboard, Airport Safety Areas Dashboard
MnSASP Hub Layer/Table (if applicable)	MnSASP Hub Airport Data/MN Airport Background
MnDOT Aeronautics Responsibility	Airport planning staff
Data Manipulation Plan from Raw State (if applicable)	State classifications are assigned across the system based on three factors, all of which are included in the MnSASP Hub Airport Data feature layer: - Part 139 certification (**Table 6.16**) - Primary runway length (**Table 6.36**) - Primary runway surface type (**Table 6.36**) See **Section 6.4.1** for the definitions of each state classification in terms of the three factors above.

Source: Kimley-Horn, 2022

[10] *State classifications are used throughout the MnSASP for identifying the appropriate facility, service and administrative items that airports should be providing. These items are dictated by several airport performance metrics defined in during Phase I of the MnSASP (see **Chapter 2. Phase I Evaluation** for more information on metrics). Any changes to an airport's state classification will require a complete reevaluation of the airport's performance across all the airport performance metrics.*

6.3.2. AIRPORT ACTIVITY

Airport activity records the type(s) and magnitude of aviation-related activities supported by or occurring at system airports. The following tables document all the data points included in the MnSASP data related to airport activity.

Table 6.11. Based Aircraft

Data Assessment	Based Aircraft
Data Point(s)	Single-engine Based Aircraft Multi-engine Based Aircraft Jet Turboprop Based Aircraft Helicopter Based Aircraft Other Based Aircraft Military Based Aircraft Total Based Aircraft Based Aircraft Data Source
Data Type	Tabular data
Description	Based aircraft provides one indicator of an airport's type and frequency of activity. This information can be used to inform an airport's need for aircraft storage facilities (hangars, tie-downs) to adequately accommodate aircraft and may be a component of identifying an airport's critical aircraft. An airport's critical aircraft defines the most sophisticated or demanding aircraft conducting at least 500 annual operations and is used to during airport planning and design. The number of aircraft based at an airport is an important component of evaluating the federal role of Nonprimary airports in the NPIAS.
Source(s)	- FAA National Based Aircraft Inventory Program: https://basedaircraft.com/BaCounts/Default.aspx - FAA ADIP
Source(s) Details	The FAA's National Based Aircraft Inventory Program (basedaircraft.com) provides validated counts of based aircraft for each Nonprimary NPIAS airport. Summary reports by state are publically available through the program's website. Authorized users including MnDOT staff can access validated counts by airport. Refer to **Section 6.4.2.1** for instructions on viewing this data for updating the data points. For Primary NPIAS and non-NPIAS airports, the FAA ADIP records the type and number of based aircraft reported by airports during 5010 inspections. The data points are included in a downloadable "Facilities" dataset available through the advanced search query. Refer to the key below for the field names containing the data points: - Single-engine Based Aircraft: SingleEngineGA - Multi-engine Based Aircraft: MultiEngineGA - Jet Turboprop Based Aircraft: JetEngineGA - Helicopter Based Aircraft: HelicoptersGA - Other Based Aircraft: GlidersOperational, Ultralights - Military Based Aircraft: MilitaryOperational - Total Based Aircraft: [sum of the counts populated in the fields above]
Date of Initial Data Collection	06/02/21 (2022 MnSASP Airport Inventory)
Update Cycle	Annually
Trigger Point(s) for Evaluation Outside of Update Cycle	None
Presentation/Use	MnSASP Hub/Airport Performance: Based Aircraft [Indicator]
MnSASP Hub Layer/Table (if applicable)	MnSASP Hub Airport Data/Airport Activity

Data Assessment	Based Aircraft
MnDOT Aeronautics Responsibility	Airport planning staff
Data Manipulation Plan from Raw State (if applicable)	See **Section 6.4.2.1** for information regarding obtaining validated based aircraft counts from the National Based Aircraft Inventory Program.

Source: Kimley-Horn, 2022

Table 6.12. Baseline Operations Counts

Data Assessment	Baseline Operations Counts
Data Point(s)	Total Baseline Operations Count Baseline Operations Count Year Baseline Operations Count Source
Data Type	Tabular data
Description	Operation counts are one primary indicator of aviation activity levels. This data are used to develop airport-specific and system-level activity forecasts, which are applied during airport planning and design.
Source(s)	MnSASP Baseline Operations Estimation Tool (using FAA TFMSC, FAA OpsNet, and airport-reported operations data collected during FAA 5010 inspections) FAA OpsNet: https://aspm.faa.gov/opsnet/sys/main.asp
Source(s) Details	The MnSASP Baseline Operations Estimation Tool was developed during the 2022 MnSASP to estimate a baseline operations count at Minnesota's GA airports without an ATCT. The estimation methodology utilizes operations data from the FAA's TFMSC, FAA OpsNet, and airport-reported 5010 operations. Operations are obtained from the Operations Network (OpsNet) for airports with an ATCT, and TFMSC for non-towered commercial service airports. The data point "Baseline Operations Count Source" denotes the source of the baseline operations data referenced for each airport.
Date of Initial Data Collection	11/18/2021 (operation counts for 2020 airport activity is recorded)
Update Cycle	Annually
Trigger Point(s) for Evaluation Outside of Update Cycle	None
Hub Presentation/Use	MnSASP Hub/Airport Performance: Airport Operations [Indicator]
MnSASP Hub Layer/Table (if applicable)	MnSASP Hub Airport Data/Airport Activity
MnDOT Aeronautics Responsibility	Airport planning staff
Data Manipulation Plan from Raw State (if applicable)	See **Section 6.4.2.2** for obtaining and manipulating operations counts data available via the FAA's OpsNet database. Note that this data is also plugged into the MnSASP Baseline Operations Estimation Tool.

Source: Kimley-Horn, 2022

Table 6.13. Drone/UAV Programs

Data Assessment	Drone/UAV Programs
Data Point(s)	UAV Program Participation – LAANC UAV Program Participation – Other
Data Type	Tabular data
Description	The emergence of commercial/recreational UASs has propted the FAA to develop systems to monitor and regulate UAV activity in the vicinity of airports, which can pose a significant risk to aircraft. The FAA's LAANC program supports the integratation of UAV activity into the NAS by facilitating communication between Part 107 pilots and recreational fliers and air traffic professionals. Under the program, UAV pilots receive near-immediate access to controlled airspace at or below 400 feet above ground level (AGL) and air traffic controllers gain visibility into the locations and times of UAV activity. LAANC can also be used to gain approval to operate a UAV above the designated altitude ceiling in a UAS Facility Map, up to 400 feet AGL. The FAA's DroneZone is available users to register UAVs more than 55 pounds, apply for a waiver/authorization under Part 107, or report a UAS/drone accident. Some airports have also developed independent monitoring/reporting programs for tracking and pre-authorizing UAV activity around their airport.
Source(s)	FAA LAANC (list of participating airports): https://www.faa.gov/uas/programs_partnerships/data_exchange/laanc_facilities/ MnSASP Airport Inventory
Source(s) Details	None
Date of Initial Data Collection	06/02/21 (2022 MnSASP Update)
Update Cycle	Biennially
Trigger Point(s) for Evaluation Outside of Update Cycle	None
Hub Presentation/Use	None
MnSASP Hub Layer/Table (if applicable)	MnSASP Hub Airport Data/Airport Activity
MnDOT Aeronautics Responsibility	Airport planning staff
Data Manipulation Plan from Raw State (if applicable)	None

Source: Kimley-Horn, 2022

Table 6.14. Emergency Medical Activity

Data Assessment	Emergency Medical Activity
Data Point(s)	Medical Aircraft – Fixed Wing Medical Aircraft – Rotorcraft Medical Aircraft – Other Aircraft Ambulance Operator 1 Operator 1 Based? Ambulance Operator 2 Operator 2 Based? Ambulance Operator 3 Operator 3 Based? Ambulance Operator 4 Operator 4 Based? Medical Evacuation Activity
Data Type	Tabular data
Description	Emergency and specialized medical care relies on air and ground transportation modes to quickly move trauma vicitims to and transfer patients between medicial facilities for appropriate care. Rotorcraft and fixed-wing aircraft are generally used when ground transportation is infeasible due to time-sensitivity, distance, remote access, or other factors. Airports that support emergency and scheduled medical air flying should optimally provide deicing facilities, Jet A fuel, on-site weather reporting (automated weather observing systems [AWOS]/automated surface observing systems [ASOS]), instrument approach capabilities, and adequate heated transient aircraft storage facilities. The data point "Medical Evacuation Activity" records the approximate frequency of emergency medical activity at the airport.
Source(s)	MnSASP Airport Inventory
Source(s) Details	None
Date of Initial Data Collection	06/02/21 (2022 MnSASP Update)
Update Cycle	Annually
Trigger Point(s) for Evaluation Outside of Update Cycle	None
Hub Presentation/Use	System Performance: Emergency Medical [Indicator]
MnSASP Hub Layer/Table (if applicable)	MnSASP Hub Airport Data/Airport Activity
MnDOT Aeronautics Responsibility	Airport planning staff
Data Manipulation Plan from Raw State (if applicable)	None

Source: Kimley-Horn, 2022

Table 6.15. FAA Filed Flight Plans

Data Assessment	FAA Filed Flight Plans
Data Point(s)	Flight ID Number Route – Airport to State Route – State to State Departure Date Departure Airport Name Departure Airport Code Departure Country Departure State Departure Latitude Departure Longitude Arrival Date Arrival Airport Name Arrival Airport Code Arrival Country Arrival State Arrival Latitude Arrival Longitude Number of Flights Departure or Arrival Query Airport State Query Airport Code
Data Type	Tabular data
Description	Reviewing flight information available in FAA-filed flight plans can be a useful indicator of aviation activity, including aircraft traffic routes and the volumes of aircraft activity being supported in the system. Part 91 of the Code of Federal Regulations (CFR) requires pilots to file flight plans with the FAA to operate under IFR in controlled airspace. Understanding the origin and destination of travelers can also be helpful in determining the economic impact of out-of-state fliers utilizing the airport.
Source(s)	FAA TFMSC
Source(s) Details	A login is required for pulling individual flight information collected in the TFMSC. This can be requested using the following link: https://aspm.faa.gov/Control/Users/sysMailTo.asp
Date of Initial Data Collection	09/17/2021
Update Cycle	Biennially
Trigger Point(s) for Evaluation Outside of Update Cycle	None
Hub Presentation/Use	Airport Dashboards: FAA Filed Flight Plan Dashboard
MnSASP Hub Layer/Table (if applicable)	FAA Filed Flight Plan Data/All Flight Plan Details

Data Assessment	FAA Filed Flight Plans
MnDOT Aeronautics Responsibility	Airport planning staff
Data Manipulation Plan from Raw State (if applicable)	See **Section 6.4.2.3** for details on pulling the data from the FAA's TFMSC database and organizing the data to upload into the Hub.

Source: Kimley-Horn, 2022

Table 6.16. Part 139 Certification

Data Assessment	Part 139 Certification
Data Point(s)	Part 139 Certification
Data Type	Tabular data
Description	Airport supporting certain types of passenger-carrying operations related to scheduled airline activity are required to hold an Airport Operating Certificate in accordance with CFR Part 139 (such airports are commonly referred to as Part 139 airports).[11] Airport Operating Certificates serve to ensure safety in air transportation. To obtain a certificate, an airport must agree to certain operational and safety standards, including those related to firefighting and rescue activities. Requirements vary depending on the size of the airport and the type of flights available. Additionally, Part 139 Certification status is one of the factors used to determine the state classification of an airport. Refer to **Table 6.5** for more information on state classification and **Section 6.4.1** for the specific criteria applied during the evaluation of state classifications.
Source(s)	FAA ADIP: https://adip.faa.gov/agis/public/#/public
Source(s) Details	Part 139 Certification is included within the search results in ADIP's advanced facilities search query as denoted under the "Part 139" column (see **Section 6.4.1.3** for a screenshot reference).
Date of Initial Data Collection	09/30/2021
Update Cycle	As required based on trigger point for evaluation
Trigger Point(s) for Evaluation Outside of Update Cycle	Part 139 certification
Hub Presentation/Use	MnSASP Report Card: Airport details element Airport Geodata: Weather Stations & NAVAIDs Dashboard, Airport Pavement Dashboard, Airport Safety Areas Dashboard
MnSASP Hub Layer/Table (if applicable)	MnSASP Hub Airport Data/Airport Activity
MnDOT Aeronautics Responsibility	Airport planning staff
Data Manipulation Plan from Raw State (if applicable)	None

Source: Kimley-Horn, 2022

[11] *Dictated by 14 CFR Part 139, available at https://www.ecfr.gov/current/title-14/chapter-I/subchapter-G/part-139*

6.3.3. FACILITIES AND SERVICES

Data on existing airport facilities and services across the system are important to maintain for continuously evaluating the system's capabilities to support different types of airport activity and identify current and future facility and service needs. The following tables document all the data points included in the MnSASP data related to existing airport facilities and services in the system.

Table 6.17. Air Traffic Control Tower

Data Assessment	ATCT
Data Point(s)	ATCT
Data Type	Tabular data
Description	ATCTs facilitate the safe and efficient the flow of traffic in the NAS. These facilities are most common at commercial service and reliever airports although can also be found at some busier GA airports.
Source(s)	FAA ADIP: https://adip.faa.gov/agis/public/#/public
Source(s) Details	ATCTs are included in the downloadable "Facility" dataset available through ADIP's advanced search query under the field name "ATCT."
Date of Initial Data Collection	10/20/2020
Update Cycle	As required based on trigger point for evaluation
Trigger Point(s) for Evaluation Outside of Update Cycle	Construction of a new ATCT
Hub Presentation/Use	None
MnSASP Hub Layer/Table (if applicable)	MnSASP Hub Airport Data/Facilities and Services
MnDOT Aeronautics Responsibility	Airport planning staff
Data Manipulation Plan from Raw State (if applicable)	None

Source: Kimley-Horn, 2022

Table 6.18. Aircraft Rental

Data Assessment	Aircraft Rental
Data Point(s)	Aircraft Rental
Data Type	Tabular data
Description	Aircraft rentals can be provided by FBOs or other airport tenants to support aviation users in Minnesota that do not own an aircraft (or the type/size of aircraft to accomplish a specific purpose/flight).
Source(s)	FAA ADIP: https://adip.faa.gov/agis/public/#/public
Source(s) Details	None
Date of Initial Data Collection	06/02/21 (2022 MnSASP Update)

Data Assessment	Aircraft Rental
Update Cycle	Annually
Trigger Point(s) for Evaluation Outside of Update Cycle	None
Hub Presentation/Use	MnSASP Hub/Airport Performance: Available Services [Indicator]
MnSASP Hub Layer/Table (if applicable)	MnSASP Hub Airport Data/Facilities and Services
MnDOT Aeronautics Responsibility	Airport planning staff
Data Manipulation Plan from Raw State (if applicable)	The field "Other Services" in ADIP's "Facilities" dataset will be populated with the character code "RNTL" if the airport has aircraft rentals available. Refer to ADIP's data dictionary for a full key of character codes used with the field "Other Services."[12]

Source: Kimley-Horn, 2022

Table 6.19. Airfield Facilities

Data Assessment	Airfield Facilities
Data Point(s)	Beacon Wind Cone
Data Type	Tabular data
Description	Rotating beacons and wind cones serve as important navigational aids for pilots. Per Minnesota Rules 8800.1600 Subp. 7, all public airports must be equipped with a wind cone (referred to as a wind sock in rules).
Source(s)	FAA ADIP: https://adip.faa.gov/agis/public/#/public
Source(s) Details	The data points are included in a downloadable "Facilities" dataset available through the ADIP advanced search query. Refer to the key below for the field names containing the data points: - Beacon: BeaconSchedule (see Data Manipulation Plan) - Wind Cone: WindIndicator (see Data Manipulation Plan)
Date of Initial Data Collection	09/30/2021
Update Cycle	Annually
Trigger Point(s) for Evaluation Outside of Update Cycle	None
Hub Presentation/Use	System Performance: Adequate Navigational Systems [Metric] Airport Performance: Navigation Systems [Metric] MnSASP Report Card: Navigation Systems [Metric]

[12] *The ADIP data dictionary is available online at https://adip.faa.gov/agis/public/#/onlineAmrDataDictionary (accessed May 2022).*

Data Assessment	Airfield Facilities
MnSASP Hub Layer/Table (if applicable)	MnSASP Hub Airport Data/Facilities and Services
MnDOT Aeronautics Responsibility	Airport planning staff
Data Manipulation Plan from Raw State (if applicable)	The field "BeaconSchedule" in ADIP's "Facilities" dataset will be populated with "Y" if the airport has a beacon installed. If the data point is blank, then the airport does not have a beacon installed. The field "WindIndicator" in the Facilities dataset in ADIP will note a "Y" in the dataset if the airport has a wind cone installed. If a "N" is denoted, the airport does not have a wind cone installed.

Source: Kimley-Horn, 2022

Table 6.20. Airport Reference Code (ARC)

Data Assessment	ARC
Data Point(s)	Existing ARC Future ARC
Data Type	Tabular data
Description	The ARC is a unique designation system created by the FAA to designate the overall planning and design criteria for airports. The identification of an airport's ARC starts with identifying the most critical aircraft accommodated by the airport, which is defined as the most demanding/sophisticated aircraft conducting at least 500 annual operations. Using the operational performance and geometric characteristics of the critical aircraft, airports are assigned an alpha-numeric identifier reflecting the aircraft's approach speed (Aircraft Approach Category [AAC]) and the aircraft's wingspan and tail height (Airplane Design Group [ADG]).
Source(s)	ALPs
Source(s) Details	ALPs denote the existing ARC and the future ARC for the anticipated future and/or maximum build-out of the airport.
Date of Initial Data Collection	06/02/21
Update Cycle	As required based on trigger point for evaluation
Trigger Point(s) for Evaluation Outside of Update Cycle	Completion of a new or updated ALP and/or master plan
Hub Presentation/Use	None
MnSASP Hub Layer/Table (if applicable)	MnSASP Hub Airport Data/Facilities and Services
MnDOT Aeronautics Responsibility	ALP Program Manager
Data Manipulation Plan from Raw State (if applicable)	None

Source: Kimley-Horn, 2022

Table 6.21. Courtesy Car

Data Assessment	Courtesy Car
Data Point(s)	Courtesy Car Courtesy Car Make Courtesy Car Model Courtesy Car Year Courtesy Car Owner Courtesy Car KBB Grade
Data Type	Tabular data
Description	Courtesy cars provide airport visitors with direct connectivity between airports and surrounding communities with greater travel flexibility. To evaluate vehicles, airports reported condition based on Kelley Blue Book (KBB) grades. There is some subjectivity in the vehicle condition(s) being reported. Details on the tiers established by KBB are available at: https://auto.howstuffworks.com/buying-selling/kelley-blue-book4.htm.
Source(s)	MnSASP Airport Inventory
Source(s) Details	None
Date of Initial Data Collection	06/02/21 (2022 MnSASP Update)
Update Cycle	Annually
Trigger Point(s) for Evaluation Outside of Update Cycle	None
Hub Presentation/Use	MnSASP Hub/System Performance: Courtesy and Rental Cars [Indicator] MnSASP Hub/Airport Performance: Courtesy Car/Rental Car [Metric], Available Services [Indicator]
MnSASP Hub Layer/Table (if applicable)	MnSASP Hub Airport Data/Facilities and Services
MnDOT Aeronautics Responsibility	Airport planning staff
Data Manipulation Plan from Raw State (if applicable)	N/A

Source: Kimley-Horn, 2022

Table 6.22. Fixed-Base Operator (FBO)

Data Assessment	FBO
Data Point(s)	FBO 1 Name FBO 1 Ownership FBO 2 Name FBO 2 Ownership FBO 3 Name FBO 3 Ownership
Data Type	Tabular data

Data Assessment	FBO
Description	FBOs are on-airport businesses that supports aircraft activity and pilots/passengers with aviation-related services such as fuel, aircraft parking, hangar storage, flight planning and pilot lounge space, aircraft maintenance, and aircraft rentals. FBOs may also support and/or facilitate services such as ground connectivity options such as courtesy cars. FBOs can be operated by an independent company or directly by the airport sponsor. This information is noted in the data points titled with "Ownership."
Source(s)	MnSASP Airport Inventory
Source(s) Details	None
Date of Initial Data Collection	06/02/21 (2022 MnSASP Update)
Update Cycle	Annually
Trigger Point(s) for Evaluation Outside of Update Cycle	None
Hub Presentation/Use	MnSASP Hub/Airport Performance: Available Services [Indicator]
MnSASP Hub Layer/Table (if applicable)	MnSASP Hub Airport Data/Facilities and Services
MnDOT Aeronautics Responsibility	Airport planning staff
Data Manipulation Plan from Raw State (if applicable)	N/A

Source: Kimley-Horn, 2022

Table 6.23. Fencing

Data Assessment	Fencing
Data Point(s)	Security Fencing Wildlife Fencing Controlled Vehicle Access Other Airport Fencing
Data Type	Tabular data
Description	Airport fencing impedes wildlife from entering an airport environment and enhances airport security by preventing unauthorized access to the airport. Fencing can range in coverage from full perimeter to encompassing limited parts of the airport (e.g., runway, apron).
Source(s)	MnSASP Airport Inventory
Source(s) Details	None
Date of Initial Data Collection	06/02/21 (2022 MnSASP Update)
Update Cycle	Biennially

Data Assessment	Fencing
Trigger Point(s) for Evaluation Outside of Update Cycle	Completion of a fencing improvement project
Hub Presentation/Use	MnSASP Hub/Airport Performance: Fencing [Metric]
MnSASP Hub Layer/Table (if applicable)	MnSASP Hub Airport Data/Facilities and Services
MnDOT Aeronautics Responsibility	Airport planning staff
Data Manipulation Plan from Raw State (if applicable)	None

Source: Kimley-Horn, 2022

Table 6.24. Fuel

Data Assessment	Fuel
Data Point(s)	Jet A Available Jet A Available 24/7 Jet A Provider 100LL Available 100LL Available 24/7 100LL Provider SAF Available SAF Available 24/7 Other Fuel Provider Other Fuel Available 24/7 Other Fuel Available
Data Type	Tabular data
Description	Fuel availability is largely driven by the type of users at an airport. Piston-powered aircraft require 100 low lead (LL), while turbine engines require Jet A. Service offerings can be either self- or full-service and provided by the airport or a third-party (such as an FBO). Airports may also provide alternative fuel types including sustainable aviation fuels (SAF) or automobile gas (commonly referred to as MOGAS).
Source(s)	FAA ADIP: https://adip.faa.gov/agis/public/#/public
Source(s) Details	None
Date of Initial Data Collection	06/02/21 (2022 MnSASP Update)
Update Cycle	Biennially
Trigger Point(s) for Evaluation Outside of Update Cycle	Installation of a new fuel farm or provision of a new fuel type
Presentation/Use	MnSASP Hub/System Performance: Fuel Availability at Airports [Indicator] MnSASP Hub/Airport Performance: Fuel [Metric], Available Services [Indicator]

Data Assessment	Fuel
MnSASP Hub Layer/Table (if applicable)	MnSASP Hub Airport Data/Facilities and Services
MnDOT Aeronautics Responsibility	Airport planning staff
Data Manipulation Plan from Raw State (if applicable)	The field "Fuel Types" in ADIP's "Facilities" dataset indicates all the types of fuel available at each airport. This dataset is downloadable as an Excel file in ADIP's advanced facilities search. Use the following key to identify the fuel type by the corresponding character code populated into the field: - 100LL fuel: "100LL" - Jet A fuel: "A" - MOGAS: "MOGAS" Refer to ADIP's data dictionary for a full key of character codes used with the "Fuel Types" field (listed as "Fuel" in the dictionary).[13]

Source: Kimley-Horn, 2022

Table 6.25. GA Terminal Building

Data Assessment	GA Terminal Building
Data Point(s)	GA Terminal GA Terminal Comments Restroom Pilot Lounge Car Parking Public Phone
Data Type	Tabular data
Description	GA terminal, administration, and arrival/departure buildings provide space, shelter, and work areas for pilots, passengers, and travelers. Per Minnesota licensing requirements (Minnesota Rules Part 8800.1600), all public airports must provide public restroom facilities and phones. Additionally, airports may also provide car parking and/or pilot lounge space.
Source(s)	MnSASP Airport Inventory
Source(s) Details	None
Date of Initial Data Collection	06/02/21 (2022 MnSASP Update)
Update Cycle	Biennially
Trigger Point(s) for Evaluation Outside of Update Cycle	Terminal improvement project (renovation/addition or new construction)
Hub Presentation/Use	MnSASP Hub/System Performance: Adequate Arrival/Departure Terminal Building [Metric]

[13] *The ADIP Data Dictionary is available at https://adip.faa.gov/agis/public/#/onlineAmrDataDictionary (accessed May 2022)*

Data Assessment	GA Terminal Building
	MnSASP Hub/Airport Performance: General Aviation (GA) Terminal/ Administration Building [Metric] MnSASP Hub / MnSASP Report Card: General Aviation (GA) Terminal/ Administration Building [Metric]
MnSASP Hub Layer/Table (if applicable)	MnSASP Hub Airport Data/Facilities and Services
MnDOT Aeronautics Responsibility	Airport planning staff
Data Manipulation Plan from Raw State (if applicable)	None

Source: Kimley-Horn, 2022

Table 6.26. Maintenance, Repair, Overhaul (MRO) and Other Aircraft Support Services

Data Assessment	MRO and Other Aircraft Support Services
Data Point(s)	Avionics Repair Maintenance Repair Engine Overhaul Other Aircraft Service(s) Other Aircraft Service(s) Details
Data Type	Tabular data
Description	Maintenance, repair, and overhaul (MRO) services are widely available across the system to fulfill aircraft-related needs. MRO services typically include one or more of the following services: avionics repair, aircraft maintenance repair, and engine overhauls. Other aircraft services can include aircraft painting, interior renovations, or specialized MRO support for specific types of aircraft.
Source(s)	MnSASP Airport Inventory
Source(s) Details	None
Date of Initial Data Collection	06/02/21 (2022 MnSASP Update)
Update Cycle	Biennially
Trigger Point(s) for Evaluation Outside of Update Cycle	None
Hub Presentation/Use	MnSASP Hub/System Performance: Maintenance and Repair at Airports [Indicator] MnSASP Hub/Airport Performance: Available Services [Indicator]
MnSASP Hub Layer/Table (if applicable)	MnSASP Hub Airport Data/Facilities and Services
MnDOT Aeronautics Responsibility	Airport planning staff
Data Manipulation Plan from Raw State (if applicable)	None

Source: Kimley-Horn, 2022

Table 6.27. Rental Car

Data Assessment	Rental Car
Data Point(s)	Rental Car On-site Rental Car Off-site
Data Type	Tabular data
Description	Like courtesy cars, rental cars provide direct connectivity between airports and surrounding communities. Rental car services are typically available at airports that provide scheduled or unscheduled commercial service and can be present on-airport property or off-site at a nearby location.
Source(s)	MnSASP Airport Inventory
Source(s) Details	None
Date of Initial Data Collection	06/02/21 (2022 MnSASP Update)
Update Cycle	Annually
Trigger Point(s) for Evaluation Outside of Update Cycle	None
Hub Presentation/Use	MnSASP Hub/Airport Performance: Courtesy Car/Rental Car [Metric], Available Services [Indicator]
MnSASP Hub Layer/Table (if applicable)	MnSASP Hub Airport Data/Facilities and Services
MnDOT Aeronautics Responsibility	Airport planning staff
Data Manipulation Plan from Raw State (if applicable)	None

Source: Kimley-Horn, 2022

Table 6.28. Through-the-Fence (TTF) Operations

Data Assessment	TTF
Data Point(s)	TTF Operations Residential TTF Operations Commercial TTF Operations TTF Operations Description
Data Type	Tabular data
Description	TTF operations allow for aircraft users to directly access airside facilities (runways, taxiways) from land adjacent to, but not on, airport property. There are two major types of TTF: TTF operations tied with residential use (Residential TTF Operations) and TTF operations tied with an off-airport businesses and commercial use (Commercial TTF Operations).
Source(s)	MnSASP Airport Inventory
Source(s) Details	None
Date of Initial Data Collection	06/02/21 (2022 MnSASP Update)

Data Assessment	TTF
Update Cycle	Biennially
Trigger Point(s) for Evaluation Outside of Update Cycle	None
Hub Presentation/Use	None
MnSASP Hub Layer/Table (if applicable)	MnSASP Hub Airport Data/Facilities and Services
MnDOT Aeronautics Responsibility	Airport planning staff
Data Manipulation Plan from Raw State (if applicable)	None

Source: Kimley-Horn, 2022

Table 6.29. Wind Coverage

Data Assessment	Wind Coverage
Data Point(s)	Wind Coverage
Data Type	Tabular data
Description	Wind coverage indicates the percentage of time that an airport experiences adequate wind conditions based on an airport's runway configuration(s). Adequate wind coverage is determined using the maximum speed and direction of wind that certain aircraft are safely able to operate, known as the allowable crosswind component. Based on the allowable crosswind component and the available runway configuration(s), wind coverage is generated. This data point specifically denotes the wind coverage for all runways in all-weather conditions associated with the highest crosswind component denoted on the ALP.
Source(s)	ALPs
Source(s) Details	All-weather conditions and the highest crosswind component denoted
Date of Initial Data Collection	06/02/21
Update Cycle	None
Trigger Point(s) for Evaluation Outside of Update Cycle	Completion of a new/updated ALP or new runway construction/realignment project
Hub Presentation/Use	MnSASP Hub/System Performance: Adequate Wind Coverage [Metric] MnSASP Hub/MnSASP Report Card: Wind Coverage [Metric]
MnSASP Hub Layer/Table (if applicable)	MnSASP Hub Airport Data/Facilities and Services
MnDOT Aeronautics Responsibility	Airport Layout Plan Coordinator
Data Manipulation Plan from Raw State (if applicable)	None

Source: Kimley-Horn, 2022

6.3.4. RUNWAY/TAXIWAY DATA

Runways and taxiways represent the most important facilities at an airport for supporting aircraft activity. Maintaining attribute and obstruction data on these facilities is important for continuously evaluating the aeronautical capabilities present across the system and identifying any obstructions that present a safety risk to operating aircraft. The following tables document all the data points included in the MnSASP data related to runways and taxiways.

Table 6.30. Primary Runway

Data Assessment	Primary Runway
Data Point(s)	Primary Runway
Data Type	Tabular data
Description	The primary runway is generally defined as having the most critical design specifications and is typically equipped with the most sophisticated NAVAIDs. Each airport's primary runway is evaluated across several system and airport performance metrics (see Hub Presentation/Use for a list of all metrics related to the primary runway).
Source(s)	MnSASP Airport Inventory
Source(s) Details	As a part of the MnSASP Airport Inventory, airports are asked to identify their primary runway based on frequency of use and ability to accommodate the most sophisticated or demanding aircraft utilizing the facility.
Date of Initial Data Collection	06/02/21 (2022 MnSASP Update)
Update Cycle	As required based on trigger point for evaluation
Trigger Point(s) for Evaluation Outside of Update Cycle	Completion of a runway improvement project
Hub Presentation/Use	MnSASP Hub/System Performance: Adequate Approaches to Airports [Metric], Adequate Navigational Systems [Metric] MnSASP Hub/Airport Performance: Primary Runway Width [Metric], Runway Lighting [Metric], Primary Runway Approaches [Metric], Navigation Systems [Metric]
MnSASP Hub Layer/Table (if applicable)	MnSASP Hub Airport Data/Runway/Taxiway Data MnSASP Hub Airport Data/MN PCI Data
MnDOT Aeronautics Responsibility	Airport planning staff
Data Manipulation Plan from Raw State (if applicable)	None

Source: Kimley-Horn, 2022

Table 6.31. Runway Approach Type

Data Assessment	Runway Approach Type
Data Point(s)	Base End Approach Type Reciprocal End Approach Type
Data Type	Tabular data
Description	Runway approach procedures provide guidance for aircraft transitioning from the en route phase of a flight to the approach and landing phases. Each runway end can be equipped with different NAVAIDs that provide a different level of approach guidance for pilots. For simplicity, the MnSASP data records six distinct types of approaches for each runway end.
Source(s)	FAA ADIP: https://adip.faa.gov/agis/public/#/public
Source(s) Details	The data points are included in a downloadable "Runways" dataset available through the ADIP advanced search query. Refer to the key below for the field names containing the data points: - Base End Approach Type: Base Obstacle Part77 - Reciprocal End Approach Type: Reciprocal Obstacle Part77
Date of Initial Data Collection	09/30/2021
Update Cycle	As required based on trigger point for evaluation
Trigger Point(s) for Evaluation Outside of Update Cycle	Development of a new or modification of an existing runway approach
Hub Presentation/Use	MnSASP Hub/System Performance: Adequate Approaches to Airports [Metric] MnSASP Hub/Airport Performance: Primary Runway Approaches [Metric]
MnSASP Hub Layer/Table (if applicable)	MnSASP Hub Airport Data/Runway/Taxiway Data
MnDOT Aeronautics Responsibility	Airport planning staff
Data Manipulation Plan from Raw State (if applicable)	Each record in ADIP's downloadable runway dataset includes data for each runway among all the airports selected in the advanced search. However, this dataset only provides the FAA site numbers (#) as the airport identifier for each runway record. For joining the FAA IDs to each runway record for updating the "Runway/Taxiway Data" table in the Hub, refer to the instructions included in Section 6.4.2.3.

Source: Kimley-Horn, 2022

Table 6.32. Runway Coordinates

Data Assessment	Runway Coordinates
Data Point(s)	Base End Latitude Base End Longitude Reciprocal End Latitude Reciprocal End Longitude
Data Type	Tabular data

Data Assessment	Runway Coordinates
Description	As a spatial point of reference, these data points record the latitude and longitude coordinates of each runway end. These coordinates are in DMS format.
Source(s)	FAA ADIP: https://adip.faa.gov/agis/public/#/public
Source(s) Details	The data points are included in a downloadable "Runways" dataset available through the ADIP advanced search query. Refer to the key below for the field names containing the data points: - Base End Latitude: Base Latitude DMS - Base End Longitude: Base Longitude DMS - Reciprocal End Latitude: Reciprocal Latitude DMS - Reciprocal End Longitude: Reciprocal Longitude DMS
Date of Initial Data Collection	09/30/2021
Update Cycle	As required based on trigger point for evaluation
Trigger Point(s) for Evaluation Outside of Update Cycle	Runway extension, relocation, or realignment project
Hub Presentation/Use	None
MnSASP Hub Layer/Table (if applicable)	MnSASP Hub Airport Data/Runway/Taxiway Data
MnDOT Aeronautics Responsibility	Airport planning staff
Data Manipulation Plan from Raw State (if applicable)	Each record in ADIP's downloadable runway dataset includes data for each runway at all airports selected in the advanced search. However, this dataset only provides the FAA site numbers (#) as the airport identifier for each runway record. For joining the FAA IDs to each runway record for updating the "Runway/Taxiway Data" table in the Hub, refer to the instructions included in Section 6.4.2.3.

Source: Kimley-Horn, 2022

Table 6.33. Runway Identification

Data Assessment	Runway Identification
Data Point(s)	Runway ID Base End ID Reciprocal End ID
Data Type	Tabular data
Description	Runways are assigned a unique numeric identifier (e.g., 01/19, 18/36) based on the orientation of its magnetic azimuth (compass bearing). Parallel runway identifiers are further indicated by the letters L, R, C for left, right, center (respectively; e.g., 18L/36R, 04R/22L).
Source(s)	FAA ADIP: https://adip.faa.gov/agis/public/#/public

Data Assessment	Runway Identification
Source(s) Details	The data points are included in a downloadable "Runways" dataset available through the ADIP advanced search query. Refer to the key below for the field names containing the data points: - Runway ID: Runway Id - Base End ID: Runway Id (all characters before the "/") - Reciprocal End ID: Runway Id (all characters after the "/")
Date of Initial Data Collection	09/30/2021
Update Cycle	As required based on trigger point for evaluation
Trigger Point(s) for Evaluation Outside of Update Cycle	Completion of an ALP update or any type of reorientation
Hub Presentation/Use	MnSASP Hub/System Performance: Adequate Approaches to Airports [Metric], Adequate Navigational Systems [Metric], Airport Surfaces Clear of Obstructions [Metric] MnSASP Hub/Airport Performance: Primary Runway Width [Metric], Runway Lighting [Metric], Primary Runway Approaches [Metric], Navigation Systems [Metric] , Airport Surfaces [Metric] MnSASP Hub/MnSASP Report Card: Runway Approach [Metric], Navigation Systems [Metric], Airport Obstructions [Metric]
MnSASP Hub Layer/Table (if applicable)	MnSASP Hub Airport Data/Runway/Taxiway Data
MnDOT Aeronautics Responsibility	Airport planning staff
Data Manipulation Plan from Raw State (if applicable)	Each record in ADIP's downloadable runway dataset includes data for each runway at all airports selected in the advanced search. However, this dataset only provides the FAA site number (#) as the airport identifier for each runway record. For joining the FAA IDs to each runway record for updating the "Runway/Taxiway Data" table in the Hub, refer to the instructions included in Section 6.4.2.3.

Source: Kimley-Horn, 2022

Table 6.34. Runway Dimensions

Data Assessment	Runway Dimensions
Data Point(s)	Runway Length Runway Width
Data Type	Tabular data
Description	Runways are rectangular surfaces, so the dimensions can be adequate described by the length and width of the surface (measured in feet).
Source(s)	FAA ADIP: https://adip.faa.gov/agis/public/#/public
Source(s) Details	The data points are included in a downloadable "Runways" dataset available through the ADIP advanced search query. Refer to the key below for the field names containing the data points: - Runway Length: Length

Data Assessment	Runway Dimensions
	- Runway Width: Width
Date of Initial Data Collection	09/30/2021
Update Cycle	As required based on trigger point for evaluation
Trigger Point(s) for Evaluation Outside of Update Cycle	Applicable runway improvement project
Hub Presentation/Use	MnSASP Hub/Airport Performance: Primary Runway Width [Metric]
MnSASP Hub Layer/Table (if applicable)	MnSASP Hub Airport Data/Runway/Taxiway Data
MnDOT Aeronautics Responsibility	Airport planning staff
Data Manipulation Plan from Raw State (if applicable)	Each record in ADIP's downloadable runway dataset includes data for each runway among all the airports selected in the advanced search. However, this dataset only provides the FAA site numbers (#) as the airport identifier for each runway record. For joining the FAA IDs to each runway record for updating the "Runway/Taxiway Data" table in the Hub, refer to the instructions included in Section 6.4.2.3.

Source: Kimley-Horn, 2022

Table 6.35. Runway Surface Type and Condition

Data Assessment	Runway Surface Type and Condition
Data Point(s)	Surface Type/Condition
Data Type	Tabular data
Description	Runway surfaces can vary in material to include paved (e.g., concrete, asphalt) and unpaved (e.g., turf, dirt, water).[14] This data point identifies the surface type of each runway and provides a general note on the condition of the surface (i.e., excellent, good, fair, poor, failed).
Source(s)	FAA ADIP: https://adip.faa.gov/agis/public/#/public
Source(s) Details	Surface Type/Condition is included in a downloadable "Runways" dataset available through ADIP's advanced search query under the field name "Surface Type Condition."
Date of Initial Data Collection	09/30/2021
Update Cycle	Annual
Trigger Point(s) for Evaluation Outside of Update Cycle	Runway improvement project
Hub Presentation/Use	None

[14] Refer to the data dictionary available in ADIP's advanced facilities search for a complete and updated list of all runway surface types.

Data Assessment	Runway Surface Type and Condition
MnSASP Hub Layer/Table (if applicable)	MnSASP Hub Airport Data/Runway/Taxiway Data
MnDOT Aeronautics Responsibility	Airport planning staff
Data Manipulation Plan from Raw State (if applicable)	Each record in ADIP's downloadable Runway dataset includes data for each runway at the airports selected in the advanced search. However, this dataset only includes the FAA site number (#) as the airport identifier for each runway record. For joining the FAA IDs to each runway record for updating the "Runway/Taxiway Data" table in the Hub, refer to the instructions included in Section 6.4.2.3.

Source: Kimley-Horn, 2022

Table 6.36. Runway Lighting

Data Assessment	Runway Lighting
Data Point(s)	Edge Light Intensity Base End VGSI Base End ALS Base End REIL Base End Centerline Lights Base End Touchdown Lights Reciprocal End VGSI Reciprocal End ALS Reciprocal End REIL Reciprocal End Centerline Lights Reciprocal End Touchdown Lights
Data Type	Tabular data
Description	Runway edge lighting intensity can range from low to high intensity and may also include non-standard lighting. Each runway end can also be equipped with one or more navigational aids for pilots including, but not limited to: visual glide slope indicator (VGSI), approach lighting system (ALS), runway end identifier lights (REILs), centerline lights, and touchdown lights.
Source(s)	FAA ADIP: https://adip.faa.gov/agis/public/#/public
Source(s) Details	The data points are included in a downloadable "Runways" dataset available through the ADIP advanced search query. Refer to the key below for the field names containing the data points: - Edge Light Intensity: Edge Light Intensity - Base End VGSI: Base VGSI - Base End ALS: Base ALS - Base End REIL: Base REIL - Base End Centerline Lights: Base Centerline Lights - Base End Touchdown Lights: Base Touchdown Lights - Reciprocal End VGSI: Reciprocal VGSI - Reciprocal End ALS: Reciprocal ALS - Reciprocal End REIL: Reciprocal REIL

Data Assessment	Runway Lighting
	- Reciprocal End Centerline Lights: Reciprocal Centerline Lights - Reciprocal End Touchdown Lights: Reciprocal Touchdown Lights
Date of Initial Data Collection	09/30/2021
Update Cycle	As required based on trigger point for evaluation
Trigger Point(s) for Evaluation Outside of Update Cycle	Installation of runway lighting projects
Hub Presentation/Use	MnSASP Hub/System Performance: Adequate Navigational Systems [Metric] MnSASP Hub/Airport Performance: Runway Lighting [Metric], Navigation Systems [Metric]
MnSASP Hub Layer/Table (if applicable)	MnSASP Hub Airport Data/Runway/Taxiway Data
MnDOT Aeronautics Responsibility	Airport planning staff
Data Manipulation Plan from Raw State (if applicable)	Each record in ADIP's downloadable runway dataset includes data for each runway at the airports selected in the advanced search. However, this dataset only includes the FAA site number (#) as the airport identifier for each runway record. For joining the FAA IDs to each runway record for updating the "Runway/Taxiway Data" table in the Hub, refer to the instructions included in Section 6.4.2.3.

Source: Kimley-Horn, 2022

Table 6.37. Runway Visibility Minimums

Data Assessment	Runway Visibility Minimums
Data Point(s)	Base End Minimums Reciprocal End Minimums
Data Type	Tabular data
Description	Approach visibility minimums identify the shortest visible distance that a runway can be safely utilized for an aircraft approach. Each runway end can be equipped with different NAVAIDs that provide a different level of approach guidance and landing capability for pilots. Approach minimums are also determined by topography and terrain characteristics of the area surrounding the airport.
Source(s)	FAA ADIP: https://adip.faa.gov/agis/public/#/public
Source(s) Details	ADIP maintains FAA-published approach plates associated with all active approach procedures available at airports that denotes the visibility minimums associated with each type of runway approach. See Section 6.4.2.6 for instructions on obtaining visibility minimums from approach plates.
Date of Initial Data Collection	09/30/2021
Update Cycle	As required based on trigger point for evaluation

Data Assessment	Runway Visibility Minimums
Trigger Point(s) for Evaluation Outside of Update Cycle	Development of a new or modification of an existing runway approach
Hub Presentation/Use	MnSASP Hub/System Performance: Adequate Approaches to Airports [Metric] MnSASP Hub/Airport Performance: Primary Runway Approaches [Metric]
MnSASP Hub Layer/Table (if applicable)	MnSASP Hub Airport Data/Runway/Taxiway Data
MnDOT Aeronautics Responsibility	Airport planning staff
Data Manipulation Plan from Raw State (if applicable)	Runway visibility minimums can be pulled by reviewing FAA-published approach plates available in ADIP. See **Section 6.4.2.6** for instructions on pulling the visibility minimums from approach plates.

Source: Kimley-Horn, 2022

Table 6.38. Runway Obstructions

Data Assessment	Runway Obstructions
Data Point(s)	Base End Obstructions Reciprocal End Obstructions
Data Type	Tabular data
Description	The critical areas surrounding runways must be clear of obstructions. These data points store close-in obstructions (obstructions within 200 feet of a runway end) that are cited in an airport's last 5010 inspection.
Source(s)	FAA ADIP: https://adip.faa.gov/agis/public/#/public
Source(s) Details	The data points are included in a downloadable "Remarks" dataset available through the ADIP advanced search query. See **Section 6.4.2.5** for the Data Manipulation Plan associated with the "Remarks" dataset.
Date of Initial Data Collection	09/30/2021
Update Cycle	Annually
Trigger Point(s) for Evaluation Outside of Update Cycle	Completion of a runway obstruction removal project or comprehensive obstruction evaluation study
Hub Presentation/Use	MnSASP Hub/System Performance: Airport Surfaces Clear of Obstructions [Metric] MnSASP Hub/Airport Performance: Airport Surfaces [Metric] MnSASP Hub / MnSASP Report Card: Airport Obstructions [Metric]
MnSASP Hub Layer/Table (if applicable)	MnSASP Hub Airport Data/Runway/Taxiway Data
MnDOT Aeronautics Responsibility	Airport planning staff
Data Manipulation Plan from Raw State (if applicable)	As a part of airport 5010 inspections, runways are evaluated for close-in obstructions, which present the most acute risk to arriving/departing aircraft.

Data Assessment	Runway Obstructions
	This runway obstruction information is published in the airport's 5010 report under the Remarks section. FAA's ADIP database organizes the Remarks data into a separate downloadable dataset that can be pulled using the advanced facilities search query in ADIP. Refer to **Section 6.4.2.5** for instructions on pulling the Remarks data and manipulating the dataset to conform with the MnSASP data.

Source: Kimley-Horn, 2022

Table 6.39. Taxiway Attributes

Data Assessment	Taxiway Attributes
Data Point(s)	Taxiway Type Taxiway Width
Data Type	Tabular data
Description	Taxiways serve as intermediary connections to connect aircraft between parking/storage facilities and runways. There are several types of taxiways that provide for differing levels of aircraft movement capability: full parallel taxiways, partial parallel taxiways, and connector taxiways. The type of taxiway most appropriate for a specific airport is dependent on the type and frequency of aviation activity witnessed and airside geometry.
Source(s)	MnSASP Airport Inventory
Source(s) Details	None
Date of Initial Data Collection	06/02/21 (2022 MnSASP Update)
Update Cycle	As required based on trigger point for evaluation
Trigger Point(s) for Evaluation Outside of Update Cycle	Taxiway improvement project
Presentation/Use	MnSASP Hub/Airport Performance: Parallel Taxiway [Metric], Taxiway Width [Metric]
MnSASP Hub Layer/Table (if applicable)	MnSASP Hub Airport Data/Runway/Taxiway Data
MnDOT Aeronautics Responsibility	Airport planning staff
Data Manipulation Plan from Raw State (if applicable)	None

Source: Kimley-Horn, 2022

6.3.5. AIRCRAFT STORAGE

MnDOT Aeronautics can use aircraft storage capacity and occupancy data to identify specific airports, regions, or airport classifications where capacity needs exist or to measure the total capacity across the system. Aircraft storage options such as tiedowns, t-hangars, and box hangars are available across the system. The following tables document all the data points included in the MnSASP data related to aircraft storage.

Table 6.40. Hangars

Data Assessment	Hangars
Data Point(s)	T-Hangar Total Spaces T-Hangar Spaces Occupied Box Hangar - Based Aircraft Total Spaces Box Hangar - Based Aircraft Heat Box Hangar - Based Aircraft Occupied Box Hangar - Based Aircraft Square Footage Box Hangar - Transient Aircraft Total Spaces Box Hangar - Transient Aircraft Heating Box Hangar - Transient Aircraft Square Footage Total Hangar Spaces Total Hangar Spaces Occupied T-Hangar Shortage Box Hangar Shortage Hangar Shortage Description Hangar Waitlist
Data Type	Tabular data
Description	Aircraft hangars are used to store aircraft indoors while not in-use. Two types of hangars are common in Minnesota: T-hangars for small GA aircraft and box hangars for large GA and commercial service aircraft including jets. In Minnesota, many aircraft hangars are climate-controlled to avoid inclement weather and protect against the cold winter season. Airports without excess capacity (i.e., no available spaces) may maintain a hangar waitlist to track needs and contact individuals seeking a hangar when space becomes available.
Source(s)	MnSASP Airport Inventory
Source(s) Details	None
Date of Initial Data Collection	06/02/21 (2022 MnSASP Update)
Update Cycle	Annually
Trigger Point(s) for Evaluation Outside of Update Cycle	New hangar construction
Hub Presentation/Use	MnSASP Hub/Airport Performance: Transient Aircraft Storage [Metric]
MnSASP Hub Layer/Table (if applicable)	MnSASP Hub Airport Data/Aircraft Storage
MnDOT Aeronautics Responsibility	Airport planning staff
Data Manipulation Plan from Raw State (if applicable)	None

Source: Kimley-Horn, 2022

Table 6.41. Tiedowns

Data Assessment	Tiedowns
Data Point(s)	Paved Tiedown - Based Aircraft Spaces Paved Tiedown - Based Aircraft Spaces Occupied Paved Tiedown - Transient Aircraft Spaces Grass Tiedown - Based Aircraft Spaces Grass Tiedown - Based Aircraft Spaces Occupied Grass Tiedown - Transient Aircraft Spaces Total Tiedown Spaces Total Tiedown Spaces Occupied
Data Type	Tabular data
Description	Aircraft tiedowns allow for both based and transient aircraft to park outdoors for short-term and long-term use. Tie-downs may be installed on paved aprons or grass/turn areas.
Source(s)	MnSASP Airport Inventory
Source(s) Details	None
Date of Initial Data Collection	06/02/21 (2022 MnSASP Update)
Update Cycle	Annually
Trigger Point(s) for Evaluation Outside of Update Cycle	Addition of new tiedown spaces, apron improvement project, or a hangar construction project
Hub Presentation/Use	MnSASP Hub/Airport Performance: Aircraft Parking [Metric]
MnSASP Hub Layer/Table (if applicable)	MnSASP Hub Airport Data/Aircraft Storage
MnDOT Aeronautics Responsibility	Airport planning staff
Data Manipulation Plan from Raw State (if applicable)	None

Source: Kimley-Horn, 2022

6.3.6. PLANNING AND SPECIAL STUDIES

Airport planning efforts evaluate the current conditions at airports against existing and forecasted future aviation activities; state, federal, and local requirements; and other factors to identify future improvement needs. Because airport improvements typically rely on public funds, it is important for MnDOT Aeronautics to maintain records of all aviation facility planning documentation. MnDOT Aeronautics can use this documentation to make informed decisions about project priorities, resource allocation, and grant management. The following tables document all the data points included in the MnSASP data related to planning and special studies completed at system airports.

Table 6.42. Clear Zone Information (Tabular Data)

Data Assessment	Clear Zone Information
Data Point(s)	Clear Zone Depicted on ALP Clear Zone Ownership Clear Zone Ownership Description Clear Zone Maintenance Description
Data Type	Tabular data (associated spatial layer summarized in Table 6.61)
Description	Clear zones are trapezoidal shapes beyond each runway end that should be clear of all airspace obstructions and owned in fee simple to provide for the highest level of control and airport land use compatibility. These surfaces are based on the approach type at a given runway end and Part 77 surfaces (primary surface and approach surface). Per the MnDOT Clear Zone Policy, airport owners are encouraged to purchase clear zones in fee title or complete a MnDOT-approved Clear Zone Acquisition Plan (CZAP).
Source(s)	MnSASP Airport Inventory
Source(s) Details	None
Date of Initial Data Collection	06/02/21 (2022 MnSASP Update)
Update Cycle	Biennially
Trigger Point(s) for Evaluation Outside of Update Cycle	- Clear zones should be confirmed to be depicted on ALP during ALP approval - Clear zone ownership/description should be evaluated upon clear zone acqusition - Clear zone maintenance should be evaluated in conjunction with clear zone acqusition or an obstruction removal project
Hub Presentation/Use	MnSASP Hub/Airport Performance: Clear Zone Ownership [Metric]
MnSASP Hub Layer/Table (if applicable)	MnSASP Hub Airport Data/Planning and Special Studies
MnDOT Aeronautics Responsibility	Airport planning staff
Data Manipulation Plan from Raw State (if applicable)	N/A

Source: Kimley-Horn, 2022

Table 6.43. Economic Impact

Data Assessment	Economic Impact
Data Point(s)	Economic Impact - Total Employment Economic Impact - Total Payroll Economic Impact - Total Spending Total Annually Economic Activity Economic Impact Brochure Link
Data Type	Tabular data

Data Assessment	Economic Impact
Description	Airports generate economic benefit to local, regional, and statewide economies through on-airport activities and visitor spending measured in terms of annual employment, payroll, spending, and economic activity.
Source(s)	MnDOT Aeronautics Statewide Airport Economic Impact Study (2019): http://www.dot.state.mn.us/airport-economic-study/
Source(s) Details	The Statewide Airport Economic Impact Study Technical Report includes all the economic impact data for each airport.
Date of Initial Data Collection	10/28/2021 (2019 Statewide Airport Economic Impact Study)
Update Cycle	Completion of a new Statewide Airport Economic Impact Study (anticipated every five to seven years)
Trigger Point(s) for Evaluation Outside of Update Cycle	None
Hub Presentation/Use	MnSASP Hub/System Performance: Economic Impact [Indicator] MnSASP Hub / Airport Dashboards: Airport Economic Impact Dashboard
MnSASP Hub Layer/Table (if applicable)	MnSASP Hub Airport Data/Planning and Special Studies
MnDOT Aeronautics Responsibility	Airport planning staff
Data Manipulation Plan from Raw State (if applicable)	None

Source: Kimley-Horn, 2022

Table 6.44. Federal Funding

Data Assessment	Federal Funding
Data Point(s)	Federal Funds
Data Type	Tabular data
Description	Public funds are often used to support airport improvement projects, operations, and maintenance of existing facilities. For airports included in the NPIAS, this funding can come from the FAA's AIP. This data point reports the average AIP funding received over the last four years.
Source(s)	FAA AIP Grant Histories: https://www.faa.gov/airports/aip/grant_histories/lookup/
Source(s) Details	None
Date of Initial Data Collection	3/15/2021 (Reflects average AIP funding from 2017-2020)
Update Cycle	Annually
Trigger Point(s) for Evaluation Outside of Update Cycle	None

Data Assessment	Federal Funding
Hub Presentation/Use	None
MnSASP Hub Layer/Table (if applicable)	MnSASP Hub Airport Data/Planning and Special Studies
MnDOT Aeronautics Responsibility	Airport planning staff
Data Manipulation Plan from Raw State (if applicable)	See **Section 6.4.2.7** for guidance on pulling and organizing the AIP data and organizing the dataset to conform with the MnSASP data.

Source: Kimley-Horn, 2022

Table 6.45. Land Development / Use

Data Assessment	Land Development / Use
Data Point(s)	Available Land for Development Available Land for Development Description Available Land for Development - Water Available Available Land for Development - Gas Available Available Land for Development - Electric Available Available Land for Development - Sewer Available Available Land for Development - ALP Indicated Limitations for Development Limitations for Development Description Land Use or Transportation Planning Land Use or Transportation Planning Description
Data Type	Tabular data
Description	The ability to complete airport development projects is often dictated by the land available for use and the utilities available to support proposed facilities and services. This type of planning is typically completed as a part of an ALP and/or master plan update. Additionally, airports may be included in broader county/municipality planning efforts as documented in land use and transportation plans.
Source(s)	MnSASP Airport Inventory
Source(s) Details	None
Date of Initial Data Collection	06/02/21 (2022 MnSASP Update)
Update Cycle	Biennially
Trigger Point(s) for Evaluation Outside of Update Cycle	ALP and/or master plan updates
Hub Presentation/Use	None
MnSASP Hub Layer/Table (if applicable)	MnSASP Hub Airport Data/Planning and Special Studies

Data Assessment	Land Development / Use
MnDOT Aeronautics Responsibility	Airport planning staff
Data Manipulation Plan from Raw State (if applicable)	None

Source: Kimley-Horn, 2022

Table 6.46. Local Obstruction Study

Data Assessment	Local Obstruction Study
Data Point(s)	Local Obstruction Study Local Obstruction Study Year
Data Type	Tabular data
Description	Airports may complete an obstruction study (independent of the close-in obstruction evaluation completed with 5010 inspections) to detail any obstacles into critical airspace on or in the vicinity of airports that can pose a risk to aircraft operations and people and property on the ground.
Source(s)	MnSASP Airport Inventory
Source(s) Details	None
Date of Initial Data Collection	06/02/21 (2022 MnSASP Update)
Update Cycle	As required based on trigger point for evaluation
Trigger Point(s) for Evaluation Outside of Update Cycle	Completion of a local obstruction study or ALP with AGIS survey
Hub Presentation/Use	None
MnSASP Hub Layer/Table (if applicable)	MnSASP Hub Airport Data/Planning and Special Studies
MnDOT Aeronautics Responsibility	Airport planning staff
Data Manipulation Plan from Raw State (if applicable)	None

Source: Kimley-Horn, 2022

Table 6.47. Master Plan / Airport Layout Plan

Data Assessment	Master Plan / ALP
Data Point(s)	Master Plan Master Plan Year ALP Narrative ALP Narrative Year ALP No Narrative ALP No Narrative Year

Data Assessment	Master Plan / ALP
Data Type	Tabular data
Description	ALPs provide a graphical representation of existing/planned facilities and design standards at an airport. An airport master plan serves as an airport's long-term strategic plan to guide future development. In lieu of completing a comprehensive master plan, the ALPs may also be completed in conjunction with a narrative report to document existing conditions and future facility needs.
Source(s)	MnSASP Airport Inventory
Source(s) Details	None
Date of Initial Data Collection	06/02/21 (2022 MnSASP Update)
Update Cycle	None
Trigger Point(s) for Evaluation Outside of Update Cycle	Completion and MnDOT approval of a master plan, ALP, and/or narrative report
Hub Presentation/Use	MnSASP Hub/System Performance: Up-to-Date Planning Documents [Metric] MnSASP Hub/Airport Performance: Airport Layout Plans [Metric]
MnSASP Hub Layer/Table (if applicable)	MnSASP Hub Airport Data/Planning and Special Studies
MnDOT Aeronautics Responsibility	Airport Layout Plan Coordinator
Data Manipulation Plan from Raw State (if applicable)	None

Source: Kimley-Horn, 2022

Table 6.48. Minimum Standards

Data Assessment	Minimum Standards
Data Point(s)	Minimum Standards Minimum Standards Description
Data Type	Tabular data
Description	Minimum standards document the minimum requirements that must be met by all airport users to provide a safe operating environment; protect the public, airport facilities, users, and tenants; and provide for fair and equitable commercial activities.
Source(s)	MnSASP Airport Inventory
Source(s) Details	None
Date of Initial Data Collection	06/02/21 (2022 MnSASP Update)
Update Cycle	Bienially
Trigger Point(s) for Evaluation Outside of Update Cycle	Adoption of new minimum standards

Data Assessment	Minimum Standards
Hub Presentation/Use	MnSASP Hub/Airport Performance: Minimum Standards [Metric]
MnSASP Hub Layer/Table (if applicable)	MnSASP Hub Airport Data/Planning and Special Studies
MnDOT Aeronautics Responsibility	Airport planning staff
Data Manipulation Plan from Raw State (if applicable)	None

Source: Kimley-Horn, 2022

Table 6.49. Part 150 Study

Data Assessment	Part 150 Study
Data Point(s)	Part 150 Part 150 Year
Data Type	Tabular data
Description	Airports complete a Part 150 Noise Compatibility Study to determine to measure existing and future noise generated by an airports and its impacts on the surrounding community. These studies also identify mitigation techniques to reduce noise over sensitive airports and provide recommended actions to enhance airport land use compatibility. Part 150 studies include noise exposure maps to depict the volume of noise experienced in the vicinity of an airport.
Source(s)	MnSASP Airport Inventory
Source(s) Details	None
Date of Initial Data Collection	06/02/21 (2022 MnSASP Update)
Update Cycle	As required based on trigger point for evaluation
Trigger Point(s) for Evaluation Outside of Update Cycle	Completion and approval of a Part 150 Noise Compatibility Study
Hub Presentation/Use	None
MnSASP Hub Layer/Table (if applicable)	MnSASP Hub Airport Data/Planning and Special Studies
MnDOT Aeronautics Responsibility	Airport planning staff
Data Manipulation Plan from Raw State (if applicable)	None

Source: Kimley-Horn, 2022

Table 6.50. Pavement Condition Report

Data Assessment	Pavement Condition Report
Data Point(s)	Pavement Condition Report
Data Type	Tabular data (web links)
Description	MnDOT Aeronautics oversees the Airport Pavement Management System (APMS) for nearly all paved airports in Minnesota.[15] This includes completing periodic inspections of all airfield pavement at study airports to determine the pavement condition index (PCI). This evaluation is published in individual pavement condition reports completed for each airport participating in the APMS.
Source(s)	MnDOT Aeronautics APMS[16]
Source(s) Details	The APMS is inclusive of all airports in the state aviation system (see Date of Initial Data Collection).
Date of Initial Data Collection	MnDOT Aeronautics Airport Pavement Management System: 12/01/2021 (includes 103 paved airports in Minnesota not managed by the Metropolitan Airports Commission [MAC])
Update Cycle	Annually for a third of the airports in each system cycle
Trigger Point(s) for Evaluation Outside of Update Cycle	Completed airport pavement inspection
Hub Presentation/Use	MnSASP Hub/System Performance: PCI [Metric] MnSASP Hub / Airport Geodata: Airfield Pavement Dashboard
MnSASP Hub Layer/Table (if applicable)	MnSASP Hub Airport Data/Planning and Special Studies
MnDOT Aeronautics Responsibility	MnDOT APMS Coordinator
Data Manipulation Plan from Raw State (if applicable)	None

Source: Kimley-Horn, 2022

Table 6.51. State and Local Funding

Data Assessment	State and Local Funding
Data Point(s)	State Funds Local Funds
Data Type	Tabular data
Description	Public funds are generally used to support airport capital improvements projects and ongoing operating expenses at nearly all publicly owned, public use airports in Minnesota. This funding can come from state and/or local sources.

[15] MnDOT's APMS includes paved airports in the Minnesota state aviation system that are not managed by the MAC.
[16] Pavement management data collected through the MnDOT APMS is available online at https://www.dot.state.mn.us/aero/airportdevelopment/pavementmanagement.html (accessed December 2021).

Data Assessment	State and Local Funding
	This data point reports the average historical funding received from state and local government sources in the last four years.
Source(s)	MnDOT Aeronautics ACE database
Source(s) Details	The ACE database generates a historical report of expenditures in an Excel format. See Section 6.4.2.7 for manipulating this Excel output for calculating the total state and local funding by state system airport.
Date of Initial Data Collection	04/01/2021
Update Cycle	Annually
Trigger Point(s) for Evaluation Outside of Update Cycle	None
Hub Presentation/Use	None
MnSASP Hub Layer/Table (if applicable)	MnSASP Hub Airport Data/Planning and Special Studies
MnDOT Aeronautics Responsibility	Airport planning staff
Data Manipulation Plan from Raw State (if applicable)	See Section 6.4.2.7 for manipulating the Excel output generated by ACE for calculating the total state and local funding by system airport.

Source: Kimley-Horn, 2022

6.3.7. AVIATION WEATHER STATIONS

Weather reporting facilities (i.e., AWOS/ASOS) broadcast weather information over the radio as a flight planning aid for pilots. The following tables document all the data points included in the MnSASP data related to aviation weather stations in the system.

Table 6.52. Weather Station Type

Data Assessment	Weather Station Type
Data Point(s)	Type
Data Type	Point layer/Tabular data
Description	Weather reporting facilities broadcast weather information over a radio frequency for pilots to use when flying. The two types of facilities include an AWOS and ASOS (denoted in the data point "Type").
Source(s)	FAA Surface Weather Observation Stations: https://www.faa.gov/air_traffic/weather/asos/?state=MN
Source(s) Details	The FAA's Surface Weather Observation Stations webpage lists all the active AWOS/ASOS weather stations in Minnesota.
Date of Initial Data Collection	09/01/2021
Update Cycle	As required based on trigger point for evaluation
Trigger Point(s) for Evaluation Outside of Update Cycle	Installation or decommissioning of an AWOS/ASOS

Data Assessment	Weather Station Type
Hub Presentation/Use	MnSASP Hub/Airport Performance: Weather Reporting [Metric] MnSASP Hub / Airport Geodata: Weather Stations & NAVAIDs Dashboard
MnSASP Hub Layer/Table (if applicable)	MnSASP Hub Airport Data/Aviation Weather Stations
MnDOT Aeronautics Responsibility	Airport development staff
Data Manipulation Plan from Raw State (if applicable)	None. Additional information regarding the MnSASP Weather Station Visual Assessment is available in **Appendix C. Minnesota NAVAIDs** of the 2022 MnSASP Technical Report.

Source: Kimley-Horn, 2022

Table 6.53. Weather Stations Coordinates

Data Assessment	Weather Station Coordinates
Data Point(s)	Latitude Longitude
Data Type	Spatial data (points)
Description	Coordinate data for the aviation weather stations in Minnesota (maintained as latitude/longitude data in ADIP) is used to identify the location of each weather facility and serves as the main reference for plotting each weather station point in the "MN Aviation Weather Stations" layer.
Source(s)	MnDOT Aeronautics
Source(s) Details	As a part of the MnSASP Weather Station Visual Assessment, all weather stations were validated against the FAA's ADIP.
Date of Initial Data Collection	09/01/2021
Update Cycle	As required based on trigger point for evaluation
Trigger Point(s) for Evaluation Outside of Update Cycle	Installation or decommissioning of an AWOS/ASOS
Hub Presentation/Use	MnSASP Hub/Airport Geodata: Weather Stations & NAVAIDs Dashboard
MnSASP Hub Layer/Table (if applicable)	MnSASP Hub Airport Data/Aviation Weather Stations
MnDOT Aeronautics Responsibility	Airport development staff
Data Manipulation Plan from Raw State (if applicable)	Refer to **Section 6.4.1.1** for converting the coordinates in DMS format to decimal degrees to conform with the MnSASP data parameters.

Source: Kimley-Horn, 2022

Table 6.54. Live Weather Station Data

Data Assessment	Live Weather Station Data
Data Point(s)	METAR Data Link
Data Type	Tabular data (web links)
Description	Live weather readings from each weather station in the system can be accessed through the web links populated in the data point "METAR Data Link." These data are in the format of METAR reports.

Data Assessment	Live Weather Station Data
Source(s)	National Oceanic and Atmospheric Administration (NOAA) Aviation Weather Center (AWC) Meteorological Aerodrome Reports (METARs): https://www.aviationweather.gov/metar
Source(s) Details	None
Date of Initial Data Collection	09/01/2021
Update Cycle	As required based on trigger point for evaluation
Trigger Point(s) for Evaluation Outside of Update Cycle	Installation or decommissioning of an AWOS/ASOS
Hub Presentation/Use	MnSASP Hub/Airport Performance: Weather Reporting [Metric] MnSASP Hub / Airport Geodata: Weather Stations & NAVAIDs Dashboard
MnSASP Hub Layer/Table (if applicable)	MnSASP Hub Airport Data/Aviation Weather Stations
MnDOT Aeronautics Responsibility	Airport development staff
Data Manipulation Plan from Raw State (if applicable)	None

Source: Kimley-Horn, 2022

Table 6.55. Weather Station Visual Assessment

Data Assessment	Weather Station Visual Assessment
Data Point(s)	Validation On Airport? Remarks Sighting Assessment
Data Type	Tabular data
Description	As a part of the 2022 MnSASP, a visual assessment was completed for all weather stations to identify any obstructions within their critical area based on FAA siting requirements. The findings of this visual assessment are documented within these data points: - Validation: Confirming that the weather station is operational in the system - On Airport: Denoting whether the airport is on airport property - Remarks: Additional notes on validating the weather station and its location - Sighting Assessment: Notes any obstructions within the critical areas surrounding the weather stations[17]
Source(s)	MnSASP Weather Station Visual Assessment
Source(s) Details	As a part of the MnSASP Weather Station Visual Assessment, all weather stations were validated against information provided in the FAA's ADIP.
Date of Initial Data Collection	09/01/2021
Update Cycle	Triennially
Trigger Point(s) for Evaluation Outside of Update Cycle	Installation or decommissioning of an AWOS/ASOS

[17] *Critical areas around aviation weather stations are defined per FAA Order 6560.20C.*

Data Assessment	Weather Station Visual Assessment
Hub Presentation/Use	MnSASP Hub/Airport Performance: Weather Reporting [Metric] MnSASP Hub / Airport Geodata: Weather Stations & NAVAIDs Dashboard
MnSASP Hub Layer/Table (if applicable)	MnSASP Hub Airport Data/Aviation Weather Stations
MnDOT Aeronautics Responsibility	Airport development staff
Data Manipulation Plan from Raw State (if applicable)	The visual assessment was a manual process that utilized Google Earth satellite imagery to evaluate each weather station for obstructions that are potentially contributing to errant data being collected. Additional information regarding the MnSASP Weather Station Visual Assessment is available in **Appendix C** of the 2022 MnSASP Technical Report.

Source: Kimley-Horn, 2022

6.3.8. AIRFIELD PAVEMENT

Airfield pavement represents the most important asset to an airport for supporting aircraft activity. It can also represent the greatest expense for an airport to maintain. To help airports preserve this critical aviation facility, MnDOT Aeronautics maintains the APMS to evaluate all airside pavement and develop prioritized recommendations for their ongoing maintenance. This includes completing periodic inspections of all airfield pavement across the system to make informed decisions about pavement preservation needs. The following tables document all the data points included in the MnSASP data related to airfield pavement.

Table 6.56. Airfield Pavement

Data Assessment	Airfield Pavement
Data Point(s)	FAA ID Branch ID Section ID Pavement Use FOD Index PCI Assessment Surface Area (sqft) FOD Inspection Date PCI Inspection Date Shape
Data Type	Polygon layer/Tabular data
Description	MnDOT Aeronautics oversees an APMS for nearly all paved airports in Minnesota.[18] This includes completing periodic inspections of all airfield pavement across the airports in the system and evaluating pavement condition by individual segment (identified as the data point "Section ID"). Pavement condition is evaluated on a scale known as PCI ranging from zero to 100, with zero indicating complete failure and 100 indicating perfect condition (data point "PCI"). Additionally, pavement is also evaluated by the susceptibility of foreign object debris (FOD) created from the pavement (data point "FOD Index").

[18] *MnDOT's APMS includes paved airports in the Minnesota state aviation system that are not managed by the MAC].*

Data Assessment	Airfield Pavement
Source(s)	MnDOT Aeronautics APMS[19]
Source(s) Details	This layer includes 103 paved airports in Minnesota not managed by the MAC.
Date of Initial Data Collection	MnDOT Aeronautics Airport Pavement Management System: 12/01/2021
Update Cycle	Annually for a third of the airports in each system cycle
Trigger Point(s) for Evaluation Outside of Update Cycle	Airfield pavement improvement project
Hub Presentation/Use	MnSASP Hub/System Performance: PCI [Metric] MnSASP Hub/Airport Geodata: Airfield Pavement Dashboard
MnSASP Hub Layer/Table (if applicable)	MnSASP Hub Airport Data/Airfield Pavement
MnDOT Aeronautics Responsibility	MnDOT Aeronautics Pavement Management staff
Data Manipulation Plan from Raw State (if applicable)	The APMS uses PAVER to map all airfield pavement at study airports and store data collected during pavement inspections (PCI, FOD). Upon completion of a new airport pavement inspection cycle, the updated inspection data needs to be reflected in the existing layer in the Hub. Nearly all the data maintained in PAVER have the same field names as the existing layer in the MnSASP data (except for FAA ID, which is recorded as NetworkID in PAVER). For adding new pavement segments, append the new polygon data to the existing layer in the Hub. Note that there are several fields in the existing layer that were added and populated through manual work and code. See below for populating these fields: - Pavement Use: Manual entry - Surface Area (sqft): Use the "Calculate" function in ArcGIS Online to calculate the square footage for the pavement segments (refer to the MnSASP Hub User's Guide for guidance on using the function)

Source: Kimley-Horn, 2022

6.3.9. NAVAIDS

NAVAIDs are critical facilities to maintain in the system for pilots to safety and efficiently navigate through airspace and provide guidance in low visibility conditions including nighttime and inclement weather. The following tables document all the data points included in the MnSASP data related to NAVAIDs in the system.

Table 6.57. Instrument Landing System

Data Assessment	Instrument Landing System
Data Point(s)	Type NAVAID Name Latitude Longitude Magnetic Variation Elevation (ft)

[19] *MnDOT Aeronautics AMPS data is available online at https://www.dot.state.mn.us/aero/airportdevelopment/pavementmanagement.html (accessed December 2021).*

Data Assessment	Instrument Landing System
	City State Owner Operator Ownership Type Facility ID
Data Type	Point layer / Tabular data
Description	An airport ILS is a radio-based NAVAID for short-range guidance with aircraft landing in low-visibility conditions.
Source(s)	MnDOT Aeronautics Airport Development Staff ArcGIS analysis
Source(s) Details	Airport development staff maintains a data repository of state-managed NAVAIDs in Minnesota including mapping coordinate data. Refer to the MnSASP Hub User's Guide for guidance on mapping coordinate data in the Hub.
Date of Initial Data Collection	08/04/2021
Update Cycle	As required based on trigger point for evaluation
Trigger Point(s) for Evaluation Outside of Update Cycle	Installation of a new NAVAID or decommissioning of existing equipment
Hub Presentation/Use	MnSASP Hub/Airport Geodata: Weather Stations & NAVAIDs Dashboard
MnSASP Hub Layer/Table (if applicable)	NAVAIDs/Instrument Landing System (ILS)
MnDOT Aeronautics Responsibility	Navigation systems engineering team
Data Manipulation Plan from Raw State (if applicable)	Coordinate data (latitude, longitude) is usually recorded in DMS format, which is incompatible for the MnSASP data (plotting the points in ArcGIS). See **Section 6.4.1** for instructions on converting from DMS to decimal degrees to conform with the MnSASP data parameters.

Source: Kimley-Horn, 2022

Table 6.58. VOR/DME/TACAN/VORTAC Location Points

Data Assessment	VOR/DME/TACAN/VORTAC Location Points
Data Point(s)	Type Latitude Longitude Magnetic Variation Facility Name Database Elevation (ft) Facility ID NAVAID Name City Validation Date FAA Region Owner Operator

Data Assessment	VOR/DME/TACAN/VORTAC Location Points
	Class Service Coverages (nm) Hours of Operation ARTCC Channel Frequency Status Ownership Type
Data Type	Point layer/Tabular data
Description	This layer stores the location points for all active VOR/DME, TACAN, and VORTAC stations in Minnesota. Very high frequency omni-directional range (VOR) are radio-based NAVAIDs used for route navigation. These systems are often paired with distance measuring equipment (DME) to provide pilots with the distance to/from a VOR station. A tactical air navigation system (TACAN) is a specialized NAVAID that provides similar navigational guidance as VOR/DME but are specifically used to support military operations. Co-located VORs and TACANs are known as VORTACs.
Source(s)	- MnDOT Airport Development Staff - ArcGIS analysis
Source(s) Details	Airport development staff maintains a data repository of state-managed NAVAIDs in Minnesota including coordinate data. Refer to the MnSASP Hub User's Guide for guidance on mapping the location points in the Hub.
Date of Initial Data Collection	08/04/2021
Update Cycle	As required based on trigger point for evaluation
Trigger Point(s) for Evaluation Outside of Update Cycle	Installation of a new NAVAID or decommissioning of existing equipment
Hub Presentation/Use	MnSASP Hub/Airport Geodata: Weather Stations & NAVAIDs Dashboard
MnSASP Hub Layer/Table (if applicable)	NAVAIDs/VOR/DME/TACAN/VORTAC Location Points
MnDOT Aeronautics Responsibility	Navigation systems engineering team
Data Manipulation Plan from Raw State (if applicable)	The coordinate data (Latitude, Longitude) is usually recorded in DMS format, which is incompatible for the MnSASP data (plotting the points in ArcGIS). See **Section 6.4.1** for instructions on converting from DMS to decimal degrees to conform with the MnSASP data parameters.

Source: Kimley-Horn, 2022

Table 6.59. VOR/DME/TACAN/VORTAC Service Buffers

Data Assessment	VOR/DME/TACAN/VORTAC Service Buffers
Data Point(s)	Database Type Latitude Longitude Magnetic Variation Facility Name Elevation (ft)

Data Assessment	VOR/DME/TACAN/VORTAC Service Buffers
	Facility ID NAVAID Name City Validation Date FAA Region Owner Operator Class Hours of Operation ARTCC Channel Frequency Status Buffer Distance (nm) Minimum Elevation (ft) Maximum Elevation (ft) Ownership Type
Data Type	Spatial data (polygons)
Description	This layer stores the service buffers for all active VOR/DME, TACAN, and VORTAC stations in Minnesota. VOR are radio-based NAVAIDs used for route navigation. These systems are often paired with DME to provide pilots with the distance to/from a VOR station. A TACAN system is a specialized NAVAID that provide similar navigational guidance as VOR/DME but specifically support military operations. Co-located VORs and TACANs are known as VORTACs.
Source(s)	- MnDOT Airport Development Staff - ArcGIS analyses
Source(s) Details	Airport development staff maintains a data repository of state-managed NAVAIDs in Minnesota. Refer to Section 6.4.1.4 for assigning the service coverages to each NAVAID. Refer to the MnSASP Hub User's Guide for guidance on mapping the service buffers (polygons) in the Hub.
Date of Initial Data Collection	08/04/2021
Update Cycle	As required based on trigger point for evaluation
Trigger Point(s) for Evaluation Outside of Update Cycle	Installation of a new NAVAID or decommissioning of existing equipment
Hub Presentation/Use	MnSASP Hub/Airport Geodata: Weather Stations & NAVAIDs Dashboard
MnSASP Hub Layer/Table (if applicable)	NAVAIDs/VOR/DME/TACAN/VORTAC Service Buffers
MnDOT Aeronautics Responsibility	Navigation systems engineering team
Data Manipulation Plan from Raw State (if applicable)	The coordinate data (Latitude, Longitude) is usually recorded in DMS format, which is incompatible for the MnSASP data (plotting the points in ArcGIS). See **Section 6.4.1** for instructions on converting from DMS to decimal degrees to conform with the MnSASP data parameters.

Source: Kimley-Horn, 2022

6.3.10. AIRPORT ZONING

In accordance with Minnesota Statutes and public airport licensing requirements, airport sponsors must have an established zoning authority for the airport, or be in the process of doing so, to receive various types of state funding.[20] Additionally, communities within airport influence areas must also enact airport compatible zoning in accordance with state law. The following table documents all the data points included in the MnSASP data related to airport zoning.

Table 6.60. Zoning

Data Assessment	Zoning
Data Point(s)	Zone Type Shape Area (acres) Shape Year
Data Type	Spatial data (polygons)
Description	Each airport adopts a safety zoning ordinance that in conformance with the standards in Minnesota Rules Chapter 8800.2400. Safety zoning ordinances define the airport compatible land uses in and around airports that must be restricted to enhance the operational safety of aircraft and protect people and property. Minnesota Rules defines three types of zones with different land use regulation: Zone A, Zone B, and Zone C. Refer to **Section 6.4.1.5** for a sample graphic depicting each zone type.
Source(s)	MnDOT Aeronautics Zoning Information Warehouse: https://www.dot.state.mn.us/aero/planning/zoning-warehouse.html
Source(s) Details	None
Date of Initial Data Collection	08/17/2021 ("Year" data point denotes the year of the most recent update to each airport's zoning ordinance)
Update Cycle	As required based on trigger point for evaluation
Trigger Point(s) for Evaluation Outside of Update Cycle	- Updates to airport zoning ordinances - Airport land acquisition
Hub Presentation/Use	MnSASP Hub/System Performance: Adequate Safety Zoning Ordinances [Metric] MnSASP Hub/Airport Performance: Airport Zoning [Metric] MnSASP Hub/Airport Geodata: Airport Safety Areas Dashboard
MnSASP Hub Layer/Table (if applicable)	MnSASP Hub Airport Data/Airport Zoning
MnDOT Aeronautics Responsibility	Airport planning staff
Data Manipulation Plan from Raw State (if applicable)	For updating this layer, remove and append the new polygon data to the existing layer in the Hub. Refer to the MnSASP Hub User's Guide for guidance on mapping the polygons in the Hub. Note that there are several fields in the existing layer that were added and populated through manual work and code: - Zone Type, Year: Manual entry - Shape Area (acres): Use the "Calculate" function in ArcGIS Online to calculate the area of each zone in acres (refer to the MnSASP Hub User's Guide for guidance on using the function)

Source: Kimley-Horn, 2022

[20] *Per Minnesota Statutes Chapter 360.061 to 360.074.*

6.3.11. AIRPORT SAFETY AREAS (SPATIAL LAYERS)[21]

Airports must regulate the airspace in and around aircraft movement areas to keep clear of obstructions. The following tables document all the data layers included in the MnSASP data related to airport safety areas.[22]

Table 6.61. Clear Zones (Spatial Layers)

Data Assessment	Clear Zones
Data Layers	Clear Zones (Existing) Clear Zones (Ultimate)
Data Type	Spatial data (polygons)
Description	Clear zones are trapezoidal areas beyond each runway end that must be clear of all airspace obstructions and zoned appropriated to prevent the congregation of people. These surfaces are based on the approach type at a given runway end and Part 77 surfaces (primary and approach surfaces, see Table 6.62 for details). Per the MnDOT Clear Zone Policy, airport owners are required to purchase clear zones in fee title or have a MnDOT-approved CZAP. The clear zone spatial layer in the MnSASP data is organized by the timeframe that the clear zones are applicable to (i.e., existing or ultimate airport build-out conditions).
Source(s)	Airports (via ALPs and ArcGIS analyses)
Source(s) Details	The initial mapping of the clear zones involved the following steps: - Review ALPs and FAA ADIP to obtain the approach type and runway end coordinates - Calculate all primary surface and approach surface dimensions across the system (Refer to Appendix 7 of the FAA AC 150/5300-13A for Part 77 dimensional standards[23]) Primary and approach surface dimensions and the approach type were used to calculate the dimensions of the clear zone surfaces for each runway end (See Section 6.4.1.6 for clear zone dimensional standards). See Section 6.4.1.7 for a summary of the initial mapping tasks completed during the 2022 MnSASP. Moving forward, MnDOT Aeronautics can require that airports and their consultants provide shapefiles of their clear zones for the airport's existing and ultimate build-out conditions during ALP development/updates (electronic ALP or eALP).
Date of Initial Data Collection	12/15/2021
Update Cycle	As required based on trigger point for evaluation

[21] MnDOT Aeronautics will only be responsible for updating the Hub with the new polygon data provided by airports. It is the responsibility of the airports to develop and provide the polygon layers for MnDOT Aeronautics to upload into the MnSASP Hub. Refer to the MnSASP Hub User's Guide for guidance on importing the new layers into the MnSASP Hub.
[22] This section details the content and organization of the Airport Safety Areas feature layer in the MnSASP data, which includes individual polygon layers for each type of safety area and the timeframe that the safety area is applicable to (i.e., existing or future airport build-out conditions).
[23] The latest version of AC 150/5300-13A can be viewed at the following website: https://www.faa.gov/airports/resources/advisory_circulars/index.cfm/go/document.current/documentNumber/150_5300-13

Data Assessment	Clear Zones
Trigger Point(s) for Evaluation Outside of Update Cycle	- Completion of a ALP or master plan - Updates to runway category, visibility minimums, or approach type
Hub Presentation/Use	MnSASP Hub/Airport Geodata: Airport Safety Areas Dashboard
MnSASP Hub Layer/Table (if applicable)	Airport Safety Areas/Clear Zones (Existing) Airport Safety Areas Clear Zones (Ultimate)
MnDOT Aeronautics Responsibility	Airport planning staff[24]
Data Manipulation Plan from Raw State (if applicable)	Clear zones need to be remapped in GIS in conjunction with a triggering event.[25] See **Section 6.4.1.7** for a summary of the initial mapping tasks completed during the 2022 MnSASP.

Source: Kimley-Horn, 2022

Table 6.62. Part 77 Surfaces

Data Assessment	Part 77 Surfaces
Data Layers	Primary Surface (Existing) Primary Surface (Ultimate) Horizontal Surface (Existing) Horizontal Surface (Ultimate) Conical Surface (Existing) Conical Surface (Ultimate) Approach Surface (Existing) Approach Surface (Ultimate)
Data Type	Spatial data (polygons)
Description	49 CFR Part 77 defines imaginary surfaces in and around airports that are deemed sensitive and must be kept clear of obstructions to maintain safe, navigable airspace. These surfaces are tied with runways to protect aircraft departures and arrivals. All Part 77 spatial layers in the MnSASP data are organized by the timeframe that the surfaces are applicable to (i.e., existing or ultimate airport build-out conditions).
Source(s)	Airports (via ALPs and ArcGIS analyses)
Source(s) Details	The initial mapping of Part 77 surfaces involved: - Obtain runway data (design characteristics and the approach category) from the FAA's ADIP and ALPs - Evaluate these dimensions against the FAA's runway design standards (Refer to Appendix 7 of the FAA AC 150/5300-13A[26]) - Calculate the dimensions and map all Part 77 surfaces See Section 6.4.1.7 for a summary of the initial mapping tasks completed during the 2022 MnSASP.

[24] MnDOT Aeronautics will only be responsible for updating the Hub with the new polygon data provided by airports. It is the responsibility of the airports to develop and provide the polygon layers for MnDOT Aeronautics to upload into the MnSASP Hub.
[25] Ibid.
[26] The latest version of AC 150/5300-13A can be viewed at https://www.faa.gov/airports/resources/advisory_circulars/index.cfm/go/document.current/documentNumber/150_5300-13

Data Assessment	Part 77 Surfaces
	Moving forward, MnDOT Aeronautics can require that airports and their consultants provide shapefiles of all Part 77 surfaces for existing and ultimate build-out conditions as depicted on their latest ALP (eALPs).
Date of Initial Data Collection	12/15/2021
Update Cycle	As required based on trigger point for evaluation
Trigger Point(s) for Evaluation Outside of Update Cycle	Change to applicable dimensions
Hub Presentation/Use	MnSASP Hub/Airport Geodata: Airport Safety Areas Dashboard
MnSASP Hub Layer/Table (if applicable)	Airport Safety Areas
MnDOT Aeronautics Responsibility	Airport planning staff[27]
Data Manipulation Plan from Raw State (if applicable)	Part 77 surfaces need to be remapped in GIS in conjunction with a triggering event.[28] See **Section 6.4.1.7** for a summary of the initial mapping tasks completed during the 2022 MnSASP.

Source: Kimley-Horn, 2022

Table 6.63. Runway Protection Zones (RPZs)

Data Assessment	RPZs
Data Layers	RPZ (Existing) RPZ (Ultimate)
Data Type	Spatial data (polygons)
Description	RPZs are trapezoidal areas off each runway end that are kept clear of obstructions to enhance the protection of people and property on the ground from errant aircraft activity, particularly in cases where aircraft land or crash beyond the runway end. All RPZ spatial layers in the MnSASP data are organized by the timeframe that the surfaces are applicable to (i.e., existing or ultimate airport build-out conditions).
Source(s)	Airports (via ALPs and ArcGIS analyses)
Source(s) Details	The initial mapping of RPZs involved: - Obtain runway data (design characteristics and the approach category) from the FAA's ADIP and ALPs - Evaluate dimensions against the FAA's runway design standards (Refer to Appendix 7 of the FAA AC]150/5300-13A[29]) - Calculate the dimensions and map all RPZs across the system See Section 6.4.1.7 for a summary of the initial mapping tasks completed during the 2022 MnSASP. Moving forward, MnDOT Aeronautics can require that

[27] MnDOT Aeronautics will only be responsible for updating the Hub with the new polygon data provided by airports. It is the responsibility of the airports to develop and provide the polygon layers for MnDOT Aeronautics to upload into the MnSASP Hub.
[28] Ibid.
[29] The latest version of AC 150/5300-13A can be viewed at https://www.faa.gov/airports/resources/advisory_circulars/index.cfm/go/document.current/documentNumber/150_5300-13

Data Assessment	RPZs
	airports provide shapefiles of their RPZs for the airport's existing and ultimate build-out conditions as depicted on their latest ALP (eALPs).
Date of Initial Data Collection	12/15/2021
Update Cycle	As required based on trigger point for evaluation
Trigger Point(s) for Evaluation Outside of Update Cycle	Changes to applicable RPZ dimensions
Hub Presentation/Use	MnSASP Hub/Airport Geodata: Airport Safety Areas Dashboard
MnSASP Hub Layer/Table (if applicable)	Airport Safety Areas
MnDOT Aeronautics Responsibility	Airport planning staff[30]
Data Manipulation Plan from Raw State (if applicable)	RPZs need to be remapped in GIS in conjunction with a triggering event.[31] See **Section 6.4.1.7** for a summary of the initial mapping tasks completed during the 2022 MnSASP.

Source: Kimley-Horn, 2022

6.3.12. SYSTEM INDICATORS

The 2022 MnSASP identified several indicators of the system's activity, available aircraft services, and pilots based in Minnesota. The following tables document all the data points included in the MnSASP data related to system indicators.

Table 6.64. Aviation Fatalities

Data Assessment	Aviation Fatalities
Data Point(s)	Aviation Fatalities
Data Type	Tabular data
Description	This data point reflects the total number of annual aviation-related fatalities in Minnesota.
Source(s)	NTSB CAROL: https://data.ntsb.gov/carol-main-public/landing-page
Source(s) Details	The NTSB's CAROL database records aviation investigations completed by the NTSB. The following criteria were inputted into the search query to obtain details about all aviation-related accidents in Minnesota in 2020 (refer to **Section 6.4.1.8** for a screenshot reference): - State: Minnesota - Event Date: Between 1/1/2020 – 01/01/2021 - Mode: Aviation - Highest Injury Level: Fatal
Date of Initial Data Collection	01/24/2022 (aviation accidents in 2020)

[30] MnDOT Aeronautics will only be responsible for updating the Hub with the new polygon data provided by airports. It is the responsibility of the airports to develop and provide the polygon layers for MnDOT Aeronautics to upload into the MnSASP Hub.
[31] Ibid.

Data Assessment	Aviation Fatalities
Update Cycle	Annually
Trigger Point(s) for Evaluation Outside of Update Cycle	Aviation-related fatality in Minnesota
Hub Presentation/Use	MnSASP Hub/System Performance: Aviation Fatalities [Indicator][32]
MnSASP Hub Layer/Table (if applicable)	MnSASP Indicator Data
MnDOT Aeronautics Responsibility	Airport planning staff
Data Manipulation Plan from Raw State (if applicable)	Using the search parameters defined in the source details (see **Section 6.4.1.8** for a screenshot reference), all aviation accidents are reported in the results. To identify the total number of fatalities, each event report was downloaded and inspected to identify the total number of fatalities that resulted from each accident. These were added up to develop this data point.

Source: Kimley-Horn, 2022

Table 6.65. Aviation-Related Accidents

Data Assessment	Aviation-Related Accidents
Data Point(s)	Aviation Accidents
Data Type	Tabular data
Description	This data point reflects the total number of annual aviation-related accidents in Minnesota. Aviation accidents are defined as an aviation event with at least one fatality.
Source(s)	NTSB CAROL: https://data.ntsb.gov/carol-main-public/landing-page
Source(s) Details	The NTSB's CAROL database records aviation investigations completed by the NTSB. The following criteria were inputted into the search query to identify details about each aviation-related accident in Minnesota between 2020: - State: Minnesota - Event Date: Between 1/1/2020 - 01/01/2021 - Mode: Aviation - Highest Injury Level: Fatal
Date of Initial Data Collection	01/24/2022 (aviation accidents in 2020)
Update Cycle	Annually
Trigger Point(s) for Evaluation Outside of Update Cycle	Aviation-related accident leading to at least one fatality

[32] *This indicator in the dashboard is a static statistic and will not be able to be filtered using the available filters configured (i.e., state classification, MnDOT district).*

Data Assessment	Aviation-Related Accidents
Hub Presentation/Use	MnSASP Hub/System Performance: Aviation-Related Accidents [Indicator][33]
MnSASP Hub Layer/Table (if applicable)	MnSASP Indicator Data
MnDOT Aeronautics Responsibility	Airport planning staff
Data Manipulation Plan from Raw State (if applicable)	Using the search parameters defined in the source details (see **Section 6.4.1.8** for a screenshot reference), all aviation accidents are reported in the results. The number of results indicate the total number of aviation-related accidents in Minnesota.

Source: Kimley-Horn, 2022

Table 6.66. Certified Pilots Within 30 Nautical Miles of an Airport

Data Assessment	Certified Pilots within 30 Nautical Miles (NM) of an Airport
Data Point(s)	Total MN Certified Pilots Certified Pilots within 30nm
Data Type	Tabular data
Description	The total number of certified pilots within a certain distance of an airport is one indicator of the potential demand for a local airport. Airports in close proximity to large concentrations of pilots have a higher likelihood of experiencing higher activity levels including based aircraft and aircraft operations.
Source(s)	- FAA Civil Airmen Statistics: https://www.faa.gov/licenses_certificates/airmen_certification/releasable_airmen_download/ - ArcGIS analyses (refer to the steps in **Section 6.4.2.2**)
Source(s) Details	Calculating the number of certified pilots within 30 nm of each airport requires running the geocoding service and completing a geographical proximity analysis in ArcGIS Online. Please note that the geocoding analysis require a large number of credits in ArcGIS Online to complete, so consult with your GIS administrator before running this service.[34] Refer to the steps in **Section 6.4.2.2** to complete these analyses and calculate the total number of certified pilots within 30 nm of each system airport.
Date of Initial Data Collection	08/18/2021
Update Cycle	Annually
Trigger Point(s) for Evaluation Outside of Update Cycle	None

[33] This indicator in the dashboard is a static statistic and will not be able to be filtered using the available filters configured (i.e., state classification, MnDOT district).

[34] The geographic proximity analysis requires use of ArcGIS's geocoding system to plot the locations of all certified pilots in Minnesota using the addresses recorded. Using the geocoding function requires a large number of credits to plot the addresses for all certified pilots based in Minnesota. As of 8/18/21, there were a total of 11,874 certified pilots in Minnesota. Geocoding all the addresses associated to all these pilots required approximately 475 credits (40 credits per 1,000 addresses).

Data Assessment	Certified Pilots within 30 Nautical Miles (NM) of an Airport
Hub Presentation/Use	MnSASP Hub/System Performance: Certified Pilots [Indicator][35] MnSASP Hub/Airport Performance: Certified Pilots within 30 nm [Indicator]
MnSASP Hub Layer/Table (if applicable)	Total MN Certified Pilots: MnSASP Indicator Data Certified Pilots within 30nm: MnSASP Hub Airport Data/Airport Activity
MnDOT Aeronautics Responsibility	Airport planning staff
Data Manipulation Plan from Raw State (if applicable)	See **Section 6.4.2.2** for instructions on completing the proximity analysis necessary for populating these data points.

Source: Kimley-Horn, 2022

Table 6.67. Fuel Availability at Airports

Data Assessment	Fuel Availability at Airports
Data Point(s)	Fuel Proximity
Data Type	Tabular data
Description	This data point reflects the total number of airports that are within 50 nm of another airport with Jet A fuel available 24 hours a day, 7 days a week (24/7) and 30 nm of another airport with 100LL fuel available 24/7. This is divided by the total airports in the state aviation system to determine the percentage of airports that fulfill the criteria described above.
Source(s)	- MnSASP Airport Inventory - ArcGIS proximity analysis
Source(s) Details	Calculating the total number of airports that fulfill the criteria for the data point (see Description) requires a proximity analysis using the fuel-specific data points (see Table **6.24**) and all airport reference points (mapped using the data points in Table **6.4**). The proximity analysis spatially compares all the airports in the system with airports that fulfill the fuel availability criteria using a 30 nm and 50 nm proximity (as applicable). This analysis is configured into an ArcGIS Notebook (System Indicators - Proximity Analyses) to automatically calculate the total number of airports that fulfill the criteria and update the data point. Refer to the MnSASP Hub User's Guide for guidance on running the ArcGIS Notebook for updating this data point.
Date of Initial Data Collection	- 2022 MnSASP Update: 06/02/2021 - ArcGIS proximity analysis: 08/18/2021
Update Cycle	As required based on trigger point for evaluation
Trigger Point(s) for Evaluation Outside of Update Cycle	Addition or removal of Jet A or 100LL fuel at any system airport
Hub Presentation/Use	MnSASP Hub/System Performance: Fuel Availability at Airports [Indicator]
MnSASP Hub Layer/Table (if applicable)	MnSASP Indicator Data

[35] This indicator in the dashboard is a static statistic and will not be able to be filtered using the available filters configured (i.e., state classification, MnDOT district).

Data Assessment	Fuel Availability at Airports
MnDOT Aeronautics Responsibility	Airport planning staff
Data Manipulation Plan from Raw State (if applicable)	Refer to the MnSASP Hub User's Guide for guidance on running the ArcGIS Notebook "System Indicators – Proximity Analyses" for updating this data point.

Source: Kimley-Horn, 2022

Table 6.68. Population Access to an Airline Service Airport

Data Assessment	Population Access to an Airline Service Airport
Data Point(s)	CS Airport Proximity Total MN Population
Data Type	Tabular data
Description	CSAirportProximity is the total population in Minnesota within a 60-minutes surface travel time to a Key Commercial Service Airport. This is divided by the total population in Minnesota (Total MN Population) to calculate the percentage of Minnesota's population within a 60-minutes surface travel time to a Key Commercial Service Airport.
Source(s)	- ArcGIS drive-time proximity analysis - ESRI Business Analyst
Source(s) Details	Calculating the total population that fulfill the criteria for the data point CSAirportProximity (see Description) requires creating drive-time buffers for each airport with a Part 139 certification (see Table 6.16) and comparing the buffer coverage with the population in Minnesota.36 By plugging in the drive-time buffer layer into ESRI's Business Analyst tool, the population within the 60-minute drive time buffers is calculated to update the CSAirportProximity data point.37
Date of Initial Data Collection	08/18/2021
Update Cycle	As required based on trigger point for evaluation
Trigger Point(s) for Evaluation Outside of Update Cycle	Part 139 certification changes or a new U.S. Census release
Hub Presentation/Use	MnSASP Hub/System Performance: Population Access to Airline Service Airport [Indicator][38]
MnSASP Hub Layer/Table (if applicable)	MnSASP Indicator Data
MnDOT Aeronautics Responsibility	Airport planning staff, MnDOT GIS administrator
Data Manipulation Plan from Raw State (if applicable)	Calculating the total population that fulfill the criteria for the data point CSAirportProximity (see Description) requires creating 60-minute drive-time buffers for each airport with a Part 139 certification (see Table 6.16).39 The

[36] Generating drive-time buffers requires the use of credits in ArcGIS Online. Consult with your GIS administrator before running this service.
[37] ESRI's Business Analyst tool requires a paid subscription.
[38] This indicator in the dashboard is a static statistic and will not be able to be filtered using the available filters configured (i.e., state classification, MnDOT district).
[39] Generating drive-time buffers requires the use of credits in ArcGIS Online. Consult with your GIS administrator before running this service.

Data Assessment	Population Access to an Airline Service Airport
	buffers must be snipped to the state boundary (to only count Minnesota residents) and dissolved (to prevent double counting of residents). The resulting refined drive-time buffer layer needs to be uploaded into ESRI's Business Analyst tool to calculate the population within the singular buffer. The data result will update the CSAirportProximity data point.[40]

Source: Kimley-Horn, 2022

Table 6.69. Registered Aircraft in Minnesota

Data Assessment	Registered Aircraft in Minnesota
Data Point(s)	Registered AC
Data Type	Tabular data
Description	Total number of registered aircraft in Minnesota
Source(s)	FAA Aircraft Registry[41]
Source(s) Details	None
Date of Initial Data Collection	08/18/2021
Update Cycle	Annually
Trigger Point(s) for Evaluation Outside of Update Cycle	None
Hub Presentation/Use	MnSASP Hub/System Performance: Registered Aircraft [Indicator][42]
MnSASP Hub Layer/Table (if applicable)	MnSASP Indicator Data
MnDOT Aeronautics Responsibility	Airport planning staff
Data Manipulation Plan from Raw State (if applicable)	See **Section 6.4.2.10** for complete instructions on pulling the data from the FAA's Aircraft Registry and organizing the data for conforming to the MnSASP data.

Source: Kimley-Horn, 2022

Table 6.70. Runway Incursions

Data Assessment	Runway Incursions
Data Point(s)	Runway Incursions
Data Type	Tabular data
Description	This data point reflects the total number of reported runway incursions at towered airports in Minnesota.
Source(s)	- NASA ASRS: https://akama.arc.nasa.gov/ASRSDBOnline/QueryWizard_Filter.aspx - NTSB CAROL: https://data.ntsb.gov/carol-main-public/landing-page

[40] ESRI's Business Analyst tool requires a paid subscription.
[41] The FAA Aircraft Registry is available online at https://www.faa.gov/licenses_certificates/aircraft_certification/aircraft_registry/releasable_aircraft_download/ (accessed August 2021).
[42] This indicator is presented in the dashboard as a static statistic as it is representative of the state's total registered aircraft. As such, it cannot be filtered using the available filters configured (i.e., state classification, MnDOT district).

Data Assessment	Runway Incursions
Source(s) Details	Calculating the total number of runway incursions requires a review of the: - NASA ASRS to gather the number of runway incursion incidents - NTSB CAROL database collects the runway incursion accidents See **Section 6.4.1.9** for complete instructions on populating this data point.
Date of Initial Data Collection	10/11/2021 (runway incursions in 2020)
Update Cycle	Annually
Trigger Point(s) for Evaluation Outside of Update Cycle	Runway incursion at a towered airport in Minesota
Hub Presentation/Use	MnSASP Hub/System Performance: Runway Incursions [Indicator][43]
MnSASP Hub Layer/Table (if applicable)	MnSASP Indicator Data
MnDOT Aeronautics Responsibility	Airport planning staff
Data Manipulation Plan from Raw State (if applicable)	See **Section 6.4.1.9** for complete instructions on populating this data point.

Source: Kimley-Horn, 2022

Table 6.71. Systemwide Maintenance and Repair Availability

Data Assessment	Systemwide Maintenance and Repair Availability
Data Point(s)	MRO Proximity
Data Type	Tabular data
Description	Total number of airports within 50 nm of an airport that has aircraft MRO facilities defined in terms of the following: - Aircraft services, repairing, and maintenance location - Avionics repair location - Engine overhaul location This data point is used to calculate a percentage of the total state aviation system that fulfills the criteria above.
Source(s)	MnSASP Inventory ArcGIS proximity analysis
Source(s) Details	Calculating the total number of airports that fulfill the criteria for the data point (see Description) requires a proximity analysis using the MRO-specific data points (see Table **6.26**) and all airport reference points **(MnSASP Hub Airport Data / Airport Background)**. The proximity analysis spatially compares all airports with airports that have MRO facilities within 50 nm. This analysis is configured into an ArcGIS Notebook (System Indicators - Proximity Analyses) to

[43] *This indicator in the dashboard is a static statistic and will not be able to be filtered using the available filters configured (i.e., state classification, MnDOT district).*

Data Assessment	Systemwide Maintenance and Repair Availability
	automatically calculate the total number of airports that fulfill the criteria and update the data point in the Hub. Refer to the MnSASP Hub User's Guide for guidance on running the ArcGIS Notebook.
Date of Initial Data Collection	08/18/2021
Update Cycle	As required based on trigger point for evaluation
Trigger Point(s) for Evaluation Outside of Update Cycle	Addition or removal of MRO service availability at any system airport
Hub Presentation/Use	MnSASP Hub/System Performance: Maintenance and Repair at Airports [Indicator][44]
MnSASP Hub Layer/Table (if applicable)	MnSASP Indicator Data
MnDOT Aeronautics Responsibility	Airport planning staff
Data Manipulation Plan from Raw State (if applicable)	The workflow for updating this data point is configured into an ArcGIS Notebook (System Indicators - Proximity Analyses). Refer to the MnSASP Hub User's Guide for guidance on running the ArcGIS Notebook.

Source: Kimley-Horn, 2022

6.4. Supplemental Data Points and Manipulation Details

This section provides additional context to the data points assessment in the previous sections and details the data manipulation process for several data points in the MnSASP data. Additionally, a separate matrix has also been prepared that consolidates the most pertinent information for updating all data points in the MnSASP Hub included as Appendix D of the 2022 MnSASP Technical Report. This section is divided into two sections:

- Additional Data Point Information: Provides additional details about specific data points covered in Section 6.3
- Data Manipulation Plan Details: Provides instructions on how to conduct the analyses required to obtain the data points covered in Section 6.3

[44] *This indicator in the dashboard is a static statistic and will not be able to be filtered using the available filters configured (i.e., state classification, MnDOT district).*

6.4.1. ADDITIONAL DATA POINT INFORMATION

The following subsections include additional details on the data points documented in the data points assessment (Section 6.3).

6.4.1.1. Convert DMS to Decimal Degrees

ArcGIS Online can only create location points with coordinate information in decimal degrees. To convert DMS to decimal degrees, use the following formula for latitude/longitude coordinates: Decimal degrees = (+/-) Degrees (+/-) (Minutes ÷ 60) (+/-) (Seconds ÷ 3,600). Refer to the following steps for an example of converting the following coordinates to decimal degrees: 47° 15' 37.683" N / 96° 24' 0.95" W

- Latitude conversion: Decimal degrees = 47 + (15 ÷ 60) + (37.683 ÷ 3,600) = 47.2605 N
- Longitude conversion: Decimal degrees = -96 - (24 ÷ 60) – (0.95 ÷ 3,600) = 96.4002 W

The Federal Communications Commission (FCC) has an online calculator tool available online for completing the coordinate conversion: https://www.fcc.gov/media/radio/dms-decimal.

6.4.1.2. State Classifications

Table 6.72 provides the criteria used to classify Minnesota's state system airports. These criteria were updated as part of Phase I of the MnSASP.

Table 6.72. MnSASP State Classification Assignment Criteria

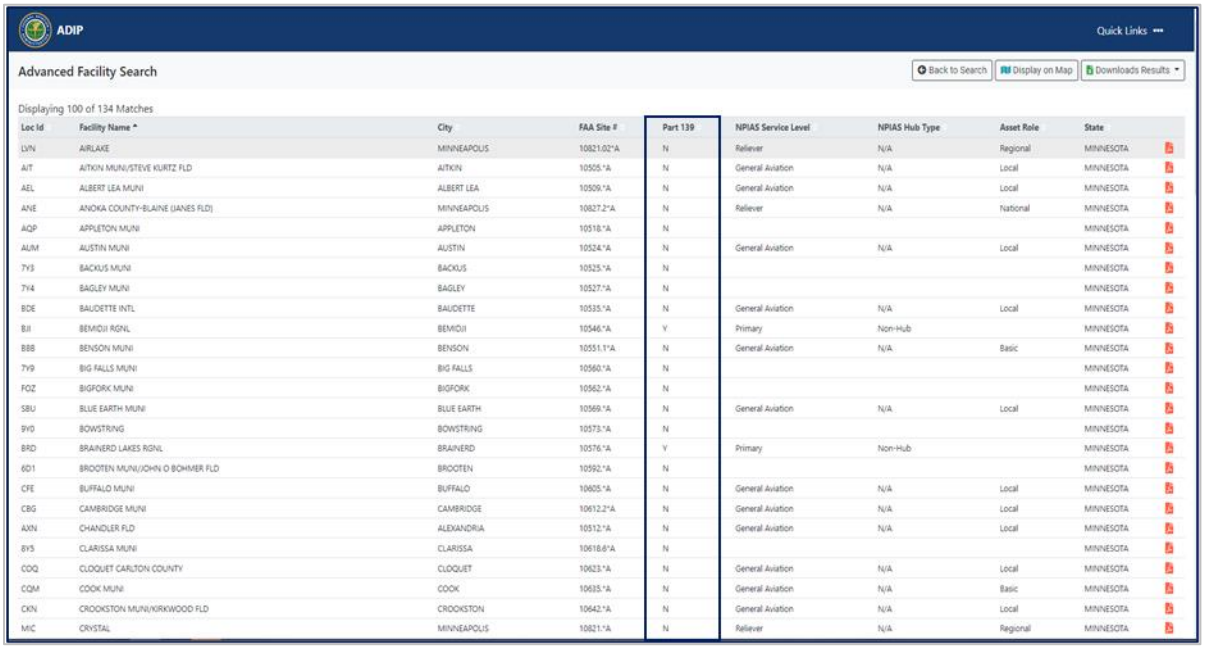
State Classifications	Criteria
Key Commercial Service	Part 139 Certificate
Key General Aviation	General aviation airports with paved runway >4,900 feet
Intermediate Large	Paved runway >3,800 feet and <4,900 feet
Intermediate Small	Paved runway < 3,800 feet
Landing Strip Turf	Unpaved turf runway of any length

Source: MnSASP Phase I, 2019

6.4.1.3. Part 139 Certification

Figure 6-1 provides a screenshot reference for identifying the Part 139 certification status for each airport in ADIP's advanced facility search results.

Figure 6-1. Part 139 Certification in ADIP Advanced Facility Search



Loc Id	Facility Name	City	FAA Site #	Part 139	NPIAS Service Level	NPIAS Hub Type	Asset Role	State
LVN	AIRLAKE	MINNEAPOLIS	10821.02*A	N	Reliever	N/A	Regional	MINNESOTA
AIT	AITKIN MUNI/STEVE KURTZ FLD	AITKIN	10505.*A	N	General Aviation	N/A	Local	MINNESOTA
AEL	ALBERT LEA MUNI	ALBERT LEA	10509.*A	N	General Aviation	N/A	Local	MINNESOTA
ANE	ANOKA COUNTY-BLAINE (JANES FLD)	MINNEAPOLIS	10827.2*A	N	Reliever	N/A	National	MINNESOTA
AQP	APPLETON MUNI	APPLETON	10518.*A	N				MINNESOTA
AUM	AUSTIN MUNI	AUSTIN	10524.*A	N	General Aviation	N/A	Local	MINNESOTA
7Y3	BACKUS MUNI	BACKUS	10525.*A	N				MINNESOTA
7Y4	BAGLEY MUNI	BAGLEY	10527.*A	N				MINNESOTA
BDE	BAUDETTE INTL	BAUDETTE	10535.*A	N	General Aviation	N/A	Local	MINNESOTA
BJI	BEMIDJI RGNL	BEMIDJI	10546.*A	Y	Primary	Non-Hub		MINNESOTA
BBB	BENSON MUNI	BENSON	10551.1*A	N	General Aviation	N/A	Basic	MINNESOTA
7Y9	BIG FALLS MUNI	BIG FALLS	10560.*A	N				MINNESOTA
FOZ	BIGFORK MUNI	BIGFORK	10562.*A	N				MINNESOTA
SBU	BLUE EARTH MUNI	BLUE EARTH	10569.*A	N	General Aviation	N/A	Local	MINNESOTA
9V0	BOWSTRING	BOWSTRING	10573.*A	N				MINNESOTA
BRD	BRAINERD LAKES RGNL	BRAINERD	10576.*A	Y	Primary	Non-Hub		MINNESOTA
6D1	BROOTEN MUNI/JOHN O BOHMER FLD	BROOTEN	10592.*A	N				MINNESOTA
CFE	BUFFALO MUNI	BUFFALO	10605.*A	N	General Aviation	N/A	Local	MINNESOTA
CBG	CAMBRIDGE MUNI	CAMBRIDGE	10612.2*A	N	General Aviation	N/A	Local	MINNESOTA
AXN	CHANDLER FLD	ALEXANDRIA	10512.*A	N	General Aviation	N/A	Local	MINNESOTA
8Y5	CLARISSA MUNI	CLARISSA	10618.6*A	N				MINNESOTA
CQQ	CLOQUET CARLTON COUNTY	CLOQUET	10623.*A	N	General Aviation	N/A	Local	MINNESOTA
CQM	COOK MUNI	COOK	10635.*A	N	General Aviation	N/A	Basic	MINNESOTA
CKN	CROOKSTON MUNI/KIRKWOOD FLD	CROOKSTON	10642.*A	N	General Aviation	N/A	Local	MINNESOTA
MIC	CRYSTAL	MINNEAPOLIS	10821.*A	N	Reliever	N/A	Regional	MINNESOTA

Source: FAA ADIP, 2022

6.4.1.4. VOR/DME/TACAN/VORTAC Service Buffers

Table 6.73 defines the service coverages for all VOR/DME, VORTAC, and TACANs based on the equipment's class (populated in the data point "Class" recorded in corresponding polygon layer in the "MN NAVAIDs_Service Buffers" feature layer). This data should be plugged into the following data points in the layer: Buffer Distance (nm), Minimum Elevation (ft), Maximum Elevation (ft).

Table 6.73. VOR/DME/VORTAC/TACAN Service Coverages

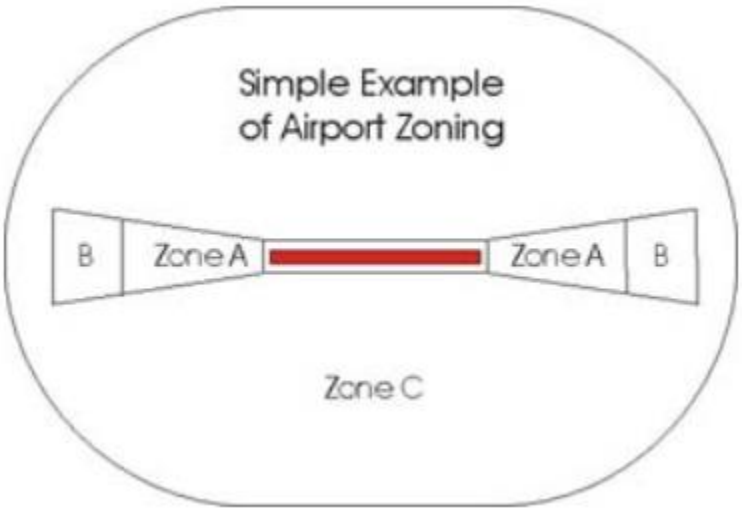
Class	Altitude (ft)	Distance (miles)
T	Below 12,000	25
L	Below 18,000	40
H	Below 14,500	40
H	14,500 – 17,999	100
H	18,000 – 45,000	130
H	Above 45,000	100

Source: FAA Aeronautical Information Manual (Chapter 1, Section 1), 2022

6.4.1.5. Airport Zoning

Figure 6-2 depicts a sample airport zoning map for a visual reference of the three types of safety zones (Zone A, Zone B, Zone C) defined in Minnesota Rules Chapter 8800.2400.

Figure 6-2. MnDOT Airport Zoning Graphic Reference



Source: MnDOT Aeronautics Airport Zoning Information Warehouse, 2022

6.4.1.6. Clear Zones

Clear zone configurations are primarily based on primary and approach surfaces as defined by Federal Aviation Regulations (FAR) Part 77, *Safe, Efficient Use, and Preservation of Navigable Airspace*.[45] Clear zone dimensions are based on runway category,[46] visibility minimums (as applicable), and most critical approach type. Table 6.74 provides the clear zone dimensions (updated as part of the 2022 MnSASP). Clear zones begin at the end of the primary surface. The primary surface extends 200 feet beyond each runway end for all paved runways. The primary surface ends at the runway ends for all turf runways. Inner widths align with width of the primary surface. Outer widths are determined by the width of the approach surface at the applicable clear zone length.

Table 6.74. Clear Zone Dimensional Standards

Approach Type (Runway Category) – Visibility Minimum, as Applicable	Length Beyond Runway End (Feet)	Inner Width (Feet)	Length of Surface (Feet)	Outer Width (Feet)
Turf	0	250	1,000	Width of Approach Surface at 1,000 feet
A(V)	200	250	1,000	Width of Approach Surface at 1,000 feet
B(V)	200	500	1,000	Width of Approach Surface at 1,000 feet
NP(A)	200	500	1,000	Width of Approach Surface at 1,000 feet

[45] Clear zone dimensions break from those established by FAR Part 77 for airports with a non-precision instrument approach (NP) by providing separate dimensions for runway ends with visibility minimums greater than ¾ mile (referred to as D1) and visibility minimums of ½ mile (referred to as D2). FAR Par 77 only provides one dimensional standard for NP(D) for visibility minimums as low as ¾ mile.

[46] Runway categories are defined in terms of surface type (i.e., turf versus paved) and utility versus other-than-utility.

Approach Type (Runway Category) – Visibility Minimum, as Applicable	Length Beyond Runway End (Feet)	Inner Width (Feet)	Length of Surface (Feet)	Outer Width (Feet)
NP(C) – Visibility minimums greater than ¾ mile	200	500	1,700	Width of Approach Surface at 1,700 feet
*NP(D1) – Greater than or equal to ¾ - mile visibility	200	1,000	1,700	Width of Approach Surface at 1,700 feet
*NP(D2) – ½ - mile visibility	200	1,000	2,500	Width of Approach Surface at 2,500 feet
PIR	200	1,000	2,500	Width of Approach Surface at 2,500 feet

**Note: Clear zone dimensions break from those established by FAR Part 77 for airports with a non-precision instrument approach (NP) by providing separate dimensions for runway ends with visibility minimums greater than ¾ mile (referred to as D1) and visibility minimums of ½ mile (referred to as D2). FAR Par 77 only provides one dimensional standard for NP(D) for visibility minimums as low as ¾ mile. Definitions: A = Utility runways. B = Runways larger than utility. C = Visibility minimums greater than ¾ mile. D1 = Visibility minimums greater or equal to ¾ mile. D2 = Visibility minimums of ½ mile. V = Visual approach. NP = Non-precision instrument approach. PIR = Precision instrument approach. Sources: MnDOT Aeronautics, 2022; FAR Part 77*

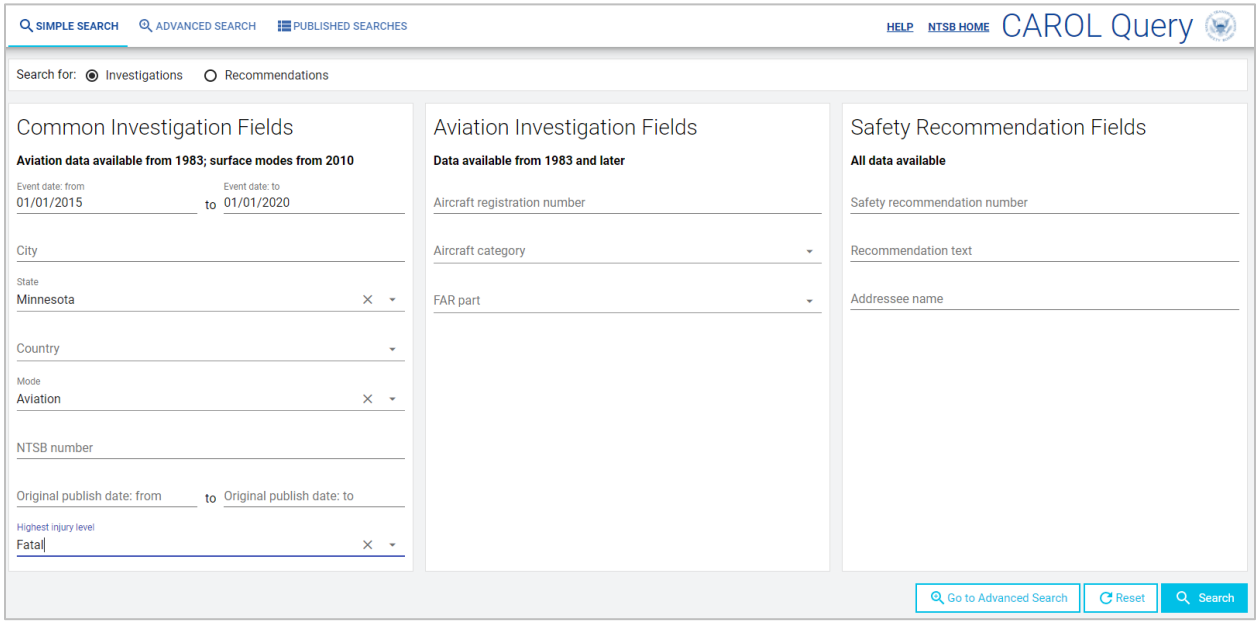
6.4.1.7. Airport Safety Areas Mapping

The initial mapping of the airport safety areas utilized a combination of AutoCAD, a proprietary mapping software developed by Kimley-Horn, and ArcGIS Pro. Within AutoCAD, the first step is to initialize blank AutoCAD drawings and setting the geospatial reference in each. Each dataset is divided by the State Plane Coordinate Zone and there is one drawing file per Zone. Each drawing is then processed through Kimley-Horn's proprietary mapping software by reading in the data files and translating the data into AutoCAD drawing objects (according to the dimensions data). The program then examines this initial output and processes each object type into a separate KML file by State Plane Coordinate Zone. Each KML file is converted into a shapefile using ArcGIS Pro to be published within the Airport Safety Areas feature layer in the Hub.

6.4.1.8. Aviation-Related Accidents and Fatalities

Figure 6-3 presents the parameters to enter in the NTSB CAROL Database search query to return all aviation accident events in Minnesota. The total number of records returned indicate the number of aviation-related accidents in Minnesota to populate into the data point.

Figure 6-3. NTSB CAROL Database Query for Aviation Accidents



Sources: NTSB CAROL Database, 2022; Kimley-Horn, 2022

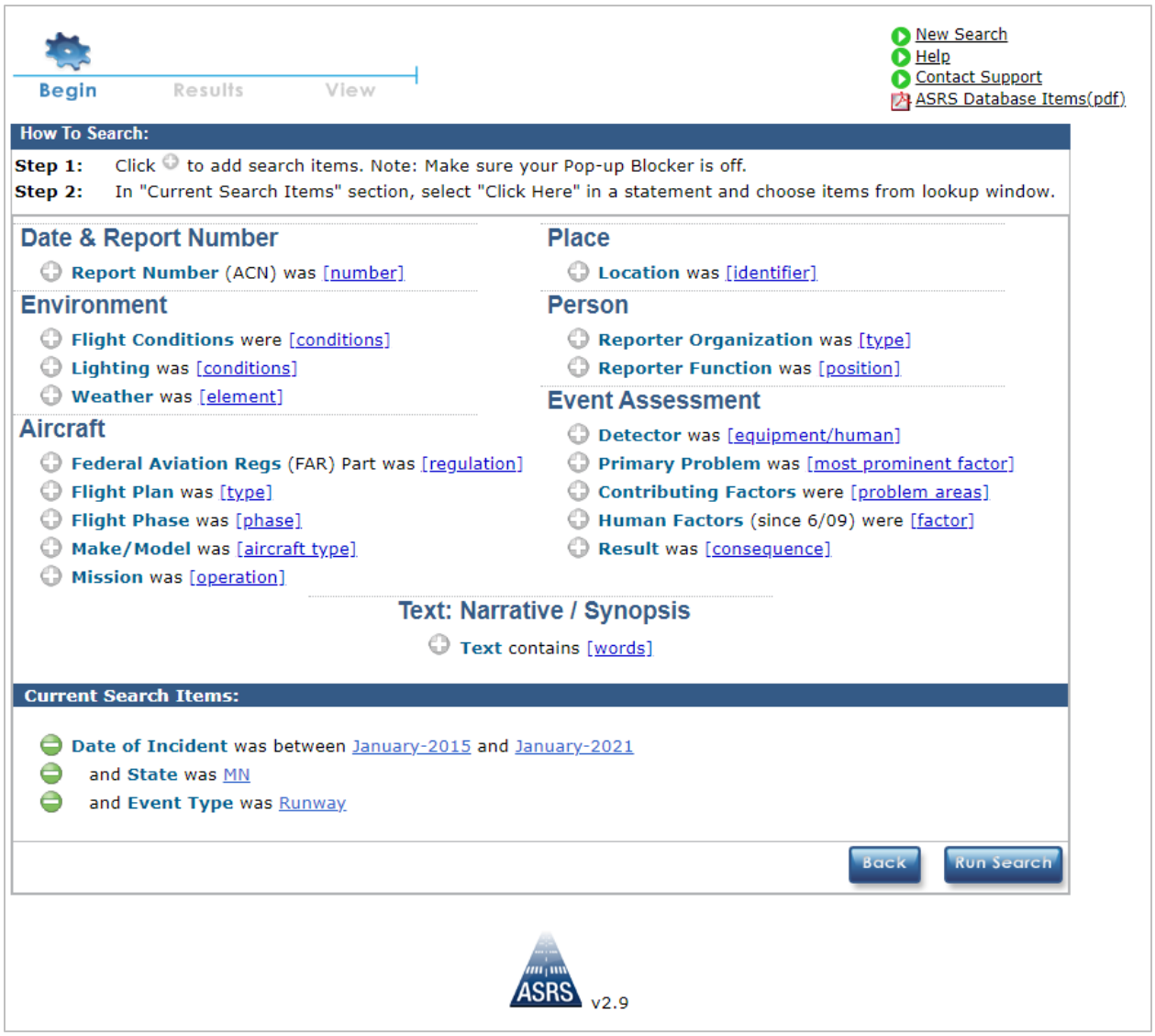
6.4.1.9. Runway Incursions

Refer to the list below and **Figure 6-4** for the parameters to enter into the NASA ASRS Database search query to return all runway incursion incidents in Minnesota.

- Date of Incident: Between 1/1/2015-12/31/2020
- State: "MN"
- Event Type: "Ground Incursion – Runway"

The NASA ASRS only records incidents, so calculating the total number of runway incursions also requires reviewing the NTSB reports completed from aviation accidents recorded in the NTSB CAROL database (refer to **Figure 6-3** for the search parameters). The aviation accidents that were the result of a runway incursion should be reviewed and cross-referenced with the NASA ASRS to identify any accidents not recorded in NASA ASRS. These unique cases should be added to the total number of runway incursions for updating this data point to be comprehensive of all applicable aviation events. The NASA ASRS database can be accessed at https://asrs.arc.nasa.gov/search/database.html.

Figure 6-4. NASA ASRS Database Query for Runway Incursions



Source: NASA ASRS Database, 2022; Kimley-Horn, 2022

6.4.2. DATA MANIPULATION PLAN DETAILS

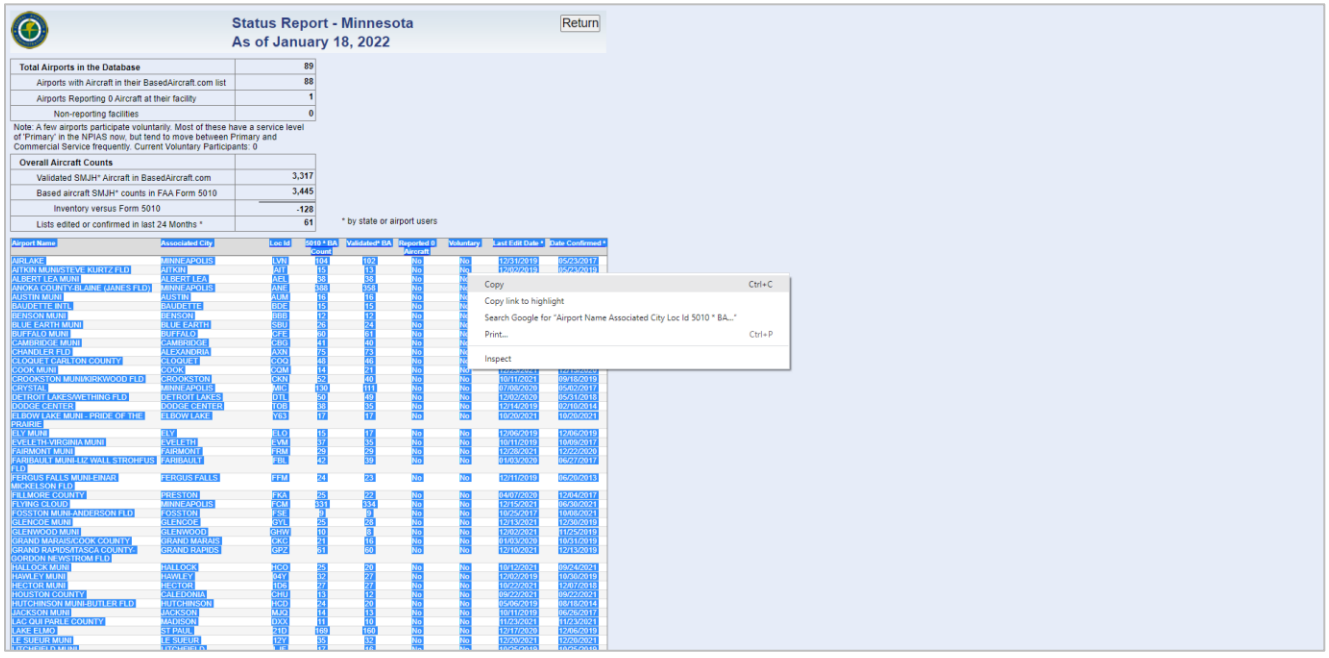
The following subsections provide guidance on the data manipulation work needed for certain MnSASP data points.

6.4.2.1. Based Aircraft

Complete the following steps to obtain the number of based aircraft at Nonprimary NPIAS airports in Minnesota:

1) Navigate to the following website: https://basedaircraft.com/BaCounts/Default.aspx.
2) In the dropdown next to "State Counts," select "Minnesota" and click "Go."
3) The following page will present a summary of all validated and airport-reported based aircraft counts in Minnesota and a table providing a detailed breakdown by Nonprimary NPIAS airport. Select and copy all the content included in the table. Refer to **Figure 6-5** for a screenshot reference.
4) For further analysis, this table content can be pasted into an Excel file.

Figure 6-5. Copy Based Aircraft Counts by Airport



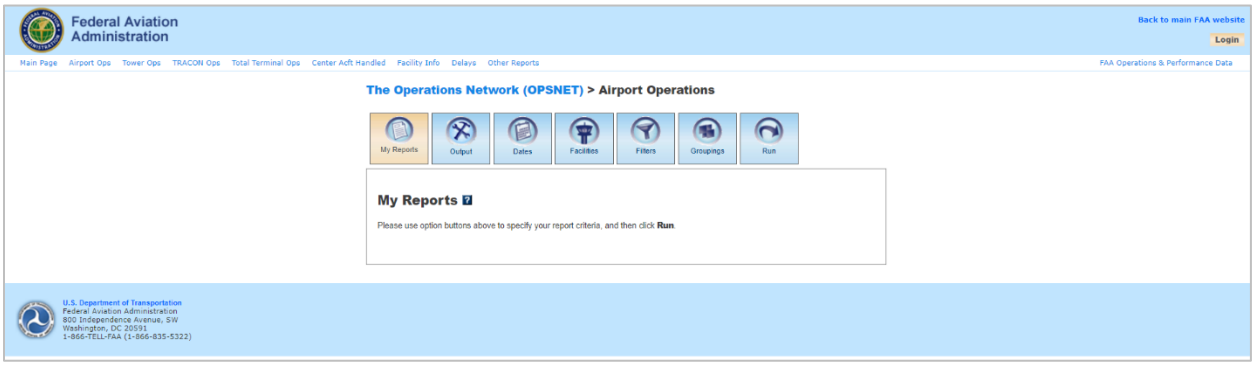
Sources: FAA National Based Aircraft Inventory Program, 2022; Kimley-Horn, 2022

6.4.2.2. Baseline Operations Counts (OpsNet)

Complete the following steps to pull baseline operations counts from the FAA's OpsNet for towered airports and manipulate the data for populating the corresponding data point:

1) Navigate to the following website: https://aspm.faa.gov/opsnet/sys/main.asp.
2) Click on "Airport Operations" to navigate into the query search for airport-specific operations data. Refer to **Figure 6-6** for a screenshot reference.

Figure 6-6. OpsNet Airport Operations Query Home Page



Source: FAA OpsNet, 2022

3) Under the "Output" tab, select the following:
   - Display: "Standard Report"
   - Options: Check all the fields
   - Format: "MS Excel"
4) Under the "Dates" tab, select the date range that you want to pull operations data for.
5) Under the "Facilities" tab, select "State" and then locate and check "Minnesota" in the list.
6) Under the "Filters" tab, make sure that "No Filters" is selected.
7) Under the "Groupings" tab, select the fields "Date", "Airport", and "State."
8) Upon clicking "Run", an Excel file will download with all the operations data available across the system (Minnesota airports with an ATCT).

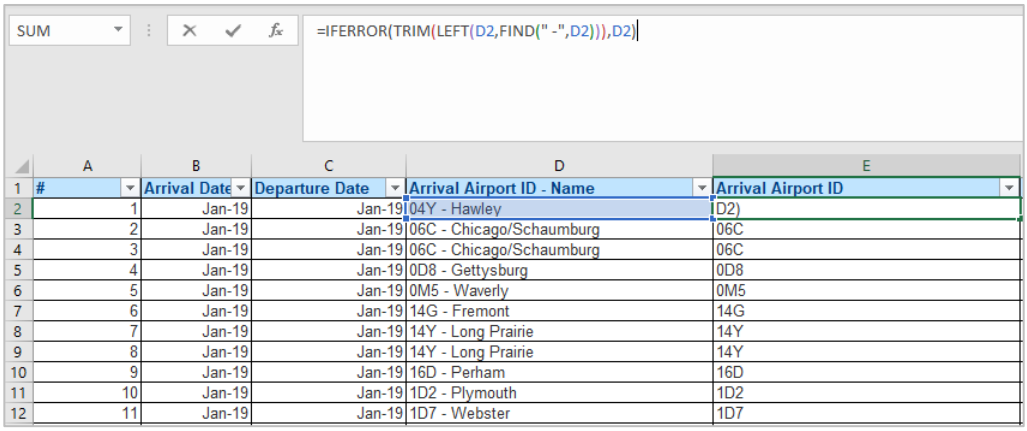
6.4.2.3. FAA Filed Flight Plan Data

The following steps detail how to manipulate the raw flight data pulled from FAA TFMSC for updating the MnSASP Hub.

1) Navigate to the FAA's Operations and Performance Data portal (https://aspm.faa.gov/) and login with account credentials. A login can be requested from the FAA using the following link: https://aspm.faa.gov/Control/Users/sysMailTo.asp.
2) Once logged in, navigate to the TFMSC database and use the search query to pull individual flight information for all operations originating or terminating in Minnesota. Given the large amount of data, it is recommended to output this data into two datasets that includes Minnesota-based departures and Minnesota-based arrivals. Steps 3 should be reflected in both datasets.
3) Open the datasets and copy the data into a clean Excel sheet with concise headers to describe each column of data.
4) To conform the data to the MnSASP Hub, several new data fields need to be created to provide background information for each arrival and departure airport.

- Airport ID (one field for each arrival and departure airport): Isolates the airport ID from the concatenated airport ID – name field. Refer to Figure 6-7 for a screenshot reference.

Figure 6-7. FAA Filed Flight Plan Data – Airport ID Field

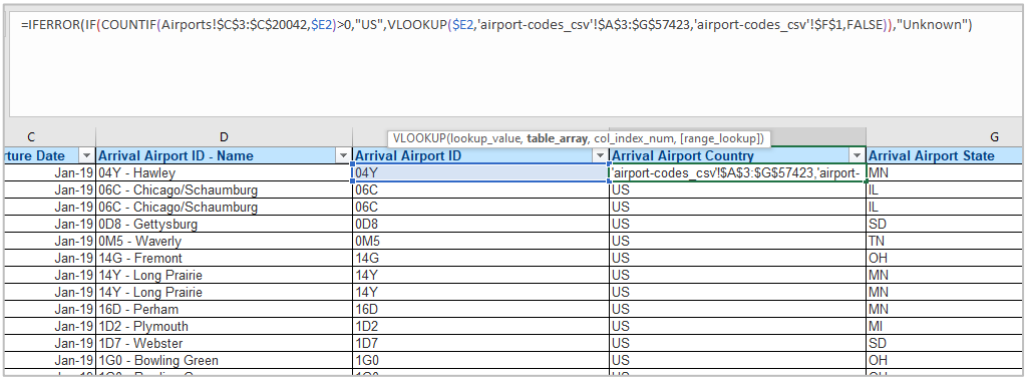


#	Arrival Date	Departure Date	Arrival Airport ID - Name	Arrival Airport ID
1	Jan-19	Jan-19	04Y - Hawley	D2)
2	Jan-19	Jan-19	06C - Chicago/Schaumburg	06C
3	Jan-19	Jan-19	06C - Chicago/Schaumburg	06C
4	Jan-19	Jan-19	0D8 - Gettysburg	0D8
5	Jan-19	Jan-19	0M5 - Waverly	0M5
6	Jan-19	Jan-19	14G - Fremont	14G
7	Jan-19	Jan-19	14Y - Long Prairie	14Y
8	Jan-19	Jan-19	14Y - Long Prairie	14Y
9	Jan-19	Jan-19	16D - Perham	16D
10	Jan-19	Jan-19	1D2 - Plymouth	1D2
11	Jan-19	Jan-19	1D7 - Webster	1D7

Source: Kimley-Horn, 2022

- Airport Country (one field for each arrival and departure airport): Denotes whether the airport is located in the U.S. This requires referencing a complete dataset of all U.S. airports that includes the FAA ID, state, and coordinate location of each airport. The following dataset was pulled for initially mapping the filed flight plan data in the MnSASP Hub: https://datahub.io/core/airport-codes#resource-airport-codes. Add this dataset into the Excel workbook and refer to Figure 6-8 for a screenshot reference for the formula used to pull in this information.

Figure 6-8. FAA Filed Flight Plan Data – Airport Country Field

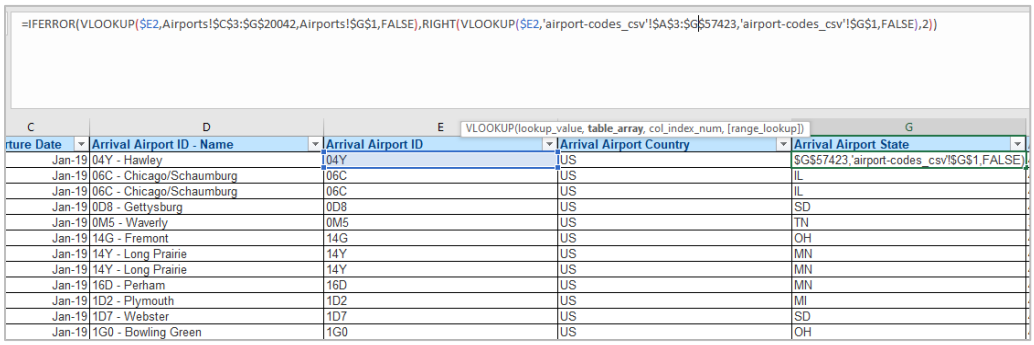


ture Date	Arrival Airport ID - Name	Arrival Airport ID	Arrival Airport Country	Arrival Airport State
Jan-19	04Y - Hawley	04Y	'airport-codes_csv'!$A$3:$G$57423,'airport-	MN
Jan-19	06C - Chicago/Schaumburg	06C	US	IL
Jan-19	06C - Chicago/Schaumburg	06C	US	IL
Jan-19	0D8 - Gettysburg	0D8	US	SD
Jan-19	0M5 - Waverly	0M5	US	TN
Jan-19	14G - Fremont	14G	US	OH
Jan-19	14Y - Long Prairie	14Y	US	MN
Jan-19	14Y - Long Prairie	14Y	US	MN
Jan-19	16D - Perham	16D	US	MN
Jan-19	1D2 - Plymouth	1D2	US	MI
Jan-19	1D7 - Webster	1D7	US	SD
Jan-19	1G0 - Bowling Green	1G0	US	OH

Source: Kimley-Horn, 2022

- Airport State (one field for each arrival and departure airport): Denotes the U.S. state that the airport is located in. This requires referencing a complete dataset of all airports that includes the FAA ID, state, and coordinate location of each airport. The following dataset was pulled for initially mapping the filed flight plan data in the MnSASP Hub: https://datahub.io/core/airport-codes#resource-airport-codes. Add this dataset into the Excel workbook and refer to Figure 6-9 for a screenshot reference for the formula used to pull in this information.

Figure 6-9. FAA Filed Flight Plan Data – Airport State Field



=IFERROR(VLOOKUP($E2,Airports!$C$3:$G$20042,Airports!$G$1,FALSE),RIGHT(VLOOKUP($E2,'airport-codes_csv'!$A$3:$G$57423,'airport-codes_csv'!$G$1,FALSE),2))

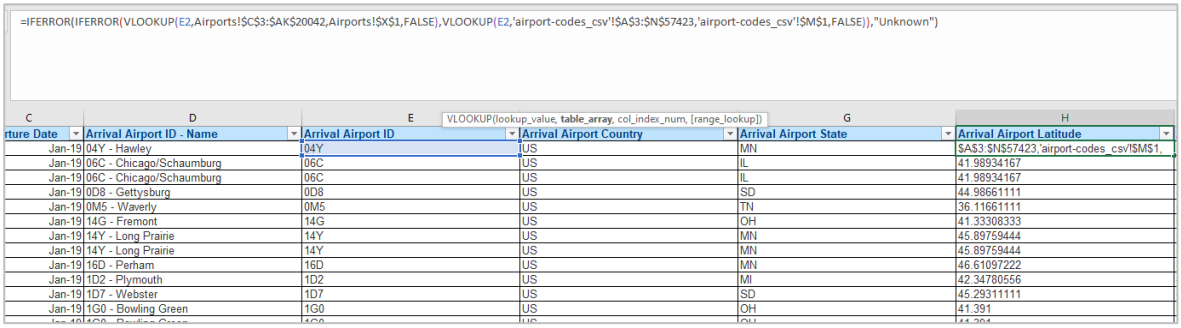
VLOOKUP(lookup_value, **table_array**, col_index_num, [range_lookup])

C	D	E	G
ture Date	Arrival Airport ID - Name	Arrival Airport ID	Arrival Airport Country	Arrival Airport State
Jan-19	04Y - Hawley	04Y	US	$G$57423,'airport-codes_csv'!$G$1,FALSE)
Jan-19	06C - Chicago/Schaumburg	06C	US	IL
Jan-19	06C - Chicago/Schaumburg	06C	US	IL
Jan-19	0D8 - Gettysburg	0D8	US	SD
Jan-19	0M5 - Waverly	0M5	US	TN
Jan-19	14G - Fremont	14G	US	OH
Jan-19	14Y - Long Prairie	14Y	US	MN
Jan-19	14Y - Long Prairie	14Y	US	MN
Jan-19	16D - Perham	16D	US	MN
Jan-19	1D2 - Plymouth	1D2	US	MI
Jan-19	1D7 - Webster	1D7	US	SD
Jan-19	1G0 - Bowling Green	1G0	US	OH

Source: Kimley-Horn, 2022

- Airport Latitude and Longitude (two fields for each arrival and departure airport): Denotes the latitude and longitude coordinates that the airport is located in. This requires referencing a complete dataset of all airports that includes the FAA ID, state, and coordinate location of each airport. The following dataset was pulled for initially mapping the filed flight plan data in the MnSASP Hub: https://datahub.io/core/airport-codes#resource-airport-codes. Add this dataset into the Excel workbook and refer to Figure 6-10 for a screenshot reference for the formula used to pull in this information.

Figure 6-10. FAA Filed Flight Plan Data – Airport Coordinate Field (Latitude shown)



=IFERROR(IFERROR(VLOOKUP(E2,Airports!$C$3:$AK$20042,Airports!$X$1,FALSE),VLOOKUP(E2,'airport-codes_csv'!$A$3:$N$57423,'airport-codes_csv'!$M$1,FALSE)),"Unknown")

VLOOKUP(lookup_value, **table_array**, col_index_num, [range_lookup])

C	D	E	G	H
ture Date	Arrival Airport ID - Name	Arrival Airport ID	Arrival Airport Country	Arrival Airport State	Arrival Airport Latitude
Jan-19	04Y - Hawley	04Y	US	MN	$A$3:$N$57423,'airport-codes_csv'!$M$1,
Jan-19	06C - Chicago/Schaumburg	06C	US	IL	41.98934167
Jan-19	06C - Chicago/Schaumburg	06C	US	IL	41.98934167
Jan-19	0D8 - Gettysburg	0D8	US	SD	44.98661111
Jan-19	0M5 - Waverly	0M5	US	TN	36.11661111
Jan-19	14G - Fremont	14G	US	OH	41.33308333
Jan-19	14Y - Long Prairie	14Y	US	MN	45.89759444
Jan-19	14Y - Long Prairie	14Y	US	MN	45.89759444
Jan-19	16D - Perham	16D	US	MN	46.61097222
Jan-19	1D2 - Plymouth	1D2	US	MI	42.34780556
Jan-19	1D7 - Webster	1D7	US	SD	45.29311111
Jan-19	1G0 - Bowling Green	1G0	US	OH	41.391

Source: Kimley-Horn, 2022

5) Use the new country fields to filter the datasets and remove all international routes.

6) Add the following data fields to each dataset (use the exact field names noted):

- ROUTE_AIRPORT: Concatenate the departure airport ID and arrival airport ID with a hyphen.
- RP_APT_STATE: Concatenate the departure airport ID and arrival airport state with a hyphen.
- RT_STATE: Concatenate the departure airport state and arrival airport state with a hyphen.
- DPT_ARR: Denotes whether the departure or arrival airport is in Minnesota. Populate this field with “Arrival” or “Departure”.
- QUERY_STATE: For Minnesota arrivals, populate this field with the departure airport state. For Minnesota departure, populate this field with the arrival airport state.
- QUERY_AIRPORT: For Minnesota arrivals, populate this field with the departure airport ID. For Minnesota departure, populate this field with the arrival airport ID.

7) Combine the departure and arrival datasets and consolidate the data to include the following fields:

- ID_NUM: Flight ID Number
- ROUTE_AIRPORT: Route – Airport Codes
- RT_APT_STATE: Route – Airport to State
- ROUTE_SATE: Route – States
- DPT_DATE: Departure Date
- DPT_AIRPORT_NAME: Departure Airport Name
- DPT_AIRPORT_ID: Departure Airport Code
- DPT_COUNTRY: Departure Airport Country Code
- DPT_STATE: Departure State
- DPT_LAT: Departure Airport Latitude
- DPT_LONG: Departure Airport Longitude
- ARR_DATE: Arrival Date
- ARR_AIRPORT_NAME: Arrival Airport Name
- ARR_AIRPORT_ID: Arrival Airport Code
- ARR_COUNTRY: Arrival Airport Country Code
- ARR_STATE: Arrival State
- ARR_LAT: Arrival Airport Latitude
- ARR_LONG: Arrival Airport Longitude
- QUERY_STATE: Query Airport State
- QUERY_AIRPORT: Query Airport Code

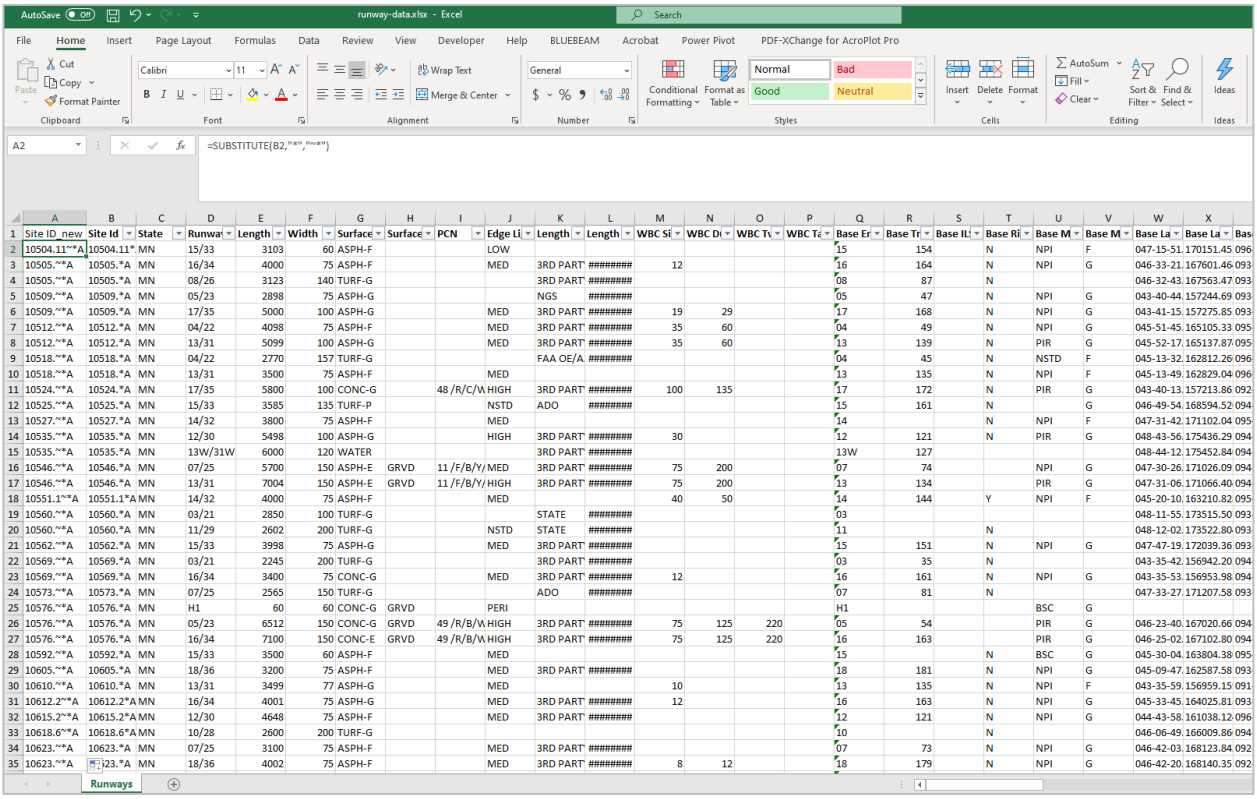
8) Reflect this new data in the "All Flight Plan Details" table included in the FAA Filed Flight Plan Data feature layer. Refer to the MnSASP Hub User's Guide for guidance on updating this data table.

6.4.2.4. Runway Data

The following steps detail how to manipulate the raw runway data pulled from the FAA's ADIP for updating the MnSASP Hub.

1) Navigate to the FAA's ADIP: https://adip.faa.gov/agis/public/#/public.
2) Locate and click "Go To Advanced Facility Search".
3) Using ADIP's advanced facility search, search for all the airports in the state aviation system and click "Execute Search" (as of 1/1/2022, this includes all publicly owned, public use airports in MN).
4) Download the runway and facility datasets.
5) To join the datasets, the Site Id will be used as the common key. However, the Site Ids need to be manipulated to accurately join the airport information using a Vlookup function. Create a new column A in both sheets that will be populated with the manipulated Site Ids.
6) Input the following formula in the first row of the new column that should be referencing the Site Ids: =SUBSTITUTE(B2,"*",".").
7) Copy this formula down through sheet, and repeat for the other sheet (refer to **Figure 6-11** for screenshot reference).

Figure 6-11. Insert Substitute Function for ADIP Runway Data

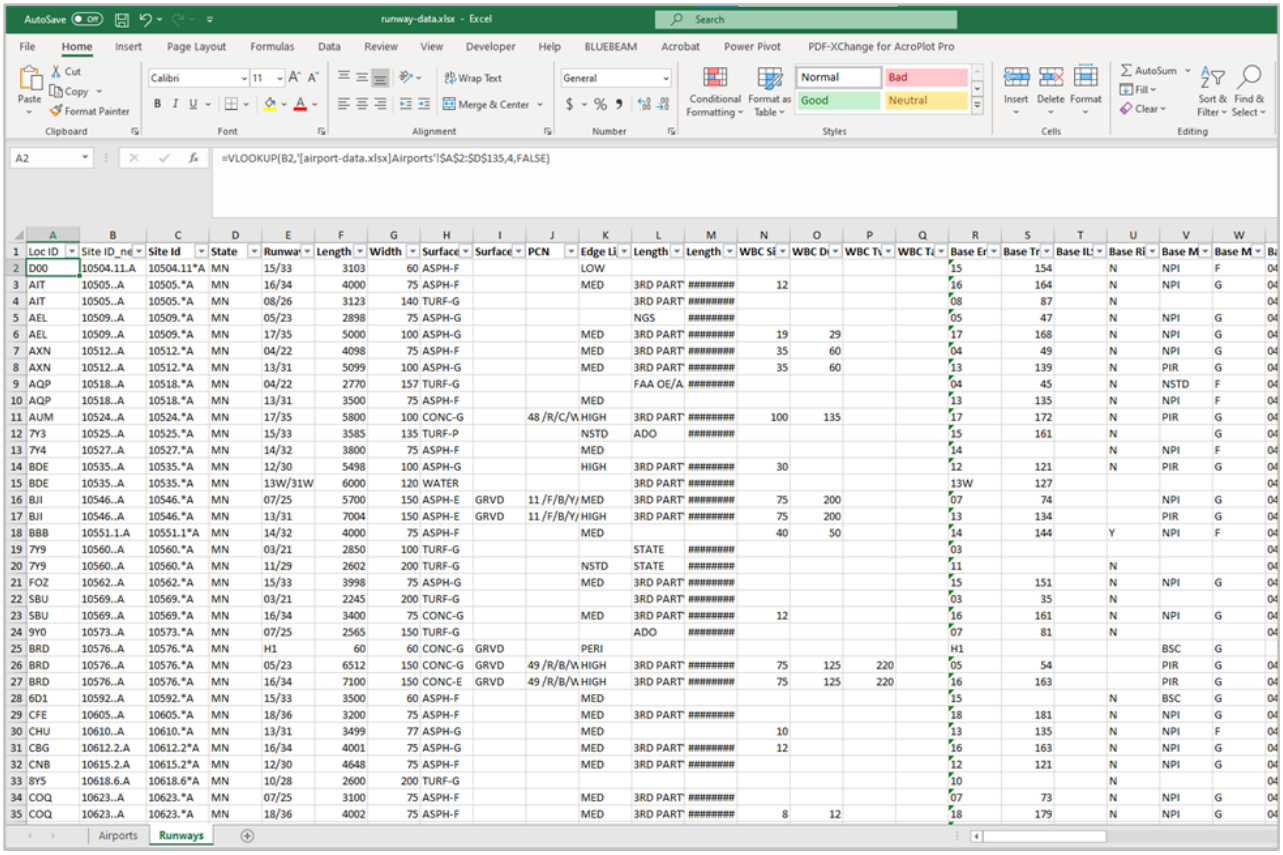


Source: Kimley-Horn, 2022

8) Insert a new column in the runways dataset that will include the FAA three-letter identifiers (titled Loc Id in the airport data sheet).

9) Insert a Vlookup function in the new column to join the Loc ID from the airport data sheet into the runways data sheet using the manipulated site IDs as the common key. See **Figure 6-12** for screenshot reference.

Figure 6-12. Join FAA IDs to ADIP Runway Data



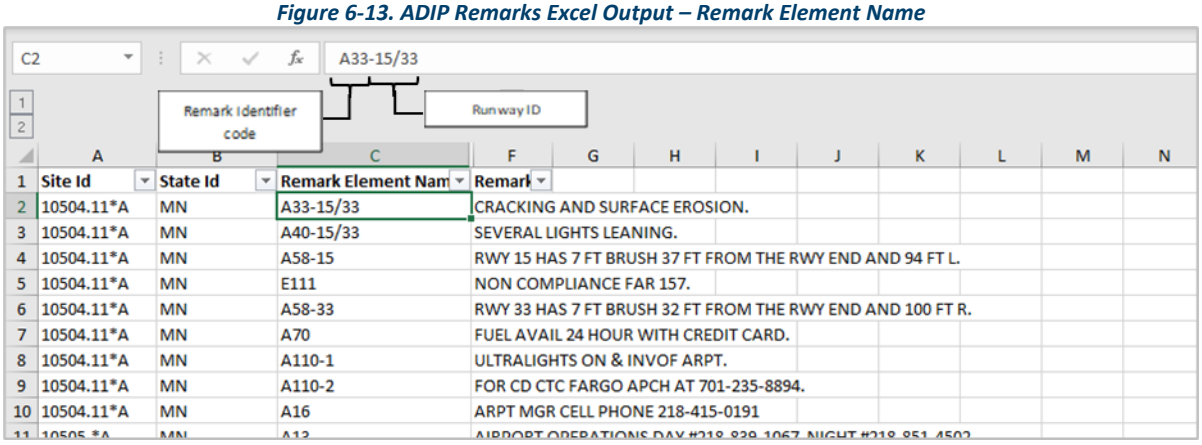
Source: Kimley-Horn, 2022

6.4.2.5. Runway Obstruction Data

As a part of airport 5010 inspections, runways are evaluated for close-in obstructions in the critical areas that can present a risk to arriving/departing aircraft. This runway obstruction information is published in the airport's 5010 report under the remarks section. FAA's ADIP database organizes the remarks data into a separate downloadable dataset that can be pulled using the advanced facilities search query in ADIP. See below for instructions on accessing the remarks data and pulling the runway obstruction data.

1) Navigate to the FAA's ADIP: https://adip.faa.gov/agis/public/#/public.
2) Locate and click "Go To Advanced Facility Search."
3) Using ADIP's advanced facility search, search for all the airports in the state aviation system and click "Execute Search" (as of 1/1/2022, this includes all publicly owned, public use airports in MN).
4) Download the Remarks dataset.
5) The Remarks dataset is categorized by type using the "Remark Element Name" field. According to the Airports Master Record Data Dictionary, the records with the remark element name starting with "A58" notes any close-in obstructions affecting a runway. Refer to **Figure 6-13** for a screenshot reference.

Figure 6-13. ADIP Remarks Excel Output – Remark Element Name



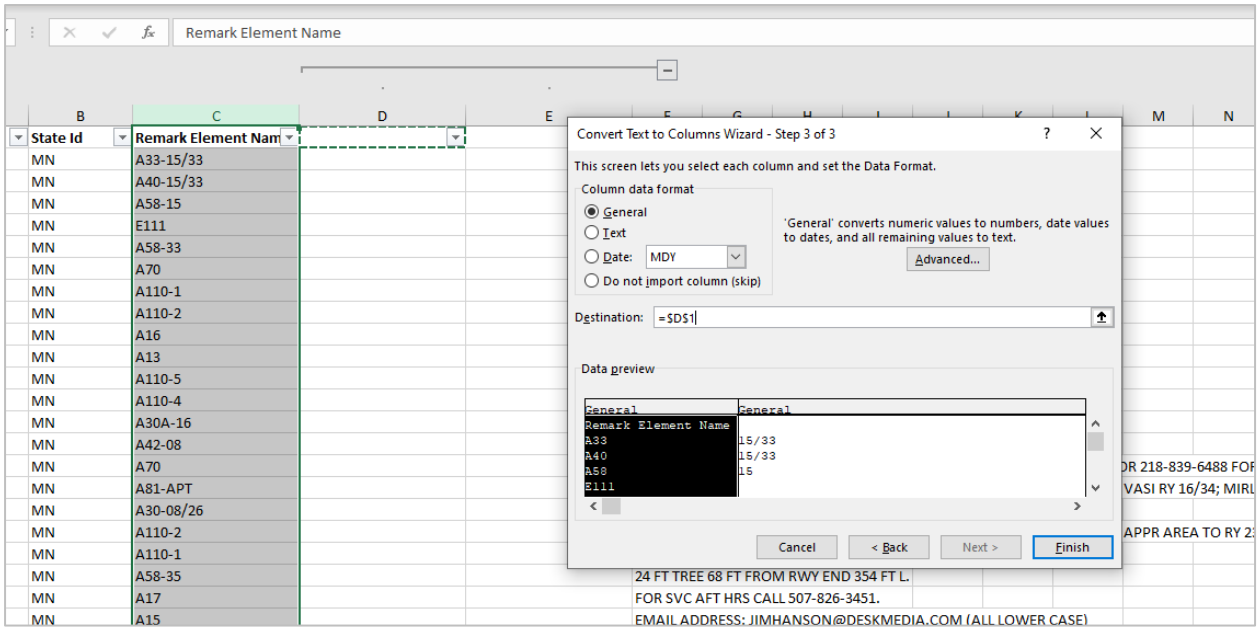
	A	B	C	F
1	Site Id	State Id	Remark Element Nam	Remark
2	10504.11*A	MN	A33-15/33	CRACKING AND SURFACE EROSION.
3	10504.11*A	MN	A40-15/33	SEVERAL LIGHTS LEANING.
4	10504.11*A	MN	A58-15	RWY 15 HAS 7 FT BRUSH 37 FT FROM THE RWY END AND 94 FT L.
5	10504.11*A	MN	E111	NON COMPLIANCE FAR 157.
6	10504.11*A	MN	A58-33	RWY 33 HAS 7 FT BRUSH 32 FT FROM THE RWY END AND 100 FT R.
7	10504.11*A	MN	A70	FUEL AVAIL 24 HOUR WITH CREDIT CARD.
8	10504.11*A	MN	A110-1	ULTRALIGHTS ON & INVOF ARPT.
9	10504.11*A	MN	A110-2	FOR CD CTC FARGO APCH AT 701-235-8894.
10	10504.11*A	MN	A16	ARPT MGR CELL PHONE 218-415-0191
11	10505.*A	MN	A13	AIRPORT OPERATIONS DAY #218-839-1067 NIGHT #218-851-4502

Source: Kimley-Horn, 2022

6) To filter the remarks by the element identifier code "A58", the remark element name column needs to be split by the element identifier code and the airport runway associated to the obstruction. This split information will be contained in two new columns, so create two columns adjacent to the remark element name column. To populate these new columns with the split data, select the remark element name column and use the "Text to Columns" function available in the data tab. Through the function's wizard setup, enter the following criteria:

- Step 1 of 3 (Original data type): "Delimited"
- Step 2 of 3 (Delimiters): Select "Other" and input a hyphen "-"
- Step 3 of 3: Specify the destination as the first cell in the new column (refer to for a screenshot reference in Figure 6-14)

Figure 6-14. ADIP Remarks Excel Output – Text to Columns Wizard Step 3



B	C
State Id	Remark Element Nam
MN	A33-15/33
MN	A40-15/33
MN	A58-15
MN	E111
MN	A58-33
MN	A70
MN	A110-1
MN	A110-2
MN	A16
MN	A13
MN	A110-5
MN	A110-4
MN	A30A-16
MN	A42-08
MN	A70
MN	A81-APT
MN	A30-08/26
MN	A110-2
MN	A110-1
MN	A58-35
MN	A17
MN	A15

Source: Kimley-Horn, 2022

7) Filter the new remark identifier column to "A58" to isolate the obstruction-related remarks.

8) Use the site IDs and runway IDs to identify the close-in obstructions recorded at the airports. This data will need to be plugged into the Runway Data table included in the MnSASP Hub Airport Data feature layer in the MnSASP Hub. This is a manual process of switching back and forth between Runway Data table and the remarks dataset to populate the obstruction data points in the Runway Data table. Refer to the MnSASP Hub User's Guide for guidance on accessing the MnSASP Hub Airport Data feature layer and updating the Runway Data table.

The Airports Master Record Data Dictionary describes the construct of all the downloadable datasets in ADIP, including the remarks data. Refer to the following link to access the Data Dictionary: https://adip.faa.gov/agis/public/#/onlineAmrDataDictionary.

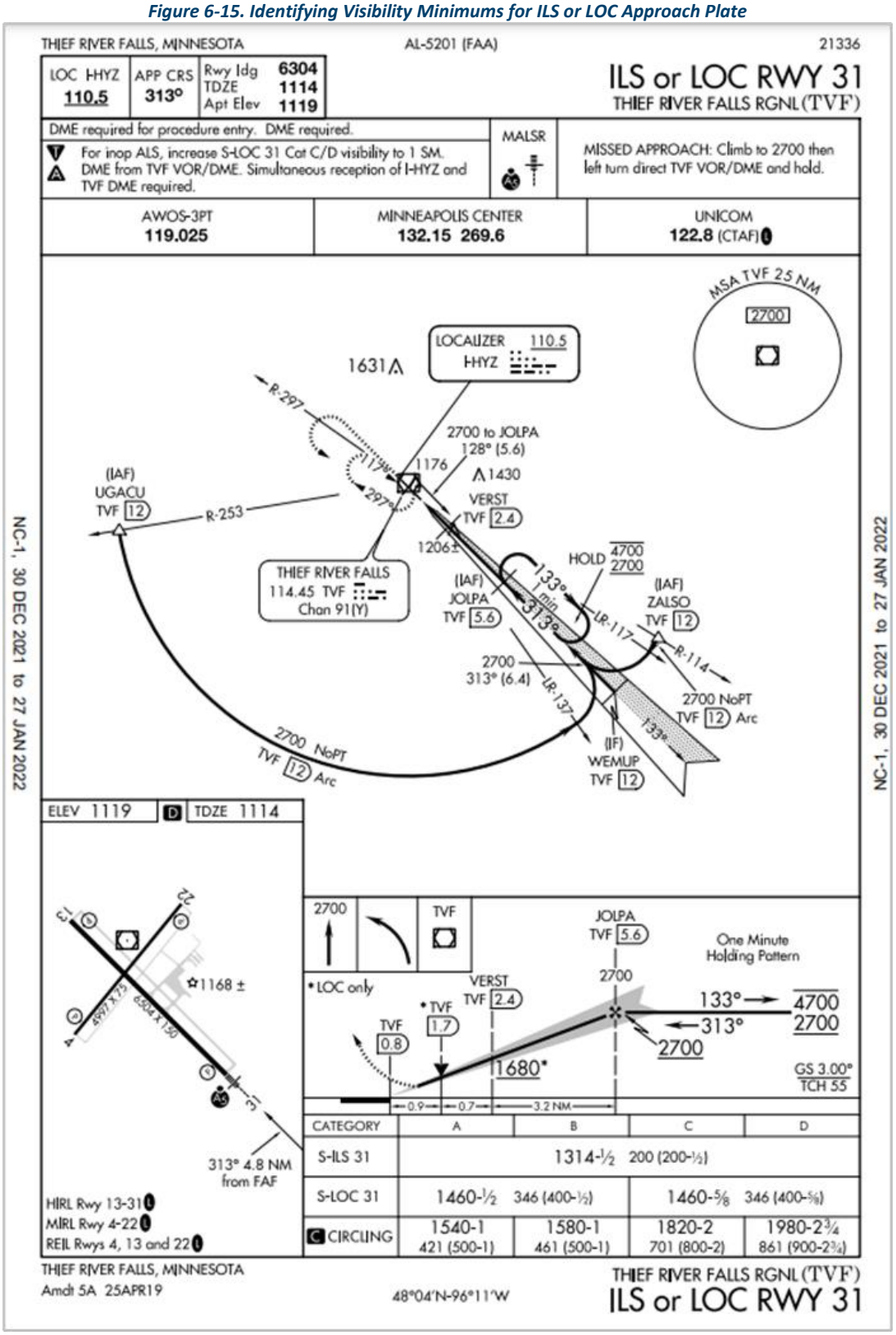
Note that ALPs can help identify other obstructions affecting Minnesota system airport runways and validate the 5010 remarks.

6.4.2.6. Runway Visibility Minimums

The following steps describe how to locate and review FAA-published approach plates to pull the most critical runway visibility minimums established.

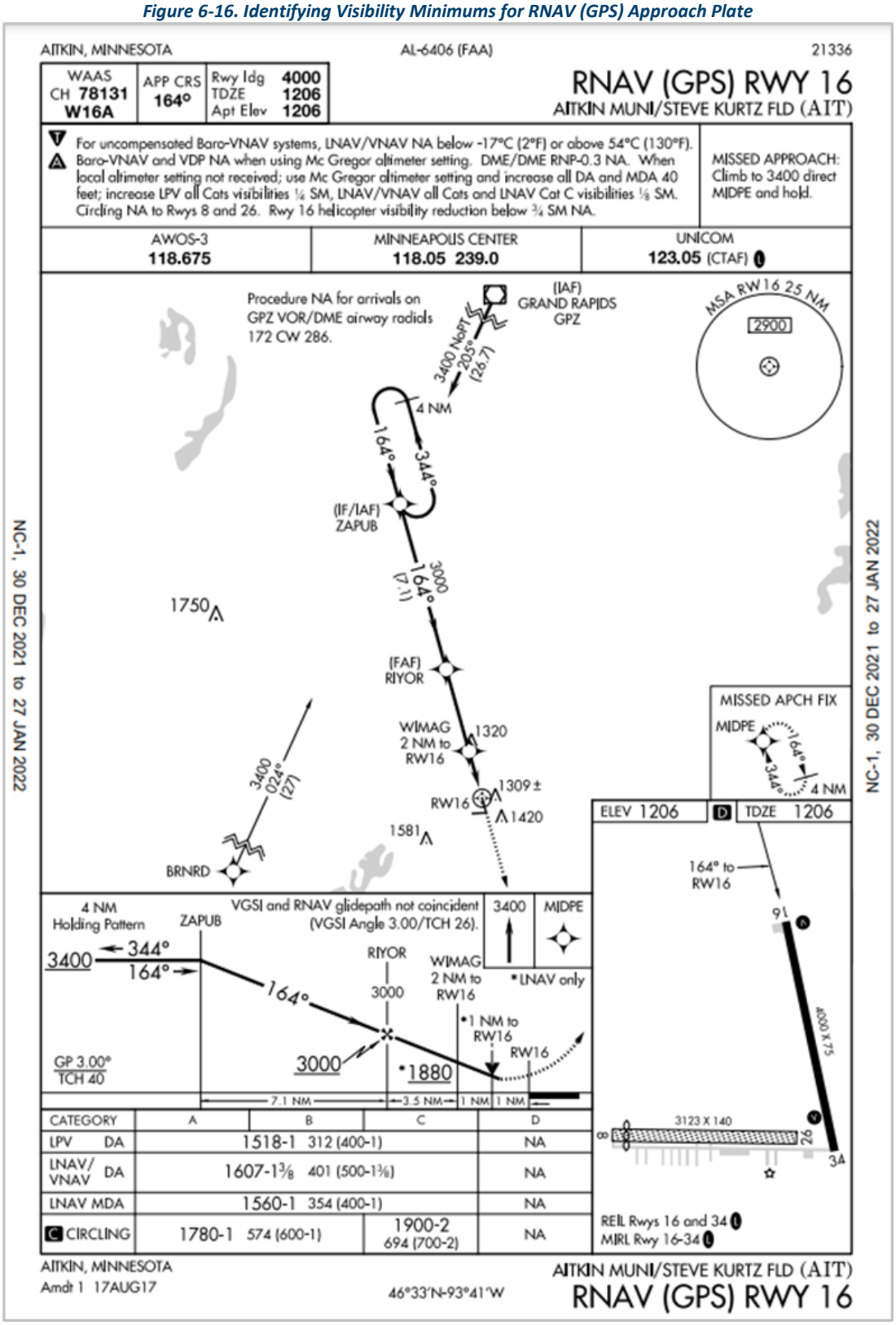
1) In ADIP's basic search query, search for the airport to review using the FAA three-letter identifier.
2) In the left-hand navigation window, locate and click "Charts."
    - If the window is titled "No Charts Found," the airport does not have any instrument approach plates published – there are only visual approach(es) equipped at the airport and the visibility minimums should be noted as "VISUAL."
3) Under the heading "Instrument Approach Procedure (IAP) Charts," there are links to access the approach plates for the runways that have at least one instrument approach. The review of these approach plates should be completed in the following order to pull the lowest possible visibility minimum associated with each runway end (where applicable): ILS or LOC, RNAV (GPS).
4) For the approach plate opened, review the approach categories listed at the bottom. Review the first category listed and identify the number listed after the hyphen. This is the lowest visibility minimum associated with that runway end. Refer to **Figure 6-15** and **Figure 6-16** for screenshot references.

Figure 6-15. Identifying Visibility Minimums for ILS or LOC Approach Plate



Source: FAA ADIP, 2022

Figure 6-16. Identifying Visibility Minimums for RNAV (GPS) Approach Plate



Source: FAA ADIP, 2022

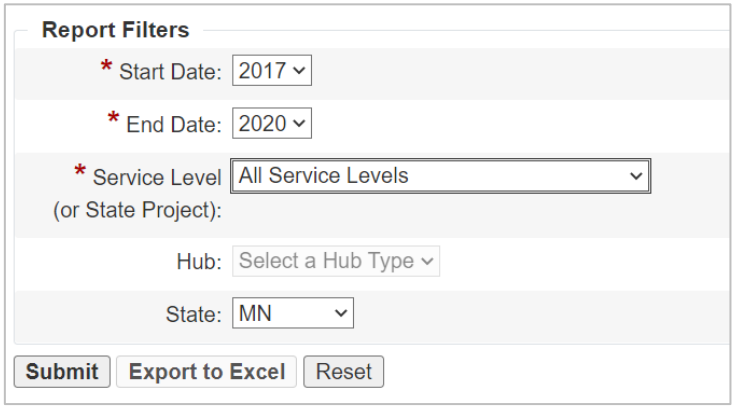
6.4.2.7. Federal Funding

The following steps describe how to download FAA AIP grant history and calculate the average annual AIP funding across four years of data.

1) Navigate to the following website: https://www.faa.gov/airports/aip/grant_histories/lookup/.

2) Scroll down the page to the section titled "Report Filters" and input the intended search criteria. Refer to **Figure 6-17** for a screenshot reference.

Figure 6-17. AIP Grant History Look-Up Tool



Sources: FAA AIP, 2022

3) Select "Submit" then "Export to Excel" to download an Excel-version of the AIP grant history for all Minnesota airports.

4) Open the downloaded Excel file. The column populated with AIP federal funding data by airport may be in an incompatible data format for analysis (i.e. text format). If this is the case, add a new column and convert the column to a number format. Make sure to title the new column to distinguish it from the raw AIP data column. Refer to **Figure 6-18** for a screenshot reference of the formula to use.

Figure 6-18. AIP Grant History Data – Convert to Number Format

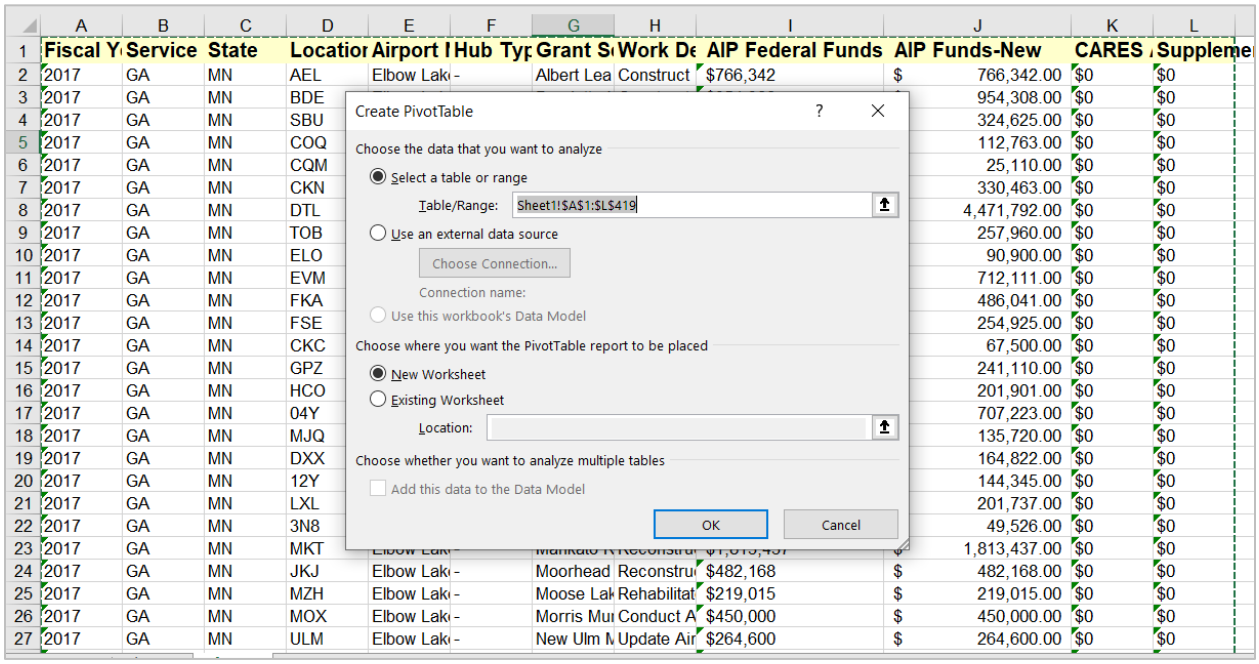
J2 =NUMBERVALUE(I2)

	A	B	C	D	E	F	G	H	I	J	K	L
1	Fiscal Y	Service	State	Locatior	Airport I	Hub Typ	Grant S	Work De	AIP Federal Funds	AIP Funds	CARES	Suppleme
2	2017	GA	MN	AEL	Elbow Lak	-	Albert Lea	Construct	$766,342	$ 766,342.00	$0	$0
3	2017	GA	MN	BDE	Elbow Lak	-	Baudette I	Construct	$954,308	$ 954,308.00	$0	$0
4	2017	GA	MN	SBU	Elbow Lak	-	Blue Earth	Construct	$324,625	$ 324,625.00	$0	$0
5	2017	GA	MN	COQ	Elbow Lak	-	Cloquet Ca	Rehabilitat	$112,763	$ 112,763.00	$0	$0
6	2017	GA	MN	CQM	Elbow Lak	-	Cook Muni	Rehabilitat	$25,110	$ 25,110.00	$0	$0
7	2017	GA	MN	CKN	Elbow Lak	-	Crookston	Construct	$330,463	$ 330,463.00	$0	$0
8	2017	GA	MN	DTL	Elbow Lak	-	Detroit Lak	Construct	$4,471,792	$ 4,471,792.00	$0	$0
9	2017	GA	MN	TOB	Elbow Lak	-	Dodge Ce	Reconstru	$257,960	$ 257,960.00	$0	$0
10	2017	GA	MN	ELO	Elbow Lak	-	Ely Munici	Reconstru	$90,900	$ 90,900.00	$0	$0
11	2017	GA	MN	EVM	Elbow Lak	-	Eveleth-Vi	Construct	$712,111	$ 712,111.00	$0	$0
12	2017	GA	MN	FKA	Elbow Lak	-	Fillmore C	Conduct A	$486,041	$ 486,041.00	$0	$0
13	2017	GA	MN	FSE	Elbow Lak	-	Fosston M	Rehabilitat	$254,925	$ 254,925.00	$0	$0
14	2017	GA	MN	CKC	Elbow Lak	-	Grand Mar	Conduct E	$67,500	$ 67,500.00	$0	$0
15	2017	GA	MN	GPZ	Elbow Lak	-	Grand Rap	Construct	$241,110	$ 241,110.00	$0	$0
16	2017	GA	MN	HCO	Elbow Lak	-	Hallock Mu	Construct	$201,901	$ 201,901.00	$0	$0

Source: Kimley-Horn, 2022

5) Create a Pivot Table from the full dataset. Refer to **Figure 6-19** for a screenshot reference.

Figure 6-19. AIP Grant History Data – Create Pivot Table

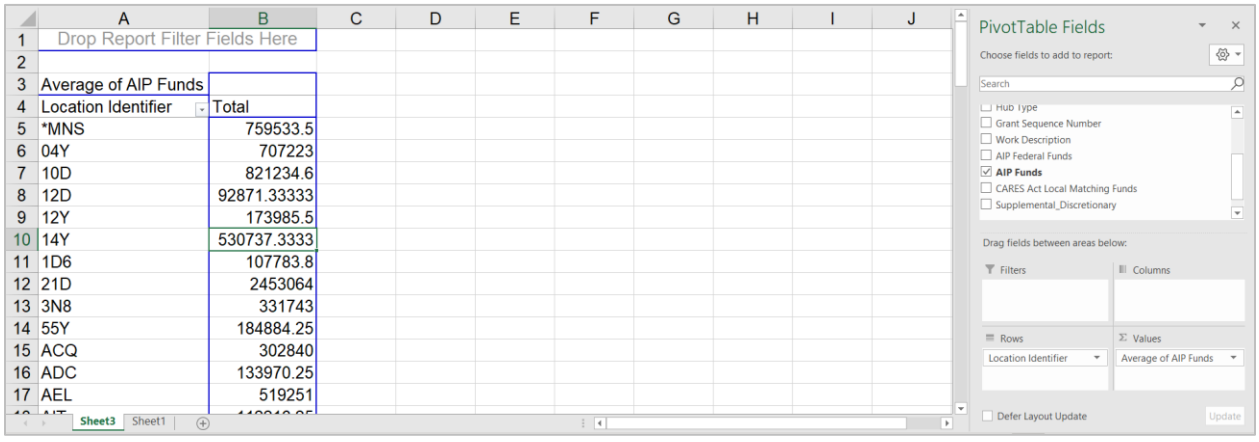


	A	B	C	D	E	F	G	H	I	J	K	L
1	Fiscal Y	Service	State	Locatior	Airport I	Hub Typ	Grant S	Work De	AIP Federal Funds	AIP Funds-New	CARES	Supplemer
2	2017	GA	MN	AEL	Elbow Lak	-	Albert Lea	Construct	$766,342	$ 766,342.00	$0	$0
3	2017	GA	MN	BDE						954,308.00	$0	$0
4	2017	GA	MN	SBU						324,625.00	$0	$0
5	2017	GA	MN	COQ						112,763.00	$0	$0
6	2017	GA	MN	CQM						25,110.00	$0	$0
7	2017	GA	MN	CKN						330,463.00	$0	$0
8	2017	GA	MN	DTL						4,471,792.00	$0	$0
9	2017	GA	MN	TOB						257,960.00	$0	$0
10	2017	GA	MN	ELO						90,900.00	$0	$0
11	2017	GA	MN	EVM						712,111.00	$0	$0
12	2017	GA	MN	FKA						486,041.00	$0	$0
13	2017	GA	MN	FSE						254,925.00	$0	$0
14	2017	GA	MN	CKC						67,500.00	$0	$0
15	2017	GA	MN	GPZ						241,110.00	$0	$0
16	2017	GA	MN	HCO						201,901.00	$0	$0
17	2017	GA	MN	04Y						707,223.00	$0	$0
18	2017	GA	MN	MJQ						135,720.00	$0	$0
19	2017	GA	MN	DXX						164,822.00	$0	$0
20	2017	GA	MN	12Y						144,345.00	$0	$0
21	2017	GA	MN	LXL						201,737.00	$0	$0
22	2017	GA	MN	3N8						49,526.00	$0	$0
23	2017	GA	MN	MKT						1,813,437.00	$0	$0
24	2017	GA	MN	JKJ	Elbow Lak	-	Moorhead	Reconstru	$482,168	$ 482,168.00	$0	$0
25	2017	GA	MN	MZH	Elbow Lak	-	Moose Lak	Rehabilitat	$219,015	$ 219,015.00	$0	$0
26	2017	GA	MN	MOX	Elbow Lak	-	Morris Mu	Conduct A	$450,000	$ 450,000.00	$0	$0
27	2017	GA	MN	ULM	Elbow Lak	-	New Ulm M	Update Air	$264,600	$ 264,600.00	$0	$0

Source: Kimley-Horn, 2022

6) Configure the new Pivot Table to have the average AIP funding by Location ID. The resulting table will have the average 4-year AIP funding by airport ID. Refer to **Figure 6-20** for a screenshot reference.

Figure 6-20. AIP Grant History Data – Configure Pivot Table



Source: Kimley-Horn, 2022

6.4.2.8. State and Local Funding

The Excel output[47] generated from the MnDOT ACE database includes seven labeled header categories, with the actual data occupying a maximum of five columns. The data are organized by three-letter identifiers, which are included as individual header rows, and include all of the airport's specific project funding data under each airport's header row. There are also blank rows that serve to separate each airport's project funding data. In total, there are five types of rows observed in the raw dataset. Given the complexity of the rows, which results in the data not being organized in an intuitive way to review the historical project data by airport, there are three major tasks to organize the data for easily pulling the state and local funding data aggregated by airport.

- Identify Types of Rows: Identify and denote each row with the type of data populated
- Reformat Data based on the Row Type: Reformat the data based on the row types populated in the previous step
- Filtering for Relevant Data: The reformatted data is pulled into another sheet and filtered by the relevant data rows to make the final dataset concise and setup for further analyses

Each of these steps is described in detail below. Figure 6-21 presents a comparison between a sample of the source data and the results of the data manipulation steps.

Figure 6-21. ACE Project Data Output vs Desired Format

Region	Ident	Municipality	Payment Date	Federal	State	Local
E						
6D1	BROOTEN					
>---- Brooten Airport ----<	05/28/1958	$0.00	$9,545.01	$0.00		
GRADING, PAVING, DRAINAGE	12/18/1978	$0.00	$162,641.62	$41,513.84		
LAND	12/14/1978	$0.00	$122,000.00	$36,882.44		
PAVEMENT CRACK REPAIR	10/19/1991	$0.00	$9,966.67	$4,983.33		

Sample of data export

Region	Ident	Municipality		Payment Date	Federal	State	Local
E	6D1	BROOTEN	>---- Brooten Airport ----<	05/28/1958	$0.00	$9,545.01	$0.00
E	6D1	BROOTEN	GRADING, PAVING, DRAINAGE	12/18/1978	$0.00	$162,641.62	$41,513.84
E	6D1	BROOTEN	LAND	12/14/1978	$0.00	$122,000.00	$36,882.44
E	6D1	BROOTEN	PAVEMENT CRACK REPAIR	10/19/1991	$0.00	$9,966.67	$4,983.33

Sample of desired format, where each row can be understood by itself.

Sources: MnDOT Aeronautics ACE Database, 2021; Kimley-Horn, 2022

Identify Types of Rows

There are five categories of rows observed in the output:

- Airport or category name
- Total rows
- Blank spacer rows

[47] *The data manipulation plan described in this section is based on the Excel output provided to Kimley-Horn on 04/08/2021 and is subject to change based on formatting changes to the output.*

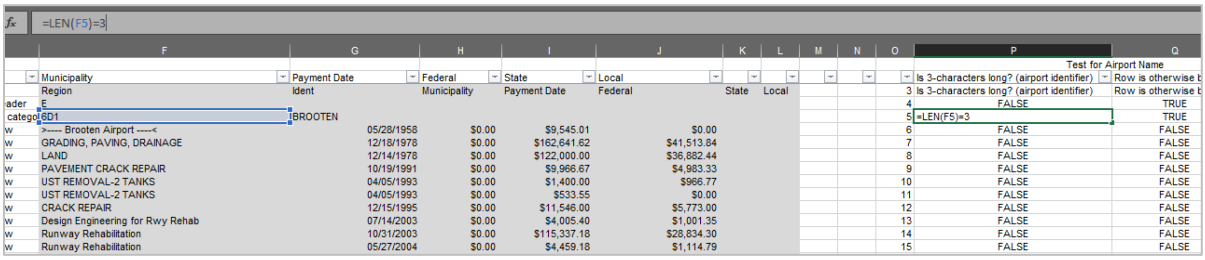
- Region header
- Normal row – project name and funding amounts

"Flags" for these categories were created in individual "helper columns" alongside the original data.

Airport or Category Name

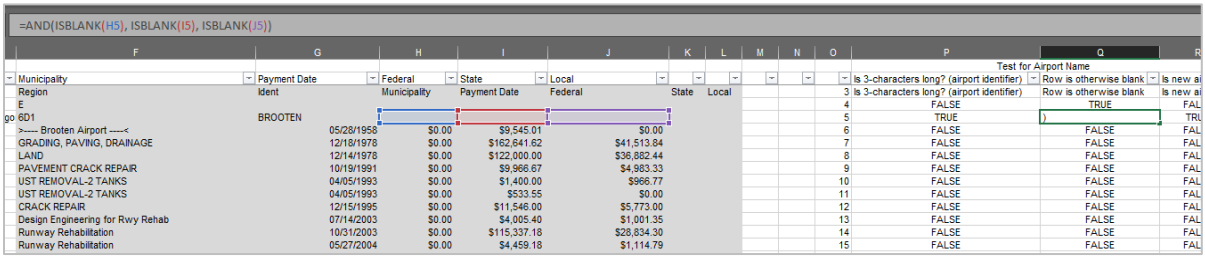
Columns Q, R, and R: If the value in the first column is three characters long (column P) and the row had blank cells in the last three columns (Column Q), then it is a header for a new airport. Less than a dozen other rows identified should be treated in this manner, but which did not have the three-letter airport identifiers in the first column. These were identified by the pattern of blank and non-blank columns. Refer to Figure 6-22, Figure 6-23, and Figure 6-24 for a screenshot reference for each column.

Figure 6-22. ACE Data Manipulation – Column P



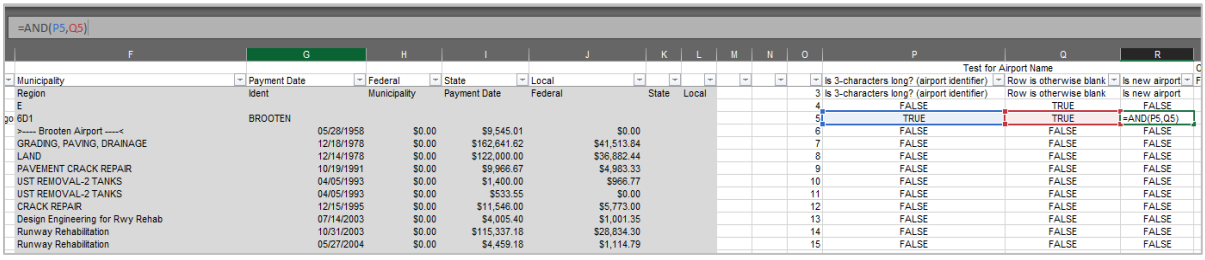
Sources: MnDOT Aeronautics ACE Database, 2021; Kimley-Horn, 2022

Figure 6-23. ACE Data Manipulation – Column Q



Sources: MnDOT Aeronautics ACE Database, 2021; Kimley-Horn, 2022

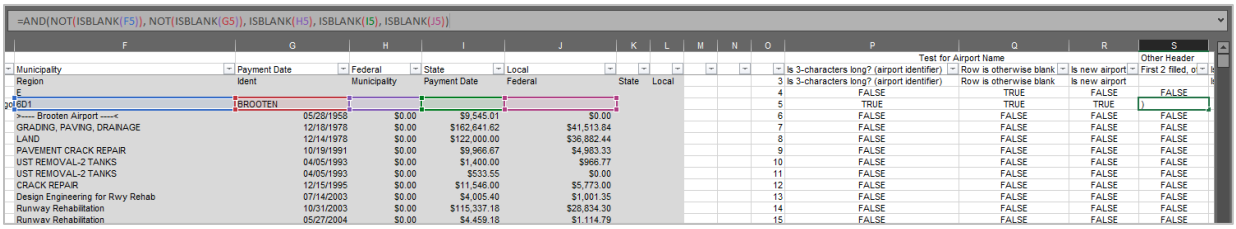
Figure 6-24. ACE Data Manipulation – Column R



Sources: MnDOT Aeronautics ACE Database, 2021; Kimley-Horn, 2022

Column S: If the row had blank cells in the last three columns, and the first two columns were not blank, then it is a header that should be treated in a similar manner to an airport header. Refer to Figure 6-25 for a screenshot reference of this column.

Figure 6-25. ACE Data Manipulation – Column S



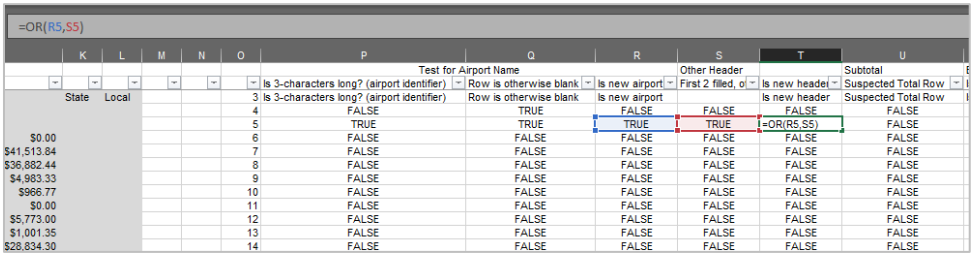
Region	Ident	Municipality	Payment Date	Federal	State	Local
E						
6D1	BROOTEN					
>---- Brooten Airport ----<		05/28/1958	$0.00	$9,545.01	$0.00	
GRADING, PAVING, DRAINAGE		12/18/1978	$0.00	$162,641.62	$41,513.84	
LAND		12/14/1978	$0.00	$122,000.00	$36,882.44	
PAVEMENT CRACK REPAIR		10/19/1991	$0.00	$9,966.67	$4,983.33	
UST REMOVAL-2 TANKS		04/05/1993	$0.00	$1,400.00	$966.77	
UST REMOVAL-2 TANKS		04/05/1993	$0.00	$533.55	$0.00	
CRACK REPAIR		12/15/1995	$0.00	$11,546.00	$5,773.00	
Design Engineering for Rwy Rehab		07/14/2003	$0.00	$4,005.40	$1,001.35	
Runway Rehabilitation		10/31/2003	$0.00	$115,337.18	$28,834.30	
Runway Rehabilitation		05/27/2004	$0.00	$4,459.18	$1,114.79	

Is 3-characters long? (airport identifier)	Row is otherwise blank	Is new airport	First 2 filled, o
3 Is 3-characters long? (airport identifier)	Row is otherwise blank	Is new airport	
4 FALSE	TRUE	FALSE	FALSE
5 TRUE	TRUE	TRUE	)
6 FALSE	FALSE	FALSE	FALSE
7 FALSE	FALSE	FALSE	FALSE
8 FALSE	FALSE	FALSE	FALSE
9 FALSE	FALSE	FALSE	FALSE
10 FALSE	FALSE	FALSE	FALSE
11 FALSE	FALSE	FALSE	FALSE
12 FALSE	FALSE	FALSE	FALSE
13 FALSE	FALSE	FALSE	FALSE
14 FALSE	FALSE	FALSE	FALSE
15 FALSE	FALSE	FALSE	FALSE

Sources: MnDOT Aeronautics ACE Database, 2021; Kimley-Horn, 2022

Column T: If it is an airport header flagged in column R or a header flagged in column S, it is a new header. Refer to Figure 6-26 for a screenshot reference of this column.

Figure 6-26. ACE Data Manipulation – Column T



State	Local	Is 3-characters long? (airport identifier)	Row is otherwise blank	Is new airport	First 2 filled, o	Is new header	Suspected Total Row
		3 Is 3-characters long? (airport identifier)	Row is otherwise blank	Is new airport		Is new header	Suspected Total Row
		4 FALSE	TRUE	FALSE	FALSE	FALSE	FALSE
		5 TRUE	TRUE	TRUE	TRUE	=OR(R5,S5)	FALSE
$0.00		6 FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
$41,513.84		7 FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
$36,882.44		8 FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
$4,983.33		9 FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
$966.77		10 FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
$0.00		11 FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
$5,773.00		12 FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
$1,001.35		13 FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
$28,834.30		14 FALSE	FALSE	FALSE	FALSE	FALSE	FALSE

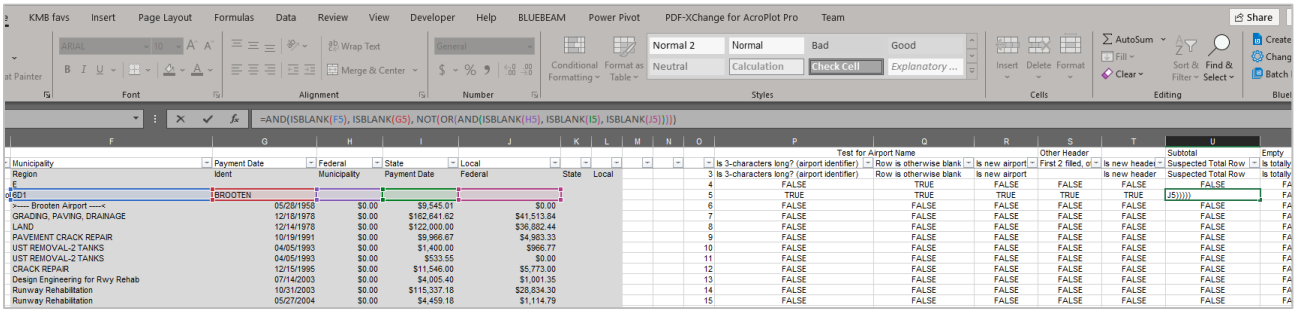
Sources: MnDOT Aeronautics ACE Database, 2021; Kimley-Horn, 2022

Total Row

Total rows do not have labels in the first two columns, but have values in all the last three columns.

Column U: If the first and second columns are both blank and none of the last three columns are blank, then it is a total row. Refer to Figure 6-27 for a screenshot reference of this column.

Figure 6-27. ACE Data Manipulation – Column U



Region	Ident	Municipality	Payment Date	Federal	State	Local
E						
6D1	BROOTEN					
>---- Brooten Airport ----<		05/28/1958	$0.00	$9,545.01	$0.00	
GRADING, PAVING, DRAINAGE		12/18/1978	$0.00	$162,641.62	$41,513.84	
LAND		12/14/1978	$0.00	$122,000.00	$36,882.44	
PAVEMENT CRACK REPAIR		10/19/1991	$0.00	$9,966.67	$4,983.33	
UST REMOVAL-2 TANKS		04/05/1993	$0.00	$1,400.00	$966.77	
UST REMOVAL-2 TANKS		04/05/1993	$0.00	$533.55	$0.00	
CRACK REPAIR		12/15/1995	$0.00	$11,546.00	$5,773.00	
Design Engineering for Rwy Rehab		07/14/2003	$0.00	$4,005.40	$1,001.35	
Runway Rehabilitation		10/31/2003	$0.00	$115,337.18	$28,834.30	
Runway Rehabilitation		05/27/2004	$0.00	$4,459.18	$1,114.79	

Is 3-characters long? (airport identifier)	Row is otherwise blank	Is new airport	First 2 filled, o	Is new header	Suspected Total Row	Is totally
3 Is 3-characters long? (airport identifier)	Row is otherwise blank	Is new airport		Is new header	Suspected Total Row	Is totally
4 FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FA
5 TRUE	TRUE	TRUE	TRUE	TRUE	J5)))))	FA
6 FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FA
7 FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FA
8 FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FA
9 FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FA
10 FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FA
11 FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FA
12 FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FA
13 FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FA
14 FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FA
15 FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FA

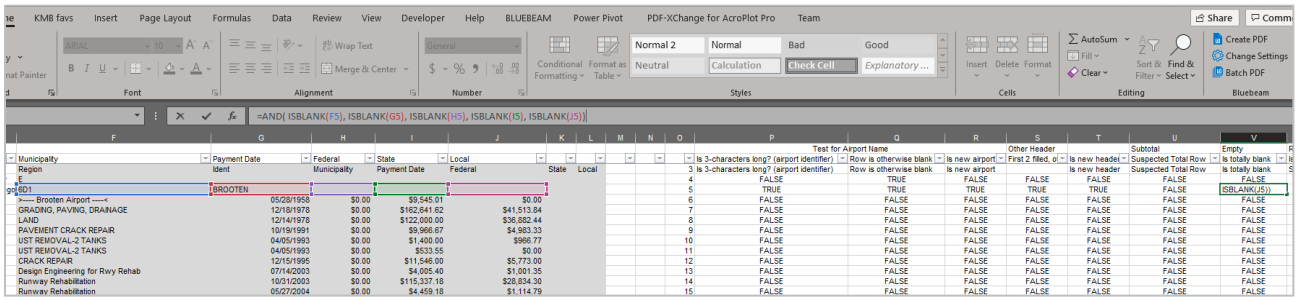
Sources: MnDOT Aeronautics ACE Database, 2021; Kimley-Horn, 2022

Blank Spacer Rows

Some rows were entirely blank, typically before a total row.

Column V: If all five columns are blank, it is a spacer row. Refer to Figure 6-28 for a screenshot reference of this column.

Figure 6-28 - ACE Data Manipulation – Column V



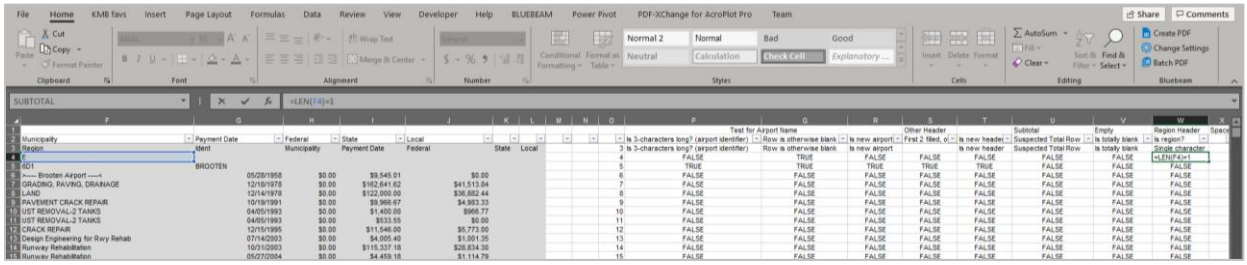
Sources: MnDOT Aeronautics ACE Database, 2021; Kimley-Horn, 2022

Region Header

Region header rows were observed to have a single character in the first column, such as "E."

Column W: If the value in the first column is one character long, it is a Region Header. Refer to **Figure 6-29** for a screenshot reference of this column.

Figure 6-29. ACE Data Manipulation – Column W



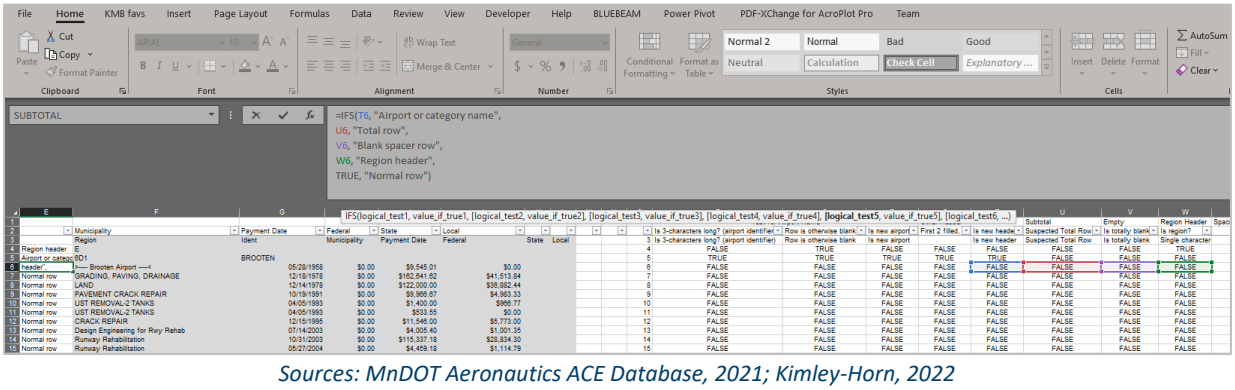
Sources: MnDOT Aeronautics ACE Database, 2021; Kimley-Horn, 2022

Normal Project Row

Having ruled out the other types of row data, anything remaining was considered a normal row.

Embedded in Column E: If none of the other patterns were found, label it a normal row. Refer to **Figure 6-30** for a screenshot reference of this column.

Figure 6-30. ACE Data Manipulation – Column E



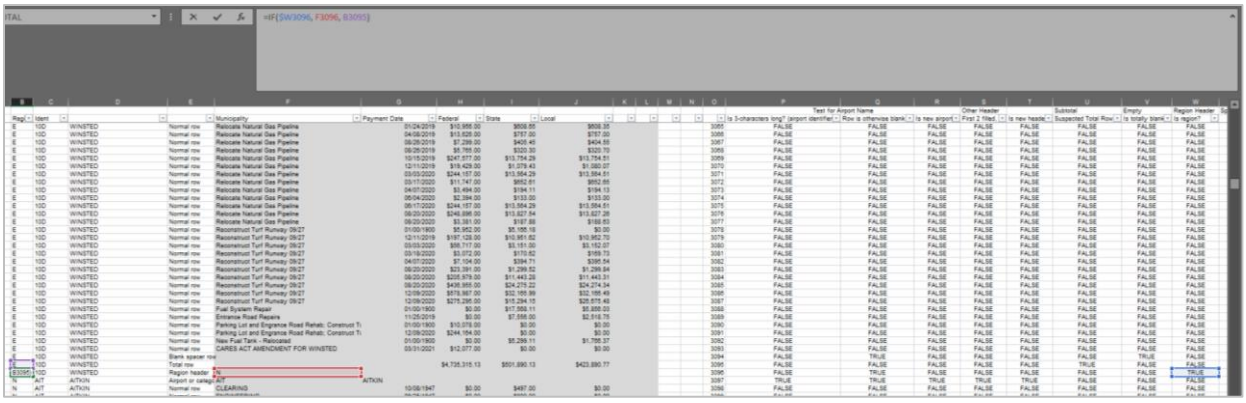
Sources: MnDOT Aeronautics ACE Database, 2021; Kimley-Horn, 2022

Reformatting Data Based on the Row Type

The next step is to list the heading information of Region, Airport Identifier, and Municipality for each row so that a single row identified a project, airport, and region, without needing to visually reference previous rows. Some "helper columns" were created to the left of the original data.

Region (Column B): If this row is flagged as a Region Header, list the current row's value for Region Header; otherwise, show the Region Header from this column in the previous row. Refer to Figure 6-31 for a screenshot reference of this column.

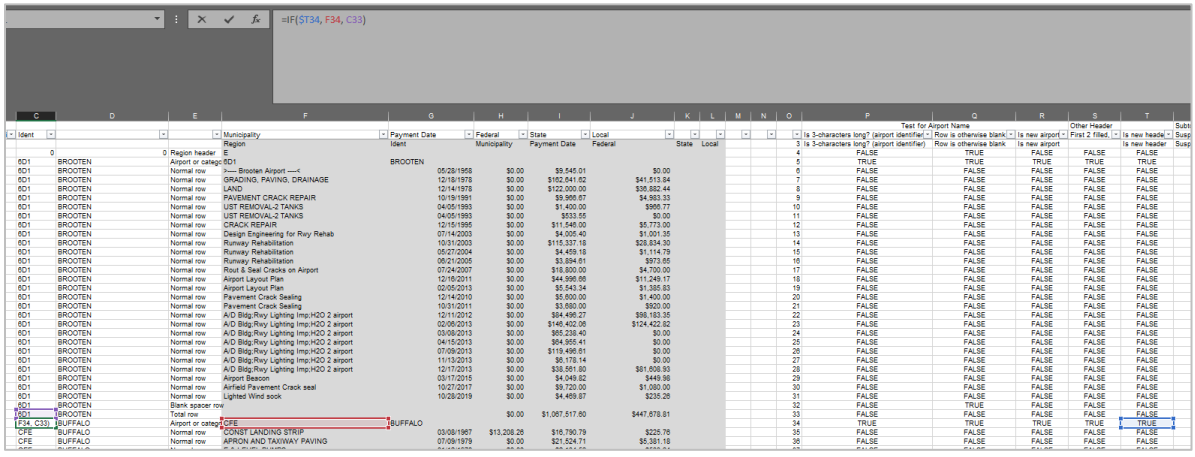
Figure 6-31. ACE Data Manipulation – Column B



Sources: MnDOT Aeronautics ACE Database, 2021; Kimley-Horn, 2022

Airport Identifier (Column C): If this row is flagged as an Airport or Category Name, list the current row's value from the first column of data; otherwise, show the Airport Identifier from this column in the previous row. Refer to Figure 6-32 for a screenshot reference of this column.

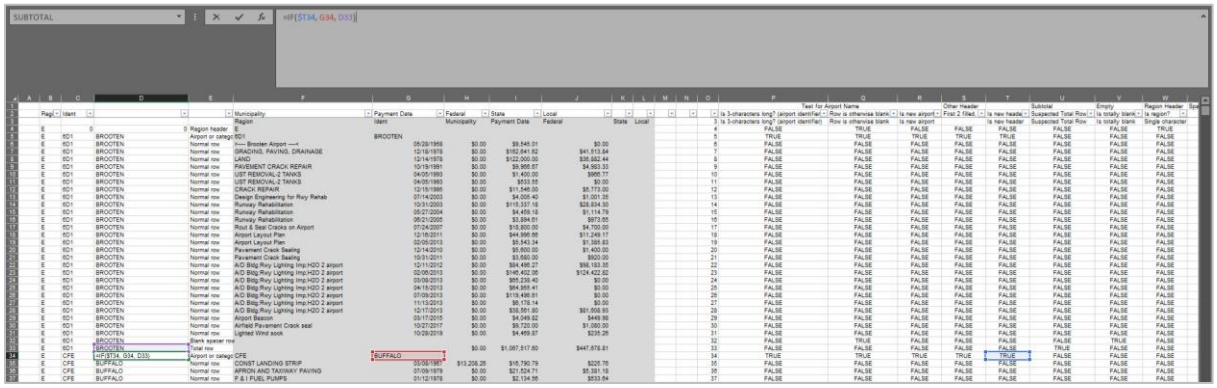
Figure 6-32. ACE Data Manipulation – Column C



Sources: MnDOT Aeronautics ACE Database, 2021; Kimley-Horn, 2022

Municipality (Column D): If this row is flagged as an Airport or Category Name, list the current row's value from the second column of data; otherwise, show the Municipality from this column in the previous row. Refer to Figure 6-33 for a screenshot reference of this column.

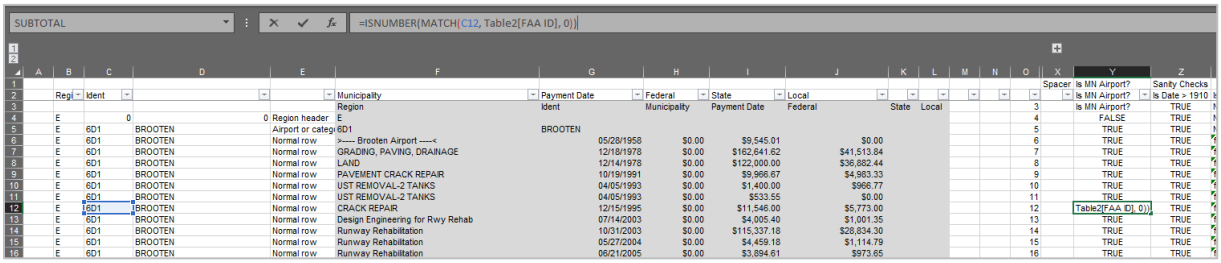
Figure 6-33. ACE Data Manipulation – Column D



Sources: MnDOT Aeronautics ACE Database, 2021; Kimley-Horn, 2022

Is MN Airport? (Column Y): Using the helper column with Airport Identifier for each row, this column checked for a match for a three-letter airport identifier was found in the list of Minnesota Airport's FAA IDs. Refer to Figure 6-34 for a screenshot reference of this column.

Figure 6-34. ACE Data Manipulation – Column Y



	Region	Ident			Municipality	Payment Date	Federal	State	Local					Spacer	Is MN Airport?	Sanity Checks
					Region	Ident	Municipality	Payment Date	Federal	State	Local				Is MN Airport?	Is Date > 1910
4	E	0		0	Region header	E								4	FALSE	TRUE
5	E	6D1	BROOTEN		Airport or categ	6D1	BROOTEN							5	TRUE	TRUE
6	E	6D1	BROOTEN		Normal row	>---- Brooten Airport ----<		05/28/1958	$0.00	$9,545.01	$0.00			6	TRUE	TRUE
7	E	6D1	BROOTEN		Normal row	GRADING, PAVING, DRAINAGE		12/18/1978	$0.00	$162,641.62	$41,513.84			7	TRUE	TRUE
8	E	6D1	BROOTEN		Normal row	LAND		12/14/1978	$0.00	$122,000.00	$36,882.44			8	TRUE	TRUE
9	E	6D1	BROOTEN		Normal row	PAVEMENT CRACK REPAIR		10/19/1991	$0.00	$9,966.67	$4,983.33			9	TRUE	TRUE
10	E	6D1	BROOTEN		Normal row	UST REMOVAL-2 TANKS		04/05/1993	$0.00	$1,400.00	$966.77			10	TRUE	TRUE
11	E	6D1	BROOTEN		Normal row	UST REMOVAL-2 TANKS		04/05/1993	$0.00	$533.55	$0.00			11	TRUE	TRUE
12	E	6D1	BROOTEN		Normal row	CRACK REPAIR		12/15/1995	$0.00	$11,546.00	$5,773.00			12	Table2[FAA ID], 0))	TRUE
13	E	6D1	BROOTEN		Normal row	Design Engineering for Rwy Rehab		07/14/2003	$0.00	$4,005.40	$1,001.35			13	TRUE	TRUE
14	E	6D1	BROOTEN		Normal row	Runway Rehabilitation		10/31/2003	$0.00	$115,337.18	$28,834.30			14	TRUE	TRUE
15	E	6D1	BROOTEN		Normal row	Runway Rehabilitation		05/27/2004	$0.00	$4,459.18	$1,114.79			15	TRUE	TRUE
16	E	6D1	BROOTEN		Normal row	Runway Rehabilitation		06/21/2005	$0.00	$3,894.61	$973.65			16	TRUE	TRUE

Sources: MnDOT Aeronautics ACE Database, 2021; Kimley-Horn, 2022

Filtering for Relevant Data

The data of interest in the reformatted data sheet are just those rows of project funding that are for airports in Minnesota. The airport and region header information had already been listed for each row, so rows containing just that information were no longer important. Spacer rows had never contained information, and total rows were unnecessary for an analysis in spreadsheet software.

To remove the extraneous rows described above, filter Row Category (Column E) to "Normal Row" and Is MN Airport (Column Y) to True. Copy this filtered result into a new worksheet to create a fresh dataset to conduct further analyses on (refer to Figure 6-35 for a screenshot reference).

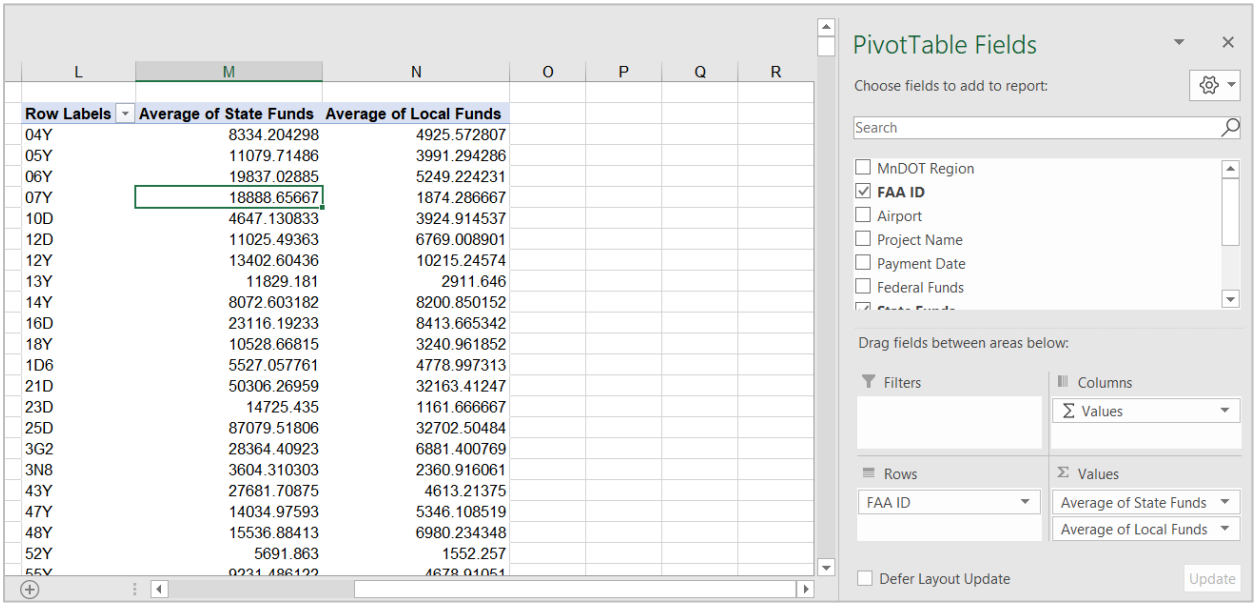
Figure 6-35. Relevant ACE Data

Row Numb	Regi	Iden		Category	Municipality	Payment Da	Federal	State	Local
6	E	6D1	BROOTEN	Normal row	>---- Brooten Airport ----<	05/28/1958	$0.00	$9,545.01	$0.00
7	E	6D1	BROOTEN	Normal row	GRADING, PAVING, DRAINAGE	12/18/1978	$0.00	$162,641.62	$41,513.84
8	E	6D1	BROOTEN	Normal row	LAND	12/14/1978	$0.00	$122,000.00	$36,882.44
9	E	6D1	BROOTEN	Normal row	PAVEMENT CRACK REPAIR	10/19/1991	$0.00	$9,966.67	$4,983.33
10	E	6D1	BROOTEN	Normal row	UST REMOVAL-2 TANKS	04/05/1993	$0.00	$1,400.00	$966.77
11	E	6D1	BROOTEN	Normal row	UST REMOVAL-2 TANKS	04/05/1993	$0.00	$533.55	$0.00
12	E	6D1	BROOTEN	Normal row	CRACK REPAIR	12/15/1995	$0.00	$11,546.00	$5,773.00
13	E	6D1	BROOTEN	Normal row	Design Engineering for Rwy Rehab	07/14/2003	$0.00	$4,005.40	$1,001.35
14	E	6D1	BROOTEN	Normal row	Runway Rehabilitation	10/31/2003	$0.00	$115,337.18	$28,834.30
15	E	6D1	BROOTEN	Normal row	Runway Rehabilitation	05/27/2004	$0.00	$4,459.18	$1,114.79
16	E	6D1	BROOTEN	Normal row	Runway Rehabilitation	06/21/2005	$0.00	$3,894.61	$973.65
17	E	6D1	BROOTEN	Normal row	Rout & Seal Cracks on Airport	07/24/2007	$0.00	$18,800.00	$4,700.00
18	E	6D1	BROOTEN	Normal row	Airport Layout Plan	12/16/2011	$0.00	$44,996.66	$11,249.17
19	E	6D1	BROOTEN	Normal row	Airport Layout Plan	02/05/2013	$0.00	$5,543.34	$1,385.83
20	E	6D1	BROOTEN	Normal row	Pavement Crack Sealing	12/14/2010	$0.00	$5,600.00	$1,400.00
21	E	6D1	BROOTEN	Normal row	Pavement Crack Sealing	10/31/2011	$0.00	$3,680.00	$920.00
22	E	6D1	BROOTEN	Normal row	A/D Bldg;Rwy Lighting Imp;H2O 2 airport	12/11/2012	$0.00	$84,496.27	$98,183.35
23	E	6D1	BROOTEN	Normal row	A/D Bldg;Rwy Lighting Imp;H2O 2 airport	02/06/2013	$0.00	$146,402.06	$124,422.82
24	E	6D1	BROOTEN	Normal row	A/D Bldg;Rwy Lighting Imp;H2O 2 airport	03/08/2013	$0.00	$65,238.40	$0.00
25	E	6D1	BROOTEN	Normal row	A/D Bldg;Rwy Lighting Imp;H2O 2 airport	04/15/2013	$0.00	$64,955.41	$0.00
26	E	6D1	BROOTEN	Normal row	A/D Bldg;Rwy Lighting Imp;H2O 2 airport	07/09/2013	$0.00	$119,496.61	$0.00
27	E	6D1	BROOTEN	Normal row	A/D Bldg;Rwy Lighting Imp;H2O 2 airport	11/13/2013	$0.00	$6,178.14	$0.00

Sources: MnDOT Aeronautics ACE Database, 2021; Kimley-Horn, 2022

To calculate the four-year average state and local project received by airport, create and configure a pivot table from this new dataset. Refer to Figure 6-36 for a screenshot reference.

Figure 6-36. ACE Data Pivot Table Analysis



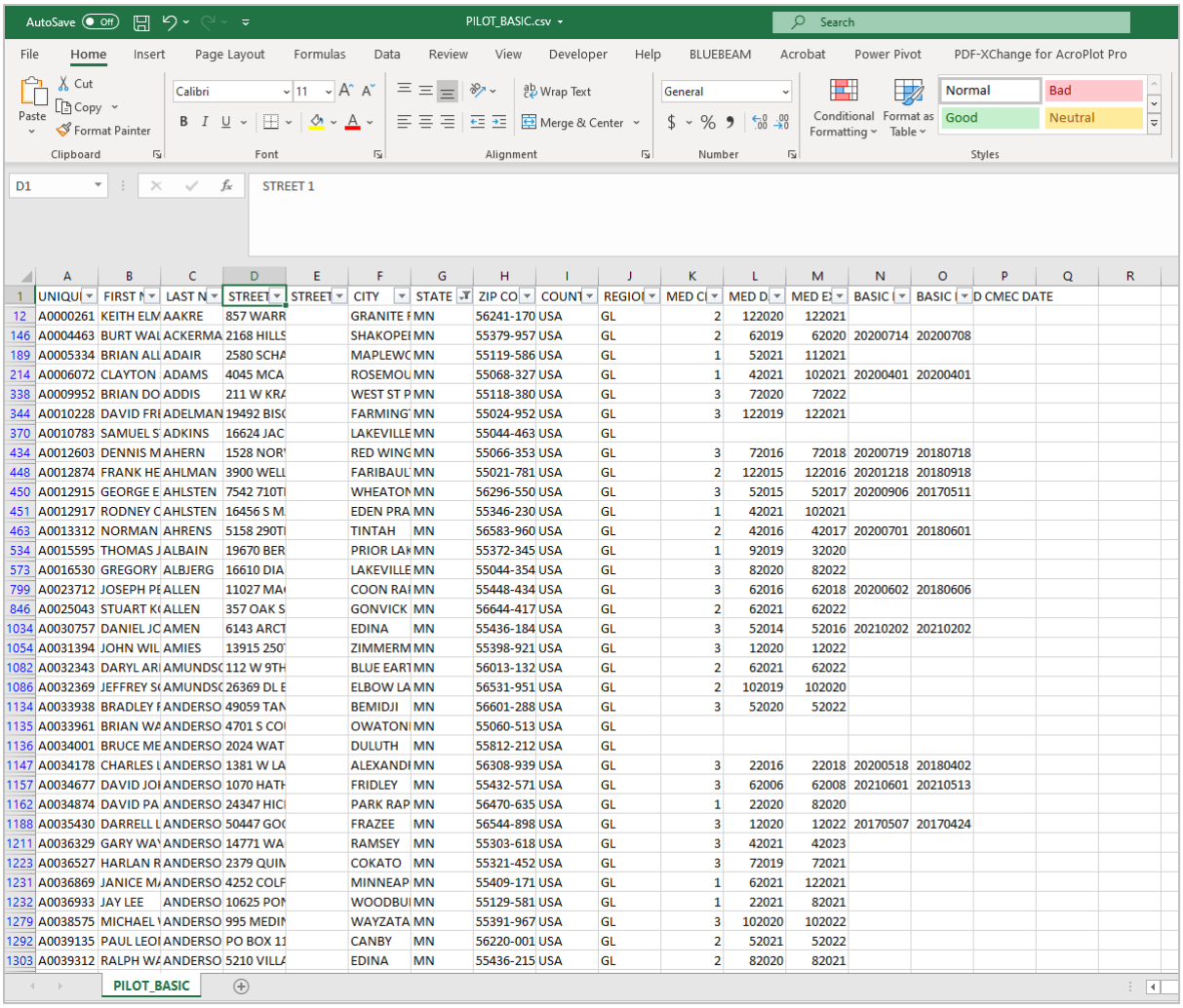
Source: Kimley-Horn, 2022

6.4.2.9. Certified Pilots within 30 Nautical Miles

The following steps describe the process for pulling the FAA's Airmen Certification Database and manipulating the data to conform with the MnSASP data parameters.

1) Navigate to the following website: https://www.faa.gov/licenses_certificates/airmen_certification/releasable_airmen_download/.
2) Download the full FAA Airmen Certification Database in comma separated format (CSV) and extract all the contents of the zip folder.
3) The "PILOT_BASIC.csv" file records all the certified pilots based in the United States. Open this file and ensure that the sheet contains the following information: street address, city, state, and zip code.
4) Add a filter to the header row of the data and use the dropdown for state to select "MN" only. Refer to **Figure 6-37** for a screenshot reference.

Figure 6-37. Filter Certified Pilot Data to Minnesota-Based Pilots Only



	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
1	UNIQU	FIRST N	LAST N	STREET	STREET	CITY	STATE	ZIP CO	COUNT	REGIO	MED CI	MED D	MED E	BASIC (	BASIC (	D CMEC DATE		
12	A0000261	KEITH ELM	AAKRE	857 WARR		GRANITE F	MN	56241-170	USA	GL	2	122020	122021					
146	A0004463	BURT WAL	ACKERMA	2168 HILLS		SHAKOPEE	MN	55379-957	USA	GL	2	62019	62020	20200714	20200708			
189	A0005334	BRIAN ALL	ADAIR	2580 SCHA		MAPLEWO	MN	55119-586	USA	GL	1	52021	112021					
214	A0006072	CLAYTON	ADAMS	4045 MCA		ROSEMOU	MN	55068-327	USA	GL	1	42021	102021	20200401	20200401			
338	A0009952	BRIAN DO	ADDIS	211 W KRA		WEST ST P	MN	55118-380	USA	GL	3	72020	72022					
344	A0010228	DAVID FRI	ADELMAN	19492 BIS		FARMING	MN	55024-952	USA	GL	3	122019	122021					
370	A0010783	SAMUEL S	ADKINS	16624 JAC		LAKEVILLE	MN	55044-463	USA	GL								
434	A0012603	DENNIS M	AHERN	1528 NOR		RED WING	MN	55066-353	USA	GL	3	72016	72018	20200719	20180718			
448	A0012874	FRANK HE	AHLMAN	3900 WELL		FARIBAUL	MN	55021-781	USA	GL	2	122015	122016	20201218	20180918			
450	A0012915	GEORGE E	AHLSTEN	7542 710TI		WHEATON	MN	56296-550	USA	GL	3	52015	52017	20200906	20170511			
451	A0012917	RODNEY C	AHLSTEN	16456 S M		EDEN PRA	MN	55346-230	USA	GL	1	42021	102021					
463	A0013312	NORMAN	AHRENS	5158 290TI		TINTAH	MN	56583-960	USA	GL	2	42016	42017	20200701	20180601			
534	A0015595	THOMAS J	ALBAIN	19670 BER		PRIOR LAK	MN	55372-345	USA	GL	1	92019	32020					
573	A0016530	GREGORY	ALBJERG	16610 DIA		LAKEVILLE	MN	55044-354	USA	GL	3	82020	82022					
799	A0023712	JOSEPH PE	ALLEN	11027 MA		COON RA	MN	55448-434	USA	GL	3	62016	62018	20200602	20180606			
846	A0025043	STUART K	ALLEN	357 OAK S		GONVICK	MN	56644-417	USA	GL	2	62021	62022					
1034	A0030757	DANIEL JC	AMEN	6143 ARCT		EDINA	MN	55436-184	USA	GL	3	52014	52016	20210202	20210202			
1054	A0031394	JOHN WIL	AMIES	13915 250		ZIMMERM	MN	55398-921	USA	GL	3	12020	12022					
1082	A0032343	DARYL AR	AMUNDSO	112 W 9TH		BLUE EAR	MN	56013-132	USA	GL	2	62021	62022					
1086	A0032369	JEFFREY S	AMUNDSO	26369 DL E		ELBOW LA	MN	56531-951	USA	GL	2	102019	102020					
1134	A0033938	BRADLEY F	ANDERSO	49059 TAN		BEMIDJI	MN	56601-288	USA	GL	3	52020	52022					
1135	A0033961	BRIAN WA	ANDERSO	4701 S CO		OWATON	MN	55060-513	USA	GL								
1136	A0034001	BRUCE ME	ANDERSO	2024 WAT		DULUTH	MN	55812-212	USA	GL								
1147	A0034178	CHARLES L	ANDERSO	1381 W LA		ALEXANDI	MN	56308-939	USA	GL	3	22016	22018	20200518	20180402			
1157	A0034677	DAVID JO	ANDERSO	1070 HATH		FRIDLEY	MN	55432-571	USA	GL	3	62006	62008	20210601	20210513			
1162	A0034874	DAVID PA	ANDERSO	24347 HIC		PARK RAP	MN	56470-635	USA	GL	1	22020	82020					
1188	A0035430	DARRELL L	ANDERSO	50447 GO		FRAZEE	MN	56544-898	USA	GL	3	12020	12022	20170507	20170424			
1211	A0036329	GARY WA	ANDERSO	14771 WA		RAMSEY	MN	55303-618	USA	GL	3	42021	42023					
1223	A0036527	HARLAN R	ANDERSO	2379 QUIN		COKATO	MN	55321-452	USA	GL	3	72019	72021					
1231	A0036869	JANICE M	ANDERSO	4252 COLF		MINNEAP	MN	55409-171	USA	GL	1	62021	122021					
1232	A0036933	JAY LEE	ANDERSO	10625 PON		WOODBU	MN	55129-581	USA	GL	1	22021	82021					
1279	A0038575	MICHAEL	ANDERSO	995 MEDI		WAYZATA	MN	55391-967	USA	GL	3	102020	102022					
1292	A0039135	PAUL LEO	ANDERSO	PO BOX 11		CANBY	MN	56220-001	USA	GL	2	52021	52022					
1303	A0039312	RALPH WA	ANDERSO	5210 VILLA		EDINA	MN	55436-215	USA	GL	2	82020	82021					

Source: Kimley-Horn, 2022

5) Copy the filtered data to a new CSV file and save this new CSV file in a place where it can easily be retrieved. This new file will be imported into ArcGIS Online and geocoded.

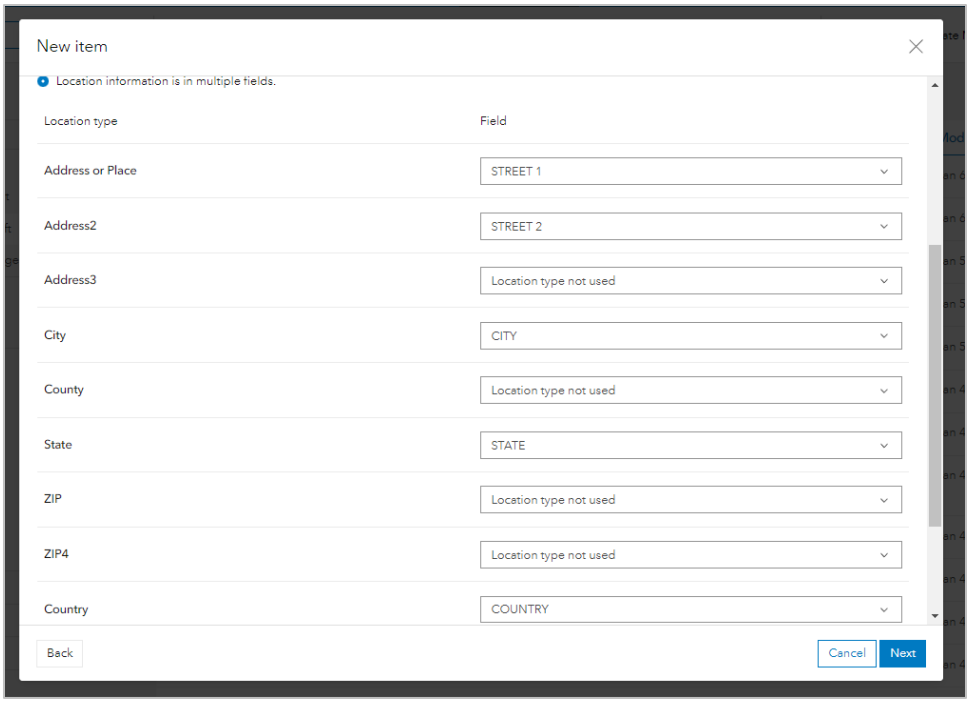
6) Open ArcGIS Online, navigate to "Content," select "New Item," and search for the new CSV file.

7) In the next window, select the first option ("Add [name of CSV file] and create a hosted feature layer or table") that will convert the CSV into a hosted feature layer or table.

8) The next window asks for the fields that should be included in the new feature layer/table. Ensure that street address, city, state, and zip code are all included in this list, and then click "Next."

9) The next window asks for the fields that include the location information to specify. Under "Location Fields," select "Location Information is in multiple fields." This opens a list of dropdowns to specify the field corresponding to each location type. Refer to **Figure 6-38** for a screenshot reference.

Figure 6-38. Map location Types to Data Table Fields

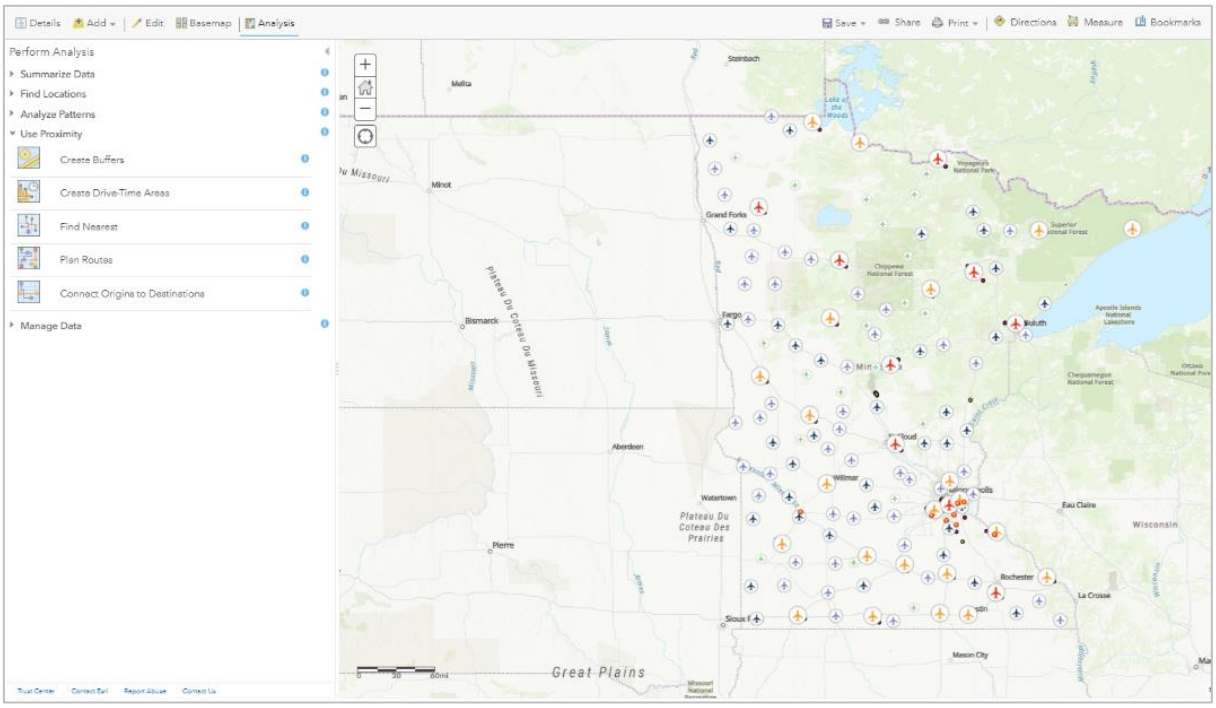


Sources: ArcGIS Online, 2022; Kimley-Horn, 2022

10) Review the number of credits that will be consumed by geocoding the addresses. Consult with your GIS administrator before running this service.

11) The final window asks for tags to add to the new feature layer and a summary. Per MnDOT's GIS review guidelines (updated as of 10/4/21), the following tags are required: MnDOT, MnDOT Official, MN, Minnesota. The summary should accurately adequately describe the content and purpose of the new feature layer (refer to **Figure 6-39** below). Once all the information has been populated, click "Save."

Figure 6-39. Certified Pilots Feature Layer Item Details



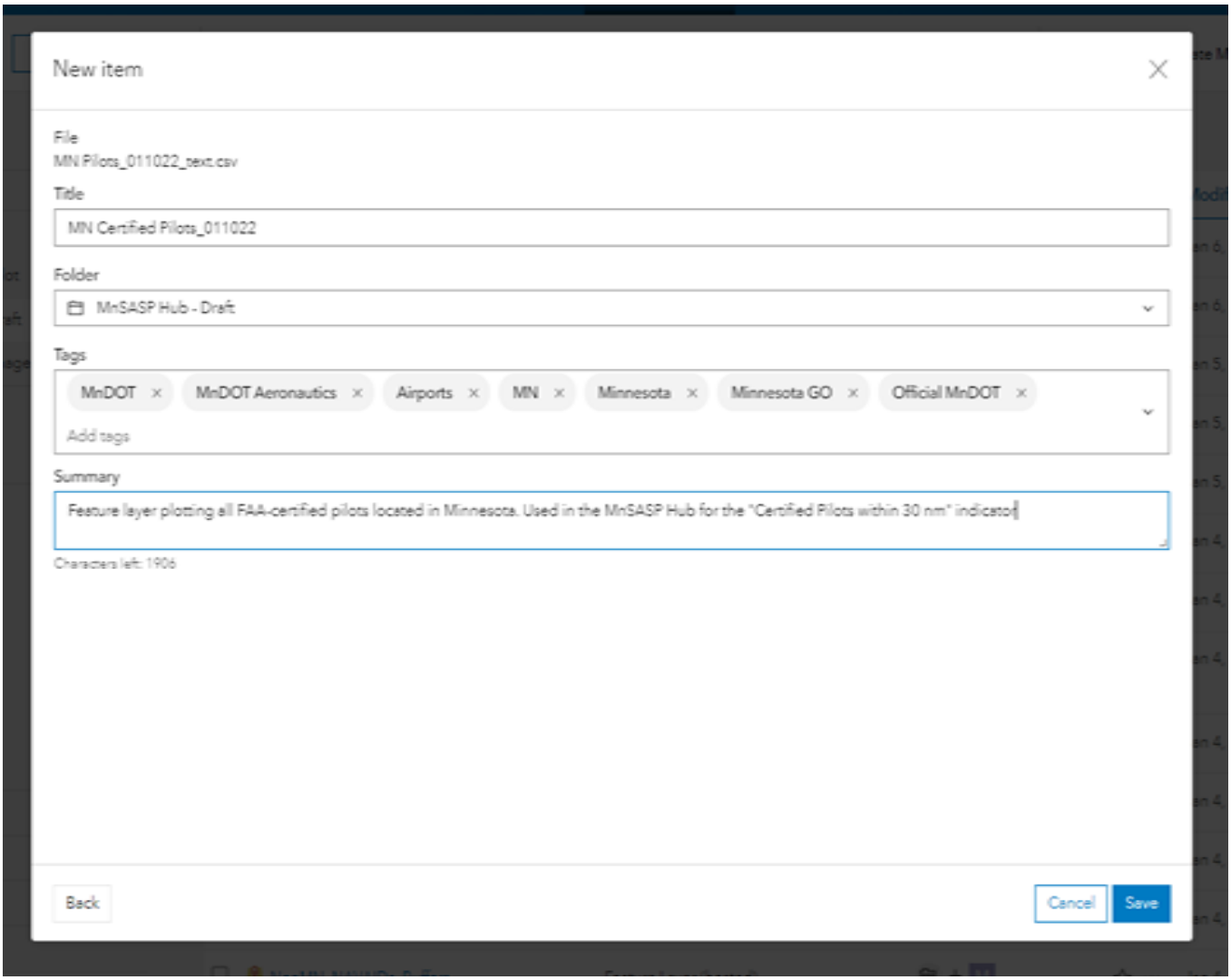
Sources: ArcGIS Online 2022; Kimley-Horn 2022

12) Once the new feature layer has been created, the item's detail page appears. To start the proximity analysis, locate and click "Open in Map Viewer Classic." Note that the proximity analysis can also be completed in "Map Viewer."

13) To complete the proximity analysis in the map viewer, 30nm buffers need to be created around each of the airports in the state aviation system. Add the "MnSASP Hub Airport Data" feature layer to the new web map (if it is not already populated in the map – this may have happened by default).

14) Locate the sublayer "MnSASP Hub Airport Data – Airport Background." To create the 30nm buffers, locate and click "Perform Analysis" -> "Use Proximity" -> "Create Buffers." Refer to **Figure 6-40** for a screenshot reference.

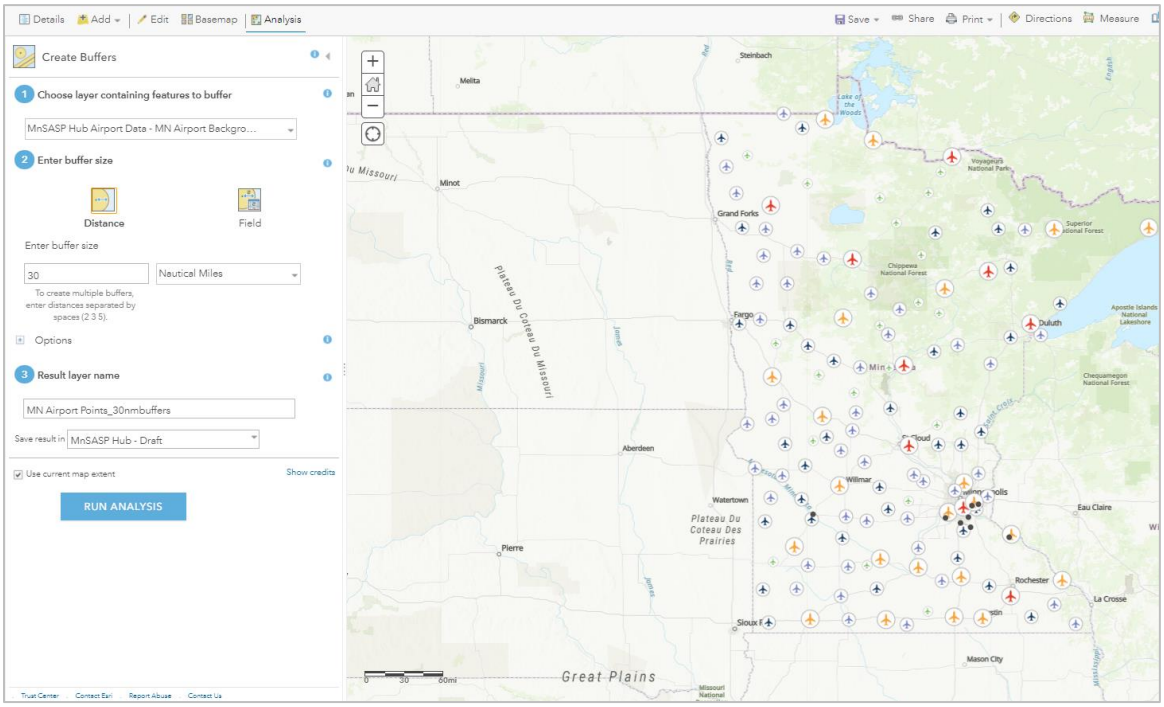
Figure 6-40. Locate Buffer Analysis Tool



Source: ArcGIS Online 2022; Kimley-Horn 2022

15) In the following window, specify a 30 nm buffer size and a distinct name for the new layer of buffers (e.g., MN Airport Points_30nmbuffers"). For saving the buffer layer, specify a location that can be easily retrieved from for future use. Once these parameters are specified, click "Run Analysis." Refer to **Figure 6-41** for a screenshot reference.

Figure 6-41. Buffer Analysis Parameter Selection

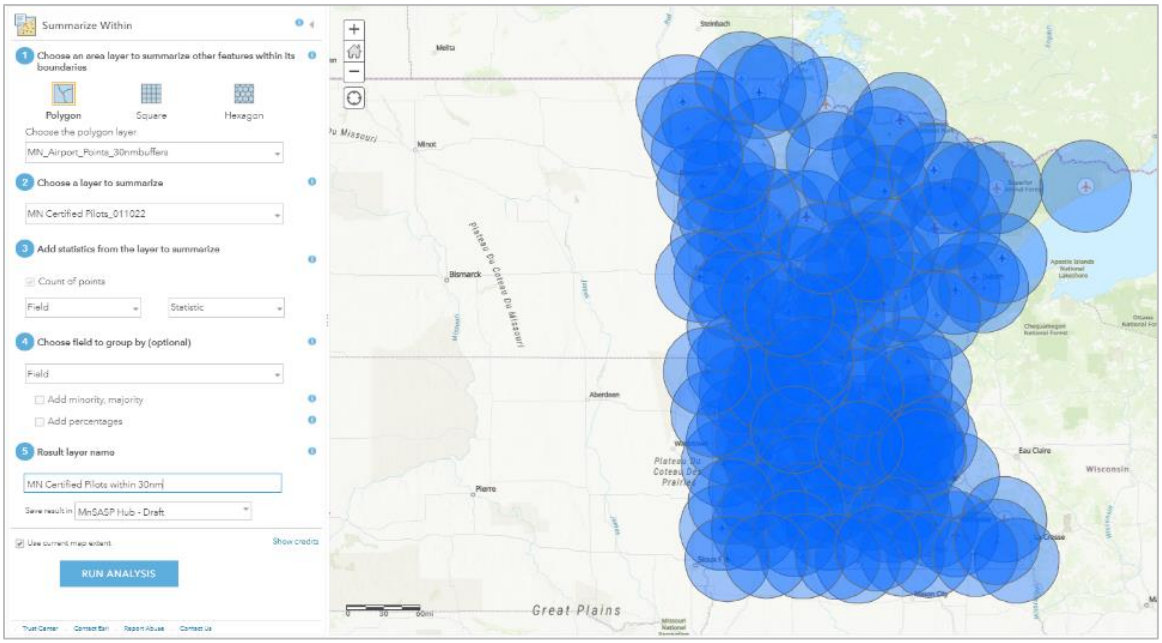


Sources: ArcGIS Online, 2022; Kimley-Horn, 2022

16) Once the analysis is complete, the new 30nm buffers should appear in the map for all airports. With the buffers created, the proximity analysis can now be completed. Locate the new buffer layer in the left-hand list and click “Perform Analysis” -> “Summarize Data” -> “Summarize Within.”

17) In the following criteria window, ensure that the buffer layer is selected as the “polygon layer” and the certified pilot feature layer is selected as the layer to summarize. For the remaining criteria, refer to **Figure 6-42** for a screenshot reference. Once all the criteria are set, click “Run Analysis.”

Figure 6-42. Proximity Analysis Criteria



Source: ArcGIS Online, 2022, Kimley-Horn, 2022

18) A new feature layer will be created with the first field populating the number of certified pilots within each airport's 30 nm proximity buffer.

6.4.2.10. Registered Aircraft in Minnesota

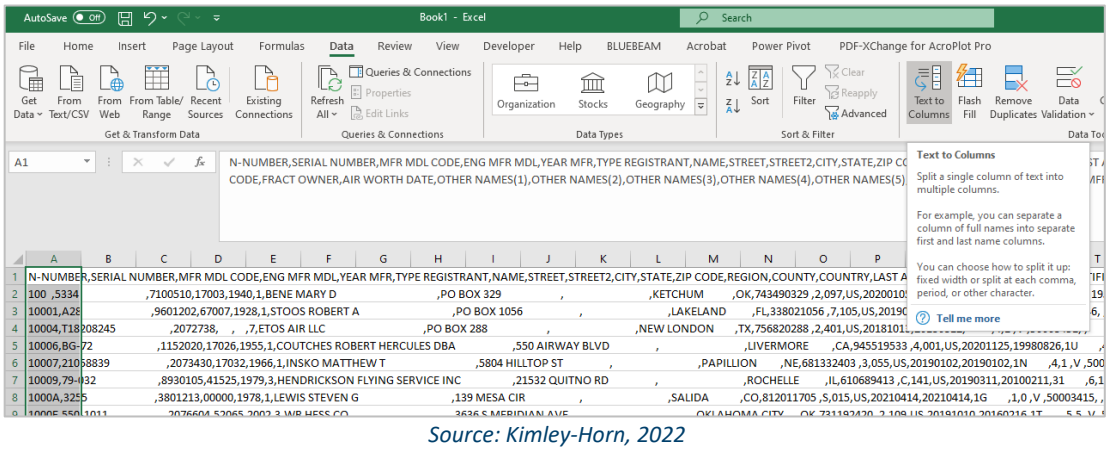
1) Navigate to the following website: https://www.faa.gov/licenses_certificates/aircraft_certification/aircraft_registry/releasable_aircraft_download/.

2) Download the full FAA Aircraft Registration Database and extract all the contents of the zip folder.

3) The download contains multiple text files and a PDF reference. The text file titled "MASTER" contains all the pertinent information for this task. Copy this data into a new Excel workbook.

4) To parse the data, locate and select the "Text to Columns" function to split the fields by commas. Refer to **Figure 6-43** for a screenshot reference.

Figure 6-43. Text to Columns function

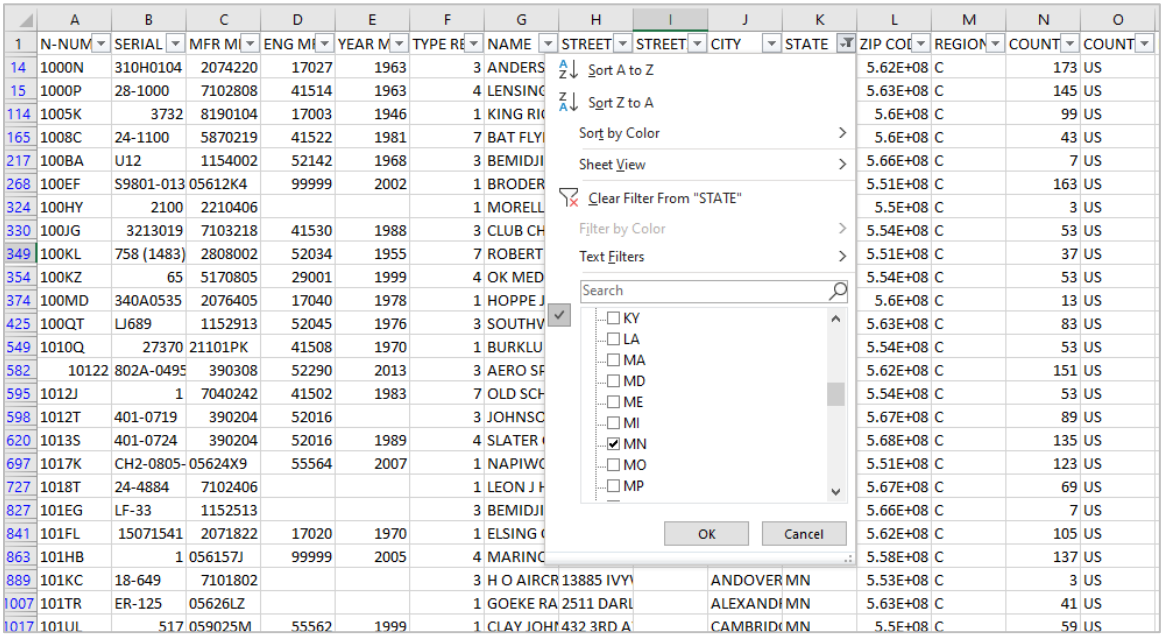


Source: Kimley-Horn, 2022

5) Convert the data into a table (Insert tab -> Table) to add filters throughout the dataset.

6) Use the state filter to only include the registered aircraft in Minnesota. Refer to **Figure 6-44** for a screenshot reference.

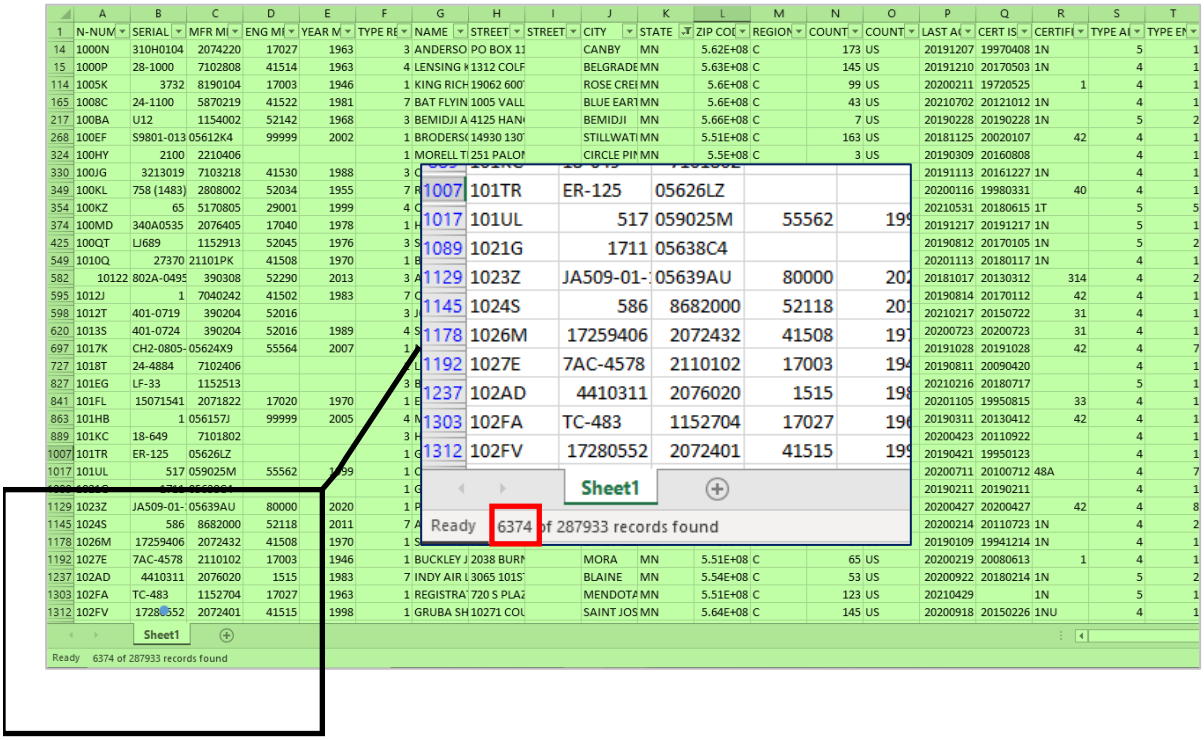
Figure 6-44. Registered Aircraft – Add State Filter



Source: Kimley-Horn, 2022

7) The number of registered aircraft in this filtered dataset is located at the bottom left of the sheet. Refer to **Figure 6-45** for a screenshot reference.

Figure 6-45. Registered Aircraft – Number of Filtered Records



Source: Kimley-Horn, 2022

6.5. Summary

The MnSASP Hub offers an interactive and engaging platform to quickly view airport and system characterics, as well as reliably assess performance in terms of the metrics established by the MnSASP. The application also facilitates MnDOT Aeronautics' ability to conduct continuous system planning by supporting the identification and justification of airport improvement needs. However, MnSASP data will quickly become outdated as planning, design, and construction projects are completed; zoning is updated; land is acquired; and airport sponsors, users, and MnDOT Aeronautics continue to work on behalf of airports. Additionally, changing aviation activity levels generated by new and shifting aviation demands will too impact the accuracy of MnSASP data. As a result, it is imperative that MnSASP data be continusely monitored and updated to remain useful over time. Although MnDOT Aeronuatics is responsible for maintaining the MnSASP Hub, data updates must be a collaborative effort between airport sponsors, consultants, engineers, and other aviation stakeholders to support the accuracy of the MnSASP Hub for continuous aviation planning. Through dedication and partnership between the stakeholders primarily responsible for the preservation and expansion of Minnesota's state system airports, the MnSASP Hub offers an exciting, unique, and promising opportunity to align policy- and funding-related decisions with actual, data-driven needs within the state.